

LuBo®



ADS

ADP/M/T

ACST

ADU

APU

**TECHNICAL
INFORMATION**

ADS SERIES

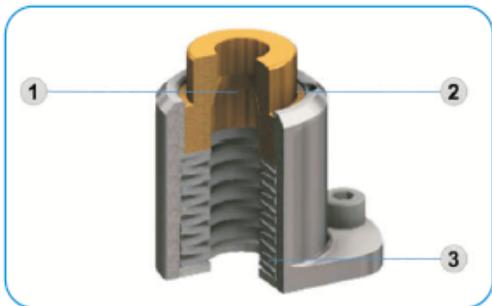
PATENTED



FEATURES

- ADS is the disc spring integral stripping unit available in any standard retainer various series depending on retainer specifications and maker [Retainer thickness 25 mm, 30 mm, 41 mm, Dayton/Misumi]
- The variable standard series are based on the punch blank diameter (10, 13, 16, 20, 25).
- The stripper can be replace by one step.
- Assembled on the retainer without machine work.

ADS, ADS-M, ADS-B



• Disk springs were assembled non-removable structure to maintain the optimum disc spring stacking structure.

PATENTED

No.	Part	Spec.
1	Stripper	CAC304 *SM45C
2	Retaining Ring	
3	Power Unit	
-	Spring	Schonorr
-	Wrench Bolt	M8x25
-	Disk Washer	M8

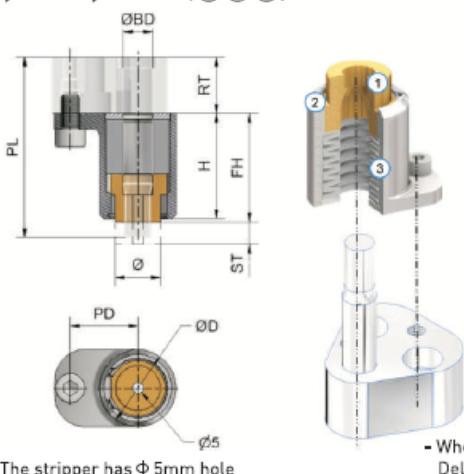
* MoS2 coated Steel stripper is option

Series	Retainer Thickness			Stripping Force kN (kgf)	Punch Length		
	25t	30t	41t (Ball lock)		80	90	100
ADS-10 (L:O)	●			4.4 (455)	●	●○	●○
ADS-13 (L:O)	●			4.7 (480)	●	●○	●○
ADS-16	●			5.4 (550)		●	●
ADS-20	●			6 (620)		●	●
ADS-25	●			9.7 (990)		●	●
ADS-10M (L:O)		●		4.4 (455)	●	●○	●○
ADS-13M (L:O)		●		4.7 (480)	●	●○	●○
ADS-16M (L:O)		●		5.4 (550)	●	●○	●○
ADS-20M (L:O)		●		6 (620)	●	●○	●○
ADS-25M (L:O)		●		9.7 (990)	●	●○	●○
ADS-10B			●	4.4 (455)		●	●
ADS-13B			●	4.7 (480)		●	●
ADS-16B			●	5.4 (550)		●	●
ADS-20B			●	6 (620)		●	●
ADS25B			●	9.7 (990)		●	●

• Due to the characteristics of the disc spring stacking structure, the maximum spinning power can vary by about 7 %.

ADS, ADS-L, ADS-B

ADS, ADS-L, ADS-B (①②③)



PATENTED



Series	BD	D	PD	H	* Retainer Thickness(RT)		ST.	* Max. Force
					25mm	41mm		
ADS-10(B)				46.6				
ADS-10L	10	30	26.9	55				
ADS-13(B)				46.6				
ADS-13L	13	34	30	55				
ADS-16				54				
ADS-16B	16	43	31.8	45.7				
ADS-20				54.4				
ADS-20B	20	50	33.5	47				
ADS-25				54.5				
ADS-25B	25	50	40.6	46				

ORDER

CODE	PL	Mat'l
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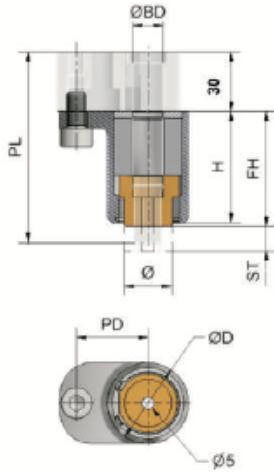
ADS-10 - 80 - C
ADS-10B - 90 -
ADS-10L - 90 -

* C: Mos2 coated steel stripper / SM45C

- * Due to the characteristics of the disc spring stacking structure, the maximum stripping force can vary about 7 %.
- * ADS, ADS-B for Dayton 30t standard retainer, For Misumi 25t retainer refer to ADSM
- Disk springs were assembled non-removable structure to maintain the optimum disc spring stacking structure.
- Ordered with Punch code, will be delivery with additional machine work on the stripper

ADS-M/ML

ADS-M/ML (①②③)



* ML: Long stroke



PATENTED



- When ordering with punch and retainer,
Delivery with assembled

- The stripper has Ø 5mm hole

Series	BD	D	PD	H
ADS-10M				43.5
ADS-10ML	10	30	29	51
ADS-13M				43.5
ADS-13ML	13	34	32	51
ADS-16M				43
ADS-16ML	16	43	34	50.5
ADS-20M				43
ADS-20ML	20	50	36	50.5
ADS-25M				43
ADS-25ML	25	60	39	50.5

Series	Punch Length PL/ Final Height FH			ST.	* Max. Force
	80mm	90mm	100mm		
ADS-10M	45	55	65	6.5	4.4 (455)
ADS-10ML	X	52.5	62.5	9	
ADS-13M	45	55	65	6.5	4.7 (480)
ADS-13ML	X	52.5	62.5	9	
ADS-16M	45	55	65	6.5	5.4 (550)
ADS-16ML	X	52	62	9.5	
ADS-20M	45	55	65	7	6 (620)
ADS-20ML	X	52	62	9.5	
ADS-25M	45	55	65	7	9.7 (990)
ADS-25ML	X	52	62	9.5	

ORDER

CODE	PL	Mat'l
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ADS-10 - 80 - C

ADS-10M - 90

ADS-10ML - 100

* C: MoS₂ coated steel stripper / SM45C

* Due to the characteristics of the disc spring stacking structure, the maximum stripping force can vary about 7 %.

* ADS-M, ADS-ML for Misumi 25t retainer, For Dayton retainer refer to ADS

* Disk springs were assembled non-removable structure to maintain the optimum disc spring stacking structure.

* Ordered with Punch code, will be delivery with additional machine work on the stripper

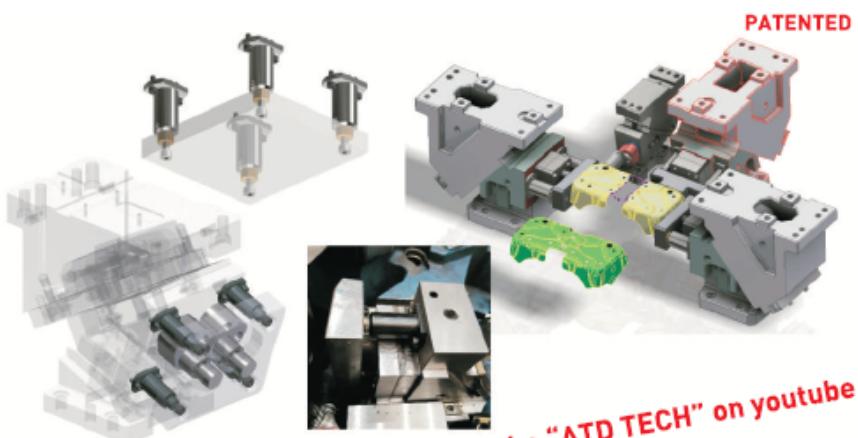


ATD TECH.

Analog To Digital Technologies

DISK PAD GUIDE UNIT

ADP, ADPT, ADPM SERIES

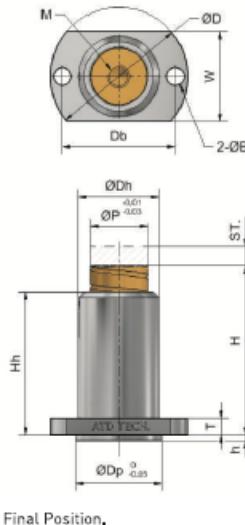


FEATURES

- ADP was developed for pad guiding part with disc springs inside.
- Applicable for Cam Pad, Upper Die Pad, Lower Die Pad
- More performance for high-speed SPM.
- The guide pin diameter and the padding forces are specified.
- Modular products with rectangular standard shape also standardized, it makes easy to design and die making.
- Depending on the assembly space and the working conditions, can select two or four unit modules.
- The pad module can be supplied with additional machine works.

ADP

ADP



CODE	ST	Hh	H	Max. Force
ADP-30x8	8.3	62.5	67.5	455kg
ADP-30x13	13	74	79	
ADP-34x8	8.3	62.5	68.5	480kg
ADP-34x13	13	79	85	
ADP-42x10	10.5	75	80	
ADP-42x15	15	89	95	
ADP-50x10	10	73.5	80	
ADP-50x15	15	91.5	98	620kg
ADP-60x10	10	74.8	85.5	
ADP-60x15	15	91.5	102	990kg

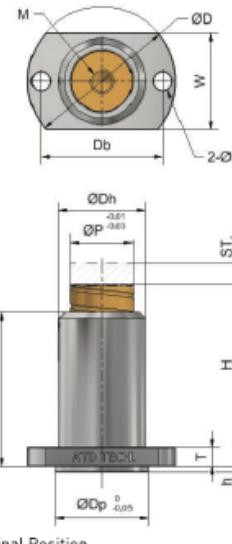
- Due to the characteristics of the disc spring stacking structure, the maximum spinning power can vary by about 7 %.



- Delivery with pad plates refer to ADPM Series.
- Contact regional distributor for more information.

ADPT

ADPT



CODE	ST	Hh	H	Max. Force
ADPT-30x8	8.3	62.5	67.5	455kg
ADPT-30x13	13	74	79	
ADPT-34x8	8.3	62.5	68.5	480kg
ADPT-34x13	13	79	85	
ADPT-42x10	10.5	75	80	
ADPT-42x15	15	89	95	550kg
ADPT-50x10	10	73.5	80	
ADPT-50x15	15	91.5	98	620kg

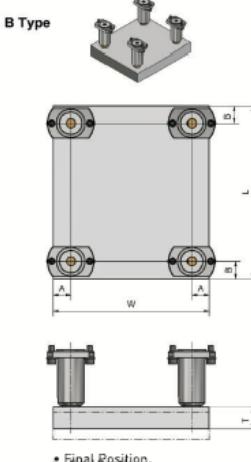
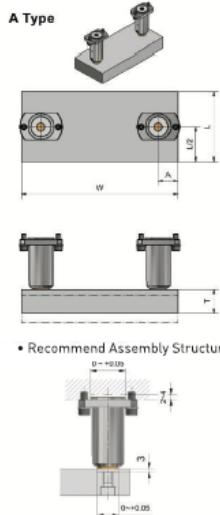
- Due to the characteristics of the disc spring stacking structure, the maximum spinning power can vary by about 7 %.



- Delivery with pad plates refer to ADPM Series.
- Contact regional distributor for more information.

ADPM

ADPM, ADPMT



* W, L Dim. Is every 10 mm

ORDER

SERIES x ST - TYPE - W x L x T x A x B x Mat'i
 ADPM-30x13 - A - 55 x 150 x 20 x 15 x 15 x SM45C

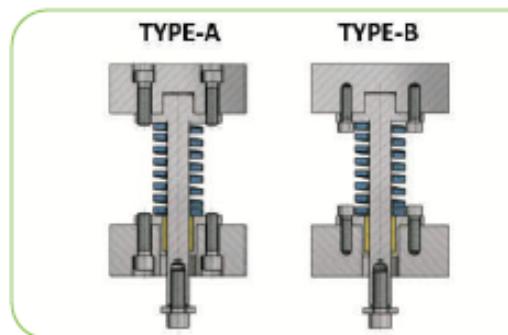
- Material: SS400 (Standard)
- Only for guide unit ADP, ADPT
- Contact regional distributor to delivery with additional machine work
- Due to the characteristics of the disc spring stacking structure, the maximum spinning power can vary by about 7 %.

SERIES	Max. Force	
	A type	B type
ADPM(T)-30	910 kg	1,820 kg
ADPM(T)-34	960 kg	1,920 kg
ADPM(T)-42	1,100 kg	2,200 kg
ADPM(T)-50	1,240 kg	2,480 kg
ADPM-60	1,980 kg	3,960 kg

ACST SERIES

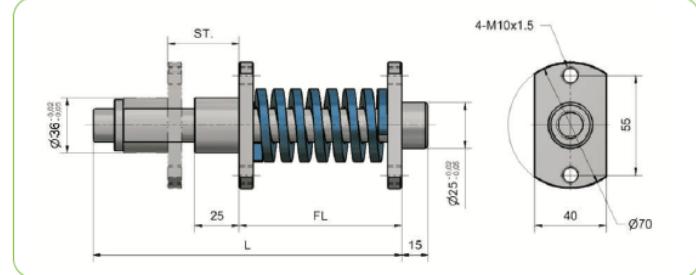


(UNIT: mm, kgf)

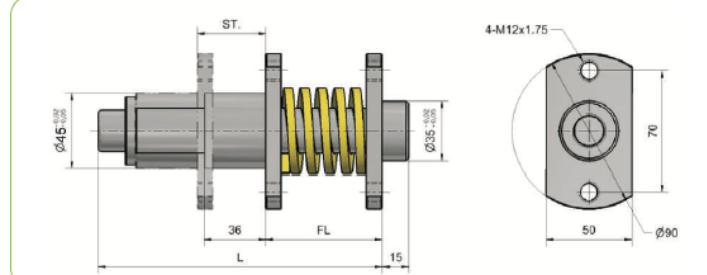


CODE	Type A	Type B
ACST - 40	M10	M8
ACST - 50	M12	M10
ACST - 60	M16	M12

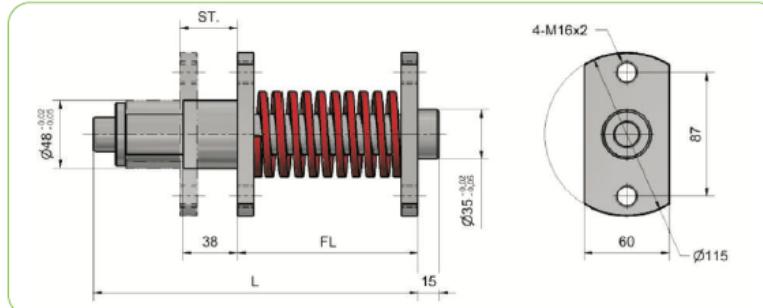
ACST 40 SERIES



ACST 50 SERIES



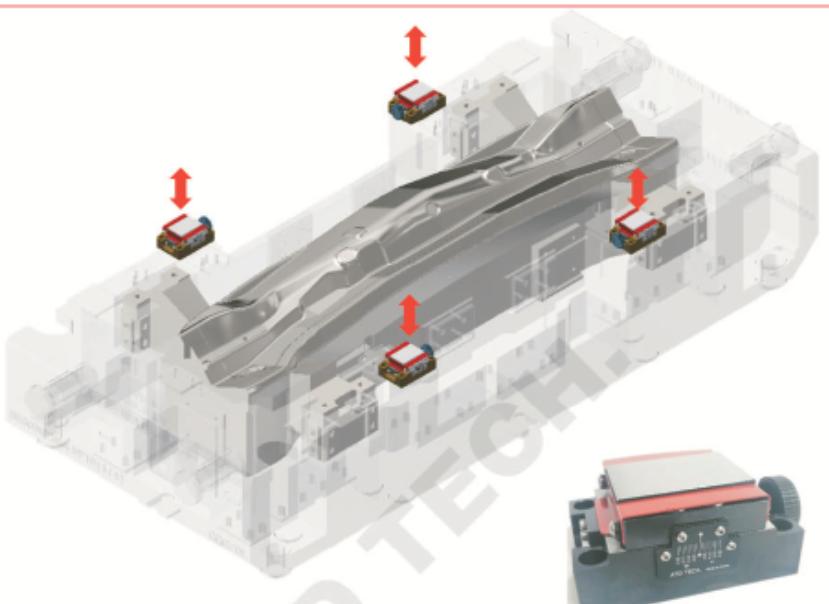
ACST 60 SERIES





ADJUSTABLE DISTANCE UNIT

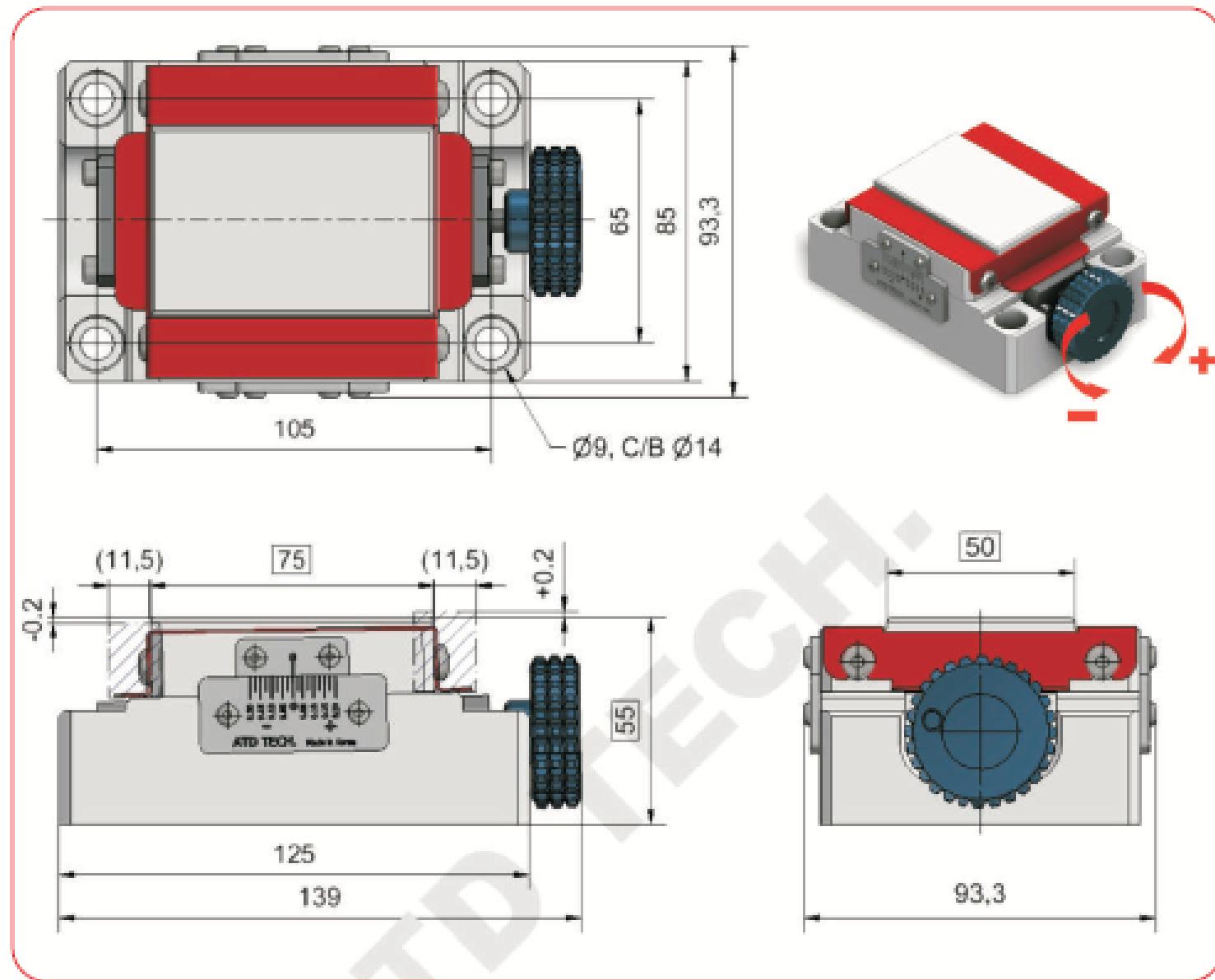
ADU-55



FEATURES

- No seam plate is required for distance block height adjustment.
- Precise height adjustment is possible by the adjustment handle.
- Easily adjustment on the stamping line.
- Adjustable height range is -0.2 ~ +0.2
- Maximum allowable load: 120 ton.
- The metric scale is mounted on both sides.

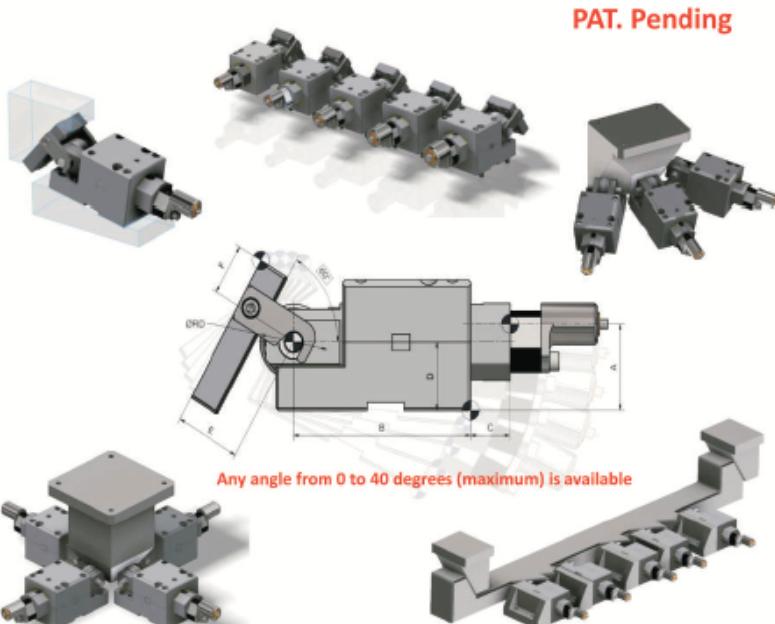
ADU-55





ATD PIERCING UNIT

APU



- No more oversized cams in piercing process !
- Resolve the limit of mold cost reduction by high speed stamping!
- Built-in gas spring ensures stable production performance !
- 5-degree unit of standard unit cam Overcome working angle limit!
- More effective for AHSS, Thick material, aluminum !
- Compliant with standard retainer specifications
- Resolve wear plate stretch problem by rolling mechanism



ATD TECH.

Analog To Digital Technologies

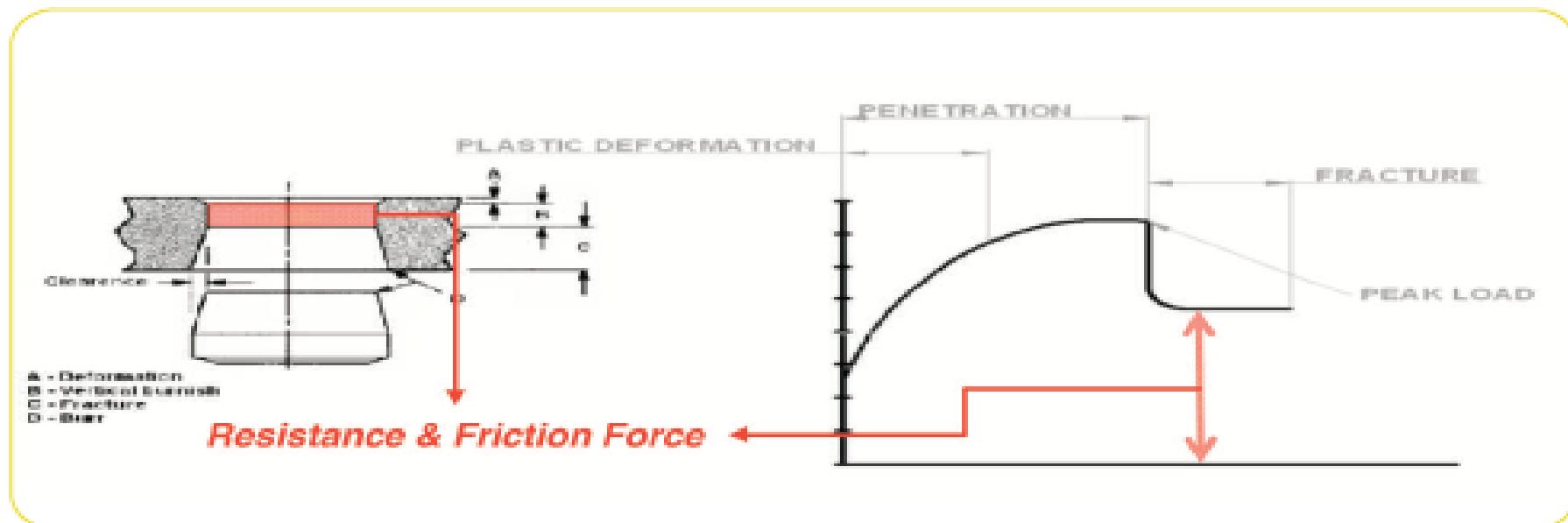
TECHNICAL INFORMATION

Disk Stipper for High Tensile Strength & Thick Material

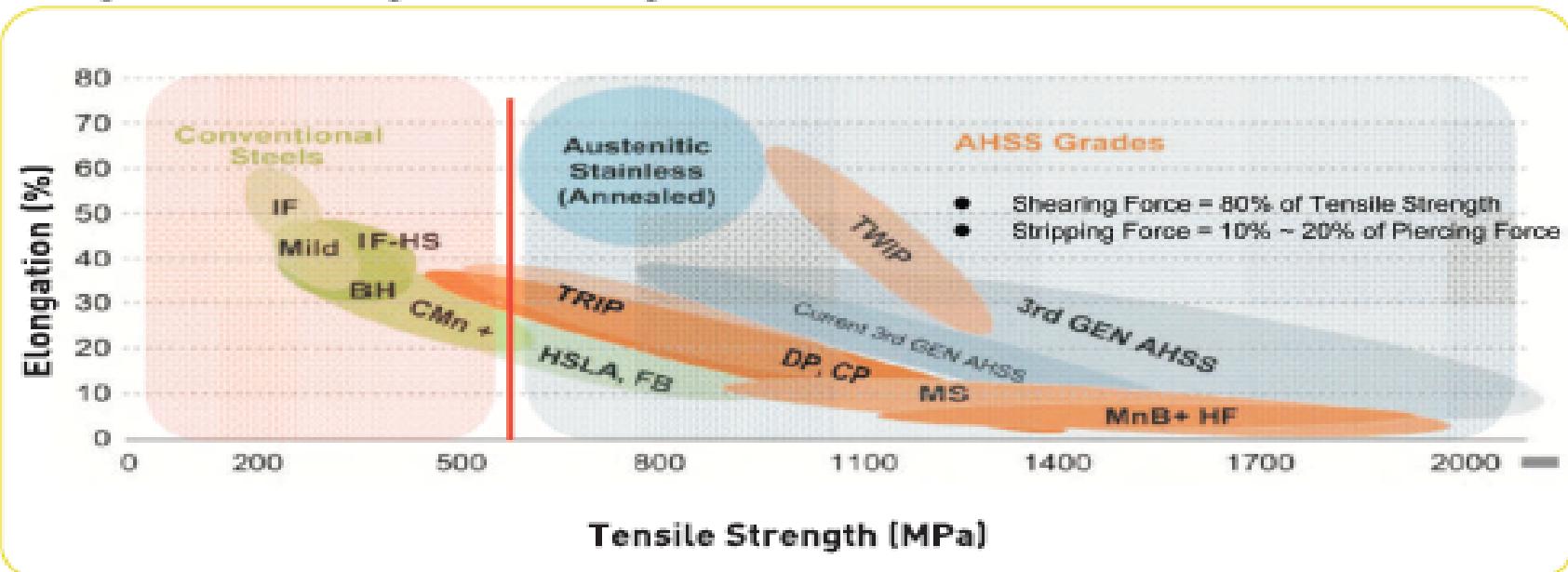


PTC, Patent Pending

Stripping force & piercing force & AHSS material



- The higher the Piercing Force, the higher the Return Force



Conventional Cam Piercing Process' wear amount issues with return force

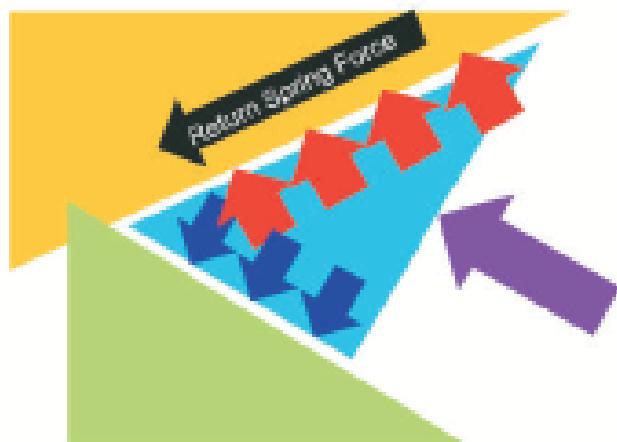


Fig.1 Aerial Cams' Internal Pressure Principle

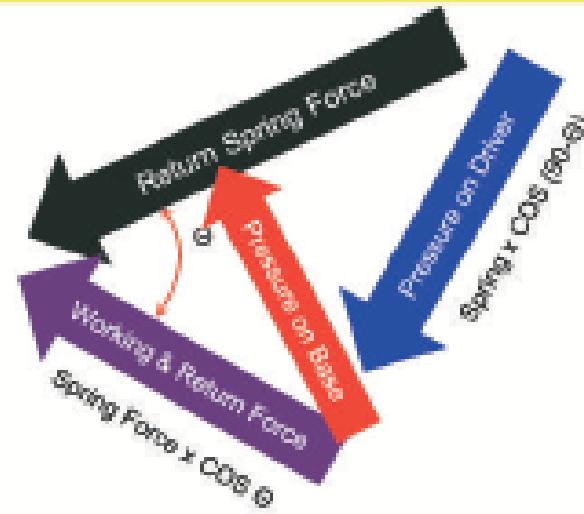
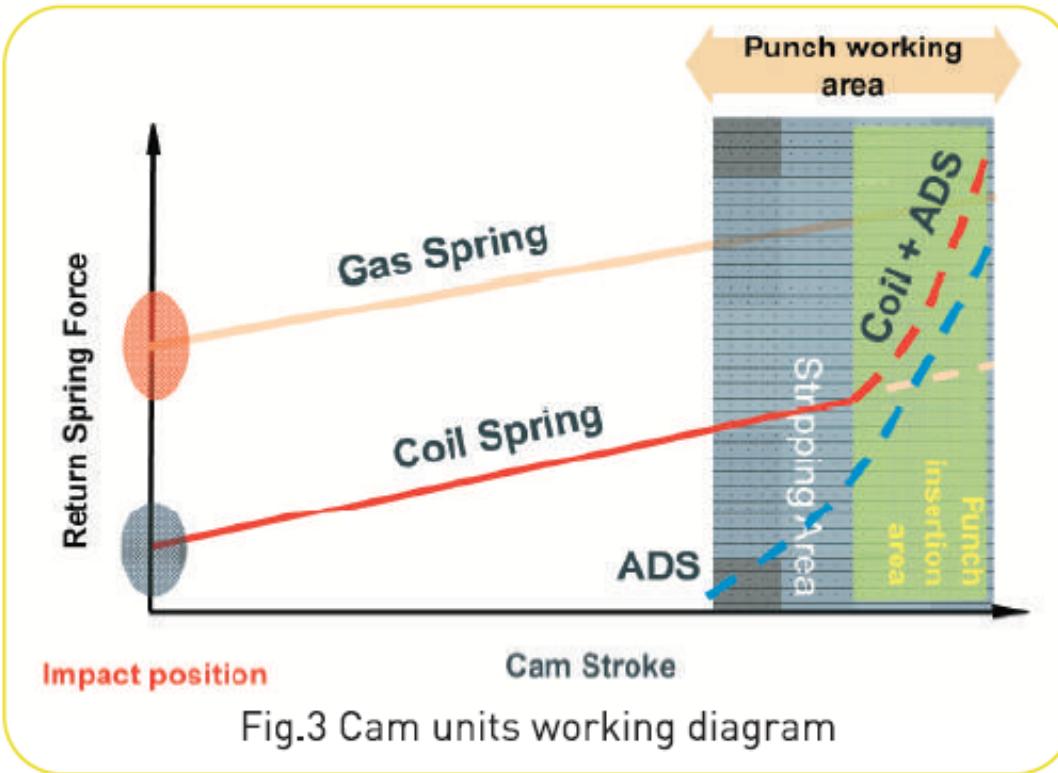


Fig.2 Relations of the force

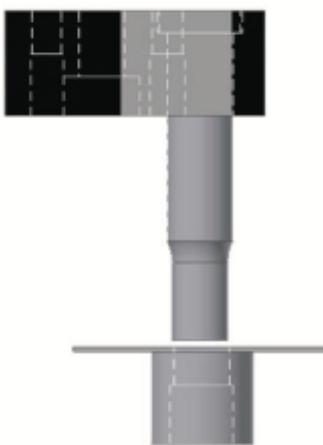
The best solution for piercing higher grade steels is to provide a lower initial return force, and a higher final force during the penetration stage of the pierce (prior to the rupture point), this can be achieved utilizing the ADS stripper.



pressure between the cam driver and cam base, which highly contributes to the unit's wear, and the reduction of the unit's life cycle. A proper return force is the most important factor contributing to the die quality (without increasing the surface pressure).

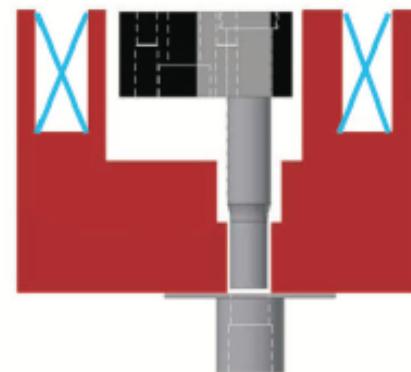
The return force of a conventional cam unit is dependent solely on the return spring force, placed at the cam base, however since the spring is not pushing in the same direction as the cam, the force is not fully transferred. This increases the surface

Piercing Process



- Material: Tensile Strength 650Mpa / 1t
- Shearing Strength: $650 * 0,8 = 520\text{Mpa}$
- PI Dia.: 13mm
- W/Force = $1*13*3.14*52 = 2,100\text{kg}$
- Stripping Force: $2,100 * 0.10 - 0.2 = 210 \sim 318\text{kg}$

With PAD Structure



With ADS



- Pad Assembly (Pad Block, Spring, Pad Guide, Spool Retainer..)
- With assembly structure M/C work

- ATD TECH. ADS-16-P13
- Without additional M/C work
- Final Stripping Force = 500kg

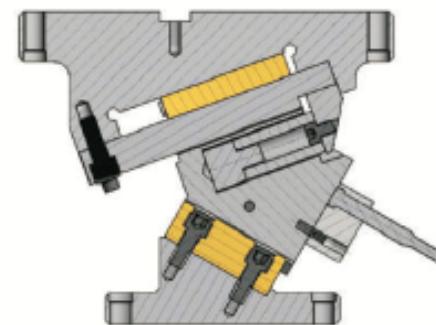
COST

• PAD Structure



• ATD TECH. ADS Stripper

Cam Piercing Process



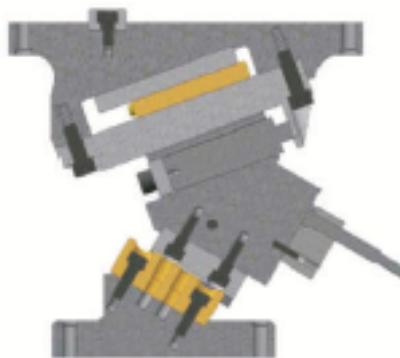
Sankyo UCMSC 50-30

- Material: Tensile Strength 650Mpa, 1t
- Cam Structure: Aerial, 30 degree
- Shearing Strength: $650 * 0.8 = 520 \text{ Mpa}$
- Piercing Dia.: 13mm
- Working Force = $1 * 13 * 3.14 * 52 = 2,100 \text{ kg}$
- Stripping Force: $2,100 * 0.1 \sim 0.2 = 210 \text{ kg} \sim 420 \text{ kg}$

COST Compare

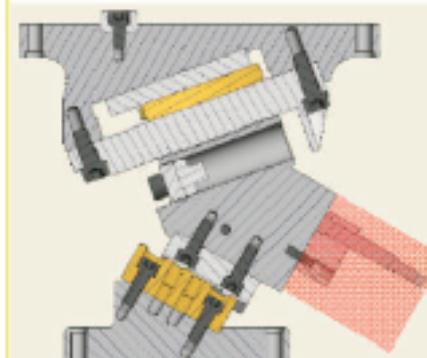
- Cam Upgrade
- Cam Pad
- ATD TECH. ADS Disk Stripper

Case-1 / Cam Upgrade



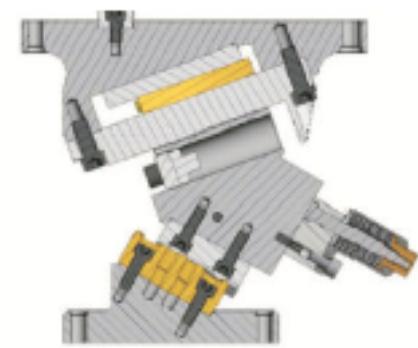
- UCMSC 50-30 → UCMSNR 70-30-GK
- COST: 250% more

Case-2 / Cam Pad



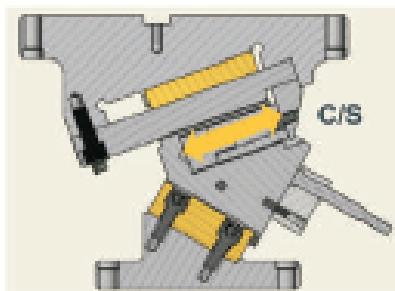
- Added Parts: Pad Ass'y (Pad Block, Spring, Pad Guide, Spool Retainer..)
- With additional M/C work

Case-3 / ADS



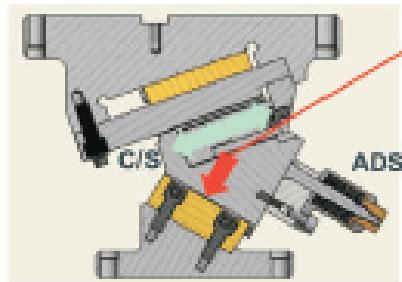
- ATD TECH. ADS-16-P13
- 추가가공 : 없음
- Stripping Force = 500kg

Cam Piercing Process



- UCMSC 50-30

Case 2 /
Disk Stripper

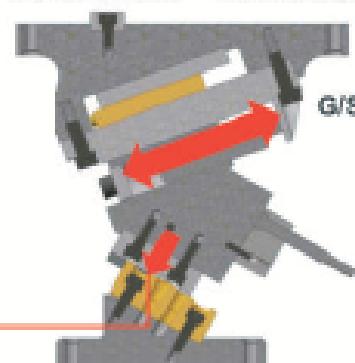
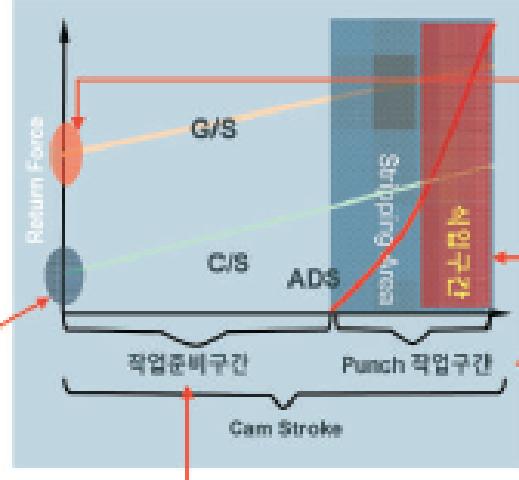


- UCMSC 50-30 & ATD TECH. ADS-10

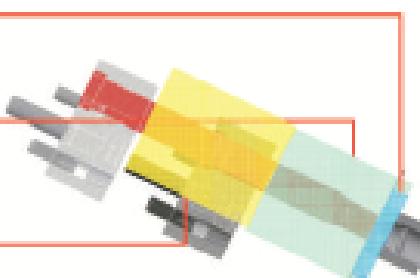
- Unit Cam Initial Return Force \leftrightarrow Wear amount
- UCMSNR 70-30 – GK (Gas Spring)

Case-1 / Cam Upgrade

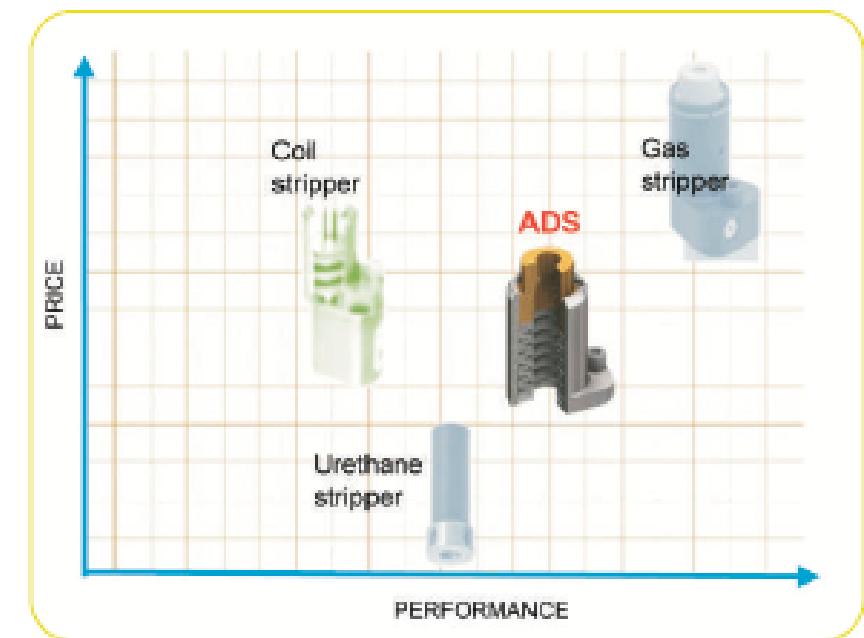
C/S: Coil Spring, G/S: Gas Spring, ADS: Disk Spring



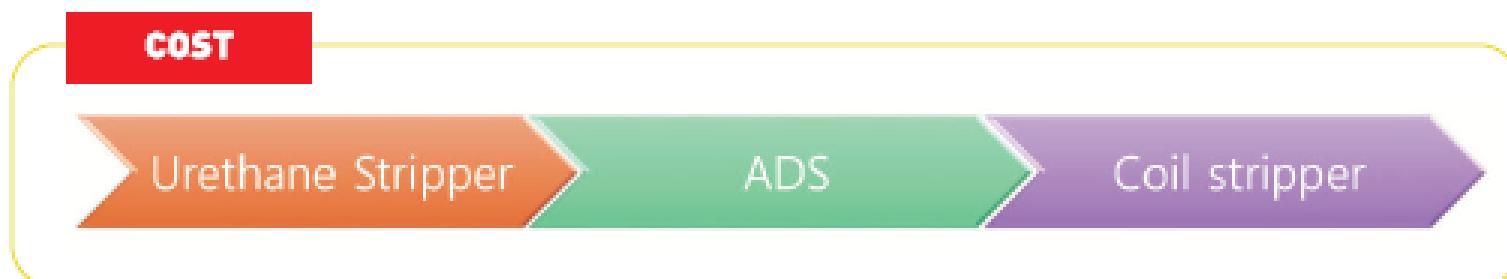
- High impact forces applied by the high initial gas spring force on the contacting area



Comparison of Strippers' Forces



- The urethane stripper is the most cheap and weak
- The coil spring stripper is more longer stroke and limitational final force
- The disk stripper also has limitation final force but the most higher force as limitational area
- ATD TECH ADS stripper has developed with suitable multi lamination structure and stable structure



Structure & Features

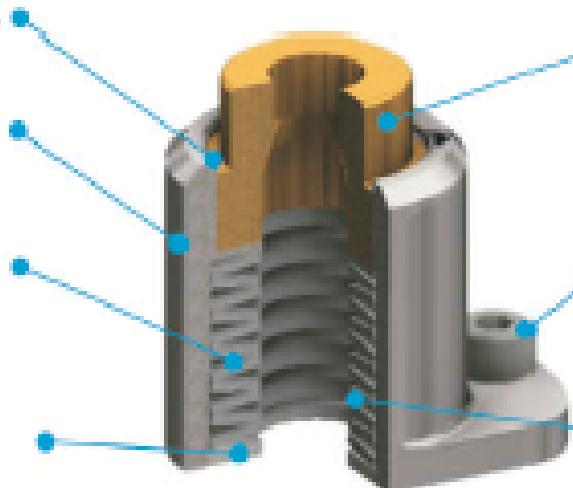
PTC Patent Pending

Retaining Ring : Easy assembly structure

Housing : Special alloy HRC30~

Disk Spring : Made in Germany
SCHNORR

Cover & Washer : Special alloy HRC30~



Stripper : Prevent panel defects, Special cooper alloy

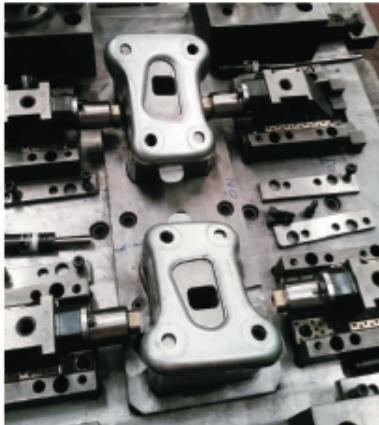
Bolt & Disk Washer : Strength 12.9 Wrench Bolt with prevent washer

Mo2 Grease filling up : reduction of frictional resistance

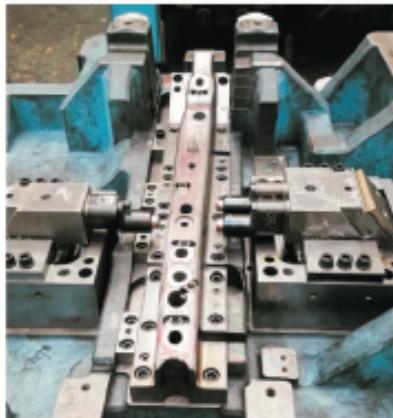
Applications



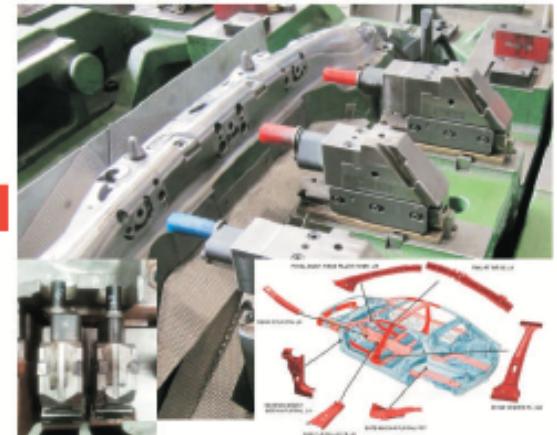
- Material Condition: 400Mpa / 3.8t
- Cam Unit: 65x40
- Pi. Dia.: 12.8mm
- Working Force = $3.8 \times 12.8 \times 3.14 \times 35 = 5.3$ ton
- Req. Stripping Force : $5,300 \times 0.15 = 795$ kg



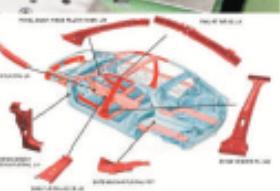
- Cam Return Force: Gas Spring 255kg
- Stripper: ADS-16-P12.8 (Proto Type)
- Final Stripping Force: 550 kg
- Total Stripping Force: $255 + 550 = 800$ kg



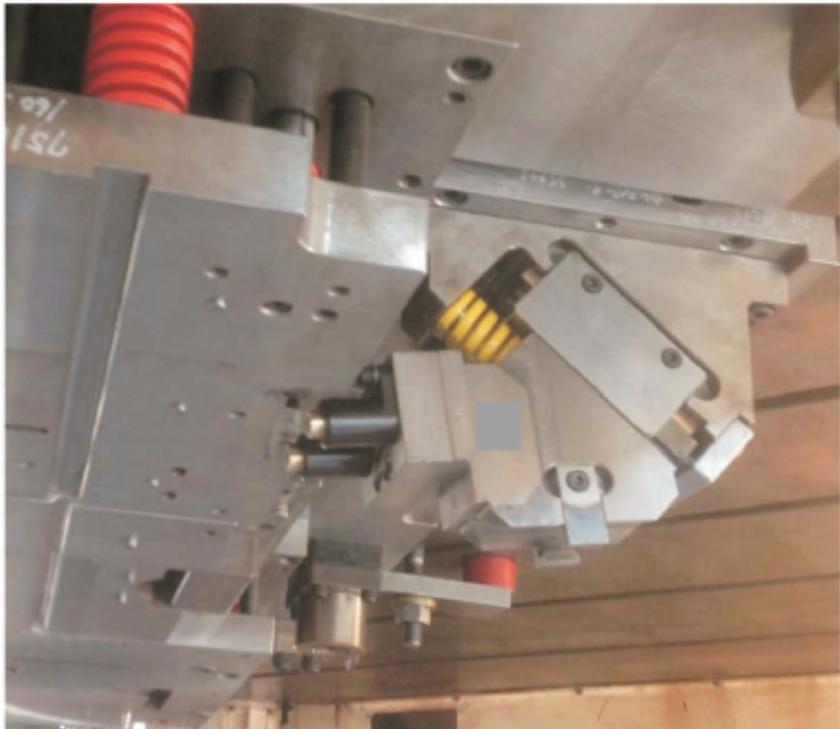
Material Condition:
Cam Unit: Special
Pi. Dia.: Dayton C85 W12.85
Working Force =
Req. Stripping Force =



- Cam Return Force:
- Stripper: ADS-16B-C85-W13.05
- Final Stripping Force: 550 kg
- Total Stripping Force:



Applications

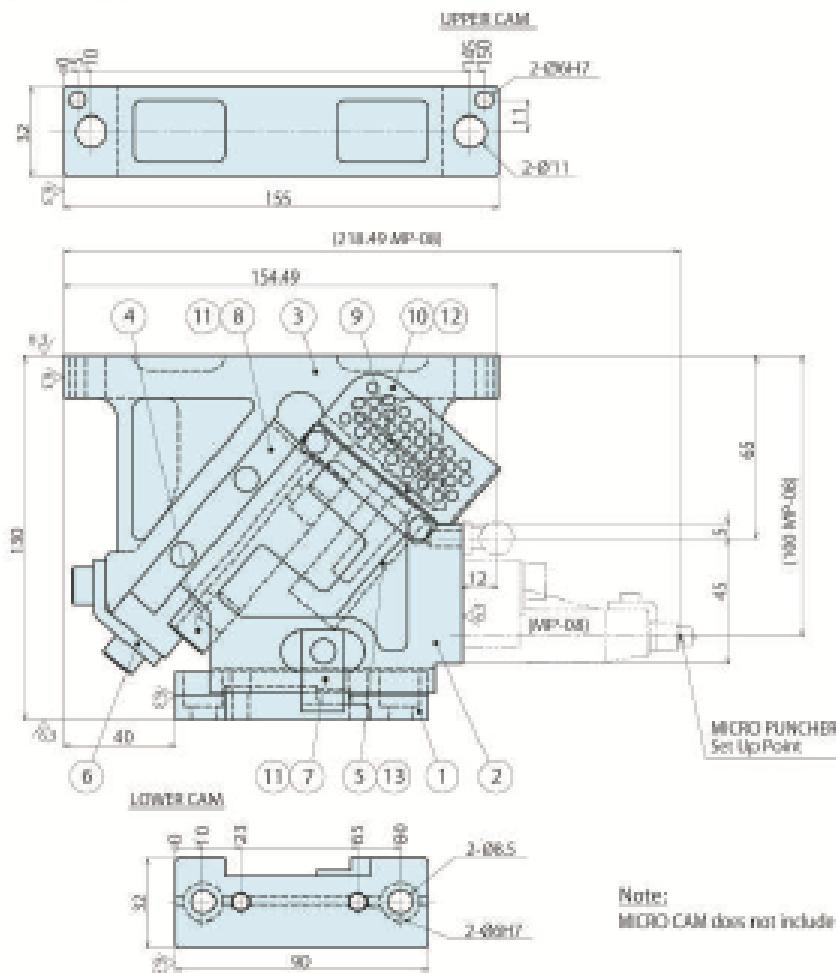


- Material Condition: 440 Grade 1.6t
- Cam Unit: Aerial Cam
- Pi. Dia.: Misumi Retainer 30T, 2-P8.2
- Working Force =
- Req. Stripping Force =
- SPM: 40~45
- Cam Return Force:
- Stripper: ADS-13M-P8.2
- Final Stripping Force: 480 kg
- Total Stripping Force: $480 \times 2 = 960\text{kg}$

DADCO®

MICRO CAM

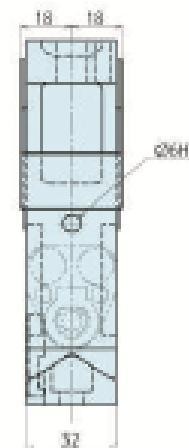
— STANDARD TYPE —



■ Spring Force

Standard Name	Spring Device	Initial Force (N)	Final Force (N)
MC-PSS-150	GAS SPRING	-	754
MC-PSS-1540	GAS SPRING	493	664

CAM DIAGRAM.



Note:

MICRO CAM does not include the MICRO PUNCHER (as shown) (WP-08).