

## DBN-WR90-SMA-01A machining instructions

### First operation – Create reference surfaces and rear boss

Cut off 33mm of 44 x 44 aluminium bar

Zero ABS reference at the rear jaw.

Fit squarest cut end into vice using tall thin parallels or jaw-top grips

Use 16-20 mm end mill.

Machine top face flat, removing minimal material. Toolmarks are accepted.

Machine four sides flat for 15mm from top face using 16-20 mm tool (3/4" 19.05 mm standard).

Debur and fit with machined face down in the vice, using tall parallels

Machine top face flat, removing minimal material. Toolmarks are accepted.

Machine back face to 10.0 mm away from back jaw, 24mm deep from top face, toolmarks accepted

Machine a temporary reference on the left and right face of the block, slightly deeper than the squaring cut at the bottom of that face. Zero traverse DRO ABS at left face then use ½ function at right face. 0.0 mm will be centre of finished piece.

Machine left face at -15.2 mm from centre line, 24 mm deep from top face

Machine right face at +15.2 mm from CL, 24mm deep.

Machine front face at 30.0 mm from back jaw, 24mm deep

Finish cut to rear face 25.0 mm deep at 10.5 mm from back jaw

Finish cut to side faces at +/-15.0 mm from CL, 25.0 mm deep from top face, should be 30.0 mm wide

Finish cut to front face 25.0 mm deep from top face at 29.5 mm from back jaw, should be 19.0 mm deep

Create reference surfaces at +/-21.5 mm at left and right of flange.

(At this point the back face of the body is still 1.0 mm too high)

### Second operation – Machine flange sides and face

Flip part so flange face is upwards. Clamp in vice on 10mm parallels. Rear face of the thick side of the body is now at 0.0, at back jaw.

Move cross-slide to 11mm backwards. Spindle is now centred with the cavity.

Change to INC mode on DRO and zero front-back

Use edge finder to locate centre between the two reference surfaces.

Machine all four edges of the flange to a finish at +/-20.7 left-right, and front-back, still in INC mode



Use 8mm carbide radiused end mill, plunge to 12mm in centre, then mill right then left to +- 7.0mm, so slot is 22.0 mm wide and 8.0 mm tall

Move cross-slide forward to -0.75 mm, climb-mill from -7.0 to +7.0 mm on back edge of slot, then move slide to +0.75 mm and climb-mill from +7.0 to -7.0 mm.

Reposition to 0.0 mm on cross slide, plunge to 24.0 mm and mill from - 7.0 to +7.0 mm

Move cross-slide back to 0.75 mm, climb mill from +7.0 to -7.0

Move cross-slide to -0.75 mm, climb mill from -7.0 to +7.0

Reposition to (0.0, 0.0)

Raise table by 1.0 mm, move cross-slide to -1.08, climb mill back face to -7.43 mm

Move cross- slide to +1.08, climb mill back face to +7.43 mm

Move cross-slide to -1.08 mm, climb mill past centre of face and feather off the cut.

Pocket should now be 22.86 mm x 10.16 mm and 25.0 mm deep.

### Third operation – Finish flange face

Drop gauge block 26.00 mm long into the cavity. Touch off the flycutter and set DRO Z height to 26.00 mm. Remove gauge block!

Finish flycut to flange face at 24.0 mm from back of cavity as measured.

### Fourth operation – Corner flats

Fit rear box between vee blocks and mill the corner flats so flat is 2 mm in from corner and flat is 4 mm long

### Fifth operation – Finish rear face

Debur and flip, flycut rear face to 29 mm from front face of flange.

### Sixth operation – Flange holes

Debur then flip with flange upright and go back to ABS mode, find centre of flange.

Drill and ream 4.10 mm holes at +-15.49 sideways, +-16.26 back to front. Deburr holes both sides, deburr corners

### Seventh operation – Socket mounting

Fix workpiece sideways in right side of vice on 10mm parallels, with flange clear of jaws. Insert gauge block into pocket and clamp in place. Fit drill chuck and find edge of block using 4mm diameter edge finder. Set left/right DRO to 22.00 mm (so zero is at 6.00 mm from cavity rear face).

Use edge finder to find centreline of body or chuck jaws. (0,0) is now the pin centre of SMA

Centre drill, then drill 3.8 and ream 4.10

Set to -4.32, -4.32, centre drill, drill 2.05, repeat at -4.32, +4.32 then +4.32, +4.32 then +4.32, -4.32.

Tap same four holes M2.5

### Finishing

Debur externally and internally. Lap front face, then polish part externally