

 **LamCam™** – Diemount Modular Cams

www.anchorlamina.com
Check our website for the latest
technical information.

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Anchor Lamina has made a commitment to the metal stamping industry by manufacturing and distributing a comprehensive collection of high quality products.

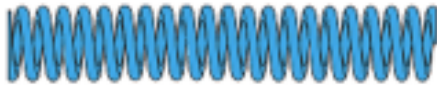
Lamina has long been known for expertise in producing precision products and has applied that knowledge into the design and production of cams with truly interchangeable parts. LamCams™ maintain consistency throughout standard lines available from bump cams to Aerial and Diemount cams to the Modular Styles.

Input from our customers has been and continues to be an important part of cam development and maintenance which assures Lamina's leadership position.

No other company surpasses our obligation to you, our customer, in supporting cams. We listen to your needs and respond when you require our assistance.

- **Ease of spring replacement from back of cam; the cam base incorporates a safety restraint system to retain the slide during spring removal**
- **High quality materials used throughout, including high-strength steel castings for major components**
- **All wear areas are double-plated with self-lubricated wear plates to reduce maintenance and accomodate high volume and long production life**
- **Three Return Spring Kit options; mechanical ISO spring, combination mechanical/nitrogen springs and nitrogen spring**
- **Pentahedron design ensures smooth and stable slide movement on 500 through 1200 Series Cams**
- **Urethane bumper cushion on slide return; Optional hydraulic shock absorber available**
- **Mounting/locating provisions include both square keys and dowel holes**
- **Meets or exceeds all of "NAAMS" cam requirements**
- **Lock-out kit installed; ready for cam installation and set up**
- **Safety back-up provisions for retaining keeper plates**
- **Improved, super-duty accelerator system standard on 0° through 30° angles**
- **Dual external positive return system**

SLIDE RETURN SYSTEM OPTIONS



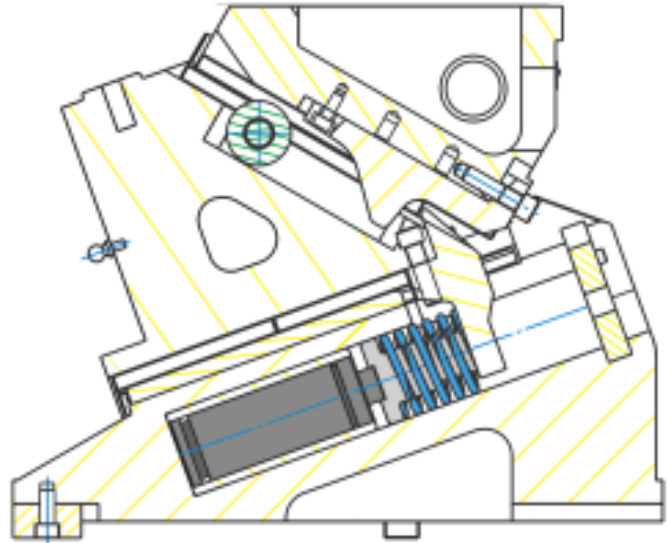
Mechanical Spring



Mechanical & Nitrogen Spring*
(Recommended)



Nitrogen Spring



Recognizing that different cam applications have different requirements, LamCam™ offers three Slide Return System Options.

1. Mechanical – Employs a conventional ISO die spring, used in cam applications where additional stripping force is not required.

2. Combination Mechanical/Nitrogen – This unique Lamina design employs an ISO die spring in series combination with a Nitrogen Spring. This return system utilizes the mechanical spring for preload, keeping the contact forces low, while providing high final loads from the nitrogen spring for stripping.

3. Nitrogen – This return system provides high return spring forces for stripping. By nature of the nitrogen spring, it also has a higher initial contact force than other return spring options. This higher contact force may result in greater wear on the cam and its accelerator system (where applicable).

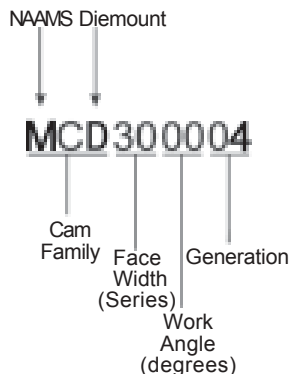
***Lamina strongly recommends the use of the Nitrogen Cylinder/Mechanical Spring Combination System for the slide return function of all Aerial and Diemount cam units.**

The benefit of using the Combination System is two-fold:

1. The force developed in the slide return system is low when the accelerator function is active (because only the mechanical spring is operative at that point), thus, wearing of the accelerator components is greatly reduced.

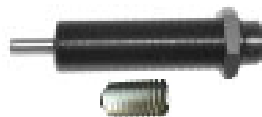
2. The total developed slide return force at the cam's shut height position is greater with the Combination System than it is with the Nitrogen-only option. The result is more on-board capability for part stripping.

PART NUMBER KEY

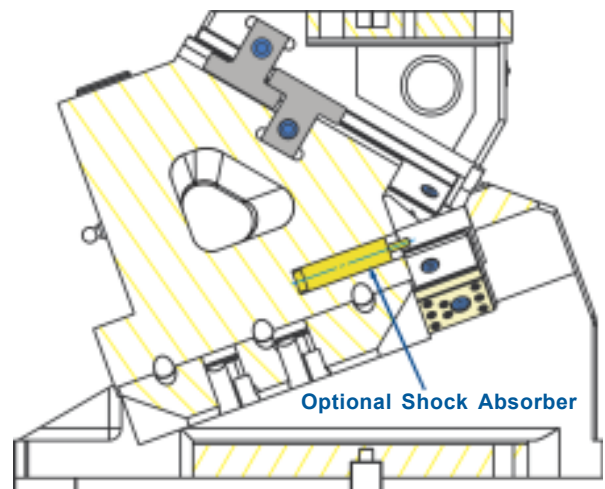


OPTIONAL SHOCK ABSORBERS

Optional shock absorbers are available and should be used in the absence of an accelerator system on low-angle cams (i.e., less than 35°) to ensure a gentle return of the slide to its home position.

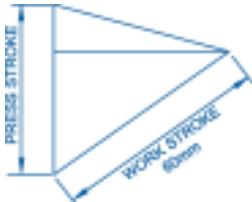


Shock Absorber and
M6x12 Set Screw



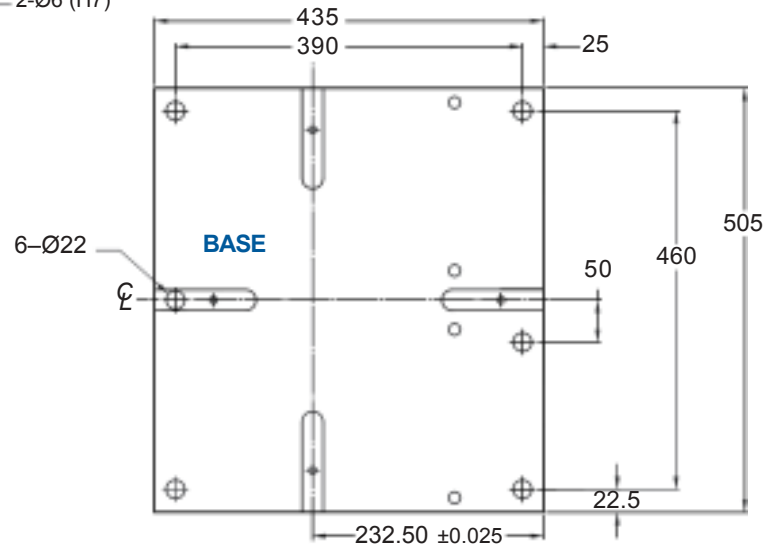
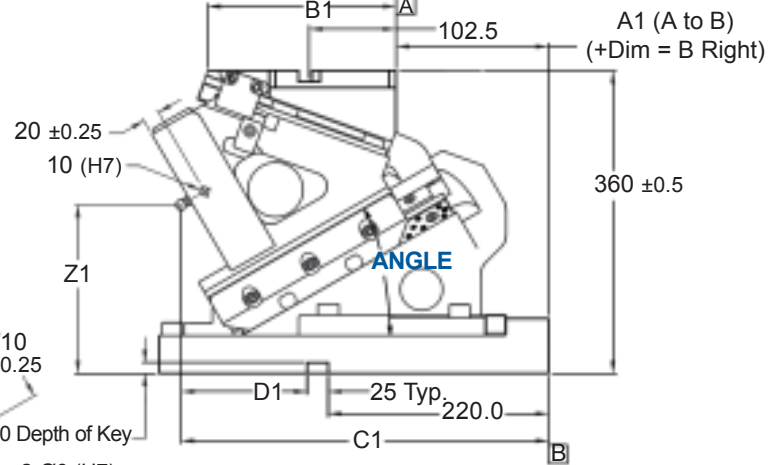
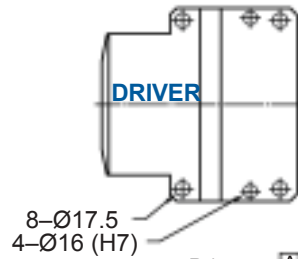
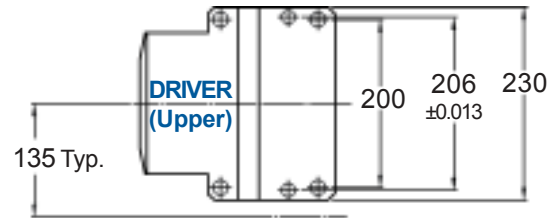
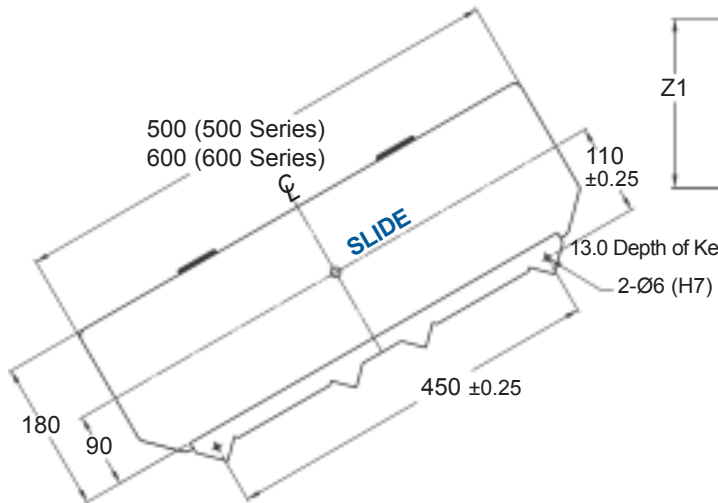
Optional Shock Absorber

500 – 600 Series DIEMOUNT MODULAR CAM



CAM DIAGRAM

ANGLE	PRESS STROKE	WORK STROKE
0	71.5	60
5	65.0	60
10	60.0	60
15	56.1	60
20	53.1	60
25	50.7	60
30	48.9	60



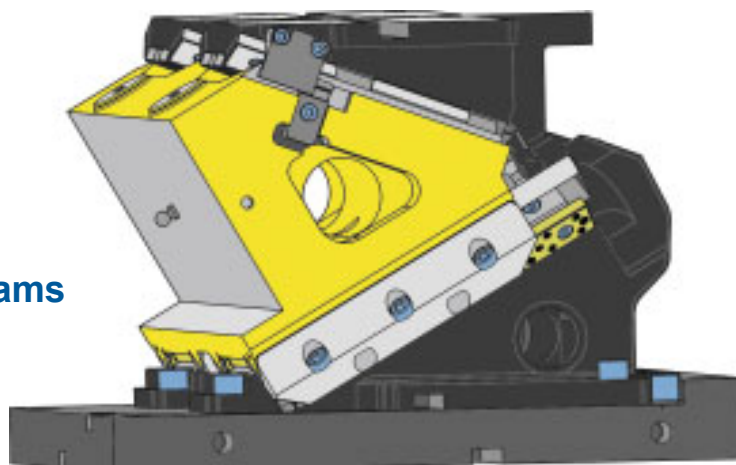
DIEMOUNT MODULAR CAM PART NUMBERS & WEIGHTS										
500 SERIES					A N G L E	600 SERIES				
PART NUMBER			WEIGHT			PART NUMBER			WEIGHT	
With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs
MCD050004M	MCD050004K	MCD050004D	296	652	0	MCD060004M	MCD060004K	MCD060004D	304	670
MCD050504M	MCD050504K	MCD050504D	288	634	5	MCD060504M	MCD060504K	MCD060504D	296	652
MCD051004M	MCD051004K	MCD051004D	290	640	10	MCD061004M	MCD061004K	MCD061004D	298	658
MCD051504M	MCD051504K	MCD051504D	286	630	15	MCD061504M	MCD061504K	MCD061504D	294	648
MCD052004M	MCD052004K	MCD052004D	288	635	20	MCD062004M	MCD062004K	MCD062004D	296	653
MCD052504M	MCD052504K	MCD052504D	279	614	25	MCD062504M	MCD062504K	MCD062504D	287	632
MCD053004M	MCD053004K	MCD053004D	286	631	30	MCD063004M	MCD063004K	MCD063004D	294	649
With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs
MCD050004MK	MCD050004MD	MCD050044	296	652	0	MCD060004MK	MCD060004MD	MCD060044	304	670
MCD050504MK	MCD050504MD	MCD050544	288	634	5	MCD060504MK	MCD060504MD	MCD060544	296	652
MCD051004MK	MCD051004MD	MCD051044	290	640	10	MCD061004MK	MCD061004MD	MCD061044	298	658
MCD051504MK	MCD051504MD	MCD051544	286	630	15	MCD061504MK	MCD061504MD	MCD061544	294	648
MCD052004MK	MCD052004MD	MCD052044	288	635	20	MCD062004MK	MCD062004MD	MCD062044	296	653
MCD052504MK	MCD052504MD	MCD052544	279	614	25	MCD062504MK	MCD062504MD	MCD062544	287	632
MCD053004MK	MCD053004MD	MCD053044	286	631	30	MCD063004MK	MCD063004MD	MCD063044	294	649

DIEMOUNT MODULAR CAM DIMENSIONS							
500-600 SERIES							
ANGLE	A1	B1	C1	D1	Z1	PRESS STROKE	WORK STROKE
0	67.6	223.4	412.0	167.0	257.0	71.5	60
5	83.6	228.0	423.0	178.0	247.3	65.0	60
10	115.0	222.5	436.9	191.9	234.4	60.0	60
15	128.9	228.9	439.5	194.5	224.5	56.1	60
20	136.4	253.5	454.1	209.1	215.6	53.1	60
25	141.4	226.3	418.8	173.8	208.4	50.7	60
30	180.0	222.1	433.6	188.6	200.5	48.9	60

Lamina produces a variety of robust LamCams™.

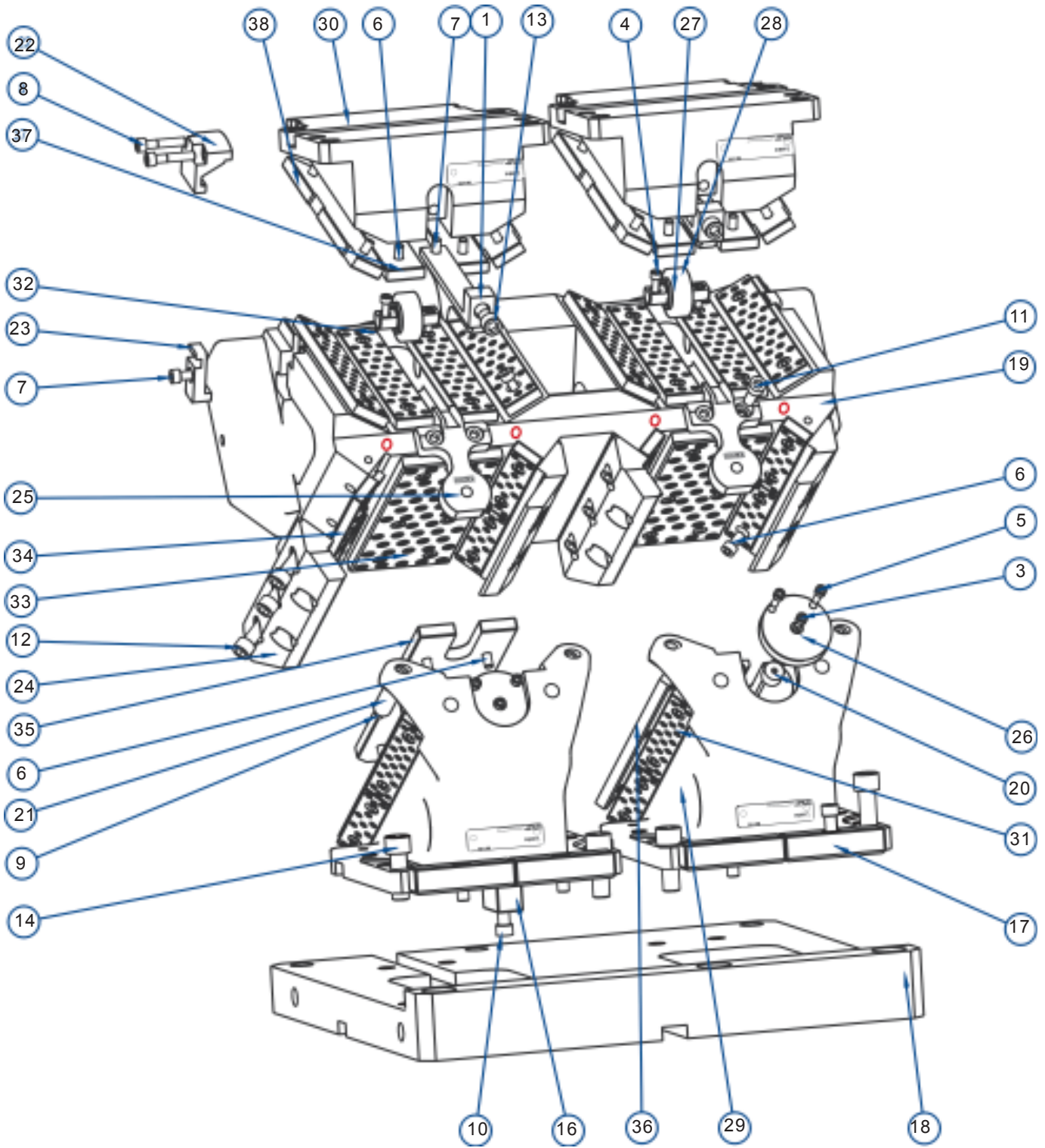
Ask about the following offering:

- Aerial and Diemount Cams
- Aerial and Diemount Modular Cams
- SlimCams™
- Bump Cams
- Roller Cams



This apparatus is covered by U.S. Patent No. 5,885,521, European Patent No. 1097010 in Austria, Belgium, Germany, Spain, France, United Kingdom, Ireland and Italy; other patents pending.

Component Parts for 500 – 600 Series Modular Diemount Cams



SHOCK ABSORBERS – OPTIONAL		
Qty	PART NUMBER	DESCRIPTION
4	MSC100028	Shock Absorber Assemblies
Shock absorbers noted in red on drawing		

Refer to 500 – 600 Series Specification Table for Return Spring Options.

COMPONENT PARTS FOR 500 – 600 SERIES DIEMOUNT MODULAR CAMS							
ITEM NO	QTY	Description	PART NUMBER	ITEM NO	QTY	Description	PART NUMBER
			MCDXXX04				MCDXXX44*
1	2	Accelerator Block (See Note 1)	14A1720@@R	22	2	Positive Return Bracket	NCM150008
3	2	Soc. Hd. Cap Screw M6x1.0x12	F010608	23	2	Positive Return Guideway	NCM150009
4	4	Soc. Hd. Cap Screw M6x1.0x16	F010609	24	4	Keeper Plate	NCM150010
5	4	Soc. Hd. Cap Screw M6x1.0x20	F010610	25	2	Spring Return Bracket	NCM150001
6	100	Soc. Hd. Cap Screw M8x1.25x16	F010809	26	2	Disk Plate	NCM200008
7	4	Soc. Hd. Cap Screw M8x1.25x20	F010810	27	2	Roller Shaft	NCM300011
8	4	Soc. Hd. Cap Screw M8x1.25x40	F010814	28	2	Roller/Liner Assembly	NCM300014
9	2	Soc. Hd. Cap Screw M8x1.25x90	F010823	29	2	Base (See Note 1)	NMA17@@13A
10	6	Soc. Hd. Cap Screw M10x1.5x25	F011011	30	2	Driver (See Note 1)	NMA17@@24
11	4	Soc. Hd. Cap Screw M12x1.50x30	F011012	31	4	Bronze S/L Wearplate 12x30x160mm	WCC120006
12	12	Soc. Hd. Cap Screw M12x1.75x35	F011213	31	2	Steel S/L Wearplate 12x30x160mm	WCT120006
13	2	Soc. Hd. Cap Screw M12x1.75x45	F011215	32	8	Bronze S/L Wearplate 12x38x200mm	WCC120007
14	8	Soc. Hd. Cap Screw M16x2.0x45	F011615	32	8	Steel S/L Wearplate 12x38x200mm	WCT120007
15	8	Drive Screw #4x3/16SS	F1TS187	33	2	Bronze S/L Wearplate 12x100x240mm	WCC120008
16	2	NAAMS Key 25x25x50mm	M082505	33	2	Steel S/L Wearplate 12x100x240mm	WCT120008
17	4	NAAMS Key 25x25x100mm	M082510	34	12	Bronze S/L Wearplate 12x30x125mm	WCC120009
18	1	Machined Plate	MMA060001	34	12	Steel S/L Wearplate 12x30x125mm	WCT120009
19	1	Slide (0°–30°)	MMD063034	35	2	Steel Wearplate 12x100x290mm	WCS120006
20	2	Rubber Bumpers	MSC100003	36	4	Steel Wearplate 12x30x285mm	WCS120008
21	2	Lockout Spacer	NCM070008	37	4	Hard Steel Wearplate 12x38x225mm	WCS120009
				38	4	Steel Wearplate Mod. 12x38x225mm	WCS120014

Note 1: For @@ in part numbers insert: (50 for 0°); (45 for 5°); (40 for 10°); (35 for 15°); (30 for 20°); (25 for 25°) and (20 for 30°).

500-600 Series Specifications				RETURN SPRING KIT OPTIONS	
Spring Kit Option	Spring Kit Part # (2 Required)	Pre-Load kg (lbs.) -f	Final Load kg (lbs.) -f	Recognizing that different cam applications have different requirements, Lamina offers three Return Spring Kit Options:	
Mechanical	SKC170001	64 (141)	278 (613)	1	Mechanical - Employs conventional ISO Die Springs - used in cam applications where additional stripping force is not required.
Combination - Mech./Nitrogen (Kaller)	SKC170002	51.3 (113)	458 (1010)		
Combination - Mech./Nitrogen (Dadco)	SKC170012	51.3 (113)	458 (1010)	2	Combination Mechanical/Nitrogen - This unique Lamina design employs an ISO Die Spring in series combination with a Nitrogen Spring. This return system utilizes the mechanical spring for pre-load, keeping the forces low, while providing high final loads from the nitrogen spring for stripping.
Nitrogen (Kaller)	SKC170003	276 (609) (a)	373 (822)		
Nitrogen (Dadco)	SKC170013	276 (609) (a)	348 (767)		
Tooling Allowance	Protrusion - mm	175 Maximum		3	Nitrogen - This return system provides high return spring forces for stripping. By nature of the nitrogen spring, it also has higher initial contact force than other return spring options. This higher initial contact load may result in greater wear on the cam and its accelerator system (where applicable.)
	Weight - kg (lbs)	64 (140) Maximum			
Rated Capacity (b)	435 kN : 44.3 M-Tons : 48.8 US Tons				

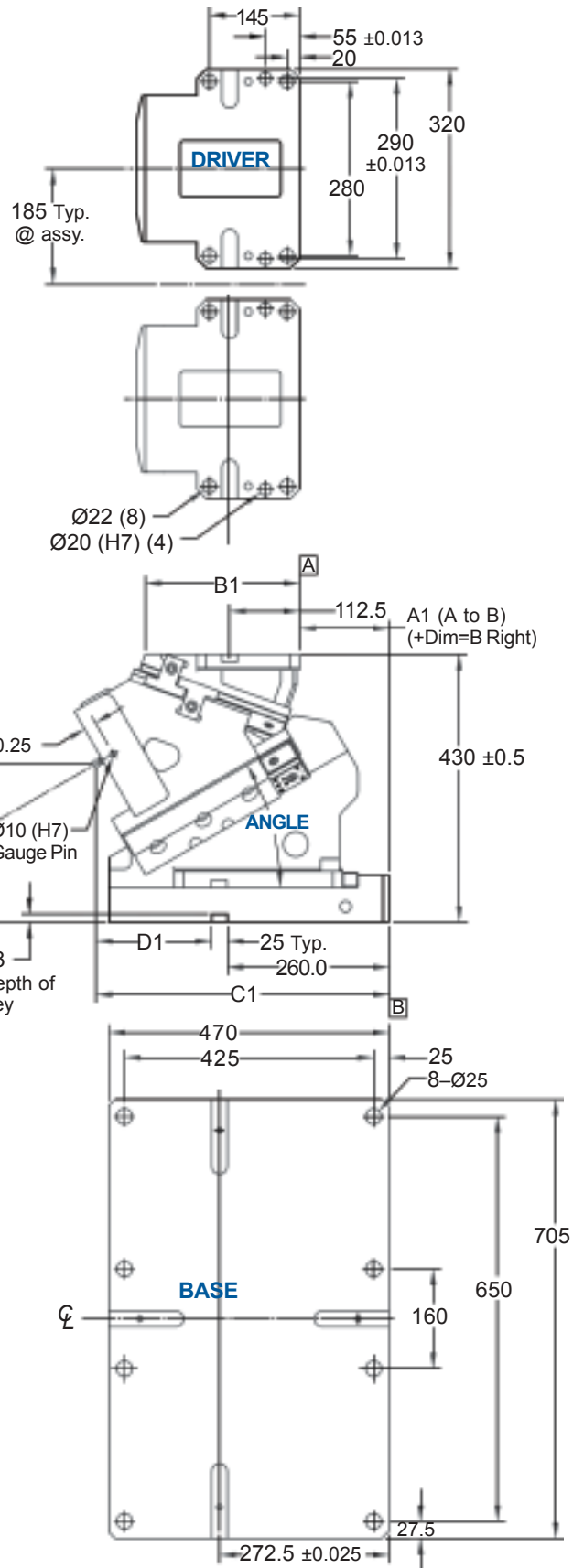
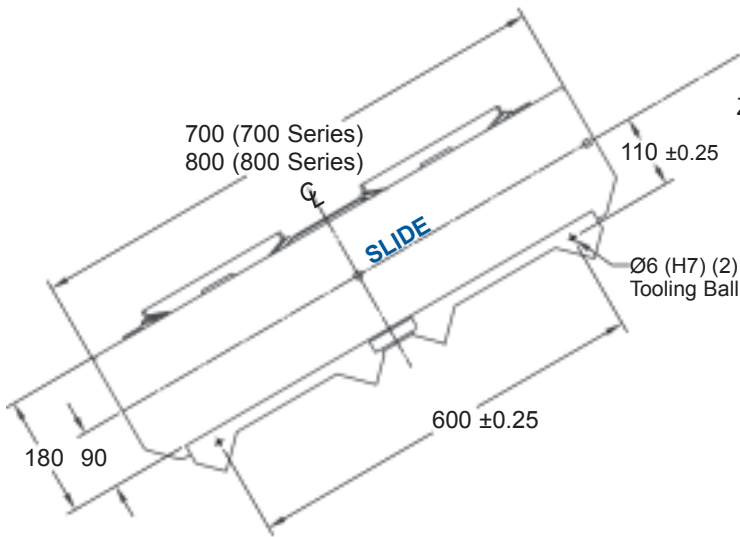
(a) Actual "preload" = 0, this force is at initial contact with nitrogen spring.

(b) @1.6 million cycles & 0.04mm wear

700 – 800 Series DIEMOUNT MODULAR CAM



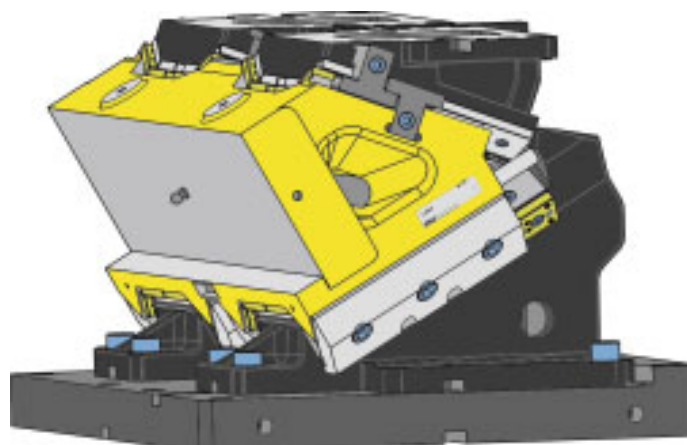
ANGLE	PRESS STROKE	WORK STROKE
0	71.5	60
5	65.0	60
10	60.0	60
15	56.1	60
20	53.1	60
25	50.7	60
30	48.9	60



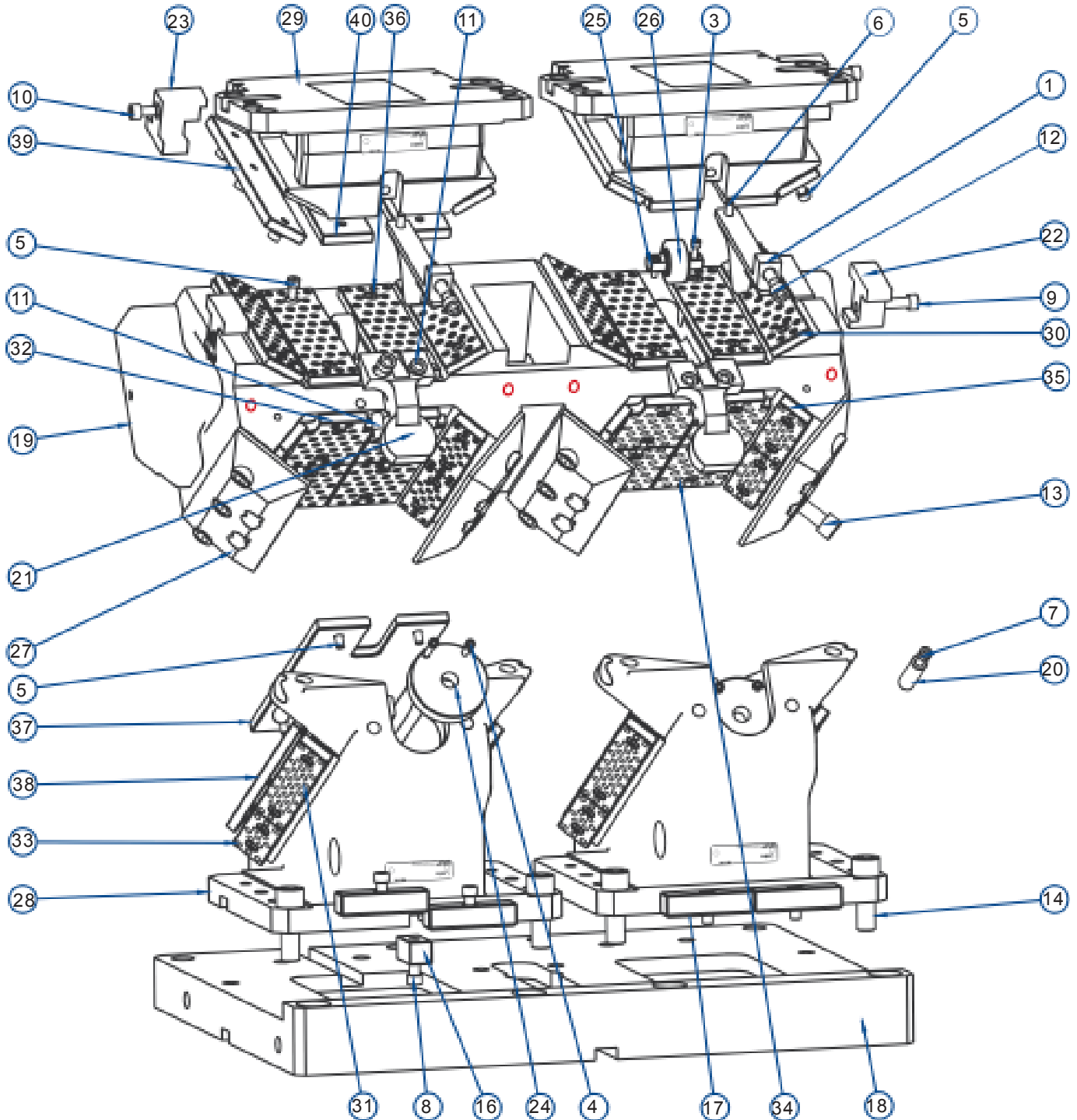
DIEMOUNT MODULAR CAM PART NUMBERS & WEIGHTS										
700 SERIES					A N G L E	800 SERIES				
PART NUMBER			WEIGHT			PART NUMBER			WEIGHT	
With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs
MCD070004M	MCD070004K	MCD070004D	525	1157	0	MCD080004M	MCD080004K	MCD080004D	533	1157
MCD070504M	MCD070504K	MCD070504D	522	1151	5	MCD080504M	MCD080504K	MCD080504D	530	1169
MCD071004M	MCD071004K	MCD071004D	519	1145	10	MCD081004M	MCD081004K	MCD081004D	528	1163
MCD071504M	MCD071504K	MCD071504D	520	1146	15	MCD081504M	MCD081504K	MCD081504D	528	1164
MCD072004M	MCD072004K	MCD072004D	521	1149	20	MCD082004M	MCD082004K	MCD082004D	529	1167
MCD072504M	MCD072504K	MCD072504D	527	1162	25	MCD082504M	MCD082504K	MCD082504D	535	1180
MCD073004M	MCD073004K	MCD073004D	513	1131	30	MCD083004M	MCD083004K	MCD083004D	521	1149
With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs
MCD070004MK	MCD070004MD	MCD070044	525	1157	0	MCD080004MK	MCD080004MD	MCD080044	533	1157
MCD070504MK	MCD070504MD	MCD070544	522	1151	5	MCD080504MK	MCD080504MD	MCD080544	530	1169
MCD071004MK	MCD071004MD	MCD071044	519	1145	10	MCD081004MK	MCD081004MD	MCD081044	528	1163
MCD071504MK	MCD071504MD	MCD071544	520	1146	15	MCD081504MK	MCD081504MD	MCD081544	528	1164
MCD072004MK	MCD072004MD	MCD072044	521	1149	20	MCD082004MK	MCD082004MD	MCD082044	529	1167
MCD072504MK	MCD072504MD	MCD072544	527	1162	25	MCD082504MK	MCD082504MD	MCD082544	535	1180
MCD073004MK	MCD073004MD	MCD073044	513	1131	30	MCD083004MK	MCD083004MD	MCD083044	521	1149

DIEMOUNT MODULAR CAM DIMENSIONS							
700-800 SERIES							
ANGLE	A1	B1	C1	D1	Z1	PRESS STROKE	WORK STROKE
0	71.3	220.0	439.0	154.0	324.0	71.5	60
5	78.9	225.0	451.9	166.9	294.9	65.0	60
10	113.7	225.0	465.6	180.6	298.1	60.0	60
15	136.9	225.0	481.5	196.5	275.5	56.1	60
20	148.2	242.5	495.6	210.6	271.0	53.1	60
25	172.4	250.0	513.1	228.1	262.5	50.7	60
30	143.7	248.0	470.6	185.6	254.4	48.9	60

**Cams may be customized to your specifications.
Contact Lamina for more information.**



Component Parts for 700 – 800 Series Modular Diemount Cams



SHOCK ABSORBERS – OPTIONAL		
Qty	PART NUMBER	DESCRIPTION
4	MSC100029	Shock Absorber Assemblies
Shock absorber installation noted in red on drawing		

Refer to 700 – 800 Series Specifications for Return Spring Options.

COMPONENT PARTS FOR 700– 800 SERIES DIEMOUNT MODULAR CAMS

ITEM NO	QTY	Description	PART NUMBER	ITEM NO	QTY	Description	PART NUMBER	
			MCDXXX04				MCDXXX04	MCDXXX44*
1	2	Accelerator Block (See Note 1)	14A1230@@R	25	2	Roller Shaft	NCM300011	
3	4	Soc. Hd. Cap Screw M6x1.0x16	F010609	26	2	Roller/Liner Assembly	NCM300014	
4	4	Soc. Hd. Cap Screw M6x1.0x30	F010612	27	4	Keeper Plate	NCM303004	
5	108	Soc. Hd. Cap Screw M8x1.25x16	F010809	28	2	Base (See Note 1)	NMA25@@13S	
6	2	Soc. Hd. Cap Screw M8x1.25x20	F010810	29	2	Driver (See Note 1)	NMA25@@24	
7	2	Soc. Hd. Cap Screw M8x1.25x90	F010823	30	4	Bronze S/L Wearplate 12x50x200mm	WCC120002	
8	6	Soc. Hd. Cap Screw M10x1.5x25	F011011	30	1	Steel S/L Wearplate 12x50x200mm		WCT120002
9	2	Soc. Hd. Cap Screw M10x1.5x35	F011013	31	1	Bronze S/L Wearplate 12x40x200mm	WCC120005	
10	2	Soc. Hd. Cap Screw M10x1.5x50	F011016	31	1	Steel S/L Wearplate 12x40x200mm		WCT120005
11	6	Soc. Hd. Cap Screw M12x1.75x35	F011213	32	2	Bronze S/L Wearplate 12x80x125mm N	WCC120015	
12	4	Soc. Hd. Cap Screw M12x1.75x45	F011215	32	2	Steel S/L Wearplate 12x80x125mm N		WCT120015
13	12	Soc. Hd. Cap Screw M16x2.0x50	F011616	33	4	Bronze S/L Wearplate 12x40x100mm	WCC120019	
14	8	Soc. Hd. Cap Screw M20x2.5x60	F012018	33	4	Steel S/L Wearplate 12x40x100mm		WCT120019
15	8	Drive Screw #4x3/16SS	F1TS187	34	4	Bronze S/L Wearplate 12x80x125mm	WCC120020	
16	2	NAAMS Key 25x25x50mm	M082505	34	4	Steel S/L Wearplate 12x80x125mm		WCT120020
17	4	NAAMS Key 25x25x100mm	M082510	35	8	Bronze S/L Wearplate 12x40x125mm	WCC120021	
18	1	Base Plate	MMA080001	35	8	Steel S/L Wearplate 12x40x125mm		WCT120021
19	1	Slide (0° – 30°)	MMD085034	36	4	Bronze S/L Wearplate 12x60x200mm	WCC120022	
20	2	Lockout Spacer	NCM070008	36	4	Steel S/L Wearplate 12x60x200mm		WCT120022
21	2	Spring Return Bracket	NCM200001	37	2	Hard Steel Wearplate 12x150x300mm	WCS120001	
22	2	Positive Return Key	NCM300006	38	4	Hard Steel Wearplate 12x38x300mm	WCS120002	
23	2	Driver Return Bracket	NCM300008	39	4	Hard Steel Wearplate 12x50x250mm	WCS120003	
24	2	Disk Plate	NCM300010	40	4	Hard Steel Wearplate 12x58x250mm	WCS120004	

Note 1: For @@ in part numbers insert: (50 for 0°); (45 for 5°); (40 for 10°); (35 for 15°); (30 for 20°); (25 for 25°) and (20 for 30°).

700-800 Series Specifications				RETURN SPRING KIT OPTIONS	
Spring Kit Option	Spring Kit Part # (2 Required)	Pre-Load kg (lbs.) -f	Final Load kg (lbs.) -f	Recognizing that different cam applications have different requirements, Lamina offers three Return Spring Kit Options:	
Mechanical	IMD063305	132 (290)	528 (1162)		
Combination - Mech./Nitrogen (Kaller)	SKC250002	113 (249)	703 (1550)	1	Mechanical - Employs conventional ISO Die Springs - used in cam applications where additional stripping force is not required.
Combination - Mech./Nitrogen (Dadco)	SKC250012	113 (249)	703 (1550)		
Nitrogen (Kaller)	SKC250003	345 (760) (a)	483 (1064)	2	Combination Mechanical/Nitrogen - This unique Lamina design employs an ISO Die Spring in series combination with a Nitrogen Spring. This return system utilizes the mechanical spring for pre-load, keeping the forces low, while providing high final loads from the nitrogen spring for stripping.
Nitrogen (Dadco)	SKC250013	345 (760) (a)	483 (1064)		
Tooling Allowance	Protrusion - mm	200 Maximum		3	Nitrogen - This return system provides high return spring forces for stripping. By nature of the nitrogen spring, it also has higher initial contact force than other return spring options. This higher initial contact load may result in greater wear on the cam and its accelerator system (where applicable.)
	Weight - kg (lbs)	130 (286) Maximum			
Rated Capacity (b)	670 kN : 68.3 M-Tons :75 US Tons				

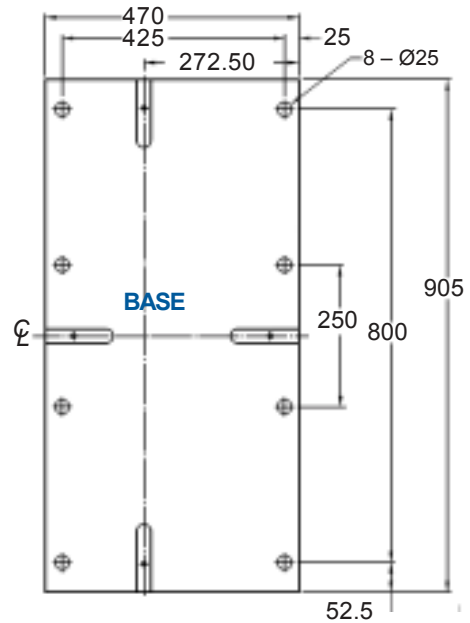
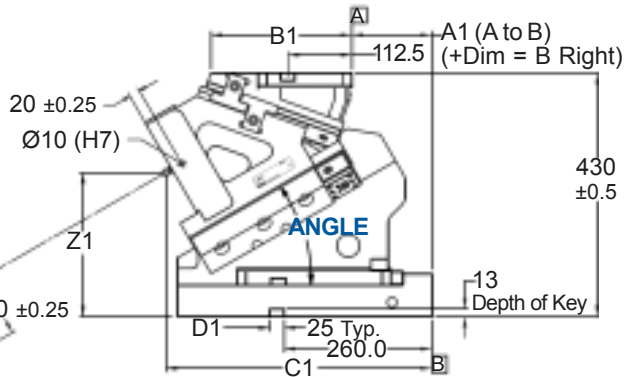
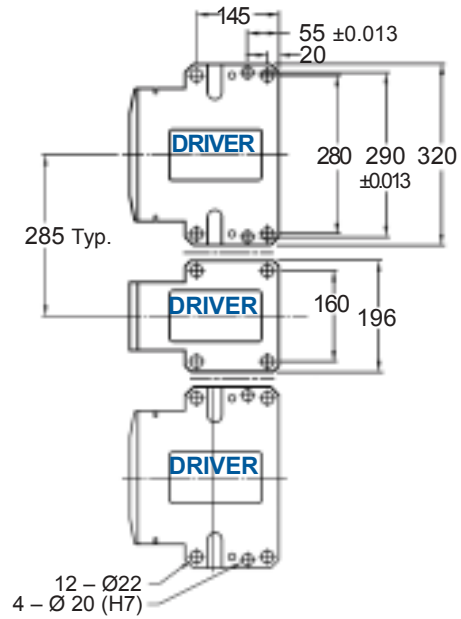
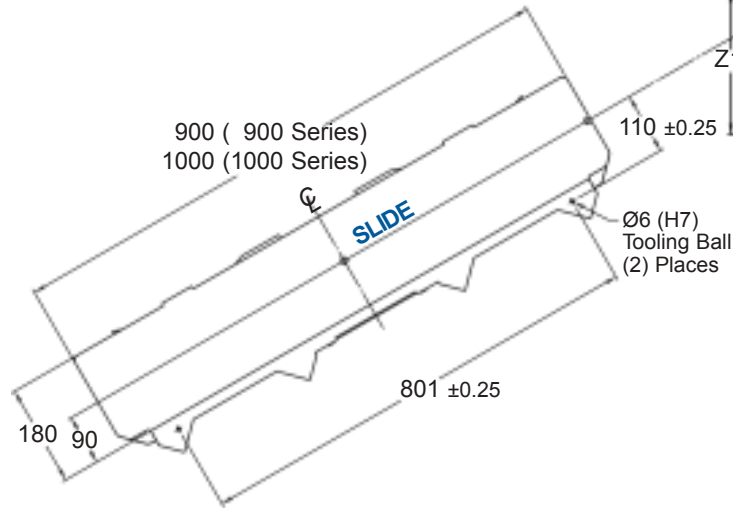
(a) Actual "preload" = 0, this force is at initial contact with nitrogen spring.

(b) @1.6 million cycles & 0.04mm wear

900 – 1000 Series DIEMOUNT MODULAR CAM



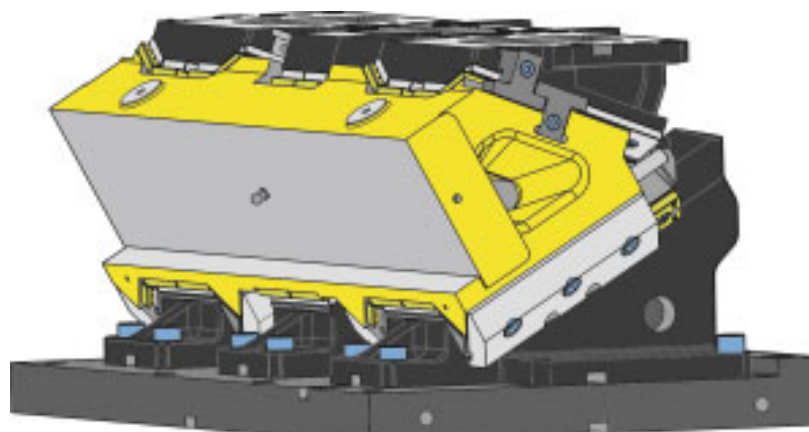
ANGLE	PRESS STROKE	WORK STROKE
0	71.5	60
5	65.0	60
10	60.0	60
15	56.1	60
20	53.1	60
25	50.7	60
30	48.9	60



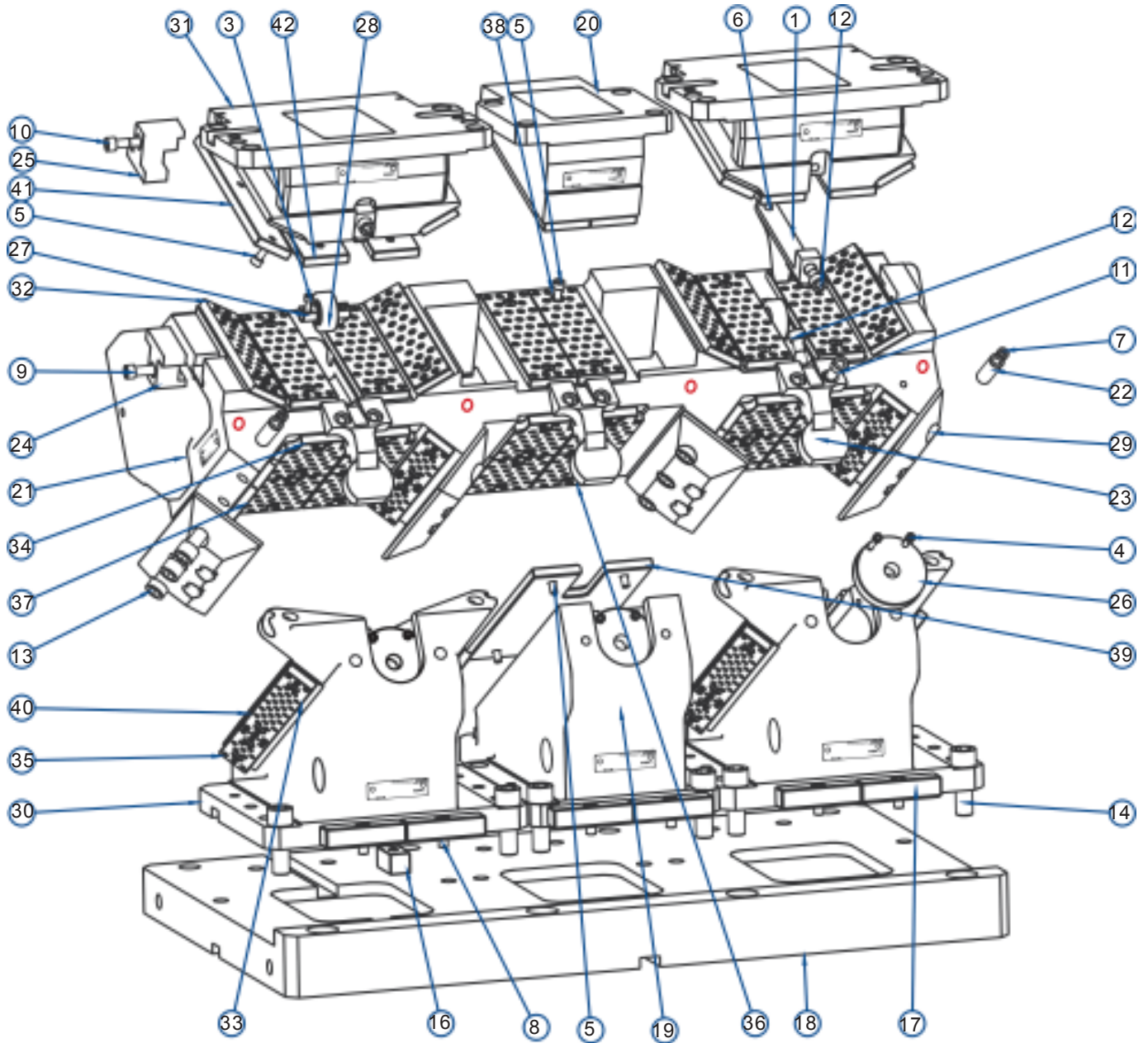
DIEMOUNT MODULAR CAM PART NUMBERS & WEIGHTS										
900 SERIES					A N G L E	1000 SERIES				
PART NUMBER			WEIGHT			PART NUMBER			WEIGHT	
With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs
MCD090004M	MCD090004K	MCD090004D	701	1546	0	MCD100004M	MCD100004K	MCD100004D	709	1564
MCD090504M	MCD090504K	MCD090504D	695	1533	5	MCD100504M	MCD100504K	MCD100504D	704	1551
MCD091004M	MCD091004K	MCD091004D	695	1533	10	MCD101004M	MCD101004K	MCD101004D	704	1551
MCD091504M	MCD091504K	MCD091504D	696	1534	15	MCD101504M	MCD101504K	MCD101504D	704	1552
MCD092004M	MCD092004K	MCD092004D	699	1541	20	MCD102004M	MCD102004K	MCD102004D	707	1559
MCD092504M	MCD092504K	MCD092504D	712	1569	25	MCD102504M	MCD102504K	MCD102504D	720	1587
MCD093004M	MCD093004K	MCD093004D	689	1519	30	MCD103004M	MCD103004K	MCD103004D	697	1537
With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs
MCD090004MK	MCD090004MD	MCD090044	701	1546	0	MCD100004MK	MCD100004MD	MCD100044	709	1564
MCD090504MK	MCD090504MD	MCD090544	695	1533	5	MCD100504MK	MCD100504MD	MCD100544	704	1551
MCD091004MK	MCD091004MD	MCD091044	695	1533	10	MCD101004MK	MCD101004MD	MCD101044	704	1551
MCD091504MK	MCD091504MD	MCD091544	696	1534	15	MCD101504MK	MCD101504MD	MCD101544	704	1552
MCD092004MK	MCD092004MD	MCD092044	699	1541	20	MCD102004MK	MCD102004MD	MCD102044	707	1559
MCD092504MK	MCD092504MD	MCD092544	712	1569	25	MCD102504MK	MCD102504MD	MCD102544	720	1587
MCD093004MK	MCD093004MD	MCD093044	689	1519	30	MCD103004MK	MCD103004MD	MCD103044	697	1537

DIEMOUNT MODULAR CAM DIMENSIONS							
900-1000 SERIES							
ANGLE	A1	B1	C1	D1	Z1	PRESS STROKE	WORK STROKE
0	71.3	220.0	439.0	154.0	324.0	71.5	60
5	78.9	225.0	451.9	166.9	294.9	65.0	60
10	113.7	225.0	465.6	180.6	298.1	60.0	60
15	136.9	225.0	481.5	196.5	275.5	56.1	60
20	148.2	242.5	495.6	210.6	271.0	53.1	60
25	172.4	250.0	513.1	228.1	262.5	50.7	60
30	143.7	248.0	470.6	185.6	254.4	48.9	60

Lamina offers value-added machining to cam faces.



Component Parts for 900 – 1000 Series Modular Diemount Cams



SHOCK ABSORBERS – OPTIONAL		
Qty	PART NUMBER	DESCRIPTION
4	MSC100029	Shock Absorber Assemblies
Shock absorber installation noted in red on drawing		

Refer to 900 – 1000 Series Specification Table for Return Spring Options.

COMPONENT PARTS FOR 900 – 1000 SERIES DIEMOUNT MODULAR CAMS							
ITEM NO	QTY	Description	PART NUMBER	ITEM NO	QTY	Description	PART NUMBER
			MCDXXX04				MCDXXX04
1	2	Accelerator Block (See Note 1)	14A1230@@R	26	3	Disk Plate	NCM1300010
3	4	Soc. Hd. Cap Screw M6x1.0x16	F010609	27	2	Roller Shaft	NCM300011
4	6	Soc. Hd. Cap Screw M6x1.0x30	F010612	28	1	Roller/Liner Assembly	NCM300014
5	130	Soc. Hd. Cap Screw M8x1.25x16	F010809	29	4	Keeper Plate	NCM303004
6	2	Soc. Hd. Cap Screw M8x1.25x20	F010810	30	2	Base (See Note 1)	NMA25@@13S
7	2	Soc. Hd. Cap Screw M8x1.25x90	F010823	31	3	Driver (See Note 1)	NMA25@@24
8	8	Soc. Hd. Cap Screw M10x1.5x25	F011011	32	4	Bronze S/L Wearplate 12x50x200mm	WCC120002
9	2	Soc. Hd. Cap Screw M10x1.5x35	F011013	32	4	Steel S/L Wearplate 12x50x200mm	WCT120002
10	2	Soc. Hd. Cap Screw M10x1.5x50	F011016	33	4	Bronze S/L Wearplate 12x40x200mm	WCC120005
11	6	Soc. Hd. Cap Screw M12x1.75x35	F011213	33	4	Steel S/L Wearplate 12x40x200mm	WCT120005
12	5	Soc. Hd. Cap Screw M12x1.75x45	F011215	34	6	Bronze S/L Wearplate 12x80x125mm N	WCC120015
13	12	Soc. Hd. Cap Screw M16x2.0x50	F011616	34	6	Steel S/L Wearplate 12x80x125mm N	WCT120015
14	12	Soc. Hd. Cap Screw M20x2.5x60	F012018	35	4	Bronze S/L Wearplate 12x40x100mm	WCC120019
15	14	Drive Screw #4x3/16SS	F1TS187	35	4	Steel S/L Wearplate 12x40x100mm	WCT120019
16	2	NAAMS Key 25x25x50mm	M082505	36	6	Bronze S/L Wearplate 12x80x125mm	WCC120020
17	6	NAAMS Key 25x25x100mm	M082510	36	6	Steel S/L Wearplate 12x80x125mm	WCT120020
18	1	Base Plate	MMA101501	37	8	Bronze S/L Wearplate 12x40x125mm	WCC120021
19	1	Base (See Note 1)	MMA10@@12S	37	8	Steel S/L Wearplate 12x40x125mm	WCT120021
20	1	Driver (See Note 1)	MMA10@@24	38	6	Bronze S/L Wearplate 12x60x200mm	WCC120022
21	1	Slide (0° – 30°)	MMD105034	38	6	Steel S/L Wearplate 12x60x200mm	WCT120022
22	2	Lockout Spacer	NCM070008	39	3	Hard Steel Wearplate 12x150x300mm	WCS120001
23	3	Spring Return Bracket	NCM300001	40	4	Hard Steel Wearplate 12x38x300mm	WCS120006
24	2	Positive Return Key –Slide	NCM300006	41	4	Hard Steel Wearplate 12x50x250mm	WCS120003
25	2	Driver Return Bracket	NCM300008	42	6	Hard Steel Wearplate 12x58x250mm	WCS120004

Note 1: For @@ in part numbers insert: (50 for 0°); (45 for 5°); (40 for 10°); (35 for 15°); (30 for 20°); (25 for 25°) and (20 for 30°).

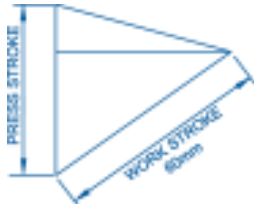
900-1000 Series Specifications				RETURN SPRING KIT OPTIONS	
Spring Kit Option	Spring Kit Part # (3 Required)	Pre-Load kg (lbs.) -f	Final Load kg (lbs.) -f	Recognizing that different cam applications have different requirements, Lamina offers three Return Spring Kit Options:	
Mechanical	IMD063305	132 (290)	528 (1162)	1	Mechanical - Employs conventional ISO Die Springs - used in cam applications where additional stripping force is not required.
Combination - Mech./Nitrogen (Kaller)	SKC250002	113 (249)	703 (1550)		
Combination - Mech./Nitrogen (Dadco)	SKC250012	113 (249)	703 (1550)	2	Combination Mechanical/Nitrogen - This unique Lamina design employs an ISO Die Spring in series combination with a Nitrogen Spring. This return system utilizes the mechanical spring for pre-load, keeping the forces low, while providing high final loads from the nitrogen spring for stripping.
Nitrogen (Kaller)	SKC250003	345 (760) (a)	507 (1117)		
Nitrogen (Dadco)	SKC250013	345 (760) (a)	483 (1064)		
Tooling Allowance	Protrusion - mm	200 Maximum		3	Nitrogen - This return system provides high return spring forces for stripping. By nature of the nitrogen spring, it also has higher initial contact force than other return spring options. This higher initial contact load may result in greater wear on the cam and its accelerator system (where applicable.)
	Weight - kg (lbs)	175 (386) Maximum			
Rated Capacity (b)	1000 kN : 102 M-Tons 112 US Tons				

(a) Actual "preload" = 0, this force is at initial contact with nitrogen spring.

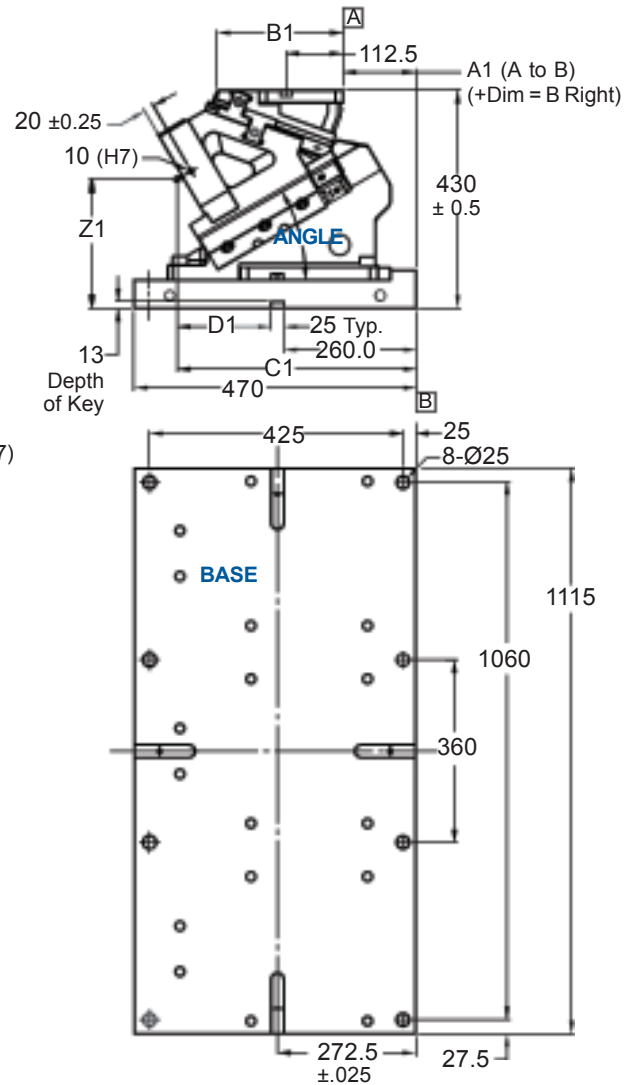
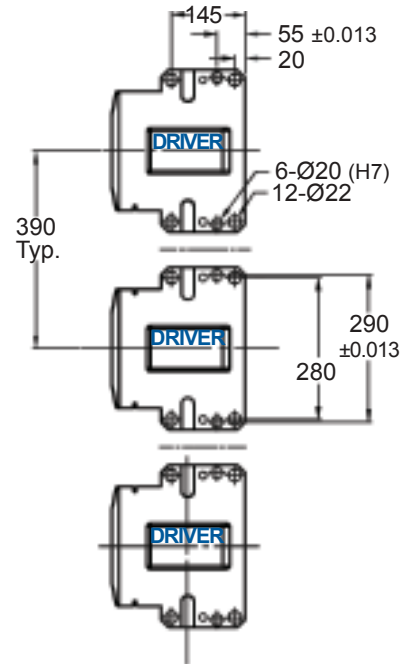
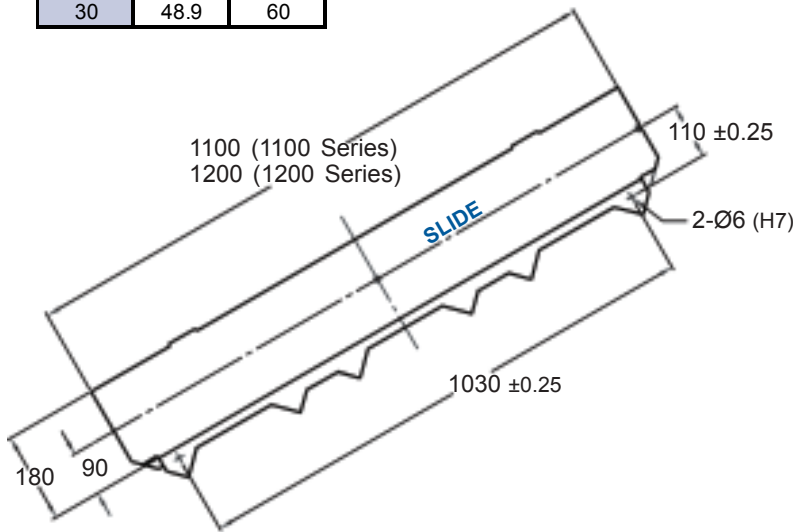
(b) @1.6 million cycles & 0.04mm wear

1100 – 1200 Series DIEMOUNT MODULAR CAM

AUTOMOTIVE METRIC
NAAMS STANDARD



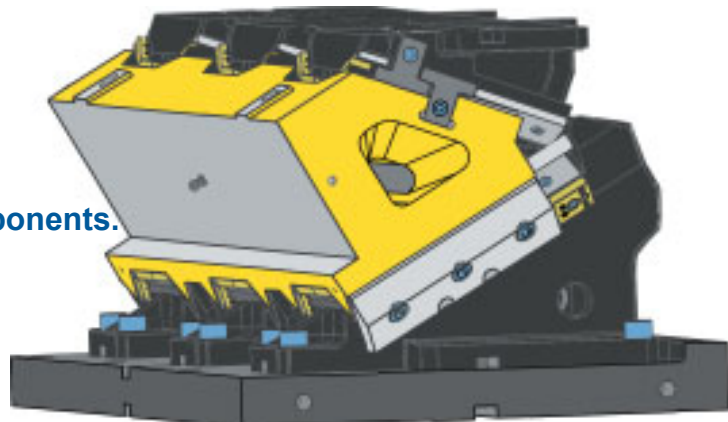
ANGLE	PRESS STROKE	WORK STROKE
0	71.5	60
5	65.0	60
10	60.0	60
15	56.1	60
20	53.1	60
25	50.7	60
30	48.9	60



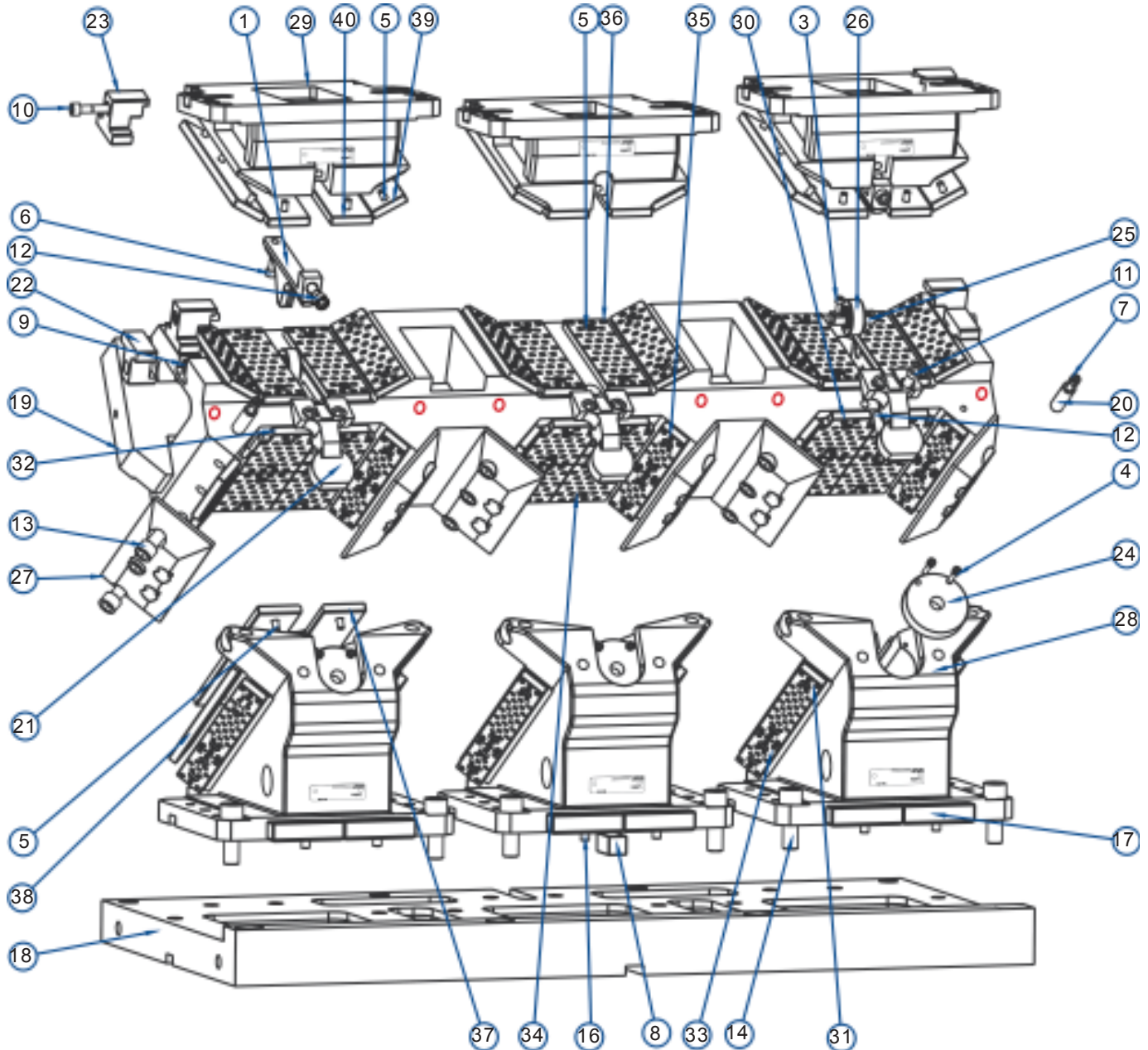
DIEMOUNT MODULAR CAM PART NUMBERS & WEIGHTS										
1100 SERIES					A N G L E	1200 SERIES				
PART NUMBER			WEIGHT			PART NUMBER			WEIGHT	
With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring Kit	With Kaller Gas Spring Kit	With Dadco Gas Spring Kit	kg	lbs
MCD110004M	MCD110004K	MCD110004D	833	1837	0	MCD120004M	MCD120004K	MCD120004D	841	1855
MCD110504M	MCD110504K	MCD110504D	824	1816	5	MCD120504M	MCD120504K	MCD120504D	832	1834
MCD111004M	MCD111004K	MCD111004D	800	1763	10	MCD121004M	MCD121004K	MCD121004D	808	1781
MCD111504M	MCD111504K	MCD111504D	796	1754	15	MCD121504M	MCD121504K	MCD121504D	804	1772
MCD112004M	MCD112004K	MCD112004D	800	1764	20	MCD122004M	MCD122004K	MCD122004D	808	1782
MCD112504M	MCD112504K	MCD112504D	821	1810	25	MCD122504M	MCD122504K	MCD122504D	829	1828
MCD113004M	MCD113004K	MCD113004D	812	1790	30	MCD123004M	MCD123004K	MCD123004D	820	1808
With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs		With Mechanical Spring & Kaller Gas Spring Kit	With Mechanical Spring & Dadco Gas Spring Kit	With double steel wearplates & Dadco Gas Spring Kit	kg	lbs
MCD110004MK	MCD110004MD	MCD110044	833	1837	0	MCD120004MK	MCD120004MD	MCD120044	841	1855
MCD110504MK	MCD110504MD	MCD110544	824	1816	5	MCD120504MK	MCD120504MD	MCD120544	832	1834
MCD111004MK	MCD111004MD	MCD111044	800	1763	10	MCD121004MK	MCD121004MD	MCD121044	808	1781
MCD111504MK	MCD111504MD	MCD111544	796	1754	15	MCD121504MK	MCD121504MD	MCD121544	804	1772
MCD112004MK	MCD112004MD	MCD112044	800	1764	20	MCD122004MK	MCD122004MD	MCD122044	808	1782
MCD112504MK	MCD112504MD	MCD112544	821	1810	25	MCD122504MK	MCD122504MD	MCD122544	829	1828
MCD113004MK	MCD113004MD	MCD113044	812	1790	30	MCD123004MK	MCD123004MD	MCD123044	820	1808

DIEMOUNT MODULAR CAM DIMENSIONS							
1100-1200 SERIES							
ANGLE	A1	B1	C1	D1	Z1	PRESS STROKE	WORK STROKE
0	71.3	220.0	439.0	154.0	324.0	71.5	60
5	78.9	225.0	451.9	166.9	294.9	65.0	60
10	113.7	225.0	465.6	180.6	298.1	60.0	60
15	136.9	225.0	481.5	196.5	275.5	56.1	60
20	148.2	242.5	495.6	210.6	271.0	53.1	60
25	172.4	250.0	513.1	228.1	262.5	50.7	60
30	143.7	248.0	470.6	185.6	254.4	48.9	60

LamCams™ are made from standard components.
Replacement parts are readily available.



Component Parts for 1100 – 1200 Series Modular Diemount Cams



SHOCK ABSORBERS – OPTIONAL		
Qty	PART NUMBER	DESCRIPTION
6	MSC100029	Shock Absorber Assemblies
Shock absorber installation noted in red on drawing		

Refer to 1100 – 1200 Series Specifications Table for Return Spring Options.

COMPONENT PARTS FOR 1100 – 1200 SERIES DIEMOUNT MODULAR CAMS							
ITEM NO	QTY	Description	PART NUMBER	ITEM NO	QTY	Description	PART NUMBER
			MCDXXX04				MCDXXX04
1	2	Accelerator Block (See Note 1)	14A1230@@R	25	2	Roller Shaft	NCM300011
3	4	Soc. Hd. Cap Screw M6x1.0x16	F010609	26	2	Roller/Liner Assembly	NCM300014
4	6	Soc. Hd. Cap Screw M6x1.0x30	F010612	27	6	Keeper Plate	NCM303004
5	162	Soc. Hd. Cap Screw M8x1.25x16	F010809	28	3	Base (See Note 1)	NMA25@@13S
6	2	Soc. Hd. Cap Screw M8x1.25x20	F010810	29	3	Driver (See Note 1)	NMA25@@24
7	2	Soc. Hd. Cap Screw M8x1.25x90	F010823	30	6	Bronze S/L Wearplate 12x50x200mm	WCC120002
8	8	Soc. Hd. Cap Screw M10x1.5x25	F011011	30	6	Steel S/L Wearplate 12x50x200mm	WCT120002
9	2	Soc. Hd. Cap Screw M10x1.5x35	F011013	31	6	Bronze S/L Wearplate 12x40x200mm	WCC120005
10	4	Soc. Hd. Cap Screw M10x1.5x50	F011016	31	6	Steel S/L Wearplate 12x40x200mm	WCT120005
11	6	Soc. Hd. Cap Screw M12x1.75x35	F011213	32	6	Bronze S/L Wearplate 12x80x125mm N	WCC120015
12	8	Soc. Hd. Cap Screw M12x1.75x45	F011215	32	6	Steel S/L Wearplate 12x80x125mm N	WCT120015
13	18	Soc. Hd. Cap Screw M16x2.0x50	F011616	33	6	Bronze S/L Wearplate 12x40x100mm	WCC120019
14	12	Soc. Hd. Cap Screw M20x2.5x60	F012018	33	6	Steel S/L Wearplate 12x40x100mm	WCT120019
15	14	Drive Screw #4x3/16SS	F1TS187	34	6	Bronze S/L Wearplate 12x80x125mm	WCC120020
16	2	NAAMS Key 25x25x50mm	M082505	34	6	Steel S/L Wearplate 12x80x125mm	WCT120020
17	6	NAAMS Key 25x25x100mm	M082510	35	12	Bronze S/L Wearplate 12x40x125mm	WCC120021
18	1	Base Plate	MMA122001	35	12	Steel S/L Wearplate 12x40x125mm	WCT120021
19	1	Slide (0° – 30°)	MMD123034	36	6	Bronze S/L Wearplate 12x60x200mm	WCC120022
20	1	Lockout Spacer	NCM070008	36	6	Steel S/L Wearplate 12x60x200mm	WCT120022
21	3	Spring Return Bracket	NCM300001	37	3	Hard Steel Wearplate 12x150x300mm	WCS120001
22	2	Positive Return Key –Slide	NCM300006	38	6	Hard Steel Wearplate 12x38x300mm	WCS120002
23	2	Driver Return Bracket	NCM300008	39	6	Hard Steel Wearplate 12x50x250mm	WCS120003
24	3	Disk Plate	NCM1300010	40	6	Hard Steel Wearplate 12x58x250mm	WCS120004

Note 1: For @@ in part numbers insert: (50 for 0°); (45 for 5°); (40 for 10°); (35 for 15°); (30 for 20°); (25 for 25°) and (20 for 30°).

1100-1200 Series Specifications				RETURN SPRING KIT OPTIONS	
Spring Kit Option	Spring Kit Part # (3 Required)	Pre-Load* kg (lbs.) -f	Final Load* kg (lbs.) -f	Recognizing that different cam applications have different requirements, Lamina offers three Return Spring Kit Options:	
Mechanical	IMD063305	132 (290)	528 (1162)	1	Mechanical - Employs conventional ISO Die Springs - used in cam applications where additional stripping force is not required.
Combination - Mech./Nitrogen (Kaller)	SKC250002	113 (249)	703 (1550)		
Combination - Mech./Nitrogen (Dadco)	SKC250012	113 (249)	703 (1550)	2	Combination Mechanical/Nitrogen - This unique Lamina design employs an ISO Die Spring in series combination with a Nitrogen Spring. This return system utilizes the mechanical spring for pre-load, keeping the forces low, while providing high final loads from the nitrogen spring for stripping.
Nitrogen (Kaller)	SKC250003	345 (760) (a)	507 (1117)		
Nitrogen (Dadco)	SKC250013	345 (760) (a)	483 (1064)		
Tooling Allowance	Protrusion - mm	200 Maximum		3	Nitrogen - This return system provides high return spring forces for stripping. By nature of the nitrogen spring, it also has higher initial contact force than other return spring options. This higher initial contact load may result in greater wear on the cam and its accelerator system (where applicable.)
	Weight - kg (lbs)	195 (430) Maximum			
Rated Capacity (b)	1100 kN : 112 M-Tons 123 US Tons				

* Per unit

(a) Actual "preload" = 0, this force is at initial contact with nitrogen spring.

(b) @1.6 million cycles & 0.04mm wear

Thank you for considering a Lamina “Die Mount Modular” type cam unit. This unit was manufactured with great care and pride, as a simple solution to complex cam operations.

The following information will be helpful during installation and testing of the cam unit. Before installation, please read these instructions thoroughly and note all precautions presented. Keep these instructions with the cam unit until installation is complete and then file them for future reference.

INSTALLATION INSTRUCTIONS

Caution: When installing the cam unit while the die set is mounted in the press, ensure that safety blocks are in place.

1. Verify that the Return Spring Kit is not in the cam and that the Lockout kits are installed. If the Spring Kits are installed in the cam:
 - a. Remove the disk plates, spring return brackets (behind the disk plates) (caution; the spring return brackets have spring preload force pushing against it) and spring kits.
 - b. Install the lockout kits by placing the lockout spacer between the slide and the ears of the cam base; install the cap screws provided through the ears, lockout spacer and thread into back of slide. This lockout position of the slide relates to the specified shut height of the cam assembly.
 - c. Remove the positive return bracket from the slide and accelerator (where applicable) from the driver.
2. Secure the cam unit base/slide assembly onto lower die shoe using the print dimensions for locations (locate within the indicated tolerance $\pm 0.5\text{mm}$ left/right and back/front).
 - a. Assemble and match upper and lower die shoes to prescribed shut height.
 - b. Fit cam driver assemblies to cam slide by allowing it to nest laterally.
 - c. Do not tighten the driver mounting screws 100% at this point; tighten only after the drivers are seated properly with the slide cam assembly. After this, drill and ream for dowels.
3. Position the tooling components onto the slide face and transfer their mounting screw holes. Utilize established die steels or buttons to determine this location. Drill and tap the slide face for the tooling components. Removing the slide from the cam unit base assembly may allow easier machining. To remove the slide:
 - a. Remove lockout kit.
 - b. Carefully remove the keeper plates by removing 3 screws from each keeper plate. The slide may be removed from the cam base.
 - c. After machining for tooling components, assemble the slide back onto the cam base by reinstalling keeper plates (torque screws properly) and mount the tooling components to the slide face, fastening with mounting screws (do not fully tighten).
4. Position the tooling components into their final location by using the corresponding die steels/buttons and assuring for proper die clearances. When the location has been satisfied, tighten mounting screws to proper torque.
5. Drill and ream the slide face to dowel the tooling components to slide (refer to #4 above). Use of pull dowels is recommended to locate tooling components.
6. Reattach positive return bracket to slide and accelerator ramp to upper die shoe.
7. Thoroughly clean the cam unit; lubricate the wear plates with light to medium oil. Assemble the cam (if disassembled) and install in die set. This initial lubrication is very important to allow for proper break-in of the cam unit assembly.
8. Verify the free movement of all sliding components. When satisfied as to its function, install the return springs into the cam.
9. Make sure accelerator ramp is positioned so as to allow for smooth engagement of roller with accelerator (where applicable).

SEATING TORQUE TABLE					
Soc. Hd. Cap Screw Size	TORQUE N.m/In-Lbs	Soc. Hd. Cap Screw Size	TORQUE N.m/In-Lbs	Low Soc. Hd. Cap Screw Size	TORQUE N.m/In-Lbs
M6	16/140	M12	135/1,200	M6	14.5/130
M8	39/350	M16	330/2,900	M8	35/310
M10	77/680	N/A	N/A	M10	70/620

Anchor Lamina Inc., PO Box 2540, Farmington Hills, MI 48333
 Phone: 800-652-6462, Fax: 248-553-6842, Email: sales@lamina.com

