



## Spindle, Chuck and Draw Tube Specifications

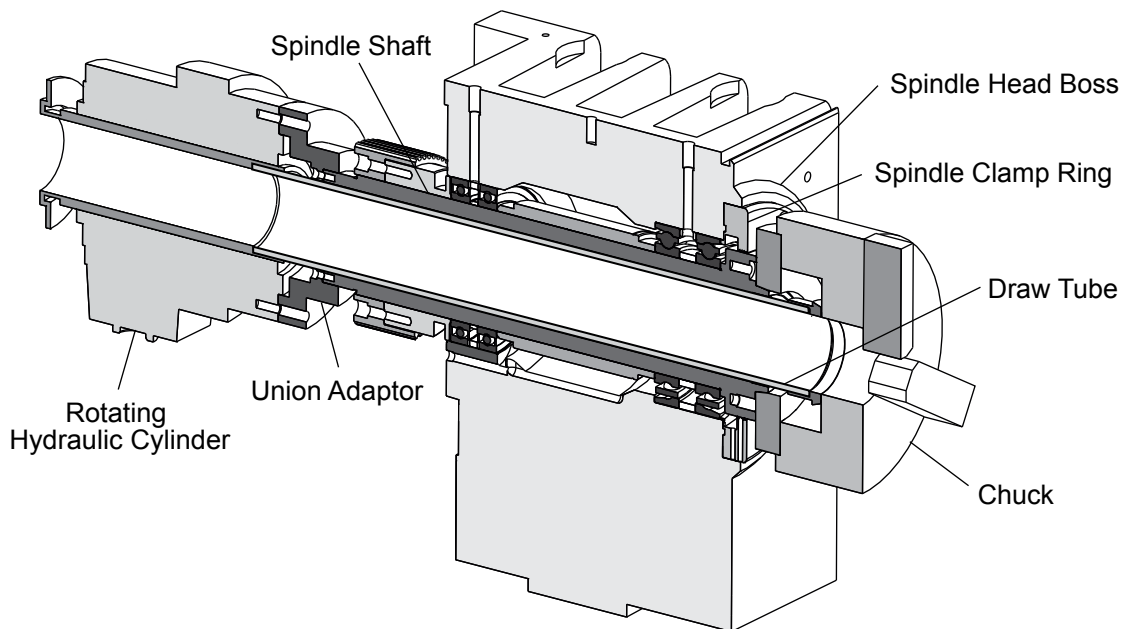
### Lathes (DS, ST, OL and TL Series)

#### Overview

This document provides detailed dimensions and information required by workholding vendors in order to adequately supply their products. There are certain applications where the included standard workholding does not meet customer needs and aftermarket products will be required. Some examples of these aftermarket products are listed below.

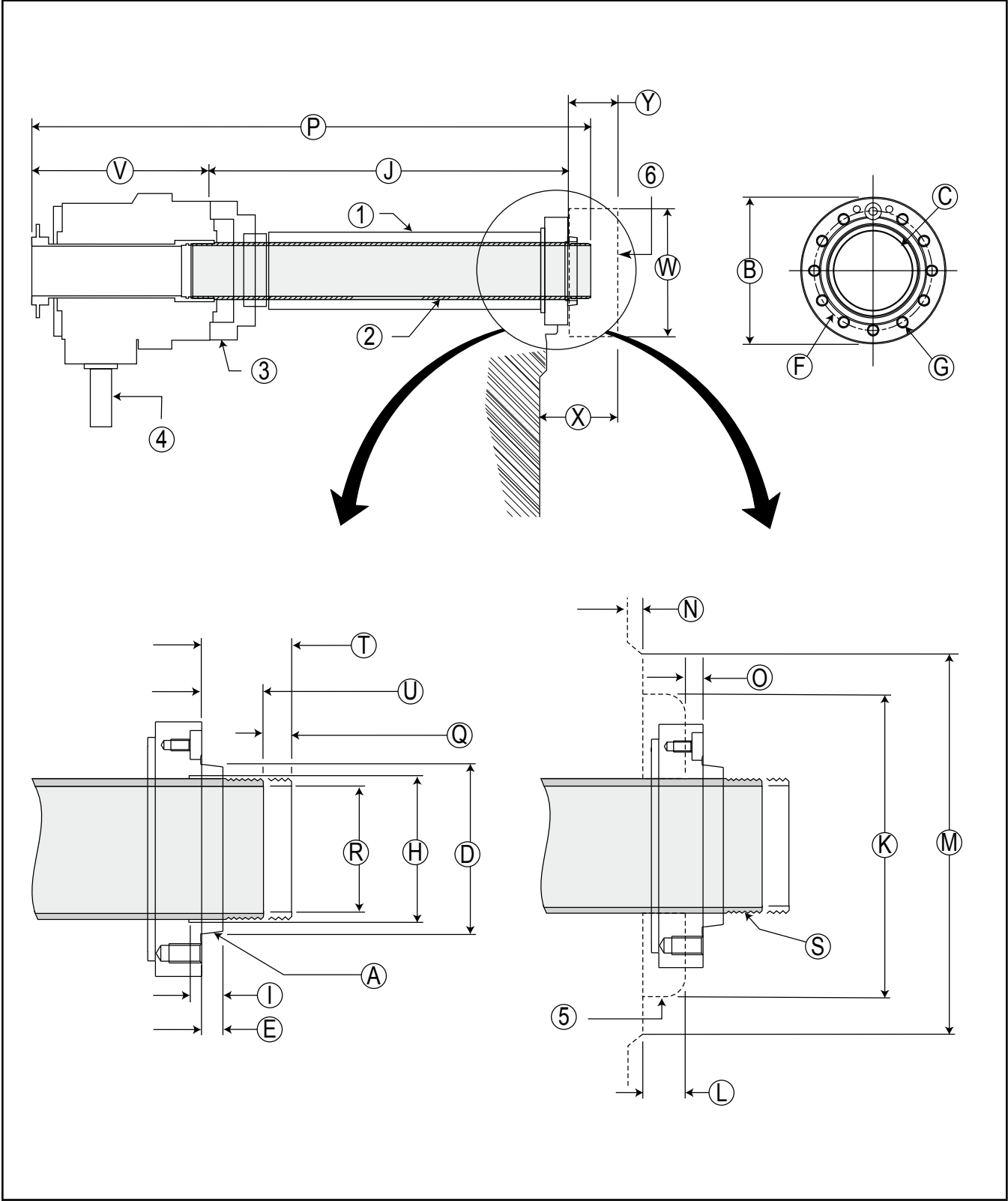
- Liners and liner adaptors
- Long stroke hydraulic chucks
- High precision chucks
- Collet closers (assorted)
- Draw Tubes
- Extended stroke actuators (rotating cylinders)
- Specialty workholding (two-jaw chucks)

The figures and tables shown on the following pages are representative of all the lathe models as listed. See the figure reference letter, e.g., A, B, etc., in the corresponding table for details on the dimensions.



*Lathe Spindle (Section View)*

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*Lathe — Standard and Dual Spindle Series*

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Standard Lathe/Y-Axis/Super Speed			
Ref	FEATURE	ST-10/10Y	ST-15
A	Nose Type (Basic Size)	A2-5 (5")	A2-6 (6")
B	Outside Diameter (OD)	5.13" / 130.3 mm	6.50" / 165.1 mm
C	Inside Diameter (ID)	2.31" / 58.7 mm	3.50" / 88.9 mm
D	Pilot Diameter	3.25" / 82.6 mm	4.19" / 106.4 mm
E	Length of Pilot	0.50" / 12.7 mm	0.56" / 14.2 mm
F	Bolt Circle Diameter	4.13" / 104.9 mm	5.25" / 133.4 mm
G	Bolt Hole Size	7/16-14 UNC-3B	1/2-13 UNC-3B
H	SPINDLE	Inside Relief Diameter	2.50" / 63.5 mm
I		Inside Relief Depth	0.62" / 15.7 mm
J		Face to Adapter Length	22.75" / 577.9 mm
K		Clamp Ring Diameter	10.00" / 254 mm
L		Clamp Ring Height	0.28" / 7.1 mm
M		Head Boss Diameter	10.75" / 273.1 mm
N		Head Boss Height	0.38" / 9.7 mm
O		Face to Clamp Ring	1.03" / 26.2 mm
P		Overall Length <sup>(1)</sup> ( <sup>6</sup> )	32.45" / 824.2 mm
		Max RPM	6000
Q	Stroke <sup>(2)</sup>	0.51" / 13.0 mm	
R	DRAW TUBE	Inside Diameter (ID)	1.81" +.03"/-.00 46 mm +0.8/- 0
S		Thread	M55 X 2.0 / 0.70" L.
T		Extended <sup>(3)</sup>	1.68" / 42.7 mm
U		Retracted <sup>(4)</sup>	1.09" / 27.7 mm
V		Union Length <sup>(5)</sup> ( <sup>7</sup> )	8.03" / 204.0 mm
W	CHUCK	Diameter <sup>(6)</sup>	6.5" / 165 mm
X		Face to Bulkhead	5.0" / 127 mm
Y		Body Thickness	3.5" / 89 mm
		Master Jaw (MJ) Serrations	1.5 mm X 60°
		MJ T-nut Threads	M10
	MJ Bolt Spacing	20 mm	
Features (referenced as P through W above) list minimum dimensions.			
Footnotes:			
<sup>(1)</sup> Tip of Draw Tube to union rear face (ST and DS lathes). Front to rear spindle faces (TL lathes).			
<sup>(2)</sup> Without chuck installed.			
<sup>(3)</sup> From spindle face mounting surface			
<sup>(4)</sup> From spindle face to Draw Tube front edge.			
<sup>(5)</sup> Front mount face to rear mount face.			
<sup>(6)</sup> Standard Chuck. Optional Power Chuck OPC10 (10") available for ST-20. OPC12 (12") available for ST-30. OPC15 (15") available for ST-35/Y.			
<sup>(7)</sup> Dimension may vary up to +/- 1" / 25.4 mm due to multiple vendors			

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Standard Lathe/Y-Axis/Super Speed				
Ref	FEATURE	ST-20/Y/SS/SSY	ST-25/25Y	
A	Nose Type (Basic Size)	A2-6 (6")	A2-6 (6")	
B	Outside Diameter (OD)	6.50" / 165.1 mm	6.50" / 165.1 mm	
C	Inside Diameter (ID)	3.50" / 88.9 mm	3.50" / 88.9 mm	
D	Pilot Diameter	4.19" / 106.4 mm	4.19" / 106.4 mm	
E	Length of Pilot	0.56" / 14.2 mm	0.56" / 14.2 mm	
F	Bolt Circle Diameter	5.25" / 133.4 mm	5.25" / 133.4 mm	
G	Bolt Hole Size	1/2-13 UNC-3B	1/2-13 UNC-3B	
H	SPINDLE	Inside Relief Diameter	3.56" / 90.4 mm	
I		Inside Relief Depth	0.75" / 19.1 mm	
J		Face to Adapter Length	22.53" / 572.3 mm	
K		Clamp Ring Diameter	10.00" / 254 mm	
L		Clamp Ring Height	0.27" / 6.9 mm	
M		Head Boss Diameter	10.75" / 273.1 mm	
N		Head Boss Height	0.38" / 9.7 mm	
O		Face to Clamp Ring	0.38" / 9.7 mm	
P		Overall Length <sup>(1)</sup> <sup>(8)</sup>	33.01" / 838.5 mm	31.75" / 806.5 mm
		Max RPM <sup>(2)</sup>	4000 / 5000	3400
Q	Stroke <sup>(3)</sup>	0.87" / 22.1 mm	0.98" / 24.9 mm	
R	DRAW TUBE	Inside Diameter (ID)	2.060" +.015/- .005 52.32 mm +0.38/- 0.13	
S		Thread	M60 X 1.5 / 0.62" L.	
T		Extended <sup>(4)</sup>	1.98" / 50.3 mm	
U		Retracted <sup>(5)</sup>	1.11" / 28.2 mm	
V		Union Length <sup>(6)</sup> <sup>(8)</sup>	8.50" / 215.9 mm	
W	CHUCK	Diameter <sup>(7)</sup>	8.3" / 211 mm	
X		Face to Bulkhead	5.0" / 127 mm	
Y		Body Thickness	4.0" / 102 mm	
		Master Jaw (MJ) Serrations	1.5 mm X 60°	
		MJ T-nut Threads	M12	
	MJ Bolt Spacing	25 mm	30 mm	
Features (referenced as P through W above) list minimum dimensions.				
Footnotes:				
<sup>(1)</sup> Tip of Draw Tube to union rear face (ST and DS lathes). Front to rear spindle faces (TL lathes).				
<sup>(2)</sup> Lower Revolutions Per Minute (RPM) value is for standard model. Higher RPM value is for SS models.				
<sup>(3)</sup> Without chuck installed.				
<sup>(4)</sup> From spindle face mounting surface				
<sup>(5)</sup> From spindle face to Draw Tube front edge.				
<sup>(6)</sup> Front mount face to rear mount face.				
<sup>(7)</sup> Standard Chuck. Optional Power Chuck OPC10 (10") available for ST-20. OPC12 (12") available for ST-30. OPC15 (15") available for ST-35/Y.				
<sup>(8)</sup> Dimension may vary up to +/- 1" / 25.4 mm due to multiple vendors				

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Standard Lathe/Y-Axis/Super Speed			
Ref	FEATURE	ST-30/Y/SS/SSY	ST-35/35Y
A	Nose Type (Basic Size)	A2-6 (6")	A2-8 (8")
B	Outside Diameter (OD)	6.50" / 165.1 mm	8.25" / 209.6 mm
C	Inside Diameter (ID)	3.50" / 88.9 mm	4.63" / 117.6 mm
D	Pilot Diameter	4.19" / 106.4 mm	5.50" / 139.7 mm
E	Length of Pilot	0.56" / 14.2 mm	0.69" / 17.5 mm
F	Bolt Circle Diameter	5.25" / 133.4 mm	6.75" / 171.5 mm
G	Bolt Hole Size	1/2-13 UNC-3B	5/8-11 UNC-3B
H	SPINDLE	Inside Relief Diameter	3.56" / 90.4 mm
I		Inside Relief Depth	0.75" / 19.1 mm
J		Face to Adapter Length	22.53" / 572.3 mm
K		Clamp Ring Diameter	10.00" / 254 mm
L		Clamp Ring Height	0.27" / 6.9 mm
M		Head Boss Diameter	10.75" / 273.1 mm
N		Head Boss Height	0.38" / 9.7 mm
O		Face to Clamp Ring	0.38" / 9.7 mm
P		Overall Length <sup>(1)</sup> <sup>(8)</sup>	31.75" / 806.5 mm
		Max RPM <sup>(2)</sup>	3400 / 4800
Q	Stroke <sup>(3)</sup>	0.98" / 24.9 mm	
R	DRAW TUBE	Inside Diameter (ID)	3.070" +/- .005 77.98 mm +/- 0.13
S		Thread	M85 X 2.0 / 1.18" L.
T		Extended <sup>(4)</sup>	2.06" / 52.3 mm
U		Retracted <sup>(5)</sup>	1.07" / 27.2 mm
V		Union Length <sup>(6)</sup> <sup>(8)</sup>	9.84" / 249.9 mm
W	CHUCK	Diameter <sup>(7)</sup>	10.0" / 254 mm
X		Face to Bulkhead	5.75" / 146.1 mm
Y		Body Thickness	4.5" / 114.3 mm
		Master Jaw (MJ) Serrations	1.5 mm X 60°
		MJ T-nut Threads	M12
	MJ Bolt Spacing	30 mm	
Features (referenced as P through W above) list minimum dimensions.			
Footnotes:			
<sup>(1)</sup> Tip of Draw Tube to union rear face (ST and DS lathes). Front to rear spindle faces (TL lathes).			
<sup>(2)</sup> Lower Revolutions Per Minute (RPM) value is for standard model. Higher RPM value is for SS models.			
<sup>(3)</sup> Without chuck installed.			
<sup>(4)</sup> From spindle face mounting surface			
<sup>(5)</sup> From spindle face to Draw Tube front edge			
<sup>(6)</sup> Front mount face to rear mount face.			
<sup>(7)</sup> Standard Chuck. Optional Power Chuck OPC10 (10") available for ST-20. OPC12 (12") available for ST-30. OPC15 (15") available for ST-35/Y.			
<sup>(8)</sup> Dimension may vary up to +/- 1" / 25.4 mm due to multiple vendors			

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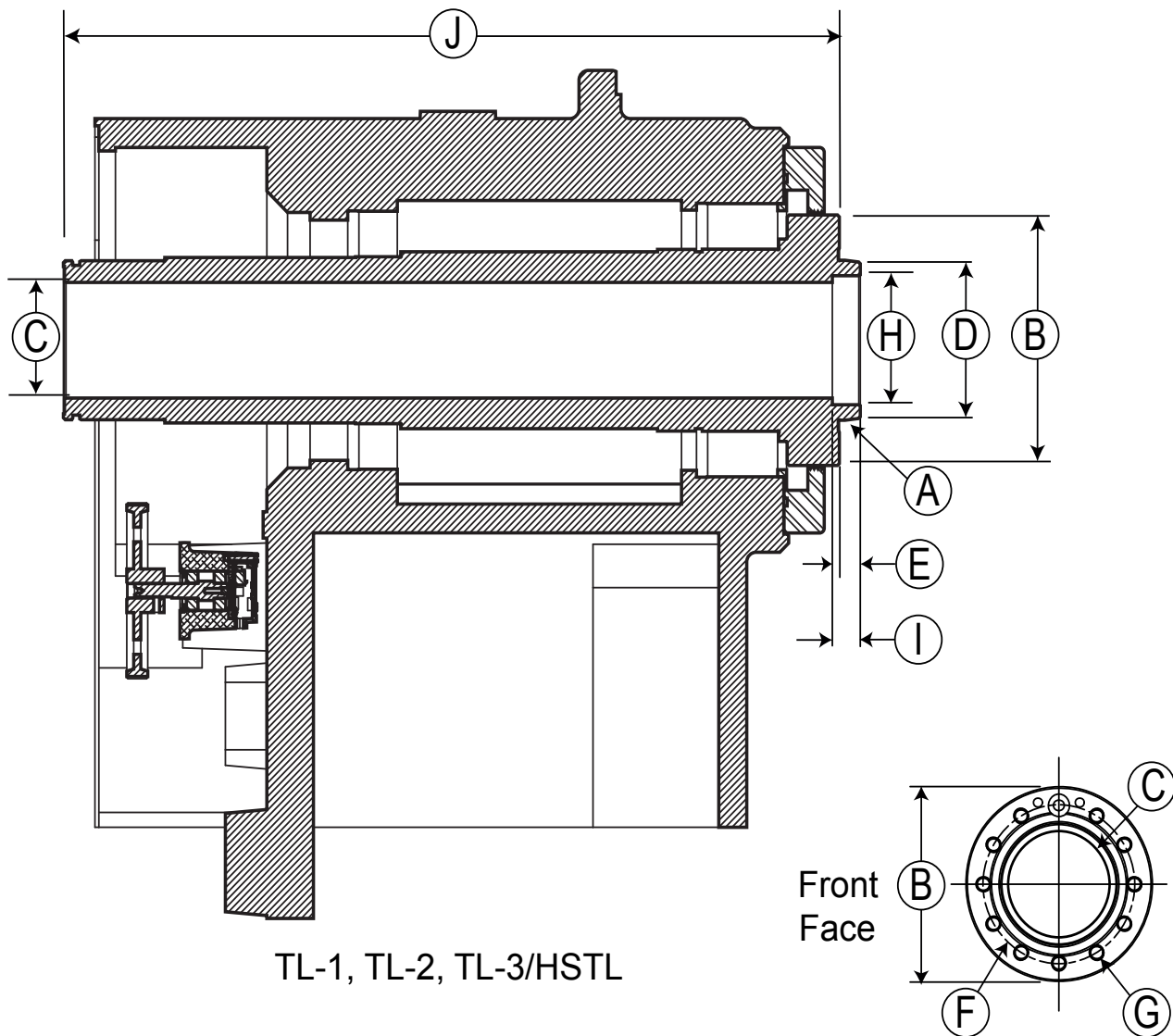
Standard Lathe/Y-Axis/Super Speed/Long Bed				
Ref	FEATURE	ST40/40L	ST45/45L	
A	Nose Type (Basic Size)	A2-8 (8")	A2-11 (11")	
B	Outside Diameter (OD)	8.25" / 209.6 mm	11.00" / 279.4 mm	
C	Inside Diameter (ID)	4.63" / 117.6 mm	7.08" / 179.8 mm	
D	Pilot Diameter	5.50" / 139.7 mm	7.75" / 196.9 mm	
E	Length of Pilot	0.69" / 17.5 mm	0.75" / 19.1 mm	
F	Bolt Circle Diameter	6.75" / 171.5 mm	9.25" / 235.0 mm	
G	Bolt Hole Size	5/8-11 UNC-3B	3/4-10 UNC-2B	
H	SPINDLE	Inside Relief Diameter	N/A	
I		Inside Relief Depth	N/A	
J		Face to Adapter Length	30.72" / 780.3 mm	32.72" / 831.1 mm
K		Clamp Ring Diameter	16.70" / 424.2 mm	16.70" / 424.2 mm
L		Clamp Ring Height	0.59" / 15.0 mm	0.63" / 16.0 mm
M		Head Boss Diameter	17.85" / 453.4 mm	17.85" / 453.4 mm
N		Head Boss Height	0.75" / 19.1 mm	0.75" / 19.1 mm
O		Face to Clamp Ring	0.12" / 3.0 mm	0.34" / 8.6 mm
P		Overall Length <sup>(1)</sup> <sup>(6)</sup>	45.55" / 1157.0 mm	51.65" / 1311.9 mm
		Max RPM	2400	1400
Q	DRAW TUBE	Stroke <sup>(2)</sup>	0.90" / 22.9 mm	
R		Inside Diameter (ID)	4.062" +/- .005 103.17 mm +/- 0.13	6.51" +.02/- .00 165.4 mm +0.5/- 0
S		Thread	M115 X 2.0 / 1.13" L.	M175 X 3.0 / 2.90" L.
T		Extended <sup>(3)</sup>	2.67" / 67.8 mm	2.91" / 73.9 mm
U		Retracted <sup>(4)</sup>	1.77" / 45.0 mm	1.73" / 43.9 mm
V		Union Length <sup>(5)</sup> <sup>(6)</sup>	11.61" / 294.9 mm	17.16" / 435.9 mm
W		Diameter	15.0" / 381 mm	18.0" / 457 mm
X		Face to Bulkhead	7.75" / 196.9 mm	8.75" / 222.3 mm
Y	CHUCK	Body Thickness	6.25" / 158.8 mm	7.25" / 184.2 mm
		Master Jaw (MJ) Serrations	1.5 mm X 60°	3.0 mm X 60°
		MJ T-nut Threads	M20	M20
		MJ Bolt Spacing	43 mm	50 mm
Features (referenced as P through W above) list minimum dimensions.				
Footnotes:				
<sup>(1)</sup> Tip of Draw Tube to union rear face (ST and DS lathes). Front to rear spindle faces (TL lathes).				
<sup>(2)</sup> Without chuck installed.				
<sup>(3)</sup> From spindle face mounting surface				
<sup>(4)</sup> From spindle face to Draw Tube front edge.				
<sup>(5)</sup> Front mount face to rear mount face.				
<sup>(6)</sup> Dimension may vary up to +/- 1" / 25.4 mm due to multiple vendors.				

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Toolroom Lathe			
Ref	FEATURE	TL-1/TL-2	TL-3/HSTL
A	Nose Type (Basic Size)	A2-6 (6")	A2-6 (6")
B	Outside Diameter (OD)	6.50" / 165.1 mm	6.50" / 165.1 mm
C	Inside Diameter (ID)	3.000" +/- .005 76.2 mm +/- 0.13	3.500" +/- .005 88.9 mm +/- 0.13
D	Pilot Diameter	4.19" / 106.4 mm	4.19" / 106.4 mm
E	Length of Pilot	0.56" / 14.2 mm	0.56" / 14.2 mm
F	Bolt Circle Diameter	5.25" / 133.4 mm	5.25" / 133.4 mm
G	Bolt Hole Size	1/2-13 UNC-3B	1/2-13 UNC-3B
H	Inside Relief Diameter	3.35" / 85.1 mm	3.56" / 90.4 mm
I	Inside Relief Depth	0.71" / 18.0 mm	0.75" / 19.1 mm
J	Overall Length (1)	20.82" / 528.8 mm	22.11" / 561.6 mm

Footnotes:  
(1) Tip of Draw Tube to union rear face (ST and DS lathes). Front to rear spindle faces (TL lathes).

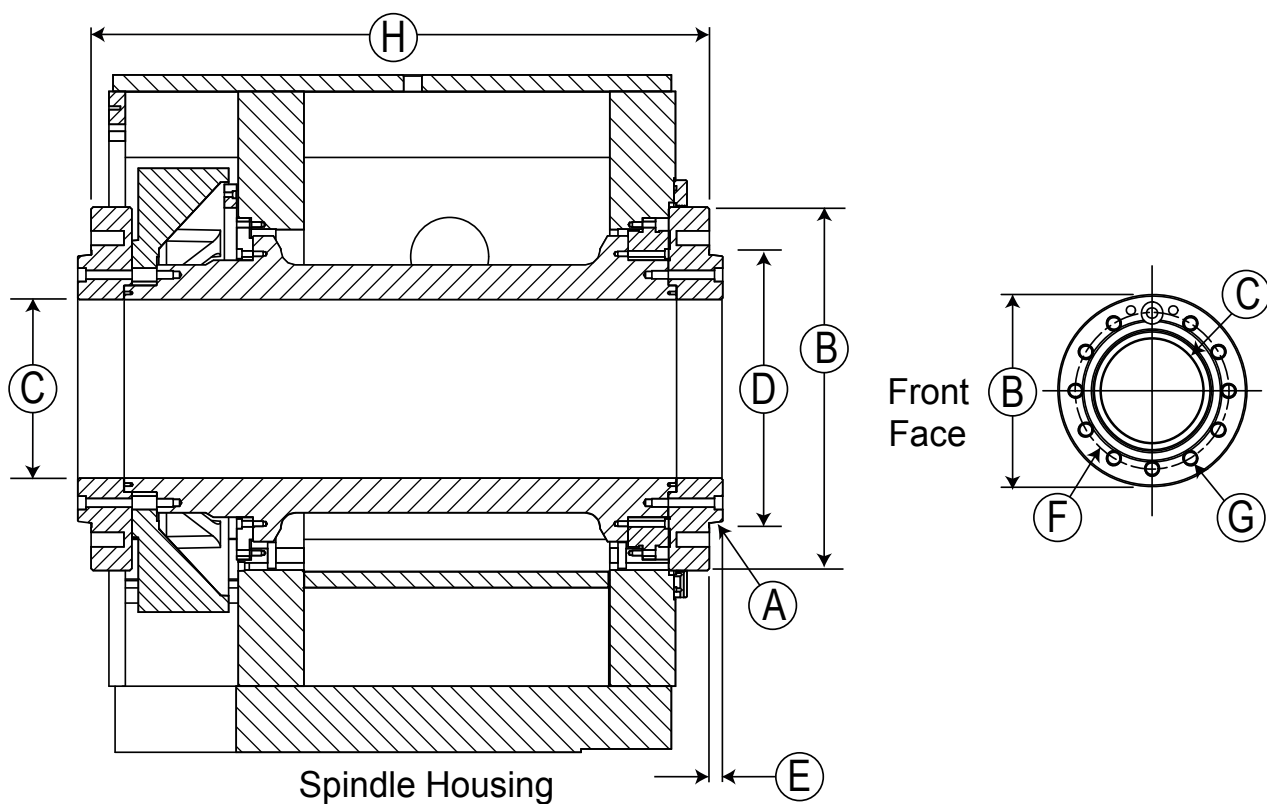
*Lathe — Toolroom Series*



TL-1, TL-2, TL-3/HSTL

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Front and Rear Chuck Lathes (TL-3B, ST-50/55)					
Ref	FEATURE	TL-3B	ST-50	ST-55	
A	Nose Type (Basic Size)	A2-15 (15")	A2-15 (15")	A1-20 (20")	
B	Outside Diameter (OD)	15.00" / 381 mm	15.00" / 381 mm	20.47" / 520 mm	
C	SPINDLE	Inside Diameter (ID)	8.500" +/- .005 215.9 mm +/- 0.13mm	8.500" +/- 0.005 215.9mm +/- 0.13 mm	12.510" +/- 0.005" 317.8mm +/- 0.025 mm
D		Pilot Diameter	11.25" / 285.8 mm	11.25" / 285.8 mm	16.25" / 412.8 mm
E		Length of Pilot	0.81" / 20.6 mm	0.81" / 20.6 mm	0.875" / 22.23 mm
F		Bolt Circle Diameter	13.00" / 330.2 mm	13.00" / 330.2 mm	18.25" / 463.6 mm
G		Bolt Hole Size	7/8-9 UNC-2B	7/8-9 UNC-2B	1-8 UNC-2B
H		Overall Length <sup>(1)</sup> <sub>(2)</sub>	23.05" / 585.5 mm	35.83" / 910 mm	36.62" / 930 mm
		Max RPM	650	1200	1000
Footnotes:					
<sup>(1)</sup> Front to rear spindle faces.					
<sup>(2)</sup> Dimension may vary up to +/- 1" / 25.4 mm due to multiple vendors.					
<sup>(3)</sup> Front and rear spindle faces have the same bolt hole patterns.					





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Dual Spindle Lathe/Y-Axis/Super Speed/Big Bore				
Ref	FEATURE	DS-30/Y/SS/SSY	DS-30/SS (2 <sup>nd</sup> Spindle)	DS-30 ( 3" Dia. Draw Tube)
A	Nose Type (Basic Size)	A2-6 (6")	A2-5 (5")	A2-6 (6")
B	Outside Diameter (OD)	6.50" / 165.1 mm	5.13" / 130.3 mm	6.50" / 165.1 mm
C	Inside Diameter (ID)	3.50" / 88.9 mm	2.44" / 62.0 mm	3.50" / 88.9 mm
D	Pilot Diameter	4.19" / 106.4 mm	3.25" / 82.6 mm	4.19" / 106.4 mm
E	Length of Pilot	0.56" / 14.2 mm	0.50" / 12.7 mm	0.56" / 14.2 mm
F	Bolt Circle Diameter	5.25" / 133.4 mm	4.13" / 104.9 mm	5.25" / 133.4 mm
G	Bolt Hole Size	1/2-13 UNC-3B	7/16-14 UNC-3B	1/2-13 UNC-3B
H	Inside Relief Diameter	3.56" / 90.4 mm	2.63" / 66.8 mm	3.56" / 90.4 mm
I	Inside Relief Depth	0.75" / 19.1 mm	0.62" / 15.7 mm	0.75" / 19.1 mm
J	Face to Adapter Length	22.53" / 572.3 mm	23.66" / 601.0 mm	22.53" / 572.3 mm
K	Clamp Ring Diameter	10.00" / 254 mm	8.00" / 203.2 mm	10.00" / 254 mm
L	Clamp Ring Height	0.27" / 6.9 mm	1.09" / 27.7 mm	0.27" / 6.9 mm
M	Head Boss Diameter	10.75" / 273.1 mm	N/A	10.75" / 273.1 mm
N	Head Boss Height	0.38" / 9.7 mm	N/A	0.38" / 9.7 mm
O	Face to Clamp Ring	0.38" / 9.7 mm	1.03" / 26.2 mm	0.38" / 9.7 mm
P	Overall Length <sup>(1)</sup> <sup>(8)</sup>	33.01" / 838.5 mm	34.28" / 870.7 mm	31.75" / 806.5 mm
	Max RPM <sup>(2)</sup>	4000 / 4800	4000 / 4800	4000
Q	Stroke <sup>(3)</sup>	0.87" / 22.1 mm	0.87" / 22.1 mm	0.98" / 24.9 mm
R	Inside Diameter (ID)	2.060" +.015/- .005 52.32 mm +0.38/- 0.13	2.060" +.015/- .005 52.32 mm +0.38/- 0.13	3.070" +/- .005 77.98 mm +/- 0.13
S	Thread	M60 X 1.5 / 0.62" L.	M60 X 1.5 / 0.62" L.	M85 X 2.0 / 1.18" L.
T	Extended <sup>(4)</sup>	1.98" / 50.3 mm	2.19" / 55.6 mm	2.12" / 53.8 mm
U	Retracted <sup>(5)</sup>	1.11" / 28.2 mm	1.25" / 31.8 mm	1.13" / 28.7 mm
V	Union Length <sup>(6)</sup> <sup>(8)</sup>	8.50" / 215.9 mm	8.50" / 215.9 mm	8.03" / 204.0 mm
W	Diameter <sup>(7)</sup>	8.3" / 211 mm	8.3" / 211 mm	10.0" / 254 mm
X	Face to Bulkhead	5" / 127 mm	N/A	5.75" / 146.1 mm
Y	Body Thickness	4.0" / 102 mm	4.0" / 102 mm	4.5" / 114 mm
	Master Jaw (MJ) Serrations	1.5 mm X 60°	1.5 mm X 60°	1.5 mm X 60°
	MJ T-nut Threads	M12	M12	M12
	MJ Bolt Spacing	25 mm	25 mm	30 mm
Features (referenced as P through W above) list minimum dimensions.				
Footnotes:				
<sup>(1)</sup> Tip of Draw Tube to union rear face (ST and DS lathes). Front to rear spindle faces (TL lathes).				
<sup>(2)</sup> Lower Revolutions Per Minute (RPM) value is for standard model. Higher RPM value is for SS models.				
<sup>(3)</sup> Without chuck installed. For OL-1 stroke = 5C collet movement.				
<sup>(4)</sup> From spindle face mounting surface (all except OL-1).				
<sup>(5)</sup> From spindle face to Draw Tube front edge.				
<sup>(6)</sup> Front mount face to rear mount face.				
<sup>(7)</sup> Standard Chuck. Optional Power Chuck OPC10 (10") available for ST-20. OPC12 (12") available for ST-30. OPC15 (15") available for ST-35/Y.				
<sup>(8)</sup> Dimension may vary up to +/- 1" / 25.4 mm due to multiple vendors.				

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Office Lathe		
Ref	FEATURE	OL-1
A	Nose Type (Basic Size)	2-3/16"-10 NS-2A
B	Outside Diameter (OD)	2.19" / 55.6 mm
C	Inside Diameter (ID)	1.25" / 31.8 mm
D	Bolt Circle Diameter	Threaded Nose (See E)
E	Bolt Hole Size	2-3/16"-10 NS-2A
F	Clamp Ring Diameter	4.94" / 125.5 mm
G	Clamp Ring Height	0.65" / 16.5 mm
H	Face to Clamp Ring	1.45" / 36.8 mm
I	Overall Length <sup>(2)</sup> <sup>(3)</sup>	14.00" / 355.6 mm
	Max RPM	6000
J	Stroke <sup>(1)</sup>	0.45" / 11.4 mm
K	Inside Diameter (ID)	1.2500" +.0004/- .0000 31.75 mm +0.01/- 0
	Thread	1 1/4"- 20 NS-2A
	Extended	2.80" / 71.1 mm
	Retracted	3.25" / 82.6 mm
	Diameter	4.0" / 102 mm
	Face to Bulkhead	3.44" / 87.4 mm
	Body Thickness	2.38" / 60.5 mm

Footnotes:

(1) 5C collet movement

(2) From spindle face to inside spindle ID bore.

(3) Dimension may vary up to +/- 1" / 25.4 mm due to multiple vendors

