



MENATEK
Defense Technologies

**FOR EXTREME
PERFORMANCE**

MENATEK TST MACHINE

*Track Shoe CNC Transfer Machine (**TST**) is a multi-station and multi-spindle machine which is designed for military and heavy-duty vehicles. This superior model is equipped with servo motors, controllers, sensors and other electronic equipment. Adjustable, flexible and efficient Transfer Machine is completely feasible for Industry 4.0. **TST** can follow a schedule, give a report, warn the operator in critical situations or for maintenance etc.*

*The workpieces are located and clamped in fixtures that are placed in a circular path. During one cycle, consecutive machining operations are performed simultaneously. As the indexing table turns, the subsequent machining operation is repeated on the workpiece which was just machined by the previous station. **TST** combines automated part feed with simultaneous operations, enabling rapid production of parts.*

Rigid Body and High-Accuracy Servo Motors Enable High Precision Machining

*In **TST** spindles are positioned appropriately to perform processes on different surfaces of the workpiece. All operations of a workpiece are performed simultaneously with different spindles at different stations in **TST**. Indexing enables **TST** to have spindles which are placed on three sides of each station having different functions. Machine tools stop during loading and unloading but its carried out at one station in **TST** while other machining processes continue at the other stations.*

Optical and Tactile Quality Control Capability

Save Space & Energy up to 10 times.

Track Shoe CNC Transfer Machine is used for mass production of the track shoes belong to military and heavy duty vehicles. Annual production capacity range **from 300.000 to 500.000** units to tens of millions of units.

Optical and Tactile Quality Control Capability

 **Production Cycle Time 50-90 sec. / pcs.**



Number of Stations

6



Number of Units

11



Number of Servo Axis

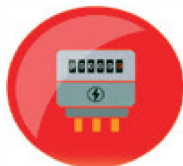
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Material Cast
or Forged Alloy Steel

4140, 4340
and others

Automatic Feeding with Advanced (6-axis) robotic Arm increase cost efficiency



Power Requirement

50 kw



Space Requirement

50 m²



Production
Capability

50-90 sn



Biggest Machinable
Work Piece

Min 130 mm
Max 280 mm





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TECHNICAL SPECIFICATIONS

ROTARY TABLE

Vertical 6 stations rotary table, 22 tons index locking pressures, calculated with 2.25 extra safety coefficient, Single Piece, No-Welding, No-Casting, main shaft and body made from normalized steel,

Rotation clockwise or anti-clockwise direction,

Stop at inter position for easy tool change and calibration,

Mitsubishi Servo Driven Direct Drive Turret Rotation System (4 million pulse, Absolute Encoder),

Tedisa Brand High Precision Hirth Couplings (+2" Indexing Accuracy),

Double Bedding Construction (Double-Side Index Casted Bed with Vibration Damping Feature),

The Turret is also supported by an extra conic bearing. In this way; friction in the rotating system is reduced; rigid, precise and fast indexing are provided and also the life of the rotating system is increased.

Additional tracking system for detecting turret position with laser sensors,

Internal Pressured Oil Mist System prevents chips and coolant from entering the table mechanism.

Furthermore this system reduces maintenance requirements with pulverized air-oil mixture.

With Smart-Seal Technic, sealing is secured by using special figured dust and oil seals.

WORKPIECE HOLDER GROUP

Self-Centering, parallel jaws chuck that can be adjusted up to the maximum practicable stroke, (While the chuck fix the workpiece to be processed, it also makes centering.

The advantage of this system is that it can be processed without changing the center, especially in materials with variable outer diameter dimensions.)

Positive pressurization system that prevents chip and coolant from entering the internal mechanism of the chuck, reducing maintenance requirements with pulverized air-oil mixture,

Chuck jaws that can be adjusted mechanically from the minimum stroke to the maximum allowed stroke. Hydraulically driven system with adjustable clamping forces,

Workpiece holder group made of hardened special steel, precision grinded on all moving surfaces, extra rigid and with precise positioning capability,

HYDRAULIC EQUIPMENTS

Hydraulic Oil (46 Numbered) Passes Through Continuous Filtration, Eaton Vickers or Equivalent Hydraulic Pump, Valve and Control Group, 15 – 80 Bar Working Pressure,

Easy to clean hydraulic tank design with low maintenance requirements,

System and chuck pressures are adjustable at all points by pressure regulating valves,

Monitorable main system, turret indexing pressure and chuck pressure by indicators,

Oil cooling with Emmegi or equivalent air circulation to maintain proper oil temperature,

Chiller controlled cooling group suitable for hot working environments (45 Celsius degrees and above),

Level indicators that show the hydraulic oil level and warn when the hydraulic oil is low ,

Easy to find, Euro normed standard hydraulic equipment.

AUXILIARY LIQUID GROUP AND CHIP CONVEYOR

Auxiliary liquid tank with continuous filtration,

Tank capacities varying between 400-3000 litres suitable for chip type and amount,

Japan Showa Denki Oil Mist (Steam Converter),

Slideway oil separator unit with belt mechanism,

15 Bar Additional Auxiliary Liquid Pump,

Chip conveyor suitable for steel chips,

Chip conveyor with overload protection and forward and reverse function,

Chiller controlled cooling group, (Option)

Automatic PT100 controlled heating group with resistance suitable for cold working environments

(10 Celsius degrees and below) (Option),

Level indicators that show the auxiliary liquid level and warn when the auxiliary liquid is low.



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SERVO MOTOR & DRIVER GROUP

Low inertia, high performance (MITSUBISHI) 4 serial Servo Motor and Driver, Multi Turn Absolute Positioning (No-Lose Positioning), 22 bit high-resolution, 4,000,000 pulse Encoders .

Quick start-up function with single button “prepare machine” command that does not lose the location information with smart memory feature during power cuts and emergency stop uses.

The Super Tracking Function resets the pulse to ensure that the actual position of the motor is the same as the command.

High performance servo motors from 10 kW to 55 kW, with 22 bit absolute encoder, Servo Drivers; SSCNET III/H Fiber Optic 100 megabit, Automatic Motor Recognition, High performance motion control system not affected by noise with fiber optic communication, Internal functions such as extra axis synchronization, CAM control and etc. with the addition of Simple Motion Module, In case of control computer failure; with independent Motion CNC CPU architecture, the feature of not losing servo positioning control, operator warning system in case of cutting tool dullness or breakage with the function of adjusting the lower and upper torque limit.

AUTOMATION

In our automation systems, Mitsubishi RV-20FRM-D robot with 6 axis, IP 67 certified water and dust resistant, 0.05 mm high precision are preferred.

The selection is made according to the requirements of the work to be done, such as extension distance and workpiece's characteristics.

By integrating robotic automation systems into our high technology Transfer Machine; other processes such as loading-unloading, measurement, aligning are also rapidly carried out in addition to standard machining.

Advantages of Robotic Automation

Working 24 hours without a pause,

Up to 85% saving in labor costs, Up to 80% reduction in part deterioration caused by operator error during feeding,

Preventing operator-related time loss and up to 50% increase in capacity of the machine especially for quick machining workpieces,

Smaller logistic space need through its compact structure.