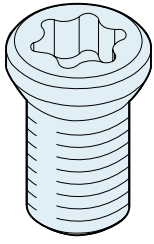


# Spare Parts

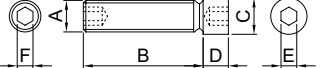
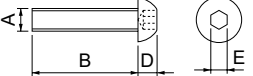
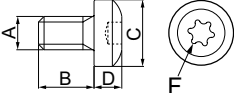
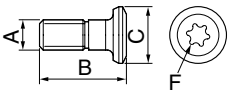

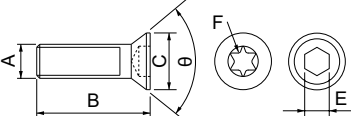
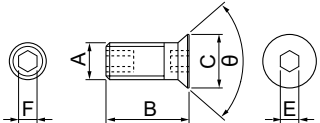
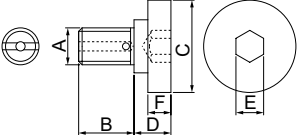
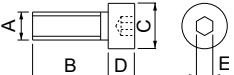


# P

**P1~P18**

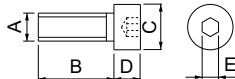
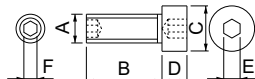
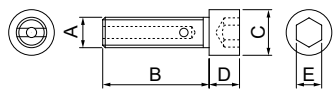
Screws	P2~P6
Pins	P7
Shims	P8~P12
Cartridges	P12
Clamp Sets	P13~P14
Clamps	P15
Chipbreakers	P16
Wrenches	P17~P18
Wrenches / Springs / Nuts / Punches / Others	P18

# Screws

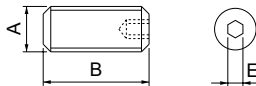
Shape	Description	Dimension (mm)							Angle (°)		Torque (N • m)	Remarks
		A	B	C	D	E	F	α	θ			
	<b>AJ</b> <b>-6X38</b>	M6X1.0	38.0	6.0	10.0	3.0	3.0	-	-	-		
	<b>-8X44-9.5</b>	M8X1.25	44.0	9.5	6.0	4.0	4.0	-	-			
	<b>-10X46</b>	M10X1.5	46.0	11.5	8.0	5.0	5.0	-	-			
	<b>BH</b> <b>3X6</b>	M3X0.5	6.0	-	1.7	2.0	-	-	-	-		
	<b>3X12</b>	M3X0.5	12.0	-	1.7	2.0	-	-	-			
	<b>6X25</b>	M6X1.0	25.0	-	3.3	4.0	-	-	-			
	<b>8X30</b>	M8X1.25	30.0	-	4.4	5.0	-	-	-			
	<b>BH</b> <b>6X10TR</b>	M6X1.0	10.0	12.0	5.0	-	T25	-	-	6.5		
	<b>CP</b> <b>8X15TL</b>	M8X1.25	15.0	15.0	-	-	T25	-	-	6.0	L...shows Left-hand Thread	
	<b>8X23TL</b>		23.0									
	<b>CS</b> <b>-2D</b>	M4X0.7	21.5	6.4	3.5	2.5	2.0	-	-	-		
	<b>-3D</b>	M5X0.8	22.0	8.0	4.0	3.0	2.5	-	-			
	<b>-5D</b>	M5X0.8	28.0	8.0	4.0	3.0	2.5	-	-			
	<b>GS</b> <b>-50</b>	M5X0.8	13.0	7.5	-	3.0	-	-	82°	-		
	<b>-50S</b>	M5X0.8	9.0	7.5	-	3.0	-	-	82°			
	<b>GS</b> <b>-4090T<sup>R/L</sup>W</b>	M4X0.7	9.0	5.8	-	2.0	2.0	-	82°	-	R...shows Right-hand Thread L...shows Left-hand Thread	
	<b>HF</b> <b>20X53H</b>	M20X2.5	35.0	43.0	18.0	14.0	14.0	-	-	-	With Coolant Hole	
	<b>24X60H</b>	M24X3.0	40.5	65.0	19.5	17.0						
	<b>HH</b> <b>3X6</b>	M3X0.5	6.0	5.5	3.0	2.5	-	-	-	-		
	<b>3X12</b>		12.0									
	<b>HH</b> <b>4X16</b>	M4X0.7	16.0	7.0	4.0	3.0	-	-	-			
	<b>HH</b> <b>5X15</b>	M5X0.8	15.0	8.5	5.0	4.0	-	-	-			
			16.0									
			20.0									
			25.0									
			30.0									
	<b>HH</b> <b>6X12</b>	M6X1.0	12.0	10.0	6.0	5.0	-	-	-			
			20.0									
25.0												
30.0												

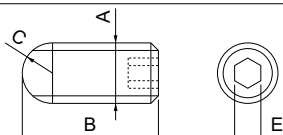
P

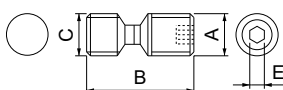
Spare Parts

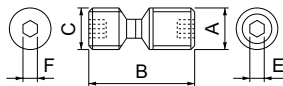
Shape	Description		Dimension (mm)						Angle (°)		Torque (N • m)	Remarks	
			A	B	C	D	E	F	α	θ			
	HH	8X25	M8X1.25	25.0	13.0	8.0	6.0	-	-	-	-		
		8X35		35.0									
		8X40		40.0									
		8X50		50.0									
		8X55		55.0									
		8X65		65.0									
		8X70		70.0									
		8X80		80.0									
		8X85		85.0									
		8X100		100.0									
		8X110		110.0									
	HH	10X25	M10X1.5	25.0	16.0	10.0	8.0	-	-	-			
		10X30		30.0									
		10X30M		30.0									
		10X30S		30.0		6.0	7.0						
		10X35		35.0		10.0	8.0						
		10X40		40.0									
	HH	12X25	M12X1.75	25.0	18.0	12.0	10.0	-	-	-			
		12X30		30.0									
		12X35		35.0									
		12X35M		35.0									
		12X40		40.0									
		12X55		55.0									
		12X65		65.0									
		12X80		80.0									
		12X85		85.0									
		12X100		100.0									
		12X110		110.0									
		12X120		120.0									
		12X130		130.0									
		12X140		140.0									
		12X150		150.0									
	HH	16X35	M16X2.0	35.0	24.0	16.0	14.0	-	-	-			
		16X40		40.0									
		16X45		45.0									
		16X65		65.0									
		16X90		90.0									
		16X110		110.0									
		16X130		130.0									
	HH	20X40	M20X2.5	40.0	30.0	20.0	17.0	-	-	-			
		20X55		55.0									
		20X75		75.0									
		20X90		90.0									
		20X110		110.0									
		20X120		120.0									
		20X140		140.0									
		20X150		150.0									
		20X170		170.0									
	HH	24X40	M24X3.0	40.0	36.0	24.0	19.0	-	-	-			
		24X60		60.0									
		24X75		75.0									
		24X90		90.0									
		24X110		110.0									
		24X120		120.0									
		24X140		140.0									
		24X150		150.0									
		24X170		170.0									
	HH	4X12	M4X0.7	12.0	7.0	4.0	3.0	2.0	-	-	-		
	HH	8X25H	M8X1.25	25.0	13.0	8.0	5.0	-	-	-	-	With Coolant Hole	
		10X30H	M10X1.5	30.0	16.0	10.0	6.0						
		12X35H	M12X1.75	35.0	18.0	12.0	8.0						
		16X52H	M16X2.0	36.0	24.0	16.0	12.0						

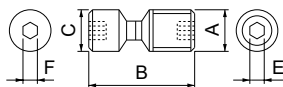
# Screws

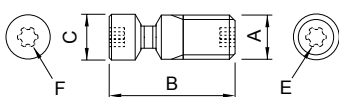
Shape	Description	Dimension (mm)						Angle (°)		Torque (N • m)	Remarks
		A	B	C	D	E	F	α	θ		
	HS 3X4P	M3X0.5	3.9	-	-	1.5	-	-	-	-	HS4X4P and HS6X4P have a flat edge
	3X4		4.0								
	3X8		8.0								
	3X12		12.0								
	3X16		16.0								
	HS 4X4P	M4X0.7	3.9	-	-	2.0	-	-	-		
	4X4		4.0								
	5X5	M5X0.8	5.0			2.5					
	HS 6X4P	M6X0.75	3.9	-	-	3.0	-	-	-		
	6X6	M6X1.0	6.0								
	6X14		14.0								
	6X22		22.0								
	HS 8X10	M8X1.25	10.0	-	-	4.0	-	-	-		
	8X12		12.0								
	HS 10X10	M10X1.5	10.0	-	-	5.0	-	-	-		
	10X16		16.0								
	HS 12X12	M12X1.75	12.0	-	-	6.0	-	-	-		
	12X16		16.0								
	12X18		18.0								
	12X20		20.0								
12X25	25.0										
12X30	30.0										
HS 16X12	M16X2.0	12.0	-	-	8.0	-	-	-			
16X18		18.0									
16X20		20.0									

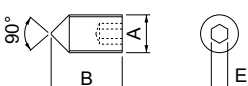
	HSB 4X8 <sup>R/L</sup>	M4X0.7	8.0	R2.0	-	2.0	-	-	-	-	R...shows Right-hand Thread L...shows Left-hand Thread
--	------------------------	--------	-----	------	---	-----	---	---	---	---	---

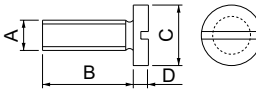
	LS -03	M5X0.8	10.0	M5X0.8	-	2.0	-	-	-	2.0	N: Silver coated	
	-03S		12.2			2.5				3.0		
	LS -03N		9.7	M5X0.8		2.0				2.0		
	-03SN		12.0			2.5				3.0		

	LS -05	M5X0.8	15.5	M5X0.8	-	2.0	2.0	-	-	2.0	
---	--------	--------	------	--------	---	-----	-----	---	---	-----	--

	LS -1	M6X1.0	17.0	6.0	-	2.5	2.5	-	-	3.0	N: Silver coated	
	-1N		14.2									
	-1S		21.0									
	-1SN		21.0									
	LS -2	M8X1.0	20.0	8.0	-	3.0	3.0	-	-	4.0		
	-2N		22.0									
	-3		24.0									
	-4N		24.0									

	LS -1P	M6X1	16.5	6.0	-	10IP	10IP	-	-	1.4	○○IP shows Torx Plus		
	-2P	M8X1	18.2	8.0		15IP	15IP			3.5			
	-3P		21.8										

	LS -11	M6X1.0	9.5	-	-	3.0	-	-	-	-	
	-15		12.5								

	M 3X8	M3X0.5	8.0	5.5	2.0	-	-	-	-	-	Flat fillister head screw equivalent to JIS B-1101
	3X12		12.0								
	4X10	M4X0.7	10.0	7.0	2.6						

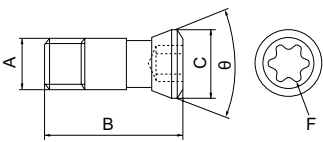
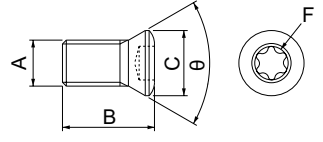
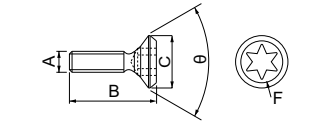
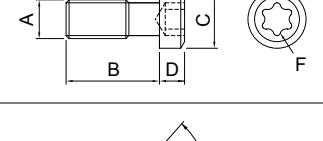
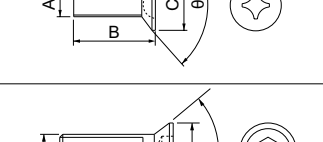
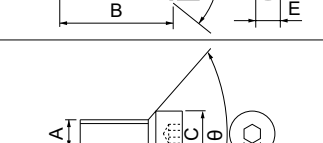
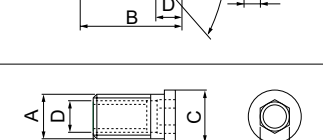
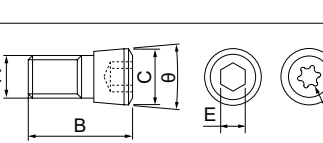
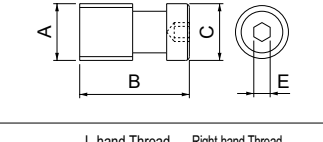
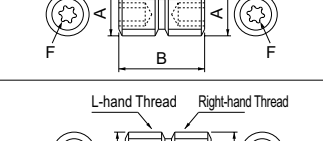
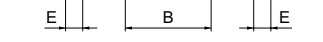
P

Spare Parts





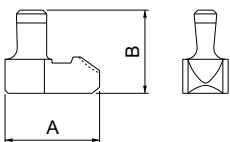
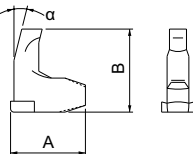
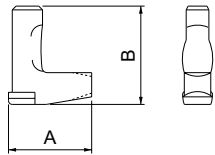
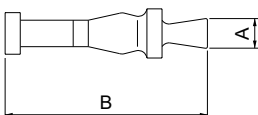
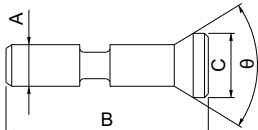
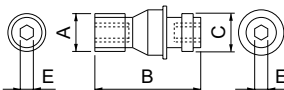
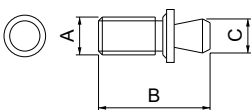
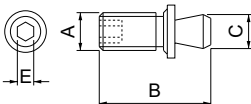
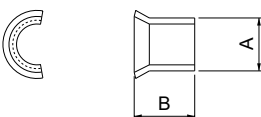
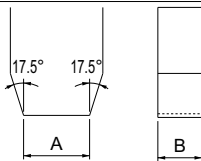
# Screws

Shape	Description	Dimension (mm)						Angle (°)		Torque (N・m)	Remarks
		A	B	C	D	E	F	α	θ		
	<b>SC</b> <b>-30067</b> <b>-35085</b> <b>-40100</b> <b>-50130</b> <b>-60160</b> <b>-60210</b>	M3X0.35 M3.5X0.35 M4X0.5 M5X0.5 M6X0.75	6.7 8.5 10.0 13.0 16.0 21.0	4.4 5.7 6.0 6.6 8.0 9.6	-	-	T8 T10 T15 T20 T25 T30	-	60°    40°	1.2 1.4 3.5 4.5 6.0 8.0	
	<b>SE</b> <b>-3070TRP</b> <b>-40050TR</b> <b>-40055TR</b> <b>-40068TR</b> <b>-40080TR</b> <b>-40090TR</b> <b>-40100TR</b>	M3X0.5  M4X0.7	7.0 5.0 5.5 6.8 8.0 9.0 10.0	4.3  5.0	-	-	9IP  T15	-	43°	1.2  3.5	○○IP shows Torx Plus
	<b>SE</b> <b>-40120TR</b> <b>-50125TR</b>	M4X0.7 M5X0.8	12.0 12.5	5.6 6.4	-	-	T15 T20	-	60°	3.5 4.5	
	<b>SH</b> <b>-50150TR</b>	M5X0.8	15.1	7.4	3.2	-	T20	-	-	4.5	
	<b>SP</b> <b>3X4</b> <b>3X6</b> <b>3X8</b> <b>3X10</b>	M3X0.5	4.0 6.0 8.0 10.0	4.0  6.0	-	-	-	-	90°	-	Below flat head screw additionally processed item Cross recessed flat head screw equivalent to JIS...B-1111
	<b>SP</b> <b>4X9</b>	M4X0.7	9.0	5.6	-	2.0	-	-	90°	-	
	<b>SP</b> <b>8X35</b>	M8X1.25	35.0	11.0	4.4	5.0	-	-	90°	-	
	<b>SPW</b> <b>-6045</b> <b>-7050</b> <b>SS</b> <b>-4N</b>	M6X0.75 M7X0.75 M5.5X0.5	9.0 9.0 8.5	7.5 8.8 6.6	M4.5X0.75 M5X0.8 M4X0.7	4.5 5.0 4.0	- - -	- - -	-	-	A shows External, D shows Internal External and Internal threads are both Right-hand threads
	<b>SV</b> <b>-60136R</b> <b>-60136TR</b>	M6X1.0	13.6	6.3	-	4.0 -	- T20	- -	6°	- 4.5	Hexagon socket Torx
	<b>TH</b> <b>8X15</b>	M8X1.25	20.0	8.5	-	4.0	-	-	-	-	
	<b>W</b> <b>6X17</b> <b>8X16</b>	M6X1.0 M8X1.0	17.0 16.0	-	-	-	T20 T25	- -	-	4.5 6.0	
	<b>W</b> <b>6X18</b> <b>6X20</b> <b>8X18</b> <b>8X21</b>	M6X1.0 M6X1.0 M8X1.25 M8X1.0	17.5 20.5 18.0 21.0	-	-	3.0 4.0	- -	- -	-	-	

P

Spare Parts

## Pins

Shape	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	LL -03 -03N -03S -03SN -03T -03TN	7.8 7.8 11.1 11.1 8.3 8.3	6.3 6.3 8.9 8.9 8.9 8.9	-	-	-	-	-	-	
	LL -05C -1C -1CN -2C	10.7 13.0 13.0 18.8	11.7 13.3 13.3 17.6	-	-	-	-	12° 14° 14° 14°	-	
	LL -1 -1K -1N -1D -1DN -2 -2K -2N -3 -3K -3N -4 -5 -5N	10.3 10.0 10.3 12.3 12.3 13.5 13.3 13.5 16.4 16.0 16.4 16.4 17.1 17.1	12.0 12.0 12.0 12.0 12.0 13.0 13.2 13.0 13.0 14.8 13.0 14.7 16.7 16.7	-	-	-	-	-	-	
	LP -2S -6S	3.65 3.65	20.0 25.0	-	-	-	-	-	-	
	LPA -11 -13 -17 LPF -11 -1113 -1117 -13 -17	2.8 2.8 2.8 2.5 2.5 2.5 3.8 3.8	11.0 13.0 17.0 11.0 13.0 17.0 13.0 17.0	4.2 3.5 3.5 5.5 5.5	-	-	-	-	60° 60°	
	TS -3S	M5X0.8	15.0	3.60	-	2.0	-	-	-	
	WP -1S 5X15	M5X0.8	17.5 15.0	3.65 5.0	-	-	-	-	-	
	WP 5X11	M5X0.8	10.5	5.0	-	2.0	-	-	-	
	LSP -1 -2 -3 LSP -2K -3K	5.0 6.5 8.25 5.1 6.7	5.3 5.6 7.9 5.2 5.7	-	-	-	-	-	-	
	P -03 -03S	2.8 3.5	1.95 1.95	-	-	-	-	-	-	

# Shims

Shape	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	$\alpha$	$\theta$	
	<b>DC -44</b>	12.55	5.0	1.5	6.0	4.4	R0.8	-	-	Shim Screw: SB-4085TR
	<b>DD -43</b>	12.55	3.4	1.3	6.0	4.4	R0.8	-	-	Shim Screw: SB-4085TR
	<b>-44</b>		5.0	1.5						
	<b>DS -44</b>	12.55	5.0	1.5	6.0	4.4	R0.8	-	-	Shim Screw: SB-4085TR
	<b>DT -32</b>	8.63	3.2	0.95	5.0	3.4	R1.6	3°	-	Shim Screw: SB-3080TR
	<b>DV -33</b>	9.40	3.5	1.2	6.0	4.4	R1.0	-	-	Shim Screw: SB-4085TR
	<b>DW -44</b>	12.65	5.0	1.5	6.0	4.4	R0.8	-	-	Shim Screw: SB-4085TR
	<b>556 C<sup>R/L</sup></b>	34.0	10.0	12.7	5.6	7.5	1.6	0°	55°	R...shows Right-Hand, L...shows Left-hand Shim Screw: HH5X16
	<b>KPS -42</b>	11.5	3.2	2.0	7.2	3.2	C1.0	7°	-	Shim Screw: SP3X8
	<b>KPT -32</b>	8.0	3.2	1.9	7.0	3.2	R0.4	11°	-	Shim Screw: SP3X8 : SP3X10
	<b>-42</b>	10.5	3.18	1.9	7.0	3.2	R0.8	11°	-	
	<b>KVN -32</b>	9.525	3.175	2.1	7.6	5.5	R0.8	-	-	Lock Pin: LP-6S : LP-2S

P

Spare Parts

Shape Handed Spare Parts show Right-hand	Description	Dimension (mm)						Angle (°)		Remarks	
		A	B	C	D	E	F	α	θ		
	LC	-32	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim Pin: LSP-1
		-32N	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim Pin: LSP-1
		-4K	11.7	3.2	1.4	8.1	6.73	R0.8	-	-	Shim Pin: LSP-3K
		-42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin: LSP-2
		-42N	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin: LSP-2
		-53	15.9	4.8	1.7	10.0	8.0	R1.2	-	-	Shim Pin: LSP-3
		-53N	15.9	4.8	1.7	10.0	8.0	R1.2	-	-	Shim Pin: LSP-3
	LC	-42 <sup>R/L</sup>	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R...shows Right-hand, L...shows Left-hand Shim Pin: LSP-2
		-42N <sup>R/L</sup>	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R...shows Right-hand, L...shows Left-hand Shim Pin: LSP-2
	LD	-32	9.47	2.4	1.3	6.18	4.68	R0.4	-	-	Shim Pin: LSP-1
		-32N	9.47	2.4	1.3	6.18	4.68	R0.4	-	-	
		-4K	11.7	3.2	1.4	8.1	6.73	R0.8	-	-	Shim Pin: LSP-3K
		-4K43		4.8	3.0	8.3	6.60	R1.2	-	-	
		-42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin: LSP-2
		-42-20		3.2	1.5	8.01	6.28	R2.0	-	-	
		-43	12.65	4.8	3.1	8.5	6.28	R0.8	-	-	Shim Pin: LSP-2
-43-20	4.8	3.1		8.5	6.28	R2.0	-	-			
	LR	-80	9.47	3.2	1.3	6.25	4.75	-	-	-	Shim Pin: LSP-1
		-81	12.65	3.2	1.5	8.01	6.28	-	-	-	Shim Pin: LSP-2
	LR	-10C	8.5	3.18	6.3	6.3	4.7	-	-	-	Shim Pin: LSP-1
		-12C	10.0	3.18	6.3	6.3	4.7	-	-	-	
		-16C	16.0	3.18	7.9	8.01	6.28	-	-	-	Shim Pin: LSP-2
	LS	-32	9.47	3.2	1.3	6.18	4.68	R0.8	-	-	Shim Pin: LSP-1
		-42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin: LSP-2
	LT	-3K	8.53	2.7	1.0	6.1	5.13	R0.8	-	-	Shim Pin: LSP-2K
		-32	9.47	2.7	1.3	6.18	4.68	R0.8	-	-	Shim Pin: LSP-1
		-32N	9.47	2.7	1.3	6.18	4.68	R0.8	-	-	Shim Pin: LSP-1
		-32N-20		2.7	1.3	6.18	4.68	R2.0	-	-	
		-42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin: LSP-2
		-42N	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	
	LW	-32	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim Pin: LSP-1
		-32N	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	
		-42	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim Pin: LSP-2
		-42N	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	
	LW	-42 <sup>R/L</sup>	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R...shows Right-hand, L...shows Left-hand Shim Pin: LSP-2
		-42N <sup>R/L</sup>	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R...shows Right-hand, L...shows Left-hand Shim Pin: LSP-2
	MSD	-42	10.7	3.18	1.85	7.0	3.3	-	20°	45°	Shim Screw: SP3X8
	MSE	-4245S	10.3	3.18	2.0	6.0	5.0	-	20°	45°	Shim Screw: SP4X9
	MSE	-4215	10.53	3.18	1.5	6.4	3.4	-	25°	15°	Shim Screw: SP3X8
		-4245	10.53	3.18	1.5	6.4	3.4	-	25°	45°	Shim Screw: SP3X8

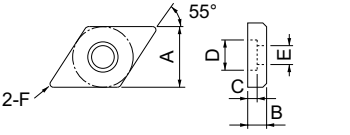
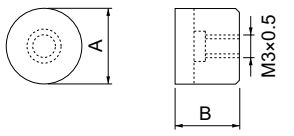
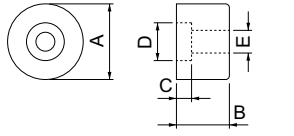
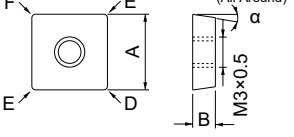
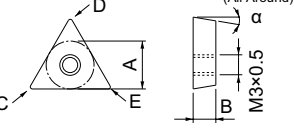
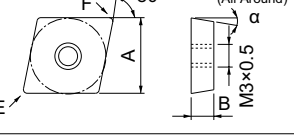
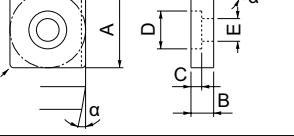
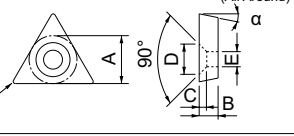
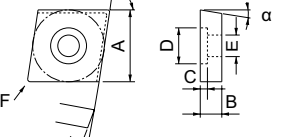
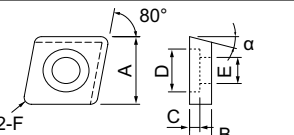
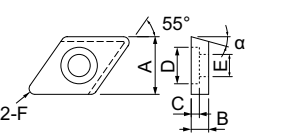
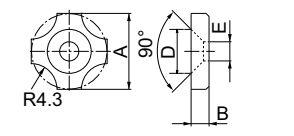


# Shims

Shape	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	$\alpha$	$\theta$	
	<b>MSO -4T245</b>	10.0	2.0	4.7	6.4	4.8	-	27°	45°	Shim Screw: SP3X6
	<b>MSO -5200</b>	12.6	3.18	1.8	8.0	6.5	R0.8	15°	-	Shim Screw: SPW-6045
	<b>MSP -42</b>	11.3	3.18	1.85	7.0	3.3	-	11°	15°	Shim Screw: SP3X8
	<b>MTE -42</b>	9.8	3.18	-	6.4	3.4	-	25°	-	Shim Screw: SP3X8
	<b>MVN -32</b>	9.525	3.2	2.1	7.4	6.5	R0.8	-	-	Lock Pin: TS-3S
	<b>SP -129</b>	9.52	9.52	R0.8	R1.6	R1.2	R1.6	-	-	Shim Screw: HH3X12
	<b>SP -141</b>	12.7	4.0	2.4	6.2	3.3	R1.2	-	-	Shim Screw: M3X8
	<b>-143</b>	12.7	7.2	2.4	6.2	3.3	R1.2	-	-	Shim Screw: M3X12
	<b>-162</b>	15.8	6.0	3.4	8.0	4.4	R1.5	-	-	Shim Screw: M4X10
	<b>SP -148</b>	12.7	8.8	2.4	6.2	3.3	R1.2	-	-	Shim Screw: BH3X12
	<b>SP -219</b>	6.35	9.52	R0.8	R1.2	R1.6	-	-	-	Shim Screw: HH3X12
	<b>SP -221</b>	9.52	4.0	2.5	6.5	3.5	R1.2	-	-	Shim Screw: M3X8
	<b>-223</b>	9.52	7.2	2.5	6.5	3.5	R1.2	-	-	Shim Screw: M3X12
	<b>SP -342</b>	12.7	6.0	2.5	6.5	3.5	R1.2	-	75°	Shim Screw: M3X8
	<b>-441</b>	12.7	4.0	2.5	6.5	3.5	R0.8	-	80°	Shim Screw: M3X8
	<b>-443</b>	12.7	7.2	2.5	6.5	3.5	R0.8	-	80°	Shim Screw: M3X12
	<b>-454</b>	15.7	8.0	3.4	8.0	4.5	R1.6	-	80°	Shim Screw: M4X10
	<b>SP -429</b>	9.52	9.52	-	-	-	R1.2	-	-	Shim Screw: HH3X12

P

Spare Parts

Shape	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	$\alpha$	$\theta$	
	SP -521	10.0	4.0	2.5	6.0	3.4	R1.2	-	-	Shim Screw: M3X8
	-523		7.2							Shim Screw: M3X12
	-541	12.7	4.0	2.5	6.0	3.4	R1.2	-	-	Shim Screw: M3X8
	-543		7.2							Shim Screw: M3X12
	SP -826	9.5	7.9	-	-	-	-	-	-	Shim Screw: HH3X12
	-829	9.52	9.52	-	-	-	-	-	-	
	SP -841	12.7	4.0	2.4	6.2	3.3	-	-	-	Shim Screw: M3X8
	-843	12.7	7.2	2.4	6.2	3.3	-	-	-	Shim Screw: M3X12
	-849	12.7	8.8	2.4	6.2	3.3	-	-	-	Shim Screw: BH3X12
	-861	15.8	6.0	3.4	8.0	4.4	-	-	-	Shim Screw: M4X10
	SP -130A	9.525	3.2	-	R0.4	R0.8	R1.2	8°	-	Shim Screw: BH3X12
	SP -210A	6.35	3.2	R0.4	R0.8	R1.2	-	8°	-	Shim Screw: BH3X6
	SP -420A	9.525	3.22	-	-	R0.8	R1.2	8°	-	Shim Screw: BH3X6
	SP -141P	12.6	4.0	2.5	6.5	3.5	R1.2	7°	-	Shim Screw: M3X8
	-143P	12.7	7.2	2.4	6.2	3.3	R1.2	7°	-	Shim Screw: M3X12
	SP -230P	8.3	3.2	2.0	7.2	3.2	R0.5	7°	-	Shim Screw: SP3X10
	SP -341P	12.6	4.0	2.5	6.5	3.5	R1.2	7°	-	Shim Screw: M3X8
	SP -441P	12.7	4.0	2.5	6.3	3.5	R1.2	11°	-	Shim Screw: M3X8
	-443P		7.2							Shim Screw: M3X12
	SP -521P	10.0	4.0	2.5	6.0	3.5	R1.2	11°	-	Shim Screw: M3X8
	-523P		7.2							Shim Screw: M3X12
	SP -RC	12.6	3.0	-	7.35	3.35	-	-	-	Shim Screw: SP3X8



# Shims / Cartridges

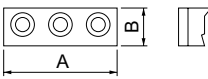
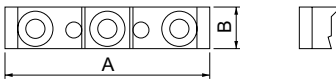
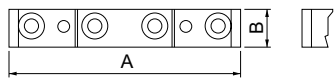
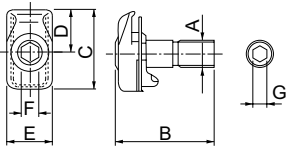
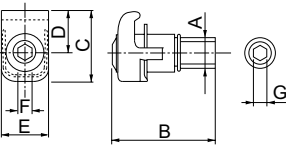
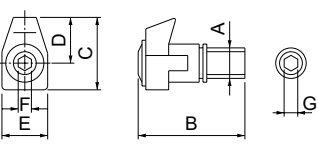
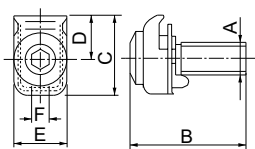
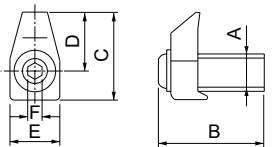
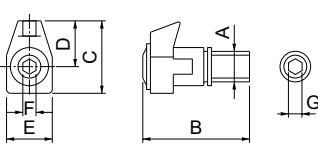
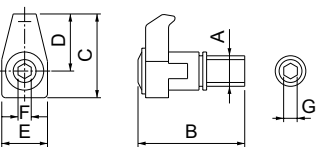
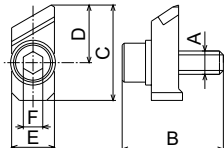
Shape Handed Spare Parts show Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	$\alpha$	$\theta$	
	<b>SVN -32</b>	8.0	3.18	1.5	3.1	2.3	R0.4	-	-	Shim Screw: SB-2050TR
	<b>SVN -32N</b>	8.2	3.18	1.5	7.0	5.9	R0.6	-	-	Shim Screw: SS-4N
	<b>TN -32</b>	9.52	3.2	6.5	7.0	4.2	R0.4	-	-	Shim Screw: SP3X8
	<b>-43</b>	12.70	3.2	8.1	7.0	4.2	R0.5	-	-	
	<b>TNW -32</b>	9.52	3.2	4.8	7.0	4.2	-	-	-	Shim Screw: SP3X8
	<b>WTN -33</b>	9.52	4.76	2.5	7.0	5.3	R0.8	-	-	Shim Pin: WP-1S
	<b>-33-20</b>						R2.0			
	<b>WWN -42</b>	12.7	3.0	1.4	7.0	5.3	R1.2	-	-	Shim Pin: WP5X15
	<b>WWP -42</b>	12.7	3.0	1.5	8.3	5.3	R1.2	11°	-	Shim Pin: WP5X11
	<b>-42-16</b>						R1.6			
	<b>MAP -2506</b>	-	9.5	14.9	20	-	-	5°	-	Clamp Screw: SB-40140TR
	<b>LSD -445R</b>	12.7	13.0	20.0	26.5	-	-	20°	45°	Dimension A shows I.D. of Insert
	<b>LSE -445R</b>	12.7	13.0	19.5	26.0	-	-	20°	45°	
	<b>LSO -445R</b>	13.494	12.0	21.3	23.5	-	-	27°	45°	
	<b>LSP -415R</b>	12.7	13.0	18.0	26.0	-	-	15°	15°	
	<b>LTE -490R</b>	12.7	12.0	17.0	30.0	-	-	15°	-	Dimension A shows I.D. of Insert

P

Spare Parts



# Clamp Sets

Shape Handed Spare Parts show Right-hand	Description	Dimension (mm)								Remarks
		A	B	C	D	E	F	G		
	<b>BCS -1</b>	64.0	13.0	-	-	-	-	-		
	<b>-5</b>	48.0	16.5	-	-	-	-	-		
	<b>BCS -2</b>	74.0	15.0	-	-	-	-	-		
	<b>-3</b>	88.0	16.0	-	-	-	-	-		
	<b>BCS -4</b>	98.0	16.0	-	-	-	-	-		
	<b>CE -010</b>	M8X1.25	28.0	24.0	6.5	13.0	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts	
	<b>-220</b>			27.0	15.8	15.0				
	<b>CE -020</b>	M8X1.25	30.0	17.0	10.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts	
	<b>CE -030</b>	M8X1.25	30.0	19.0	12.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts	
	<b>-040</b>			22.5	16.0					
	<b>CE -320</b>	M6X1.0	20.0	18.2	9.7	12.7	4.0	-		
	<b>CE -360S</b>	M6X1.0	16.0	18.0	10.55	12.4	4.0	-		
	<b>CE -030A</b>	M8X1.25	30.0	20.0	13.7	12.7	4.0	-	G: Indicates hexagon hole two side widths of back side of bolts	
	<b>CE -410</b>	M8X1.25	30.0	26.0	19.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts	
	<b>-430</b>			29.0	22.5					
	<b>CP -RC<sup>R/L</sup></b>	M6X1.0	20.0	24.5	14.8	11.0	5.0	-	R...shows Right-hand, L...shows Left-hand	

P



Spare Parts

# Clamp Sets

Shape Handed Spare Parts show Right-hand	Description	Dimension (mm)							Remarks
		A	B	C	D	E	F	G	
	<b>CPS -1</b>	M3X0.5	9.0	10.0	5.2	5.5	2.0	-	
	<b>CPS -2</b>	M5X0.8	14.5	14.0	8.5	6.8	2.5	2.5	G: Indicates hexagon hole two side widths of back side of bolts
	<b>-2P</b>		18.0						
	<b>-3</b>	M6X1.0	19.0	16.5	10.0	8.8	3.0	3.0	
	<b>CPS -2S</b>	M5X0.8	13.5	14.0	8.5	6.8	T15	2.5	G: Indicates hexagon hole two side widths of back side of bolts
	<b>-2TR</b>		15.0						
	<b>CPS -4V</b>	M4X0.7	8.9	11.3	7.3	8.0	T10	-	G: Indicates hexagon hole two side widths of back side of bolts
	<b>-5F</b>	M5X0.8	11.3	12.7	7.5	10.3	T15	2.5	
	<b>-5S</b>		18.0	15.0	9.5	11.0			
	<b>-5V</b>		13.5	12.7	7.5	10.3			
	<b>CPS -6F</b>	M6X1.0	16.5	15.6	9.5	12.2	3.0	-	G: Indicates hexagon hole two side widths of back side of bolts
	<b>-6M</b>		18.5	17.5	11.0	13.0			
	<b>-6S</b>			18.0	12.0	12.0			
	<b>-6V</b>			15.6	9.5	12.2			
	<b>-8V</b>	M8X1.25	24.0	20.8	13.0	15.5	4.0	4.0	
	<b>CPS -5E</b>	M5X0.8	13.5	17.5	12.0	9.0	T15	2.5	G: Indicates hexagon hole two side widths of back side of bolts
	<b>CPS -5<sup>R/L</sup></b>	M5X0.8	18.0	17.5	12.0	9.0	2.5	2.5	G: Indicates hexagon hole two side widths of back side of bolts R...shows Right-hand, L...shows Left-hand
	<b>LGBA -16<sup>R/L</sup>S</b>	M5X0.8	15.0	16.1	11.2	9.85	T15	2.0	G: Indicates hexagon hole two side widths of back side of bolts R...shows Right-hand, L...shows Left-hand
	<b>-22<sup>R/L</sup>S</b>			17.6	12.7				
	<b>WCS -1N</b>	M6X1.0	21.0	16.7	-	15.0	3.0	-	
	<b>WCS -8</b>	M6X1.0	21.0	19.4	-	15.0	3.0	-	

P

Spare Parts

# Clamps

Shape Handed Spare Parts show Right-hand	Description	Dimension (mm)						Angle (°)		Remarks	
		A	B	C	D	E	F	α	θ		
	<b>C    17R</b>	12.2	19.5	14.3	8.5	M8X1.25 (L-hand Thread)	-	12°	-	Clamp Screw: W8X18	
	<b>C    20R</b>	15.1	15.5	15.0	7.5	5.3	-	10°	-	Clamp Screw: TH8X15	
	<b>CH   -20R</b>	13.1	15.5	14.8	7.5	5.3	-	10°	-	Clamp Screw: TH8X15	
	<b>C    25R</b>	13.2	15.5	15.0	7.5	5.3	-	10°	-	Clamp Screw: TH8X15	
	<b>CE    -111</b>	35.0	25.0	10.0	8.0	3.0	10.0	-	-	Right-Hand	
	<b>-121</b>							-	-	Left-hand	
	<b>-131</b>							-	-	Right-Hand	
	<b>-141</b>							-	-	Left-hand	
	<b>CGA   -3<sup>R/L</sup></b>	24.0	17.66	12.0	6.2	1.9	11.0	-	-	R...shows Right-hand, L...shows Left-hand	
	<b>-4<sup>R/L</sup></b>	24.0	17.66	12.0	6.2	2.9	11.0	-	-		
	<b>-5<sup>R/L</sup></b>	27.5	18.66	12.0	6.2	3.9	14.5	-	-		
	<b>CGB   <sup>R/L</sup></b>	19.0	14.0	8.2	6.35	9.5	-	-	-	R...shows Right-hand, L...shows Left-hand	
	<b>CGH   -1<sup>R/L</sup></b>	25.0	22.0	8.0	6.05	3.0	5.5	-	-	R...shows Right-hand, L...shows Left-hand	
	<b>-2<sup>R/L</sup></b>	29.0	23.0	8.5		5.0					
	<b>-3<sup>R/L</sup></b>	29.0	23.0	8.5		6.0					6.0
	<b>CGIA   -3R</b>	10.7	17.0	10.5	5.2	1.8	2.0	-	-		
	<b>-4R</b>					2.5					
	<b>-5R</b>	15.7									3.5
	<b>CP    -2D</b>	-	11.2	21.6	-	10.4	-	-	-		
	<b>-3D</b>	-	12.0	27.6		14.0					
	<b>-5D</b>	-	13.0	32.0							
	<b>CP    -8TE</b>	17.9	12.0	12.0	M8X1.25 (L-hand Thread)	10.0	-	15°	-		
	<b>CP    -8W</b>	20.9	12.0	8.0	M8X1.25 (L-hand Thread)	13.0	-	3°	-		

P



Spare Parts

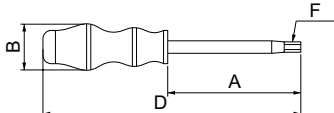
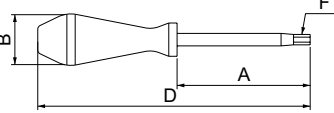
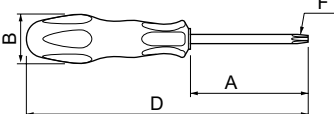
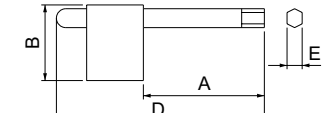
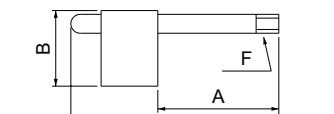
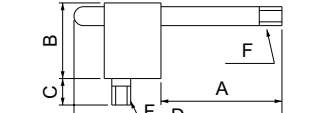
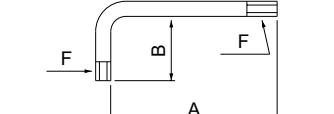
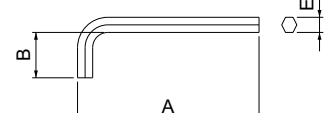
# Chipbreakers

Shape Handed Spare Parts show Right-hand	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	$\alpha$	$\theta$	
	<b>CB -11</b>	11.5	12.7	3.5	-	-	-	-	-	
	<b>-51</b>	16.0	15.6	3.5	-	-	-	-	-	
	<b>CB -12</b>	13.8	12.7	3.5	-	-	-	-	-	Right-hand
	<b>-13</b>	13.8	12.7	3.5	-	-	-	-	-	Left-hand
	<b>CB -14</b>	18.51	12.7	3.5	-	-	-	-	-	Right-hand
	<b>-15</b>	18.51	12.7	3.5	-	-	-	-	-	Left-hand
	<b>CB -16</b>	18.0	12.7	3.5	-	-	-	-	-	
	<b>-17</b>	21.0	15.6	3.5	-	-	-	-	-	
	<b>CB -S3220</b>	7.94	7.94	1.0	2.0	-	-	-	-	
	<b>-S4220</b>	11.12	11.12	2.0	2.0	-	-	-	-	
	<b>CB -T2212</b>	7.48	-	1.5	1.2	-	-	-	-	
	<b>-T3220</b>	10.87	-	2.0	2.0	-	-	-	-	

P

Spare Parts

# Wrenches

Shape	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	<b>DT</b> -7	44	16	-	114	-	T7	-	-	Torx
		70	26	-	150	-	T8	-	-	
	<b>DT</b> -10	70	29	-	160	-	T10	-	-	Torx
	-15	70	32	-	170	-	T15	-	-	
	-20	90	32	-	190	-	T20	-	-	
	-25	82	36	-	190	-	T25	-	-	
	<b>DTM</b> -6	39	17	-	113	-	T6	-	-	Top of Torx is magnetized
	-7	40	17	-	115	-	T7	-	-	
	-8	70	24	-	150	-	T8	-	-	
	-10	70	28	-	167	-	T10	-	-	
	-15	70	31	-	174	-	T15	-	-	
	<b>DTP</b> -15	81	33	-	186	-	15IP	-	-	○○ IP shows Torx Plus
	-20	100			206		20IP			
	<b>FH</b> -2	42	20	-	73	2.0	-	-	-	Hexagon
	-2.5	42	20	-	73	2.5	-	-	-	
	<b>FT</b> -6	30	20	-	65	-	T6	-	-	Torx
	-7	34	15	-	62	-	T7	-	-	
	-8	35	20	-	74	-	T8	-	-	
	-10	40	20	-	74	-	T10	-	-	
	<b>FT</b> -15	43	25.0	10.0	80	-	T15	-	-	Torx
	<b>LTW</b> -8SS	45	6.0	-	-	-	T8	-	-	Torx
	-10S	65	10.0	-	-	-	T10	-	-	
	-10SS	50	7.0	-	-	-	T10	-	-	
	-15S	65	10.0	-	-	-	T15	-	-	
	-20	57	20.0	-	-	-	T20	-	-	
	<b>LW</b> -1.5	45	14	-	-	1.5	-	-	-	Hexagon
	-2	50	16	-	-	2.0	-	-	-	
	-2.5	56	18	-	-	2.5	-	-	-	
	-3	63	20	-	-	3.0	-	-	-	
	-4	70	25	-	-	4.0	-	-	-	
	-4.5	78	26	-	-	4.5	-	-	-	
	-5	80	28	-	-	5.0	-	-	-	
	-6	90	32	-	-	6.0	-	-	-	
	-8	109	36	-	-	8.0	-	-	-	
	-10	112	40	-	-	10.0	-	-	-	
	-14	140	56	-	-	14.0	-	-	-	
	-17	160	63	-	-	17.0	-	-	-	
	-19	180	70	-	-	19.0	-	-	-	

## Reference

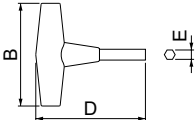
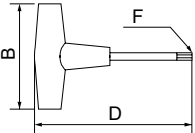
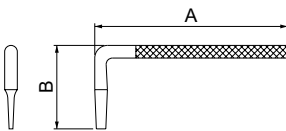
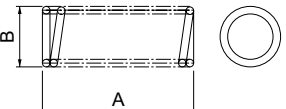
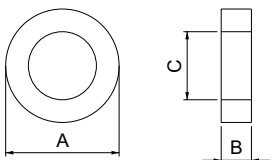
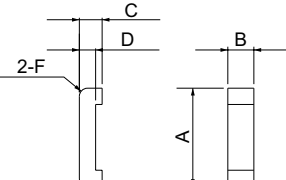
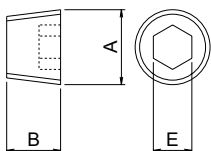
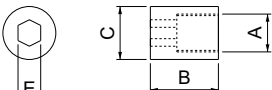
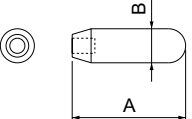
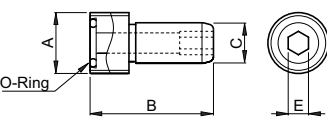
L-shape type (LTP-10, LTP-15: described in **F64** and **F65**) is Torx Plus.

Screwdriver type DTP-9 (described in **M126** and **M127**) is also Torx Plus.

P



Spare Parts

Shape	Description	Dimension (mm)						Angle (°)		Remarks
		A	B	C	D	E	F	α	θ	
	TH    -4	-	80	-	83	4.0	-	-	-	Hexagon
	TT    -15	-	70	-	138	-	T15	-	-	Torx
	TT    -25		70		70		T25			
	TT    -25L		80		145		T25			
	TT    -30		80		110		T30			
	TTC   -20	-	98	-	130	-	T20	-	-	
	TTC   -25						T25			
	LTK   -5	70	30	-	-	-	-	-	-	
	SP    -2D	8.5	5.6	-	-	-	-	-	-	Spring
	SP    -3D	12.0	7.0							
	SP    -5	12.0	6.7							
	SP    -5D	12.0	7.2							
	SP    -6	12.0	7.7							
	SP    -8	11.0	9.7							
	W    -6	11.5	1.6	6.4	-	-	-	-	-	Washer
	W    6-14	11.5	1.4	6.4						
	W    -8	15.5	1.6	8.4						
	WB   -5	10.0	1.0	5.3	-	-	-	-	-	Washer (Brass)
	WB   -6	11.5	1.6	6.4						
	WB   -8	15.5	1.6	8.4						
	WSP   -1	15.1	4.0	3.5	2.5	-	R1.25	-	-	Spacer
	GP    -1	PT1/8	7.0	-	-	5.0	-	-	-	Plug
	GP    -2	PT1/4	9.0	-	-	6.0	-	-	-	
	WN    -1	M5X8	10.0	7.0	-	3.0	-	-	-	Nut
	PC    -1	60.0	8.5	-	-	-	-	-	-	Punch
	PC    -2	65.0	10.0	-	-	-	-	-	-	
	CL    63-1	M18X1.0	36.5	12	-	6.0	-	-	-	Coolant Pipe
	CL    100-1	M24X1.5	44.0	16.0		8.0				