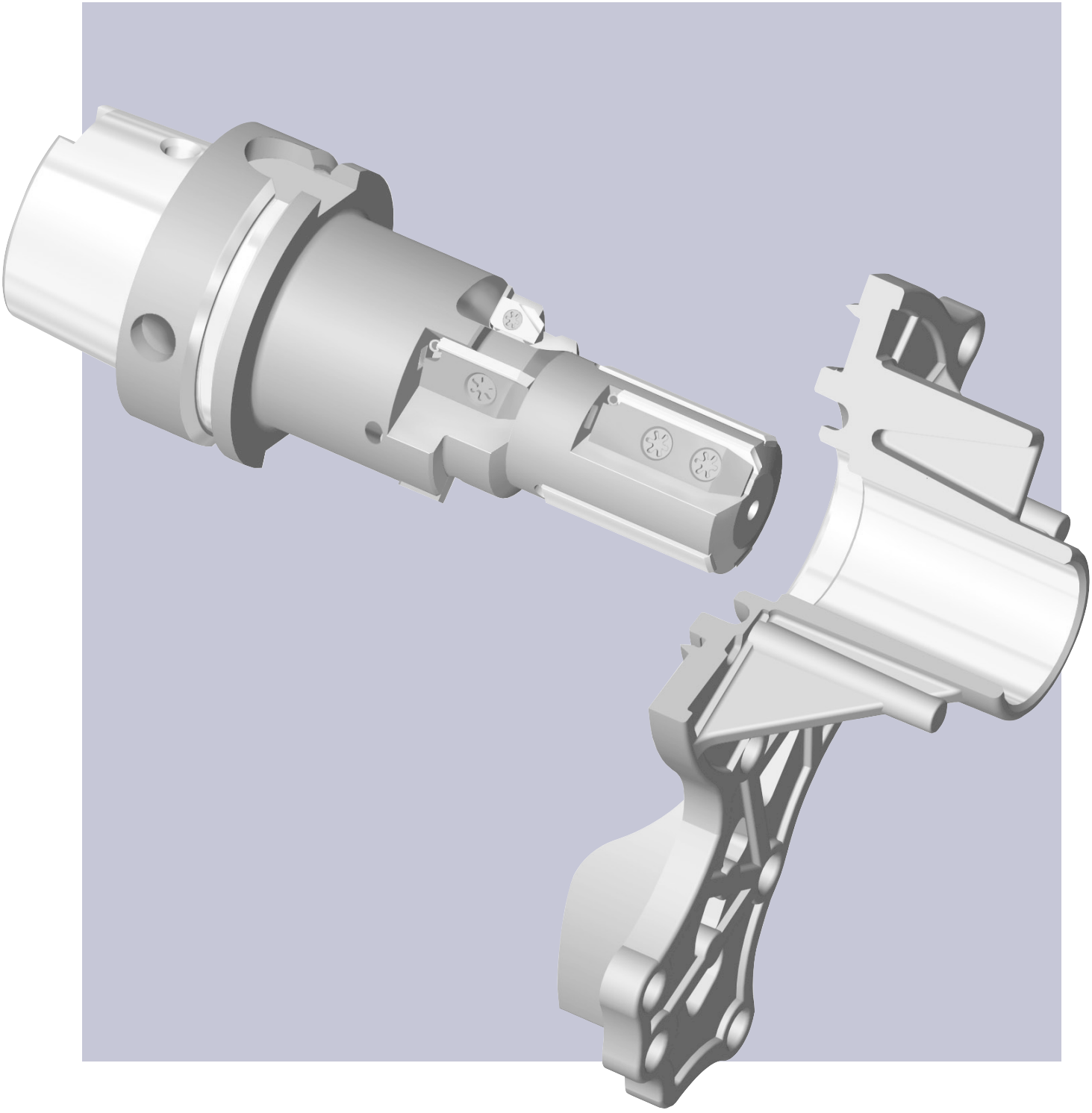
Shefcut® tool designs and applications

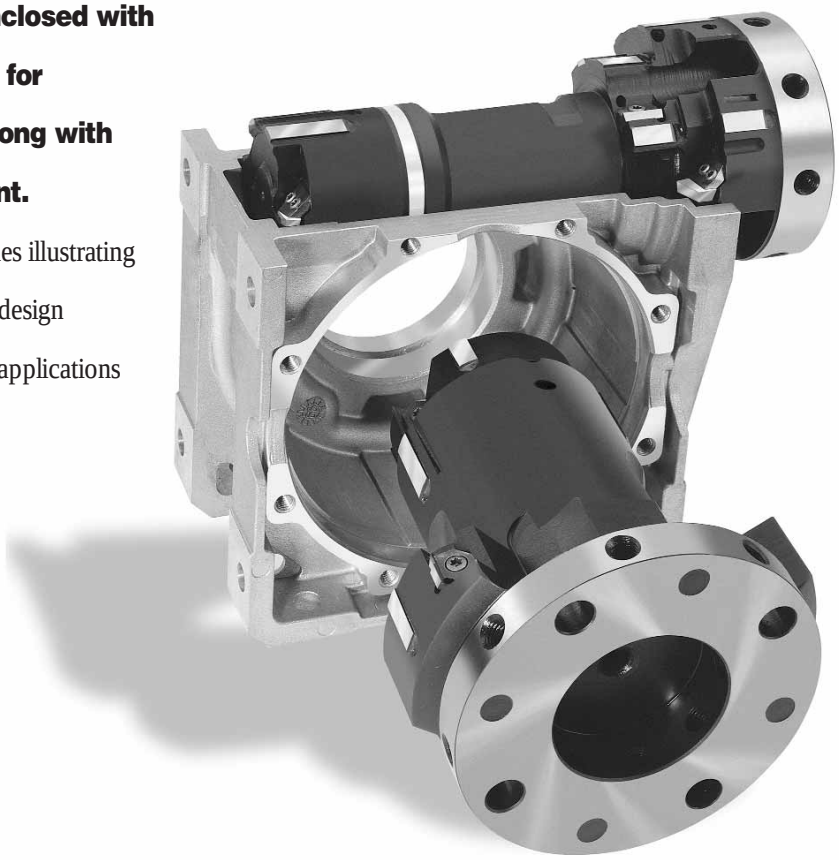


The Shefcut® design concept is tailored to suit a wide variety of applications, including tools for multiple or step diameters, short or extended work lengths, extended pad lengths, front pilots, or special shanks, and tools for use in applications where unique machining set-up requirements exist.

Cogsdill offers custom tool design and applications engineering assistance.

NOTE: A completed Application Data Sheet (see page 43) should be enclosed with your request for quotation, along with your part print.

A few examples illustrating our special tool design capabilities and applications follow.

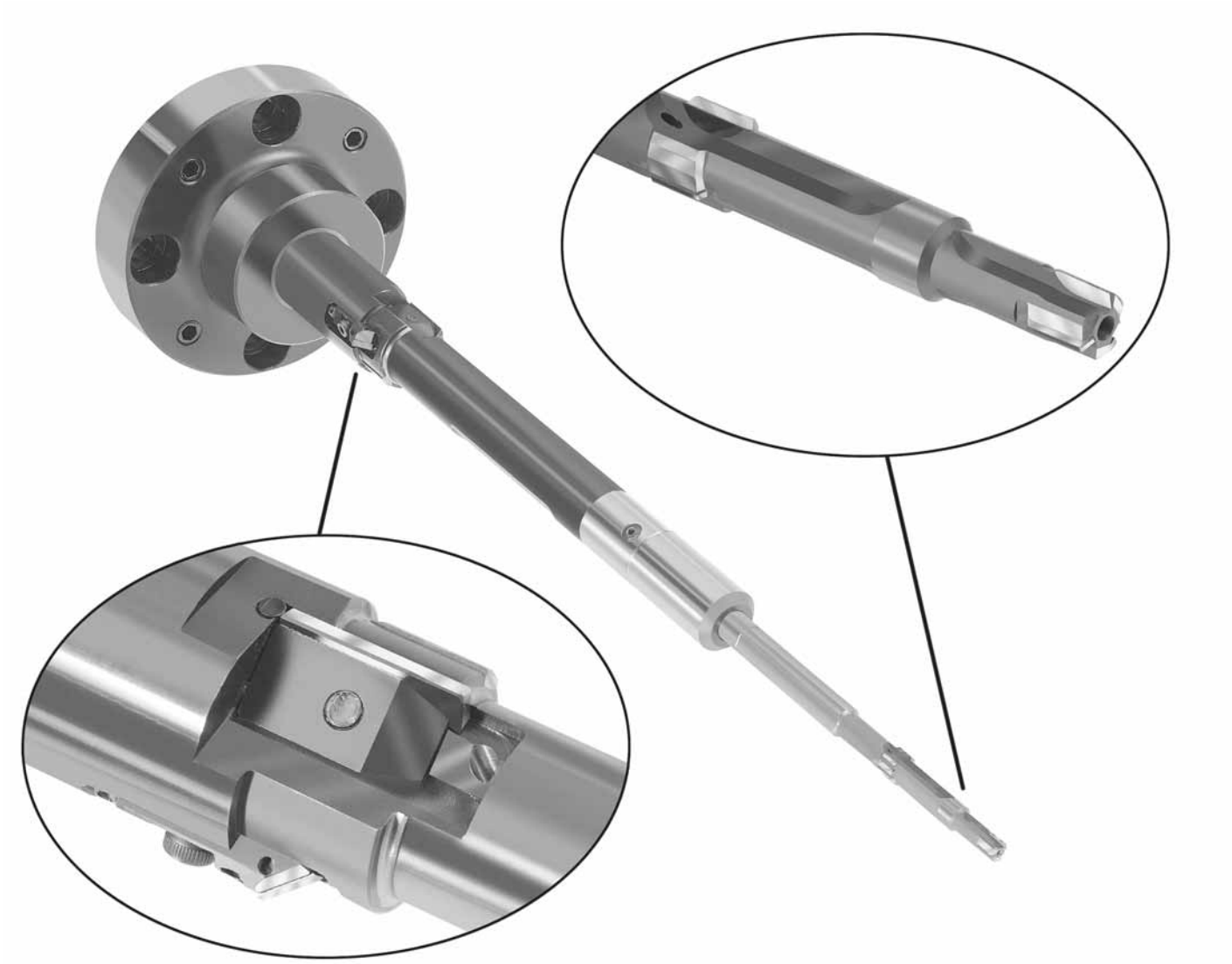


Shefcut precision boring tools machine
multi-feature bores and faces for specialized worm gear box

Tool designs

Custom tool designs to suit the application

Tool designs

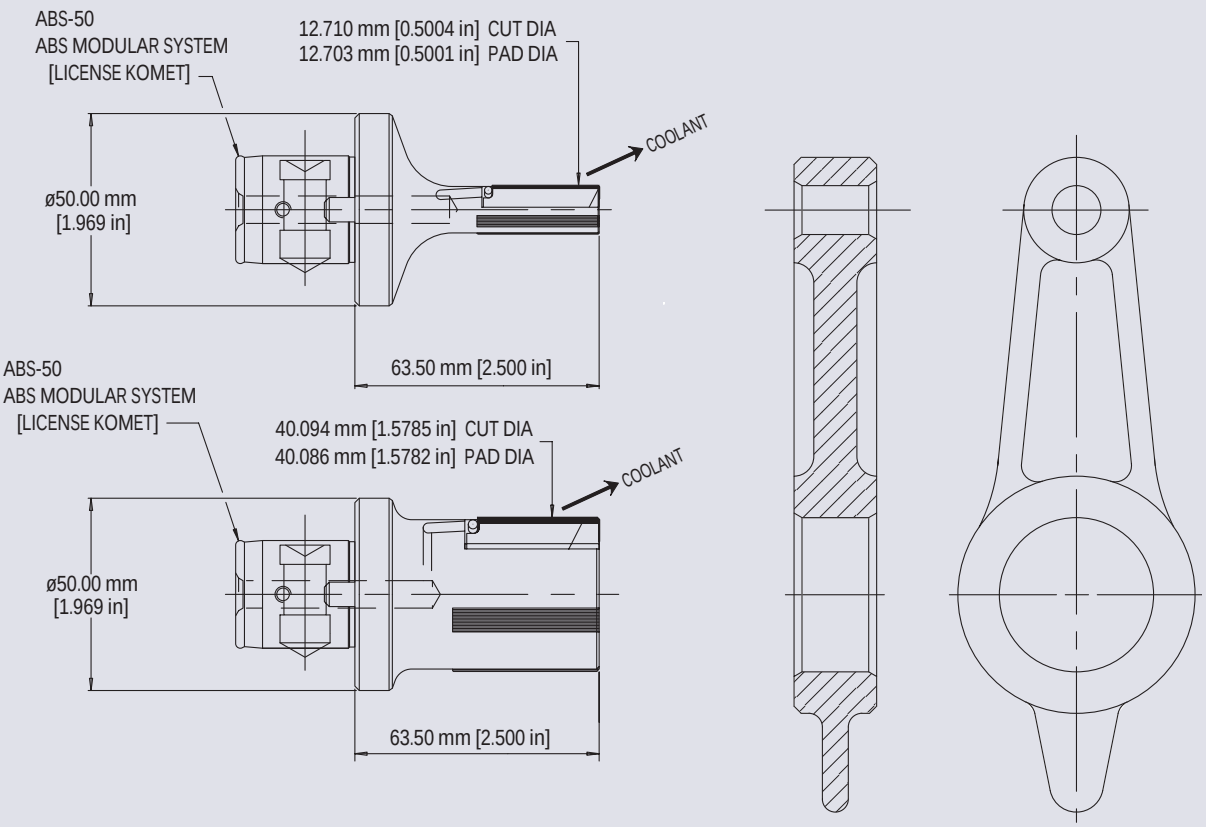


Combination tool design with Shefcut and brazed diamond tooling

Applications

Application 1

CONNECTING ROD

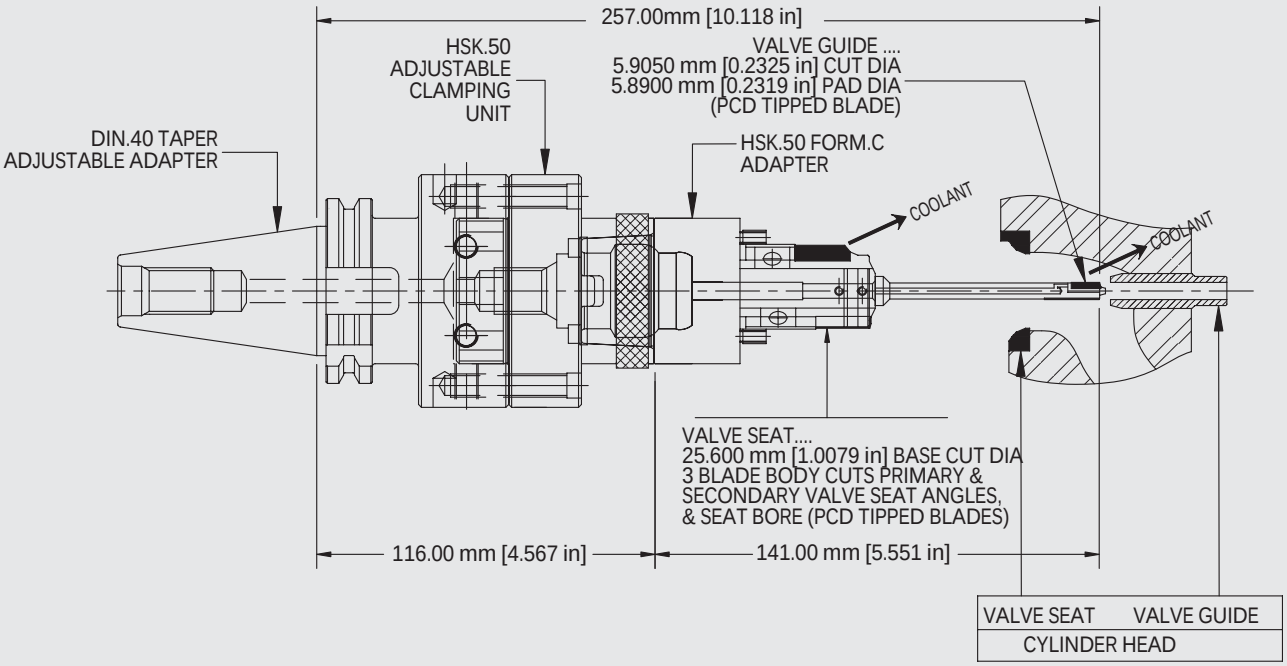


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

Application 2

CYLINDER HEAD VALVE SEAT & GUIDE

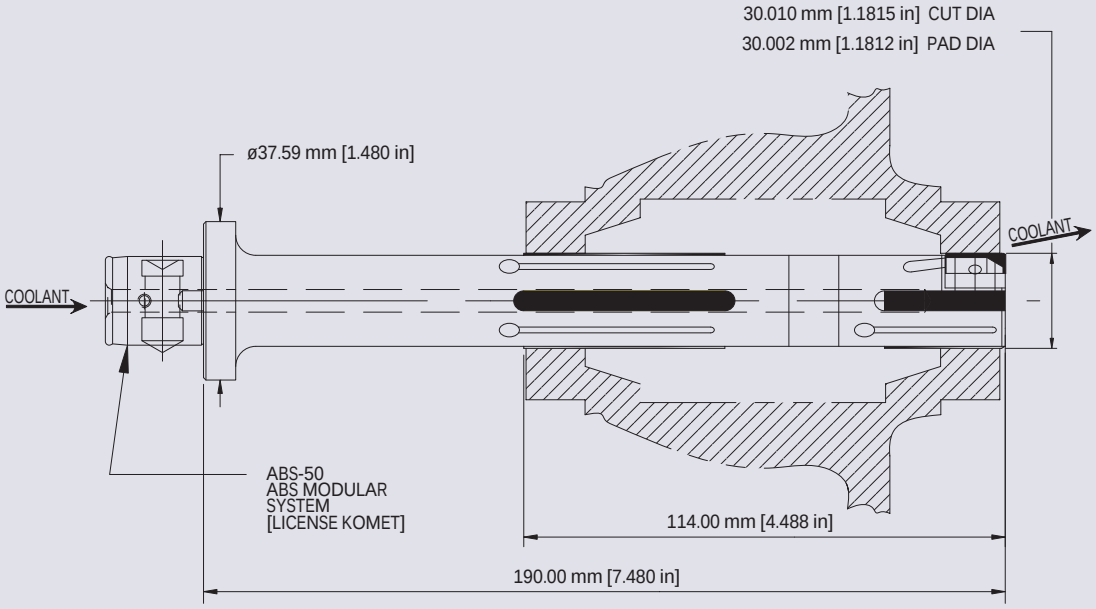


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

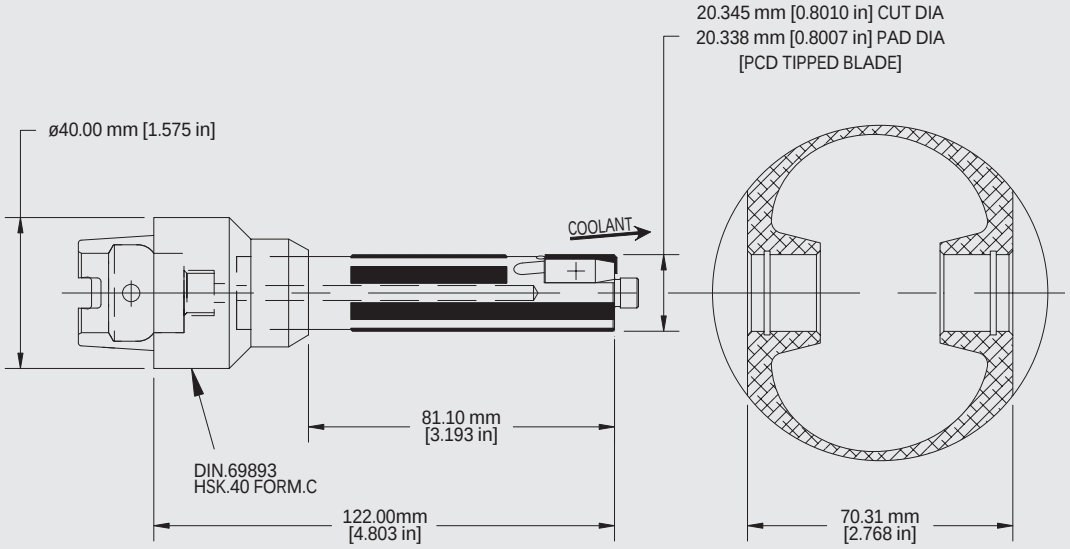
Application 3

SHIFT BAR HOUSING



Application 4

PISTON WRIST PIN BORE

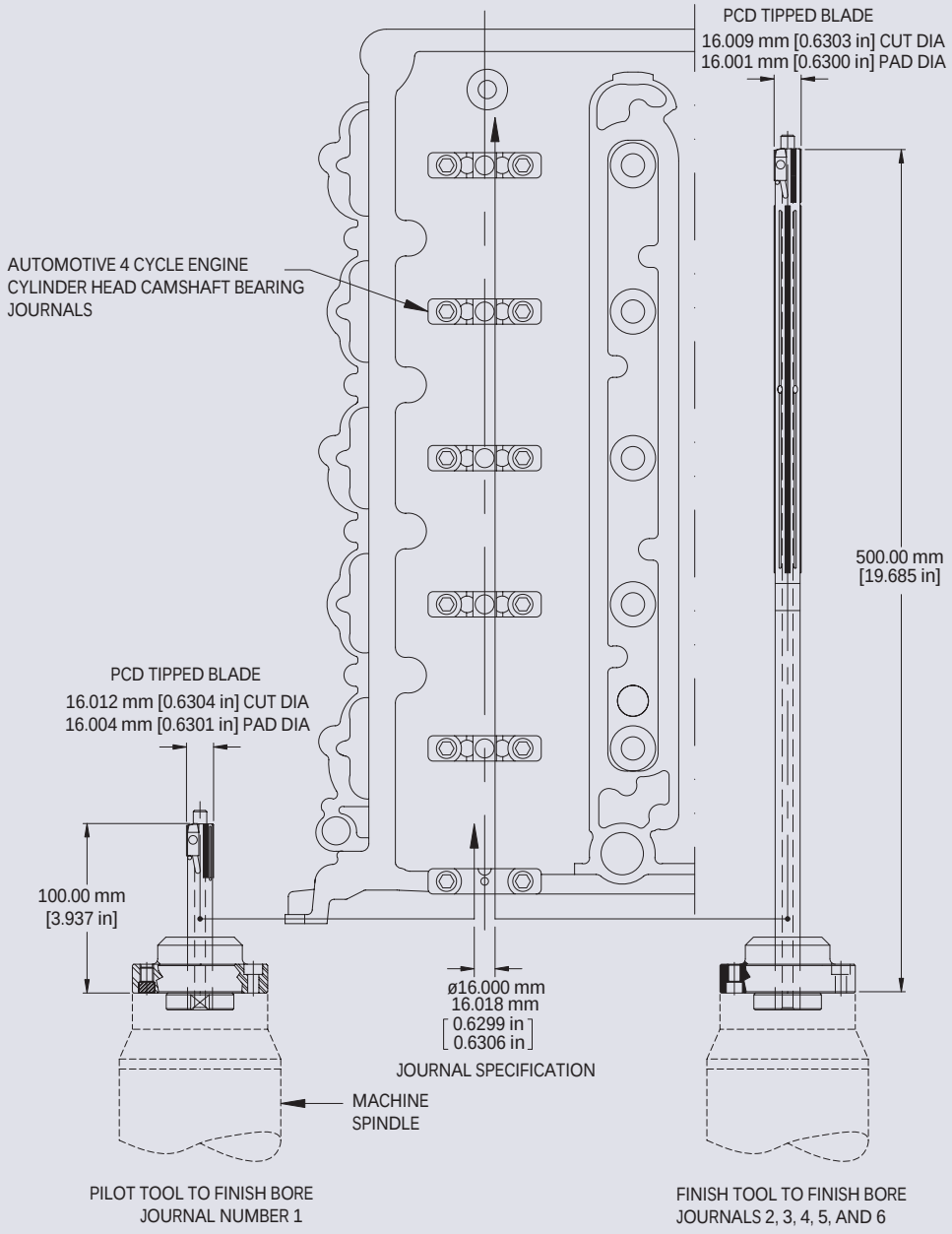


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

Application 5

AUTOMOTIVE CYLINDER HEAD CAM SHAFT BORES

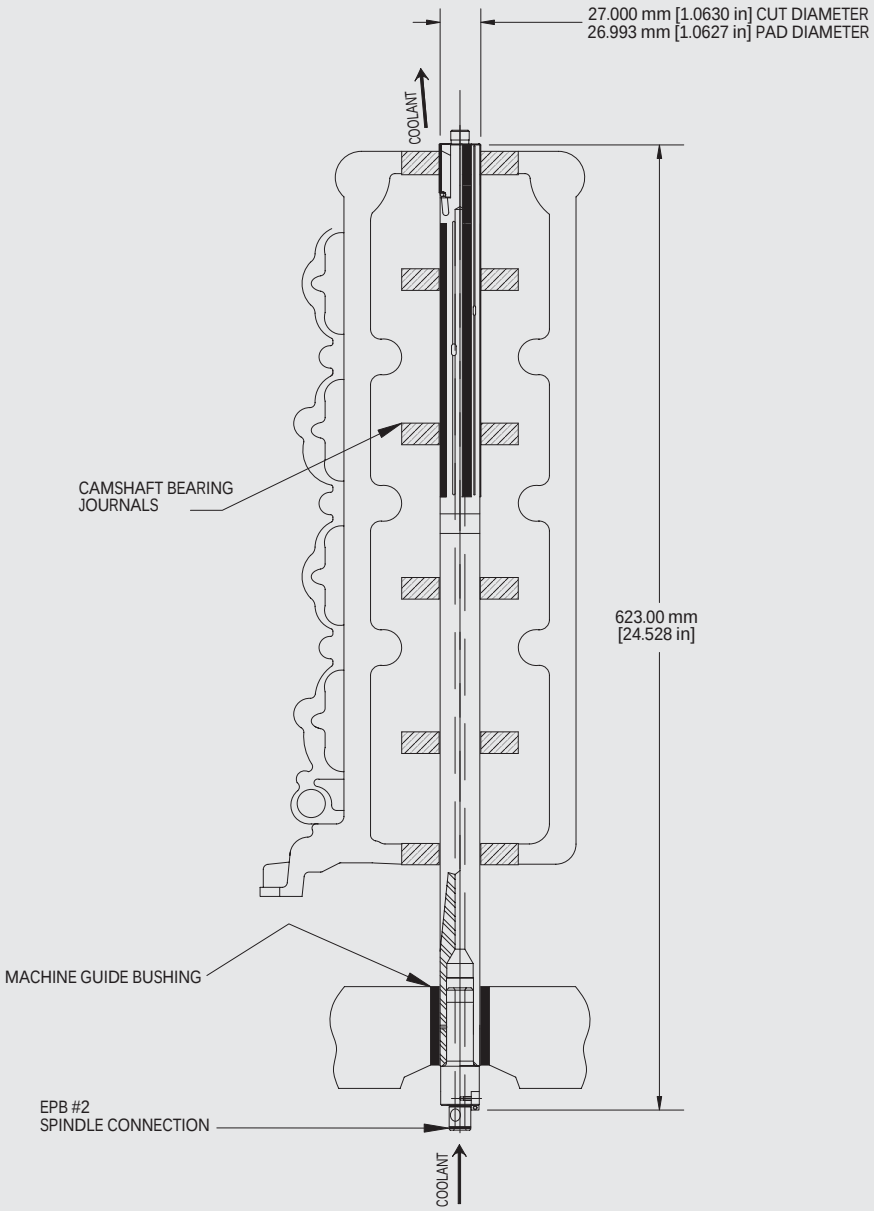


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

Application 6

AUTOMOTIVE CYLINDER HEAD CAM SHAFT BORES

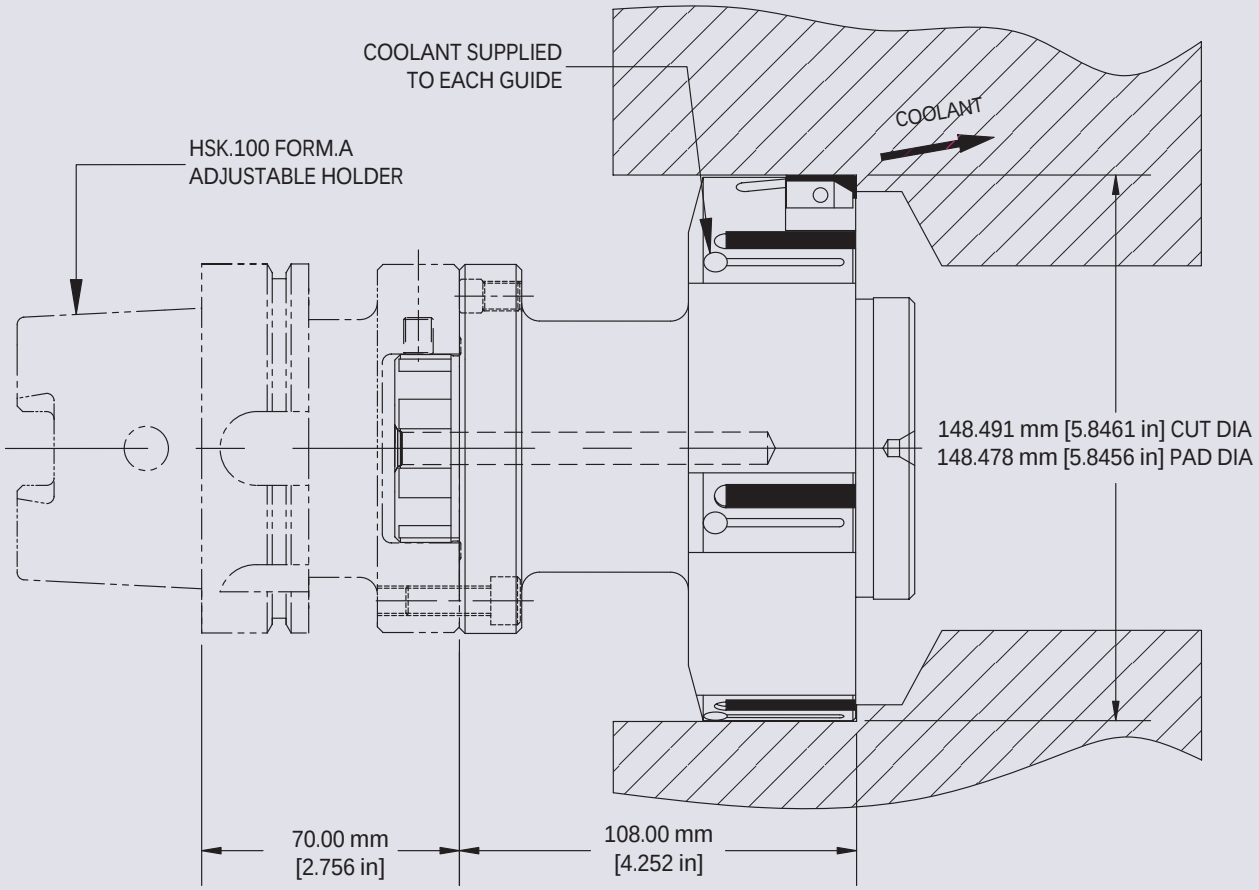


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

Application 7

CLUTCH HOUSING

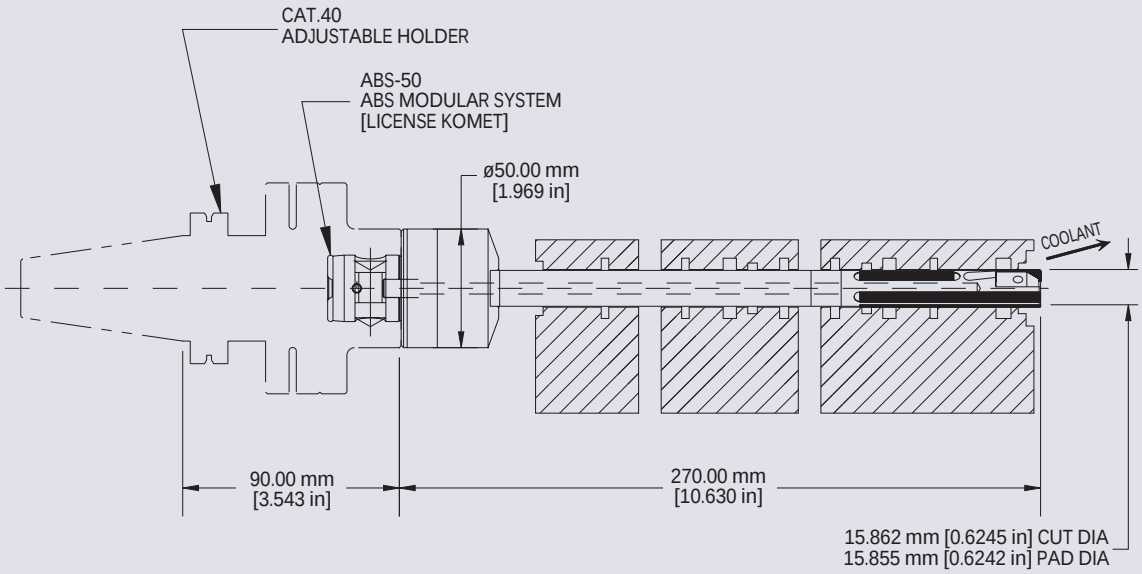


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

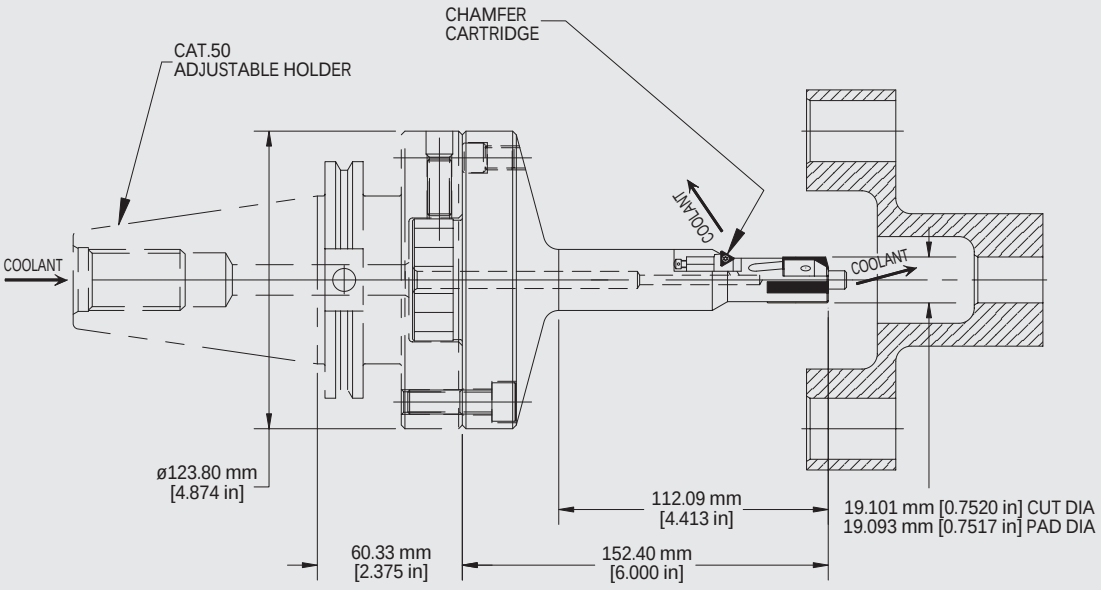
Application 8

SPOOL VALVE



Application 9

AXLE HOUSING

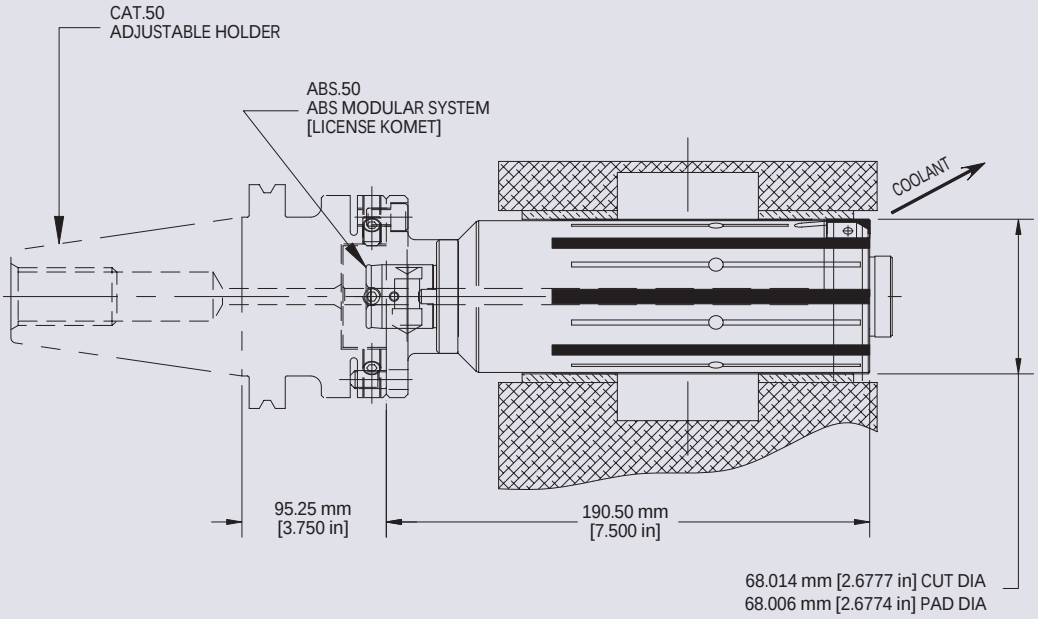


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

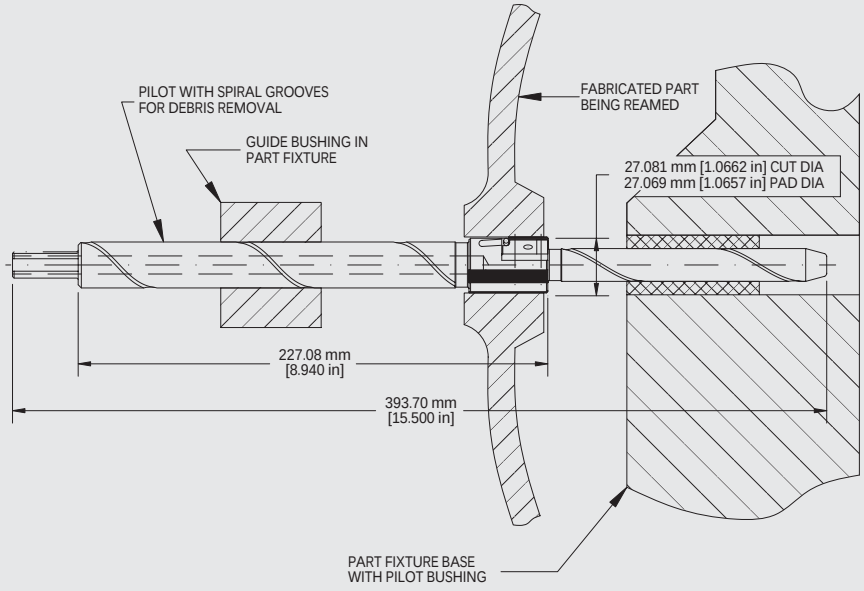
Application 10

PISTON WRIST PIN BORE



Application 11

AIRCRAFT FABRICATION

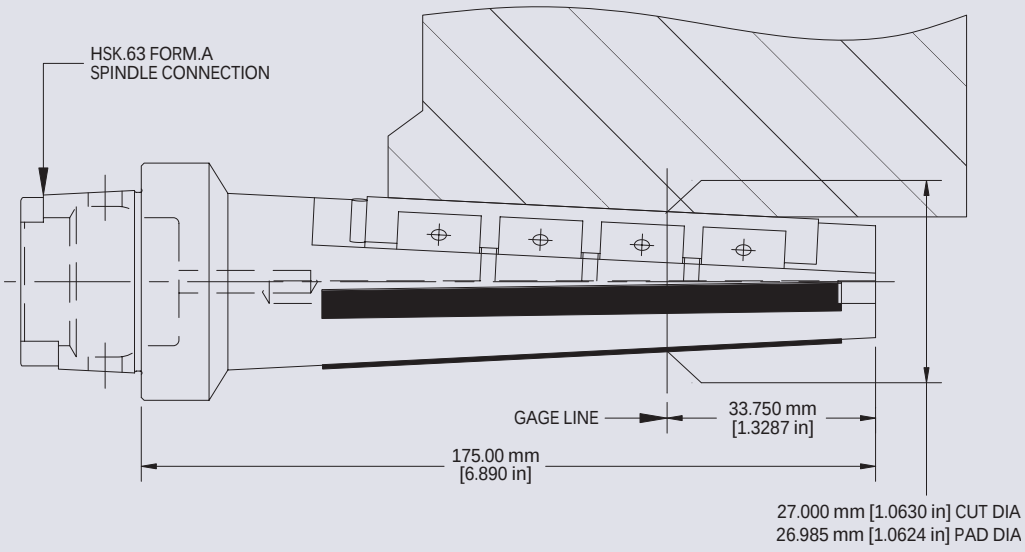


REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications

Application 12

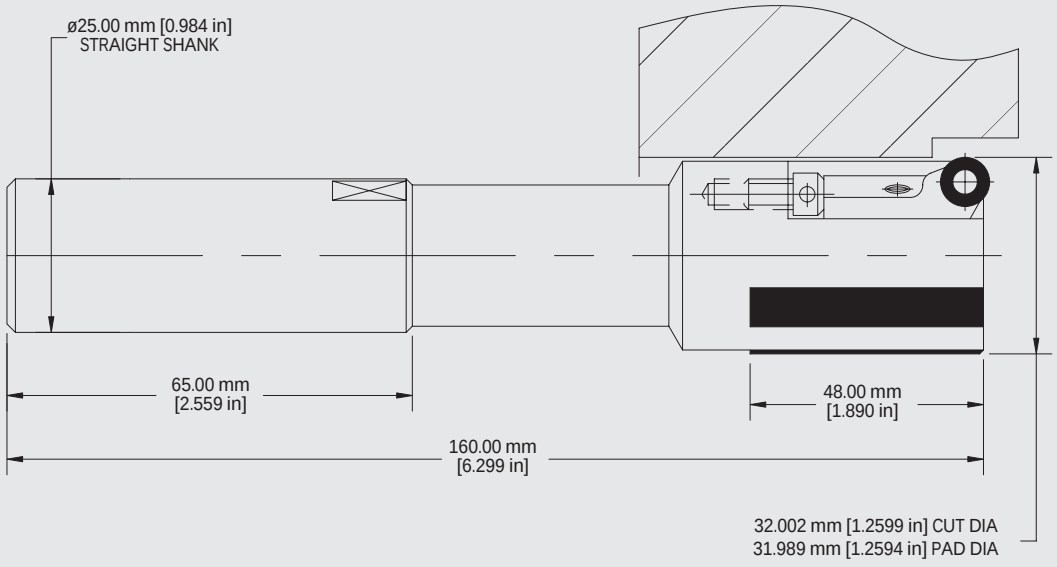
FRONT STEERING KNUCKLE



1:10 TAPER REAMER

Application 13

AXLE FLANGE



BUTTON REAMER

REFER TO APPLICATIONS MACHINING DATA, PAGE 21.

Applications machining data

Application 1

Component: Connecting rod
Material: Aluminum
Machine: Boring machine
Spindle speed: 4000 RPM
Feed rate: 0.18mm/rev (0.007 IPR)
Cycle time: 3.5 seconds
Coolant: Premium soluble (8:1)
Size achieved: ±0.0038mm (0.00015 in.)
Finish achieved: 0.5 micrometers (20 microinches) Ra

Application 2

Component: Valve seat and guide
Material: Sintered steel
Machine: Machining center
Spindle speed: Valve guide—5000 RPM; Valve seat—3000 RPM
Feed rate: Valve guide—0.15mm/rev (.006 IPR); Valve seat—0.1mm/rev (.004 IPR)
Cycle time: 10.6 seconds
Coolant: 8% soluble
Size achieved: ±0.002mm (.00008 in.)
Finish achieved: 0.7 micrometers (28 microinches) Ra

Application 3

Component: Shift bar housing
Material: Ductile cast iron
Machine: Horizontal machining center
Spindle speed: 1250 RPM
Feed rate: 0.25mm/rev (0.010 IPR)
Cycle time: 6 to 8 seconds
Coolant: Water soluble
Size achieved: 30.01mm (1.1815 in.)
Finish achieved: .63 to .75 micrometers (25 to 30 microinches) Ra

Application 4

Component: Piston wrist pin bore
Material: Cast aluminum alloy
Machine: Transfer line
Spindle speed: 3750 RPM
Feed rate: 0.15mm/rev (0.006 IPR)
Cycle time: 2 to 3 seconds
Coolant: Water soluble
Size achieved: 20.35mm (.8010 in.)
Finish achieved: 0.25 micrometers (10 microinches) Ra

Application 5

Component: Automotive cylinder head cam shaft bores
Material: Aluminum alloy
Machine: Transfer line
Spindle speed: 4000 RPM
Feed rate: 0.13mm/rev (.005 IPR)
Coolant: Semi-synthetic (10%)
Size achieved: 16.000/16.018mm (.6299/.6306 in.)
Finish achieved: .25 micrometers (10 microinches) Ra

Application 6

Component: Automotive cylinder head cam shaft bores
Material: Die-cast aluminum
Machine: Transfer line
Spindle speed: 4000 RPM
Feed rate: 0.13mm/rev (.005 IPR)
Cycle time: 30 seconds
Coolant: Semi-synthetic (10%)
Size achieved: Better than spec—±0.01mm (±0.0005 in.)
Finish achieved: Better than spec (0.75 micrometers or 30 microinches Ra)
Parts per PCD blade: 100,000

Application 7

Component: Clutch housing
Material: Aluminum
Machine: Horizontal machining center
Spindle speed: 200 RPM
Feed rate: 0.15mm/rev (.006 IPR)
Cycle time: 2 minutes
Coolant: Water soluble (10%)
Size achieved: 148.493/148.487mm (5.846/5.845 in.)
Finish achieved: 0.4 micrometers (16 microinches) Ra

Application 8

Component: Spool valve
Material: Gray cast iron
Machine: Vertical machining center
Spindle speed: 1500 RPM
Feed rate: 0.13mm/rev (.005 IPR)
Cycle time: 1 minute
Coolant: Water soluble
Size achieved: 15.86mm (.6245 in.)
Finish achieved: 0.8 micrometers (32 microinches) Ra

Application 9

Component: Axle housing
Material: Aluminum
Machine: CNC machining center
Spindle speed: 1300 RPM
Feed rate: 0.1mm/rev (.004 IPR)
Cycle time: 11 seconds per bore
Coolant: Mineral oil (8%)
Size achieved: 19.10 ±.002mm (.7520 ±.00008 in.)
Finish achieved: 0.1 micrometers (4 microinches) Ra

Application 10

Component: Piston (wrist pin bore)
Material: Brass
Machine: Horizontal machining center
Spindle speed: 400 RPM
Feed rate: 0.20mm/rev (.008 IPR)
Coolant: Water soluble
Size achieved: 68.01/68.00mm (2.6777/2.6774 in.)
Finish achieved: .3 to .4 micrometers (12 to 16 microinches) Ra

Application 11

Component: Aircraft fabrication
Material: Stainless steel
Machine: Air drill
Spindle speed: 250 RPM
Feed rate: 0.15mm/rev (.006 IPR)
Cycle time: 3 minutes
Coolant: Soluble (15:1)
Size achieved: 27.081mm (1.0662 in.)
Finish achieved: 0.8 micrometers (32 microinches) Ra or lower

Application 12

Component: Front steering knuckle
Material: Gray cast iron
Machine: Machining center
Spindle speed: 235 RPM
Feed rate: 0.3mm/rev (.012 IPR)
Cycle time: 11 seconds
Coolant: Soluble (10%)
Size achieved: To print specification
Finish achieved: .6 micrometers (24 microinches) Ra

Application 13

Component: Axle flange
Material: Gray cast iron
Machine: Lathe
Spindle speed: 2000 RPM
Feed rate: 0.18mm/rev (.007 IPR)
Cycle time: 10 seconds
Coolant: Semi-synthetic (5%)
Size achieved: 0.003mm (.0001 in.)
Finish achieved: 0.7 micrometers (28 microinches) Ra