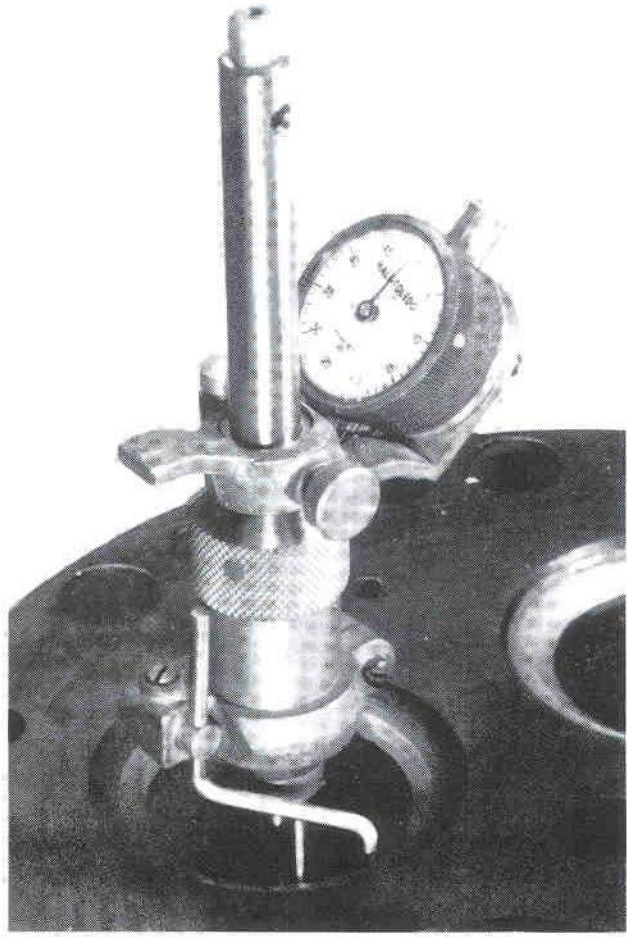
HALL
TOLEDO
(419) 893-4334
525 W. SOPHIA ST., MAUMEE, OH 43537-1847
1-800-228-4255 • FAX 419-893-6492

VALVE SEAT DIAL INDICATOR



VIP/EJ – Dial Indicators
In .001" or .0001" available to fit 7/16", 3/8" and 3/8" + .10" top diameter pilots.

9329 Dial Indicator - EDP
To be used with all valve guide pilots with 9/16 top diameter

VALVE SEAT DIAL INDICATORS

The Hall-Toledo valve seat gauge is an essential accessory in the reconditioning of valve seats. Graduated in thousandths, or ten thousandths, the indicator checks accuracy of total valve seat runout. It is very important on today's gas and diesel engines to maintain perfect contact between valve and valve seat. In reconditioning valve seats, concentricity between valve seat to valve guide must be checked. To use the Hall-Toledo dial guage simply slip it over the pilot then tighten one thumb screw and you're ready to indicate the seat. All of this takes only a matter of seconds. By using the Hall-Toledo gauge, you can catch a bad valve seat and eliminate those costly returns due to valve leakage.

Model EDP
Eccentric Valve Seat Grinder
for Diesel Engines

Operating and Servicing Instructions

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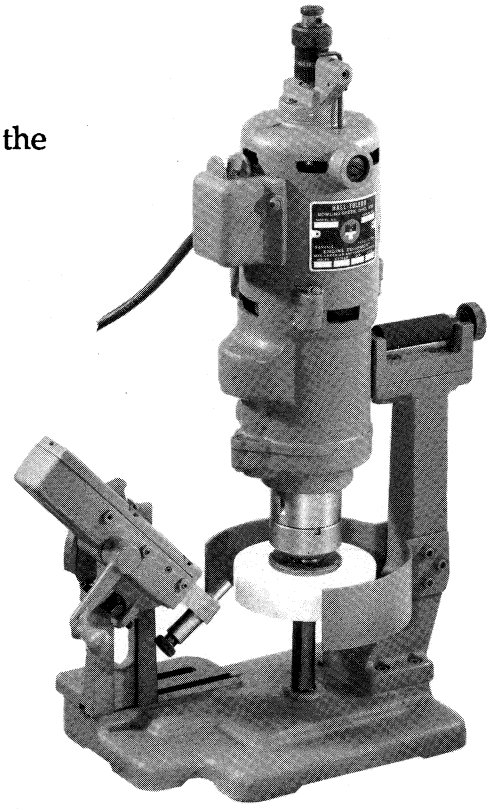
Introduction

An Explanation of The **HALL-TOLEDO** Eccentric Seat Grinding Principle



The **Hall-Toledo Model EDP Diesel Grinder** employs the Hall-Toledo eccentric grinding principle:
- a high-speed grinding wheel which revolves on an axis 3/64" from the center of the grinding seat
- a wheel center that moves at a much slower speed in planetary fashion around the seat center

While the grinding proceeds point by point around the seat, the rest of the seat does not contact the wheel. This allows the metal cuttings and wheel chips to freely escape.

A 1/2 H.P. universal current motor drives the grinding wheel at 3800 R.P.M. through double reduction gearing and operates the planetary motion at 15 R.P.M. through a two-step worm and gear train.

The Hall-Toledo pilot guides the grinder so that it produces a true seat, one which is properly centered on the valve guide. One end of the pilot accurately fits the valve guide while the other end has a close running fit in the central bore of the tool. At this point, a replaceable hardened bushing or "eccentric shaft" takes the wear.

A micrometer feed screw in the top of the grinder controls the grinding speed by adjusting the wheel's position relative to the seat. A feed rod, which is set for position and then locked in the feed nut, extends downward to rest on top of the pilot and carries the weight of the grinder during operation.

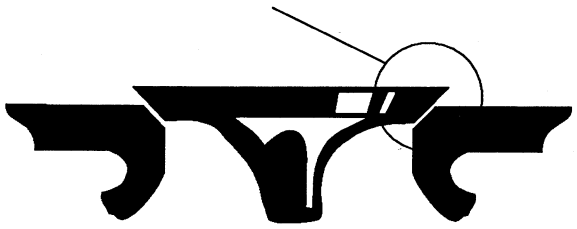
In eccentric grinding, only one point of the grinding wheel contacts the seat at any moment. However, with concentric grinders, the high-speed wheel contacts the whole seat all at once. With the latter, the accuracy of the finished seat is diminished by any of the following three conditions: 1. a hard spot which, when struck, might cause the wheel to dig in or gouge the seat at a point opposite the hard spot 2. a wheel which when loaded or glazed, could make grooves or ridges in the seat because of remaining

and undispersed cuttings 3. the rapid wear of the grinding wheel. Eccentric grinding eliminates all of these problems with its point contact method.

The **Hall-Toledo Eccentric Valve Seat Grinder** is a precision grinder employing the latest and most approved practice of "point contact" precision grinding. Its operation is simple and mechanics can use it correctly when following the instructions.

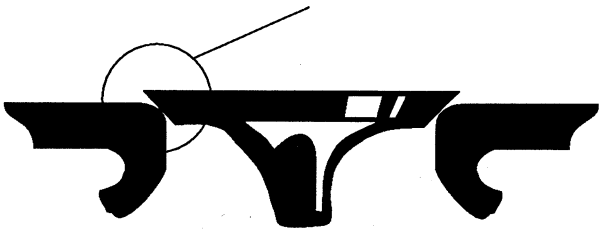
A COMPARISON OF GROUND VALVE SEATS

Note Perfect Seating Of The Valve

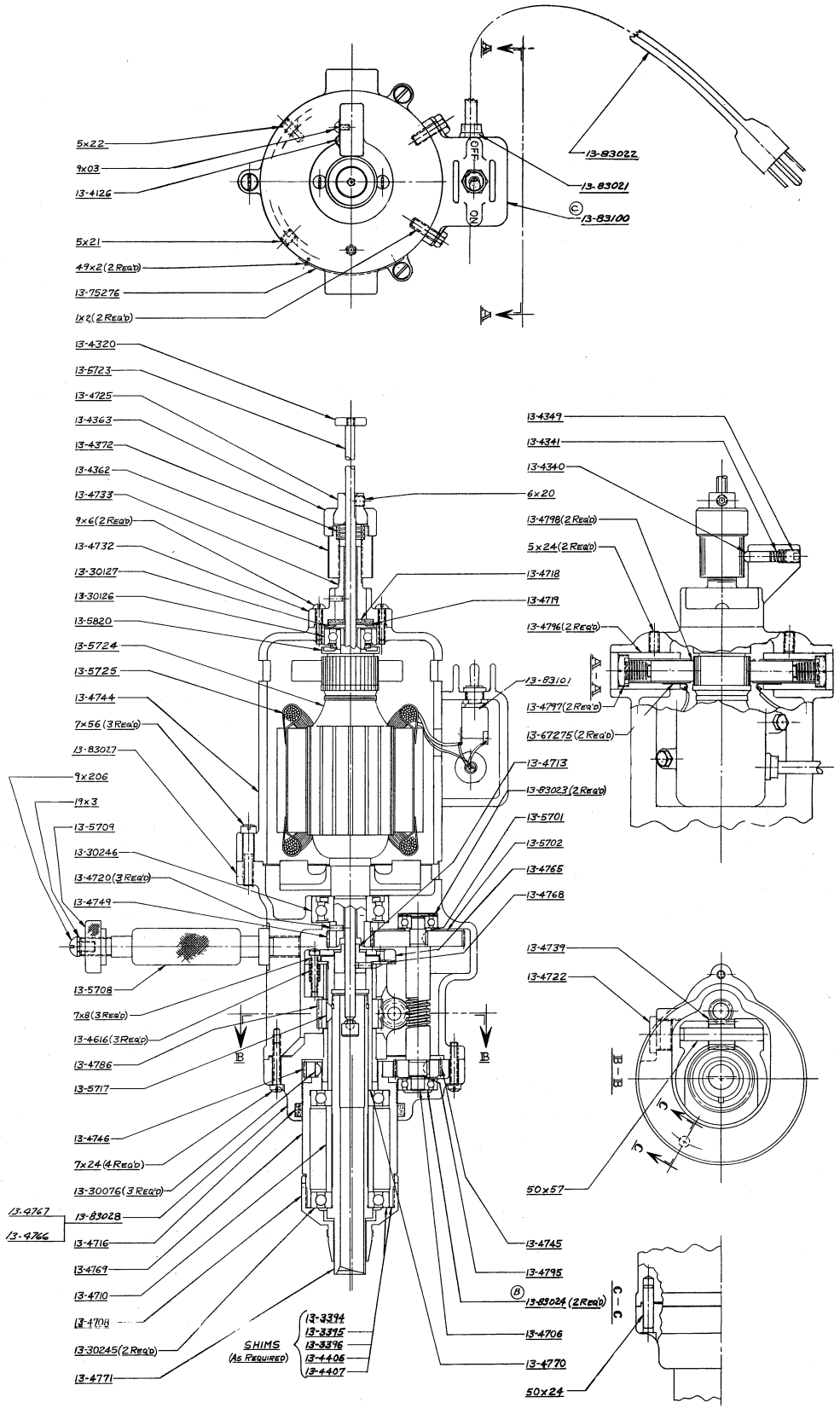


With Eccentric Grinder.
Above is a cross-section of an eccentrically ground valve in a valve seat. Note the perfect seating of the valve in contact with the flat face of the seat. Even an inexperienced operator can obtain this precision with an ECCENTRIC grinder.

Note Rounded Or Crowned Face Of The Seat



Without Eccentric Grinder.
The above shows what can happen when a valve seat is ground by the concentric method. Note the rounded or crowned face of the seat which makes only hairline contact with the valve. This happens when the grinding wheel wears rapidly and becomes grooved.



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EDP Parts List

Part No.	Name of Part
3394	Shim
3395	Shim
3396	Shim
4087	Cord Assembly
83022	Cord Assembly-New-Style-(Beginning with S/N H 14000)
4126	Wrench Clip
4320	Adjusting Rod Head
4340	Adjusting Screw Plunger
4341	Spring
4346	Cord Clip
4349	Screw
4362	Adjusting Nut
4363	Cap
4372	Spring
4406	Shim
4407	Shim
4706	Worm & Worm Shaft
4708	Stone End
4710	Spacer
4716	Washer
4718	Washer
4719	Washer Retainer
4720	Pin
4722	Shoulder Plug
4725	Adjusting Nut Ball
4732	Feed Ratchet Holder
4733	Sleeve
4739	Worm & Gear
4743	Lower Case
83027	Lower Case-New Style-(Beginning with S/N H 14000)
4744	Motor Housing
4745	Gear
4746	Spur Gear
4766	Bushing
4749	Spur Gear
4765	Thrust Plates
4767	Bushing
4769	High Speed Shaft
4768	Thrust Washer
4770	Eccentric Shaft Holder
4771	Eccentric Shaft
4786	Gear
4796	Brush Holder
4795	Washer
4797	Brush Cap
4798	Brush & Spring Assembly
5701	Spacer
5702	Upper Gear

Part No.	Name Of Part
5708	Handle
5709	Nut
5717	Key
5723	Adjusting Rod Assembly
5724	Armature 110V
5725	Field 110V
5726	Armature 220V
5727	Field 220V
5820	Dust Washer
9577	Wrench
30076	Key
30078	Spring
83023	Spring-New Style-(Beginning with S/N H 14000)
30126	Bearing-Armature-Top End
30127	Spring
30155	Bearing
83024	Bearing-New Style-(Beginning with S/N H 14000)
30245	Bearing
30246	Bearing-Armature-Bottom End
75135	Body & Bushing Assembly-Old Style-(Ending with S/N H 13999)
83028	Body & Bushing Assembly-New Style-(Beginning with S/N H 14000)
75276	Name Plate
77669	Screw Connector
78924	Control Switch
83101	Control Switch-New Style-(Beginning with S/N H 14000)
78925	Switch Guard-(Obsolete 1982)
78926	Switch Box
83100	Switch Box-New Style-(Beginning with S/N H 14000)
83021	Strain Relief
4616	Spring
5 x 21	Screw
6 x 20	Screw
7 x 24	Screw
7 x 56	Screw
9 x 03	Screw
9 x 6	Screw
49 x 2	Screw
9 x 51	Screw
1 x 1	Screw
8 x 05	Screw
5 x 24	Screw
5 x 22	Screw
50 x 34	Screw Pin
19 x 3	Washer

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PILOTS FOR MODEL EDP VALVE SEAT GRINDERS

The **Hall-Toledo** pilot consists of an upper and a lower portion. The lower portion fits into the valve guide and the upper portion projects above the valve seat into the valve seat grinder. When selecting pilots for use with **Hall-Toledo Model EDP Valve Seat Grinders,** first determine the size of pilot required.

After determining the size of pilot required, check the pilot specifications and select a pilot whose bottom length is at least 1/8" shorter, but at least 2/3 as long as the valve guide. The "length of the valve guide" is the length of the valve guide bearing against the valve stem. If the valve guides are counterbored or chamfered on the inside, the pilots will have to be correspondingly shorter.

Place the pilot in the valve guide using the special wrench furnished with this equipment. Do not wring or wind the pilot into the guide - **just gently set it against the taper**. Expand the pilot by turning the knurled knob on the top of the wrench. Do not tighten this knob excessively - merely pull it up snug with thumb and finger.

PILOT SPECIFICATIONS

Guide Size	Pilot No.	Length At "A"	Length At "B"	Pilot Type
5/16"	9523	5-1/4"	2"	C
11/32"	9246	5-1/4"	2-5/8"	C
3/8"	9266	5-1/4"	2-1/4"	C
3/8"	9245	5-1/4"	2-5/8"	C
13/32"	9244	5-1/4"	2-5/8"	C
7/16"	9267	5-1/4"	2-5/8"	C
1/2"	9274	5-1/4"	2-5/8"	C
1/2"	19249	6-7/8"	3-5/8"	C
17/32"	9565	5-1/4"	2-5/8"	C
9/16"	9675	7-1/4"	4-5/8"	C
11/16"	19456	7-1/4"	6-1/2"	C
5/8"	19424	7-5/8"	4-3/4"	C
3/4"	9367	8"	5"	C
7/8"	19014	8-1/4"	4-7/8"	E
7/8"	19259	7"	9-1/2"	E
7/8"	9559	9-5/16"	5-11/16"	E
15/16"	9661	8"	6-3/4"	E
1"	9238	8-1/4"	9-5/8"	E
1"	19301	8"	6-1/2"	E
1-1/8"	19378	9-1/4"	4-1/4"	E
1-1/4"	19094	8-11/32	7-9/32	E

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To avoid the necessity of using pilots of special length, pilots shorter than 2/3 the length of the valve guide can be used.

Once a pilot of the correct diameter and length has been selected, check the top length of the pilot to be sure that it projects at least 3" and not more than 6" above the combustion side of the valve seat to be ground.

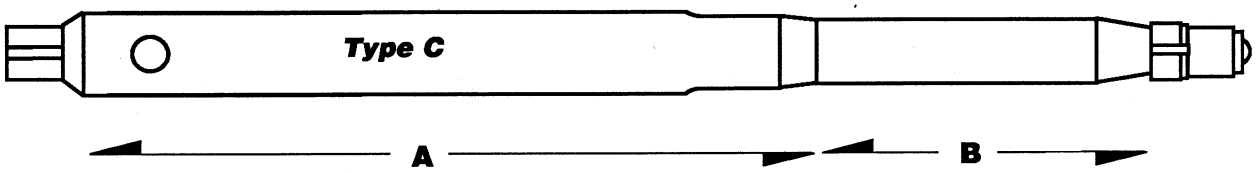
Several types of **Hall-Toledo** pilots are available. Solid, wring-in-plug pilots and expanding-collet pilots are standard and may be obtained in suitable length and diameter for each job.

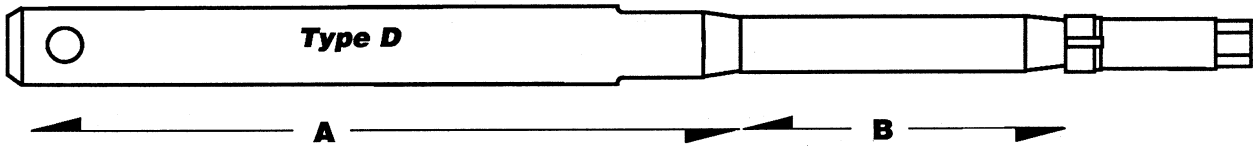
A pilot eccentric shaft clearance is .0001"—.0002" when new and may produce an unacceptable seat when worn to .001". It is important that both the pilot and eccentric shaft be cleaned before using, during use and protected from damage after use.

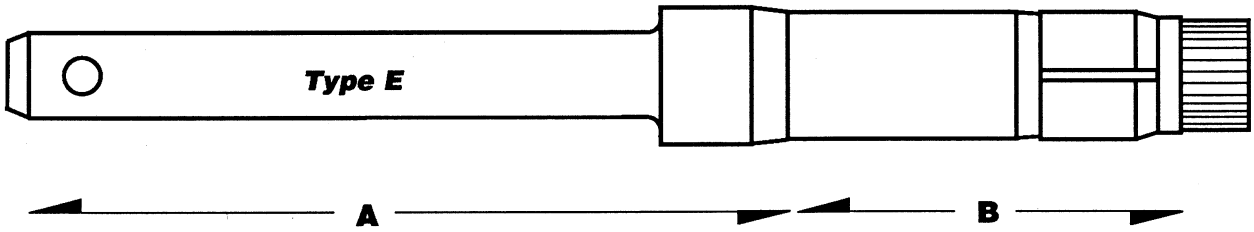
While the rotation of the eccentric shaft on the pilot is very slow — a matter of only 15-20 R.P.M. — the clearance is very small. Any abrasive matter allowed to enter the eccentric shaft could wedge and bind against the pilot and promptly cause serious wear.

Be sure that the pilot is clean, straight and fits the guide accurately. Wipe the pilot with a clean cloth before using. Do not use oil on pilots except to aid in cleaning them. Be certain to wipe free of oil. Oil on the pilot collects abrasive dust from the grinding operation and forms a lapping compound. This wears out the pilot and eccentric shaft.

NOTE: If there is doubt as to the proper pilot required for any particular job, advise us of engine make, model and serial number and we will recommend the best pilot to use.







NOTE: For a pilot price quote, blueprints should be submitted showing:

- inside diameter of valve guide
- over-all length of valve guide
- distance of valve seat from top of guide
- position of valve seat in cylinder head or block
- clearance around valve seat to combustion chamber
- type of valve seat insert, if any, giving alloy and hardness
- diameter and angle of valve seat
- Also, give make, model and serial number of engines

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SETTING THE GRINDER

Remove the grinder from the dressing stand and place it over the pilot installed in the valve guide. Loosen the allen set screw and push the feed rod down until it stops. This is then located on the top of the pilot. Tighten the set screw against the feed rod.

Turn the feed adjustment to the right (clockwise) as indicated by the arrow stamped above "release", until the grinding wheel is free and clears the seat. Check this adjustment by rotating the grinder around the pilot. Another method sometimes used is to rotate the spindle by hand to check whether or not it is clear of the seat.

GRINDING THE SEAT

First, be certain that the valves are accurate and properly faced. The complete valve job is dependent on both accurate seats and accurate valves.

Second, grind the seats with your **Model EDP** grinder according to the following procedure:

> Place metal particle ring over seat area to be ground. Start the motor. Hold handle. Turn the feed screw to the left (counter-clockwise) as indicated by the arrow at "Grind." Feed one notch at a time until the seat is cleaned up. Generally, a show of sparks around the entire seat during one eccentric revolution indicates a finished, true seat. This is one of the many advantages of **Hall-Toledo** eccentric grinding. Allow the grinding wheel to continue running until it grinds itself free. Turn the feed screw to the right (clockwise) to release the grinding wheel. Shut off the motor and allow the grinder to stop before removing it from the pilot.
>
> If the valve seat must be narrowed, this can be done by using the 30° grinding wheel on 45° seats, narrowed from the top. Use 15° narrowing the wheel on 30° seats. For "Choke" narrowing, or narrowing from the inside of the seat, use a 60° grinding wheel.

GRINDING WHEEL DRESSING

A grinding wheel is properly dressed as follows:

Clean taper on grinder spindle and inside taper of wheel insert. Screw wheel onto grinding spindle using a grinding wheel adapter if required. Place the grinder in the saddle stand being certain to firmly locate the grinding wheel end of the spindle over the dresser stand. Tighten the screw of the handle so the grinder is held firmly. Properly locate the quadrant assembly to assure full diamond traverse across the angle of the wheel. Start the motor and pass the diamond back and forth across the face of the operation until the stone has been dressed across its entire width.

The operator must be certain that the valve seat angle matches the valve face angle in accordance with the engine manufacturer's specification. Final adjustment to a specific angle, for example 45° , is obtained by blueing the valve to show proper contact with the valve seat. This should be done when installing new valves as well as when refacing present valves. Slight final adjustment of dresser angle to obtain proper valve to valve seat blue-in contact may be necessary. Once adjusted, the setting is permanent until the dresser quadrant is moved to another angle.

Maintenance

PREVENTIVE MAINTENANCE

The **Model EDP** is a grinder. There will be a certain amount of dry abrasive dust in the air when the tool is in operation. This abrasive dust will cause considerable damage and excessive wear if the tool and pilots are not cleaned frequently and well. After each job, the pilot should be carefully washed in a **SOLVENT** solution and thoroughly wiped. This cleaning will prevent abrasives from entering the eccentric shaft and prevent undue wear to either pilot or shaft. The eccentric shaft should be swabbed out occasionally with a clean cloth on the end of a stick or wire.

Pilots should always be kept clean and the collets should be removed from time to time and thoroughly cleaned so that accurate centering is possible.

Grinding wheels should always be kept away from oil. If grinding wheels do become soaked, they will not cut properly. If, by accident, some wheels become soaked with oil, allow them to stand in carbon tetrachloride for a few minutes. Then screw the wheel onto the grinder and let it spin dry. This should be repeated several times until, in most cases, the oil will be washed from the wheel so that it will again cut freely.

The **Hall-Toledo Model EDP Eccentric Grinder** is equipped with a fan mounted on the lower end of the armature which blows air through the motor case and keeps the machine cool. This is the **first place to look for trouble** when the operator notices the machine is beginning to heat excessively.

LUBRICATION

Do not add additional lubricant to the gear box if the machine begins to operate above normal temperature. Because of the high speed gear construction, excessive lubrication causes more heat to be generated. Each machine is sent out from the factory packed with enough lubricant to last for approximately 1,000 hours of operation. If lubricant must be added to the gear chamber, only about 1/2 teaspoon should be added, and then it should only be special lubricant, **Hall-Toledo No. 4475, No. 76 grease**, furnished in 6 ounce tubes. This must be obtained from **Hall-Toledo**.

ECCENTRIC SHAFT REPLACEMENT

The eccentric shaft, **(Part No. 4771)**, is very easily replaced in your shop by loosening the shaft with the two spanner wrenches included, **(Part No. 5704)**. Insert one wrench into the flats on the high speed shaft, **(Part No. 4769)**, and the other wrench into the flats on the nose-end, **(Part No. 4708)**. A slight rap with a rubber mallet or block of wood may be required to loosen it. Unscrew the nose end counter-clockwise. Pull out the spindle assembly and remove eccentric shaft from spindle. Replace with the new eccentric shaft and reverse the above steps. Make sure gears are meshed properly, tighten high speed shaft, and tighten nose end snugly.

After removing the spindle, it may appear that the gear on top of the spindle is dry. This is a normal condition as the gear operates only on a film of lubricant. The outside of the spindle should be dry at reassembly time. It is also important to remember that the housing of this machine does not serve as a bearing for the spindle.

FACTORY REPAIRS

Sometimes it may be necessary to make repairs other than those described in the preceding pages. Our Maumee factory maintains complete service facilities with experienced workmen, special tools and test equipment. Your **Model EDP** may be returned directly for an estimate of the cost of repair. Repairs to obtain new operating conditions are made only after you authorize us to proceed at the estimated cost. All shipments must be made on a postage or freight prepaid basis to our factory at **525 W. Sophia, Maumee, Ohio 43537-1847.**

EDP TROUBLESHOOTING REFERENCE GUIDE

Pre-Staging

New **Hall-Toledo** machines are run at least eight hours or more in order to:

1. run in the bearings
2. check for any problems with gear meshing
3. check for any electrical problems concerning fields and armature switches

All machines are then tested on our seat-testing equipment which will in turn show minor wear on the adjusting nut. The machines are released only after they produce a seat with a run-out of .001 inch.

Your **Hall-Toledo** eccentric valve seat grinder is a precision tool which should give years of excellent performance when cared for properly. Care should be taken not to drop or otherwise mishandle it. When not in use, the grinder should be stored in a clean, dry place where it will not be damaged by surrounding objects.

As with any machine, its performance may sometimes fall below its normal, high standards. **Hall-Toledo** provides a complete factory service facility for repairs and/or rebuilds. However, to avoid unnecessary expense for simple problems, the following is recommended on the next page:

● BEFORE CALLING FOR SERVICE - CHECK THE FOLLOWING ●

PROBLEM	CHECK FIRST/SOLUTION
Machine will not start	Brushes are holding up in brush holder (i.e. new paint, carbon build-up from brushes, etc.). Inspect, wipe off with a clean rag and replace.
Machine runs hot	The Model EDP Grinder requires time for the bearings to settle into place after shipping. The machine will run hot until they settle in. Allow 8-10 hours of working time to do this.
New machine losing accuracy	Old and/or worn-out pilots.
Not producing a good seat	**a)** Check feed rod. Unscrew nut at top of rod, let feed rod drop through nose end. If the link is worn or not there at all, replace. **b)** Check pilots. They should have a top outside diameter of 9/16" (.5625). If they indicate less than that, replace. **c)** Check eccentric shaft. This is the area of greatest wear. With proper use, the eccentric shaft should be replaced after 1000 hours of use.
Recessed seats	Allow more room for wheels to work. Wheels that are too large will hit the side of the recess and interfere with operation.

If the operation of your **Hall-Toledo** precision grinder is still not satisfactory after you have completed the troubleshooting steps as outlined above, contact our factory at **525 W. Sophia, Maumee, Ohio 43537-1847** for additional service information.

SAFE OPERATING RECOMMENDATIONS

1. **USE THE PROPER ELECTRICAL CURRENT:** Standard United States and Canadian currents are 110 to 120 volt, 60 HZ, alternating current. Other countries may use different currents. If in doubt, check the electrical rating label affixed to the unit. The wrong kind of current could cause an electrical short circuit, possible over-heating or shocks.

2. **GUARD AGAINST SHOCK HAZARDS:** Do not, for any reason, cut or remove the grounding prong from the power cord. Be sure it is plugged into a properly-installed grounding receptacle.

3. **AVOID ELECTRICAL SHOCK:** Never insert metal objects such as screwdrivers inside the electrical components of the unit.

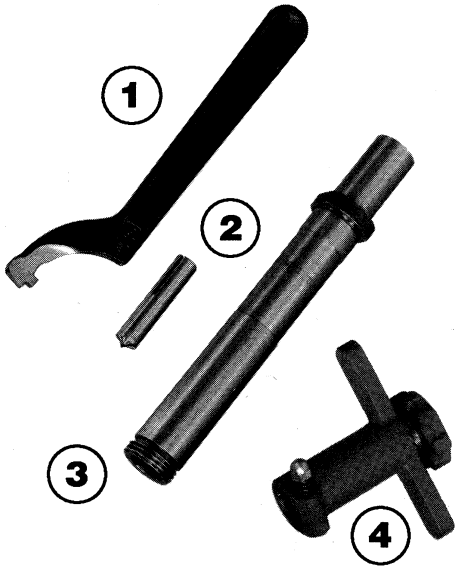
4. **TURN UNIT OFF AND UNPLUG:** Turn the Power Switch OFF when finished grinding. Unplug the unit if it will not be used for an extended period.

5. **WEAR EYE PROTECTION:** Grinders should not be operated without appropriate eye protection (i.e. goggles or safety glasses).

6. **USE HEARING PROTECTION:** For prolonged use, hearing protection is recommended.

7. **ABRASIVE PARTICLE RING:** Each EDP Basic Set comes with an abrasive particle ring that is used to contain the grinding materials released during seat grinding. We recommended that this ring be placed on the head that surrounds the valve seat during all grinding operations.

Parts & Accessories

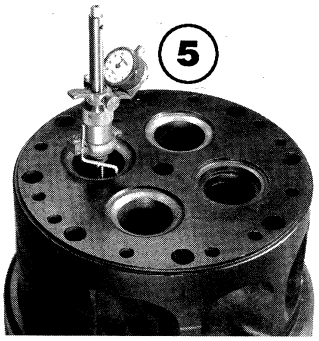


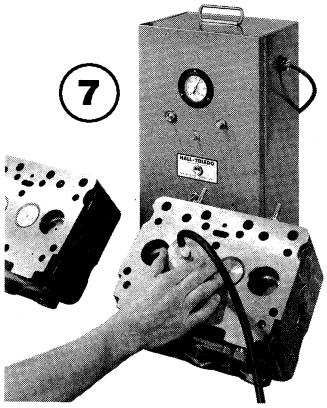
1. **Spanner Wrench: Part No. 5704.** Two are required to loosen nose end on EDP so eccentric shaft can be taken out.

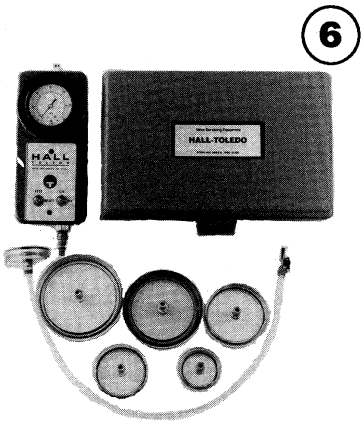
2. **Replacement Diamond: Part No. 3551.** For use with any EDP grinder dresser, **Part No. 4793.**

3. **Replacement Eccentric Shaft: Part No. 4771.** For use on any EDP Grinder.

4. **Pilot Wrench: Part No. 19090.** Used for inserting or removing pilot from guide.







5. **EDP Valve Seat Dial Gauge: Part No. 9329.** For checking run-out of valve seat; a must for precision accuracy.

6. **Model AVG Air Operated Vacuum Gauge: Part No. 83170.** Automatic air-operated gauge for a precise check of the seal between the valve seat and the valve.

7. **Model PVSVG Power Vacuum Gauge: Part No. 77123.** Simply the best way to check valve assembly seals. In seconds, the PVSVG can check a complete cylinder head and test individual valve assemblies.

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MODEL EJ ECCENTRIC VALVE SEAT GRINDER

OPERATING INSTRUCTIONS

525 West Sophia Street
Maumee, OH 43537-1847
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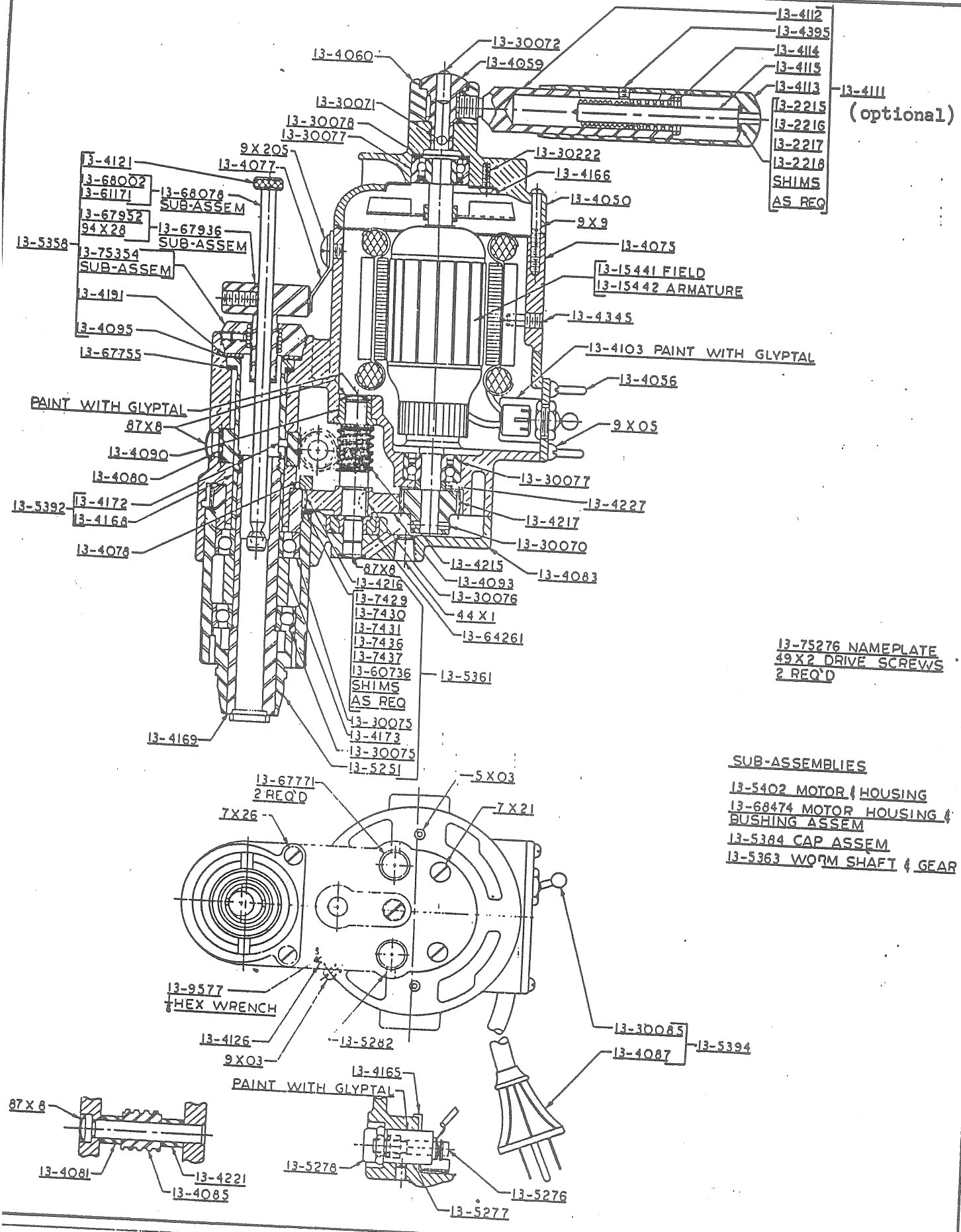
1-800-228-4255 (orders)
Fax: (419) 893-6492

EJ GRINDER
PARTS LIST - ALL MODELS

PART NO.	NAME OF PART
4056	Switch Plate
4075	Housing
4077	Spring
4078	Housing Tie
4080	Worm Gear
4081	Worm Gear
4083	Lower Cap
4085	Worm Gear
4087	Cord Set
4090	Bushing
4093	Fiber Gear
4094	Shim
4095	Shim
4096	Shim
4103	Insulator
83030	Handle
4121	Nut
4126	Wrench Clip
4165	Brush & Shield
4169	Eccentric Shaft
4179	Shim
4191	Washer
4215	Worm & Shaft
4217	Drive Gear
4221	Worm & Gear Shaft
4227	Grease Slinger
4234	Thrust Plug
5276	Brush & Spring
5277	Brush Holder
5278	Brush Cap
5282	Pin
5327	Shim
5361	Spindle & Gear Assembly
5384	Cap Assembly
5392	Eccentric Shaft Holder Assembly
9577	Allen Wrench
15439	Field 220V.
15440	Armature 220V.
15441	Field 110V.
15442	Armature 110V.
30070	Groove Pin
30071	Groove Pin
30072	Groove Pin
30075	Bearing

30076	Key
30077	Bearing
30078	Spring
30085	Switch
61077	Feed Rod Assembly
62949	Clip
64261	Rubber Bearing
67755	Loading Spring
67771	Bushing
67936	Adjusting Screw Knob
75276	Name Plate
75412	Adapter
7 x 21	Screw
7 x 26	Screw
9 x 05	Screw
9 x 9	Screw
5 x 03	Screw
9 x 205	Screw
49 x 2	Screw
44 x 1	Grease Plug
87 x 8	Expansion Plug
5 x 21	Screw
5 x 03	Screw

MODEL EJ GRINDER



GRINDING WHEELS

Proper dressing of the grinding wheel is accomplished as follows: Clean taper on grinder spindle and inside taper of wheel insert. Screw wheel onto grinding spindle. Place the grinder over the two pins in the dresser stand. NOTE: The diamond point should never protrude excessively from its support. This will impart a better and smoother dress to the wheel. Loosen the lock screw on the reverse side of the quadrant and set the diamond dresser to the proper angle of the valve seat. Tighten the lock screw. Carefully adjust the diamond tipped dressing screw until it barely touches the grinding wheel. Pull diamond off wheel with lever and re-adjust the diamond tipped dressing screw toward the grinding wheel so that approximately .005" stock will be removed from the wheel when dressed. Start the motor and pass the diamond back and forth across the face of the grinding wheel through the use of the lever. Continue this operation until the stone has been dressed across its entire width.

The operator must be certain that the valve seat angle matches the valve face angle in accordance with the engine manufacturer's specifications. Final adjustment to a specific angle, for example 45°, is obtained by blueing the valve to show proper contact with the valve seat. This should be done when installing new valves as well as when refacing present valves. Slight final adjustment of dresser angle to obtain proper valve to valve seat blue-in contact may be necessary. Once adjusted, the setting is permanent until the dresser quadrant is moved to another angle.

PILOTS

Select pilot which will be compatible to valve guide in cylinder head that work is to be performed on.

Wipe pilot with a clean cloth before using. Do not use oil on pilots except to aid in cleaning them. Be certain to wipe free of all oil. Oil on the pilot collects abrasive dust from the grinding operation, thus forming a lapping compound. This wears out the pilot and the eccentric shaft.

Place pilot in the valve guide using the special wrench furnished with this equipment. Do not wring or wind the pilot into the guide - just set it against the taper gently. Expand the pilot collet by turning the nut on the top of the pilot. Do not tighten this nut excessively, merely pull it up snug.

SETTING THE GRINDER

Remove the grinder from the dressing stand and place it over the pilot installed in the valve guide. Loosen the Allen screw, and push down the adjusting rod until it contacts the pilot. Tighten the set screw against the rod. Tighten handle by screwing clockwise at proper position desired by operator.

Turn the feed adjustment to the right (clockwise) at "release" stamped on top until the grinding wheel is free and clears the seat. Check this adjustment by rotating the grinder around the pilot with the handle. Another method sometimes used is to rotate spindle by hand to check whether or not is is clear of the seat.

GRINDING THE SEAT

First, be certain that the valves are accurate and properly faced. The complete valve job is dependent on both accurate seats and accurate valves. Second, grind the seats with your Model EJ grinder according to the following procedure:

Start motor. Hold handle as outlined. Turn the feed screw to the left (counter-clockwise). Feed one notch at a time until the seat is cleaned up. Generally, show of sparks around the entire seat during an eccentric revolution indicates a finished, true seat. This is one of the many advantages of Hall-Toledo Eccentric Grinding. Allow the grinding wheel to continue running until it grinds itself free. Turn the feed screw to the right (clockwise) to release the grinding wheel. Shut off the motor and allow the grinder to stop before removing it from the pilot.

If the valve seat must be narrowed, this can be done by using the 30° grinding wheel on 45° seats, narrowed from the top. Use 15° narrowing wheel on 30° seats. For choke narrowing, or narrowing from the inside of the seat, use a 60° wheel.

PREVENTIVE MAINTENANCE

The Model EJ is a "grinder". As such, there will necessarily be a certain amount of dry abrasive dust in the air when the tool is in operation. This abrasive dust will cause considerable damage and excessive wear if the tool and pilots are not cleaned frequently and well. After each job, the pilot should be carefully washed in a solvent solution and thoroughly wiped. This cleaning will prevent abrasive dust from being carried into the eccentric shaft

and avoid undue wear to either the pilot or the shaft. The eccentric shaft should be swabbed out occasionally with a clean cloth on the end of a stick or wire.

Pilots should always be kept clean and the collets should be removed from time to time from the pilot and thoroughly cleaned so that accurate centering is possible.

Grinding wheels, of course, should always be kept away from oil. If grinding wheels become oil soaked, they will not cut properly. If by accident some wheels do become oil soaked, allow them to stand in carbon tetrachloride for a few minutes, then screw the wheel onto the grinder and let it spin dry. This should be repeated several times and in most cases the oil will be washed from the wheel so that it will again cut freely.

The Hall-Toledo Model EJ Eccentric Grinder is equipped with a fan mounted on the upper end of the armature which blows air through the motor case and keeps the machine cool. Occasionally blow out the motor case with compressed air, directing the air into the motor case through the opening in the bottom of the motor housing. This will remove any dust which may have collected around the switch or brush holder. This cleaning will prevent possible shorting of the machine.

MAINTENANCE

The balance of these suggestions will pertain to the necessary care and maintenance of the Hall-Toledo Eccentric Valve Seat Grinder. Remember: A PRECISION INSTRUMENT CAN PRODUCE ACCURATE WORK ONLY WHEN IN GOOD CONDITION. The condition of the equipment in your shop depends entirely on the care and the attention it receives. In practically every case where trouble had been reported, it was traceable either to lack of proper understanding of the equipment or because the equipment had suffered through lack of proper care.

LUBRICATION

Do <u>not</u> add additional lubricant to the gear box if the machine begins to operate above normal temperature. Because of the high speed gear construction, excessive lubrication causes more heat to be generated. Each machine is sent out from the factory packed with lubricant to last for approximately 1,000 hours of operation. If lubricant must be added to the gear chamber, it should only be about a half teaspoon of the special lubricant Hall-Toledo #4475, No. 66 grease, furnished in 6 oz. tubes. This must be obtained from Hall-Toledo or your local jobber.

ECCENTRIC SHAFT REPLACEMENT

The eccentric shaft is very easily replaced in your shop simply by loosening the shaft with a flat piece of stock or the spanner wrench supplied with the grinder which will fit in the slot in the lower end of the eccentric shaft. The shaft can then be removed without disturbing the rest of the grinder unit. This eccentric shaft is replacement part #4169. When the eccentric shaft is replaced, it should be pulled up just snug and never tightened excessively.

When the eccentric shaft is removed from the grinder, the entire grinding wheel spindle may be removed simply by lifting it out of the case. The gear on top of the spindle may appear almost dry. This is a normal condition as the gear operates only on a film of lubricant. The outside of the spindle should be dry at re-assembly. If this spindle is coated with heavy oil or grease when re-assembled, it will rub the housing and, because of the very close fit, cause heating. It is important to remember that the housing of this machine does not serve as a bearing for the spindle.

When wear has caused the feed screw threads to become loose in the mating thrust plug, back the thrust plug out of the housing until the set screw through its side can be adjusted with an Allen wrench. All that is needed is a slight adjustment of this set screw to restore the proper fit to the mating threads of the feed screw. Re-tighten the thrust plug in the housing.

FACTORY REPAIRS

Sometimes it may be necessary to make repairs other than those decribed above. Our Maumee factory maintains complete service facilities with experienced workmen and special tools and test equipment. Your grinder may be returned through your jobber or from you directly for a free estimate of the cost of repair. Repairs to new operating condition are made only following your authorization to proceed at the estimated cost. All shipments must be made on a postage or freight prepaid basis to our factory at:

HALL-TOLEDO, INC.
525 W. SOPHIA
MAUMEE, OH 43537-1847
(419) 893-4334
1-800-228-4255 (orders)
Fax: (419) 893-6492

INFORMATION ON USING THE EJ GRINDER

A. INSTALLING THE PILOT

1. Wipe the pilot clean of all oil or grinding dust particles before installation.

2. Slide pilot into valve stem guide hole until pilot taper nests on top of guide hole. At this point do not force the pilot down since this tends to throw the pilot off center.

3. With pilot located, tighten hex nut on top of pilot until the collet takes up clearance in the guide hole. It is important not to over tighten the hex nut.

B. BEFORE GRINDING

1. Place grinder on pilot and lower until grinding wheel rests on the valve seat. Always support the motor end weight so that the machine does not tip the pilot. This support weight consists of a slight upward force on the unit's handle. When you have the proper force the grinder can be easily moved up and down the pilot with no drag.

2. With the wheel on the seat, release the feed rod so that it rests on the top of the pilot. Retighten feed rod and back off feed screw in "Release" direction for three or four clicks. The wheel should now rotate free of the seat.

C. GRINDING

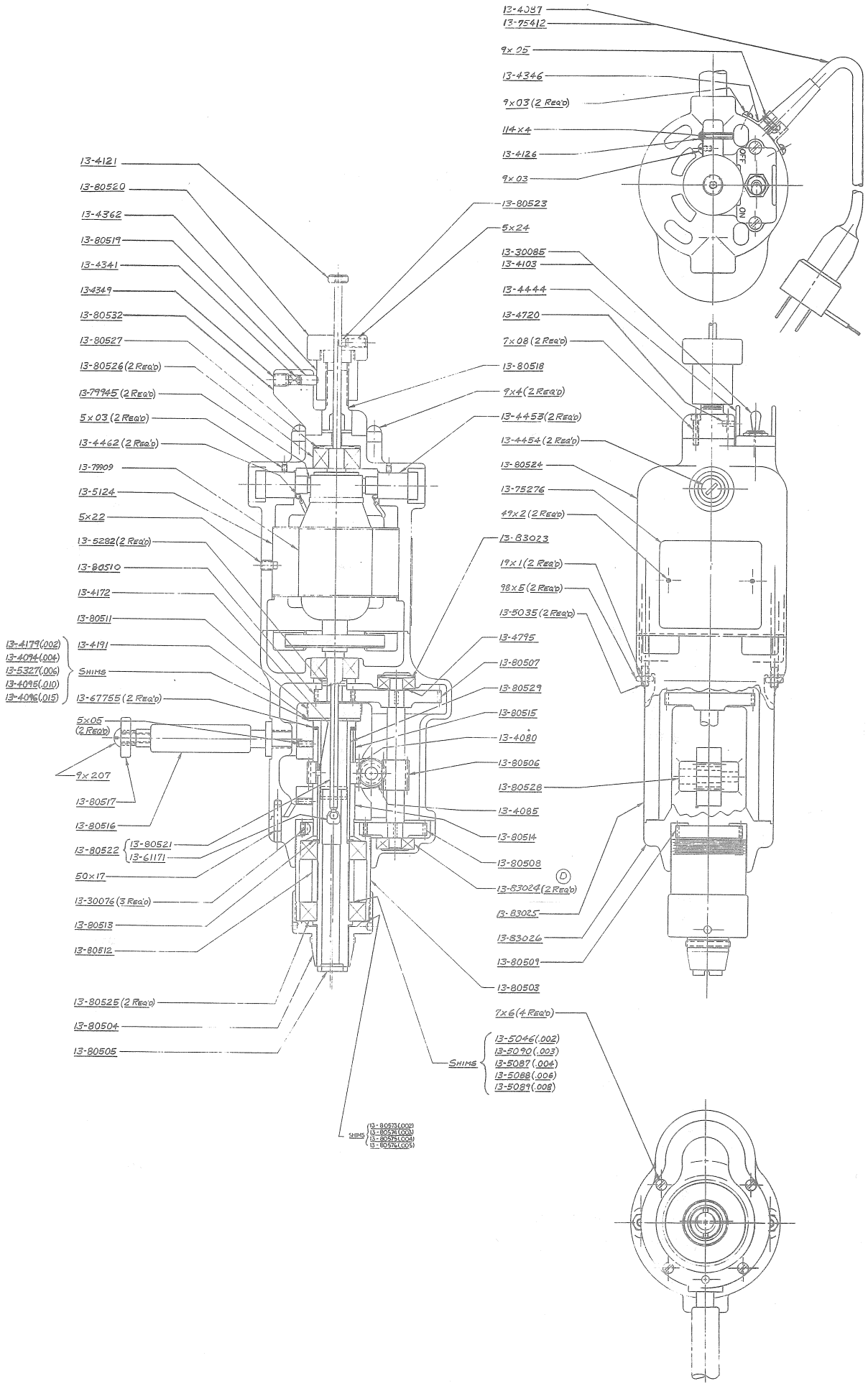
1. With the compensating force still on the handle, turn on the machine and turn the feed in the "Grind" direction. Feed down until sparks appear around the entire valve seat. This means you are removing stock from the entire diameter of the seat. Maintain the grinder in this position until the sparks disappear. At this time the grind should be completed and the seat concentric within .002 in.T.I.R.

2. Move the feed in "Release" direction a few clicks before turning the machine off. This avoids possible damage to the seat as a result of the wheel stopping in contact with the newly ground seat.

MODEL VIP
ECCENTRIC VALVE SEAT GRINDER

INSTRUCTIONS

HALL TOLEDO
525 W. Sophia
Maumee, Ohio 43537-1847
(419) 893-4334
800-228-4255


13-4087
13-75412
9x05
13-4346
9x03 (2 Req'd)
114x4
13-4126
9x03
OFF
ON
13-4121
13-80520
13-4362
13-80519
13-4341
13-4349
13-80532
13-80527
13-80526 (2 Req'd)
13-79945 (2 Req'd)
5x03 (2 Req'd)
13-4462 (2 Req'd)
13-79909
13-5124
5x22
13-5282 (2 Req'd)
13-80510
13-4172
13-80511
13-4191
SHIMS
13-4179 (.002)
13-4094 (.004)
13-5327 (.006)
13-4095 (.010)
13-4096 (.015)
13-67755 (2 Req'd)
5x05 (2 Req'd)
9x207
13-80517
13-80516
13-80522
13-80521
13-61171
50x17
13-30076 (3 Req'd)
13-80513
13-80512
13-80525 (2 Req'd)
13-80504
13-80505
13-80523
5x24
13-80518
9x4 (2 Req'd)
13-4453 (2 Req'd)
13-83023
19x1 (2 Req'd)
98x5 (2 Req'd)
13-5035 (2 Req'd)
13-4795
13-80507
13-80529
13-80515
13-4080
13-80506
13-80528
13-4085
13-80514
13-80508
D
13-83024 (2 Req'd)
13-83025
13-83026
13-80509
13-80503
7x6 (4 Req'd)
SHIMS
13-5046 (.002)
13-5090 (.003)
13-5087 (.004)
13-5088 (.006)
13-5089 (.008)
SHIMS
13-80573 (.002)
13-80574 (.003)
13-80575 (.004)
13-80576 (.005)
13-30085
13-4103
13-4444
13-4720
7x08 (2 Req'd)
13-80524
13-75276
49x2 (2 Req'd)
13-4454 (2 Req'd)

VIP GRINDER PARTS LIST

Part No.	Name of Part
4080	Gear
4085	Worm & Gear
4087	Cord Assembly
4094	Shim
4095	Shim
4096	Shim
4103	Shield
4121	Nut
4126	Wrench Clip
4172	Key
4179	Shim
4191	Washer
4341	Spring
4346	Cord Clip
4349	Set Screw
4362	Adjusting Nut
4444	Switch Plate
4453	Brush Holder
4454	Brush Cap
4455	Brush & Spring Assembly
4795	Washer
5035	Stud
5046	Shim
5087	Shim
5088	Shim
5089	Shim
5090	Shim
5124	Field
5282	Pin
5326	Shim
30076	Key
30078	Spring
30085	Switch
83024	Bearing
67755	Loading Spring
75276	Name Plate
78342	Shim
78343	Shim
79909	Armature
79945	Field Clip
79965	Pin
83025	Center Gear Housing
83026	Nose End

Part No.	Name of Part
80503	H. S. Spindle
80504	Stone End
80505	Eccentric Shaft
80506	Worm & Shaft
80507	Gear
80508	Gear
80509	Gear
80510	Drive Gear
80511	Thrust Plug
80512	Spacer
80513	Washer
80514	Lower Bushing
80515	Upper Bushing
80516	Locating Handle
80517	Lock Screw
80518	Sleeve
80519	Adjusting Screw
80520	Cap
80522	Feed Rod Assembly
80523	Feed Rod Lock Plug
80524	Housing Body
80525	Bearing
80526	Bearing
80527	Loading Spring
80529	Eccentric Shaft Holder
80532	Ratchet Cap
5 x 3	Screw
5 x 22	Screw
9 x 03	Screw
9 x 05	Screw
7 x 08	Screw
5 x 24	Screw
7 x 6	Screw
49 x 2	Screw
9 x 207	Screw
5 x 03	Screw
9 x 4	Screw
19 x 1	Washer
98 x 5	Nut
50 x 53	Pin
50 x 17	Pin
114 x 4	Wrench

GRINDING WHEELS

Proper dressing of the grinding wheel is accomplished as follows:

Clean taper on grinder spindle and inside taper of wheel insert. Screw wheel onto grinding spindle. Place the grinder in the saddle stand being certain to firmly locate the grinding wheel end of the spindle over the dresser stand. Tighten the screw of the handle so the grinder is held firmly. Properly locate the quadrant assembly to assure full diamond traverse across the angle of the wheel. Start the motor and pass the diamond back and forth across the face of the grinding wheel through the use of the lever. Continue this operation until the stone has been dressed across its entire width.

The operator must be certain that the valve seat angle matches the valve face angle in accordance with the engine manufacturer's specification. Final adjustment to a specific angle, for example 45°, is obtained by blueing the valve to show proper contact with the valve seat. This should be done when installing new valves as well as when refacing present valves. Slight final adjustment of dresser angle to obtain proper valve to valve seat blue-in contact may be necessary. Once adjusted, the setting is permanent until the dresser quadrant is moved to another angle.

PILOTS

Wipe pilot with a clean cloth before using. Do not use oil on pilots except to aid in cleaning them. Be certain to wipe free of oil. Oil on the pilot collects abrasive dust from the grinding operation thus forming a lapping compound. This wears out the pilot and eccentric shaft.

Place the pilot in the valve guide using the special wrench furnished with this equipment. Do not wring or wind the pilot into the guide - just set it against the taper gently. Expand the pilot by turning the knurled knob on the top of the wrench. Do not tighten this knob excessively - merely pull it up snug with thumb and finger.

SETTING THE GRINDER

Remove the grinder from the dressing stand and place it over the pilot installed in the valve guide. Loosen the allen set screw and push the feed rod down until it stops. This is then located on the top of the pilot. Tighten the set screw against the feed rod.

Turn the feed adjustment to the right (clockwise) as indicated by the arrow at "release" stamped on top, until the grinding wheel is free and clears the seat. Check this adjustment by rotating the grinder around the pilot. Another method sometimes used is to rotate the spindle by hand to check whether or not it is clear of the seat.

GRINDING THE SEAT

First, be certain that the valves are accurate and properly faced. The complete valve job is dependent on both accurate seats and accurate valves. Second, grind the seats with your Model VIP grinder according to the following procedure:

Start the motor. Hold handle. Turn the feed screw to the left (counter-clockwise) as indicated by the arrow at "Grind". Feed one notch at a time until the seat is cleaned up. Generally a show of sparks around the entire seat during one eccentric revolution indicates a finished, true seat. This is one of the many advantages of Hall-Toledo eccentric grinding. Allow the grinding wheel to continue running until it grinds itself free. Turn the feed screw to the right (clockwise) to release the grinding wheel. Shut off the motor and allow the grinder to stop before removing it from the pilot.

If the valve seat must be narrowed, this can be done by using the 30° grinding wheel on 45° seats, narrowed from the top. Use 15° narrowing the wheel on 30° seats. For "Choke" narrowing, or narrowing from the inside of the seat, use a 60° grinding wheel.

PREVENTIVE MAINTENANCE

The Model VIP is a grinder. As such there will necessarily be a certain amount of dry abrasive dust in the air when the tool is in operation. This abrasive dust will cause considerable damage and excessive wear if the tool and pilots are not cleaned frequently and well. After each job the pilot should be carefully washed in a SOLVENT solution and thoroughly wiped. This cleaning will prevent abrasive being carried into the eccentric shaft and avoid undue wear to either pilot or shaft. The eccentric shaft should be swabbed out occasionally with a clean cloth on the end of a stick or wire.

Pilots should always be kept clean and the collets should be removed from time to time from the pilot and thoroughly cleaned so that accurate centering is possible.

Grinding wheels, of course, should always be kept away from oil. If griding wheels do become soaked, they will not cut properly. If by accident some wheels become soaked with oil, allow them to stand in carbon tetrachloride for a few minutes: then screw the wheel onto the grinder and let is spin dry. This should be repeated several times and, in most cases, the oil will be washed from the wheel so that it will again cut freely.

The Hall-Toledo Model VIP Eccentric Grinder is equipped with a fan mounted on the lower end of the armature which blows air through the motor case and keeps the machine cool. This is the first place to look for trouble when the operator notices the machine is beginning to heat excessively.

LUBRICATION

Do not add additional lubricant to the gear box if the machine begins to operate above normal temperature. Because of the high speed gear construction, excessive lubrication causes more heat to be generated. Each machine is sent out from the factory packed with lubricant to last approximately 1,000 hours of operation. If lubricant must be added to the gear chamber, only about a half teaspoon should be added, and then it should only the the special lubricant, Hall-Toledo No. 4475, No. 76 grease, furnished in 6 ounce tubes. This must by obtained from Hall-Toledo or your local jobber.

ECCENTRIC SHAFT REPLACEMENT

The eccentric shaft is very easily replaced in your shop simply by loosening the shaft with a flat piece of stock (or the spanner wrench supplied with the grinder) which will fit in the lower end of the eccentric shaft. The shaft and spindle assembly will then come out of the machine. To remove the eccentric shaft from the spindle, unscrew the stone end of the spindle, then the eccentric shaft is easily removed. This shaft is replacement part No. 80505.

When the eccentric shaft is replaced, it should be pulled up just snug and never tightened excessively. When the shaft is removed from the grinder, the entire grinding wheel spindle may be removed simply by lifting it out of the case. The gear on top of this spindle may appear almost dry. This is a normal condition as the gear operates only on a film of lubricant. The outside of the spindle should be dry at reassembly. If this spindle is coated with heavy oil or grease when reassembled, it will rub the housing and, because of the very close fit, cause heating. It is important to remember that the housing of this machine does not serve as a bearing for the spindle.

FACTORY REPAIRS

Sometimes it may be necessary to make repairs other than those described in the preceding pages. Our Maumee factory maintains complete service facilities with experienced workmen and special tools and test equipment. Your Model VIP may be returned through your jobber or by you directly for a free estimate of the cost of repair. Repairs to obtain new operating condition are made only following your authorization to proceed at the estimated cost. All shipments must be made on a postage or freight prepaid basis to our factory at 525 W. Sophia, Maumee, Ohio 43537-1847.

EXPANDING PILOTS FOR MODEL EJ, VSE AND VIP VALVE SEAT GRINDERS

(All Pilots have a 7/16" Top Diameter)

Part No.	Guide Dia.	Guide Length	Top Length
9096	5.5MM Pilot	1 3/8"	4 15/16"
9515	6 MM Pilot	1 1/4"	4 7/16"
61350	1/4" Pilot	1 1/4"	4 7/16"
9248	7 MM Pilot	1 1/2"	4 7/16"
19343	9/32" Pilot	1 1/4"	5 7/16"
9051	5/16" Pilot	1 5/8"	4 7/16"
19340	5/16" Pilot	1 5/8"	5 7/16"
9557	8 MM Pilot	1 5/8"	4 7/16"
9676	21/64" Pilot	1 5/8"	4 7/16"
9755	8.5MM Pilot	1 7/32"	4 7/16"
9053	11/32" Pilot	1 15/16"	4 7/16"
9674	11/32" Pilot	1 15/16"	5 7/16"
9651	9 MM Pilot	1 15/16"	5 7/16"

Part No.	Guide Dia.	Guide Length	Top Length
19073	23/64" Pilot	2"	5 7/16"
9055	3/8" Pilot	1 15/16"	4 7/16"
19387	3/8" Pilot	1 15/16"	5 7/16"
9714	25/64" Pilot	2 1/4"	4 7/16"
9652	10 MM Pilot	2 5/8"	5 7/16"
9713	13/32" Pilot	2 5/8"	5 7/16"
63098	11 MM Pilot	2 3/4"	5 7/16"
9057	7/16" Pilot	2 3/4"	4 7/16"
9588	7/16" Pilot	2 3/4"	5 7/16"
9737	1/2" Pilot	2 3/4"	5 7/16"
19385	9/16" Pilot	3 5/8"	5 7/16"
19087	5/8" Pilot	3 5/8"	5 7/16"
9683	11/16" Pilot	3 7/8"	5 7/16"

STANDARD GRINDING WHEELS FOR EJ, VSE AND VIP GRINDERS

"C" TYPE (GRAY) FOR CAST IRON SEATS
"H" TYPE (BROWN) FOR STEEL SEATS
"S" TYPE (WHITE) FOR STELLITE SEATS

Outside Dia.	1 1/16	1 1/8	1 9/32	1 1/2	1 9/16	1 5/8	1 3/4	1 13/16	1 15/16	2 1/16	2 1/4	2 1/2	2 3/4	3
15°	C10615	C11215	C12815	C15015	C15615	C16215	C17515	C18115	C19315	C20615	C22515	C25015	C27515	C30015
	H10615	H11215	H12815	H15015	H15615	H16215	H17515	H18115	H19315	H20615	H22515	H25015	H27515	H30015
	S10615	S11215	S12815	S15015	S15615	S16215	S17515	S18115	S19315	S20615	S22515	S25015	S27515	S30015
30°	C10630	C11230	C12830	C15030	C15630	C16230	C17530	C18130	C19330	C20630	C22530	C25030	C27530	C30030
	H10630	H11230	H12830	H15030	H15630	H16230	H17530	H18130	H19330	H20630	H22530	H25030	H27530	H30030
	S10630	S11230	S12830	S15030	S15630	S16230	S17530	S18130	S19330	S20630	S22530	S25030	S27530	S30030
45°	C10645	C11245	C12845	C15045	C15645	C16245	C17545	C18145	C19345	C20645	C22545	C25045	C27545	C30045
	H10645	H11245	H12845	H15045	H15645	H16245	H17545	H18145	H19345	H20645	H22545	H25045	H27545	H30045
	S10645	S11245	S12845	S15045	S15645	S16245	S17545	S18145	S19345	S20645	S22545	S25045	S27545	S30045
60°	C10660	C11260	C12860	C15060	C15660	C16260	C17560	C18160	C19360	C20660	C22560	C25060	C27560	C30060
	H10660	H11260	H12860	H15060	H15660	H16260	H17560	H18160	H19360	H20660	H22560	H25060	H27560	H30060
	S10660	S11260	S12860	S15060	S15660	S16260	S17560	S18160	S19360	S20660	S22560	S25060	S27560	S30060
90°	C10690	C11290	C12890	C15090	C15690	C16290	C17590	C18190	C19390	C20690	C22590	C25090	C27590	C30090
	H10690	H11290	H12890	H15090	H15690	H16290	H17590	H18190	H19390	H20690	H22590	H25090	H27590	H30090
	S10690	S11290	S12890	S15090	S15690	S16290	S17590	S18190	S19390	S20690	S22590	S25090	S27590	S30090