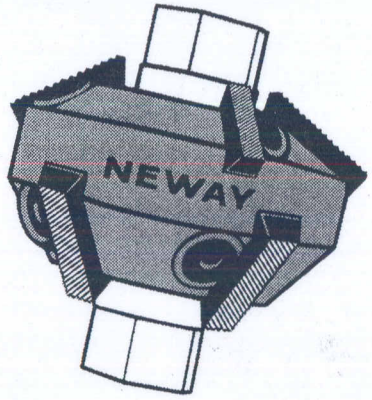
neway

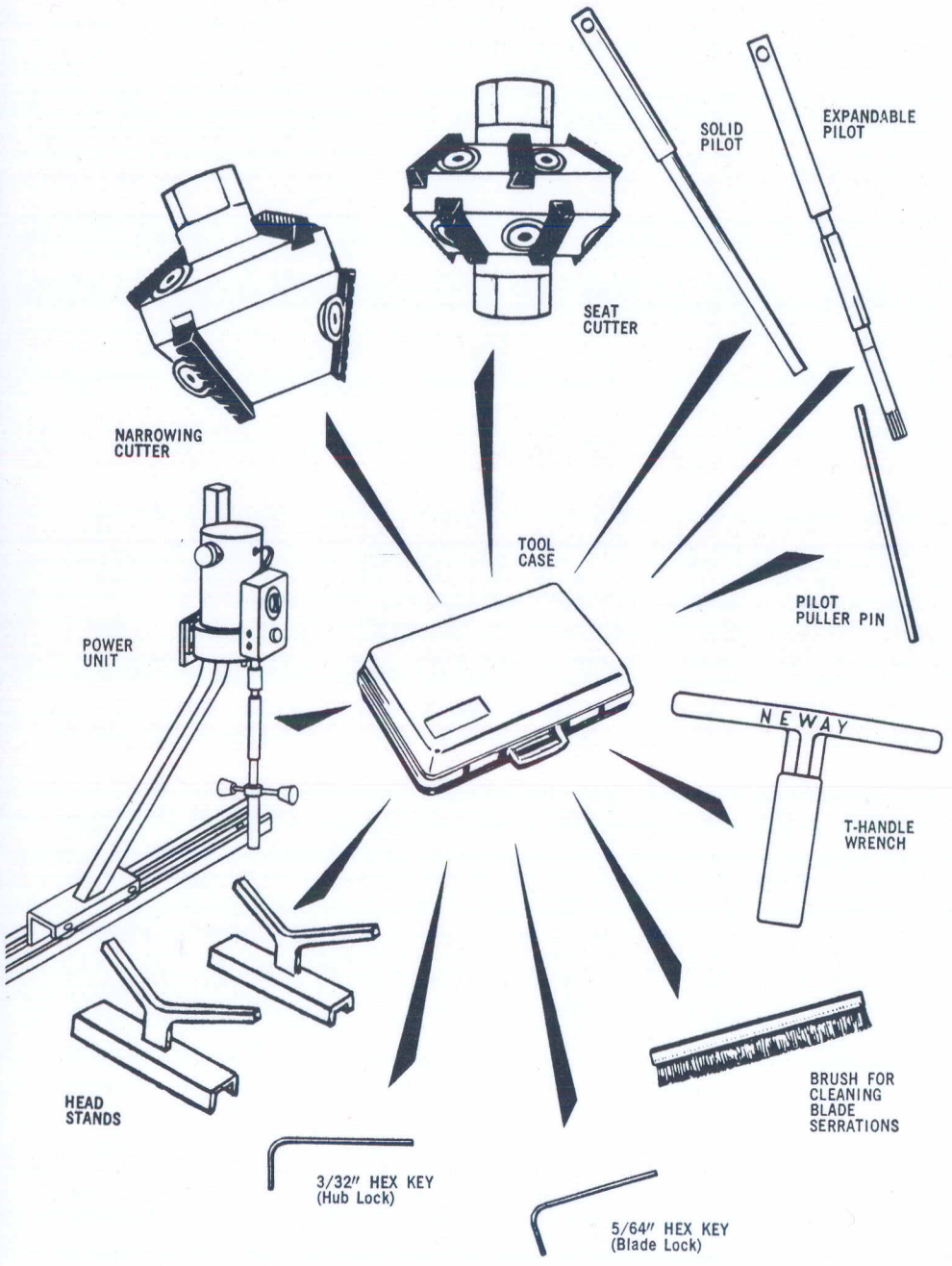


VALVE SEAT CUTTERS

•

INSTRUCTION MANUAL

PARTS IDENTIFICATION

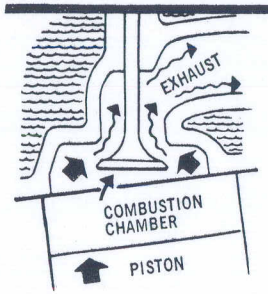


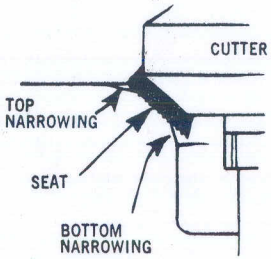
INDEX

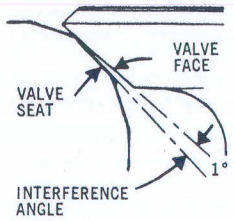
INTRODUCTION

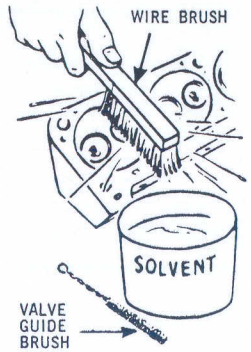
Before using these tools, read this entire manual carefully.

Later you may want to refer to specific information and can then take a short cut with the INDEX.









WHY GOOD VALVE SEATS ARE IMPORTANT

A. Good valve seats give more compression and a cooler running engine.

B. The better the valve seats and the valve faces mate, the better the valves perform their functions.

C. TWO WAYS of achieving this tight fit are:

1. SHARPLY DEFINED, CLEAN SEATS.
   These can best be achieved by first removing burned material. Above by top narrowing, below by bottom narrowing, and then cutting the seats.

2. INTERFERENCE ANGLE.
   We recommend an interference angle. This causes maximum pressure between the valve and the seat to occur at the outside diameter. Example: 45° valve - 46° Seat.

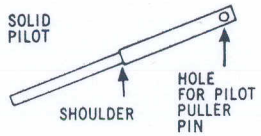
PREPARATION FOR CUTTING VALVE SEATS

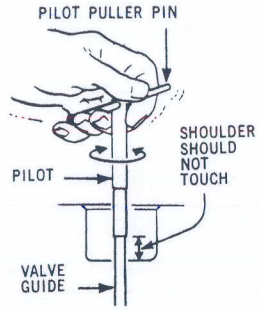
A. CLEAN CYLINDER HEAD THOROUGHLY.

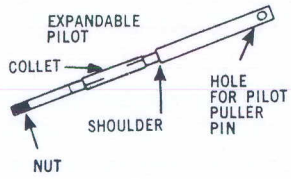
1. Remove all oil and grease with solvent.

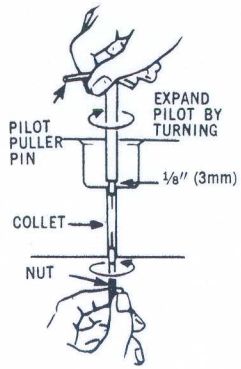
2. Remove all carbon and combustion deposits with wire brush.

NOTE: Follow recommended safety procedures when using a solvent.









B. CLEAN VALVE GUIDES.

1. Remove all deposits with wire brush.

2. Check condition of valve guides. (See MANUFACTURER'S specifications and inspection procedures.)

BADLY WORN VALVE GUIDES

Always replace or resize if not within manufacturer's specifications.

SELECTION AND USE OF PROPER PILOT

A. SOLID PILOTS.

1. Select a pilot same diameter (fractional or metric) as valve stem.

2. Insert pilot in valve guide, twisting slightly, until very snug. Pilot shoulder should not touch valve guide.
   - If small, try next size larger.
   - If too large, try next smaller size.

B. EXPANDABLE PILOTS.

1. Select a pilot same diameter (fractional or metric) as valve stem.

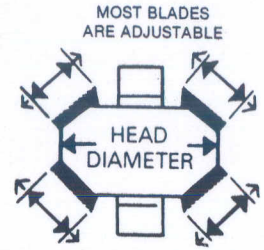
2. Insert pilot in valve guide.

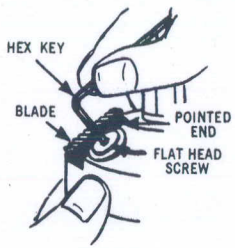
   TO AVOID PILOT DAMAGE . . .
   - Valve guide must be longer than expandable section of pilot (collet).
   - Expandable section of pilot (collet) must be inside valve guide.

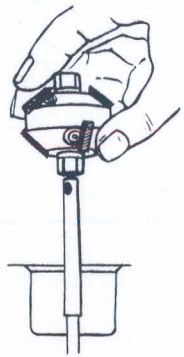
3. Pilot shoulder should be about ⅛" (3mm) above valve guide.
   Insert pilot puller pin in pilot hole. Turn and expand pilot until snug, while holding nut.

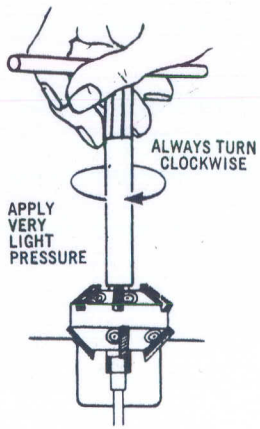
NOTE: Collet will expand maximum .020" (,5mm)

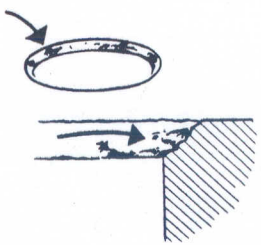
Remember, the accuracy of the valve seat cutting depends upon a tight fitting pilot in a round straight guide.











SELECTION AND USE OF PROPER VALVE SEAT CUTTERS

BEFORE USING CUTTERS, ADJUST BLADES TO REQUIRED DIAMETER. THEN TIGHTEN ALL SCREWS THAT HOLD BLADES IN PLACE.

Pointed ends must always point toward hub or center of head.

Note: Moving blades outward will increase cutting dia. to ¼" (6.5 mm) larger than cutter head diameter.

GENERAL INSTRUCTIONS

A. Select cutter approximately same size as valve head diameter and with correct angle.

B. Place cutter on pilot and slowly lower cutter to valve seat. DO NOT DROP CUTTER.

C. Place T-handle or power unit over hex of cutter.

D. Turn clockwise and apply very light pressure. Release the down pressure at end of each cut. Make one or two turns with no pressure.

CENTER THE CUTTING PRESSURE.

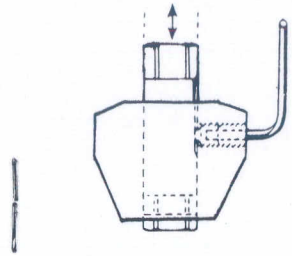
Maintain a downward pressure over centerline of pilot.

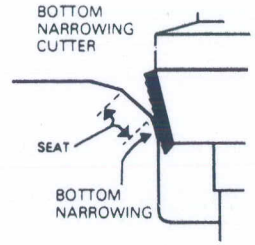
DETAILED CUTTING INSTRUCTIONS

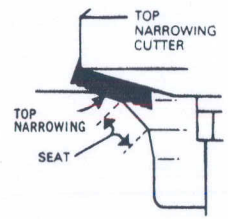
A. INITIAL INSPECTION OF SEAT.

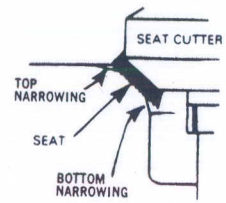
1. LOOK AT SEAT.

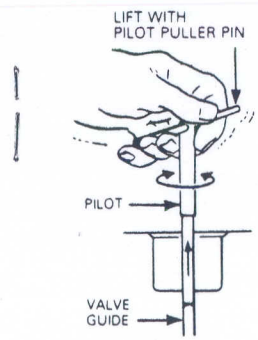
   The size of the PITS, BURN OUTS, and BLOW BYES will determine the amount of material that must be removed with the remaining cuts.

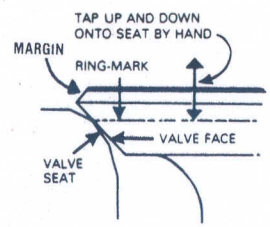












B. BOTTOM NARROWING CUT.

1. Cut lightly with narrowing cutter (usually 60° or 75°).
2. Cut until a fine continuous line is formed with valve seat. (This operation RAISES THE BOTTOM EDGE OF THE SEAT.)

   Note: Some narrowing cutters have moveable hubs so hubs will not rest on guide.

C. TOP NARROWING CUT.

1. Cut lightly with narrowing cutter.
2. Cut until seat width is slightly less than required. (This operation LOWERS THE TOP EDGE OF SEAT.)

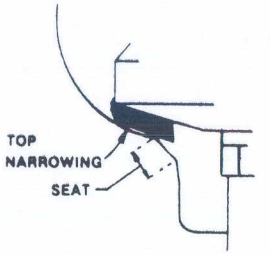
D. FINAL SEAT CUT.

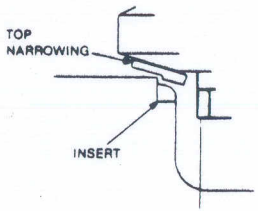
1. Cut lightly, with seat cutter.
2. Cut seat to proper width. This should take only 3 to 5 turns.

NOTE: Finished valve seat will have a machine textured finish (not highly polished or shiny). This provides a soft surface for final mating with valve in first seconds of engine operation.

E. INSPECT SEAT.

1. Remove pilot, using pilot puller pin.
2. Insert valve in valve guide.
3. Bang valve slightly up and down in the guide (holding it with fingers top and bottom — above and below the cylinder head). Do this until "Ring Mark" shows on the **valve face** surface.
4. Ring Mark should be positioned ⅓ of the way down valve face from margin.
5. If Ring Mark is too HIGH — cut top narrowing angle slightly to lower Ring Mark — if Ring Mark is too LOW cut seat angle slightly to raise mark.





F. TOP NARROWING CUT.
(Hemisphere Chamfer & Recessed Seat).

1. Adjust radius blades to blend hemispheres to top narrowing cut.

NOTE: If more than 1 radius blade is used, adjust to approximate same position.

2. Adjust (3) special stepped blades to clear step in casting.

CHECKING VALVE SEAT CONCENTRICITY AND CLOSURE

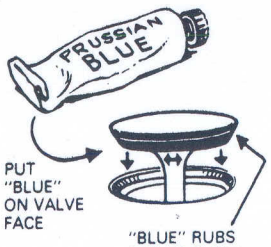
DIAL INDICATOR

CHECKS CONCENTRICITY ALL AROUND SEAT

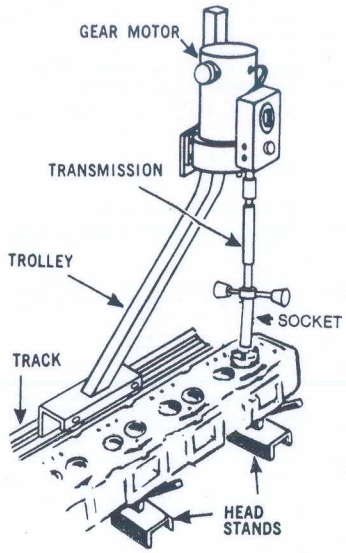
A. CONCENTRICITY:
USE VALVE SEAT DIAL INDICATOR. Concentricity should be within .002" (,05mm) (total indicator reading).

B. CLOSURE: PRUSSIAN BLUE METHOD:

1. Paint the valve face with Prussian Blue.
2. Remove pilot and insert valve into guide.
3. Turn the valve back and forth in the seat about ⅛" (3mm) without pressure. A fine clean line will appear on the face of the valve.
4. If an "open" spot appears on the line, more than ½" (12,7mm) long, return seat cutter onto pilot and blend in by turning the cutter 1 or 2 revolutions with the fingers.
5. If line has only shorter intermittent open spots, do not blend. It will peen itself in the first few seconds of engine operation.



NOTE: Use a properly refaced valve. Occasionally a newly refaced valve is a bit out of round. If so, try another valve.



POWER UNIT

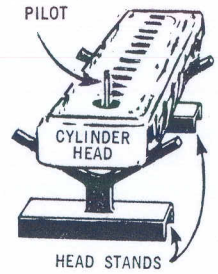
The drive unit rolls freely over the track for positioning over the valve seat being cut. Model 1700 either 30 or 60 RPM — Model 1800 variable up to 90 RPM maximum.

CAUTION: Higher RPM's may damage carbide blades.

The socket should be positioned directly over the valve seat being cut.

The transmission unit from the motor to the cutter has two universal joints and a telescoping section.

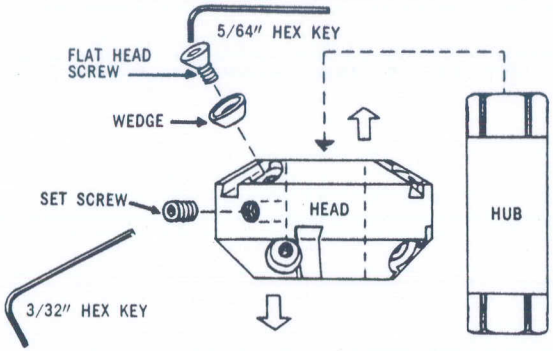
USING A NEWAY POWER UNIT WILL MAKE THE JOB OF RECONDITIONING VALVE SEATS QUICKER AND MORE ACCURATE THAN EVER BEFORE.



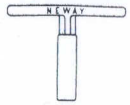
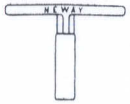
OPERATING INSTRUCTIONS FOR POWER UNIT

1. Put cylinder head onto head stands.
2. Insert pilot, using previous instructions.
3. Adjust cylinder head in "Y" of head stands, making sure the pilot is vertical (it should line up with transmission.)
4. Place cutter on pilot and slowly lower cutter to valve seat. DO NOT DROP CUTTER.
5. Place socket on cutter. Be sure the transmission is lined up over pilot. Transmission should be as straight as possible.
6. Using foot switch (1800), start motor and proceed to cut seats, as previously described. Holding the handle, apply only LIGHT PRESSURE.

BASIC PARTS LIST



HUB: 1. Adjustable only on two-sided Narrowing Cutters — 200 and 600 Series.
2. Fixed (not movable) on all other Cutters.

		
513 - 3/8" (9.5 mm) Hex for 100 Series Heads	**505 - 1/2" (12.7 mm) Hex** for 200, 600, 700 Series Heads	**503-1 Adaptor** 1/2" to 3/8"

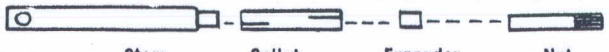
SOLID PILOTS

Tapered ,018mm/25,4mm (.0007"/1")

100 SERIES — For use only with 100 Series Heads — .297" (6,4mm) Hub I.D.
140 SERIES — For use only with 200/600/700 Series Heads — 3/8" (9,5mm) Hub I.D.

EXPANDABLE PILOTS

Collet diameters are ,1mm (.003") less than stated, and expand up to ,5mm (.020").



Stem **Collet** **Expander** **Nut**

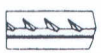
120 Series are used with 100 Series Heads only — .297" (6,4mm) Hub I.D.

150 Series are used with the 200/600/700 Series Heads. They are for engines with short valve guides — 3/8" (9,5mm) Hub I.D.

200 Series are used with the 200/600/700 Series Heads. They are for engines with long valve guides — 3/8" (9,5mm) Hub I.D.

TUNGSTEN CARBIDE BLADES


152, 154


252, 254


250, 251, 253


250 LC, 251 LC


352, 354, 355


353


553

Part No.	Length	Used In
152	1/2"	Non-serrated Blade (correction cutters)
154	3/4"	Non-serrated Blade (correction cutters)
250	3/8"	0° thru 46° Seat Cutters
250 LC	3/8"	0° thru 46° Seat Cutters (hard seats only)
251	1/2"	0° thru 46° Seat Cutters
251 LC	1/2"	0° thru 46° Seat Cutters (hard seats only)
252	1/2"	60° thru 80° Correction Cutters
253	5/16"	0° thru 46° Seat Cutters
254	3/4"	60° thru 80° Correcton Cutters
352	1/2"	Radius Blade (blending purpose)
354	3/4"	Radius Blade (blending purpose)
355	3/8"	Radius Blade (blending purpose)
353	5/16"	Honda Power Products (stepped)
553	5/16"	Suzuki Motorcycles (short-angled)

A FEW SUGGESTIONS

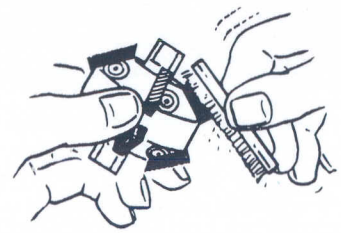
CLEAN UP CYLINDER HEAD AFTER CUTTING SEATS.

Wash or rinse thoroughly with a cleaning solution.

PROPER CARE OF CUTTERS AND PILOTS.

The tools should be kept in tool case. When removed from case, they should be placed on a cloth or pad. These precision instruments will last a long time if reasonable care is used.

PROPER CARE OF CUTTING BLADES.



Serrations on the blades should be cleaned regularly with the brush provided with each kit. (A tooth brush could also be used.)

CUTTING SOFT SEATS.

Neway Cutting Fluid (a wetting solution) is recommended when cutting soft seats. This will reduce chatter and improve the seat finish. Never use petroleum based cutting fluid.

CUTTING HARD SEATS.

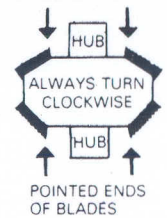
Neway's L.C. (large course) blades are recommended for cutting especially hard seats. They should NOT be used on average to soft seats. Increasing cutting pressure and decreasing cutting speed (on a Neway variable speed power unit) will also improve results on hard seats.

REPOSITIONING WORN OR NICKED BLADES.

The cutting blades do NOT have to be in the same relative position of the head. Blades may be up, down, or centered in their slots. They will always be on the same plane and angle. However, blades must extend over the seat area to be cut, with pointed ends toward hub. All blades on the same cutting angle should be replaced together. If one blade is dull the others are probably dull also. Since each blade is adjustable, worn portions or a nick can be adjusted away from the blade contact area. DO NOT OVER-TIGHTEN.

NEW BLADES.

When ordering new blades, state BLADE NUMBER or CUTTER NUMBER for which blades are required. DO NOT USE seat blades when replacing narrowing blades in 60° to 80° cutter heads. DO NOT USE narrowing blades when replacing seat blades in 0° to 46° cutter heads.



ASSEMBLE BLADES CORRECTLY.

Always be sure pointed ends on carbide blades are pointing toward the hub, or center of the head.

Occasionally problems are encountered. Here are simple solutions.

PROBABLE CAUSE	SOLUTION
Too much pressure	Apply only light pressure.
Incorrect pressure	Apply only light pressure.
Loose pilot	Select snug fitting pilot or replace valve guide.
Very soft seats	Apply wetting solution such as Neway Cutting Fluid on seats. Not petroleum base cutting fluids.
Too much pressure	Apply only light pressure.
Side load pressure	Apply pressure over centerline of pilot.
Loose pilot	Select snug fitting pilot, or replace valve guide.
Excessive valve guide wear	Replace valve guide.
Too much pressure	Apply only light pressure.
Dirt or oil	Clean serrations.
Too much pressure	Apply only light pressure.
Wrong blade position	Pointed ends of blades must be pointed toward hub.
Rough handling	Tungsten carbide blades are
Cutter dropped onto seat	very hard, but brittle, and should be handled with care.

E TEXTURED SEATS RESULT FROM PROPER USE AND CUTTERS. ENGINEERING TESTS SHOW THAT SUCH RE MUCH IMPROVED OVER GROUND SEATS.

Y:

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OPM-5/94