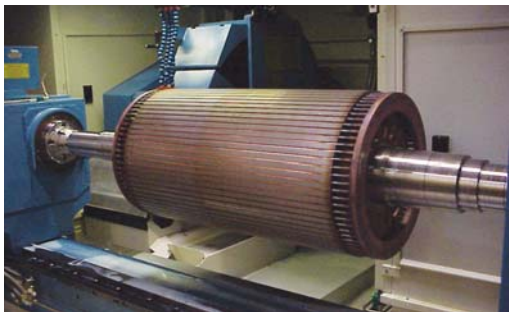
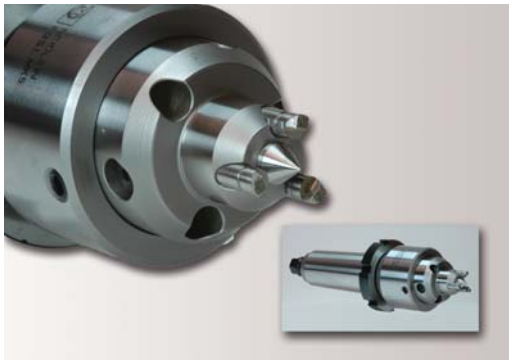
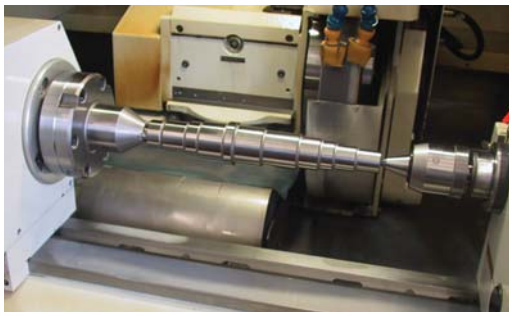
LMC Workholding

Face Drivers
Live Centers
Dead Centers







LMC Workholding

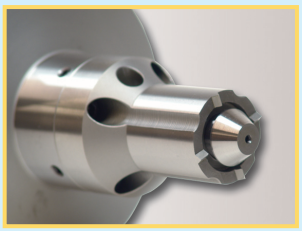
LMC Workholding is the present entity of the Logansport Machine Company, which in 1916 began building its enviable reputation for quality engineering and manufacturing of chucks and other workholding equipment. In 1989 Logansport Machine Company forged its association with Matsumoto Machine Company, a world class partner and international leader in ISO-certified power chucks, rotary tables and other workholding devices.

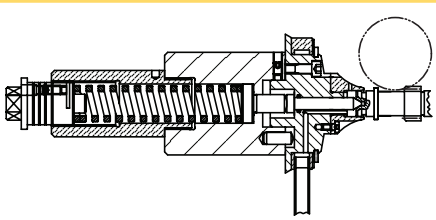
Today LMC is a valuable partner to many of the world's most renowned key technology companies, including leaders in automotive and electric motor industries.

SPECIAL APPLICATIONS

FDNC face driver for milling/hobbing

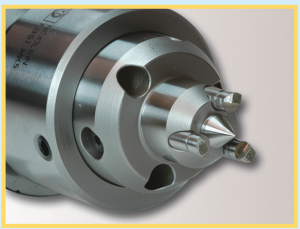
- With spring loaded center pin
- With optional coolant flush

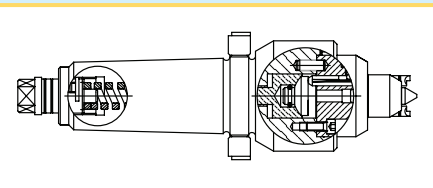




FBS for grinding

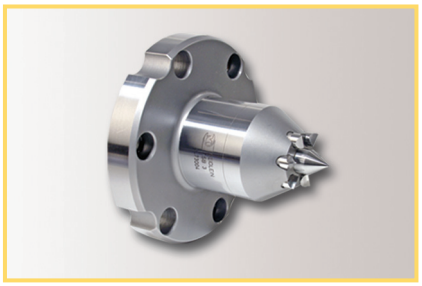
- Simple assembly via morse taper mount
- Dead zero to driver head
- Run out accuracy within .00008″ to .0002″ TIR
- Diamond coated drive pins for hard workpieces





JOIN THE REVOLUTION –

For complete machining between centers, turning, hard turning, grinding & milling. Machine the entire workpiece in one setup.



LMC FACE DRIVERS

LMC face drivers allow you to machine the entire O.D. of the workpiece in a single operation, contributing to your production efficiency, quality and cost effectiveness.

- Tighter tolerances for improved runout and durability. No other face driver is manufactured to this precision!
- Durable springs for longer life
- Special applications, grinding, hard turning, HEAVY cuts – let us prove it!

LMC CENTERS

LMC live and dead centers are produced to the same world class quality standards as our face drivers. Our live and dead centers are suited for all of today's rigorous manufacturing environments.

- Completely sealed, now with new endcap that adds further protection against chips, coolant, and grinding swarf
- Front cap placement improves tooling clearance
- Available in carbide or half carbide
- Industry leading guaranteed accuracy of .00008″ in TIR and HQ version is .00004″ (or +/-.00004″ and +/-.00002″ the way our competitors say it). All center run-out specifications are measured and checked under load.

LMC FACE DRIVER TYPE SB/FSB

Complete machining in one clamping
LMC face drivers enable the entire external contour of the workpiece to be machined in a single operation. Second operations are eliminated. Costly part handling is reduced.

No movement of datum point
The mechanical system guarantees that there is no movement of the part datum point. Temperature fluctuations that affect face drivers with heat sensitive compensating media have no affect on the LMC driver.

Heavy cuts at high concentric accuracy
The center is positively clamped in position once the workpiece has been gripped. This ensures secure workholding for heavy duty cuts. Because of the center point's spring loaded feature, variations that may occur in the depth of center drilling are of no concern.

Quick loading time
Because of the face drivers self-centering ability, workpieces can be loaded in the machine and clamped in only a few seconds. With LMC face drivers you can reduce machine downtime to a minimum. It is also possible to load and unload machines automatically.

Easy exchange of pins and centers
The easy change out of drive pins and centers simplifies operation. They are replaced on the machine without disassembling the driver head.

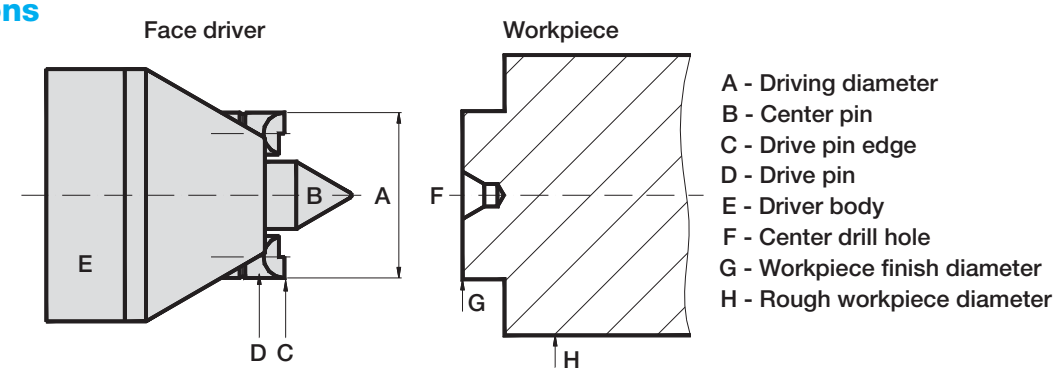
Compensating drive elements
The special mechanical system of the LMC face driver compensates for non-perpendicular workpiece end faces. Rough sawn pieces out as much as three degrees are still driven effectively.

Quick change over
Versatile mounting configurations allow quick and easy change over from chucking to face driving.

Versatile applicable
LMC face drivers are suitable for turning, grinding, milling, hobbing and other primary and secondary turning applications.

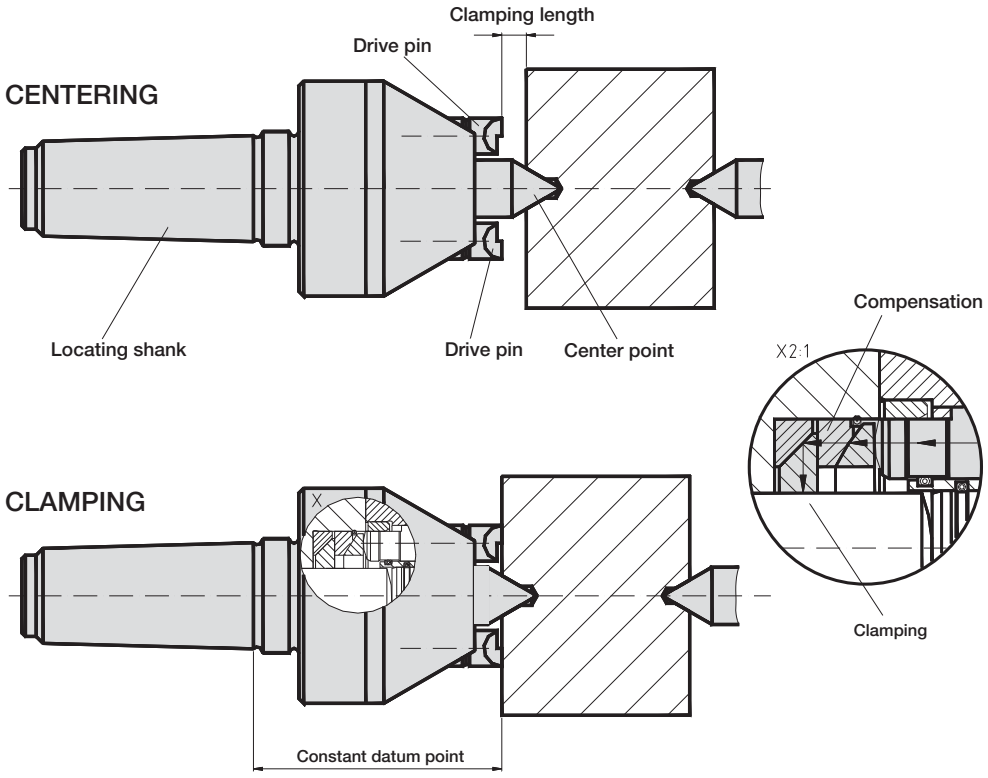
Two basic face driver styles for different mounting
Selecting the right driver style and mounting configuration is largely a function of machine type and how often changeovers will occur. LMC has the right face driver for your needs.

Definitions



A - Driving diameter
B - Center pin
C - Drive pin edge
D - Drive pin
E - Driver body
F - Center drill hole
G - Workpiece finish diameter
H - Rough workpiece diameter

HOW THE LMC FACE DRIVER TYPE SB/FSB WORKS



CHOOSING THE RIGHT FACE DRIVER TYPE SB/FSB

1. Refer to page 3 and choose the required mounting style of the face driver (tapered shank or flange mounted). Appropriate mounting adapters are available if required.

2. Determine the maximum possible driving diameter of your workpiece. Referring to tapered shank face drivers (page 4) or flange mounted face drivers (page 5), select the right size face driver based on the driving diameter (Dimension D3). Select the model number you require.

3. For choosing the drive pins for the face driver refer to page 6. Select the drive pins you require.

4. Every face driver includes a standard center point as illustrated in the chart at the top of page 8. If another style center point is necessary, because of a bigger center drill diameter for example, select the desired mushroom center from the chart shown on the bottom half of page 8. In some cases special drive pins will be required. Reference the mushroom center you are using when ordering drive pins. LMC will then assign the correct drive pins.

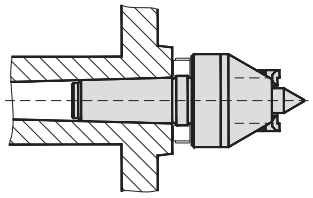
5. To get the correct tailstock pressure refer to page 9 and follow the step by step procedure indicated.

LMC Workholding

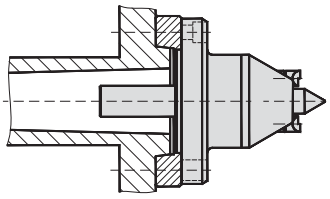
MOUNTING THE LMC FACE DRIVER TYPE SB/FSB

LMC face drivers come in two basic styles: Tapered shank (Type SB) and flange-mount (Type FSB). Both styles can be mounted either directly to a spindle or to a chuck, and a mounting adapter may or may not be required. Selecting the right driver style and mounting configuration is largely a function of machine type and how often changeovers will occur. There are four basic combinations to choose from:

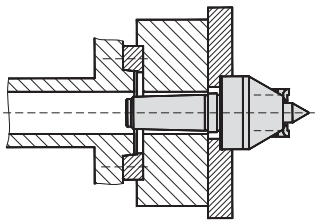
For a dedicated machine with a tapered hole through or in the spindle, choose a tapered shank (SB) driver mounted directly to the spindle.



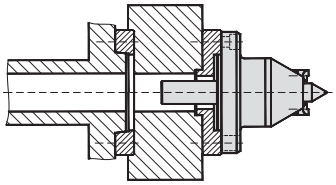
For a dedicated machine with a tapered spindle nose, choose a flange-mount (FSB) driver with a standard mounting adapter (see below).



If there will be frequent driver changes on your machine and you prefer to grip the OD of the driver, choose a tapered shank (SB) model and use a chuck with bored-out soft top jaws gripping directly on the driver head.



If there will be frequent driver changes on your machine and you prefer to mount the FSB driver to the chuck face, a simple adapter plate can be made to pilot in the chuck ID and bolt to the chuck face or master jaw “T” nuts.

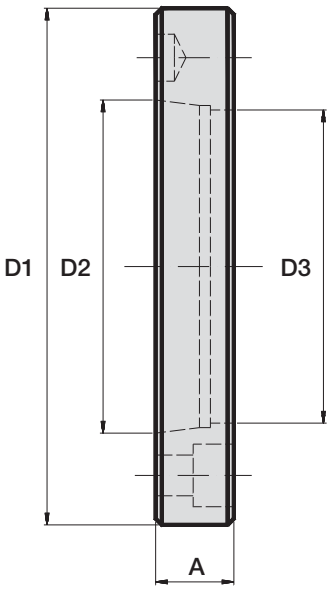


ORDERING STANDARD MOUNTING ADAPTERS

Taper Spindle Nose Adapters

The mounting adapter has two sets of three bolt holes and features LMC Workholding’s unique Dead-Zero design for dead-true precision. The face driver attaches to the mounting adapter on one side and to the spindle on the other. Removal of the driver and adapter – which remain attached to each other – from the spindle is quick and convenient.

To order the correct adapter, please refer to the drawing (right) and chart (below).



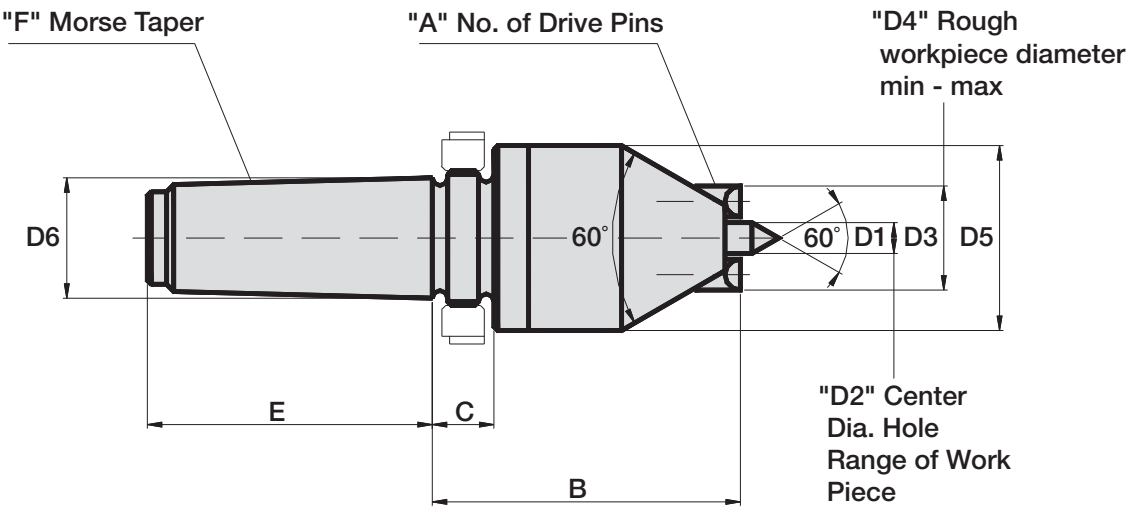
SPINDLE NOSE	D1	D2	D3	A	USED WITH TYPE FSB	ADAPTER PART NO.*
5	6.4 in. 165 mm	3.250 in. 82.57 mm	3.937 in. 100 mm	1.41 in. 35.7 mm	01 - 5	NL 74201
6	7 in. 180 mm	4.188 in. 106.39 mm	3.937 in. 100 mm	1.41 in. 35.7 mm	01 - 5	NL 74203
8	8.8 in. 225 mm	5.502 in. 139.74 mm	3.937 in. 100 mm	1.41 in. 35.7 mm	01 - 55	NL 74205
11	11.8 in. 300 mm	7.752 in. 196.89 mm	3.937 in. 100 mm	1.95 in. 49.5 mm	01 - 6	NL 74207

* For metric spindle, add an “M” to this part number

LMC Workholding

LMC FACE DRIVER TYPE SB

Tapered Shank Models

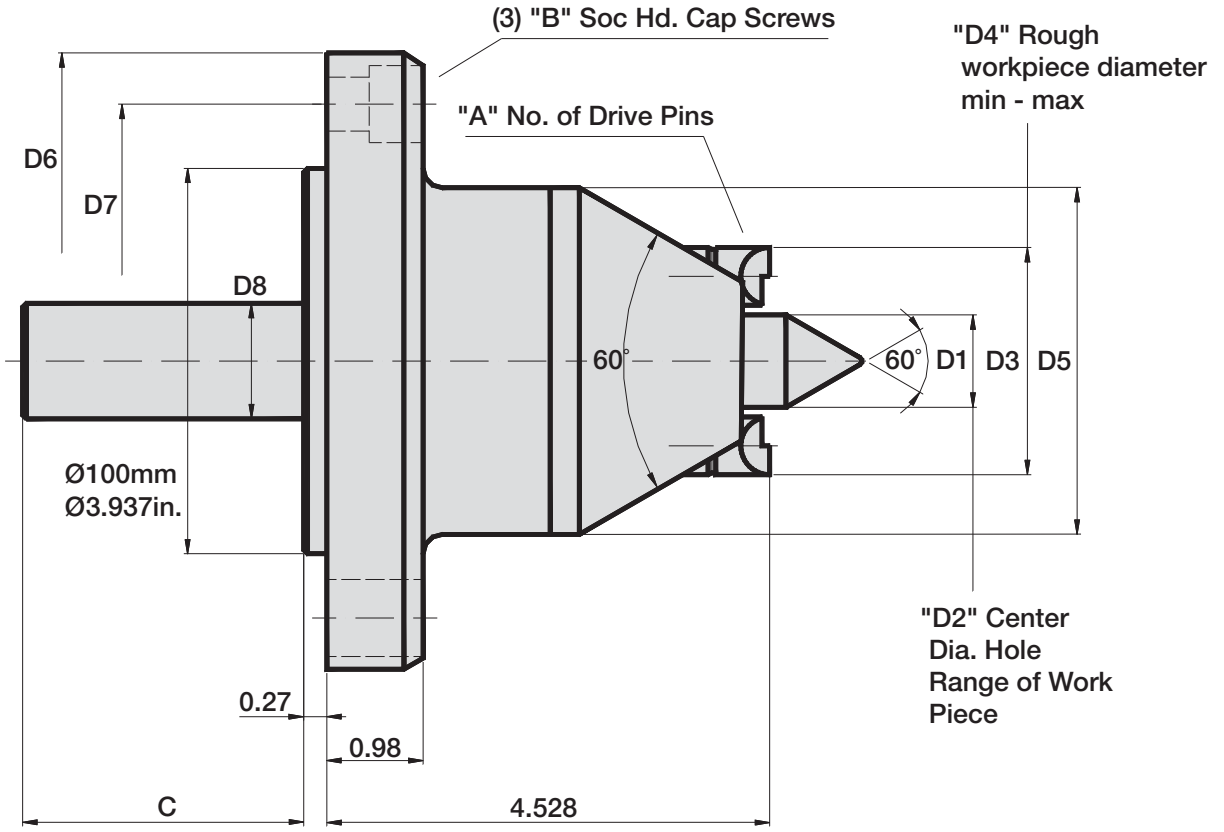


MODEL NO	Dimensions											
		WORKHOLDING DATA					GENERAL AND MOUNTING DATA					
	TYPE	D1	D2	A	D3	D4	D5	B	C	E	F	D6
NL 72016*	SB 01	0.20	0 - 0.20	3	0.67	0.354 - 1.8	1.89	3.43	0.55	2.40	3	0.94
NL 72017*	SB 01	0.20	0 - 0.20	3	0.67	0.354 - 1.8	1.89	3.43	0.63	2.91	4	1.23
NL 72018*	SB 01	0.20	0 - 0.20	3	0.67	0.354 - 1.8	1.89	3.43	0.75	3.82	5	1.75
NL 72001*	SB 0	0.12	0 - 0.12	3	0.75	0.276 - 2.0	1.89	3.43	0.55	2.40	3	0.94
NL 72002*	SB 0	0.12	0 - 0.12	3	0.75	0.276 - 2.0	1.89	3.43	0.63	2.91	4	1.23
NL 72003*	SB 0	0.12	0 - 0.12	3	0.75	0.276 - 2.0	1.89	3.43	0.75	3.82	5	1.75
NL 72019	SB 11	0.24	0 - 0.24	3	0.79	0.472 - 2.2	1.65	3.15	0.55	2.40	3	0.94
NL 72020	SB 11	0.24	0 - 0.24	3	0.79	0.472 - 2.2	1.65	3.15	0.63	2.91	4	1.23
NL 72021	SB 11	0.24	0 - 0.24	3	0.79	0.472 - 2.2	1.65	3.15	0.75	3.82	5	1.75
NL 72004	SB 1	0.31	0 - 0.31	3	1.02	0.551 - 2.6	1.89	3.15	0.55	2.40	3	0.94
NL 72005	SB 1	0.31	0 - 0.31	3	1.02	0.551 - 2.6	1.89	3.15	0.63	2.91	4	1.23
NL 72006	SB 1	0.31	0 - 0.31	3	1.02	0.551 - 2.6	1.89	3.15	0.75	3.82	5	1.75
NL 72007	SB 2	0.55	0.08 - 0.55	6	1.42	1.063 - 3.5	2.76	3.15	0.63	2.91	4	1.23
NL 72008	SB 2	0.55	0.08 - 0.55	6	1.42	1.063 - 3.5	2.76	3.15	0.75	3.82	5	1.75
NL 72009	SB 3	0.71	0.08 - 0.71	6	1.73	1.378 - 4.3	2.76	3.15	0.63	2.91	4	1.23
NL 72010	SB 3	0.71	0.08 - 0.71	6	1.73	1.378 - 4.3	2.76	3.15	0.75	3.82	5	1.75
NL 72011	SB 4	0.94	0.12 - 0.94	6	2.32	1.575 - 7.0	3.54	4.13	0.75	3.82	5	1.75
NL 72012	SB 4	0.94	0.12 - 0.94	6	2.32	1.575 - 7.0	3.54	4.13	0.79	5.28	6	2.49
NL 72013	SB 5	1.38	0.12 - 1.38	6	3.90	2.756 - 10	5.20	5.35	0.79	5.28	6	2.49
NL 72015	SB 55	1.38	0.12 - 1.38	6	5.51	4.370 - 14	7.17	5.35	0.79	5.28	6	2.49
NL 72014	SB6	1.38	0.12 - 1.38	6	6.69	5.551 - 17	8.35	5.35	0.79	5.28	6	2.49

* Drive pin location is within the body of the center on Type SB 01 and SB 0 drivers.
Note: The extracting nut is included with the face driver.

LMC FACE DRIVER TYPE FSB

Flange Type Models



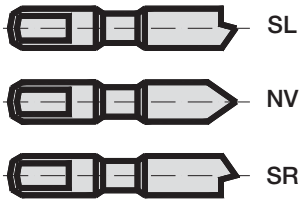
Order No.	Type	d	d1	Center ø	d2	d3	d5	d6	l	Drive Pin	Screw	No.	Clamping diameter		
													D1	D2	D3
NL73012	FSB 01	48	5	0-5	6	160	25	133.4	14	3	M12	3	8	11	17
NL73001	FSB 0	48	3	0-3	8	160	25	133.4	14	3	M12	3	6	11	19
NL73011	FSB 11	42	6	0-6	6	160	25	133.4	14	3	M12	3	11	14	20
NL73002	FSB 1	48	8	0-8	8	160	25	133.4	28	3	M12	3	13	18	26
NL73003	FSB 2	70	14	2-14	10	160	25	133.4	23	6	M12	3	26	31	36
NL73004	FSB 3	70	18	2-18	10	160	25	133.4	33	6	M12	3	34	39	44
NL73009	FSB 35	80	14	2-14	15	160	25	133.4	33	6	M12	3	29	39	49
NL73005	FSB 4	90	24	3-24	15	160	30	133.4	72	6	M12	3	39	49	59
NL73010	FSB 45	100	28	3-28	15	160	30	133.4	73	6	M12	3	49	59	69
NL73006	FSB 5	132	35	3-35	20	160	40	133.4	74	6	M12	3	69	84	99
NL73008	FSB 55	182	35	3-35	20	220	45	171.4	165	6	M16	3	110	125	140
NL73007	FSB 6	212	35	3-35	20	250	45	210	165	6	M20	3	140	155	170
NL73013	FSB 7	255	50	25-48	20	290	50	250	165	6	M20	6	180	195	210
NL73014	FSB 75	302	50	25-48	20	348	50	310	165	6	M20	6	230	245	260
NL73015	FSB 85	410	80	30-76	30	490	78	444	262	6	M20	6	320	340	360

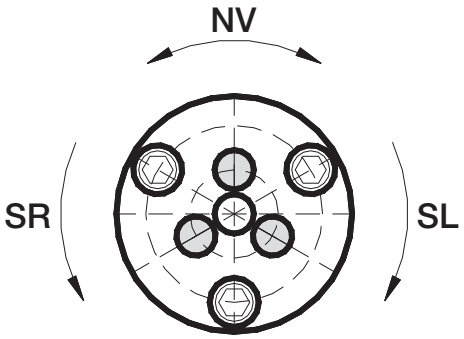
DRIVE PIN SELECTION

The drive pins used with LMC face drivers are specially ground to “grip” the end of the workpiece in the most effective fashion for given axial forces. To maximize this driving force, the pins must be matched to the direction of rotation of the machine spindle.

Spindle Rotation*	Drive Pin Type
* When looking from tailstock	
Counterclockwise (Right)	SR
Clockwise (Left)	SL
Bi-directional	NV

All drive pins are more efficient when the initial cut is made in the indicated direction of the drive pins to set the pins firmly in place.
NV type pins provide approximately 30% less force than SR and SL type pins.





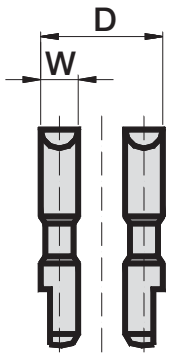
Every LMC face driver can be equipped with three standard drive pin width configurations. Each configuration gives the driver a different driving diameter, which is reflected in the chart below and on the next page.
The minimum finished diameter of the end of the workpiece must be at least .12″ (3mm) greater than the driving diameters shown. Otherwise, the outside diameter of the workpiece may be distorted. The rough diameter of the workpiece being machined should not exceed 3.0 times the driving diameter.
Ideally, drive pins penetrate the part surface approximately .02″ - .03″. Narrowing drive pins will increase unit area pressure and penetration.

Special Applications

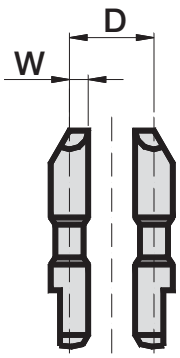
LMC Workholding also offers drive pins and units for special applications, including diamond tipped, carbide-tipped, and serrated drive pins for harder materials used in grinding and hard turning applications. Additionally, custom units can be built for non-conventional workpieces. Please contact LMC Workholding for further assistance.

DRIVER TYPE	DRIVING DIAMETER			EDGE WIDTH			DRIVE PIN ORDERING NUMBER ROTATION STYLE			NO. OF PINS
	L	M	S	L	M	S	SR	SL	NV	
SB 01 FSB 01 FFB 01	0.67 in. 17 mm	0.43 in. 11 mm	0.32 in. 8 mm	0.24 in. 6 mm	0.12 in. 3 mm	0.60 in. 1.5 mm	NL 736103 NL 736102 NL 736101	NL 736106 NL 736105 NL 736104	NL 736109 NL 736108 NL 736107	3
SB 0 FSB 0 FFB 0	0.75 in. 19 mm	0.43 in. 11 mm	0.24 in. 6 mm	0.32 in. 8 mm	0.16 in. 4 mm	0.06 in. 1.5 mm	NL 73603 NL 73602 NL 73601	NL 73606 NL 73605 NL 73604	NL 73609 NL 73608 NL 73607	3

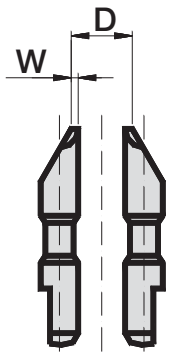
Type “L” (Large)



Type “M” (Medium)



Type “S” (Small)



Pin Configurations
D = Driving diameter
W = Pin edge width

* Half chiseled edges for better gripping

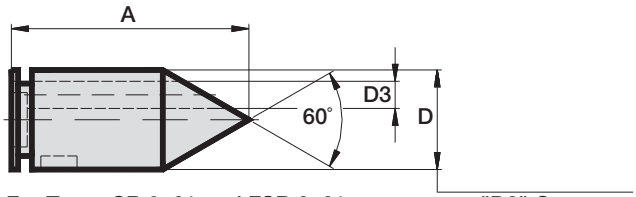
** Double chisel

DRIVER TYPE	DRIVING DIAMETER			EDGE WIDTH			DRIVE PIN ORDERING NO. ROTATION STYLE			NO. OF PINS
	L	M	S	L	M	S	SR	SL	NV	
SB 11 FSB 11 FFB 11	0.79 in. 20 mm	0.55 in. 14 mm	0.43 in. 11 mm	0.24 in. 6 mm	0.12 in. 3 mm	0.06 in. 1.5 mm	NL 73675** NL 73674** NL 73673**	NL 73678** NL 73677** NL 73676**	NL 73681 NL 73680 NL 73679	3
SB 1 FSB 1 FFB 1	1.02 in. 26 mm	0.71 in. 18 mm	0.51 in. 13 mm	0.32 in. 8 mm	0.16 in. 4 mm	0.06 in. 1.5 mm	NL 73612 NL 73611 NL 73610	NL 73615 NL 73614 NL 73613	NL 73618 NL 73617 NL 73616	3
SB 2 FSB 2 FFB 2	1.42 in. 36 mm	1.22 in. 31 mm	1.02 in. 26 mm	0.39 in. 10 mm	0.30 in. 7.5 mm	0.20 in. 5 mm	NL 73621 NL 73620 NL 73619	NL 73624 NL 73623 NL 73622	NL 73627 NL 73626 NL 73625	6
SB 3 FSB 3 FFB 3	1.73 in. 44 mm	1.54 in. 39 mm	1.34 in. 34 mm	0.39 in. 10 mm	0.30 in. 7.5 mm	0.20 in. 5 mm	NL 73630 NL 73629 NL 73628	NL 73633 NL 73632 NL 73631	NL 73636 NL 73635 NL 73634	6
FSB 35	1.93 in. 49 mm	1.54 in. 39 mm	1.14 in. 29 mm	0.20 in.* 5 mm	0.20 in.* 5 mm	0.20 in. 5 mm	NL 73684 NL 73683 NL 73682	NL 73687 NL 73686 NL 73685	NL 73690 NL 73689 NL 73688	6
SB 4 FSB 4 FFB 4	2.32 in. 59 mm	1.93 in. 49 mm	1.54 in. 39 mm	0.30 in.* 7.5 mm	0.39 in. 10 mm	0.20 in. 5 mm	NL 73669 NL 73638 NL 73637	NL 73642 NL 73641 NL 73640	NL 73645 NL 73644 NL 73643	6
FSB 45 FFB 45	2.72 in. 69 mm	2.32 in. 59 mm	1.93 in. 49 mm	0.30 in.* 7.5 mm	0.39 in. 10 mm	0.20 in. 5 mm	NL 73693 NL 73692 NL 73691	NL 73696 NL 73695 NL 73694	NL 73699 NL 73698 NL 73697	6
SB 5 FSB 5 FFB 5	3.90 in. 99 mm	3.31 in. 84 mm	2.72 in. 69 mm	0.39 in.* 10 mm	0.49 in. 12.5 mm	0.20 in. 5 mm	NL 73648 NL 73647 NL 73646	NL 73651 NL 73650 NL 73649	NL 73654 NL 73653 NL 73652	6
SB 55 FSB 55 FFB 55	5.51 in. 140 mm	4.92 in. 125 mm	4.33 in. 110 mm	0.39 in.* 10 mm	0.49 in. 12.5 mm	0.20 in. 5 mm	NL 73657 NL 73656 NL 73655	NL 73660 NL 73659 NL 73658	NL 73663 NL 73662 NL 73661	6
SB 6 FSB 6 FFB 6	6.69 in. 170 mm	6.20 in. 155 mm	5.51 in. 140 mm	0.39 in.* 10 mm	0.49 in. 12.5 mm	0.20 in. 5 mm	NL 73666 NL 73665 NL 73664	NL 73669 NL 73668 NL 73667	NL 73672 NL 73671 NL 73670	6
FSB 7	8.27 in. 210 mm	7.68 in. 195 mm	7.09 in. 180 mm	0.79 in. 20 mm	0.60 in. 15 mm	0.20 in. 5 mm	NL 73613 NL 73612 NL 73611	NL 73616 NL 73615 NL 73614	NL 73619 NL 73618 NL 73617	6
FSB 75	10.23 in. 260 mm	9.64 in. 245 mm	9.05 in. 230 mm	0.79 in. 20 mm	0.60 in. 15 mm	0.20 in. 5 mm	NL 73643 NL 73642 NL 73641	NL 73646 NL 73645 NL 73644	NL 73649 NL 73648 NL 73647	6
FSB 85	14.17 in. 360 mm	13.38 in. 340 mm	12.60 in. 320 mm	1.18 in. 30 mm	0.79 in. 20 mm	0.39 in. 10 mm	NL 73663** NL 73662** NL 73661**	NL 73666** NL 73665** NL 73664**	NL 73669 NL 73668 NL 73667	6

LMC Workholding

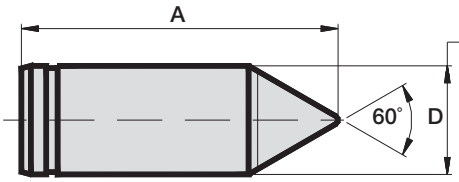
CENTER PINS FOR LMC FACE DRIVER TYPE SB/FSB

STANDARD CENTER PINS



For Types SB 0, 01 and FSB 0, 01

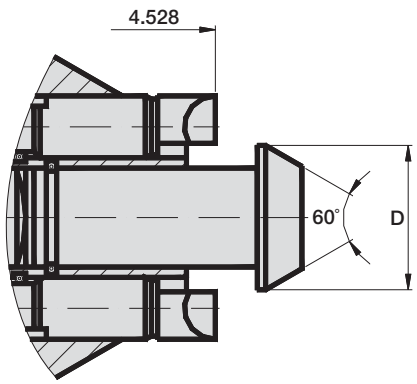
"D2" Center Dia. Hole Range of Work Piece



For Types SB 11, 1, 2, 3, 4, 5, 55, 6
For Types FSB 11, 1, 2, 3, 35, 4, 45, 5, 55, 6

ORDER NO.	FOR TYPE		D	D2	D3	A
NL 735101	SB 01	FSB 01	0.87	0-0.20	0.24	2.05
NL 73501	SB 0	FSB 0	0.87	0-0.12	0.32	2.05
NL 73511	SB 11	FSB 11	0.24	0-0.24	-	2.07
NL 73502	SB 1	FSB 1	0.32	0-0.32	-	2.07
NL 73503	SB 2	FSB 2	0.55	0.08-0.55	-	1.85
NL 73504	SB 3	FSB 3	0.71	0.08-0.71	-	2.01
NL 73509	-	FSB 35	0.55	0.08-0.55	-	1.85
NL 73505	SB 4	FSB 4	0.94	0.12-0.95	-	2.76
NL 73510	-	FSB 45	1.10	0.12-1.10	-	2.91
NL 73506	SB 5	FSB 5	1.38	0.12-1.38	-	3.78
NL 73508	SB 55	FSB 55	1.38	0.12-1.38	-	3.78
NL 73507	SB 6	FSB 6	1.38	0.12-1.38	-	3.78
NL 735301	-	FSB 7	1.97	0.87-1.97	-	3.94
NL 735401	-	FSB 75	1.97	0.87-1.97	-	3.94
NL 735501	-	FSB 85	3.15	1.18-2.99	-	5.31

MUSHROOM CENTER PINS



Note:
If you use a mushroom center, the drive pins need to have an inside setdown. If you order the drive pins, please give the order number and D dimension of the mushroom center.

ORDER NO.	FOR TYPE	D	FOR CENTER BORES
NL 735200	SB 11 FSB 11	0.307	0.217 - 0.307
NL 735201		0.394	0.295 - 0.394
NL 735202		0.472	0.335 - 0.472
NL 735203		0.551	0.453 - 0.551
NL 735204	SB 1 FSB 1	0.386	0.256 - 0.386
NL 735205		0.472	0.335 - 0.472
NL 735206		0.591	0.453 - 0.591
NL 735207		0.709	0.571 - 0.709
NL 735208	SB 2 FSB 2	0.709	0.512 - 0.709
NL 735209		0.866	0.669 - 0.866
NL 735210		1.024	0.827 - 1.024
NL 735211	SB 3 FSB 3	0.866	0.669 - 0.866
NL 735212		1.024	0.828 - 1.024
NL 735213		1.181	0.984 - 1.181
NL 735214		1.339	1.142 - 1.339
NL 735215		1.496	1.299 - 1.496
NL 735216	FSB 35	0.709	0.512 - 0.709
NL 735217		0.866	0.669 - 0.866
NL 735218		1.024	0.828 - 1.024
NL 735219		1.181	0.984 - 1.181
NL 735220		1.339	1.142 - 1.339
NL 735221		1.496	1.299 - 1.496

ORDER NO.	FOR TYPE	D	FOR CENTER BORES
NL 735222	SB 4 FSB 4	1.102	0.906 - 1.102
NL 735223		1.260	1.063 - 1.260
NL 735224		1.417	1.220 - 1.417
NL 735225		1.575	1.378 - 1.575
NL 735226		1.732	1.535 - 1.732
NL 735227	FSB 45	1.260	1.063 - 1.260
NL 735228		1.417	1.220 - 1.417
NL 735229		1.575	1.378 - 1.575
NL 735230		1.732	1.535 - 1.732
NL 735231		1.890	1.693 - 1.890
NL 735232		2.047	1.850 - 2.047
NL 735233	SB 5,55,6 FSB 5,55,6	1.575	1.339 - 1.575
NL 735234		1.772	1.535 - 1.772
NL 735235		1.969	1.732 - 1.969
NL 735236		2.165	1.929 - 2.165
NL 735237		2.362	2.126 - 2.362
NL 735238		2.559	2.323 - 2.559
NL 735239		2.756	2.520 - 2.756
NL 735240		2.953	2.717 - 2.953

Mushroom centers available for size 7, 75 and 85 per workpiece requirement, contact LMC Workholding direct for more information.

LMC Workholding

CLAMPING PRESSURE FOR LMC FACE DRIVER TYPE SB/FSB

LMC face drivers type SB/FSB require adequate force from the tailstock to operate properly. Use the following sequential tables to determine the actual tailstock pressure required.

1. Determine the Rough Workpiece Diameter to Drive Diameter Ratio
2. Determine the Chip Cross Section Area
3. Find Tailstock Force

Drive Diameter Ratio

ROUGH WORK-PIECE DIA.	DRIVING DIAMETER				
	5.91 in 150 mm	3.94 in 100 mm	1.79 in 50 mm	0.79 in 20 mm	0.39 in 10 mm
0.79 in 20 mm				1	2
1.18 in 30 mm				1.5	3
1.57 in 40 mm				2	
1.97 in 50 mm			1	2.5	
2.36 in 60 mm			1.2	3	
3.15 in 80 mm			1.6		
3.94 in 100 mm		1	2		
5.91 in 150 mm	1	1.5	3		
7.87 in 200 mm	1.3	2			
11.81 in 300 mm	2	3			

The rough diameter of the workpiece being machined shouldn't exceed 3.0 times the driving diameter.

Chip Cross Section

DEPTH OF CUT	FEED / REVOLUTION			
	0.008 in 0.2 mm	0.012 in 0.3 mm	0.016 in 0.4 mm	0.02 in 0.5 mm
0.040 in 1.0 mm	0.00032 in^2 0.2 mm^2	0.00048 in^2 0.3 mm^2	0.00064 in^2 0.4 mm^2	0.0008 in^2 0.5 mm^2
0.080 in 2.0 mm	0.00064 in^2 0.4 mm^2	0.00096 in^2 0.6 mm^2	0.00128 in^2 0.8 mm^2	0.0016 in^2 1.0 mm^2
0.120 in 3.0 mm	0.00096 in^2 0.6 mm^2	0.00144 in^2 0.9 mm^2	0.00192 in^2 1.2 mm^2	0.0024 in^2 1.5 mm^2
0.160 in 4.0 mm	0.00128 in^2 0.8 mm^2	0.00192 in^2 1.2 mm^2	0.00256 in^2 1.6 mm^2	0.0032 in^2 2.0 mm^2
0.200 in 5.0 mm	0.0016 in^2 1.0 mm^2	0.0024 in^2 1.5 mm^2	0.0032 in^2 2.0 mm^2	0.004 in^2 2.5 mm^2
0.200 in 5.0 mm	0.0016 in^2 1.0 mm^2	0.0024 in^2 1.5 mm^2	0.0032 in^2 2.0 mm^2	0.004 in^2 2.5 mm^2

Tailstock Force

CROSS SECTION	ROUGH WORKPIECE / DRIVING DIAMETER				
	1	1.5	2	2.5	3
0.0003 in^2 0.2 mm^2	495 lb 220 daN	517 lb 230 daN	540 lb 240 daN	562 lb 250 daN	584 lb 260 daN
0.0006 in^2 0.4 mm^2	540 lb 240 daN	584 lb 260 daN	629 lb 280 daN	674 lb 300 daN	719 lb 320 daN
0.0008 in^2 0.5 mm^2	562 lb 250 daN	618 lb 275 daN	674 lb 300 daN	731 lb 325 daN	787 lb 350 daN
0.0009 in^2 0.6 mm^2	584 lb 260 daN	652 lb 290 daN	719 lb 320 daN	787 lb 350 daN	854 lb 380 daN
0.0012 in^2 0.8 mm^2	629 lb 280 daN	719 lb 320 daN	809 lb 360 daN	899 lb 400 daN	989 lb 440 daN
0.0014 in^2 0.9 mm^2	652 lb 290 daN	753 lb 335 daN	854 lb 380 daN	955 lb 425 daN	1057 lb 470 daN
0.0016 in^2 1.0 mm^2	674 lb 300 daN	787 lb 350 daN	899 lb 400 daN	1012 lb 450 daN	1124 lb 500 daN
0.0019 in^2 1.2 mm^2	719 lb 320 daN	854 lb 380 daN	989 lb 440 daN	1124 lb 500 daN	1259 lb 560 daN
0.0023 in^2 1.5 mm^2	787 lb 350 daN	955 lb 425 daN	1124 lb 500 daN	1293 lb 575 daN	1461 lb 650 daN
0.0031 in^2 2.0 mm^2	899 lb 400 daN	1124 lb 500 daN	1349 lb 600 daN	1574 lb 700 daN	1798 lb 800 daN
0.0039 in^2 2.5 mm^2	1012 lb 450 daN	1293 lb 575 daN	1574 lb 700 daN	1855 lb 825 daN	2136 lb 950 daN
0.0047 in^2 3.0 mm^2	1124 lb 500 daN	1461 lb 650 daN	1798 lb 800 daN	2136 lb 950 daN	2473 lb 1100 daN
0.0062 in^2 4.0 mm^2	1349 lb 600 daN	1798 lb 800 daN	2248 lb 1000 daN	2698 lb 1200 daN	3147 lb 1400 daN
0.0078 in^2 5.0 mm^2	1574 lb 700 daN	2137 lb 950 daN	2698 lb 1200 daN	3260 lb 1450 daN	3822 lb 1700 daN
0.0155 in^2 10.0 mm^2	2698 lb 1200 daN	3822 lb 1700 daN	4946 lb 2200 daN	6070 lb 2700 daN	7194 lb 3200 daN

These tables are based on the direction of feed being toward the driver. If the feed direction is away from the driver, tailstock force must be increased 100%. For plunge cutting, tailstock force must be increased 50%. Force shown in pounds and kilos of force.

To convert kp to lb or newtons:
1 kp = approx. 2.248 lb of force, or 1 kp = 9.81 Newtons.
The force values in this table are for material hardness between 20-40 on the Rockwell "C" scale. For other hardness values please contact LMC.

LMC Workholding

LMC FACE DRIVER TYPE FFB

Complete machining in one clamping
LMC face drivers enable the entire external contour of the workpiece to be machined in a single operation. Secondary operations are eliminated. Costly part handling is reduced.

No movement of datum point
Model FFB features a fixed center point. The axial position of the workpiece is derived from the center drilled hole in the end of the workpiece.

Operation of the drive pins
Drive pins are operated by a hydraulic rotary actuator independent of the face driver located on the rear of the machine spindle.

High concentric accuracy
The locked in center pin of the FFB driver guarantees high concentric accuracy, less than 0.0004 in. (0.001 mm) TIR. With the dead zero adapter it is possible to adjust the center pin to zero runout. The positive location of the face driver center insures that once the workpiece is loaded between the driver and tailstock, high concentric accuracy will be obtained even during heavy cutting.

Quick loading time
Because of the face drivers self-centering ability, workpieces can be loaded in the machine and clamped in only a few seconds. With LMC face drivers you can reduce machine downtime to a minimum. It is also possible to load and unload machines automatically.

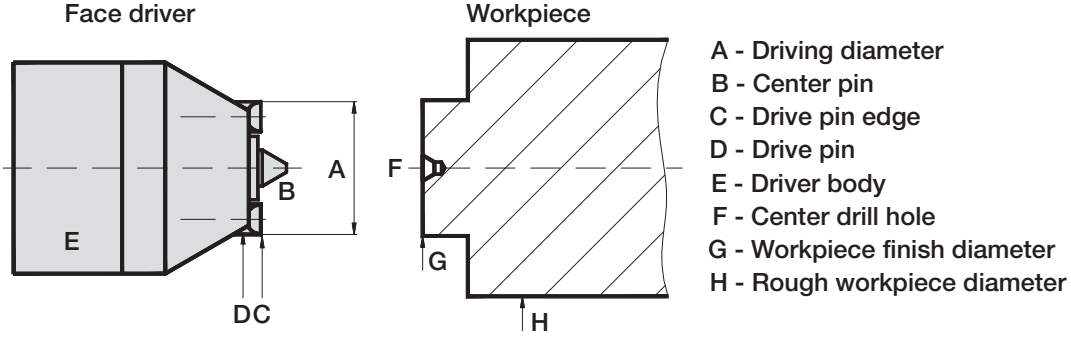
Easy exchange of pins and centers
The easy change out of drive pins and centers simplifies operation. They are replaced on the machine without disassembling the driver head.

Compensating drive elements
The special mechanical system of the LMC face driver compensates for non-perpendicular workpiece end faces. Rough sawn pieces out as much as three degrees are still driven effectively.

Quick change over
Versatile mounting configurations allow quick and easy change over from chucking to face driving.

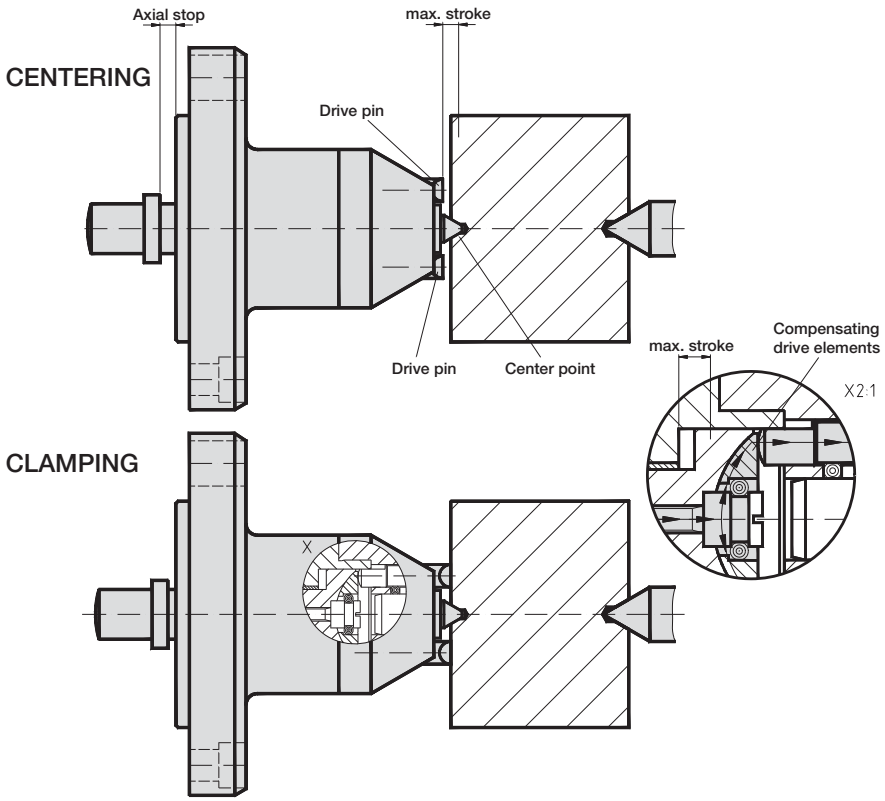
Versatile applicable
LMC face drivers are suitable for turning, grinding, milling, hobbing and other primary and secondary turning applications.

Definitions



A - Driving diameter
B - Center pin
C - Drive pin edge
D - Drive pin
E - Driver body
F - Center drill hole
G - Workpiece finish diameter
H - Rough workpiece diameter

HOW THE LMC FACE DRIVER TYPE FFB WORKS



CHOOSING THE RIGHT FACE DRIVER TYPE FFB

1. Refer to page 12 and choose the required mounting adapter for the face driver.

2. Determine the maximum possible driving diameter of your workpiece. Refer to LMC face driver type FFB (page 13) to select the right size face driver by means of the driving diameter (Dimension D3). Select the model number you require.

3. For choosing the drive pins for the face driver refer to page 6 and 7. Select the drive pins you require.

4. Every face driver includes a standard center pin as illustrated in the chart at the top of page 14. If another style center point is necessary, because of a bigger center drill diameter for example, follow the instructions on the chart shown on the bottom half of page 14 to get the mushroom center you require.

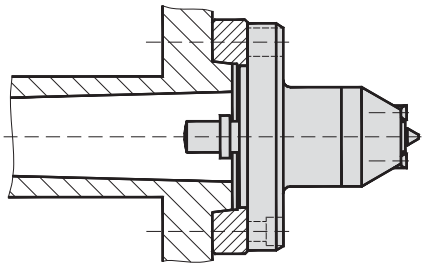
5. To get the correct clamping pressure refer to page 15 and follow the step by step procedure indicated.

6. If any further assistance is required, contact **LMC Workholding 574-735-0225.**

LMC Workholding

MOUNTING THE LMC FACE DRIVER TYPE FFB

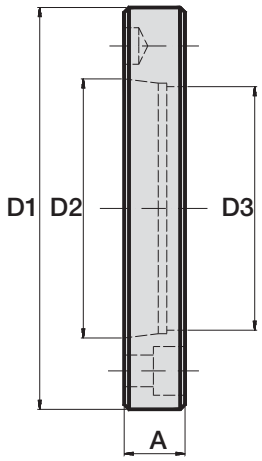
LMC face drivers type FFB are designed with a flange-mount. To mount the face driver to the spindle you need a mounting adapter, like the drawing to the right shows.



ORDERING STANDARD MOUNTING ADAPTERS

The taper spindle nose adapter has two sets of three bolt holes and features LMC Workholding's unique Dead-Zero design for dead-true precision. The face driver attaches to the mounting adapter on one side and to the spindle on the other. Removal of the driver and adapter – which remain attached to each other – from the spindle is quick and convenient.

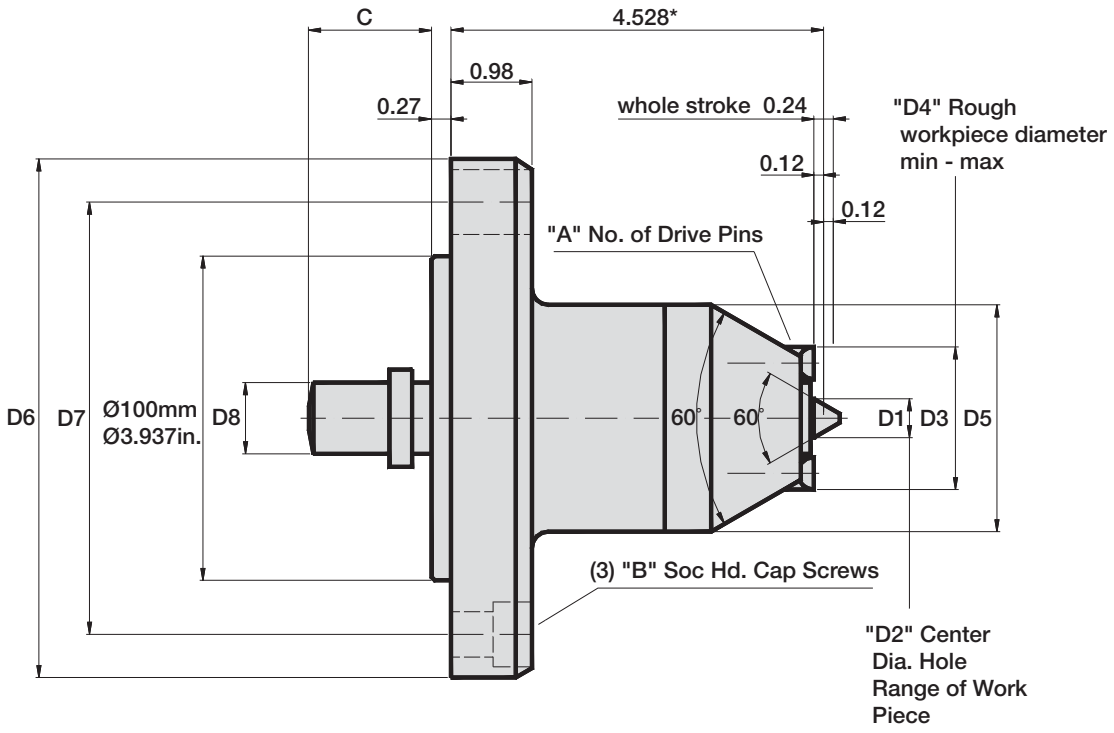
To order the correct adapter, please refer to the drawing (right) and chart (below).



SPINDLE NOSE	D1	D2	D3	A	USED WITH TYPE FFB	ADAPTER PART NO.*
5	6.4 in. 165 mm	3.250 in. 82.57 mm	3.937 in. 100 mm	1.18 in. 30 mm	01 - 5	NL 74201
6	7 in. 180 mm	4.188 in. 106.39 mm	3.937 in. 100 mm	1.18 in. 30 mm	01 - 5	NL 74203
8	8.8 in. 225 mm	5.502 in. 139.74 mm	3.937 in. 100 mm	1.18 in. 30 mm	01 - 55	NL 74205
11	11.8 in. 300 mm	7.752 in. 196.89 mm	3.937 in. 100 mm	1.37 in. 35 mm	01 - 6	NL 74207

* For metric spindle, add an "M" to this part number

LMC FACE DRIVER TYPE FFB

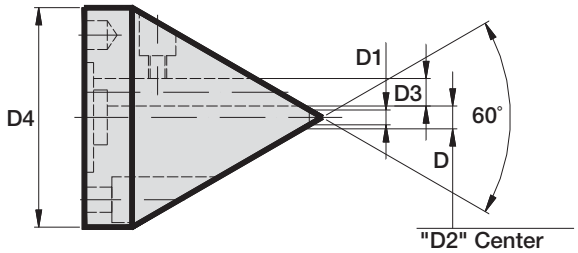


MODEL NO	Dimensions											
		WORKHOLDING DATA					GENERAL AND MOUNTING DATA					
	TYPE	D1	D2	A	D3	D4	D5	B	D6	D7	C	D8
NL 73101	FFB 01	0.20	0.04 - 0.20	3	0.67	0.354 - 2.0	2.36	M 12	6.30	5.26	1.50	0.71
NL 73112	FFB 0	0.12	0.04 - 0.12	3	0.75	0.276 - 2.2	2.36	M 12	6.30	5.26	1.50	0.71
NL 73111	FFB 11	0.31	0.08 - 0.26	3	0.79	0.472 - 2.3	1.65	M 12	6.30	5.26	1.50	0.47
NL 73102	FFB 1	0.38	0.16 - 0.33	3	1.02	0.551 - 3.0	1.89	M 12	6.30	5.26	1.50	0.71
NL 73103	FFB 2	0.39	0.16 - 0.35	3	1.42	1.063 - 4.2	2.76	M 12	6.30	5.26	1.50	0.86
NL 73104	FFB 3	0.47	0.24 - 0.43	3	1.73	1.378 - 5.2	2.76	M 12	6.30	5.26	1.50	0.83
NL 73105	FFB 4	0.63	0.39 - 0.59	5	2.32	1.575 - 7.0	3.54	M 12	6.30	5.26	1.50	0.98
NL 73106	FFB 45	0.63	0.39 - 0.59	5	2.72	1.969 - 8.0	3.94	M 12	6.30	5.26	2.13	0.98
NL 73107	FFB 5	0.63	0.39 - 0.59	5	3.90	2.756 - 12	5.20	M 12	6.30	5.26	2.13	0.98
NL 73108	FFB 55	0.63	0.39 - 0.59	5	5.51	4.370 - 16	7.17	M 16	8.66	6.75	2.72	1.57
NL 73109	FFB 6	0.63	0.39 - 0.59	5	6.69	5.551 - 20	8.66	M 20	9.84	8.27	2.72	1.57

* 5.118 in. for Type FFB 55 and FFB 6

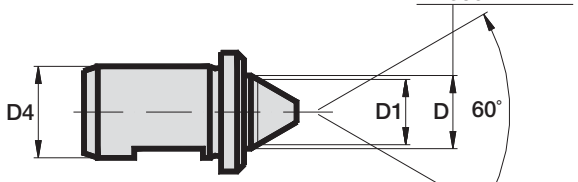
CENTER PINS FOR LMC FACE DRIVER TYPE FFB

STANDARD CENTER PINS



For Types FFB 01, 0

"D2" Center Dia. Hole Range of Work Piece

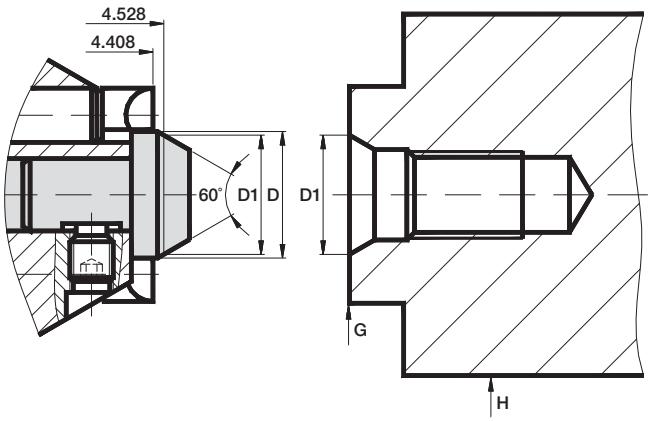


For Types FFB 11, 1, 2, 3, 4, 45, 5, 55, 6

ORDER NO.	FOR TYPE	D	D1	D2	D3	D4
NL 73401	FFB 01	0.20	0.14	0.04-0.20	0.24	1.89
NL 734101	FFB 0	0.12	0.14	0.04-0.12	0.32	1.89
NL 73411	FFB 11	0.30	0.18	0.08-0.26	-	0.24
NL 73402	FFB 1	0.39	0.26	0.16-0.33	-	0.31
NL 73403	FFB 2	0.39	0.26	0.16-0.35	-	0.55
NL 73404	FFB 3	0.47	0.34	0.24-0.43	-	0.71
NL 73405	FFB 4	0.63	0.49	0.39-0.59	-	0.79
NL 73406	FFB 45	0.63	0.49	0.39-0.59	-	1.10
NL 73407	FFB 5	0.63	0.49	0.39-0.59	-	1.38
NL 73408	FFB 55	0.63	0.49	0.39-0.59	-	1.38
NL 73409	FFB 6	0.63	0.49	0.39-0.59	-	1.38

MUSHROOM CENTER PINS

If you require a mushroom center for a face driver type FFB contact LMC and give the following dimensions. We can design the right mushroom center for you:
LMC will need the diameter of center drill hole (D1) and the workpiece finish diameter (G)



D - Diameter center pin
D1 - Diameter of center drill hole
H - Rough workpiece diameter
G - Workpiece finish diameter

LMC Workholding

CLAMPING PRESSURE FOR LMC FACE DRIVER TYPE FFB

LMC face driver type FFB require adequate force from the spindle and tailstock to operate properly. The clamping force from the tailstock has to be 20% higher than from the spindle. Use the following sequential tables to determine the actual spindle force required. To get the appropriate tailstock force add 20 percent to the calculated spindle force.

1. Determine the Rough Workpiece Diameter to Drive Diameter Ratio.
2. Determine the Chip Cross Section Area.
3. Find Headstock Force.
4. Add 20% to the calculated headstock force to get the required tailstock force.

Drive Diameter Ratio

ROUGH WORK-PIECE DIA.	DRIVING DIAMETER				
	5.91 in 150 mm	3.94 in 100 mm	1.79 in 50 mm	0.79 in 20 mm	0.39 in 10 mm
0.79 in 20 mm				1	2
1.18 in 30 mm				1.5	3
1.57 in 40 mm				2	
1.97 in 50 mm			1	2.5	
2.36 in 60 mm			1.2	3	
3.15 in 80 mm			1.6		
3.94 in 100 mm		1	2		
5.91 in 150 mm	1	1.5	3		
7.87 in 200 mm	1.3	2			
11.81 in 300 mm	2	3			

The rough diameter of the workpiece being machined shouldn't exceed 3.0 times the driving diameter.

Chip Cross Section

DEPTH OF CUT	FEED / REVOLUTION			
	0.008 in 0.2 mm	0.012 in 0.3 mm	0.016 in 0.4 mm	0.02 in 0.5 mm
0.040 in 1.0 mm	0.00032 in^2 0.2 mm^2	0.00048 in^2 0.3 mm^2	0.00064 in^2 0.4 mm^2	0.0008 in^2 0.5 mm^2
0.080 in 2.0 mm	0.00064 in^2 0.4 mm^2	0.00096 in^2 0.6 mm^2	0.00128 in^2 0.8 mm^2	0.0016 in^2 1.0 mm^2
0.120 in 3.0 mm	0.00096 in^2 0.6 mm^2	0.00144 in^2 0.9 mm^2	0.00192 in^2 1.2 mm^2	0.0024 in^2 1.5 mm^2
0.160 in 4.0 mm	0.00128 in^2 0.8 mm^2	0.00192 in^2 1.2 mm^2	0.00256 in^2 1.6 mm^2	0.0032 in^2 2.0 mm^2
0.200 in 5.0 mm	0.0016 in^2 1.0 mm^2	0.0024 in^2 1.5 mm^2	0.0032 in^2 2.0 mm^2	0.004 in^2 2.5 mm^2
0.200 in 5.0 mm	0.0016 in^2 1.0 mm^2	0.0024 in^2 1.5 mm^2	0.0032 in^2 2.0 mm^2	0.004 in^2 2.5 mm^2

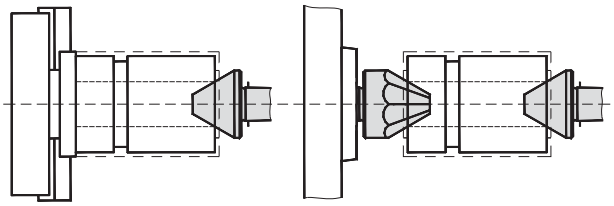
Headstock Force

CROSS SECTION	ROUGH WORKPIECE / DRIVING DIAMETER				
	1	1.5	2	2.5	3
0.0003 in^2 0.2 mm^2	495 lb 220 daN	517 lb 230 daN	540 lb 240 daN	562 lb 250 daN	584 lb 260 daN
0.0006 in^2 0.4 mm^2	540 lb 240 daN	584 lb 260 daN	629 lb 280 daN	674 lb 300 daN	719 lb 320 daN
0.0008 in^2 0.5 mm^2	562 lb 250 daN	618 lb 275 daN	674 lb 300 daN	731 lb 325 daN	787 lb 350 daN
0.0009 in^2 0.6 mm^2	584 lb 260 daN	652 lb 290 daN	719 lb 320 daN	787 lb 350 daN	854 lb 380 daN
0.0012 in^2 0.8 mm^2	629 lb 280 daN	719 lb 320 daN	809 lb 360 daN	899 lb 400 daN	989 lb 440 daN
0.0014 in^2 0.9 mm^2	652 lb 290 daN	753 lb 335 daN	854 lb 380 daN	955 lb 425 daN	1057 lb 470 daN
0.0016 in^2 1.0 mm^2	674 lb 300 daN	787 lb 350 daN	899 lb 400 daN	1012 lb 450 daN	1124 lb 500 daN
0.0019 in^2 1.2 mm^2	719 lb 320 daN	854 lb 380 daN	989 lb 440 daN	1124 lb 500 daN	1259 lb 560 daN
0.0023 in^2 1.5 mm^2	787 lb 350 daN	955 lb 425 daN	1124 lb 500 daN	1293 lb 575 daN	1461 lb 650 daN
0.0031 in^2 2.0 mm^2	899 lb 400 daN	1124 lb 500 daN	1349 lb 600 daN	1574 lb 700 daN	1798 lb 800 daN
0.0039 in^2 2.5 mm^2	1012 lb 450 daN	1293 lb 575 daN	1574 lb 700 daN	1855 lb 825 daN	2136 lb 950 daN
0.0047 in^2 3.0 mm^2	1124 lb 500 daN	1461 lb 650 daN	1798 lb 800 daN	2136 lb 950 daN	2473 lb 1100 daN
0.0062 in^2 4.0 mm^2	1349 lb 600 daN	1798 lb 800 daN	2248 lb 1000 daN	2698 lb 1200 daN	3147 lb 1400 daN
0.0078 in^2 5.0 mm^2	1574 lb 700 daN	2137 lb 950 daN	2698 lb 1200 daN	3260 lb 1450 daN	3822 lb 1700 daN
0.0155 in^2 10.0 mm^2	2698 lb 1200 daN	3822 lb 1700 daN	4946 lb 2200 daN	6070 lb 2700 daN	7194 lb 3200 daN

These tables are based on the direction of feed being toward the driver. If the feed direction is away from the driver, tailstock force must be increased 100%. For plunge cutting, tailstock force must be increased 50%.
Force is shown in pounds and kilos of force.
To convert kp to lb or newtons:
1 kp = approx. 2.248 lb of force, or 1 kp = 9.81 Newtons.
The force values in this table are for material hardness between 20-40 on the Rockwell "C" scale. For other hardness values please contact LMC.

LMC PIPE DRIVER TYPE NDG

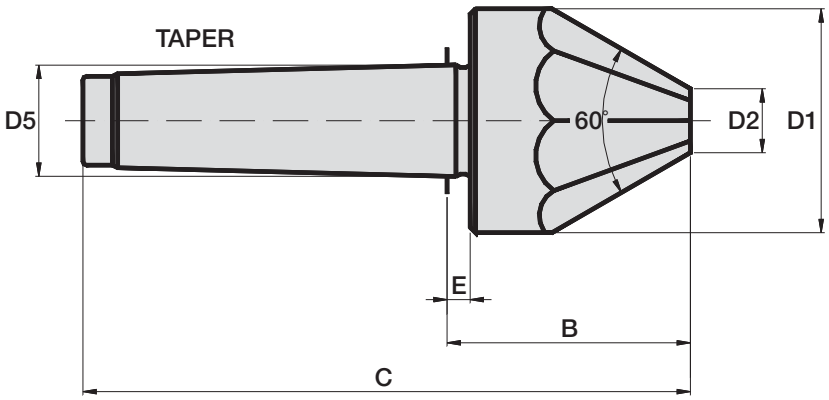
Complete machining in one clamping
LMC pipe drivers enable the entire external contour of the workpiece to be machined in a single operation. Second operations are eliminated. Costly part handling is reduced.



Wide part clamping range
LMC pipe driver heads are capable of clamping a wide range of pipe I.D. sizes. Quick-change heads extend the range even further.

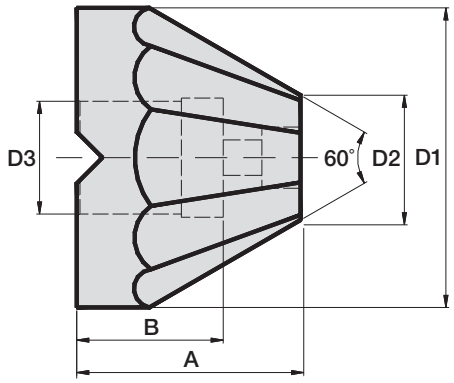
Most effective driving
LMC pipe drivers guarantee high efficiency driving through the new style and design of the ground chisel-edges.

Specials available
For required pipe driver configurations other than those shown here, please call LMC.



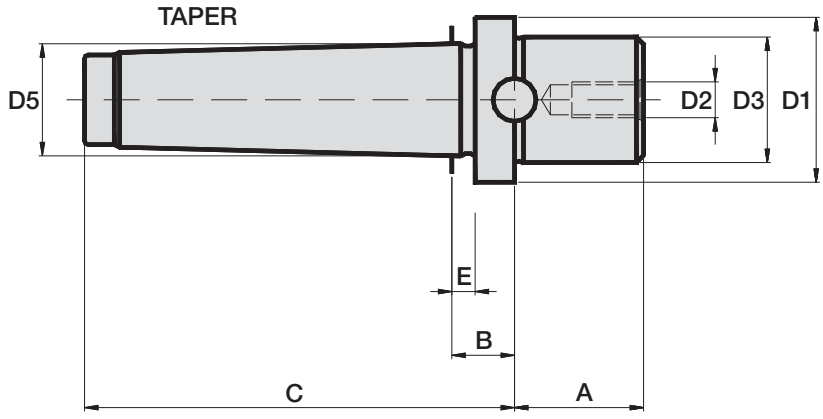
ORDER NO.	TYPE	TAPER	D1	D2	D5	B	C	E	NO. OF EDGES	CENTER DIA.	
										FROM	TO
NL 75001	NDG 0/15	2	0.71	0.00	-	1.26	0.16	2.68	6	0.08	0.67
NL 75002	NDG 0/30	3	1.22	0.00	0.94	1.97	0.20	3.35	6	0.08	1.18
NL 75003	NDG 0/15	3	1.77	0.32	0.94	2.36	0.20	3.35	6	0.35	1.69
NL 75004	NDG 0/15	3	2.48	0.71	0.94	2.44	0.20	3.35	8	0.75	2.36
NL 75005	NDG 0/15	4	1.77	0.32	1.23	2.36	0.24	4.25	6	0.35	1.69
NL 75006	NDG 0/15	4	2.48	0.71	1.23	2.44	0.24	4.25	8	0.75	2.36

INTERCHANGEABLE NOSE CONES FOR LMC PIPE DRIVER TYPE NDG



ORDER NO.	TYPE	D1	D2	D3	A	B	NO. OF EDGES	CENTER DIA.	
								FROM	TO
NL 75101	NDG 35/90	3.66	1.29	1.38	2.76	1.81	10	1.30	3.54
NL 75102	NDG 90/155	6.22	3.46	1.38	2.95	1.81	16	3.47	6.10

LMC PIPE DRIVER SHAFTS TYPE AND



ORDER-NO.	TYPE	TAPER	D1	D2	D3	D5	A	B	C	E
NL 75201	AND 35/4	4	1.81	M 10	1.38	1.23	1.42	0.63	4.25	0.20
NL 75202	AND 35/5	5	1.75	M 10	1.38	1.75	1.42	0.63	5.12	-
NL 75203	AND 35/6	6	2.52	M 10	1.38	2.49	1.42	0.63	5.67	-

LMC ULTRA LIVE CENTER

FOR ULTRA HIGH PRECISION IN PRODUCTION ENVIRONMENT

For high thrust operations
LMC ultra live centers are especially suited for high thrust operations associated with face drivers and other types of workholding devices, heavier depth of cut lathes, larger workpieces and high precision grinders.

High-performance bearings
The bearing design of the LMC ultra live centers is equipped for high axial and radial forces and also for high revolutions per minute.

High accuracy
LMC ultra live centers guarantee accuracy of .00008″ in TIR and HQ version is .00004″ (or +/-.00004″ and +/-.00002″ the way our competitors say it). All center run-out specifications are measured and checked under load.

HQ option offers .00004″ (or +/-.00002″ the way the competitors say it)

Bearings protection
LMC ultra live centers are protected against contaminants and coolant with special high speed seals.

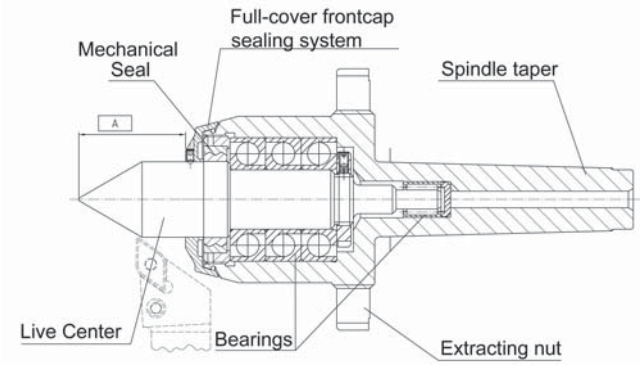
Hardened center points
LMC ultra live centers are hardened to 60 Rockwell “C” for long center point life.

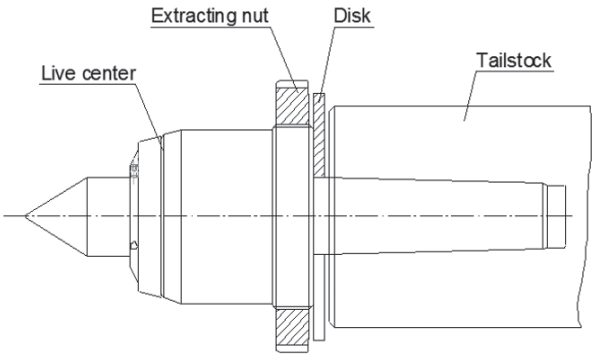
Precision crafted tools
LMC ultra live centers are precision crafted tools suited for todays manufacturing environment. The quality and craftsmanship put into LMC ultra live centers provide trouble free operation for your machine.

Maintenance free
LMC ultra live centers are maintenance free due to permanently sealed and lubricated bodies and bearings.

Extracting nut included
LMC ultra live centers include an extracting nut for easy removal of the center from the tailstock.

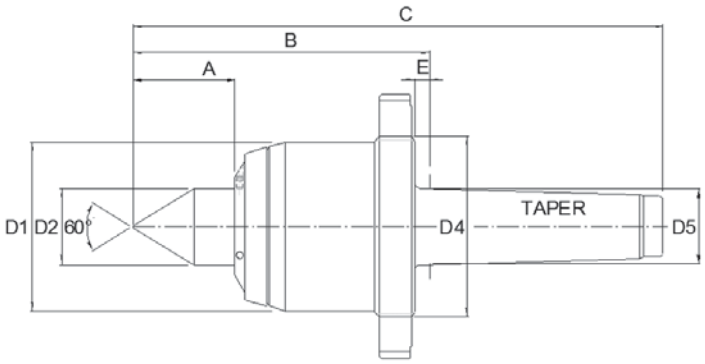
Definitions





LMC Workholding

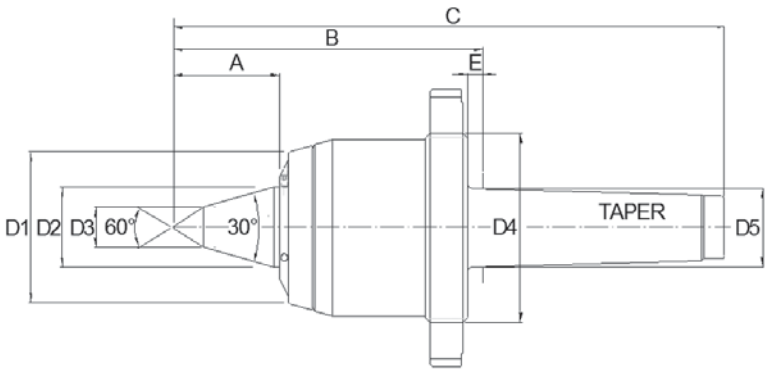
LMC ULTRA LIVE CENTER TYPE RN



ORDER-NO.	TYPE	MT	D1	D2	D4	D5	A	B	C	E	MAX RPM.	MAX THRUST* lbs
NL 81201	RN3 MK3	3	2.17	0.87	M58x1.5	0.94	1.18	3.82	7.01	0.20	10000	1400
NL 81202	RN3 MK4	4	2.17	0.87	M58x1.5	1.23	1.18	3.82	7.85	0.20	10000	1400
NL 81203	RN3 MK5	5	2.17	0.87	M58X1.5	1.75	1.18	3.82	8.92	0.20	10000	1400
NL 81204	RN4 MK4	4	2.76	1.26	M75x1.5	1.23	1.57	4.61	8.64	0.20	8000	2500
NL 81205	RN4 MK5	5	2.76	1.26	M75x1.5	1.75	1.57	4.61	9.70	0.20	8000	2500
NL 81206	RN5 MK5	5	3.62	1.77	M95x2	1.75	1.97	5.39	10.49	0.20	5500	4400
NL 81207	RN5 MK6	6	3.62	1.77	M95x2	2.49	1.97	5.47	12.56	0.20	5500	4400
NL 81208	RN6 MK6	6	4.21	2.17	M110x2	2.49	2.36	6.30	13.46	0.28	4000	6600

* Workpiece weight capacity in pounds is less than half of the thrust.

LMC ULTRA LIVE CENTER TYPE RNC

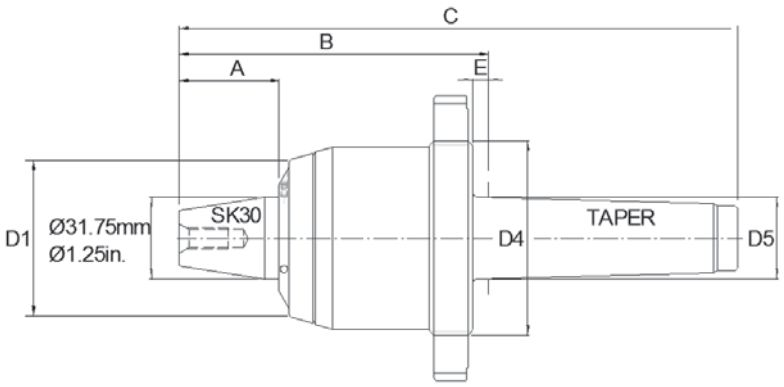


ORDER-NO.	TYPE	MT	D1	D2	D4	D5	A	B	C	E	MAX RPM.	MAX THRUST* lbs
NL 81301	RNC3 MK3	3	2.17	0.87	M58x1.5	0.94	1.42	4.06	7.24	0.20	10000	1400
NL 81302	RNC3 MK4	4	2.17	0.87	M58x1.5	1.23	1.42	4.06	8.09	0.20	10000	1400
NL 81303	RNC3 MK5	5	2.17	0.87	M58x1.5	1.75	1.42	4.06	9.15	0.20	10000	1400
NL 81304	RNC4 MK4	4	2.76	1.26	M75x1.5	1.23	1.85	4.88	8.92	0.20	8000	2500
NL 81305	RNC4 MK5	5	2.76	1.26	M75x1.5	1.75	1.85	4.88	9.98	0.20	8000	2500
NL 81306	RNC5 MK5	5	3.62	1.77	M95x2	1.75	2.56	5.98	11.08	0.20	5500	4400
NL 81307	RNC5 MK6	6	3.62	1.77	M95x2	2.49	2.56	5.98	13.15	0.20	5500	4400
NL 81308	RNC6 MK6	6	4.21	2.17	M110x2	2.49	3.03	6.89	14.13	0.28	4000	6600

* Workpiece weight capacity in pounds is less than half of the thrust.

LMC Workholding

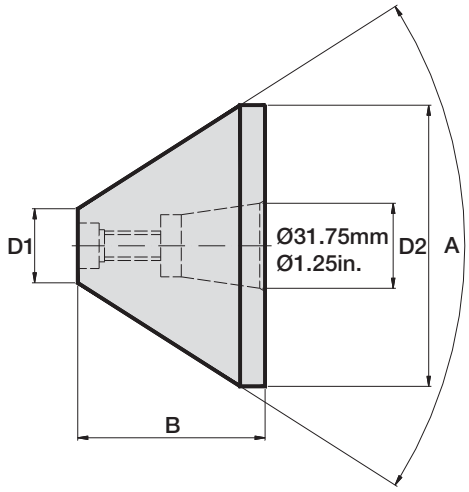
LMC ULTRA LIVE CENTER TYPE RNA



ORDER NO.	TYPE	MT	D1	D4	D5	A	B	C	E	MAX RPM.	MAX THRUST* lbs
NL 81404	RNA4 MK4	4	2.76	M75x1.5	1.23	1.77	4.80	8.84	8.84	8000	2500
NL 81405	RNA4 MK5	5	2.76	M75x1.5	1.75	1.77	4.80	3.35	9.90	8000	2500
NL 81406	RNA5 MK5	5	3.62	M95x2	7.75	1.77	5.20	3.35	10.30	5500	4400
NL 81407	RNA5 MK6	6	3.62	M95x2	2.49	1.77	5.20	3.35	12.36	5500	4400
NL 81408	RNA6 MK6	6	4.21	M110x2	2.49	1.81	5.75	4.25	12.91	4000	6600

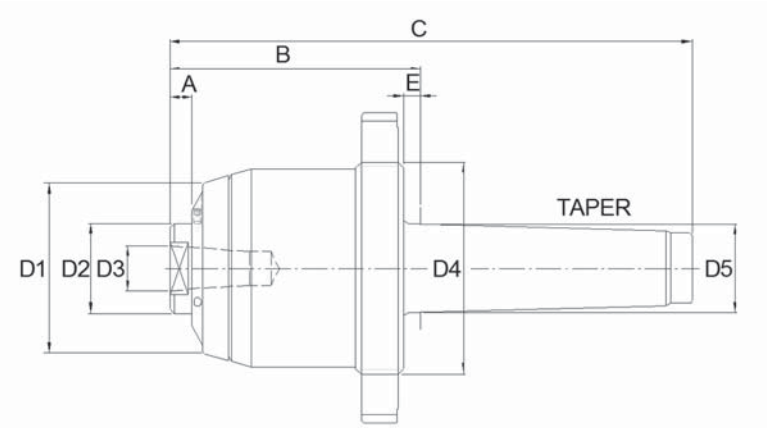
* Workpiece weight capacity in pounds is less than half of the thrust.

INTERCHANGEABLE INSERTS FOR LMC ULTRA LIVE CENTER TYPE RNA



ORDER-NO.	A	D1	D2	B
NL 81450	60	0.79	3.35	2.36
NL 81451	60	2.76	5.34	2.36
NL 81452	60	4.72	7.28	2.36
NL 81453	60	6.69	9.25	2.36
NL 81454	60	8.66	11.22	2.36
NL 81455	75	0.79	4.13	2.36
NL 81456	75	3.54	6.89	2.36
NL 81457	75	6.3	9.65	2.36
NL 81458	75	9.06	12.40	2.36
NL 81459	90	0.79	5.12	2.36
NL 81460	90	3.94	8.27	2.36
NL 81461	90	7.09	11.42	2.36

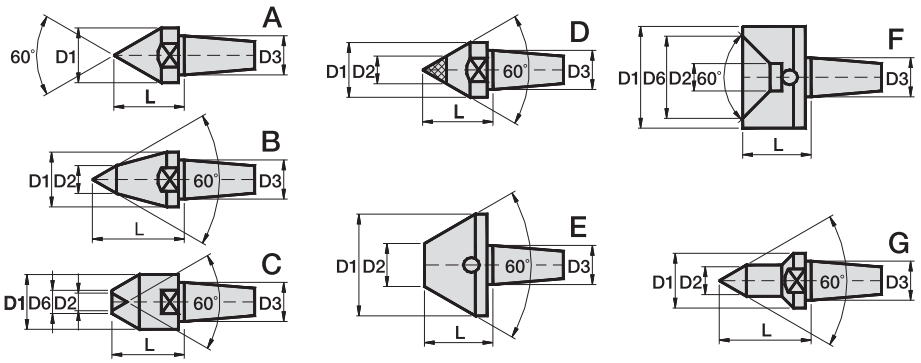
LMC ULTRA LIVE CENTER TYPE RNW



ORDER-NO.	TYPE	MT	D1	D2	D3	D4	D5	A	B	C	E	MAX RPM.	MAX THRUST* lbs
NL 81501	RNW3 MK3	3	2.17	0.87	0.63	M58x1.5	0.94	0.43	3.07	6.26	0.20	10000	1400
NL 81502	RNW3 MK4	4	2.17	0.87	0.63	M58x1.5	1.23	0.43	3.07	7.12	0.20	10000	1400
NL 81503	RNW3 MK5	5	2.17	0.87	0.63	M58X1.5	1.75	0.43	3.07	8.17	0.20	10000	1400
NL 81504	RNW4 MK4	4	2.76	1.26	0.63	M75x1.5	1.23	0.51	3.54	7.58	0.20	8000	2500
NL 81505	RNW4 MK5	5	2.76	1.26	0.63	M75x1.5	1.75	0.51	3.54	8.64	0.20	8000	2500
NL 81506	RNW5 MK5	5	3.62	1.77	0.87	M95x2	1.75	0.55	3.98	9.07	0.20	5500	4400
NL 81507	RNW5 MK6	6	3.62	1.77	0.87	M95x2	2.49	0.55	3.98	11.14	0.20	5500	4400
NL 81508	RNW6 MK6	6	4.21	2.17	0.87	M110x2	2.49	0.79	4.72	11.89	0.28	4000	6600

* Workpiece weight capacity in pounds is less than half of the thrust.

INTERCHANGEABLE INSERTS FOR LMC ULTRA LIVE CENTER TYPE RNW



ORDER-NO.	TYPE	D1	D2	D3	D6	L
NL 81560	A	1.34	-	0.87	-	1.38
NL 81561	B	1.34	0.63	0.87	-	1.77
NL 81562	C	1.34	0.39	0.87	0.28	1.14
NL 81563	D	1.34	0.71	0.87	-	1.38
NL 81564	E	2.76	1.46	0.87	-	1.34
NL 81565	F	2.76	2.52	0.87	0.94	1.34
NL 81566	G	1.34	0.63	0.87	-	1.77

ORDER-NO.	TYPE	D1	D2	D3	D6	L
NL 81550	A	0.87	-	0.63	-	1.18
NL 81551	B	0.87	0.39	0.63	-	1.57
NL 81552	C	0.87	0.28	0.63	0.39	1.18
NL 81553	D	0.87	0.43	0.63	-	1.18
NL 81554	E	2.17	1.02	0.63	-	1.18
NL 81555	F	2.17	1.97	0.63	0.63	1.18
NL 81556	G	2.17	0.39	0.63		1.57

LMC DEAD CENTER

FOR ROTATING TAILSTOCK SLEEVES

Fully hardened and ground
LMC dead centers are hardened to 60 Rockwell “C” for long life.

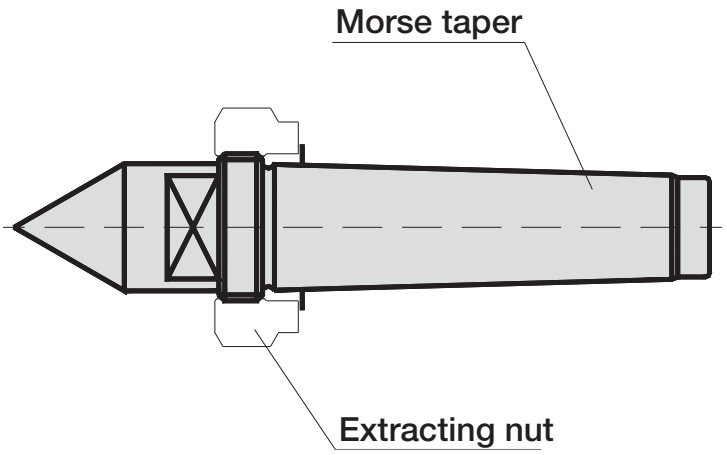
High accuracy
LMC dead centers guarantee accuracy of 0.00007 in. TIR.

Precision crafted tools
LMC dead centers are precision crafted tools suited for todays manufacturing environment. The quality and craftsmanship put into LMC dead centers provide trouble free operation for your machine.

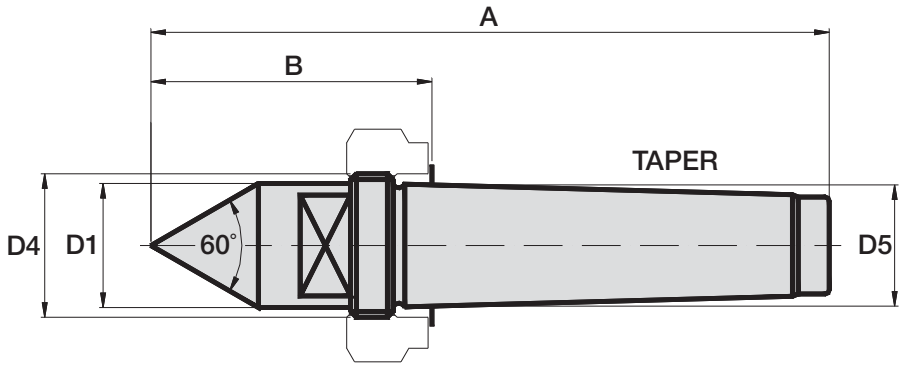
Extracting nut include
LMC dead centers include an extracting nut for easy removal of the center from the tailstock.

Specials available
For required dead centers with other dimensions than offered in this catalog call LMC.

Definitions

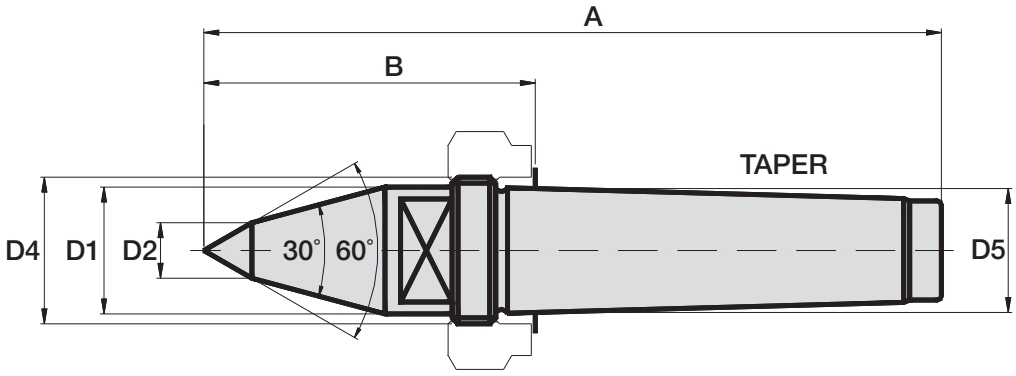


LMC DEAD CENTER TYPE FN



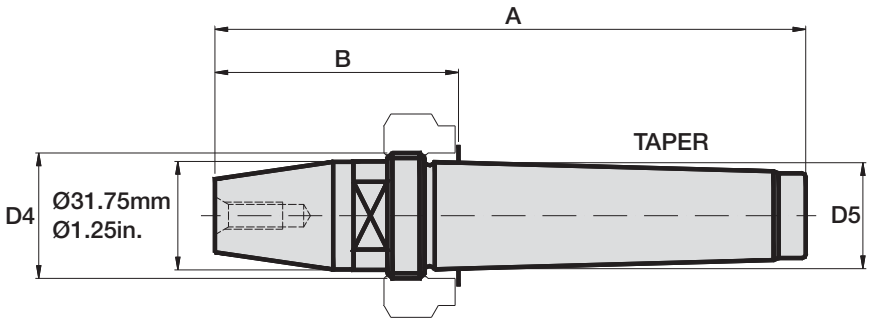
ORDER-NO.	TYPE	TAPER	D1	D4	D5	A	B
NL 92001	FN MK3	3	0.94	M27x1.5	0.94	5.43	2.24
NL 92002	FN MK4	4	1.22	M36x1.5	1.23	6.89	2.83
NL 92003	FN MK5	5	1.77	M48x1.5	1.75	8.54	3.43
NL 92004	FN MK6	6	2.48	M68x1.5	2.49	11.42	4.25

LMC DEAD CENTER TYPE FNC



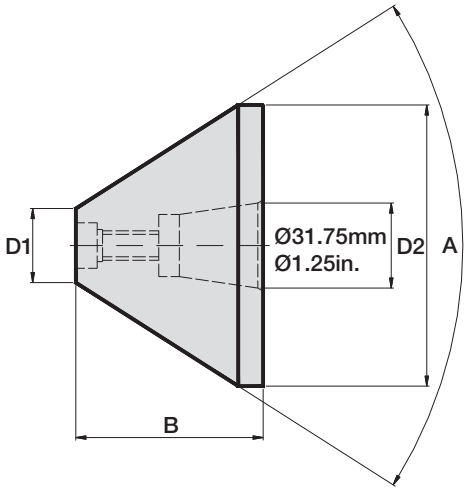
ORDER-NO.	TYPE	TAPER	D1	D2	D4	D5	A	B
NL 92101	FNC MK3	3	0.94	0.39	M27x1.5	0.94	5.83	2.64
NL 92102	FNC MK4	4	1.22	0.55	M36x1.5	1.23	7.36	3.31
NL 92103	FNC MK5	5	1.77	0.63	M48x1.5	1.75	9.53	4.41
NL 92104	FNC MK6	6	2.48	0.79	M68x1.5	2.49	12.99	5.83

LMC DEAD CENTER TYPE FNA



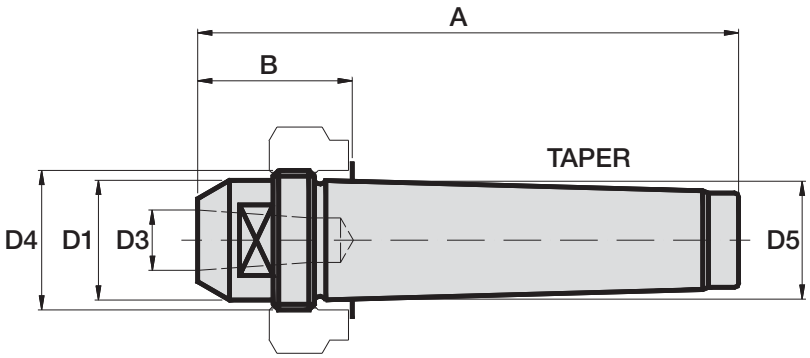
ORDER-NO.	TYPE	TAPER	D4	D5	A	B
NL 92201	FNA MK3	3	M27x1.5	0.93	5.87	2.68
NL 92202	FNA MK4	4	M36x1.5	1.23	6.83	2.80
NL 92203	FNA MK5	5	M48x1.5	1.75	7.97	2.87
NL 92204	FNA MK6	6	M68x1.5	2.49	10.37	3.21

INTERCHANGEABLE INSERTS FOR LMC DEAD CENTER TYPE FNA



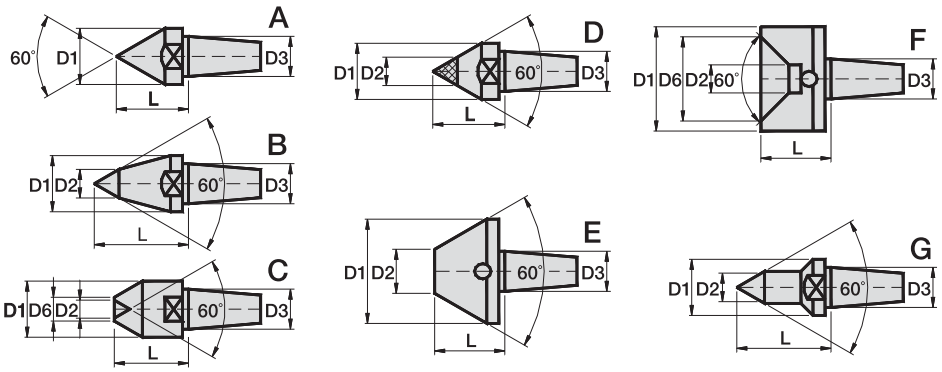
ORDER-NO.	A	D1	D2	B
NL 81450	60	0.79	3.35	2.36
NL 81451	60	2.76	5.34	2.36
NL 81452	60	4.72	7.28	2.36
NL 81453	60	6.69	9.25	2.36
NL 81454	60	8.66	11.22	2.36
NL 81455	75	0.79	4.13	2.36
NL 81456	75	3.54	6.89	2.36
NL 81457	75	6.3	9.65	2.36
NL 81458	75	9.06	12.40	2.36
NL 81459	90	0.79	5.12	2.36
NL 81460	90	3.94	8.27	2.36
NL 81461	90	7.09	11.42	2.36

LMC DEAD CENTER TYPE FNW



ORDER-NO.	TYPE	TAPER	D1	D3	D4	D5	A	B
NL 92301	FNW MK3	3	0.94	0.63	M27x1.5	0.94	4.27	1.08
NL 92302	FNW MK4	4	1.25	0.63	M36x1.5	1.23	5.30	1.26
NL 92303	FNW MK5	5	1.76	0.87	M48x1.5	1.75	6.40	1.30
NL 92304	FNW MK6	6	2.51	0.87	M68x1.5	2.49	8.80	1.63

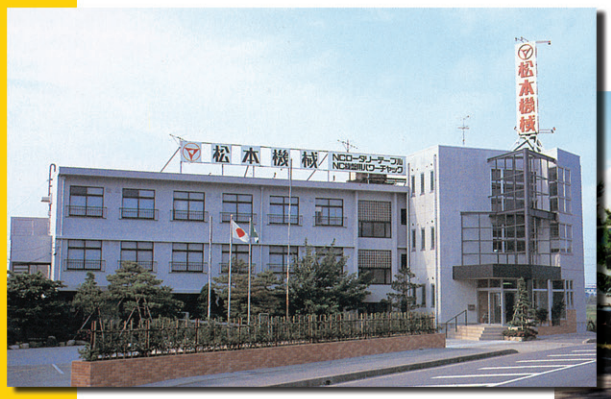
INTERCHANGEABLE INSERTS FOR LMC DEAD CENTER TYPE FNW



ORDER-NO.	TYPE	D1	D2	D3	D6	L
NL 81560	A	1.34	-	0.87	-	1.38
NL 81561	B	1.34	0.63	0.87	-	1.77
NL 81562	C	1.34	0.39	0.87	0.28	1.14
NL 81563	D	1.34	0.71	0.87	-	1.38
NL 81564	E	2.76	1.46	0.87	-	1.34
NL 81565	F	2.76	2.52	0.87	0.94	1.34
NL 81566	G	1.34	0.63	0.87	-	1.77

ORDER-NO.	TYPE	D1	D2	D3	D6	L
NL 81550	A	0.87	-	0.63	-	1.18
NL 81551	B	0.87	0.39	0.63	-	1.57
NL 81552	C	0.87	0.28	0.63	0.39	1.18
NL 81553	D	0.87	0.43	0.63	-	1.18
NL 81554	E	2.17	1.02	0.63	-	1.18
NL 81555	F	2.17	1.97	0.63	0.63	1.18
NL 81556	G	2.17	0.39	0.63		1.57

Total Workholding



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