

AUTOMOTIVE Powertrain processes

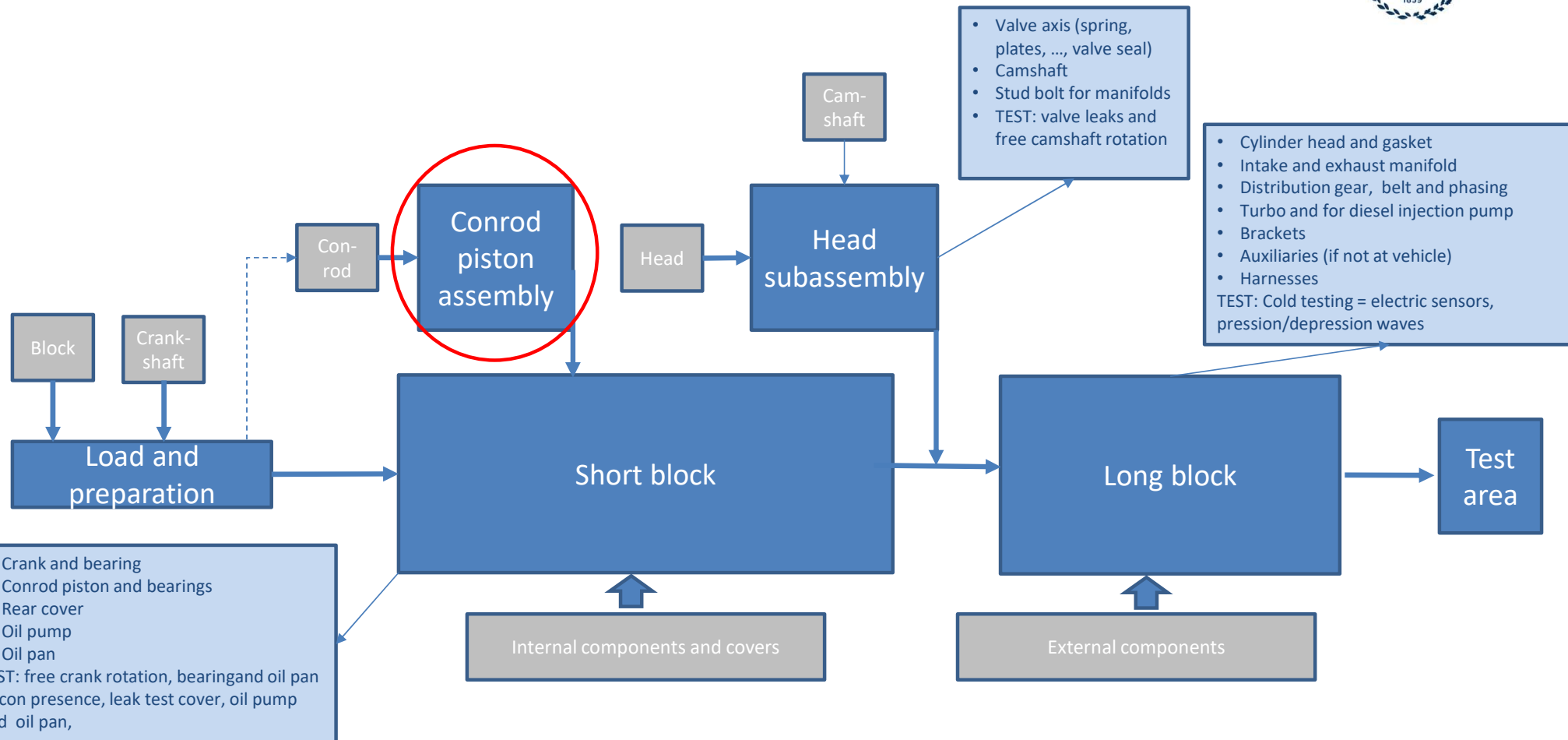
Main powertrain assembly processes

Introduction to engine assembly

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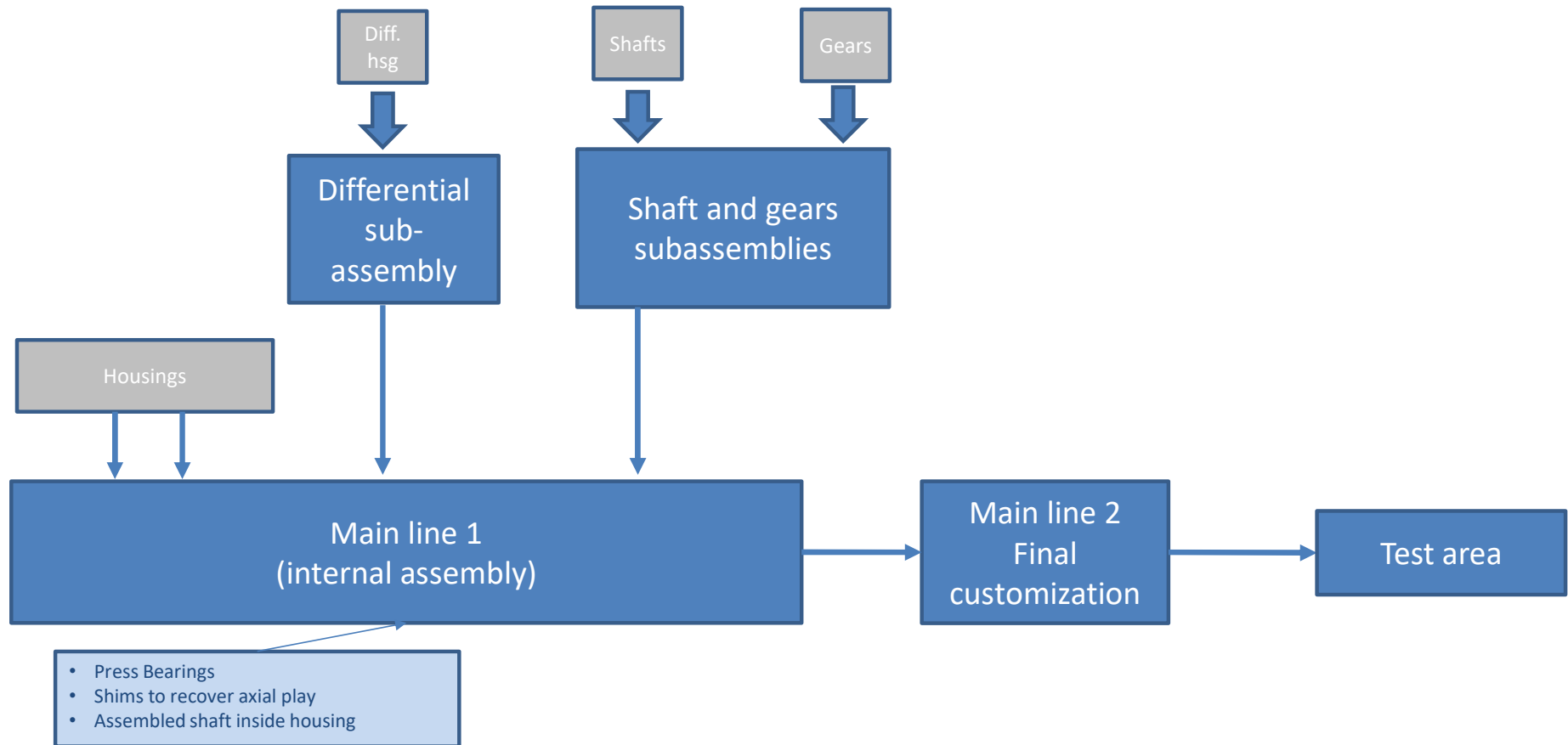
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Introduction to transmission assembly

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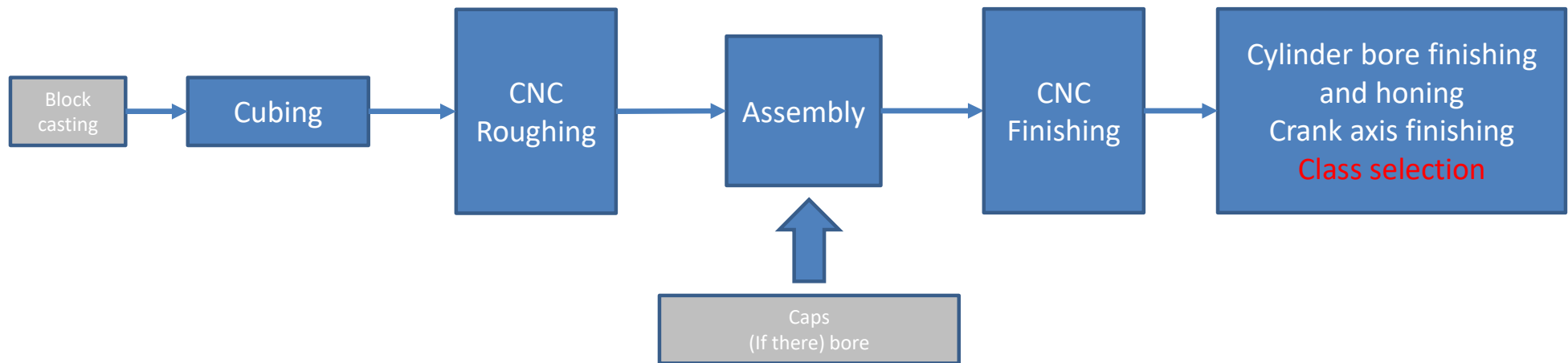
Main machining component processes

Block diagram cylinder block machining

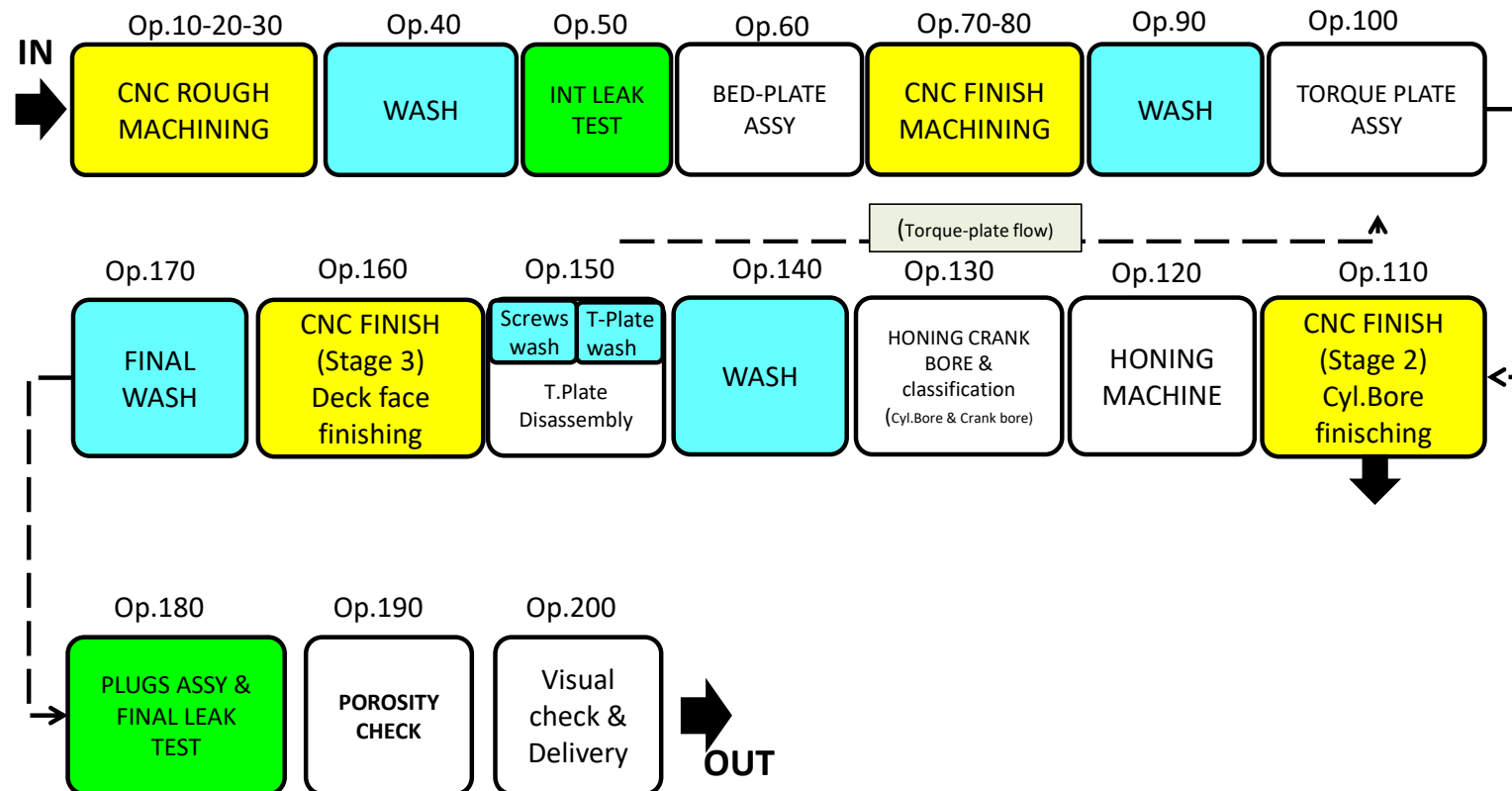
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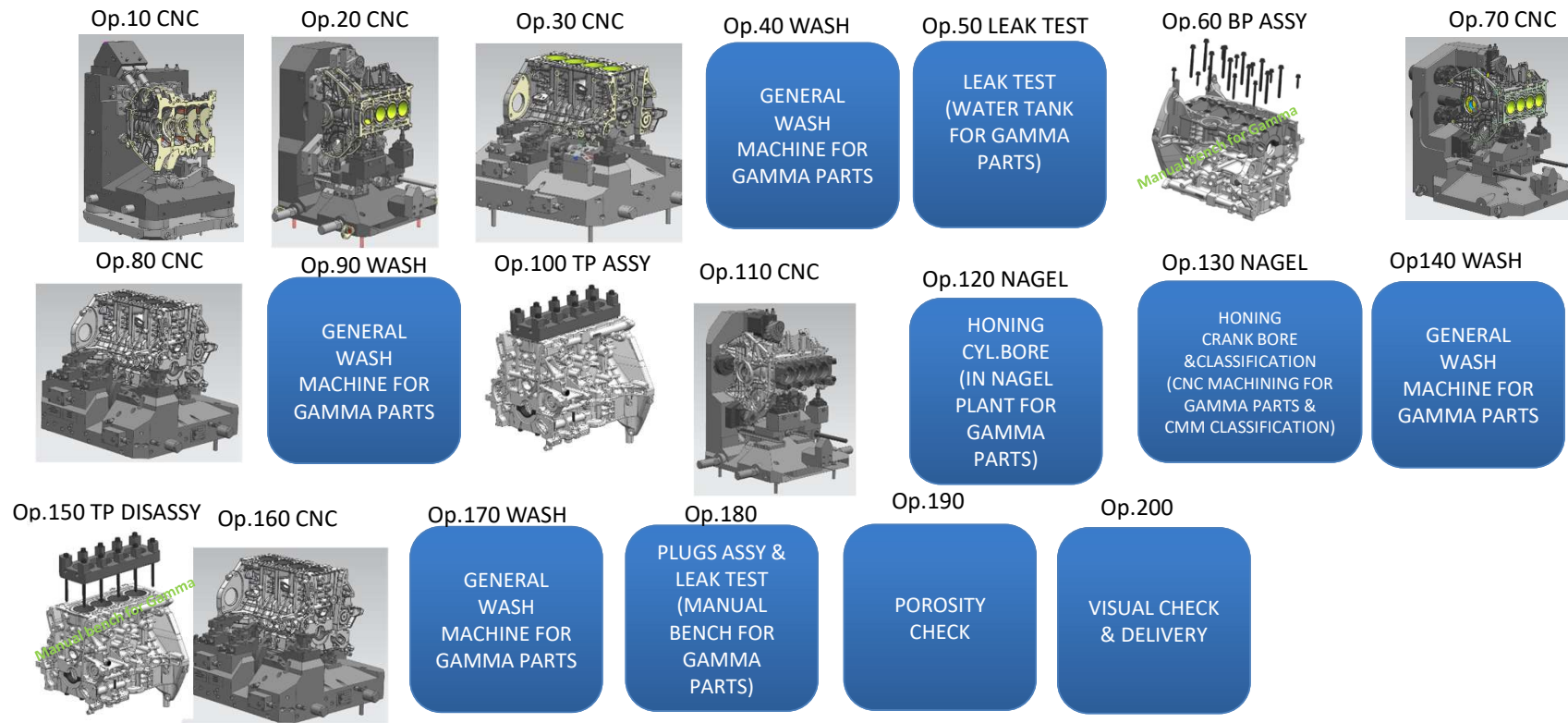
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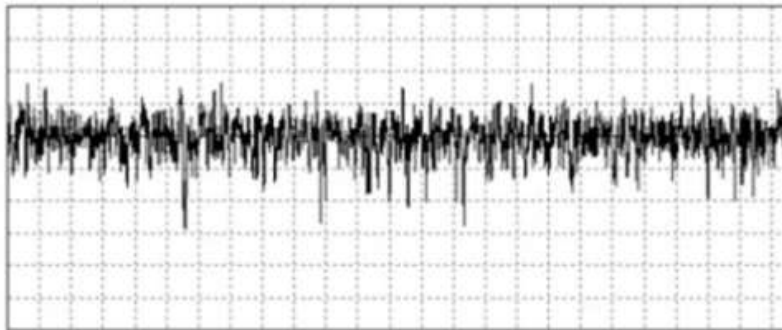
Cylinder block: cycle



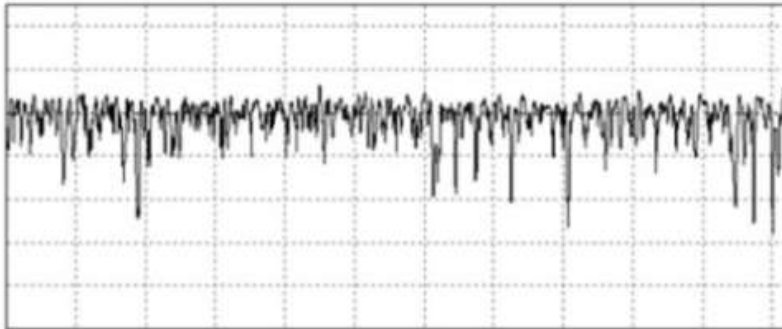
Cylinder bock: Visual cycle



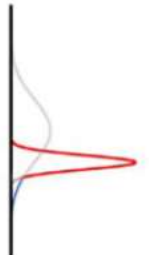
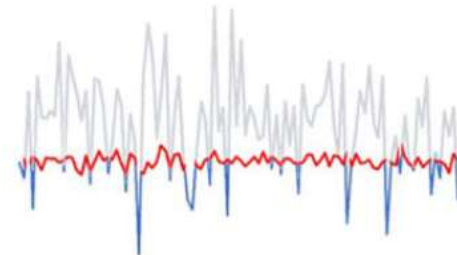
The plateau



Single-honed



Plateaued

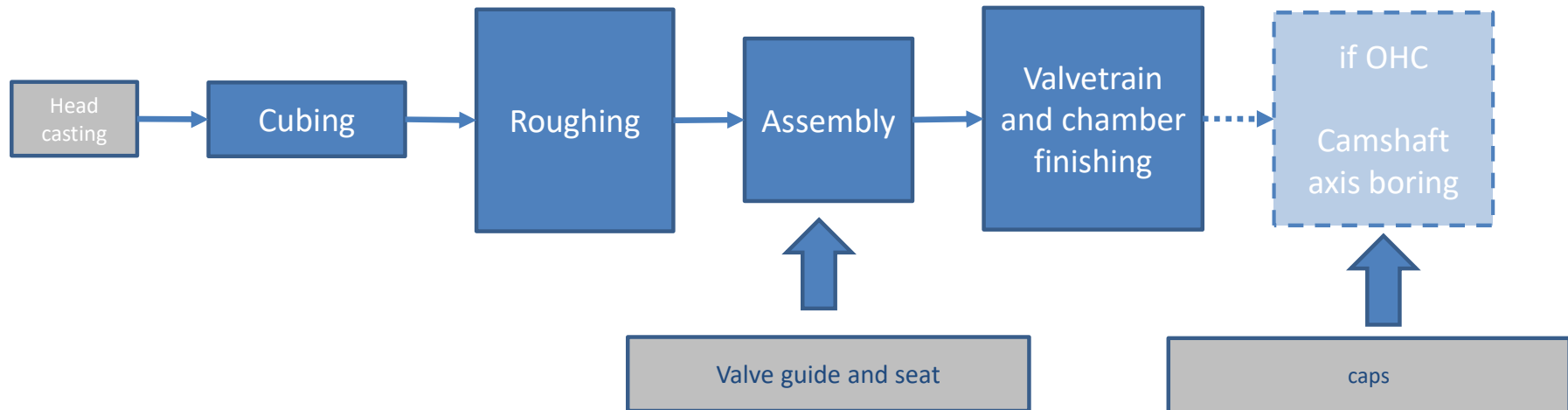


Block diagram cylinder head machining

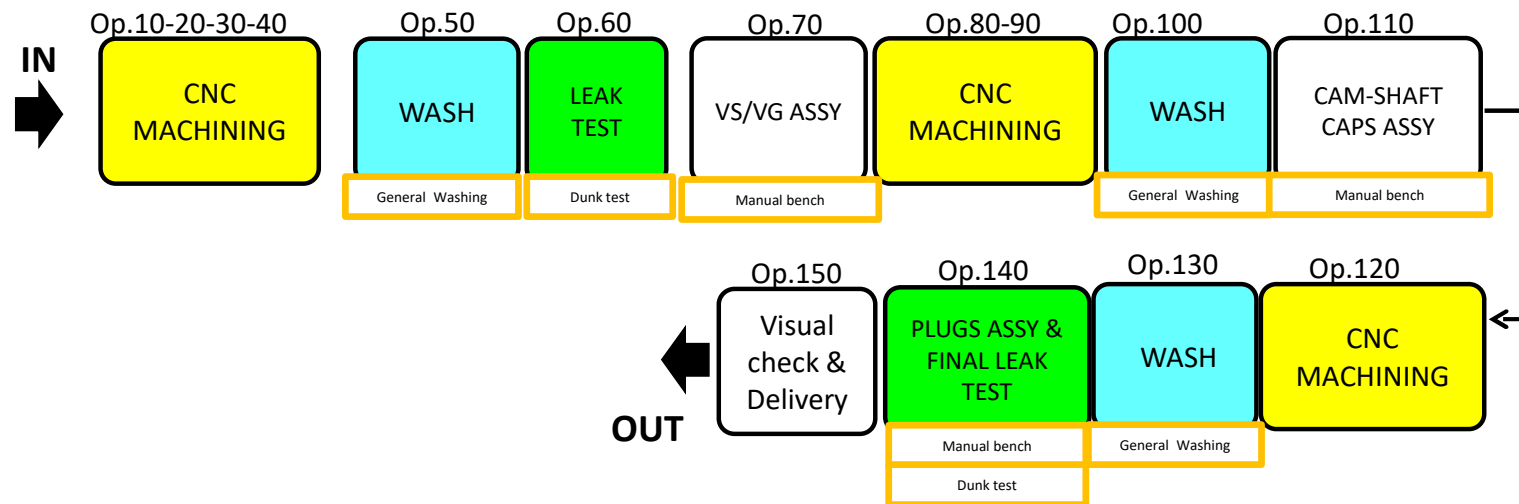
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Process flow Cylinder head

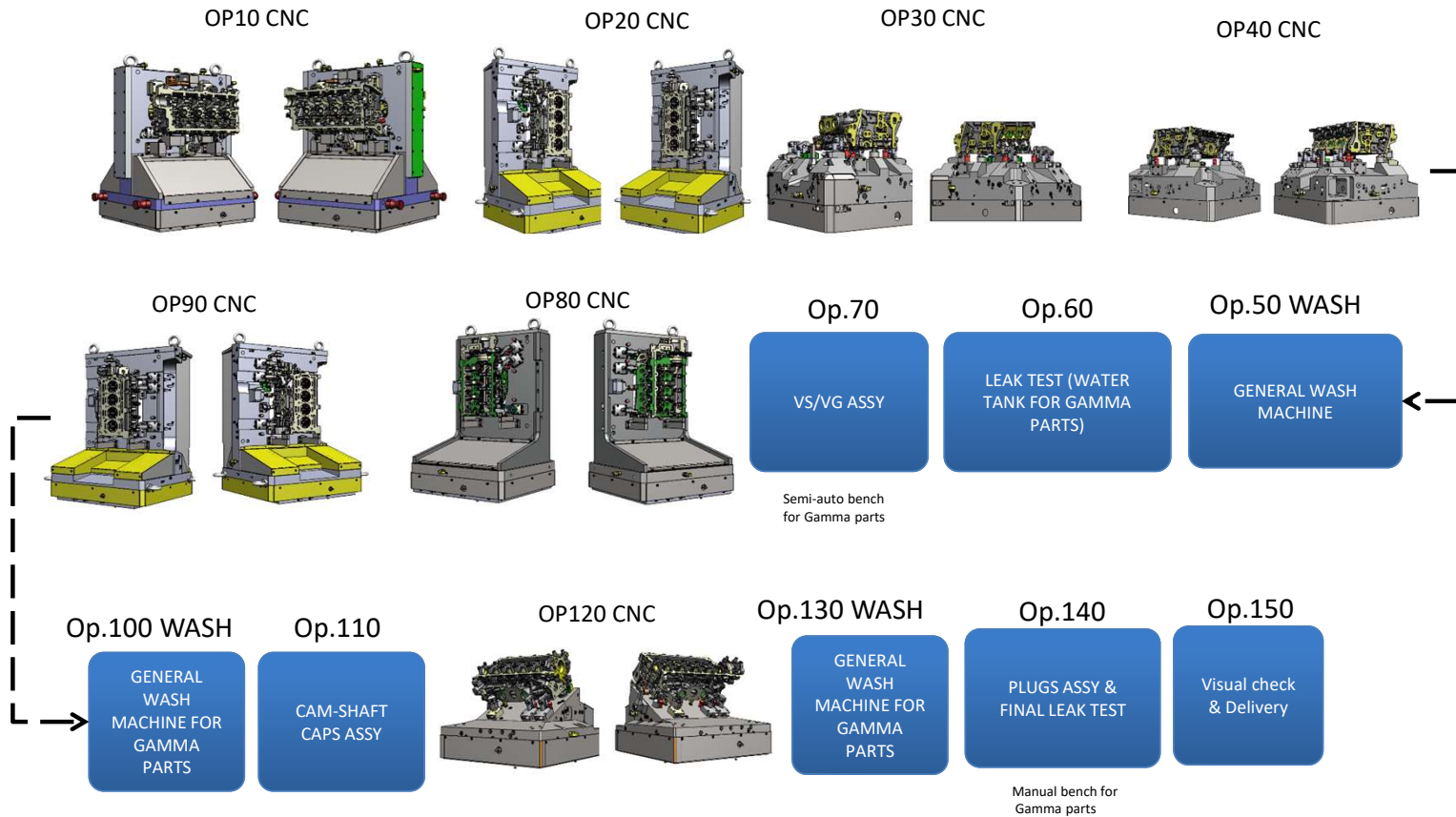


Cylinder head: visual cycle

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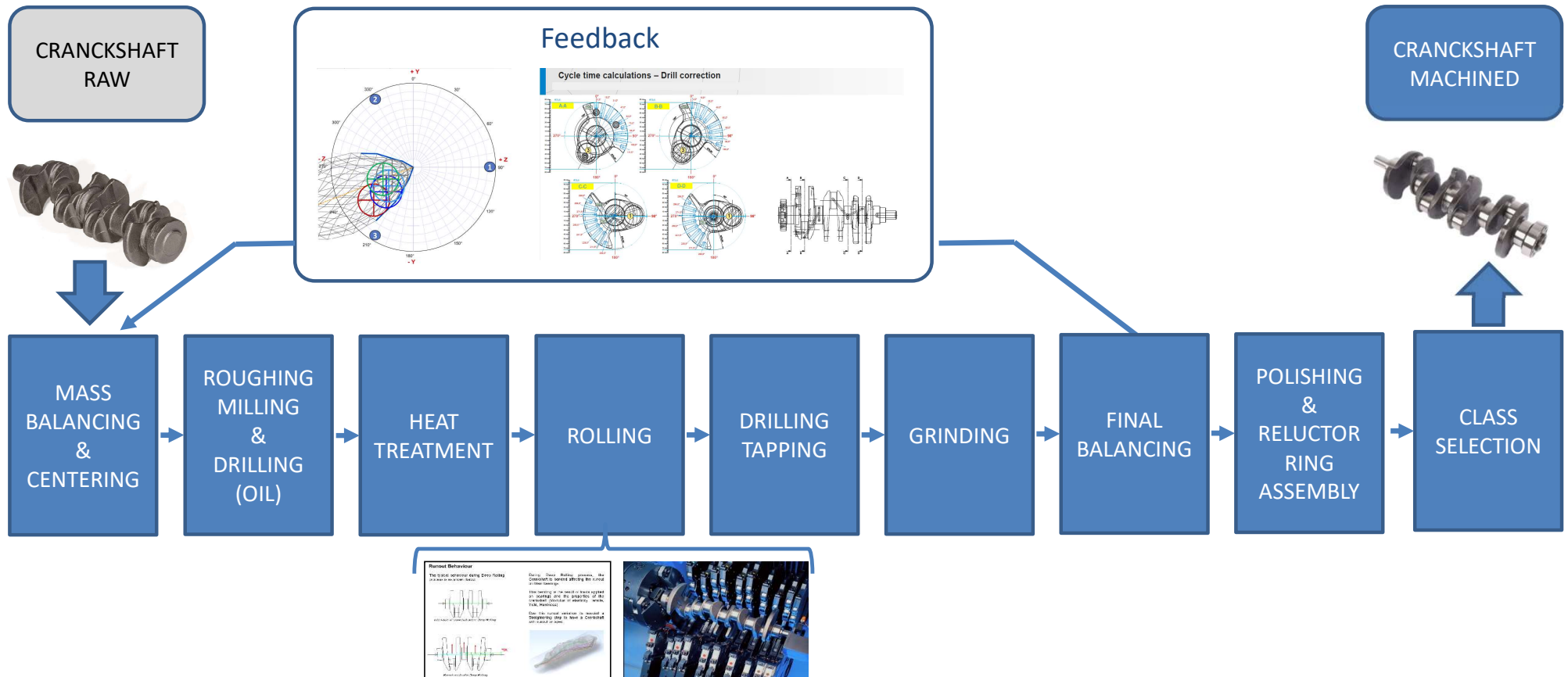
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Block diagram crankshaft machining

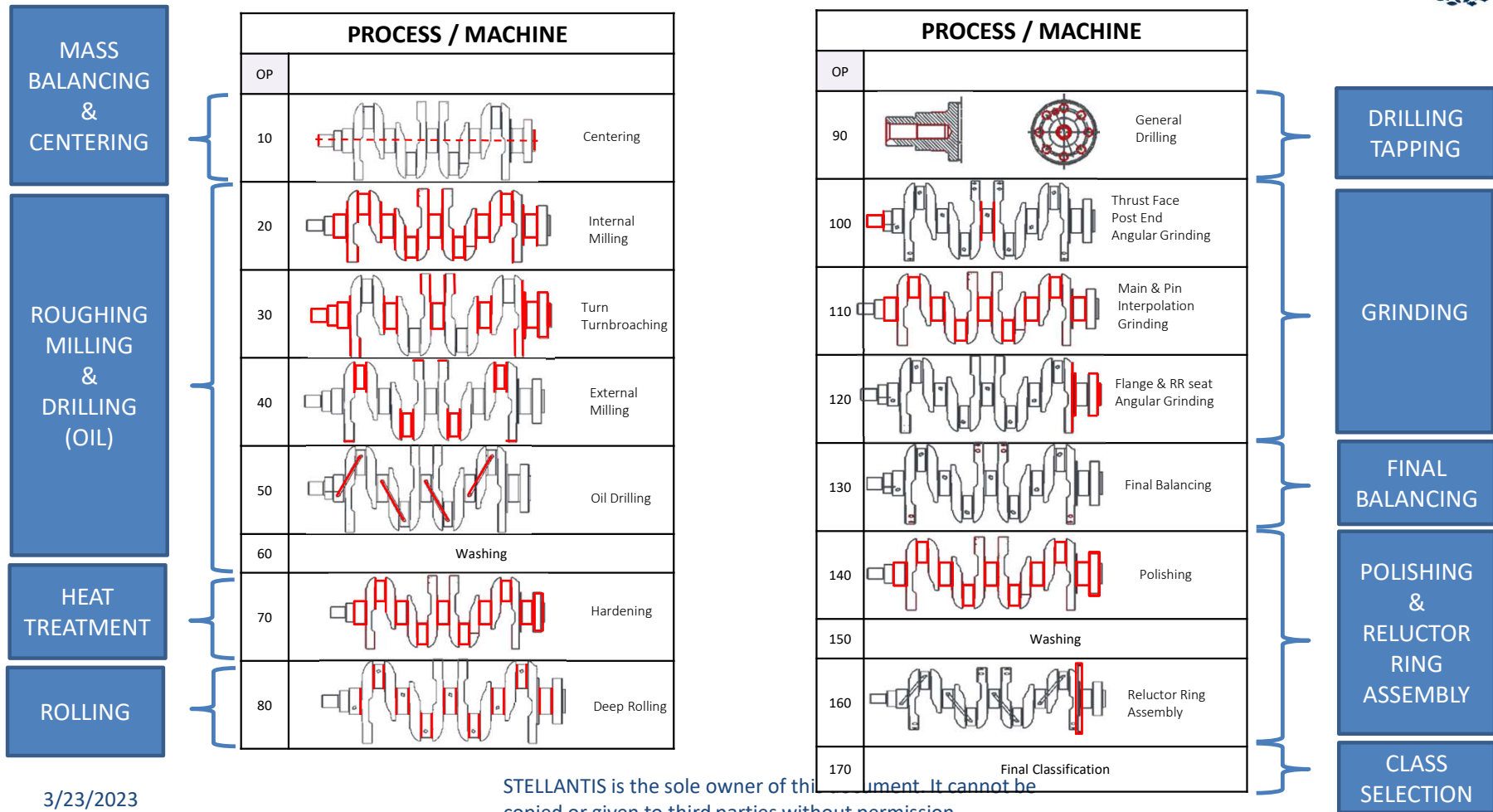


Crankshaft: visual cycle

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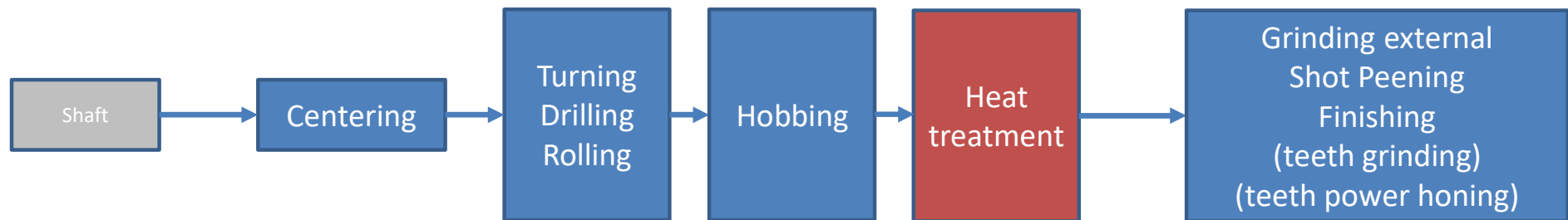
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Block diagram transmission shafts

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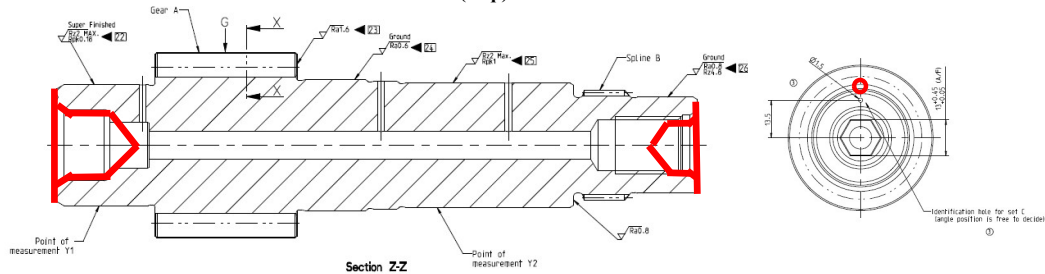
Transmission shaft: visual cycle before H.T.

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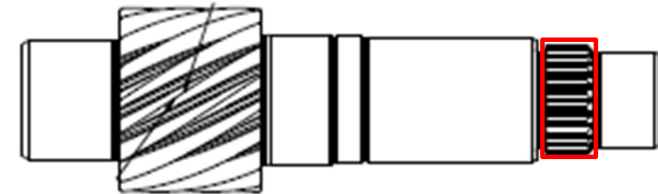


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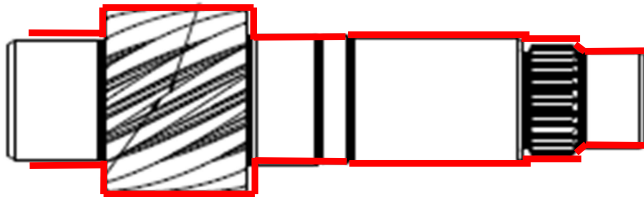
CENTERING AND FACING (Mql)



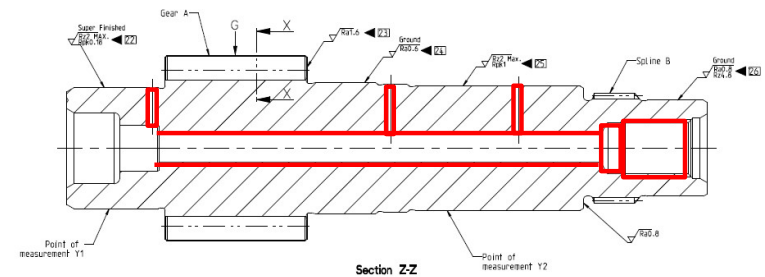
COLD ROLLING (Mql)



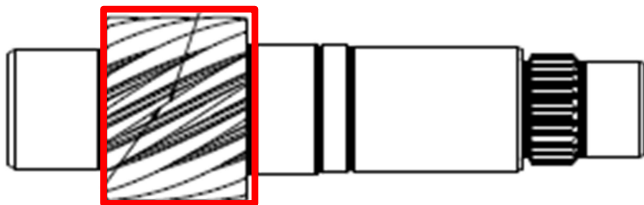
GREEN TURNING (dry)



DRILLING and TAPPING (Mal)



HOBGING and CHAMFERING (dry)



WASHING

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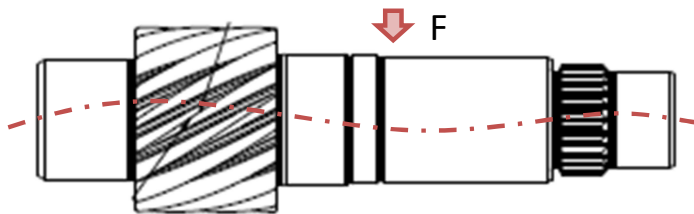
Transmission shaft: visual cycle after H.T.

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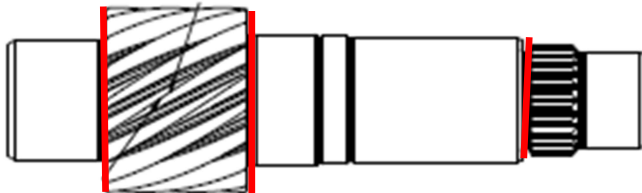


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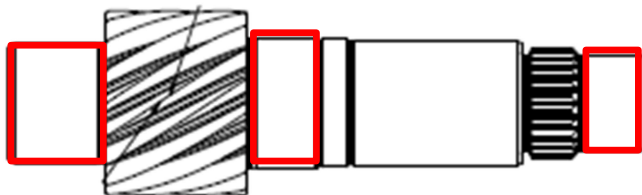
STRAIGHTENING (dry)



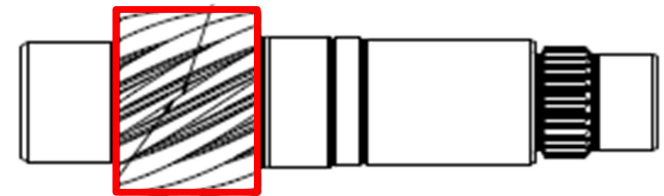
GROOVES GRINDING (oil 1)



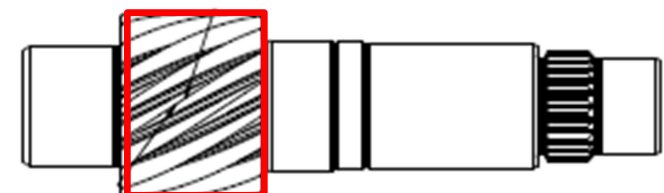
CONTOUR GRINDING (oil 1)



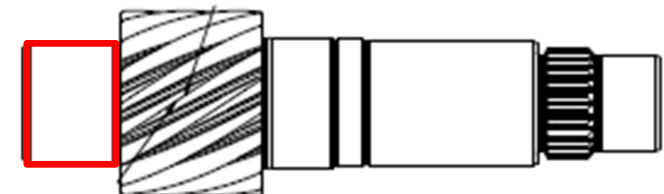
WASHING SHOT PEENING



TEETH GRINDING (oil 1)



HONING



WASHING

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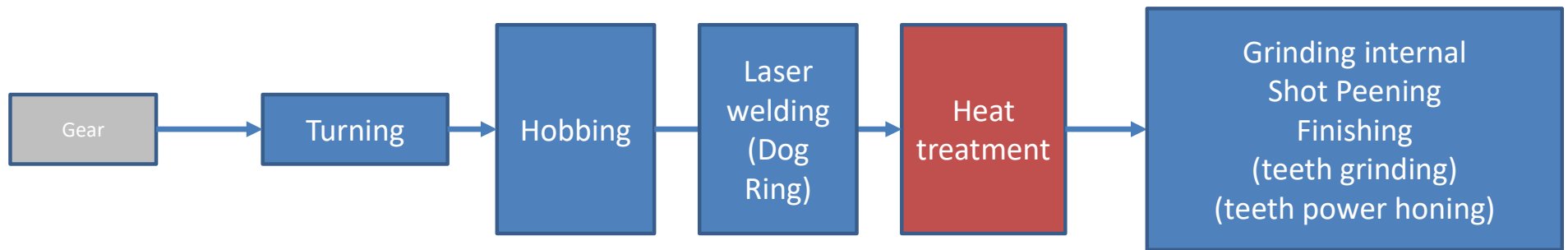
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Block diagram transmission /gear

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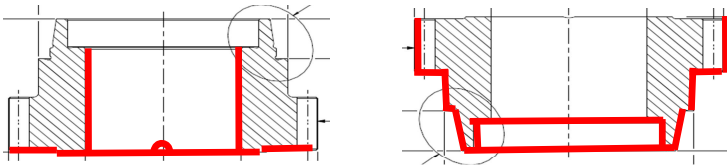
Gear: visual cycle

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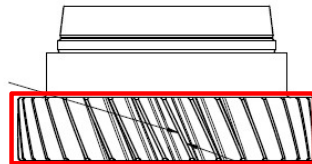


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TURNING (dry)



HOBGING and CHAMFERING (dry)

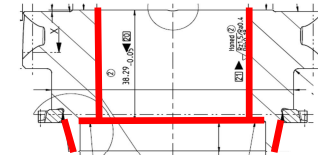


WASHING

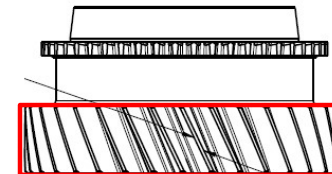
LASER WELDING & CHECK



HARD TURNING / GRINDING (emulsion)



POWER HONING (oil 1)



HEAT TREATMENT