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Machine Id	:- 1125	Serial No	:-
Category	:- Gear Related Machines	Model	:- LC 152 SIX Axis CNC Gear Hobber With Siemens 828 Advance System
Country	:- Germany	Make	:- Liebherr
Type of Machine	:- CNC Gear Hobber for Heavy Production.	Year	:-
Weight	:- 0.0	Dimensions	:-
Power	:-	Location	:-

Specification :-

This machine is recontrol or recertification with SIEMENS 828 Advance Syatem Exactly as per Liebherr Standards . The Old Original Liebherr CNC System Is replaced . All recontrolled and recertified machines are fully cleaned. All moving slides, spindles and parts handling systems are inspected for problems. Any gibs or adjustable backlash systems are adjusted to the best possible settings. All hydraulic, coolant, lubrication and pneumatic systems are checked for proper functionality and leaks. All filters are replaced. All worn hoses, broken cables, connectors, buttons, lamps and wires are replaced. All guarding is installed and checked. All machine cycles are tested. Parts are cut to verify the machine capability. Charts from the test cutting are documented for your viewing.

Mechanical Specifications

Maximum work piece diameter	6'	(150mm)
Maximum pitch (module) 86000 psi steel	5 DP	(Module-5)
Maximum hob slide travel	10'	(250mm)
Table clamping surface	4.7'	(120mm)
Maximum table rotation	150 rpm	
Minimum distance between hob CL and table center	.59'	(15mm)
Maximum distance between hob CL and table center	6.88'	(175mm)
Minimum distance between hob CL and table surface	2.00'	(50mm)
Maximum distance tailstock casting to work piece table	24.80'	(630mm)

Minimum number of teeth	3	
hobbed		
Hob head swivel range	+ / - 45 Degrees	
Maximum diameter hob	5.20'	(132mm)
Maximum hob length	7.10'	(180mm)
Maximum tangential travel (shifting)	7.10'	(180mm)
Hob spindle speed ranges	120 to 1200 rpm	
Rapid traverse:		
Axial	157.5'/min	(4000mm/min)
Radial	157.5'/min	(4000mm/min)
Tangential	118.0'/min	(3000mm/min)
Machine		
approximate net weight	16,060 lbs.	(7,300kgs)
Feed ranges:		
Axial	.004-.787'/rev	(.1-20mm/rev)
Tangential	.0004-.197'/rev	(.01-5mm/rev)
Radial	.004-.147'/rev	(.1-4 mm/rev)
Total connected power	40 HP	(30 kVA)
Operating Voltage	470 V, 60Hz	
Control Voltage	110 V	
Floor space: Length	162'	(4100mm)
Width	148'	(3770mm)
Machine overall height w/enclosure	102'	(2600mm)

Features

Machine bed with stationary table assembly, table spindle with anti-friction roller bearings

Pre-loaded re-circulating ball screws for axial, radial, and tangential feed/motions

Machine main column with infinitely variable radial feed

Power swivel hob-head for axial, radial, and tangential hobbing, hob-slide automatically clamped during work-cycles, with incremental hob-shifting, pre-selectable in both directions.

Hob head with mounted 13.1 HP, DC main motor for infinitely variable hob speeds

Quick-change' hob change system, with automatic clamping and unclamping of hob arbor and outer support bearing, controlled via push-button

Tailstock column with electrically actuated arm, (CNC control of tailstock arm)

Hydraulic clamping device (double acting) with infinitely variable clamping pressure (up to 8,800 lbs.) mounted below machine table for actuating work piece & fixture clamping

Work table positioning device providing work-table stop in pre-programmed position enabling pre-identifying gear tooth alignment prior to cutting teeth.

Controls

CNC Systems

- X radial movement
- Z axial movement
- C table rotation
- B hob rotation
- V tangential movement
- A hob head swivel
- Z1 tailstock arm positioning

- The electronic synchronization of the generating process, (i.e. hob & table rotation), is integrated in the CNC-system.

- Helix generation, (i.e. linking of the axial slide movement and table rotation, as well as tangential hobbing), (i.e. linking of tangential movement and table rotation), integrated in the CNC-system.
- Copy system for 'crowning' and end relief are part of the CNC-system, (i.e. linkage of radial and axial motion) linear and circular interpolation, max. radius 328 ft. (100M).
- Feeds programmable in mm or inches/table revolution, feeds, constant with changes in hob speed, separate overrides for feeds and speed (infinite) between 10% and 133%, altering of feed and speeds during hobbing allows optimization of cutting condition.
- CNC-system, free programmable for individual cycles, input via keyboard.
- Parametric programming with 90-variable and 10-fixed parameters.
- Parametric programs for 32 different fixed cycles repeatedly used for hobbing: (one-cut cycle, two-cut cycle, with or without radial approach, climb or conventional hobbing, with or without shifting, radial or tangential hobbing, fixed cycles for crowning or taper hobbing). Programs with degressive approach.
- Software for calculation of approach, overrun, & crowning data, (crowning radius & radius location).
- Software for single-index milling (programmable in mm or inches).
- CMOS-technique for approx. 100 part programs (components), depending on complexity of programs (32,000 characters) w/optional expansion of CMOS memory to 128K.

Parallel programming, (ability to program for different work pieces while machine is running)

data I/O via RSR-232C connector to or from a peripheral device (tape reader/puncher, magnetic cassette, or data terminal). DNC capable.

Logic capability with feasibility checks, (i.e. max./min. machine parameters are automatically scanned when new programs are made). All information displayed on CRT screen (with 8-lines and 32 characters per line), input via keyboard.

Keyboard input for the following parameters: (smallest increment)

No. of teeth	3	3
No. of hob starts	1	1
Helix angle	.0001 degree	.0001 degree
Axial travel	.0001'	0.001mm
Radial travel	.0001'	0.001mm

Tangential travel	.0001'	0.001mm
Hob shift and step size	.0001'	0.001mm
Axial, radial &tangential feed	.0001'/rev.	0.001mm/rev.
Hob rpm	1	1
Hob head swivel	.015 degree	.015 degree

- Electronic hand-wheel for manual control of any linear axis motion, including table rotation
miscellaneous (M-functions), coolant on/off, work piece clamping/unclamping, overhead work support up/down.
- Diagnostic capability with faults displayed on the CRT, while monitored on PC-controller, AC servo motors, rotational relationship, emergency stop.
- Controlled emergency shutdown (in case of disturbance or failure of main drive motor, failure of single measuring systems, or within the hydraulic area), the electronic synchronization of the
generating process is maintained until rotary motions have ceased.
- Full complement of electrics (motors/control-cabinet) including two-hand safety start button for cycle start and machine set-up (presently arranged for 235 or 470 volt, 3-phase, 60-cycles), control voltage primary 110 AC, secondary 24 DC, single phase) SIEMENS-ALLIS and SIEMENS power controls.
- Coolant filtration and thermostatic controlled oil chiller for hydraulic and cutting fluids.
- Air-conditioner for control cabinet.
- Complete coolant equipment pump &piping.
- Full machine enclosure with splash guards/covers, safety interlock on splash guard door.
- CHEMAPERM magnetic chip conveyor w/chip cart and oil return hose.
- Minimum of one (1) hob arbor and hydraulic lock-nut.
- One set of fixators (machine leveling shoes).
- Full machine documentation, operator's manuals for machine and controller, wiring &hydraulic
diagrams, parts lists, and foundation/layout drawings.