

Toolroom Lathe Operator's Addendum

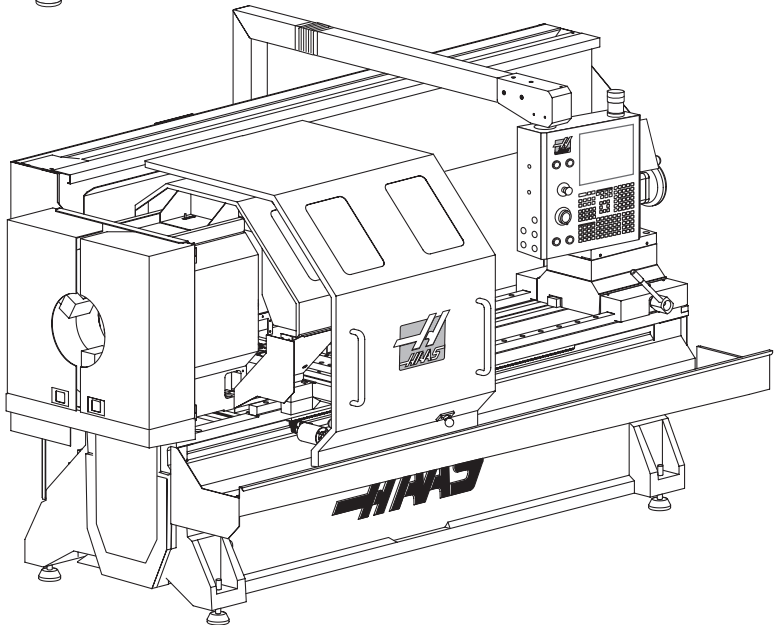
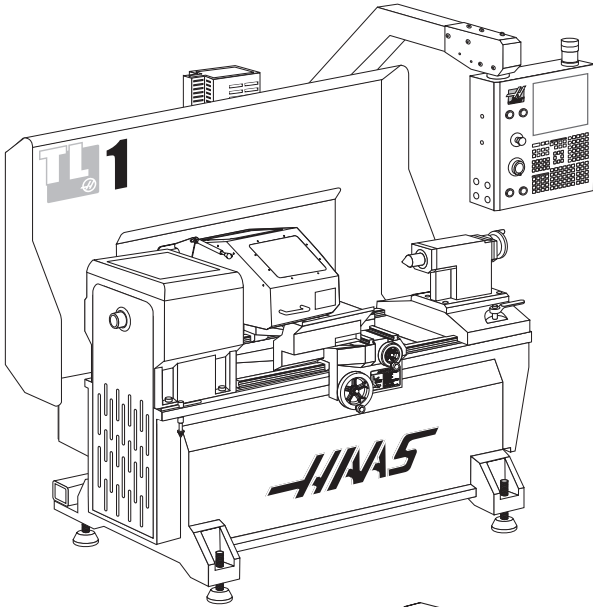




Table of Contents

1. WARRANTY	2
2. SAFETY	2
3. INSTALLATION.....	3
SHIPPING BRACKET REMOVAL.....	3
LEVELING	3
TL-4 LEVELING.....	4
ELECTRICITY REQUIREMENTS	5
4. OPERATION	7
POWER UP	7
OPTIONAL TAILSTOCK (STANDARD WITH TL-4) OPERATION	8
OPTIONAL TOOL TURRET REMOVAL/REINSTALLATION	9
TT-4 (TL-1/2)	9
TT-20 (TL-3)	11
TT-10 (TL-4)	12
MANUAL MODE.....	15
MACHINE POSITION	15
TOOL OFFSETS	16
AUTOMATIC MODE.....	16
IPS RECORDER	18
ALARMS/MESSAGES DISPLAY	19
5. MAINTENANCE.....	20
LUBRICATION - TOOLROOM LATHE	20
CHIP FILTER	21



1. WARRANTY

All new Haas Toolroom Lathes are warranted exclusively by the Haas Automation's ("Manufacturer") limited warranty against defects in material and workmanship for a period of 1 year from the date of purchase, which is the date that a machine is installed at the end user. See the Warranty section of the Lathe Operator's Manual for further warranty information.

2. SAFETY

Read and Follow all Safety Warnings – Familiarize yourself with the Safety section of the Operator's Manual. Be aware of the other people around you in the shop; flying chips can seriously injure people who may not be a safe distance away. Always wear safety glasses. Initial cuts/setups should be cut at a slower speed to reduce the possibility of tool or machine damage. As with any open frame lathe, chip screens are highly recommended.

The Toolroom Lathe (with the exception of the TL-4) is equipped with a hand held safety switch. The button must be pressed any time automatic machining is taking place. Releasing the switch will cause the spindle and axes motion to stop. In order to resume automatic machining, the button and Cycle Start must be pressed (it is not necessary to hold down the Cycle Start switch).

Workholding Safety

The care and safety issues of the workholder's manufacturer must be followed to ensure a safe working environment and to avoid damaging the machine.

Cleaning and maintenance should be done often. Inspect the equipment for improper wear, cracks or missing pieces. Do not operate if any of these are found.

Do not start the lathe until it is set up properly. Interference between the workholding equipment and the lathe will cause damage to both.

Use the correct chuck size; do not allow the chuck jaws to protrude past the chuck body.

Use additional support if turning long parts.

Remove the chuck wrench before starting the machine.

Do not modify workholding equipment.

Never exceed the maximum speed of the chuck.

Additional safety issues are outlined in the Lathe Operator's manual.



3. INSTALLATION

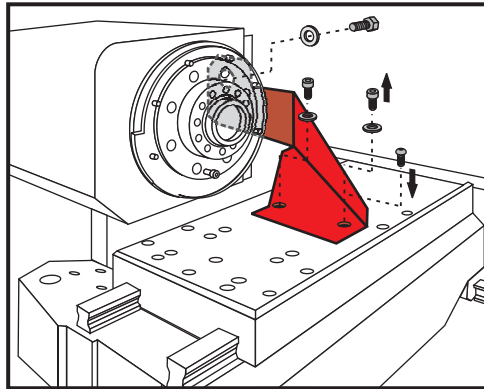
SHIPPING BRACKET REMOVAL

TL-1/2/3

1. Remove the one (1) hex head bolt that mounts the shipping bracket to the spindle head, and the two (2) bolts that mount the shipping bracket to the table.
2. After removing shipping bracket, replace two bolts removed from table with button head screws supplied.
3. Remove the pendant shipping bracket. There are 4 screws securing the pendant to the arm.

TL-4

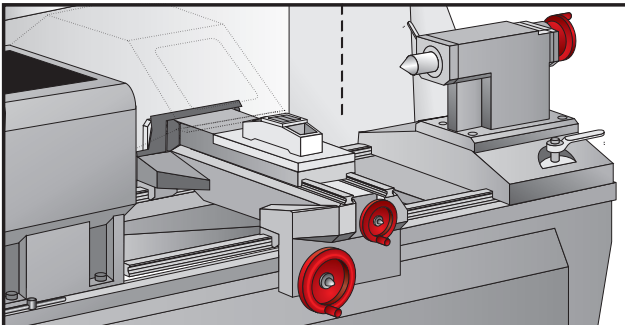
1. Remove six red shipping brackets; three from the base of the tailstock, one from the pendant, one from the traveling door and one from the table to the spindle.



TL-1/2 Shipping Bracket

LEVELING

1. Position the cross-slide close to the chuck (this is how the machine was shipped), and place a machinist's level on the cross-slide, parallel to the X-axis.



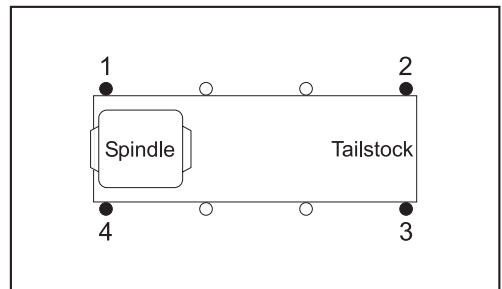
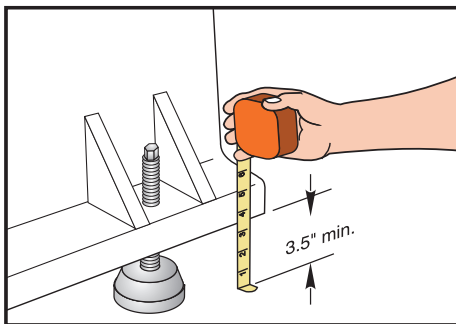
TL-1 Shown



2. Run Z-axis left to right and level machine by adjusting leveling screws. Verify each leveling screw requires approximately same torque to turn for proper loading. Once completed, tighten lock nuts on leveling screws.
3. Re-position cross-slide close to chuck, and place the level on the cross-slide, parallel to the Z-axis and run Z-axis left to right and level machine by adjusting leveling screws. Verify each leveling screw requires approximately same torque to turn to ensure proper loading. Once completed, tighten lock nuts on leveling screws.

TL-4 LEVELING

Place the lathe in position on the shop floor. Rough level by measuring from the floor to the bottom of the base (very close to 3.5 inches). Do this to the 4 corner leveling screws. The 4 middle leveling screws must not touch the leveling pads. Loosely screw the jam nuts onto the leveling screws. **An electronic level is required for the installation.** The leveling specification is $\pm .00015$ ".



1. Loosen the front corner leveling screw (3) so that it is just above the leveling pad and jog the cross-slide to the end of Z-axis travel closest to the spindle head and to the middle of X-axis travel.
2. Position the level on the cross-slide, parallel to the X-axis and adjust the corner leveling screws closest to the spindle head (1,4) until machine is level.
3. Position the level parallel to the Z-axis. Adjust the corner rear leveling screw closest to the tailstock (2) until machine is level. The front screw (3) was left loose and must remain loose.
4. Position the level parallel to the X-axis. Jog the cross slide along the Z-axis from the spindle head to the tailstock. Adjust the front corner leveling screw (3) until machine is level.
5. Jog Z-axis through its travel range to verify there is no twist. Adjust corner leveling screws until twist is removed.
6. Recheck the level in both X and Z-axes with the level parallel to the X-axis and recheck the level in both X and Z-axes with the level parallel to the Z-axis.
7. Finish leveling procedure by adjusting the 4 leveling screws in the center of the lathe until they are touching the leveling pads. Secure all leveling screws with a jam nut. Verify lathe remains level (X and Z-axes).



ELECTRICITY REQUIREMENTS

Important! Refer to local code requirements before wiring machines.

All machines require:

The power source must be grounded

Frequency range is 47-66 Hz

Line voltage that does not fluctuate more than +/-5%

Harmonic distortion is not to exceed 10% of the total RMS voltage

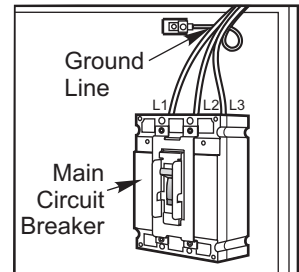
Voltage Requirements

Input Voltage	Low Volt.	TL-1,2 - 208V 3PH / 240V 1PH \pm 10% TL-3, TL-3B, TL-3HT, TL-3W, TL-4 - 240V 3PH
	High Volt.	354-488V 3PH
Power Supply Breaker (Low Volt)	TL-1,2	20 AMP 3PH / 40 AMP 1PH TL-3 50A, TL-3B, TL-3HT 100A, TL-4 200A
Haas Circuit Breaker (Low Volt)	TL-1,2 40A, TL-3 40A, TL-3B, TL-3HT 80A, TL-4 200A	
Power Supply Breaker (High Volt)	TL-1,2 20A TL-3 25A, TL-3B, TL-3HT & TL-3W 50A	
Haas Circuit Breaker (High Volt)	TL-1,2 20A, TL-3 20A, TL-3B, TL-3HT 40A	

If service run from elec. panel

is less than 100' use:

TL-1,2 1PH - 8 GA Wire /
3PH - 10 GA Wire
TL-3 8GA Wire (High 12
GA.),
TL-3B, TL-3HT 4GA. Wire
(High 8GA), TL-4 0GA



If service run from elec. panel

is more than 100' use:

TL-1,2 1PH - 6 GA Wire /
3PH - 8 GA WIRE
TL-3 6GA. Wire (High 10 GA.), TL-3B,
TL-3HT 2GA. Wire (High 6GA.), TL-4 0GA

Warning!

A separate earth ground wire of the same conductor size as the input power is required to be connected to the chassis of the machine. This ground wire is required for operator safety and for proper operation. This ground must be supplied from the main plant ground at the service entrance, and should be routed in the same conduit as the input power to the machine. A local cold water pipe, or ground rod adjacent to the machine cannot be used as a primary ground.

The maximum voltage leg-to-leg or leg-to-ground should not exceed 260 volts.



Connecting the Toolroom Lathe to Power

1. Ensure the main circuit breaker is in the OFF position. Connect the power lines to the top terminals of the main circuit breaker. Connect the separate ground line to the ground bus to the left of the circuit breaker.

NOTE: For Single Phase operation, only circuit breaker terminals L1 and L3 are used.

2. T5 is the small transformer mounted on the power supply assembly next to the main circuit breaker. Two input connectors allow it to be connected to either 240V or 200V. If incoming power is 220-250 VRMS, use the 240V connection. If incoming power is 187-219 VRMS, use the 200V connection. Failure to use the correct input connector results in either overheating of main contactor or failure to reliably engage the main contactor.

3. The main power transformer is located at the bottom-right corner of the control cabinet. It also has two different input connections located at terminal board TB2. If incoming power is 187-215 VRMS, connect wire 74 to the 208V position (center). If incoming power is 216-250 VRMS, connect wire 74 to the 240V position (left).

4. Turn main circuit breaker ON and press control panel Power-On button. Verify 320V Power Supply fault indicator displays "1" (normal power-up sequence). Verify DC bus voltage on pins 6 & 7 is approximately 335VDC if powered from 240V, or closer to 290V if powered from 208V. If voltage is not at least 260VDC, call Service Department.

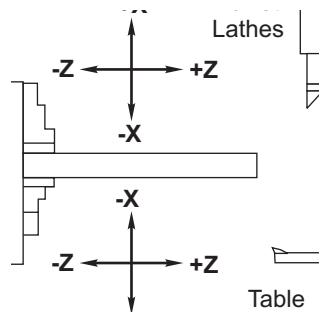
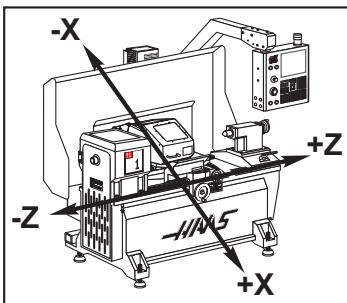
5. Turn the main circuit breaker Off, close the door, lock the latches and turn the power back on.



4. OPERATION

The Toolroom Lathe includes features aimed at a machinist used to a manually positioned lathe. The lathe uses familiar manual handles, while giving full CNC capabilities. Haas Automation has added software features to the machine control, to help develop full CNC programs and ease operation of manual mode.

At power up, the Toolroom Lathe screen is displayed. This screen shows the X and Z position of the lathe as well as the spindle speed. To navigate through the menus, use the left and right arrow keys. To select the menu, press Write/Enter. Some menus have sub-menus, which again use the left and right arrow keys and Enter to select a sub-menu. Use the arrow keys to navigate through the variables. Key in a variable using the number pad and press Write/Enter. To exit the menu press Cancel.



To change to full CNC mode, press any Display key except Offset. Press Handle Jog to return to Toolroom Lathe menus. A program entered through Toolroom Lathe screens is accessible in MDI mode (full CNC). A G-Code list is described in the Operator's manual and includes examples to demonstrate G-code usage.

POWER UP

The lathe is powered up by pressing the "Power On" button. If necessary, manually jog cross-slide and saddle away from workpiece. If equipped with tailstock, unclamp it, move it to farthest position from chuck and retract quill. Press "Power Up/Restart" and the cross-slide will automatically find home in the X axis, while the saddle finds home in the Z axis.

NOTE: Manually jog the X-axis toward the operator and the Z-axis away from the spindle, before pressing Power Up/Restart. This will save time when the machine automatically finds home. When equipped with a tool turret and a tailstock, be sure to zero return single axis so that large tools do not get obstructed by the tailstock.



OPTIONAL TAILSTOCK (STANDARD WITH TL-4) OPERATION

Loosen the clamp at the base of the tailstock casting. The tailstock base is positioned manually, then secured in place using the two clamps. The hand wheel on the rear of the casting is then used to drive the quill in and out. The TL-1/2 tailstock has a #4 Morse taper (MT4), the TL-3's use an MT5 and the TL-4 uses an MT6.

The TL-4 tailstock is moved by pinning it to the saddle and using the hand-wheel on the pendant to jog the Z-axis and move the tailstock into the desired position. To secure the TL-4 tailstock:

1. Tighten the pressure knob on the hydraulic system.
2. Use the hand pump on the hydraulic system to increase the pressure to between 2000 and 2300 psi.
3. Use the tailstock handwheel to extend the quill and lock it into place with the lever.

NOTE: Remember to remove pressure by loosening the hydraulic pressure knob before moving the tailstock.

CAUTION: When hydraulic pressure drops to 1500 psi during operation, the spindle will stop. Check hydraulic pressure often to ensure it does not drop below 2000 psi.

When tailstock is not in use, jog it to the rear stops. Hydraulic pressure is not needed to keep it in position.

OPTIONAL TOOL TURRET REMOVAL/REINSTALLATION

If installed, the optional tool turret can be removed if extra space is required for large parts or special tooling setups. The following instructions detail removal and reinstallation for each of the tool turrets available.

TT-4 (TL-1/2)

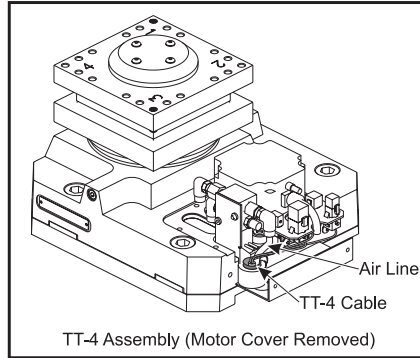
Removal

1. Turn the air to the tool changer off (Either disconnect air to the regulator or turn the regulator knob counterclockwise until pressure reads zero). Remove the turret motor cover and disconnect the air line and electrical cables from the turret. Unbolt the turret and lift off of the machine (Note shim locations for reinstallation).
2. Remove the riser block from the cross slide (TL-2).
3. Cap the electrical cable and air line, then install the chip shield.
4. Change setting 113 to either "TL Post" or "Gang TL" as appropriate.



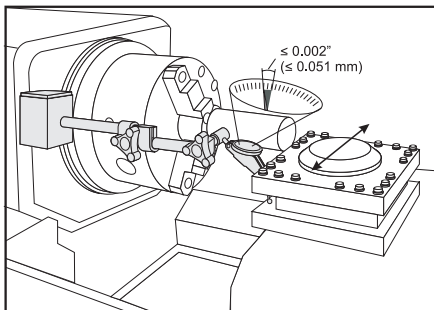
Reinstallation

1. Clean the cross slide surface and set the TT-4 on the cross slide. **TL-2:** Install riser block between tool changer and cross slide.
2. Install shims and bolt tool changer to cross slide (4 bolts), but leave loose.
3. Connect control cables and air line. Install the motor cover.

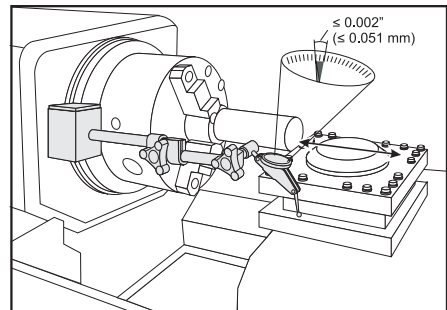


Realignment

1. Put a magnetic base indicator on the spindle casting.
2. Place the tip of the indicator on the bottom inside surface of the tool turret in the X direction.
3. Jog the X-axis and check the alignment of the tool changer along the entire surface indicated.
4. Alignment error should not exceed 0.002" (0.051 mm) over 5.5" (140 mm) travel.



Steps 1-4

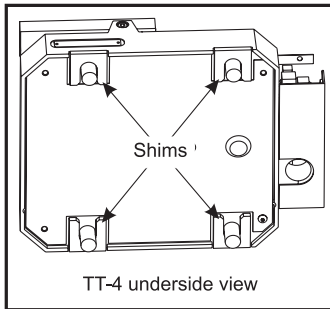


Steps 5-7

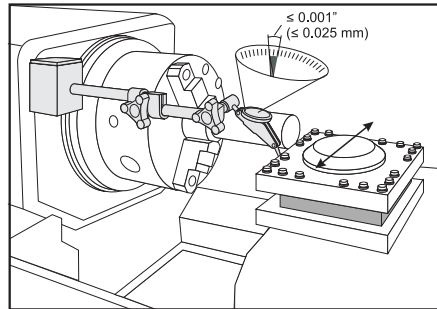
5. Place the tip of the indicator on the bottom inside surface of the tool turret in the Z direction.
6. Jog the Z-axis and check the alignment of the tool turret along the entire surface indicated.
7. Alignment error should not exceed 0.002" (0.051 mm) over 5.5" (140 mm) travel.



- To correct level alignment errors, surface grind or mill the shims to the appropriate thickness. The two surfaces must be parallel within .002" (0.051 mm).
- Re-install the shims in their appropriate locations. If the tool center is below spindle center after grinding, shim stock may be placed between the shim and tool changer housing to restore the height.



Shim Locations



Steps 10-13

- Place the indicator tip against the inner vertical surface of the tool turret (indicated by the shaded area on the illustration).
- Jog the X-Axis and measure the alignment of the tool turret over the entire surface.
- Alignment error should not exceed 0.001" (0.025 mm) over 5.5" (140 mm) travel.
- Tap the base to correct any misalignment and tighten the turret mounting bolts to 130 ft-lbs (176 Nm).
- Re-verify alignment.
- Change Setting 113 to "Auto".

TT-20 (TL-3)

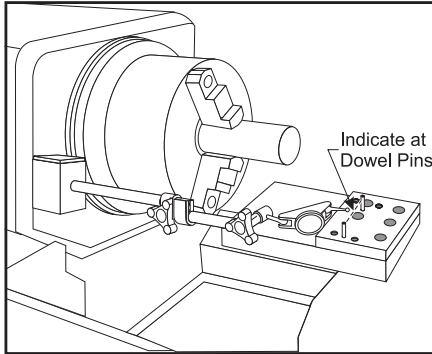
Removal

- Turn off air to the turret at the regulator, then disconnect the air line and electrical cable from the turret.
- Remove the turret mounting bolts.
- Install eyebolts into the threaded holes on both sides of the turret and use a suitable lifting device and straps to lift the turret off of the riser block. Be sure to lift the turret high enough to clear the dowel pins in the riser block before moving it out. Note the number of shims used at each corner of the turret for reinstallation.
- Remove the riser block.
- Change Setting 113 to either "TL Post" or "Gang TL" as appropriate.

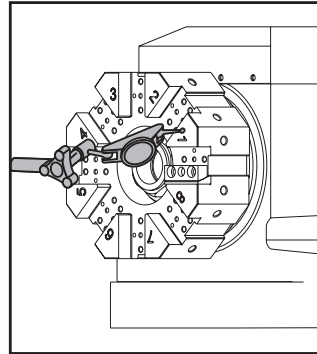


Reinstallation / Alignment

1. Stone and clean the riser block. Clean the cross slide. Align the riser block (20-3525A) with the edge of the cross slide on the tailstock side and secure loosely with five bolts. Snug one corner bolt to allow it to act as a pivot during alignment. The riser block will overlap the front of the cross slide table by a small amount.



Riser Block Alignment



Turret Alignment

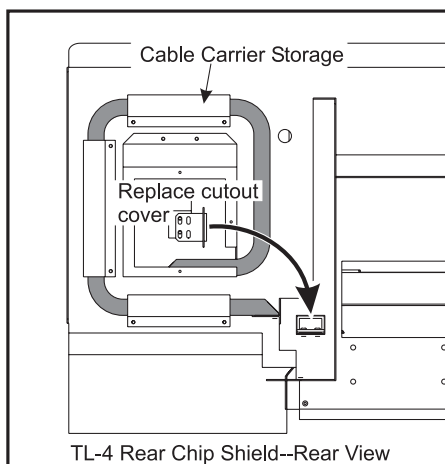
2. Make sure the dowel holes on both the riser block and the turret are clean. Insert two brass dowel pins into the riser. Line up the pins with the holes on the bottom of the turret and install, being careful not to damage anything. Bolt the turret to the riser block and snug the bolts.
3. Place an indicator tip against the face of the turret. Jog the X-Axis and check for parallelism between the spindle casting and turret face. Tap the riser block to correct any misalignment, within $.001''$. Temporarily connect air (set to 80 psi) and power. Rotate the turret 90 degrees and recheck turret face flatness, within $.001''$. When alignment is confirmed, tighten the accessible riser block bolts with the turret still installed, then lift the turret and tighten all riser block bolts to 90 ft-lbs. Reinstall the turret (with the original shims in place, if available) and reverify alignment before proceeding. Disconnect air and power.
4. Check turret height by setting up boring bar holders and appropriate diameter bars in positions 1 (toward machine front) and 4 (toward machine rear) of the turret. The bars should extend 2" from the holders. Place the tip of the indicator on top of the bar in position 1 and jog the Z-axis along the bar. The deviation can be no more than $.001''$ over the 2" travel. Move the X-axis until the bar is in line (centered) with the spindle. Measure the height difference between the bar and spindle. The two surfaces must be parallel within $.001''$. Rotate position 4 to the front and repeat measurements. Use $.001''$ horseshoe shims to raise the turret as necessary to align. Trim the tabs from the shims flush with the spacer/turret assembly. When alignment is complete, tighten the turret bolts to 90 ft-lbs.
5. Change Setting 113 to "Auto".



TT-10 (TL-4)

Removal

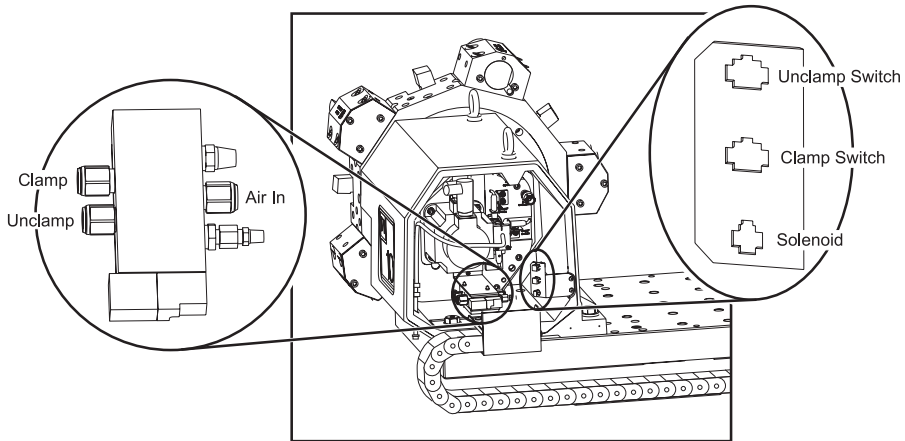
1. Turn off the machine. Turn off and disconnect shop air. Remove the T outlet from the air regulator and reinstall the elbow fitting. Reconnect lube system air line to this outlet.
2. Remove the TT-10 rear cover.
3. Disconnect all cables, coolant and the air line from the turret. Detach the turret cable carrier from its bracket.
4. The cables and cable carrier can be stored as a unit on the back side of the rear chip shield. See the following illustration. Replace the cutout cover and secure with the screws used for the cable carrier.



5. Remove the mounting bolts. Install eyebolts and use a suitable lifting device to remove the turret from the lathe.
6. Restore any previous coolant connection before proceeding.

Reinstallation

1. Clean the cross slide surface. Install eyebolts and use a suitable lifting device to mount the TT-10 unit to the cross slide plate using four .75-10 x 2.75" hex head bolts (retrofits on machines built before June 2008 will require .625" shoulder bolts). The bolts should be snug, but not fully torqued at this point.
2. Remove the rear cover of the TT-10. Secure the cable carrier bracket to the inside of the turret casting using two .25-20 x .5" BHCS.
3. Install the cable carrier between the TT-10 and the rear chip shield cutout. Secure with four .25-20 x .5" BHCS at each end (the screws at the chip shield end secure the cable carrier and the tray to the chip shield). Wrap the cables where they exit into the turret. Pull any excess cable back and wrap them in individual loops in the control cabinet. Close the Z-axis cable carrier.



4. Connect the air line to the air in port on the solenoid. Connect the motor and encoder cables.
5. Switches are labeled on the gearbox cover. Connect the TT status (clamp / unclamp) cable and solenoid cable through the connector panel. Connect the home switch to the home switch cable off of the motor encoder cable.
6. Connect the coolant line to the turret, using a reducer fitting at the cross slide ball valve.
7. Reconnect shop air and set the machine regulator to 85 PSI.
8. Power on the machine.
9. Run the machine to maximum travel in the Z and X axes and check cable travel.

Alignment

Squaring the TT-10 to the base:

1. Place mag base / indicator on the Z-axis rail on the operator side. Touch the face of the turret at tool position 1 and jog the X axis. Squareness error should not exceed 0.0004" over 10" of X-axis travel.
2. Tap the TT-10 into position to correct any error.

To spindle centerline:

1. Attach T-0028 (SL-40 BOT inspection tool holder) to tool position 1.
2. Install 15-2534 (spindle adapter plate) and a spindle alignment bar (T-1312 or T-1652).
3. Mount the indicator to the spindle alignment bar. Manually rotate the spindle to sweep the inside diameter of the inspection tool and measure runout. It should not exceed 0.001" for this tool position.
4. Repeat steps 1-3 with the inspection tool at position 4. TIR should not exceed 0.003" at this position.



5. Surface grind or mill shims to correct runout, as close to 0.0000” as possible at tool #1.
6. When runout is eliminated, repeat the base squaring procedure above. Torque the mounting bolts to 200 ft-lbs.

MANUAL MODE

Select Manual Mode by moving highlighted tab to “Manual Mode” and press Write/Enter.

X and Z Axes

This mode positions the cutting tool using the hand wheels or the pendant jog handle. When the lathe is initially powered up, the handwheels position the cutting tools and “XZ MAN” is displayed at the bottom of the pendant screen. To change position control to pendant jog handle, press Shift key and X+ or X- to control X-axis or Shift key and Z+ or Z- to control Z-axis. To return to hand wheel control, press the Shift key and X+, X-, Z+ or Z- again. Note that the sequence of using “Shift” and selecting an axis will work on most screens.

Spindle

Spindle is commanded by entering value for the spindle speed and pressing either FWD or REV. The spindle speed override keys (+/- 10%) can be used to adjust commanded speed. This also works on most screens.

MACHINE POSITION

Machine coordinates are shown on right side of display screen. Four coordinate modes are accessed by pressing the POSIT button, and can be scrolled through using Page Up and Page Down. These are:

POS-OPER – This is for the operator/setup person to use as desired, and is not used by the control for any positioning functions. In JOG mode, and with this display selected, select an axis (press X- or X+ for the X-axis or Z- or Z+ for the Z-axis). Press the ORIGIN button to set the display to zero. The (OPER-ATOR) display will then show position relative to this newly reset zero position.

POS-WORK – Shows how far the tool is away from the **X** and **Z** zero of the programmed part. On power up, it displays the value in work offset G54 automatically. The machine uses this coordinate system to run the part.

POS-MACH – Machine coordinate system automatically set on power up and the first ZERO RET. It cannot be changed by the operator or any work coordinate systems, and always shows distance from machine zero.

POS-TO GO – An incremental display that shows the travel distance remaining before the axes stop, during a programmed movement.



TOOL OFFSETS

Tool Offset

Tool offsets are described in detail in the Operator's manual. See the "Tool Nose Compensation" section for specific instructions on Radius, Radius Wear, Taper, and Tip.

Tool – The current tool number.

X Offset – The X-axis offset for the current tool.

X Wear – The amount of tool wear, in the X-axis for the current tool.

Z Offset – The Z-axis offset for the current tool.

Z Wear – The amount of tool wear, in the Z-axis for the current tool.

Radius** – The tip radius of the current tool.

Radius Wear – The amount of wear in the radius.

Taper – Compensation value for part deflection.

Tip** – Tool tip direction will be a value of 0-9.

NOTE: Tool offsets are required for running full G-code programs; they are not required by any of the single feature part programs.

**Must be entered to use Cutter Compensation; see Operator's manual for Cutter Compensation information.

AUTOMATIC MODE

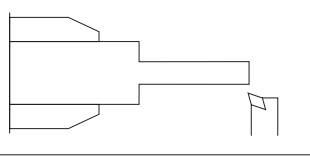
Tool offsets must be set before an automatic operation can be run. Enter the values for each tool used on the Tool Offsets screen. The tool offsets will be referenced when that tool is called in the automatic operation. Refer to the Operator's manual for more information on tool offsets.

On each of the following interactive screens the user will be asked to enter data needed to complete common machining tasks. When all data has been entered, pressing "Cycle Start" will begin the machining process.

Values entered must be measured from the centerline of the spindle.

The following is an example of an Automatic Mode screen and the definitions of the variables that will need to be entered.



MANU		SET		TURN & FACE		FER & RADIUS		L & TAP		ADING		AD RE-CUT		MING	
TOOL NUMBER	1	DIA. TO CUT	0.0000 in	MAX RPM	1000										
WORK OFFSET	54	Z DIMENSION	0.0000 in	SFM	500										
Z START PT	0.0000 in	DEPTH OF CUT	0.0000 in	FILLET RADII	0.0000 in										
OUTSIDE DIA.	0.0000 in	FEED PER REV	0.0000 in	TOOL NOSE	0.0000 in										
												Press <CYCLE START> to run in MDI or <F4> to record output to a program			
RAPID		FEED		OD TURN		ID TURN		FACE		PROFILE					

Tool Number – Enter tool to be used. Note that tool offsets must be set before automatic operation is started.

Work Offset – Enter work offset to be used (see the Operator’s manual for more information on work offsets).

Z Start Pt – Enter the Z axis starting point. New starting points can be generated by entering a positive or negative value. This value will shift the starting point the amount in Z Start Point from the work offset.

Outside Dia. – Enter the current diameter of the work piece. Manually measure the diameter.

Dia. to Cut – Enter the finished diameter.

Z Dimension – Enter the Z axis dimension of the part from the Z Start Point.

Depth of Cut – Enter the depth of cut for each pass of the stock removal.

Feed Per Rev – Enter feed per revolution. This is the distance the tool moves for each spindle revolution.

MAX RPM – Enter the maximum spindle turning speed.

SFM – Enter the Surface Feed per Minute.

Fillet Radii – Enter the corner fillet radii or enter ‘0’ for none.

Tool Nose – Enter the tool nose radius.

Advanced Users

Some operations may need additional settings modified to create required groove. Setting numbers are: 22, 28, 72, 73, 86, 95, 96, 99. See definition of setting in Operator’s Manual.

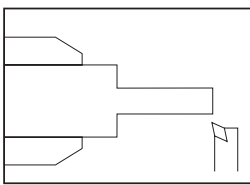
In Graphics mode tool paths are inverted; off centerline cuts show tool approaching from top of screen. The control interprets values and displays them as a customary CNC lathe, which has the tool on the other side of the part.



IPS RECORDER

The IPS recorder provides a simple method to place G-code generated by IPS into new or existing programs.

1. To access IPS, press MDI/DNC, then PROGRM/CONVRS. Refer to your Intuitive Programming System Operator Manual (ES0609 Lathe) for more information on using IPS.
2. When the recorder is available, a message appears in red in the lower right corner of the tab:

MANUAL	SETUP	TURN & FACE	HAMFER AND RADIUS	BILL & TAP	READING	ROOVING	QC	
TOOL NUMBER 1	DIA TO CUT 0.0000 in	MAX RPM 1000						<p>Press <CYCLE START> to run in MDI or <F4> to record output to a program.</p>
WORK OFFSET 54	Z DIMENSION 0.0000 in	SFM 200						
Z START PT 0.0000 in	DEPTH OF CUT 0.0500 in	FILLET RADII 0.0000 in						
OUTSIDE DIA. 0.0000 in	FEED PER REV 0.0100 in	TOOL NOSE 0.0315 in						
RAPID	FEED	OD TURN	ID TURN	FACE	PROFILE			

3. Press F4 to access the IPS recorder menu. Choose menu option 1 or 2 to continue, or option 3 to cancel and return to IPS. F4 can also be used to return to IPS from any point within IPS recorder.

IPS RECORDER	F4 - CANCEL
<p>1.) Select / Create Program</p> <p>2.) Output to current program</p> <p>3.) Cancel</p>	
<p>program.</p>	

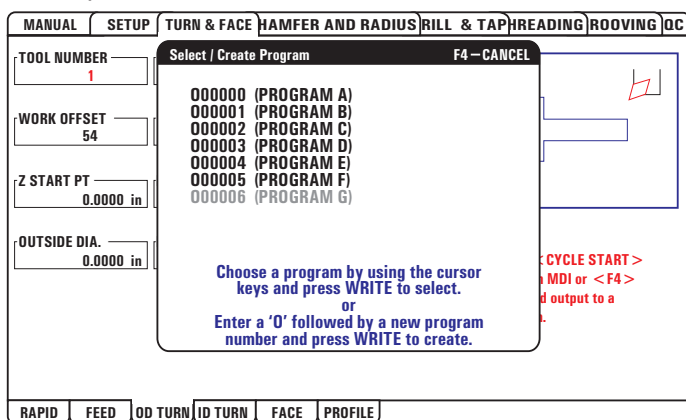
IPS Recorder Menu

Menu Option 1: Select / Create Program

Select this menu option to choose an existing program in memory or to create a new program into which the G-code will be inserted.



1. To create a new program, input the letter 'O' followed by the desired program number and press the WRITE key. The new program is created, selected, and displayed. Press the WRITE key once more to insert the IPS G-code into the new program.
2. To select an existing program, enter an existing program number using the O format (Onnnnn), then press the WRITE key to select and open the program. To choose from a list of existing programs, press the WRITE key without input. Use the cursor arrow keys to choose a program and press WRITE to open it.



3. Using the arrow keys, move the cursor to the desired insertion point for the new code. Press WRITE to insert the code.

Menu Option 2: Output to Current Program

1. Select this option to open the currently selected program in memory.
2. Use the arrow keys to move the cursor to the desired insertion point for the new code. Press WRITE to insert the code.

ALARMS/MESSAGES DISPLAY

Alarms

Select the Alarms display by pressing the ALARM / MESSAGES button. There are three types of Alarms screens. The first shows any current alarms. Pressing the Right Arrow key switches to the Alarm History screen, which shows the previously received alarms. Pressing Right Arrow again switches to the alarm viewer screen. This screen shows one alarm at a time with its description. You can then scroll through all the alarms by pressing the Up and Down Arrow keys. To view Alarm details for a known alarm number, type the number while the alarm viewer is active, then press WRITE/ENTER or the left/right cursor key.

NOTE: The Cursor and Page Up and Page Down buttons can be used to move through a large number of alarms.



Messages

The Message Display can be selected by pressing the Alarm/Mesgs button twice. This is an operator message display and has no other effect on operation of the control. Use the keypad to enter the messages. The cancel and space keys can be used to remove existing messages and the Delete button can be used to remove an entire line. Data is automatically stored and maintained even in a power-off state. The message display page will come up during power-up if there are no new alarms present.

5. MAINTENANCE

LUBRICATION - TOOLROOM LATHE

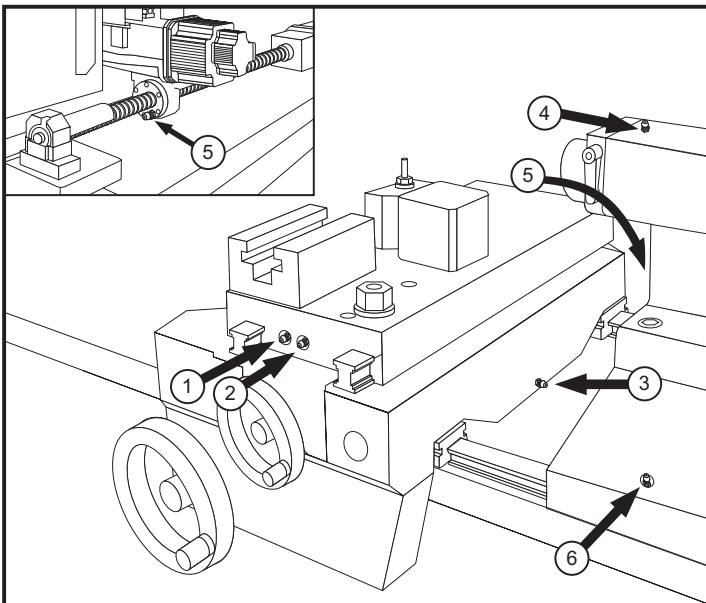
The linear guides and ball screws are manually lubricated. There is a grease fitting on the Z axis saddle which is plumbed to lubricate the four trucks. The Z-axis ball screw is lubricated through a grease fitting on the ball nut. This is accessible from the left side of the machine. The Z-axis rack should be lubricated with light oil to prevent rust.

Two grease fittings are located on the X-axis cross-slide. One is for the ball screw and the other is plumbed to the four trucks.

The optional tailstock has one grease fitting on it to lubricate the quill.

To insure proper lubrication the X and Z axes should be cycled daily and lubricated weekly, using a general-purpose lithium grease.

Lubricate with a grease gun until visible grease comes out of the ball-nut and linear guide trucks





1. X-axis cross-slide trucks
2. X-axis cross-slide ball screw
3. Z-axis saddle trucks
4. Tailstock screw
5. Z-axis saddle ball screw
6. Tailstock base; two places (one on either side).

The spindle is grease packed and needs no routine maintenance.

CHIP FILTER

The chip filter is provided with the Coolant Pump Kit option (standard with the TL-4).

Check the chip filter on a weekly basis. After removing and cleaning the chip filter, make sure the basket has been emptied of chips before restarting the machine.

See the Operator's Manual for additional maintenance issues.