CNC UNDER FLOOR WHEEL LATHE

YUL - 08

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Economical Rolling Stock Maintenance
Goes Global

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TECHNICAL DATA OF MACHINE

- Max. Main Drive Motor Capacity: 4 motors of 15 KW capacity each
- Cutting Speed while Profiling: 25 to 80 m/min
- Tool Post Feed for Wheel Profiling: 0.1 to 2.5 mm/rev
- Tool Post Rapid Speed for Both Axes: 3000 mm/min
- Max. Chip Cross Section while Profiling: 10 mm²
- Supply Voltage: 415 VAC, 50 Hz

** Special electrical supply can be considered, if required.

WHEEL SET DATA FOR MACHINING

- Max. Tread Diameter: 1250 mm
- Min. Tread Diameter: 540 mm
- Wheel Width: 75 to 145 mm
- Max. Width of Vehicle (Rolling Stock): 3600/3100 mm
- Min. Width of Vehicle (Rolling Stock): 2900/2400 mm
- Max. Axle Length: 2750 mm
- Min. Axle Length: 1200 mm
- Max. Axle Load: 300 kN
- Max./Min. Dia. for Brake Disc Machining: 700/250 mm

* Depends on track gauge

ACCURACIES OF WHEEL SET

- Wheel profiling
- Difference in Dia. of Both Wheels: <0.10 mm
- Accuracy of Wheel Profile when Compared with Standard Gauge: <0.2 mm
- Radial Run Out of Wheel: <0.10 mm
- Axial Run Out of Wheel: <0.15 mm
- Profile Surface Finish: <12.5 µm Ra
- Brake Disc Machining (Optional)
- Surface Finish: <2.5 µm Ra
- Flattness of Surface: <0.1/100 mm
- Lateral Wobble: <0.2 mm

STANDARD EQUIPMENT WITH MACHINE

- Chip Conveyor with Trolley (Bin)
- Swarf Protection Unit
- Hold Down Device for Out-board Axle Box with One Type of Adopter
- Support Jack for Out-board Axle Box
- A Set of Cutting Tools for Acceptance
- One Machining Program
- Electrical Cabinet
- Hydraulic Power Pack
- Oil Cooler
- Standard Measurement Wheel Set (Calibrated)
- Software
BEST VALUE FOR MONEY

- The machine is CE marked.
- The machine is made of close-grained cast iron structure giving dimensional & structural stability and efficient vibration damping.
- Extremely rigid dual column construction made from closed-grained castings. Both columns are robustly connected by a rigid close-grained cast iron cross rail. Rigid hold down equipment and axle box to support the jack is directly mounted on each column.
- Dual column construction with integrated cross rail which carries the CNC tool posts.
- 4 individually floating drive rollers are incorporated to compensate for wheel irregularities and maintain continuous contact.
- Electronic wear measurement system for economical depth of cut.
- Complete enclosure is provided around the machine for protection of the operator.
- Rigid, hydraulically-operated bridging rails ensure smooth roll-in & roll-out of the rolling stock.
- Single, centralised control desk to motor entire wheel measurement & machining
- Extremely wear-resistant SKC lining for sliding surfaces
- Quick change tooling for swift operating cycle
- Automatic tool retraction during power failure & emergency
- Siemens SINUMERIK 840Dsl CNC controller with WIN CC Flex software

OPTIONAL EQUIPMENT

- Software for Centralised Data for Wheel Management of the Region
- Remote-operated Electric Shunter
- Jacking Arrangement for Coupled Axle Turning
- Brake Disc Machining Arrangement
- Dust & Fumes Extractor System
- Revolving Centres for between Centre Turning
- Anti-slip Control Arrangement
- Additional Profile Machining Program
- Additional Hold Down Adaptors
- Digital Camera for Monitoring Cutting Area

CNC UNDER FLOOR WHEEL LATHE

CNC Under Floor Wheel Lathe is an automatic machine used for simultaneous re-profiling of new or worn-out wheels of railway vehicles in situ. It is capable of machining wheel sets of locomotives, coaches, wagons, trams, metros, etc. It is also capable of machining brake discs assembled on wheel sets of rolling stock.

- Economical, advanced & proven design
- Proven manufacturing techniques
- High automation & consistent accuracies
- High reliability and long service life

DURING THE AUTOMATIC CYCLE, THE FOLLOWING OPERATIONS ARE PERFORMED:

- Loading & centering of wheel set by 4 synchronised drive rollers
- Pre-measurement
- Machining of wheel profile i.e. tread & flange
- Post-measurement
- Unloading of wheel set

WHEEL SET SUPPORT & DRIVE

- 4 drive rollers provide drive and vertical support to the wheel set.
- Drive rollers are mounted on drive roller arms with anti-friction linear guideways, ensuring maximum conversion of axle load to torque which avoids slippage of the wheel set.
- Accurate centering of wheel set is ensured by synchronised lifting of wheel set by the drive rollers.
- Specially-profiled drive rollers are made of high carbon & high chromium alloy steel in hardened condition for extreme wear-resistance and for taking 8mm depth of cut in a single pass.
- Each roller is connected to 15 KW AC motor through heavy duty reduction gear box. The motors are equipped with digital variable speed drives for infinite speed variation, enabling cutting through hard spots and skid marks.
CNC TOOL POSTS
- Two extremely rigid tool posts are made of close-grained cast iron structure, having two axis each and are driven by servomotors for accurate & consistent profile.
- The tool post are rigidly mounted on the cross rail which has telescopic cover protection.
- Hardened, ground, lapped OHHS guide ways with double lipped wipers and ball screw are incorporated for accurate, smooth & controlled movement.
- Each tool post is fitted with contact type probe which is used for wear and diameter measurement of wheel sets.

WHEEL MEASUREMENT SYSTEM (Contact Type Probe)
- The machine is equipped with wheel measurement system for automatic measurement of profile & diameter before & after turning.
- Each tool post is equipped with retractable contact type probes for wear measurement and disc type unit for diameter measurement. These measuring units are mounted within dust-proof protective covers.
- Each wear measurement unit has a probe to take measurements at pre-determined six positions around the periphery when the wheel is stationary.
- Alternatively wheel measurements can be taken along the profile by means of a measuring roller unit while the wheel rotates at a slow speed.
- Economical material removal and specified accuracies are achieved when the wear measurement program processes the wear data and the CNC Software suggests the most economical depth of cut. Measurement & machining data is stored in the CNC system and can be retrieved whenever required.

SOFTWARE
- The machine is equipped with Siemens SINUMERIK 840Dsl CNC Controller with open architecture & WIN CC Flex software.
- Dedicated control software is used for machine operation, wheel measurement, data entry and displaying parameters. It also takes care of various safety measures for safe operation and displays fault messages in normal English text.
- Remote diagnostic software is used for controlling & maintaining the machine from HYT headquarters.

BREAK DISC TURNING (Optional)
- The machine is equipped with quick change tooling for brake disc turning.
- Unevenness of both side brake discs are removed by adopters which are equipped with standard tool holders & inserts.
- Tool positioning is done by ‘Z’ axis of the tool post and machining is carried out by ‘X’ axis of the tool post.

CONVEYER
- Considering the heavy material removal during profile machining operation, a heavy-duty steel belt chip conveyer is provided.
- It is installed below the machine. Necessary chutes are provided to direct the chips on to the conveyer.
- The chips falling on the conveyer belt are carried out of the pit which is then dropped in the bins placed on the ground floor for easy disposal.

HOLD DOWN DEVICE & JACK
- Hold-down device consists of hydraulically-operated rigid adjustable arm accommodating various types of adopters for exerting force on axle box.
- This device ensures continuous contact between the wheel & the drive rollers which prevents wheel slippage during turning of the wheel set.