



'Smart Technologies to **TRANSFORM** your Machine Shop'

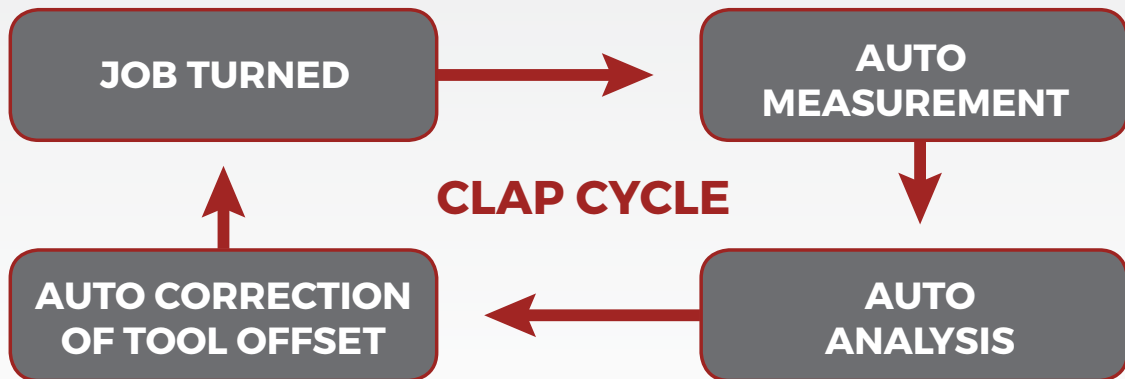
'CLOSED LOOP' TURNING SOLUTIONS



BENEFITS:

- Zero defect production
- Quality control independent of operator or inspector
- Automatic digital records of inspection
- Option of marking after inspection for traceability.
- Optimum tool life management for reducing tooling cost per component
- Use of "SISTER TOOLS" for higher O.E.E. leading to lower cost per component

CLAP: (Closed Loop Automated Production technology with auto-measurement, auto-analysis, auto-correction & digital records ensures ZERO defect production & shift from **O**BQ (Operator based quality) to **S**BQ (System based quality).



FREEDOM FROM TWO PAIN POINTS



PAIN POINT #1, OPERATOR 'RAM PRASAD'

WHY Operator has become a PAIN POINT?

- The attitude & aptitude of 'Ram Prasad' has deteriorated over the last 15 years and factories across the country are struggling to find, train and **RETAIN** skilled operators.
- He has many opportunities of more comfortable jobs in service sector and is not interested in shop-floor job with stress of ensuring quality of machined jobs.
- He is distracted by addiction to smartphone and easily available Apps.

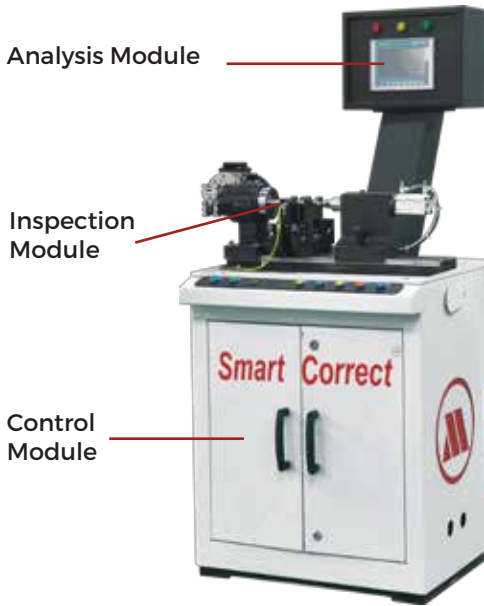


PAIN POINT # 2, INSPECTOR AJAIB SINGH

WHY Inspector has become a PAIN POINT?

- The attitude & aptitude of 'Ajaib Singh' has deteriorated over the last 15 years and **factories across the country are struggling to find, train and RETAIN** skilled Inspectors.
- He is 'cut from the same cloth' as 'Ram Prasad' and suffers from same problems.
- His job is **the most monotonous & repetitive and it is difficult** for any human to do, day in and day out.

SmartCorrect® Gauging Stations



Temperature Controlled Testing Area

MARPOSS QUALITY



DIGITAL PROBES

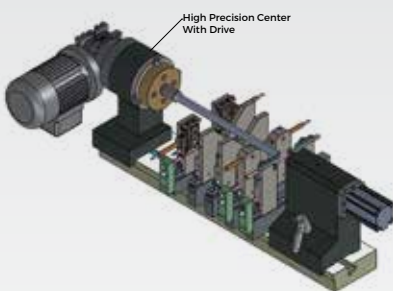


ELEMENTS

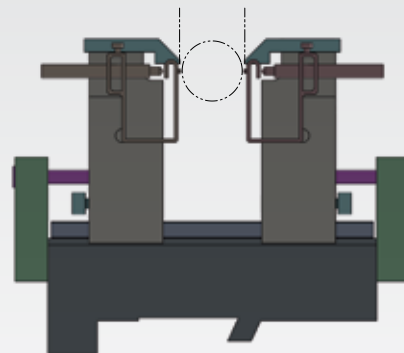


ELECTRONIC SIGNAL PROCESSORS

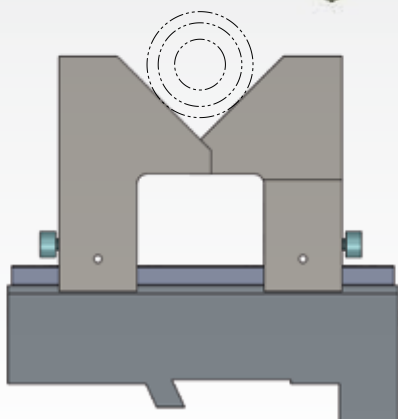
Marshall INNOVATION



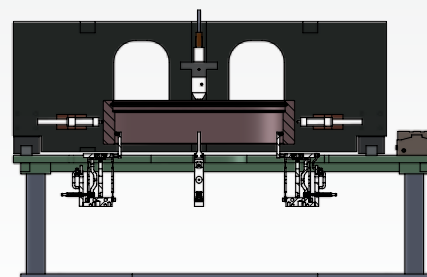
1. Inspection of shaft including runout



2. Precision Elements for mounting digital probes

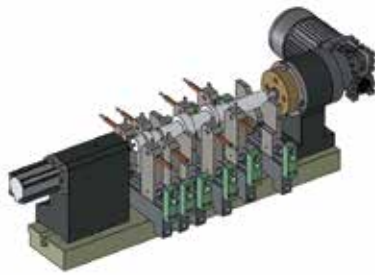


3. Adjustable precision V-Block elements



4. Ring measuring assembly

SmartCorrect® Gauging Stations @ work

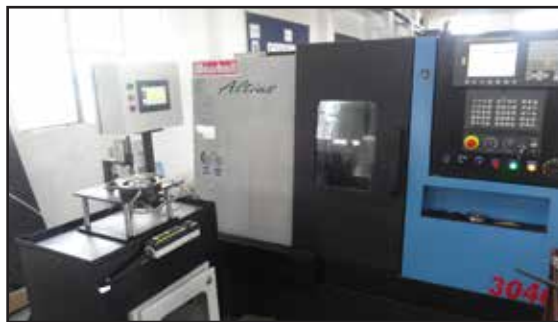
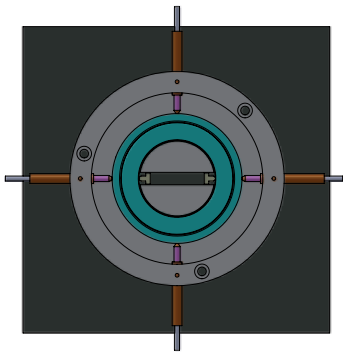
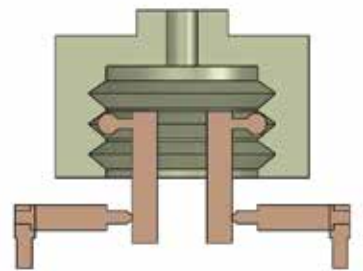


Graziano shaft being manufactured on Marshall machine with gauging station measuring several diameters & run out.

Result: Size control in 7 microns

Component with M16x1.5 Internal threading being made on 2 Nos. CITIUS machines connected to one Gauging Station.

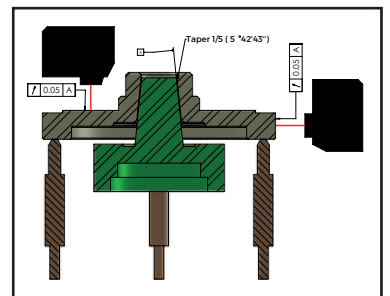
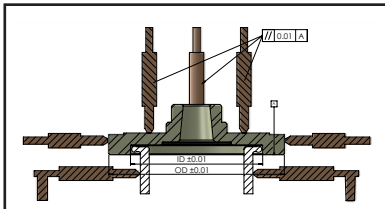
Result: Cpk>2.50



Critical hardened component (Body Starter Clutch) being hard turned on Marshall "ALTIUS" with gauging station measuring OD, bore and (ovality in both)

**Result: Size control in 8 microns.
REJECTION RATE <0.05%**

ROBOTURN 6T producing high precision Boss Rotor with three gauging station for various quality parameters.



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