



HALES MACHINE TOOL INC

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Used 2000 Daewoo Lynx B

High Performance Turning Center

The Daewoo Lynx 200 turning centers are designed for long-term high accuracy and superior surface finishes. High speed turret indexing and fast rapid traverse rates minimize non-cutting time. Classic manufacturing methods and ultra rigid construction are combined with advanced technological features to provide exceptional value.

FEATURES

- 10 or 12 HP main spindle drive
- Tool setter - standard
- Large bar capacity
- High speed spindle
- Heavy duty turret with 8.3" Curvic coupling
- Fast 0.12 second turret indexing
- One-piece Meehanite cast iron bed
- Solid box way construction
- Fluoroplastic anti-friction mating way surfaces
- Double anchor pretensioned X axis ball screw
- Fast 945 IPM rapid traverse
- Up to 1,440 pounds of Z axis thrust
- Large 11.0" maximum turning diameter
- 65 PSI coolant pump
- Metered piston distributor lubrication
- Way lube separation system
- Compact design requires minimal floor space

SPECIFICATIONS

CAPACITY:

Swing over bed

20.1"

Swing over carriage	13.7"
Maximum turning diameter	11.0"
Maximum turning length (Lynx A / Lynx B)	12.7" / 12.0"

SPINDLE:

Spindle speed (RPM)	Lynx B 50-5,000
Spindle nose	ASA-A2-6
Draw tube I.D.	2.05"
Spindle bore diameter	2.44"
A.C. Spindle Motor (30 min.)	12 HP
Maximum spindle torque	101.5 ft-lbs

BED, SADDLE, & CROSS SLIDE:

X axis travel	6.3"
Z axis travel	13.0"
Inclined angle of cross slide	30 degrees
X axis guideway span	10.0"
Z axis guideway span	15.0"
Tailstock guideway span	8.3"
X axis rapid traverse rate	790 IPM
Z axis rapid traverse rate	945 IPM
X / Z axis ball screw diameter	1.1" / 1.3"
Maximum X axis feed thrust	1,440 lbs
Maximum Z axis feed thrust	1,440 lbs

TURRET:

Number of tools	12
Turning tool shank size	1.0"
Boring bar diameter	1.5"
Turret index time (next station)	0.12 sec.
Tool selection	Bi-directional
Curvic coupling diameter	8.3"
Turret clamping force	12,100 lbs

TAILSTOCK (optional):

Tailstock quill diameter	2.6"
Tailstock quill stroke (programmable)	3.1"
Tailstock quill thrust (maximum)	830 lbs
Tailstock spindle taper	MT #4

COOLANT SYSTEM:

Coolant pump pressure	65 PSI
Coolant pump motor	1.5 HP
Coolant tank capacity	25 gal.

HYDRAULIC / LUBRICATION:

Hydraulic tank capacity	3 gal.
Hydraulic oil required	Mobil DTE 24 or Shell Tellus 32 *
Way lubrication tank capacity	0.5 gal.
Way Lubrication oil required	Mobil Vactra #2 or Shell Tonna T68 *

* Cross reference these numbers for other brands

GENERAL:

Floor space (Length X Width)	64" x 63"
Machine weight (Lynx A / Lynx B)	7,030 lbs. / 7,170 lbs.
Voltage required: Fanuc	205 - 235 volt / 3 phase
Power requirement - 12 HP	21 KVA

CONSTRUCTION

- **BED:**

The bed is a one piece Meehanite® casting with a heavy ribbing to prevent deformation and twisting. The Meehanite cast process produces a fine grain casting with excellent vibration dampening characteristics. The spindle motor mounts under the rear of the bed to maintain a very compact foot print. The slant angle of the cross slide allows chips to fall downward into the chip pan.

- **GUIDEWAYS:**

All guideways are wide wrap-around rectangular type for unsurpassed long-term rigidity and accuracy. The guideways are widely spaced to ensure stability. Each guideway is induction hardened and precision ground. Induction hardening ensures a more consistent hardness and depth of hardness than the less expensive flame hardening process. A fluoroelastomer resin called Rulon® 142 is bonded to mating way surfaces and then hand scraped for perfect fit and center height. This material provides a low friction surface which virtually eliminates guideway wear. It also provides vibration dampening for better surface finishes. Rulon® 142 has superior deformation, wear, and friction characteristics compared with other brands. Friction rate decreases as loads increase. The bed guideways are fully protected by one-piece heavy gauge stainless steel covers on both sides of the carriage.

- **BALL SCREWS AND AXIS DRIVES:**

Each axis is driven by a large diameter double-nut ball screw. The high precision Tsubaki ball screws have been specifically selected to achieve the outstanding combination high accuracy, high rapid traverse rates and high feed thrust. Both ball screws are supported on each end. The X axis ball screw is double anchored and pretensioned for accurate positioning and thermal stability. The thrust bearings are precision class P4 (AFBMA-B7) angular contact type. Ball screws are centered between the guideways and are directly mounted to the A.C. servo motors without intermediate gears or belts to minimize backlash. The Z axis servo motor is mounted on the headstock end of the ball screw. The Z axis delivers up to 1,440 pounds of feed thrust. Each axis has a flexible coupling to protect the ballscrew and minimize damage in the event of a crash. Upon impact, the coupling absorbs the shock until the servo motor overloads. The coupling resets automatically.

- **SPINDLE AND HEADSTOCK:**

The robust headstock casting is mounted on the plane as the tailstock to maintain perfect alignment and center height regardless of the bed temperature. The headstock has ribs on the outside of the casting to increase the surface area for heat dissipation. The heavy duty cartridge type spindle is supported by double row cylindrical roller bearings in the front and rear, and duplex angular thrust bearings in between. Cylindrical roller bearings feature a large contact surface which ensures the highest rigidity for heavy loads and high surface finishes. All spindle bearings are precision class P4 (AFBMA-B7) and are permanently grease lubricated. The precision NTN bearings and perfectly balanced spindles allow up to a 6,000 or 5,000 RPM on Lynx B or Lynx A respectively. Front bearing inner diameter is 3.54" and 3.93" (Lynx A and Lynx B). The design allows a 1.75" bar capacity on Lynx A and a 2" bar capacity on Lynx B..

- **SPINDLE DRIVE:**

The high-torque spindle motors provide full power over a wide speed range. Full power is achieved on the Lynx B with 5,000 RPM top speed, achieves full power from 625 RPM. The spindle motor is flange mounted on the side of the bed casting, assuring perfect alignment with the headstock. The gear-less spindle drive design requires no maintenance and eliminates the possibility of vibration to ensure the highest surface finishes.

- **TURRET:**

The turret features a large 8.3" diameter Curvic coupling and 12,100 lbs of hydraulic clamp force. This heavy duty design provides unsurpassed rigidity for fine surface finishes, long boring bar overhang ratios, and extended tool life. Turret rotation, deceleration and clamp are all controlled by a reliable high torque NOK hydraulic Index Motor. Unclamp and rotation are virtually simultaneous. Turret indexing is non-stop bi-directional, with a 0.12 second next station index time. The turret position is determined and confirmed by rotary encoder and clamp is confirmed by proximity switch. The large diameter turret enables tools to clear the standard chuck.* Standard turning tool holders utilize 1" square shank tooling and boring holder capacity is 1.5". Holders are interchangeable from station to station. A U-drill holder is provided to eliminate external piping of insert drills. Turning tools are securely attached to the turret by wedge clamps. Wedge clamping systems provide a wide clamping surface and are inherently more rigid than bolt clamping systems.

- **TAILSTOCK (Optional)**

Widely spaced guideways and heavy-duty design of the tailstock body ensure ample rigidity for both slender and heavy shafts. The quill diameter is 2.6". The quill stroke of 3.1" is activated by hand switch or program. A precision, heavy-duty Morse #4 live center is provided as standard equipment

- **TOOL SETTER:**

The tool setter reduces set-up time by minimizing the need for manual skim cuts, measurement, and entering of tool offsets. The tool setting arm mounted next to the chuck is manually lowered for setting tool offsets. The arm is made of steel to minimize thermal expansion. A four-position touch sensor mounted on the end of the arm allows tool setting in any direction. As tools are touched-off on the sensor, tool offset values are automatically calculated and entered. After tool offsets are set, the arm is lifted back to it's resting position and secured with a latch.

- **LUBRICATION:**

Automatic forced lubrication is provided to all guideways, ball screws, and the tailstock quill. Maintenance free piston distributors deliver a precise quantity of oil to each lubrication point. The piston distributors are non-clogging and the design allows way lube consumption to be minimized. The 1/2 gallon reservoir, mounted on the front of the machine, lasts up to 100 hours. A low-level alarm prevents machine from restarting until oil reservoir is replenished. System pressure is monitored to detect open or broken lube lines.

- **COOLANT SYSTEM:**

A 1.5 Hp high capacity multistage centrifugal pump delivers a high volume coolant through the turret to ball nozzles at each turret station. The pump delivers 65 PSI of pressure, meeting the requirements of most insert drill manufacturers. The high pressure flushes chips out of the drilled holes and reduces the need for time consuming peck drilling cycles. High coolant pressure also significantly increases tool life. A flow control valve located at the coolant pump allows pressure and flow rate to be reduced if necessary. The large coolant tank has a 25 gallon capacity. The chip pan slides out for easy cleaning.

- **WAYLUBE SEPARATION SYSTEM:**

A belt oil skimmer picks up waste oil from the coolant reservoir and deposits it into a separate external tank. As a result the coolant is kept clean and coolant life is extended. Waste oil tank can be conveniently drained. A sight glass indicates when the used oil should be drained.

- **CHIP GUARDING:**

Chips and coolant are contained by the fully enclosed guarding made of heavy gauge sheet metal. The door moves effortlessly on a round steel rail. The double-layer viewing window features tempered safety glass on the inside that resists scratching and an outside layer of lexan, which is virtually impenetrable.

- **QUALITY COMPONENTS:**

Only the highest quality components are used on each Lynx turning center. Each component has been selected only after rigorous quality and reliability testing. Ball screws are manufactured by Tsubaki, spindle bearings by NTN, and axis thrust bearings by NSK. Hydraulic solenoids, flow controls, and regulators are made by Parker Hannifin. The hydraulic power unit, manufactured by Daikin, is extremely compact and very quiet (less than 60 db). It also maintains a low oil temperature which minimizes thermal distortion of the turret and tailstock. Key electrical components such as circuit breakers and contactors made by Siemens are both UL listed and CSA approved. Mitsubishi and Fanuc control packages have been selected for their outstanding combination of performance and reliability.

- **PART CATCHER (optional):**

Optional part catcher is available for unattended operation with a barfeeder. The part catcher design allows the basket to remain vertical until just before part is discharged through an opening in the machine door. Parts accumulate in a box on the front door of the machine. The part catcher can handle parts up to 2" diameter and 4" long.

STANDARD EQUIPMENT

- Fanuc 21TB control
- Digital A.C. spindle and servo drives
- Open center hydraulic actuator
- Bi-directional turret with NOK Index Motor
- Tool setter
- Vogel automatic metered lubrication system
- 65 PSI multistage coolant pump
- Tsubaki high precision double-nut ball screws
- NSK class P4 angular thrust bearings
- NTN class P4 spindle bearings
- Parker Hannifin hydraulic solenoids, flow control and reducing valves
- Daikin 600 PSI hydraulic unit
- Way lube oil skimmer
- Barfeed interface
- Tool box with necessary operating tools
- Work light
- Leveling bolts and plates
- Safety features:
 - Fully enclosed work area
 - Door interlock
 - Hydraulic pressure safety switch
 - Spindle interlock
 - Program protect
 - Chucking signal

Price for machine as described above:

PRICE.....\$ 25,000.00

INCLUDES: SMW SPACE SAVER 2003 BAR LOADER, CHIP CONVEYOR, TAILSTOCK, PARTS CATCHER, FANUC 21TB CONTROL, 8" CHUCK, 3J COLLET CHUCK

SERIAL # L200714

NO WARRANTY: AS IS WHERE IS

FOB: NORTHERN MN

INSTALLATION AND TRAINING NOT INCLUDED

FANUC 21-TB CONTROL

Specifications:

Enhanced DEA1 control version	2 simultaneously controllable axes
32 bit microprocessor and data bus	0.0001" minimum programmable increment
Digital AC servos and spindle drive	263 feet tape storage length
200 registerable programs	Backlash compensation
Constant surface speed control	HRV control (precision servo)
Fine acceleration & deceleration control	Self diagnostic functions

Standard programming features:

Spindle orientation	Custom Macro B
Direct drawing (line/angle) programming	Background Editing
Peck drilling canned cycle (G83)	Programmable work shift (G54 - G59)
Circular interpolation by radius designation	Tool nose radius compensation (G40-42)
Absolute/incremental programming	Inch/metric programming
Diameter / radius programming	Chamfering, corner R
Multiple repetitive cycles (G70 - G76)	Multiple repetitive cycle type 2 (pocketing)
Canned cycles (G90, G92, G94)	Decimal point programming
Reference point return (G27 - G30)	Dwell (revolutions or seconds)
Subprogram - 4 holds nested	Skip function (G31)
F10/11/15 tape format	Programmable data input (G10)
Variable lead thread cutting	

Standard operation features:

High resolution 9" monochrome CRT	Copy and merge editing functions
Geometry and wear offsets	64 pairs of tool offsets
Run hour display	Parts counter display
Thread cutting retract	Additional block skip
Automatic tool offset calculation	Direct input of offset value measured
Input/output interface (RS232C)	Keyboard type manual data input (MDI)
Program protect key	Incremental offset
On screen spindle load meter display	On screen axis load meter display
Rapid traverse override	Feed rate override
Spindle speed override	Tape code: EIA, ISO Automatic recognition
Alarm history display	Operation history display
External message display	Help function
Clock function	

