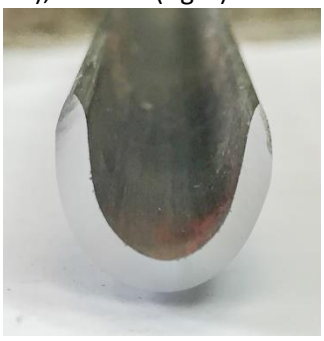
Adjustable Jig Settings for an Ellsworth grind

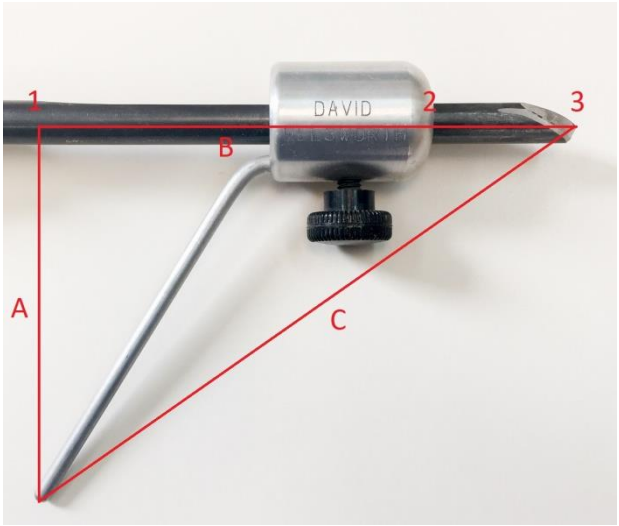
While holding Turn-n-Learn workshops and a Sharpening demo at our monthly club meeting, the Ellsworth grind has come up several times. David Ellsworth has developed a particular grind for a bowl gouge which he advocates, and he sells a gouge pre-ground and a unique sharpening jig to maintain the configuration of the grind. There is a lot of misinformation on how to get this grind with other sharpening jigs, so what is one to do if they don't have, or don't want to shell out $44.95 for a sharpening jig "unitasker" (in Alton Brown terms)?

First of all, it is important to note that the Ellsworth gouge is either ½" ($101.75) or 5/8" ($121.75), and has a parabolic flute shape (left), not "U" (right) or "V" shaped. You can't get the same grind on a gouge with a different shaped flute, and it would not perform the same. I've seen an attempt to recreate this grind on the wrong flute shape, and let's just say, it's not pretty. You may need to physically look down the flute to determine the shape, since many (most?) manufacturers don't describe the shape of their gouge flutes.



To recreate the Ellsworth grind on an adjustable jig, such as the Oneway Vari-Grind or Woodcut Tru-Grind jigs, is a matter of finding the right 3 variables (tool projection from the jig, angle of the leg, and distance setting for the support bar pivot point) to match Ellsworth's settings.

There is a right triangle formed from the tip pf the gouge being sharpened, along the flute of the gouge, and then perpendicular down to the pivot point. If this geometry is duplicated, the sharpening geometry will also.



The jigs are all designed differently, and even clamp the gouge in differently, it makes trying to match this a bit cumbersome. Everything is relative to the gouge, so start by clamping the 5/8" Ellsworth gouge in his jig, clamp the open flute to a flat surface, and measure the perpendicular distance from the gouge to the pivot point (A). This is 148 mm. Yes, the gouge is in the jig backwards, but it registers to the jig the same way, and gets the gouge out of the way for the measurement.

Next measure the distance from the pivot point to the front of the Ellsworth jig, parallel to the gouge (1-2) by clamping the front of the jig to a flat surface. This is also 148 mm.

If your grinder is set-up for the Wolverine jig, Ellsworth recommends a 55 mm (2 1/8") protrusion (2-3) of the tip beyond the front of the jig[i]. This results in a B dimension of 148 + 55 = 203 mm (8").

Now to find the settings for your adjustable jig, insert the gouge in the jig (backwards), clamp the open flute to a flat surface, and adjust the leg to get the same 148 mm "A" measurement as the Ellsworth jig. This sets the angle of the adjustable leg, one of the 3 variables.

I number the positions from the top, and call this setting #5 for Oneway Vari-Grind, and #4+ for the Woodcut Tru-Grind. I also mark or scribe a line on the jig so I can return to the same setting repeatedly.

The measured leg angles to the gouge were approximately 45 and 47 degrees, respectively.

Clamp the front of the adjusted jig to a flat surface, and measure the distance of the pivot point to the front of the jig. This gives a 1-2 measurement of 139 mm for the Vari-Grind, and 148 mm for the Tru-Grind.

The protrusion variable (2-3) is 203 mm – the 1-2 measurement, or 64 mm for Vari-Grind, and 55 mm for Tru-Grind. This defines the second variable.

The third, and last remaining variable to the set-up is the distance of the sliding arm pivot position (vee-pocket of the Wolverine arm), and this is set to whatever distance gives a 60 degree angle to the tip of the gouge.

Setting	Ellsworth	Oneway Vari-Grind	Woodcut Tru-Grind
Jig leg setting / angle	fixed	5 / 45 degrees	4+ / 47 degrees
Gouge nose protrusion	55 mm (2 1/8”)	64 mm (2 ½”)	55 mm (2 1/8”)
Pivot point setting	To get 60 degrees	To get 60 degrees*	To get 60 degrees

*approximately 5 ¼” down from the center of the wheel and 7 1/8“ from the front edge of the wheel, with Wolverine set-up, per David Ellsworth’s instructions[1]. It is about 1/16” farther away than a 50 degree Raptor jig setting.

For confirmation, after sharpening the gouge with the Ellsworth jig, I placed it in the Vari-Grind jig, with the appropriate settings, blackened the cutting edge with a marker, and with one quick pass had identical results.

I would expect some manufacturing tolerance differenced from one jig to another, but if these settings don't get you close enough, the technique for getting them can be followed.

My apologies to David Ellsworth if this takes money out of his pocket, but I feel that this information should be made available to anyone who already has an adjustable sharpening jig. In David's defense the Tru-Grind patent was not filed until 2003, and I don't know if any jigs were around in 1994 when David devised this one. As a fan of Alton Brown, I've become very critical of unitaskers, not that I don't occasionally succumb, however.

Mike

References:

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[i] "The Ellsworth Sharpening Jig" 1994