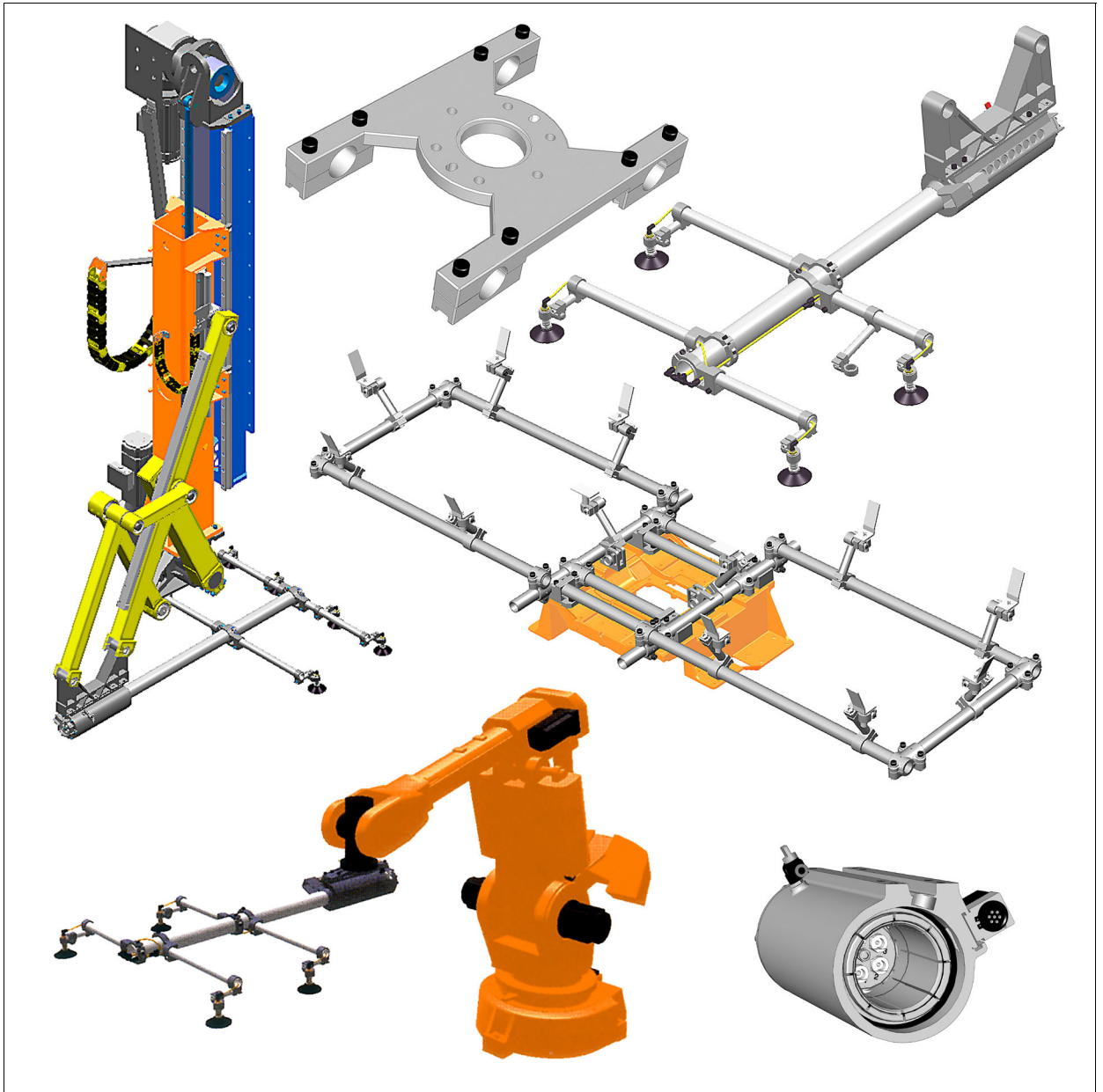


Line Automation Tooling



Automation Technologies

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1 Tooling for Feeders

1.1 Quick Change Adapter

The Quick Change Adapter is mainly made of molded and machined parts of aluminum. The inner cone is however made of steel. Viewed from the front, you can see the inner cone and the plate for five air connectors.

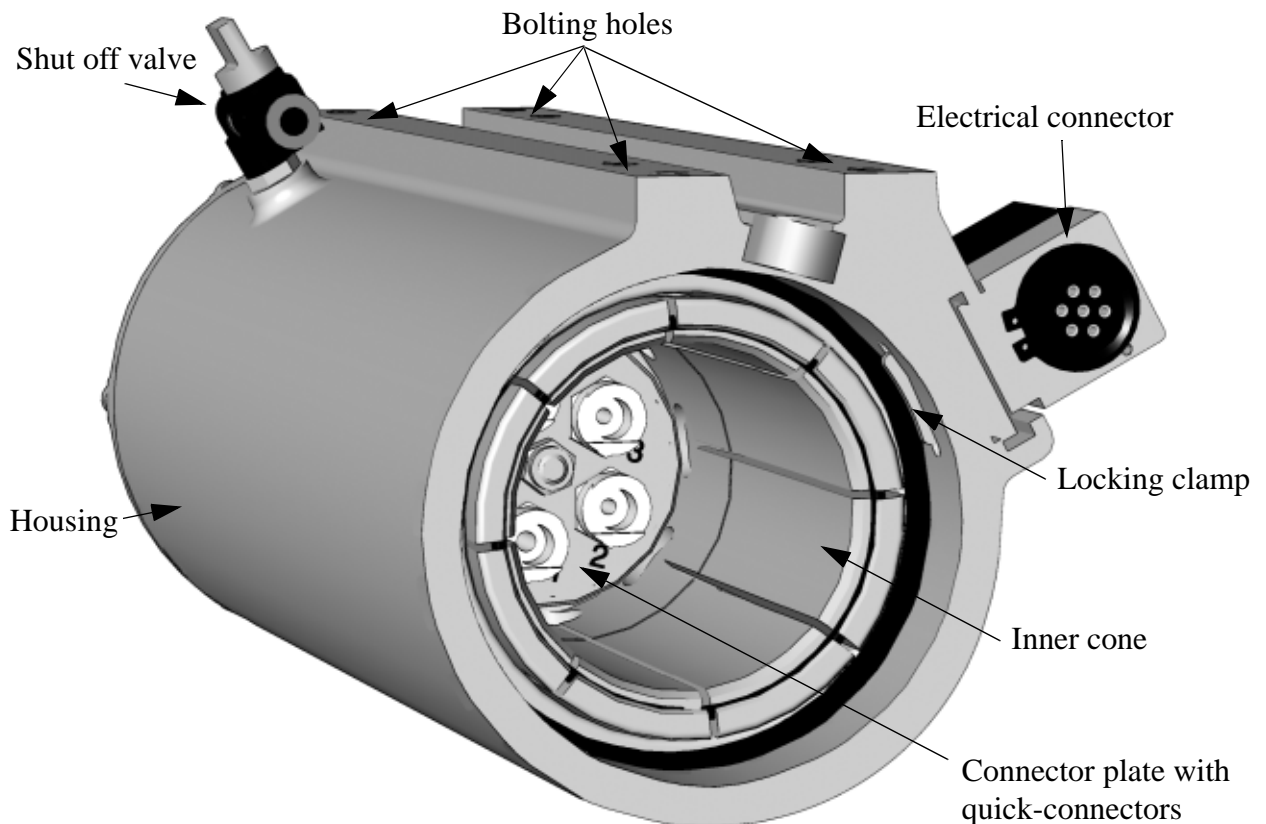
On top of the QCQ there is a mounting area including threaded holes for bolting to the manipulator. When the QCA is to be mounted on a robot, an adapter plate has to be fitted between the robot and the QCA.

The valve shuts off the compressed air supply to the QCA locking mechanism. The electrical connector is used for signals from switches on the tooling equipment. These switches are used for encoding of the stamping.

To enable the QCA to loosen its grip of the tooling shaft, compressed air need to be supplied. At loss of compressed air, the mechanism is locked.

When the compressed air is turned off, the inner cone is contracted by the internal springs and the tooling shaft is pulled into the QCA. At the same time the pneumatic components are connected to the valves and the electrical connection is made. When the inner cone is fully contracted a locking clamp secures the tooling shaft.

When compressed air is supplied, the springs are depressed, the locking clamp is released and the cone moves out releasing the tooling shaft.

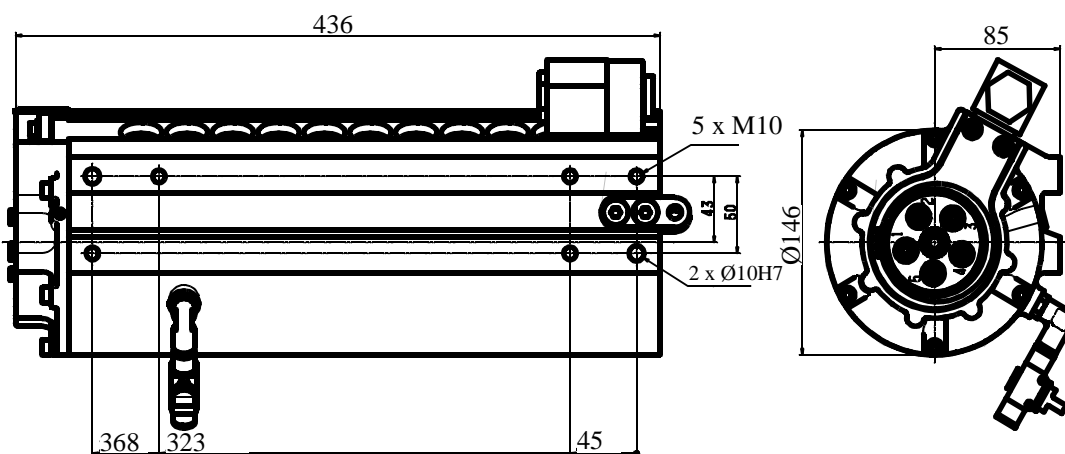


Material.....Aluminum

			Electrical female connectors and housing		
Part No.	Weight	Air connectors	No. of pins	House	Pinblock No.
91108510	16 kg	3 x $\varnothing 8$ + 2 x $\varnothing 10$	6	3045842	3045843
91111220	16 kg	3 x $\varnothing 8$ + 2 x $\varnothing 10$	18	3045842	3048888
91110794	16 kg	5 x $\varnothing 10$	6	3045842	3045843
91110795	16 kg	5 x $\varnothing 10$	18	3045842	3048888
91110796	16 kg	3 x $\varnothing 8$ + 2 x $\varnothing 10$	-	3045842	-
91110797	16 kg	5 x $\varnothing 10$	-	3045842	-

Minimum air pressure: 3 Bar.

Ambient temperature: 0 - 45°

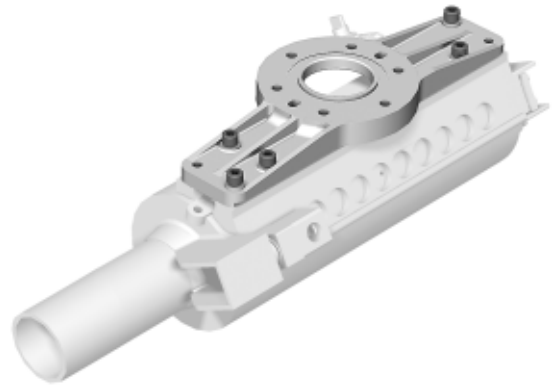


Electrical female connectors and housing		
House 3045842	Pinblock, 6-pin, 3045843	Pinblock, 18-pin, 3048888

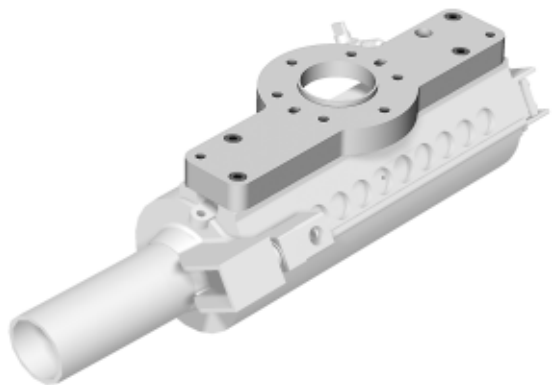
Filename: Kap1.fm, Mod date: 2005 04 07

1.2 Robot Attachment for Quick Change Adapter for Robot IRB 6400 (cast aluminum)

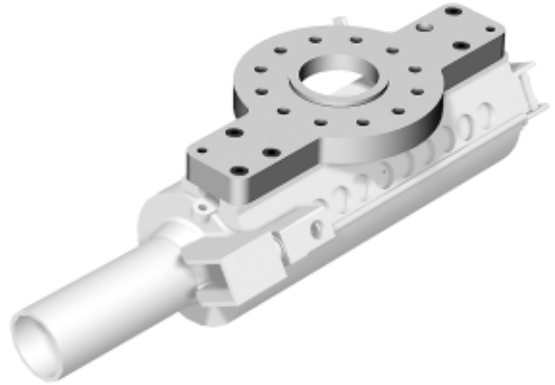
Part No. 9939563
Weight 1.378 kg
Material Aluminum
Tightening Torque for M10 47 Nm

**1.3 Robot Attachment for Quick Change Adapter for Robot IRB 6400**

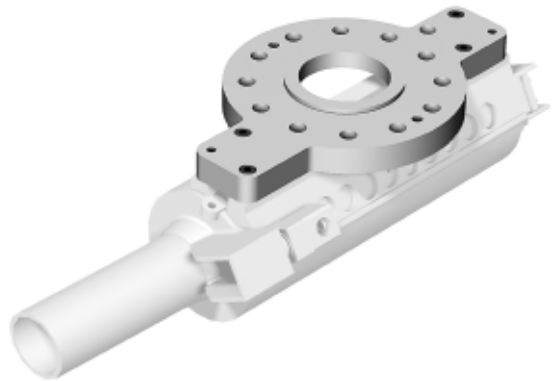
Part No. 91110782
Weight 2.232 kg
Material Aluminum
Tightening Torque for M10 47 Nm

**1.4 Robot Attachment for Quick Change Adapter for Robot IRB 6650**

Part No. 91110829
Weight 2.500 kg
Material Aluminum
Tightening Torque for M10 47 Nm

**1.5 Robot Attachment for Quick Change Adapter for Robot IRB 7600**

Part No. 91110781
Weight 2.640 kg
Material Aluminum
Tightening Torque for M10 47 Nm



1.6 Upper Tooling

6.1 Bayonet & Central Boom with clamping ring, see page 31

or

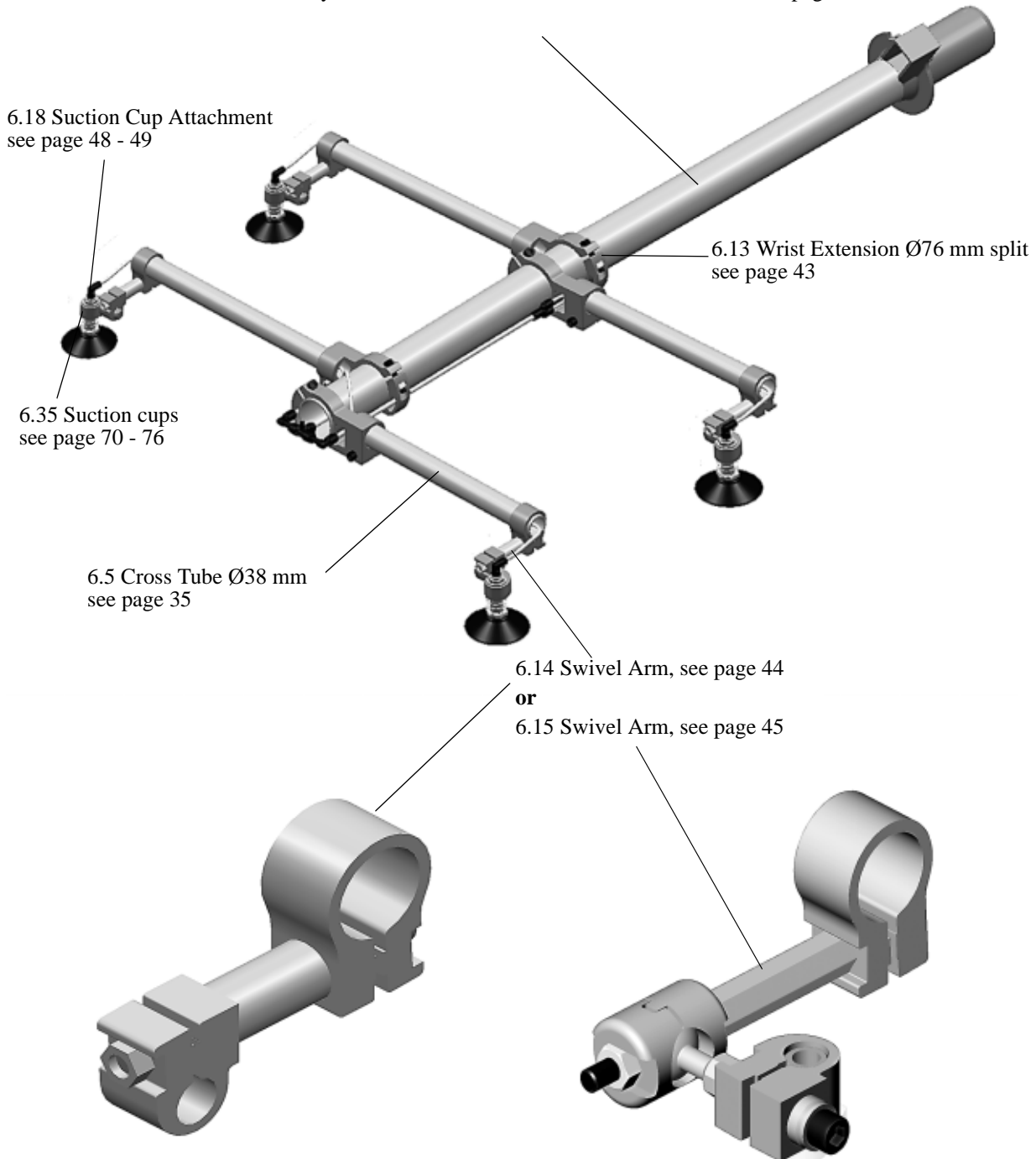
6.2 Bayonet & Central Boom, see page 32

or

6.3 Bayonet & Central Boom CPI- and BILSING-like with clamping ring, see page 33

or

6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34

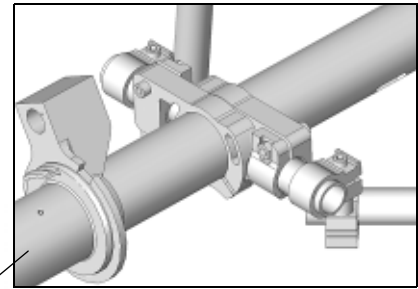


Filename: Kap1.fm, Mod date: 2005 04 07

1.7 Upper Tooling

6.18 Suction Cup Attachment
see page 48 - 49

6.5 Cross Tube Ø38 mm
see page 35



6.13 Wrist Extension Ø76 mm split
see page 43

6.35 Suction cups
see page 70 - 76

6.19 Support Anglemount
see page 51

6.33 Angle mounts
see page 66

6.1 Bayonet & Central Boom with clamping ring, see page 31

or

6.2 Bayonet & Central Boom, see page 32

or

6.3 Bayonet & Central Boom CPI- and BILSING-like with clamping ring, see page 33

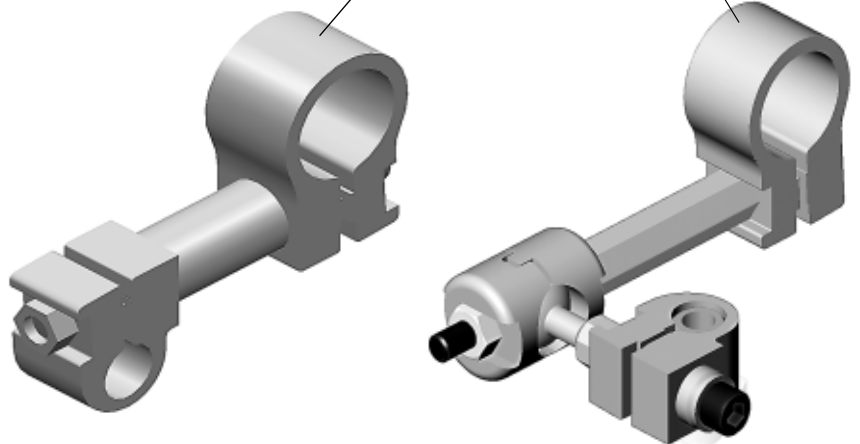
or

6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34

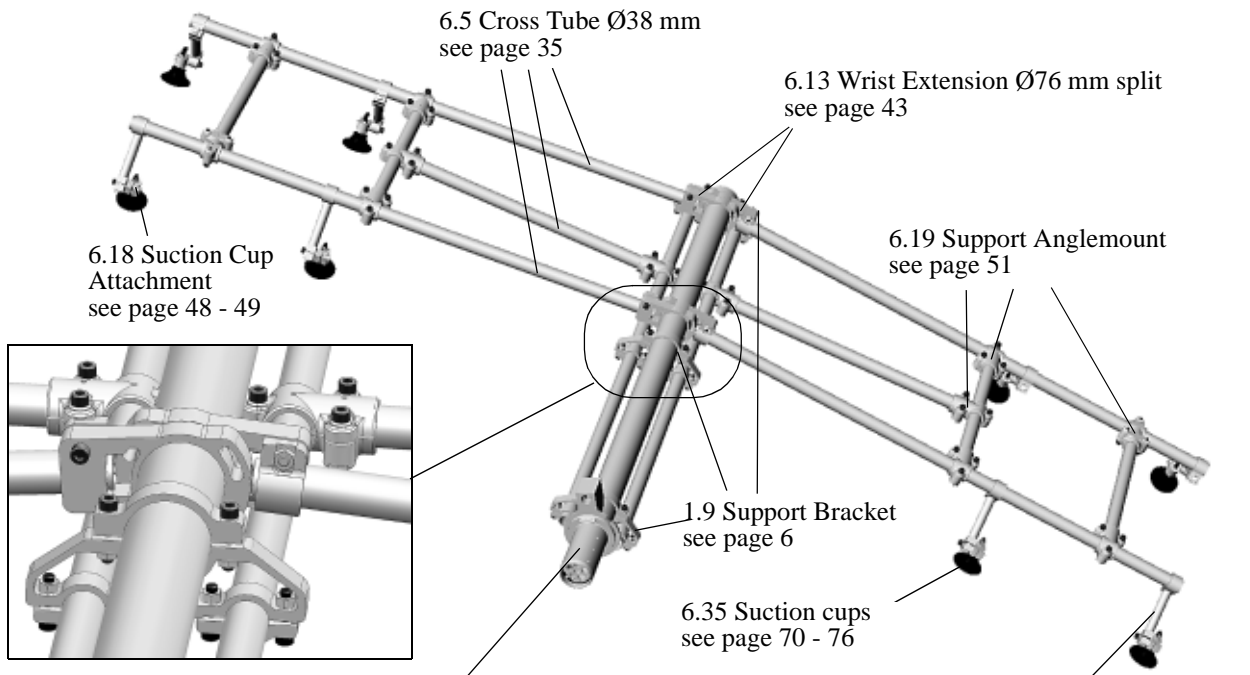
6.14 Swivel Arm, see page 44

or

6.15 Swivel Arm, see page 45



1.8 Upper Tooling



6.1 Bayonet & Central Boom with clamping ring, see page 31

or

6.2 Bayonet & Central Boom, see page 32

or

6.3 Bayonet & Central Boom CPI- and BILSING-like with clamping ring, see page 33

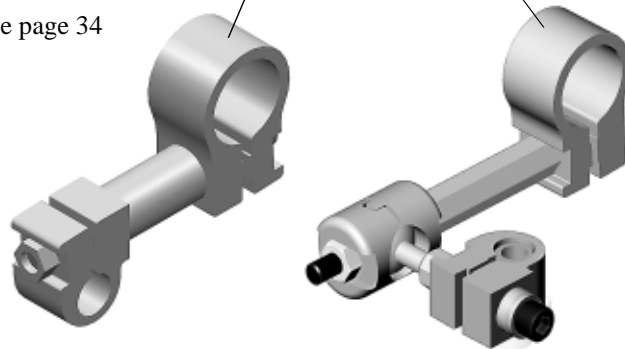
or

6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34

6.14 Swivel Arm, see page 44

or

6.15 Swivel Arm, see page 45



1.9 Support Bracket

Type:	Support Bracket		
Part number:	91111388		
Weight:	832 g		
Material:	Aluminum		
For central tube:	Ø76 mm		
For cross tube:	Ø38 mm × 2		

Filename: Kap1.fm, Mod date: 2005 04 07

1.10 Upper Tooling with Central Tube Spacer

6.1 Bayonet & Central Boom with clamping ring, see page 31

or

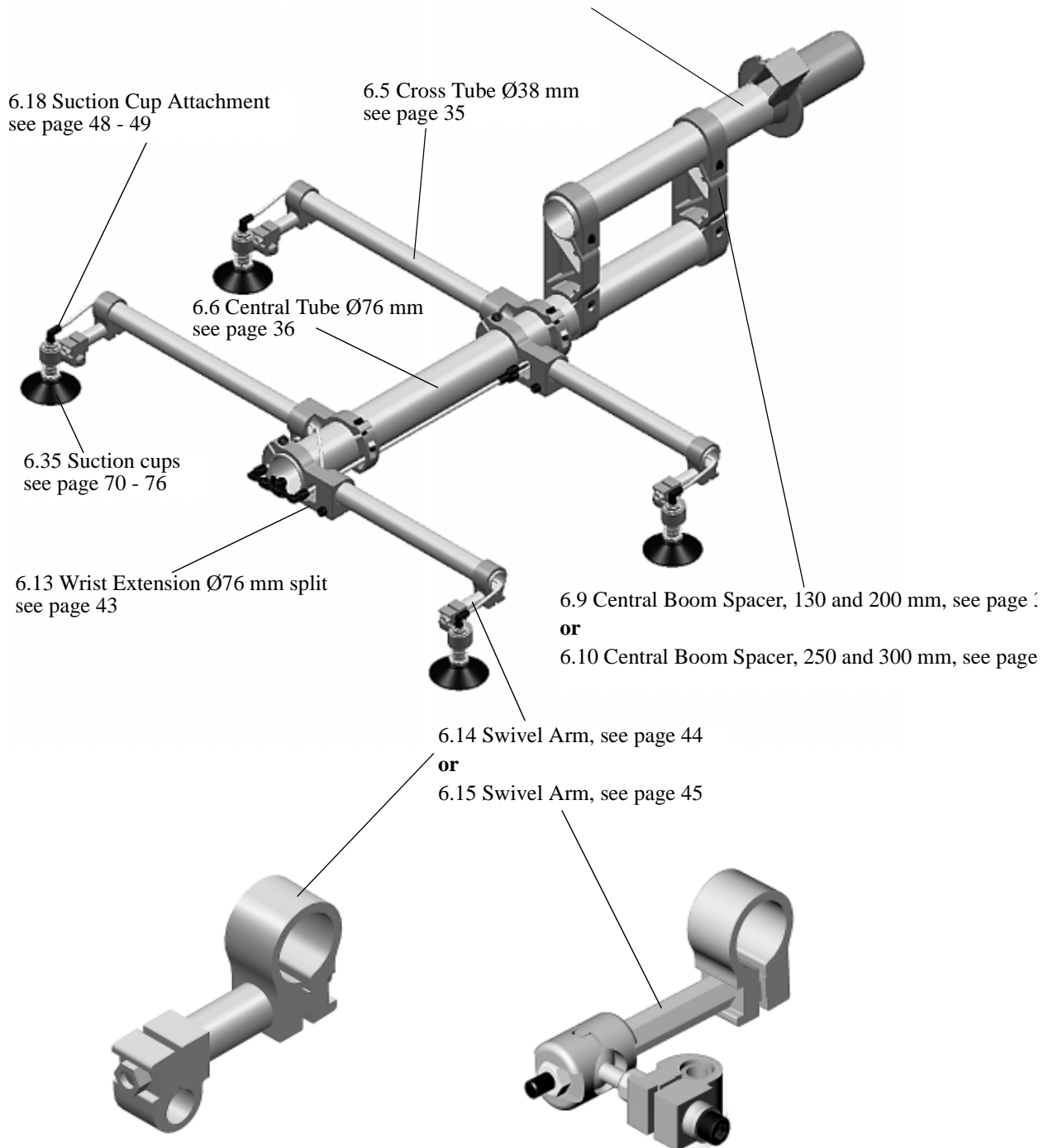
6.2 Bayonet & Central Boom, see page 32

or

6.3 Bayonet & Central Boom CPI- and BILSING-like with clamping ring, see page 33

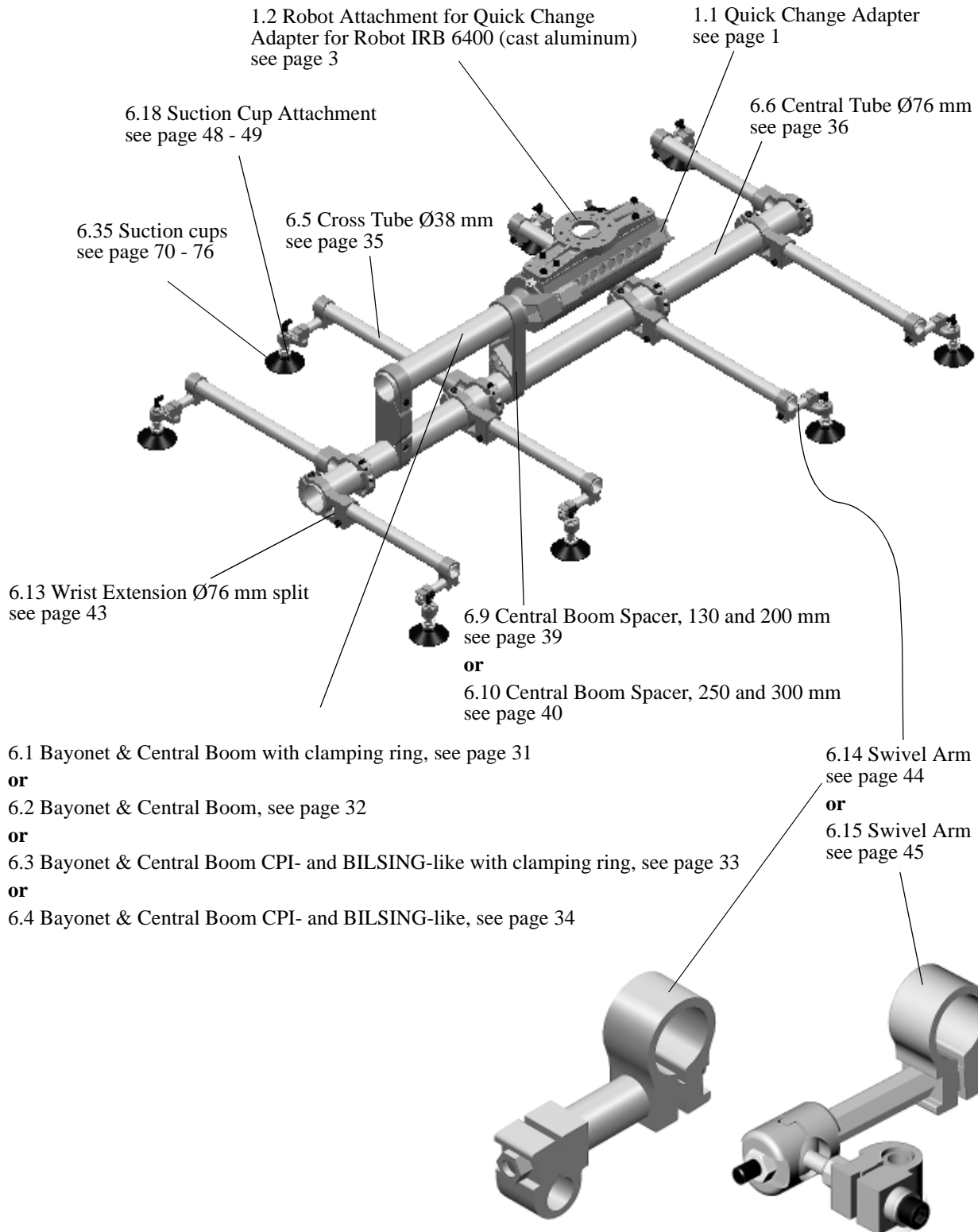
or

6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34



Filename: Kap1.fm, Mod date: 2005 04 07

1.11 Upper Tooling with Quick Change Adapter



Filename: Kap1.fm, Mod date: 2005 04 07

2 Tooling for Turning or Tipping Units

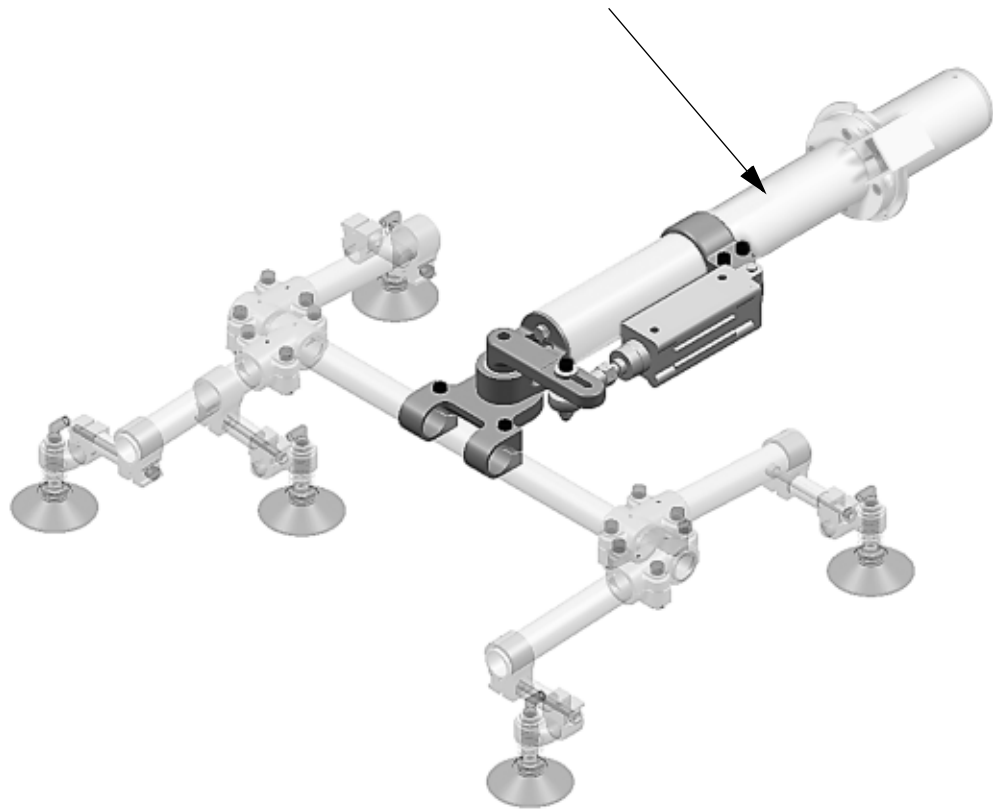
2.1 Turning Unit Cylinder Ø50, for mounting on Central Tube Ø76, for turning Cross Tube Ø38

Type	Part No.	Stroke	Turning Angle	
			Minimum	Maximum
Turning Unit Cyl. Ø50 - Ø38	9937126	50 mm	21.5°	38.0°
Turning Unit Cyl. Ø50 - Ø38	9937965	80 mm	34.5°	57.5°
Turning Unit Cyl. Ø50 - Ø38	9937966	100 mm	42.5°	69.5°
Turning Unit Cyl. Ø50 - Ø38	9937967	125 mm	55.0°	85.5°
Turning Unit Cyl. Ø50 - Ø76	9937968	160 mm	72.5°	112.5°

Central Tube is not included.
For type of Central Tube see:
6.2 Bayonet & Central Boom, see page 32

or

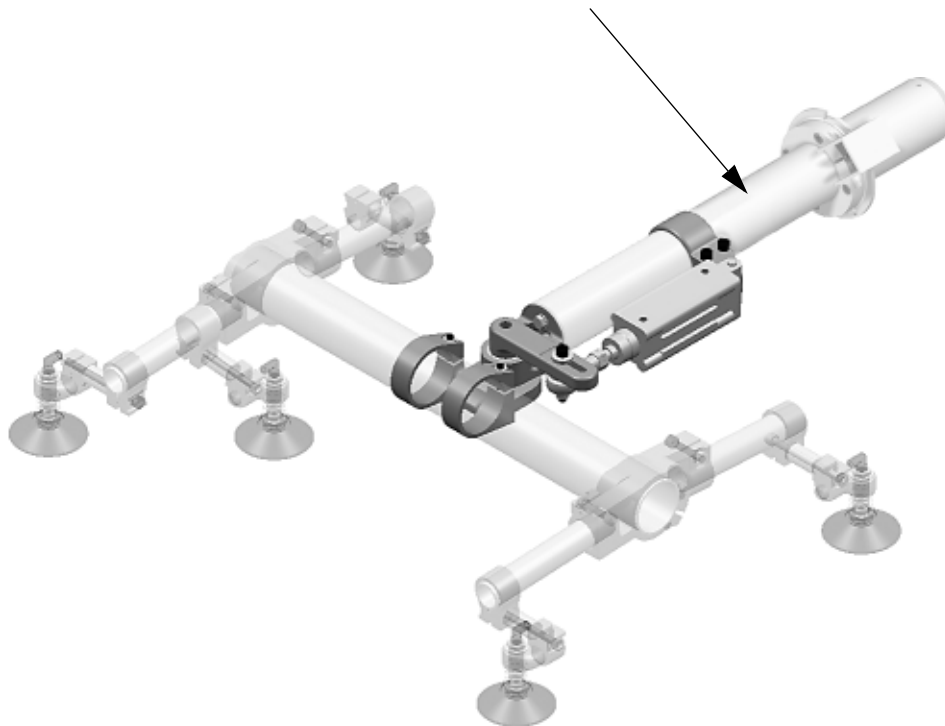
6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34



2.2 Turning Unit Cylinder Ø50, for mounting on Central Tube Ø76, for turning Central Tube Ø76 as the Cross Tube

Type	Part No.	Stroke	Turning Angle	
			Minimum	Maximum
Turning Unit Cyl. Ø50 - Ø76	9937125	50 mm	21.5°	38.0°
Turning Unit Cyl. Ø50 - Ø76	9937961	80 mm	34.5°	57.5°
Turning Unit Cyl. Ø50 - Ø76	9937962	100 mm	42.5°	69.5°
Turning Unit Cyl. Ø50 - Ø76	9937963	125 mm	55.0°	85.5°
Turning Unit Cyl. Ø50 - Ø76	9937964	160 mm	72.5°	112.5°

Central Tube is not included.
 For type of Central Tube see:
 6.2 Bayonet & Central Boom, see page 32
or
 6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34

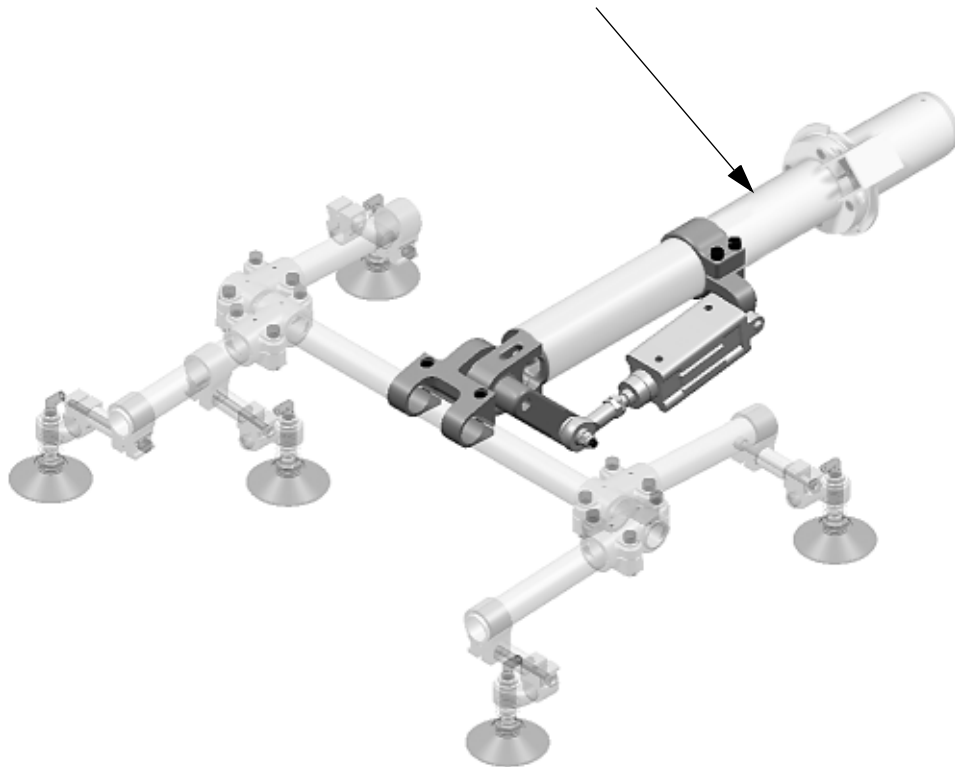


Filename: Kap2.fm, Mod date: 2005 04 07

2.3 Tipping Unit Cylinder Ø50, for mounting on Central Tube Ø76, for tipping Cross Tube Ø38

Type	Part No.	Stroke	Tipping Angle	
			Minimum	Maximum
Tipping Unit Cyl. Ø50 - Ø38	9937129	25 mm	11.5°	32.0°
Tipping Unit Cyl. Ø50 - Ø38	9937971	40 mm	16.0°	40.0°
Tipping Unit Cyl. Ø50 - Ø38	9937972	50 mm	22.5°	49.0°

Central Tube is not included.
 For type of Central Tube see:
 6.2 Bayonet & Central Boom, see page 32
or
 6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34



Filename: Kap2.fm, Mod date: 2005 04 07

2.4 Tipping Unit Cylinder Ø50, for mounting on Central Tube Ø76, for tipping Central Tube Ø76 as the Cross Tube

Type	Part No.	Stroke	Tipping Angle	
			Minimum	Maximum
Tipping Unit Cyl. Ø50 - Ø76	9937128	25 mm	11.5°	32.0°
Tipping Unit Cyl. Ø50 - Ø76	9937969	40 mm	16.0°	40.0°
Tipping Unit Cyl. Ø50 - Ø76	9937970	50 mm	22.5°	49.0°

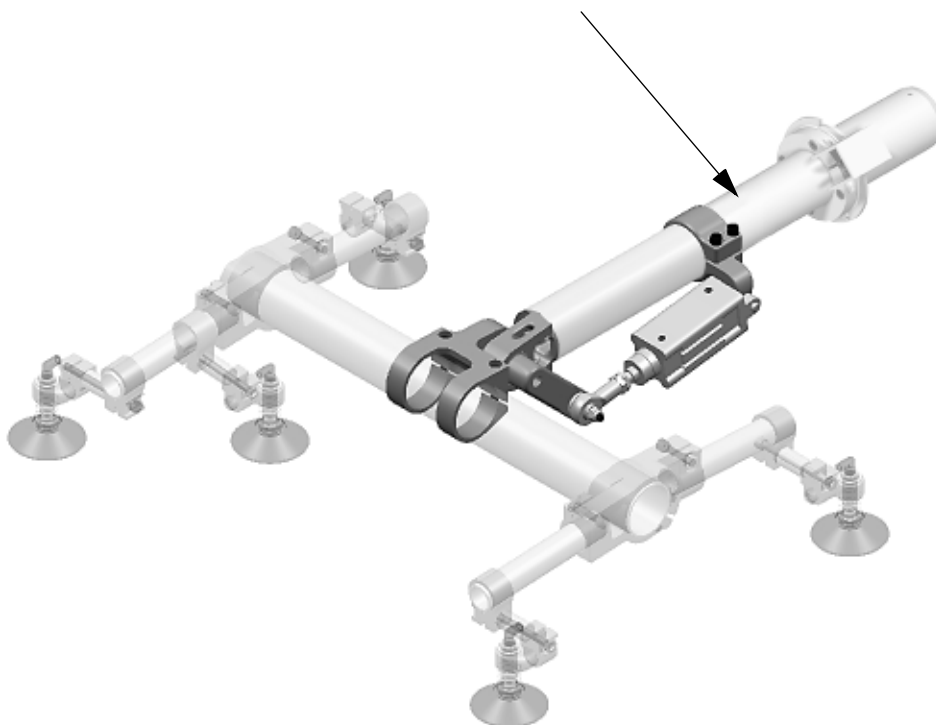
Central Tube is not included.

For type of Central Tube see:

6.2 Bayonet & Central Boom, see page 32

or

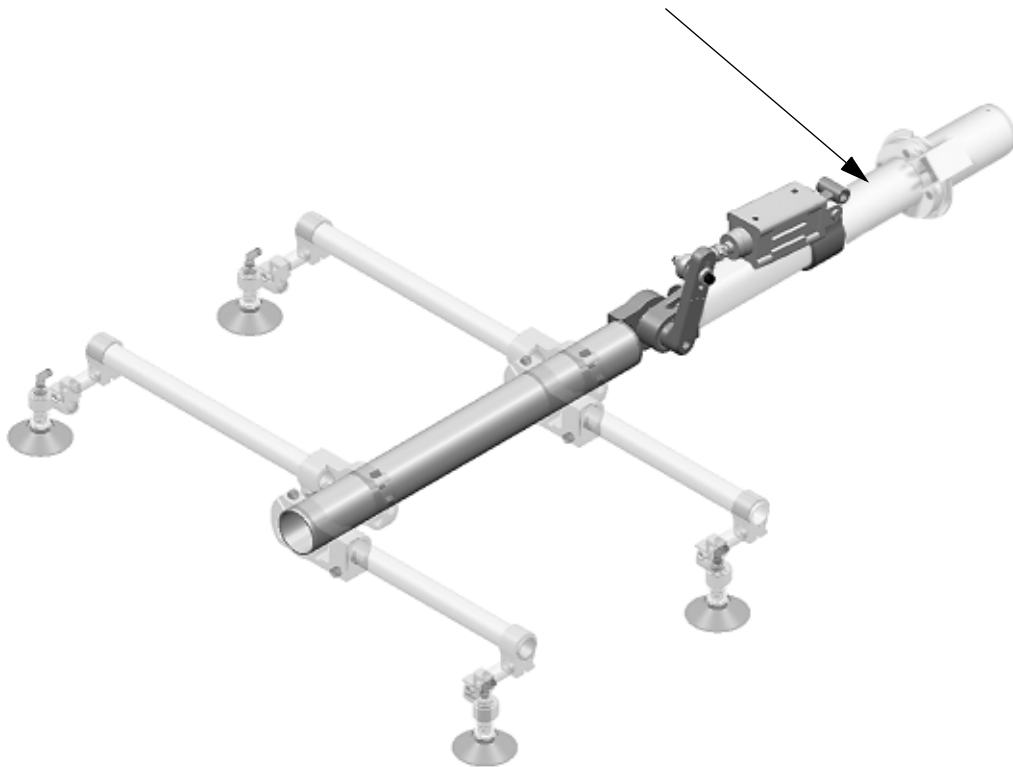
6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34



2.5 Tipping Unit Cylinder Ø63, for mounting on Central Tube Ø76, for tipping Central Tube Ø76 as the Cross Tube

Type	Part No.	Stroke	Tipping Angle	
			Minimum	Maximum
Tipping Unit Cyl. Ø63 - Ø76	9937512	25 mm	10.5°	14.5°
Tipping Unit Cyl. Ø63 - Ø76	9937959	40 mm	17.0°	24.0°
Tipping Unit Cyl. Ø63 - Ø76	9937960	50 mm	21.5°	30.5°

Central Tube is not included.
 For type of Central Tube see:
 6.2 Bayonet & Central Boom, see page 32
or
 6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34

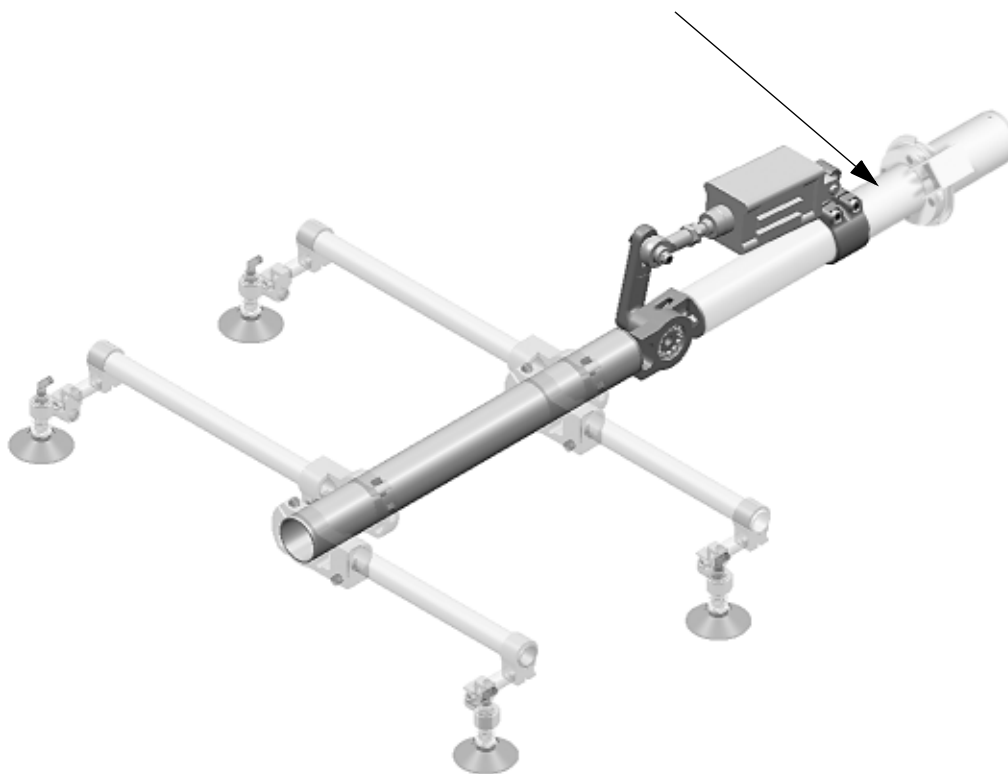


Filename: Kap2.fm, Mod date: 2005 04 07

2.6 Tipping Unit Cylinder Ø80, for mounting on Central Tube Ø76, for tipping Central Tube Ø76 as the Cross Tube

Type	Part No.	Stroke	Tipping Angle	
			Minimum	Maximum
Tipping Unit Cyl. Ø80 - Ø76	9937513	25 mm	11.0°	15.0°
Tipping Unit Cyl. Ø80 - Ø76	9937973	40 mm	17.5°	24.5°
Tipping Unit Cyl. Ø80 - Ø76	9937974	50 mm	21.5°	31.5°

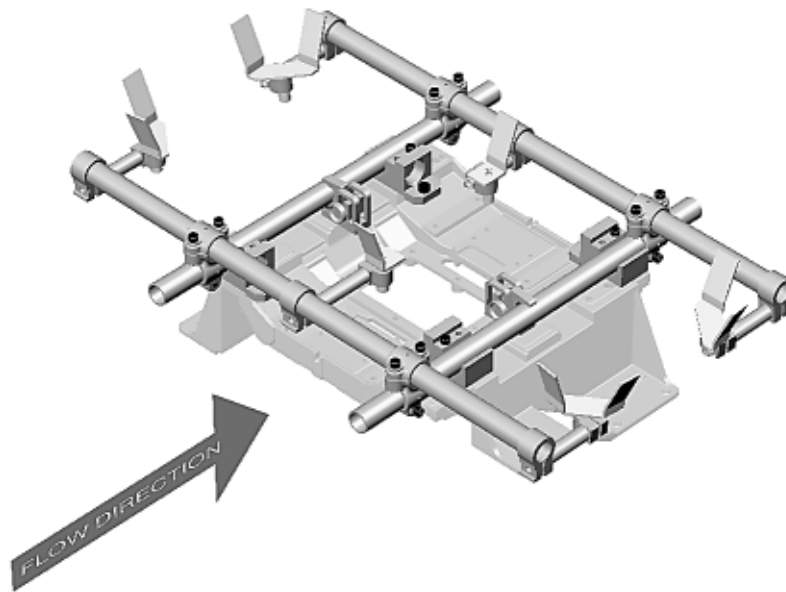
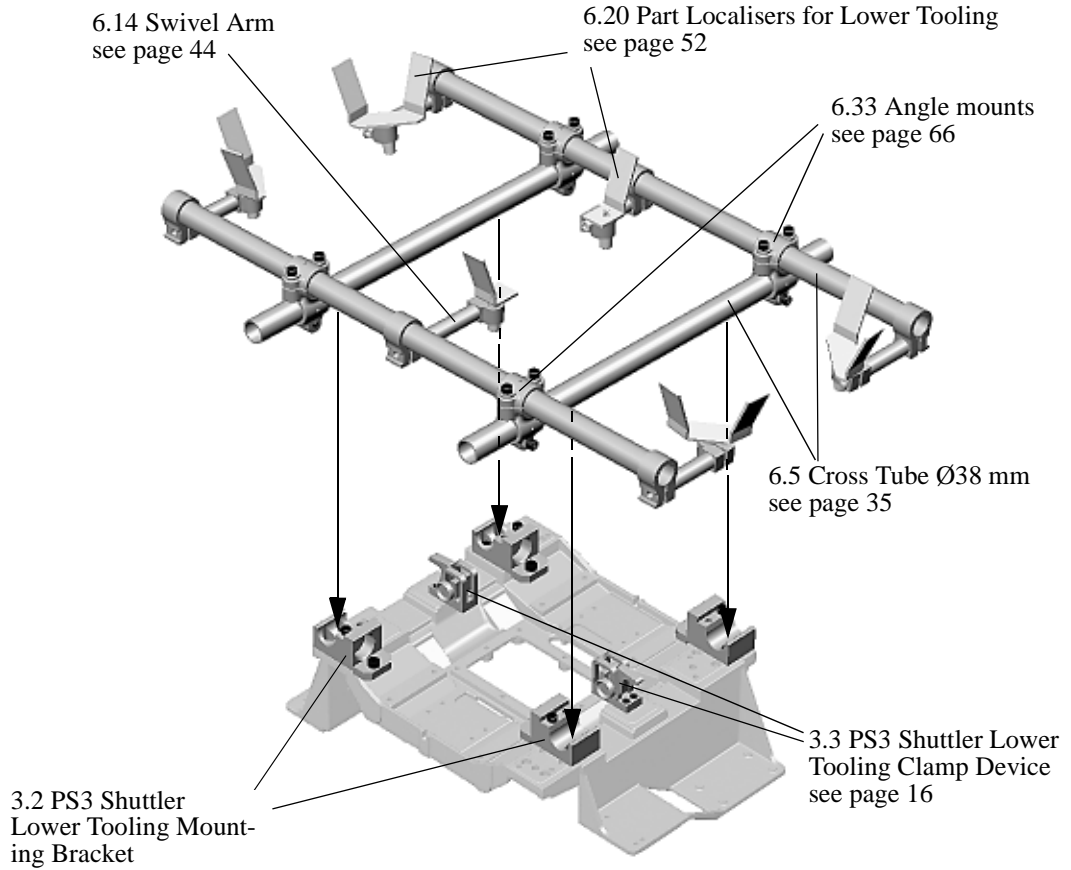
Central Tube is not included.
 For type of Central Tube see:
 6.2 Bayonet & Central Boom, see page 32
or
 6.4 Bayonet & Central Boom CPI- and BILSING-like, see page 34



Filename: Kap2.fm, Mod date: 2005 04 07

3 Tooling for Shuttlers

3.1 PS3 Shuttler Tooling Assembly



Filename: Kap3.fm, Mod date: 2005 04 07

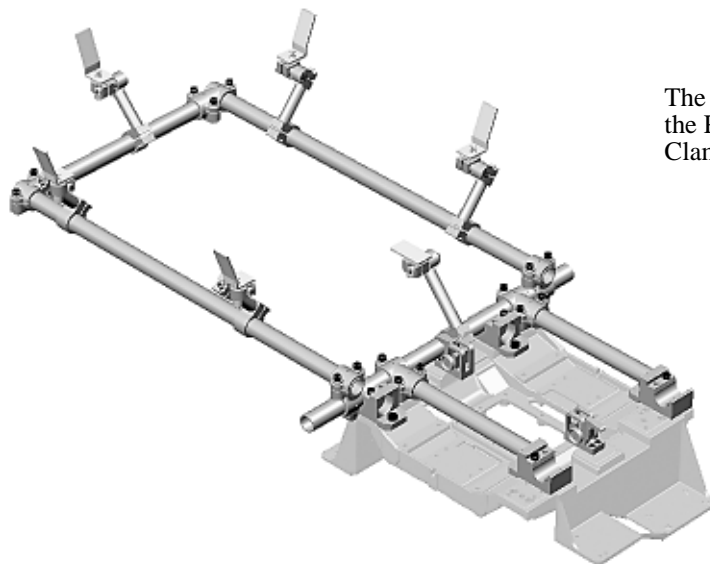
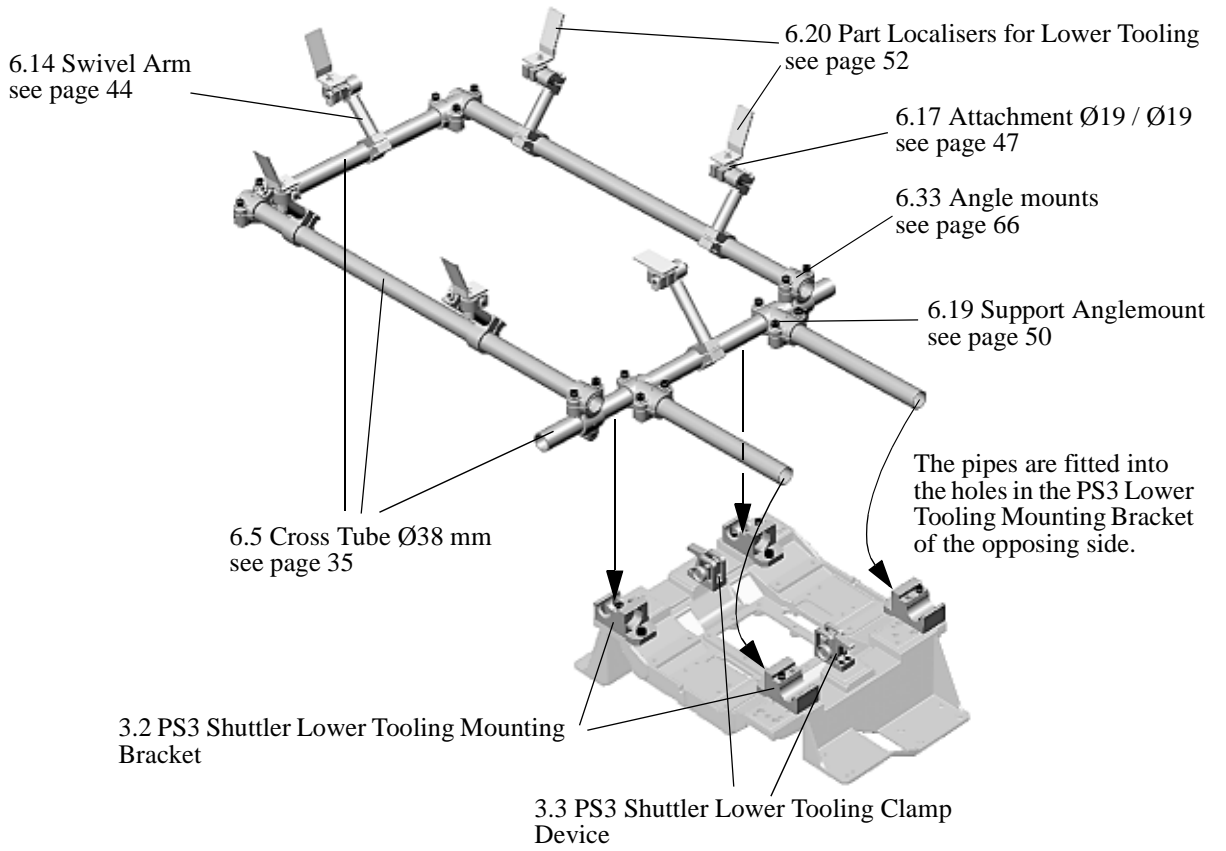
3.2 PS3 Shuttler Lower Tooling Mounting Bracket

<p>Type: PS3 Shuttler Lower Tooling Mounting Bracket</p> <p>Part number: 91109858</p> <p>Weight: 528 g</p> <p>Material: Aluminum</p> <p>For cross tube: Ø38 mm</p>		
--	--	--

3.3 PS3 Shuttler Lower Tooling Clamp Device

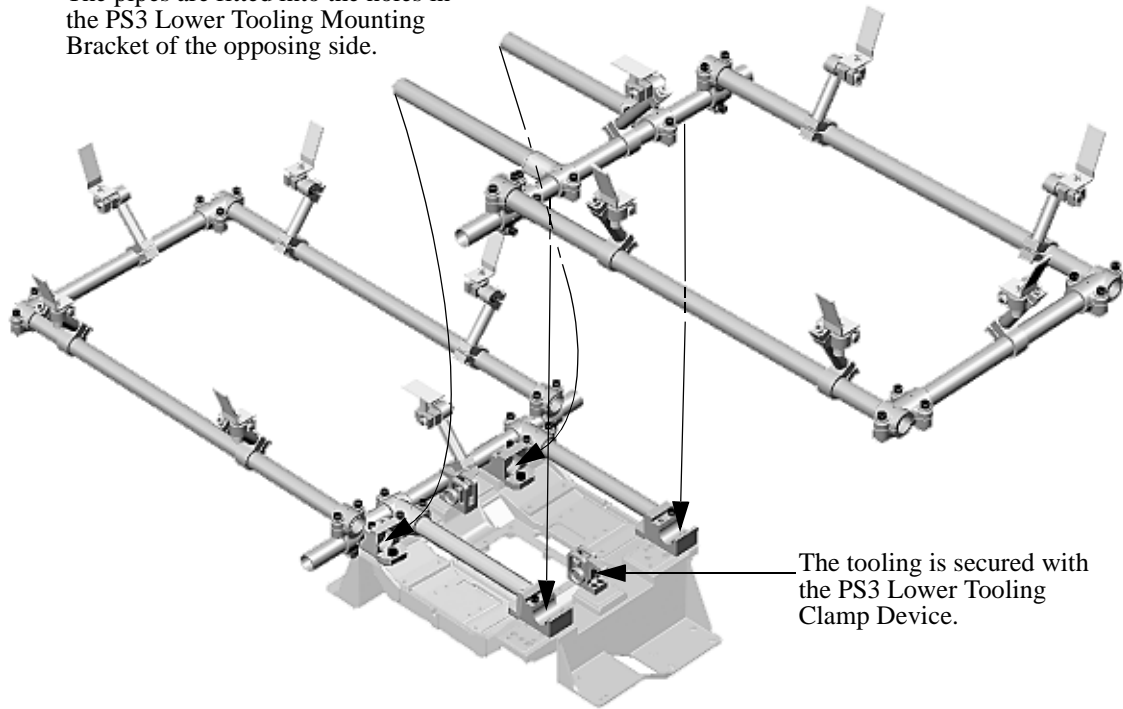
<p>Type: PS3 Shuttler Lower Tooling Clamp Device</p> <p>Part number: 91109857</p> <p>Weight: 312 g</p> <p>Material: Aluminum</p> <p>For cross tube: Ø38 mm</p>		
--	--	--

3.4 PS3 Shuttler Tooling for Split Parts

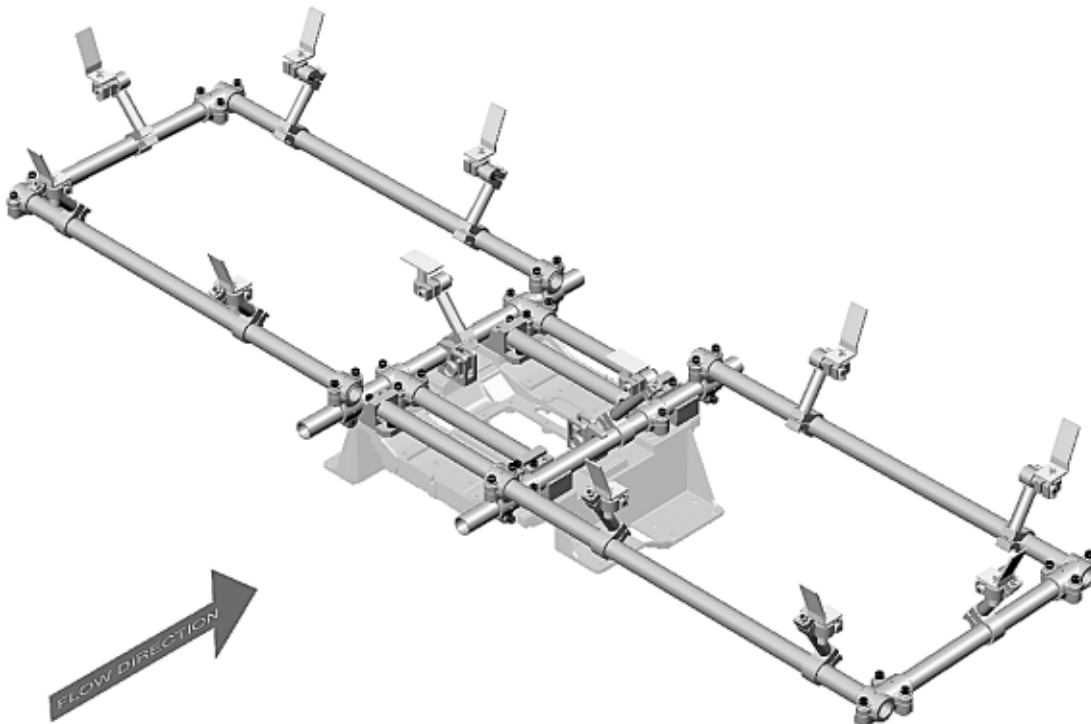


3.5 PS3 Shuttler Tooling Assembly

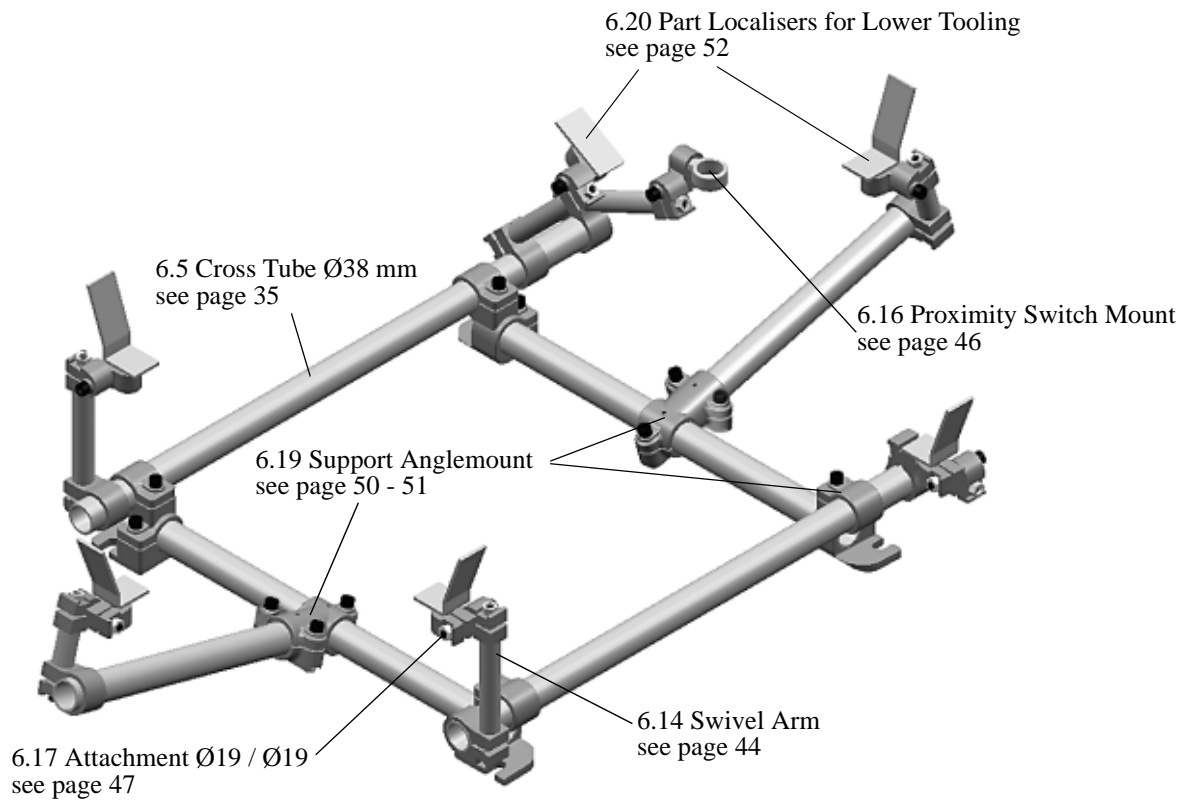
The pipes are fitted into the holes in the PS3 Lower Tooling Mounting Bracket of the opposing side.



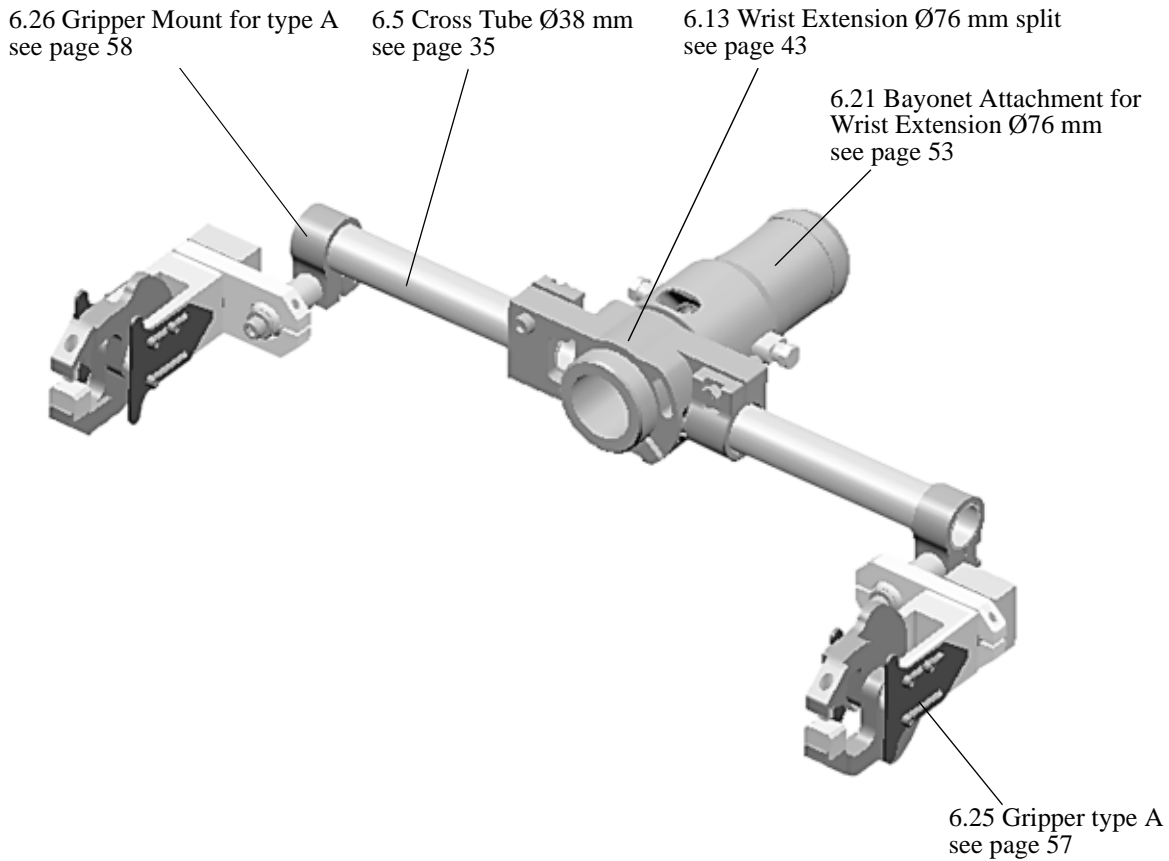
The tooling is secured with the PS3 Lower Tooling Clamp Device.



Filename: Kap3.fm, Mod date: 2005 04 07

3.6 PS2 Shuttler Tooling

3.7 EST and HEST Shuttler/Turnover Tooling

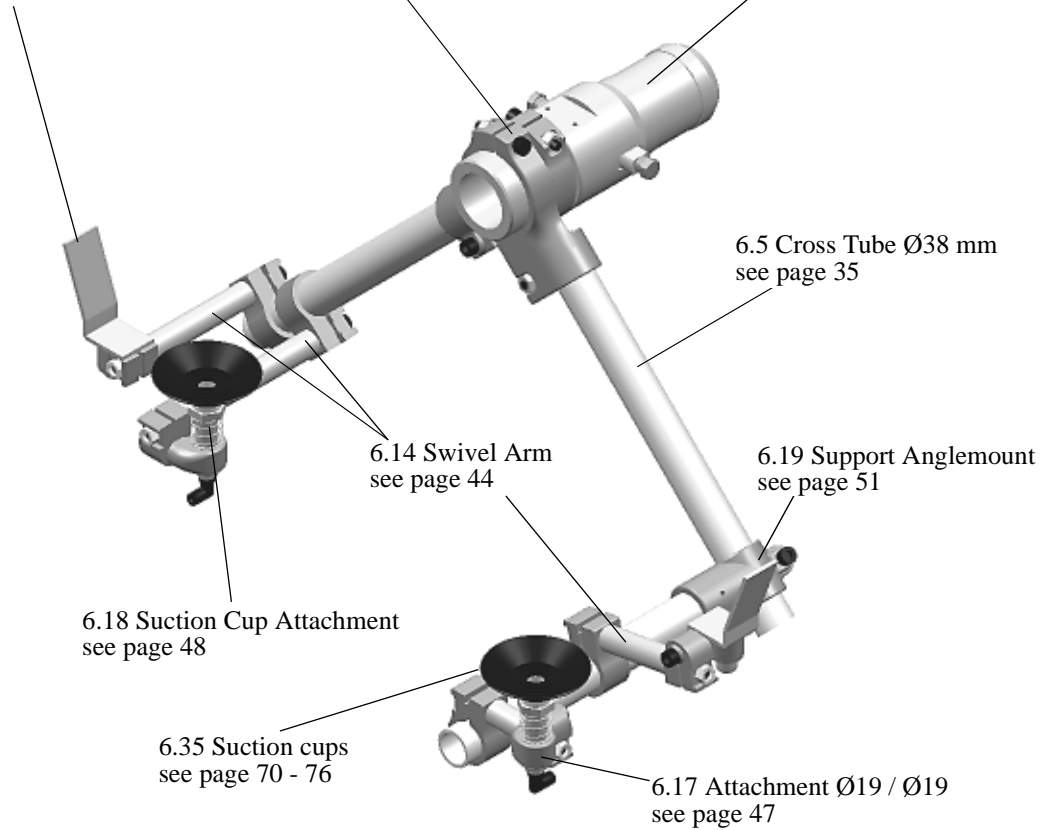


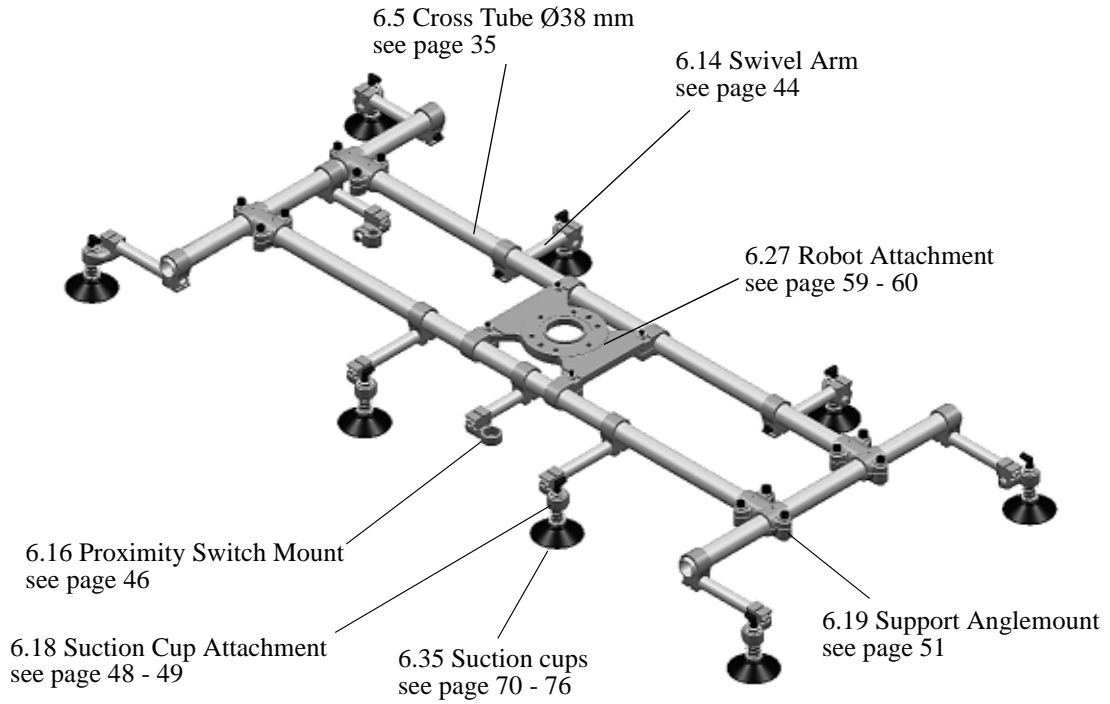
3.8 EST and HEST Shuttler/Turnover Tooling

6.20 Part Localisers for
Lower Tooling
see page 52

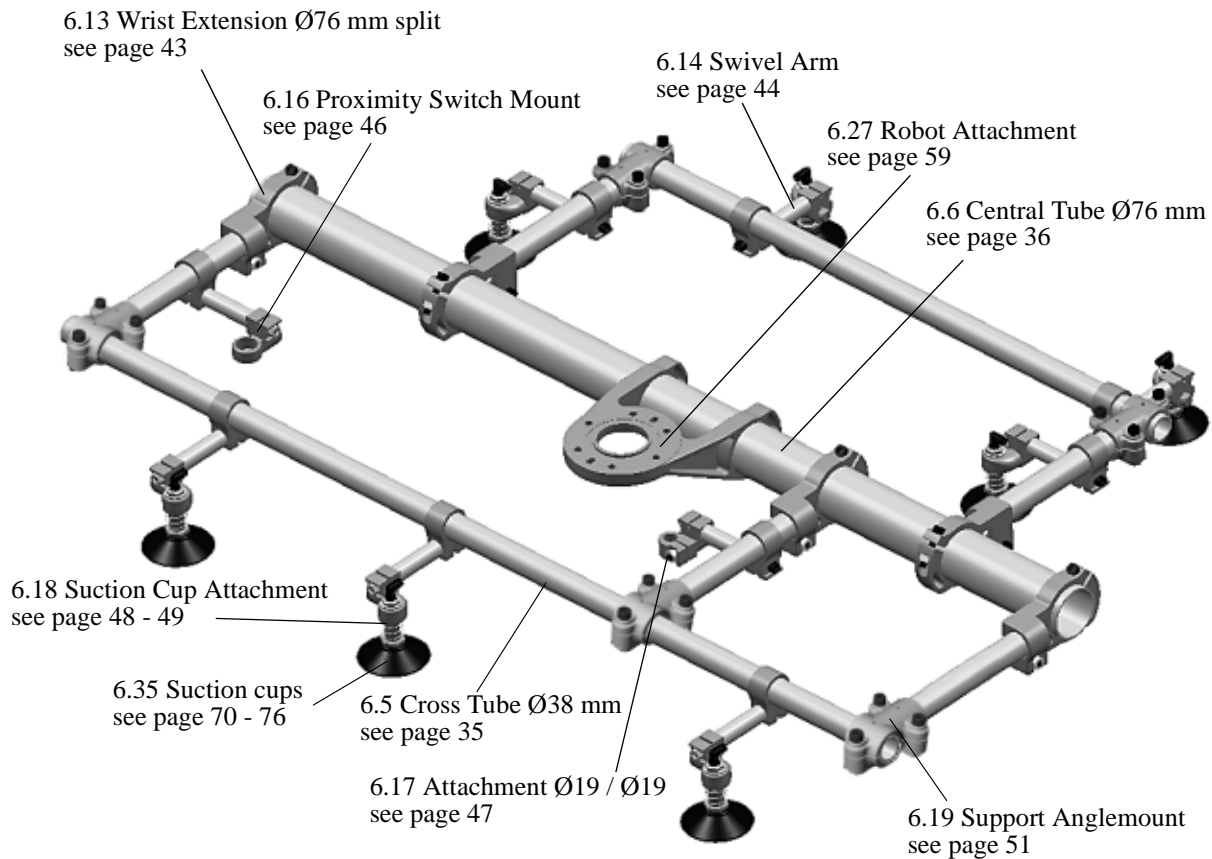
6.13 Wrist Extension Ø76 mm split
see page 43

6.21 Bayonet Attachment for
Wrist Extension Ø76 mm
see page 53



4 Tooling for ABB Robots**4.1 Suction Cup Frame for ABB robot, built of Cross Tubes Ø38 mm, without Quick Change Adapter**

4.2 Suction Cup Frame for ABB robot, built of Central Tube Ø76 mm and Cross Tubes Ø38 mm, without Quick Change Adapter



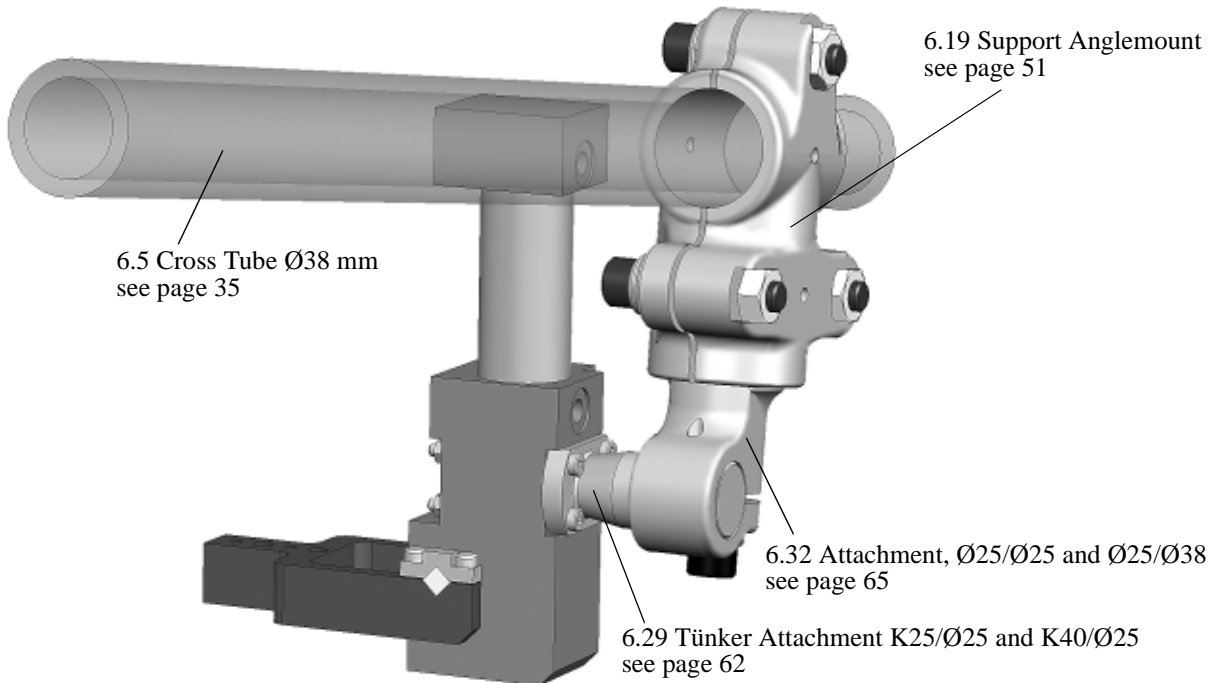
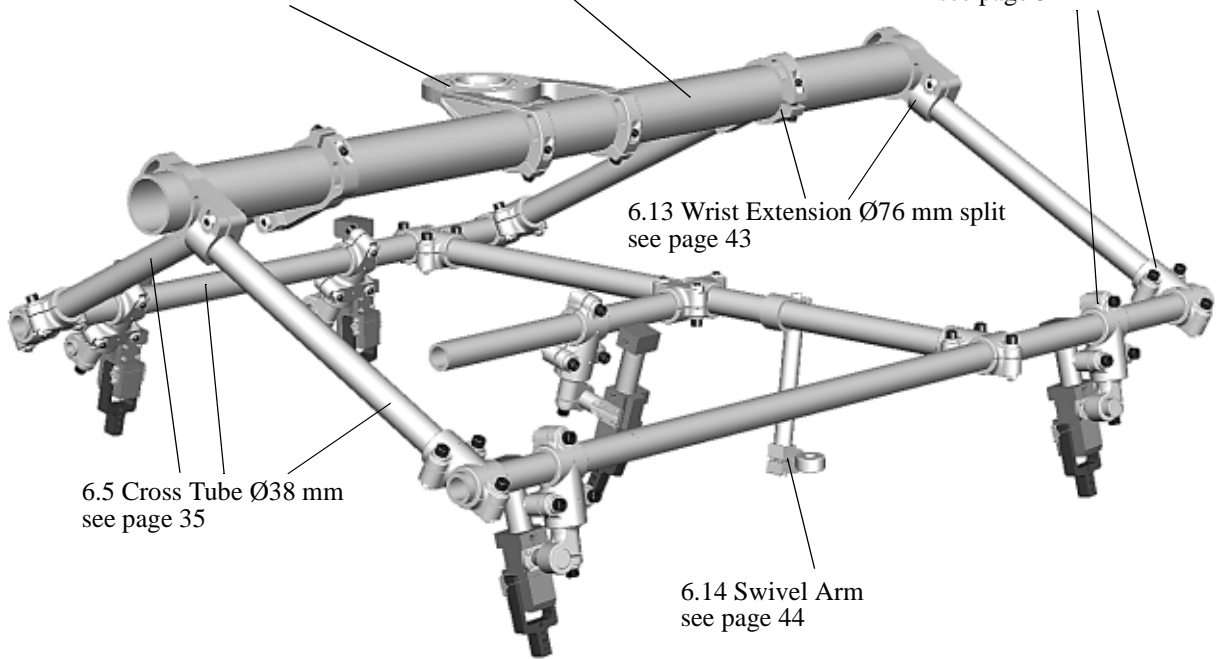
Filename: Kap4.fm, Mod date: 2005 04 07

4.3 Robot tooling with Tünker Attachments

6.27 Robot Attachment
see page 59

6.6 Central Tube Ø76 mm
see page 36

6.19 Support Anglemount
see page 51

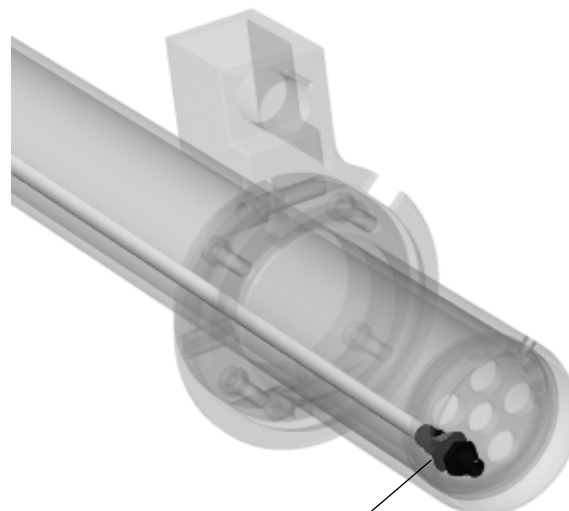


Filename: Kap4.fm, Mod date: 2005 04 07

5 Pneumatic Components

5.1 For Automatic Connection

Air components for	With Tube size Ø8 mm Part No.	With Tube size Ø10 mm Part No.
Spider for 2 Cups	9936282	91107021
Spider for 3 Cups	9936283	91107023
Spider for 4 Cups	9936284	91107024
Spider for 5 Cups	9936285	91107025
Spider for 6 Cups	9936286	91107026
Spider for 7 Cups	9936287	91107027
Spider for 8 Cups	9936288	91107028



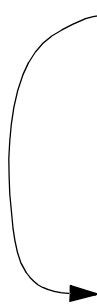
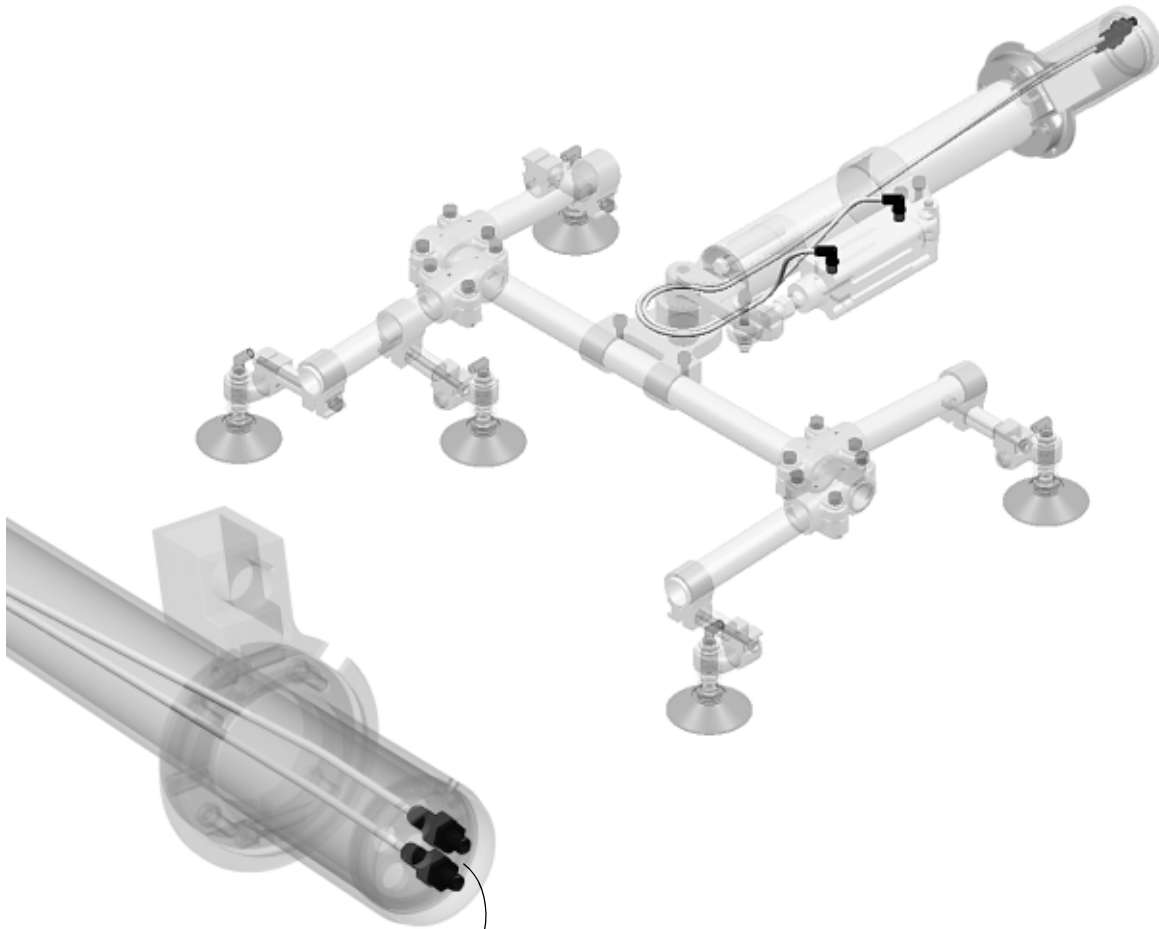
Air Quick Connector PLC 400-M10 Male. Part No. 3045075. Mount in Hole No. 1.



Filename: Kap5.fm, Mod date: 2005 04 07

5.2 Pneumatic Components

Air Components for Turn or Tipping Unit



Air Components for Turn & Tipping unit complete	91104666 for 3 x 8 + 2 x 10 mm tubes	91110793 for 5 x 10 mm tubes
Tube Ø	8 mm	10 mm
Part number for Air Quick Connector	3045840	3045075
Mount in holes	4 and 5	
For Quick Change Adapter, see page 2	91108510 91111220 91110796	91110794 91110795 91110797

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6 Components



6.1 Bayonet & Central Boom with clamping ring see page 31



6.2 Bayonet & Central Boom see page 32



6.3 Bayonet & Central Boom CPI- and BILSING-like with clamping ring see page 33



6.4 Bayonet & Central Boom CPI- and BILSING-like see page 34



6.5 Cross Tube Ø38 mm see page 35



6.6 Central Tube Ø76 mm see page 36



6.9 Central Boom Spacer, 130 and 200 mm see page 39



6.10 Central Boom Spacer, 250 and 300 mm see page 40



6.12 Wrist Extension Ø76 mm see page 42



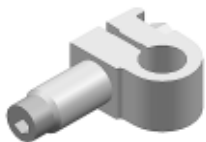
6.13 Wrist Extension Ø76 mm split see page 43



6.14 Swivel Arm see page 44



6.16 Proximity Switch Mount see page 46



6.17 Attachment Ø19 / Ø19 see page 47



6.18 Suction Cup Attachment see page 48 - 49



6.19 Support Anglemount see page 50 - 51



6.20 Part Localisers for Lower Tooling see page 52



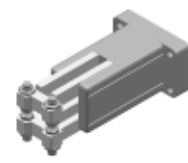
6.21 Bayonet Attachment for Wrist Extension Ø76 mm see page 53



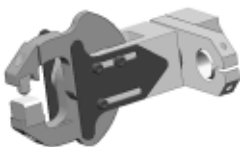
6.22 Wrist Extension Ø80 mm see page 54



6.23 Gripper Mount for type B see page 55



6.24 Gripper ISI for type B (180°) see page 56



6.25 Gripper type A see page 57



6.26 Gripper Mount for type A see page 58



6.27 Robot Attachment see page 59



6.28 Anglemount Ø76 mm see page 61



6.29 Tünger Attachment
K25/Ø25 and K40/Ø25
see page 62



6.30 Tünger Attachment
K40/Ø25/90° and K25/
Ø25/90°
see page 63



6.31 Tünger Attachment
K40/Ø38/90° and K40/Ø38
see page 64



6.32 Attachment, Ø25/Ø25
and Ø25/Ø38
see page 65



6.33 Angle mounts
see page 66 - 66



6.34 Pneumatic connectors
for air pressure and vacuum
see page 67 - 69



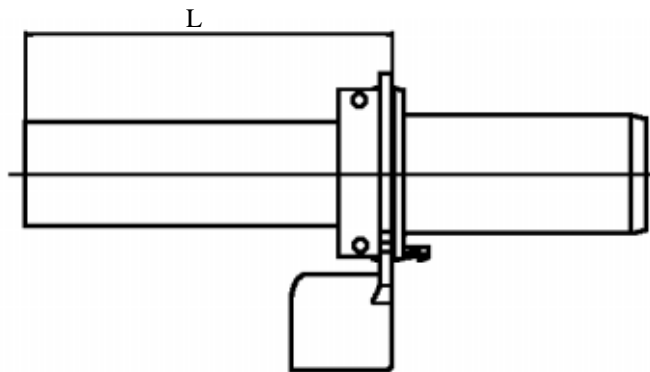
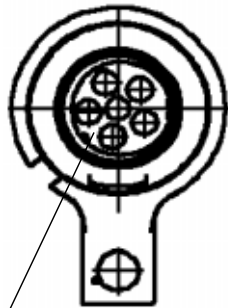
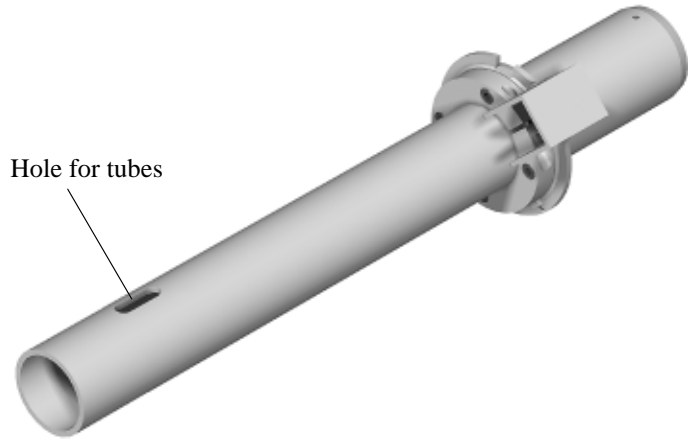
6.35 Suction cups
see page 70 - 76

6.1 Bayonet & Central Boom with clamping ring

Material: Aluminum

Thickness = 3 mm, with hole for tubes		
Length	Part No.	Weight
500 mm	91110789*	2851 g
1100 mm	91110790	3961 g
1350 mm	91111204	4424 g
1600 mm	91110791	4886 g
1850 mm	91110792	5400 g
* this item does not have a hole for tubes		

Thickness = 5 mm, with hole for tubes		
Length	Part No.	Weight
500 mm	91110785*	3592 g
1100 mm	91110786	5397 g
1350 mm	91111202	6148 g
1600 mm	91110787	6900 g
1850 mm	91111203	7652 g
2000 mm	91110788	8102 g
* this item does not have a hole for tubes		



End Plate **IS** included, Part No. 9921972.

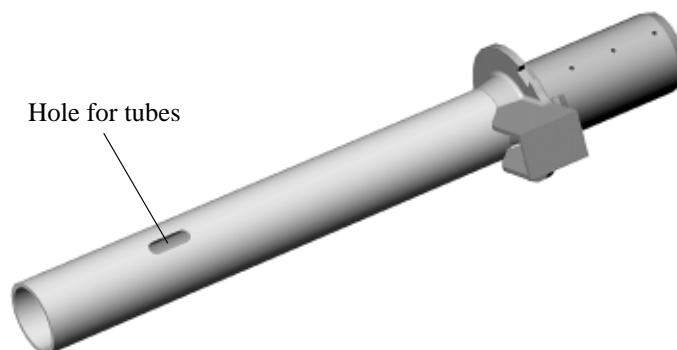
Option

Electrical male connectors and housing, NOT included		
Housing 3046099	Pinblock, 6-pin, 3046098	Pinblock, 18-pin, 3048889

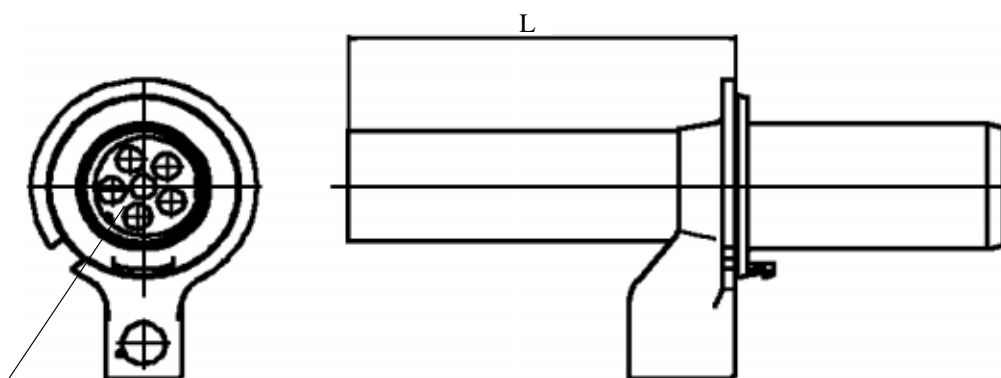
6.2 Bayonet & Central Boom

Material: Aluminum

Thickness = 3 mm, with hole for tubes		
Length	Part No.	Weight
500 mm	9936189*	2551 g
1100 mm	9936190	3661 g
1350 mm	9936191	4124 g
1600 mm	9936192	4586 g
1850 mm	9936193	5100 g
* this item does not have a hole for tubes		



Thickness = 5 mm, with hole for tubes		
Length	Part No.	Weight
500 mm	9937025*	3292 g
1100 mm	9937026	5097 g
1350 mm	9937027	5848 g
1600 mm	9937028	6600 g
1850 mm	9937029	7352 g
2000 mm	9937030	7802 g
* this item does not have a hole for tubes		



End Plate **IS** included, Part No. 9921972.

Option

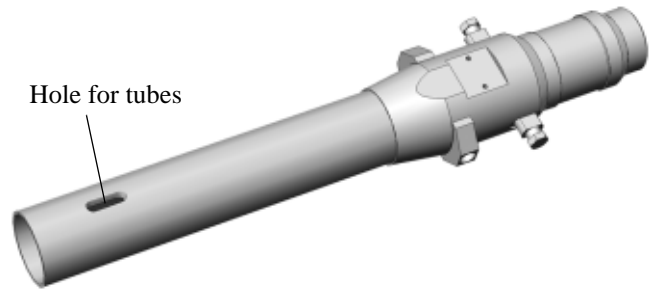
Electrical male connectors and housing, NOT included		
Housing 3046099	Pinblock, 6-pin, 3046098	Pinblock, 18-pin, 3048889

Filename: Kap6.fm, Mod date: 2005 04 07

6.3 Bayonet & Central Boom CPI- and BILSING-like with clamping ring

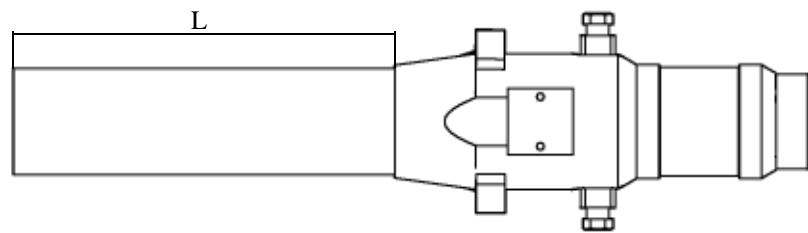
Material: Aluminum

Thickness = 3 mm, with hole for tubes			
Length	With 3 hole End Plate Part No.	Weight	With 6 hole End Plate Part No.
500 mm	91111314*	3914 g	91112116*
1350 mm	91111315	5487 g	91112117
1850 mm	91111316	6412 g	91112118
* this item does not have a hole for tubes			



Thickness = 5 mm, with hole for tubes			
Length	With 3 hole End Plate Part No.	Weight	With 6 hole End Plate Part No.
500 mm	91111317*	4556 g	91112119*
1100 mm	91111318	6380 g	91112120
1600 mm	91111319	7888 g	91112121
2000 mm	91111320	8686 g	91112122
* this item does not have a hole for tubes			

End Plate



Option

End Plates and corresponding Push-in Fittings	End Plate for Push-in Fittings, 3 holes	End Plate for Push-in Fittings, 6 holes
End Plate part No. Included	9939374	9939375
Weight of End Plate	198 g	170 g
Push-in Fittings 8 mm tube. Part No. Push-in Fittings NOT included.	G3/8 - 8 91207662	G1/8 - 8 91204069
Push-in Fittings 10 mm tube. Part No. Push-in Fittings NOT included.	G3/8 - 10 91205003	-

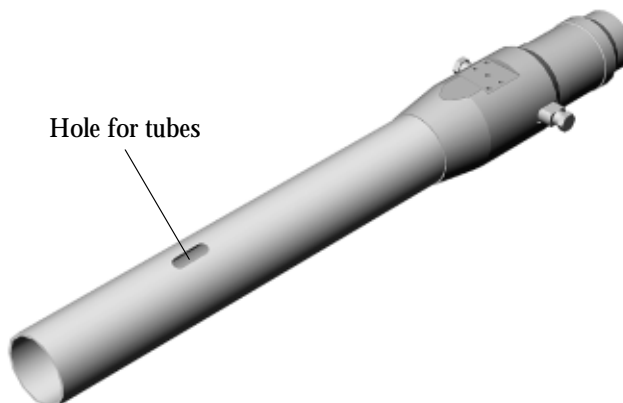
6.4 Bayonet & Central Boom CPI- and BILSING-like

(Only sold as spare part)

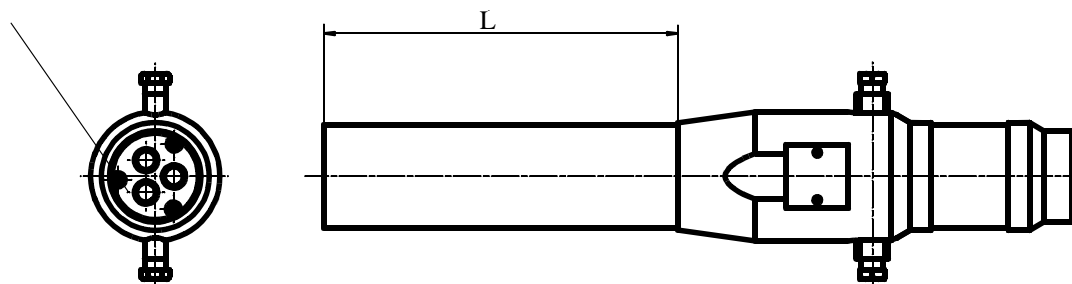
Material: Aluminum

Thickness = 3 mm, with hole for tubes			
	With 3 hole End Plate		With 6 hole End Plate
Length	Part No.	Weight	Part No.
500 mm	39915359*	3474 g	91112098*
1350 mm	39915360	5047 g	91112099
1850 mm	39915361	5972 g	91112100
* this item does not have a hole for tubes			

Thickness = 5 mm, with hole for tubes			
	With 3 hole End Plate		With 6 hole End Plate
Length	Part No.	Weight	Part No.
500 mm	39915362*	4116 g	91112101*
1100 mm	39915363	5940 g	91112102
1600 mm	39915364	7448 g	91112103
2000 mm	39915365	8246 g	91112104
* this item does not have a hole for tubes			



End Plate



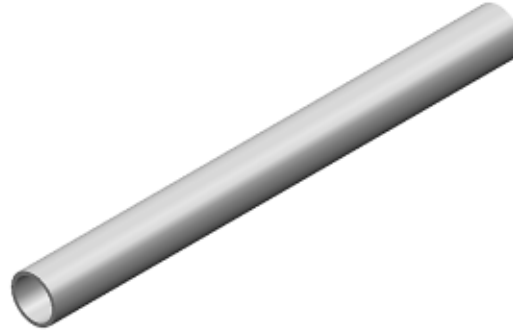
Option

End Plates and corresponding Push-in Fittings	End Plate for Push-in Fittings, 3 holes	End Plate for Push-in Fittings, 6 holes
End Plate part No. Included	9939374	9939375
Weight of End Plate	198 g	170 g
Push-in Fittings 8 mm tube. Part No. Push-in Fittings NOT included.	G3/8 - 8 91207662	G1/8 - 8 91204069
Push-in Fittings 10 mm tube. Part No. Push-in Fittings NOT included.	G3/8 - 10 91205003	-

Filename: Kap6.fm, Mod date: 2005 04 07

6.5 Cross Tube Ø38 mm

Material: Aluminum

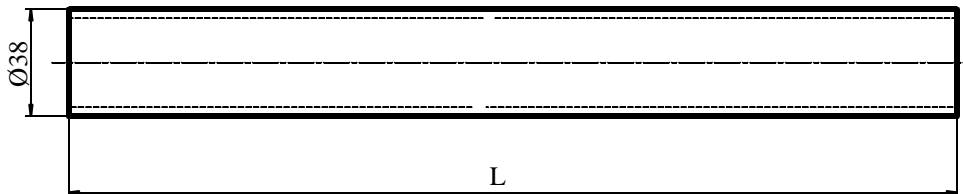


Thickness = 3 mm.

Length	Part No.	Weight
500 mm	9936324	375 g
750 mm	9936325	560 g
1000 mm	9936326	750 g
1500 mm	9936327	1125 g
2000 mm	91206682	1500 g
3000 mm	91206981	2250 g
6000 mm	8101145	4500 g

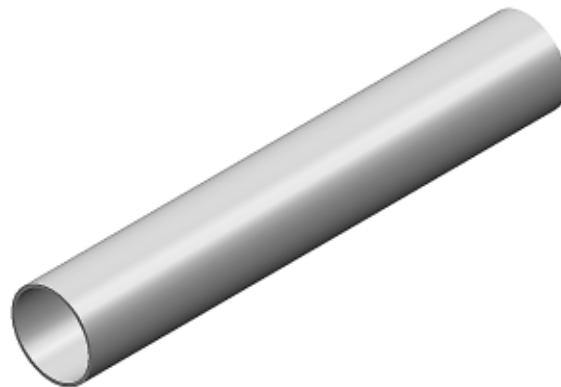
Thickness = 5 mm.

Length	Part No.	Weight
500 mm	91108321	700 g
750 mm	91108322	1050 g
1000 mm	91108323	1400 g
1500 mm	91108324	2100 g
2000 mm	91111291	2800 g
3000 mm	91111292	4200 g
6000 mm	8053730	8400 g



6.6 Central Tube Ø76 mm

Material: Aluminum

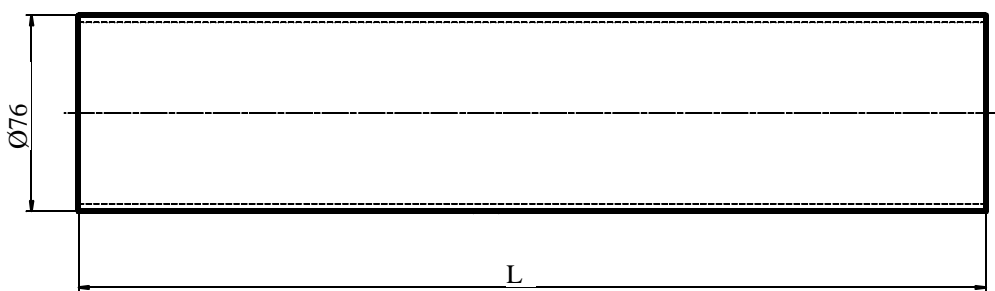


Thickness = 3 mm.

Length	Part No.	Weight
650 mm	9936318	1200 g
1250 mm	9936319	2310 g
1500 mm	9936320	2775 g
1750 mm	9936321	3240 g
2000 mm	9936322	3700 g
2150 mm	9936323	3980 g
6000 mm	8101144	11100 g

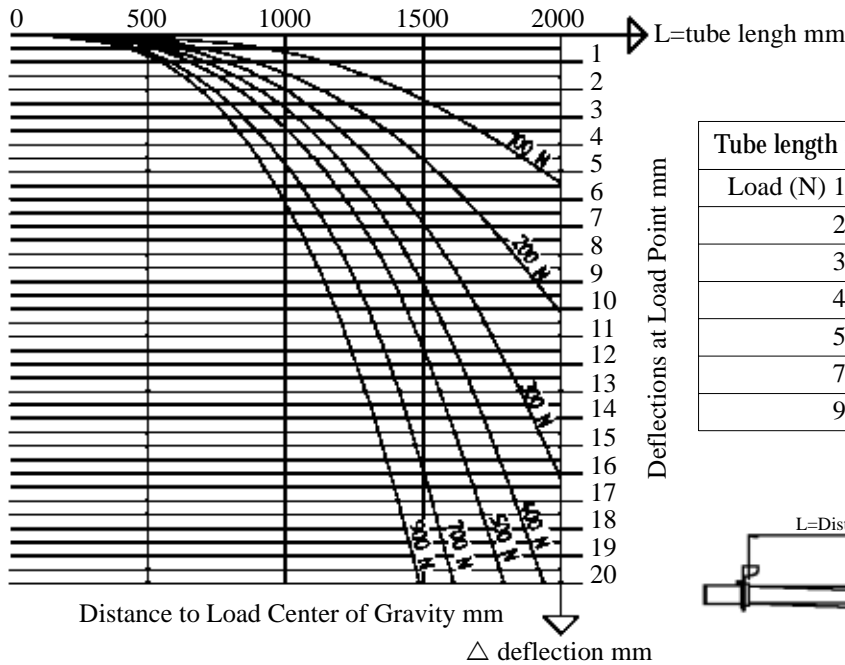
Thickness = 5 mm.

Length	Part No.	Weight
650 mm	91108325	1960 g
1250 mm	91108326	3760 g
1500 mm	91108327	4510 g
1750 mm	91108328	5270 g
2000 mm	91108329	6020 g
2150 mm	91108330	6470 g
6000 mm	8101148	18040 g



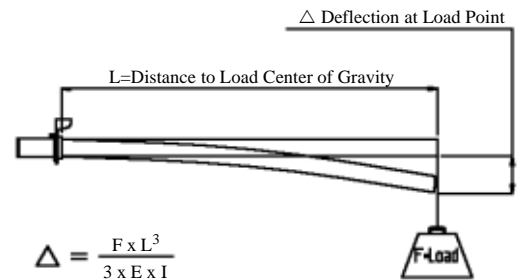
6.7 Deflection charts Ø76 tube

Aluminum Tube Outer diameter D = 76 mm
Inner diameter d = 66 mm



Deflection in mm

Tube length mm	500	1000	1500	2000
Load (N) 100 N	-	1	2	5
200 N	-	1	5	11
300 N	-	2	7	16
400 N	-	3	9	22
500 N	-	3	11	27
700 N	1	5	16	38
900 N	1	6	21	49



$$\Delta = \frac{F \times L^3}{3 \times E \times I}$$

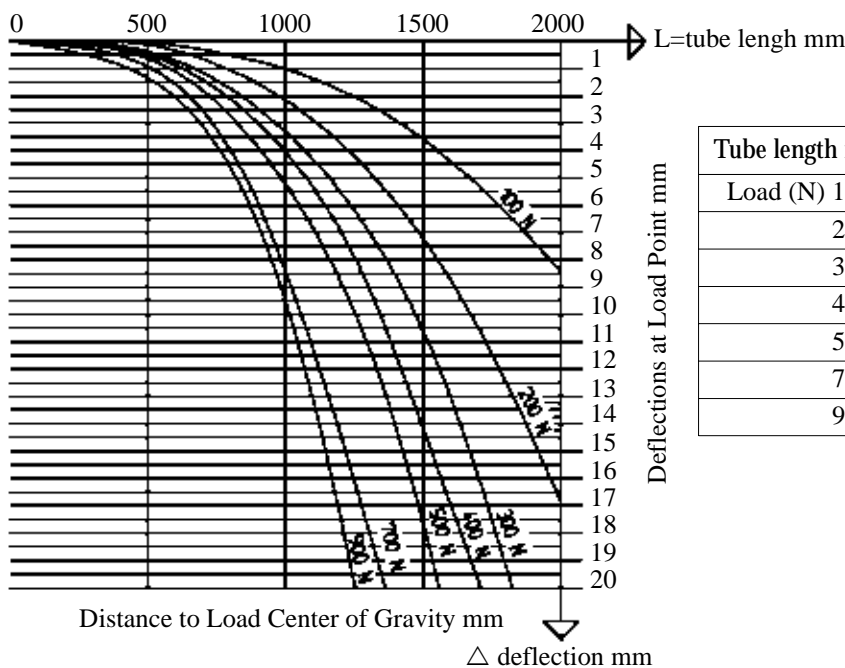
F = Load (N)

L = Length mm

E = Modulus of elasticity $6,9 \times 10^3 \text{ N/mm}^2$

I = Moments of inertia $\frac{\pi (D^4 - d^4)}{64} \text{ mm}^4$

Aluminum Tube Outer diameter D = 76 mm
Inner diameter d = 70 mm

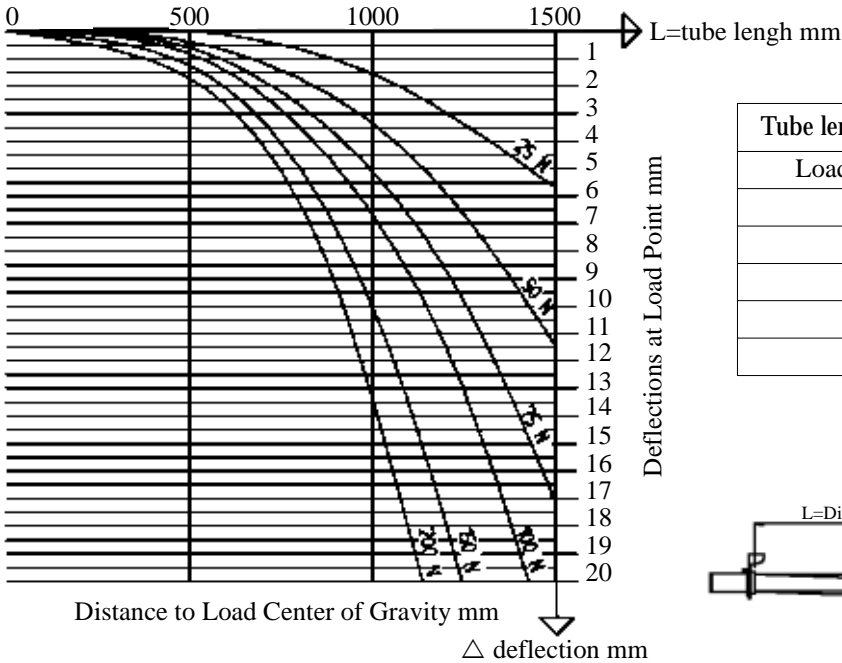


Deflection in mm

Tube length mm	500	1000	1500	2000
Load (N) 100 N	-	1	4	8
200 N	-	2	7	17
300 N	-	3	11	25
400 N	-	4	14	34
500 N	1	5	18	42
700 N	1	7	25	59
900 N	1	9	32	76

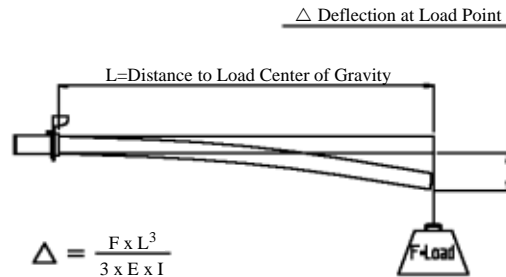
6.8 Deflection charts Ø38 tube

Aluminum Tube Outer diameter D = 38 mm
Inner diameter d = 28 mm



Deflection in mm

Tube length mm	500	1000	1500
Load (N) 25 N	-	2	6
50 N	-	3	11
75 N	-	5	17
100 N	1	7	22
150 N	1	10	34
200 N	2	13	45



$$\Delta = \frac{F \times L^3}{3 \times E \times I}$$

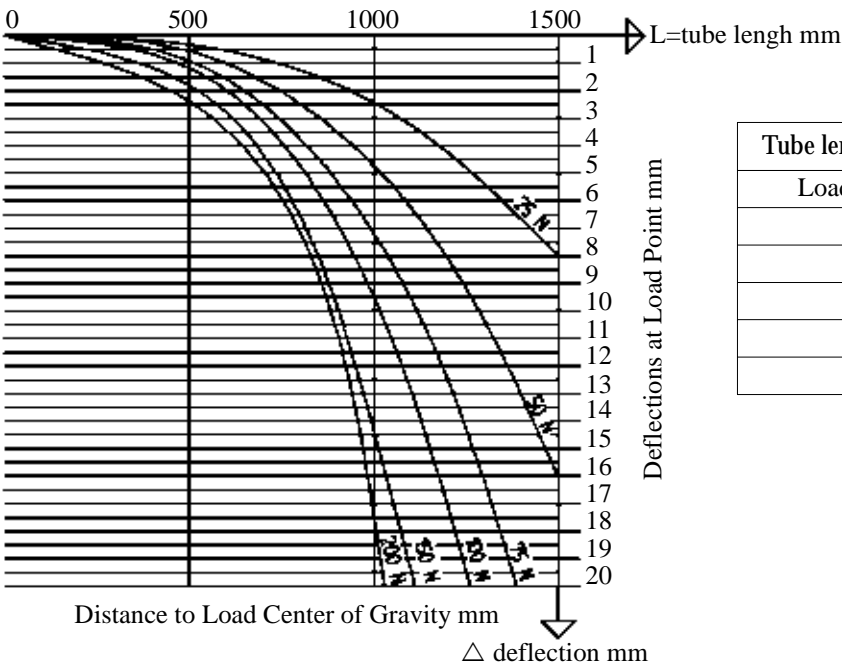
F = Load (N)

L = Length mm

E = Modulus of elasticity $6,9 \times 10^3 \text{ N/mm}^2$

I = Moments of inertia $\frac{\pi (D^4 - d^4)}{64} \text{ mm}^4$

Aluminum Tube Outer diameter D = 38 mm
Inner diameter d = 32 mm



Deflection in mm

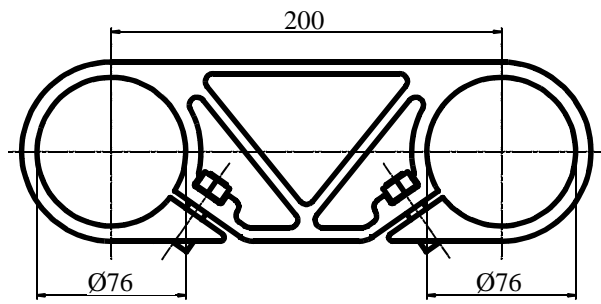
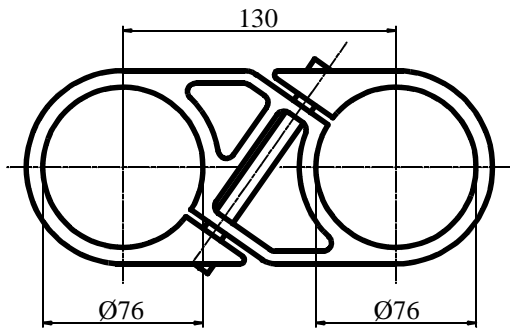
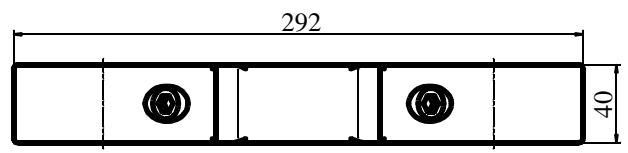
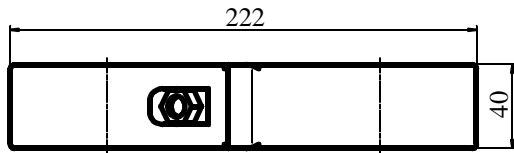
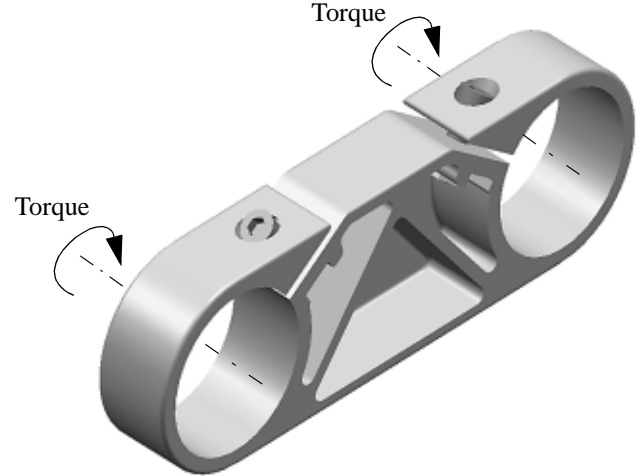
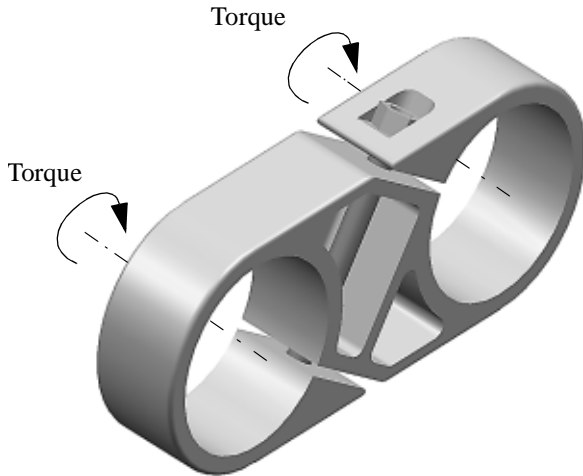
Tube length mm	500	1000	1500
Load (N) 25 N	-	3	8
50 N	1	5	16
75 N	1	7	24
100 N	1	9	32
150 N	2	14	48
200 N	2	19	64

Filename: Kap6.fm, Mod date: 2005 04 07

6.9 Central Boom Spacer, 130 and 200 mm

Type: Central Boom Spacer L=130
 Part No. 9934876
 Weight..... 824 g
 Material..... Aluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque for Ø76 Tube 440 Nm

Type:..... Central Boom Spacer L=200
 Part No..... 9934877
 Weight 1158 g
 Material Aluminum
 Tightening Torque for M10..... 47 Nm
 Maximum Torque for Ø76 Tube 440 Nm

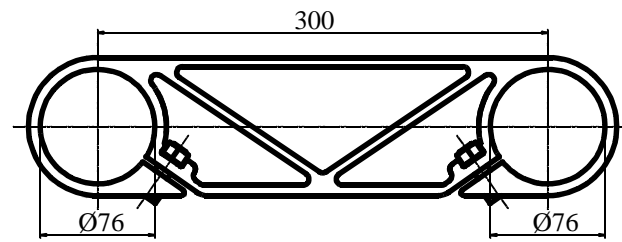
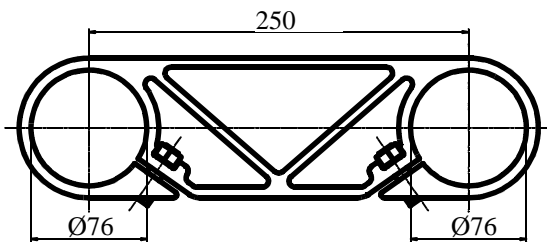
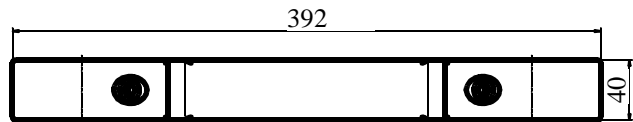
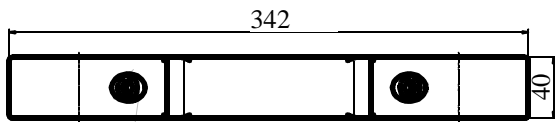
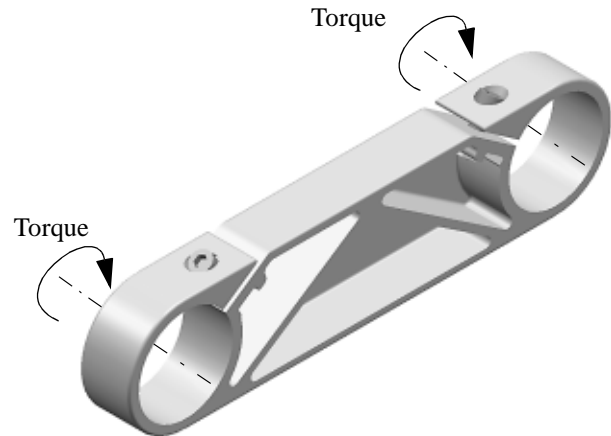
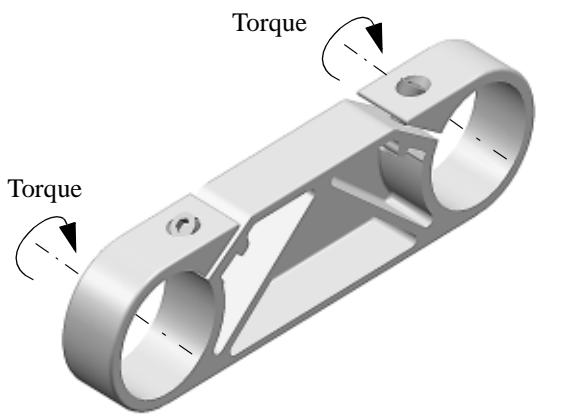


Filename: Kap6.fm, Mod date: 2005 04 07

6.10 Central Boom Spacer, 250 and 300 mm

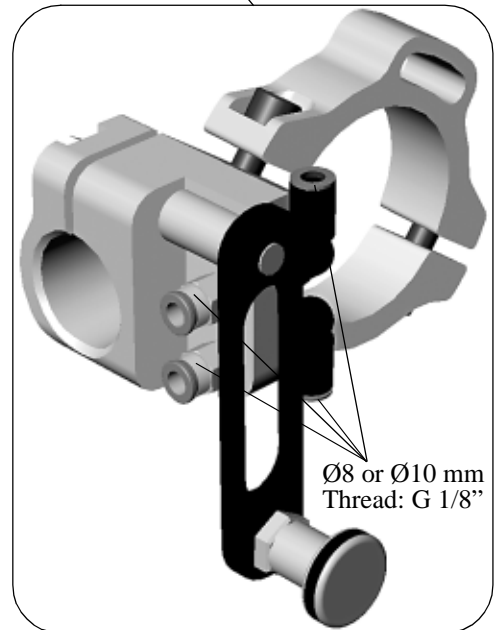
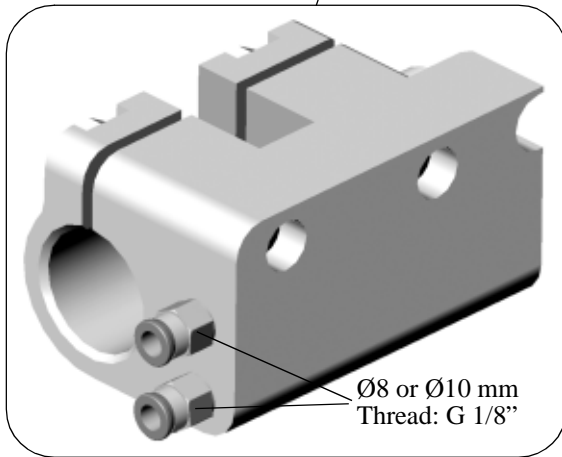
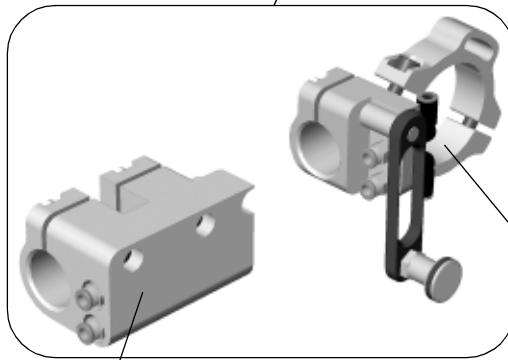
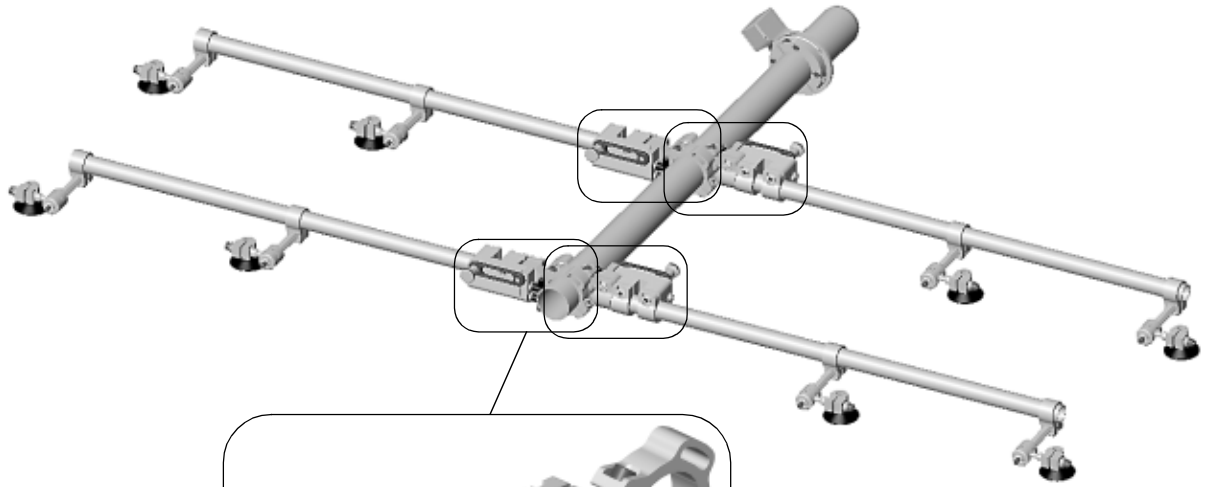
Type:Central Boom Spacer L=250
 Part No. 9934878
 Weight..... 1310 g
 MaterialAluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque for Ø76 Tube 440 Nm

Type:..... Central Boom Spacer L=300
 Part No..... 9934879
 Weight 1464 g
 Material Aluminum
 Tightening Torque for M10..... 47 Nm
 Maximum Torque for Ø76 Tube 440 Nm



Filename: Kap6.fm, Mod date: 2005 04 07

6.11 Wrist Clamp Male Ø38 & Female Ø76/38



Wrist Clamp male Ø38, Part No..... 91110820
Weight 1130 g
Material..... Aluminum

Wrist Clamp female Ø76/38, Part No...91110819
Weight..... 554 g
MaterialAluminum

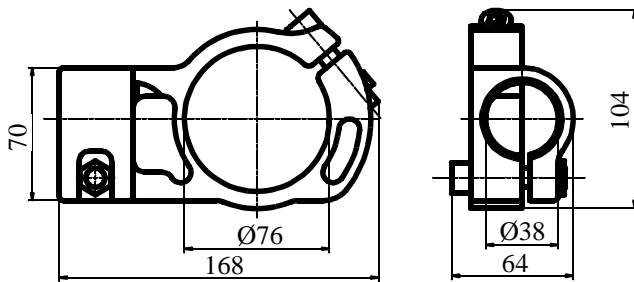
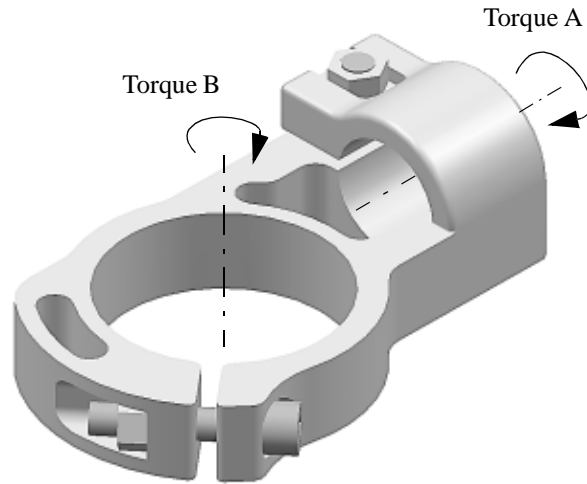
All air connctors, with a G 1/8" threading, are interchangeable.

6.12 Wrist Extension Ø76 mm

(Only sold as spare part)

Part No. 9934875

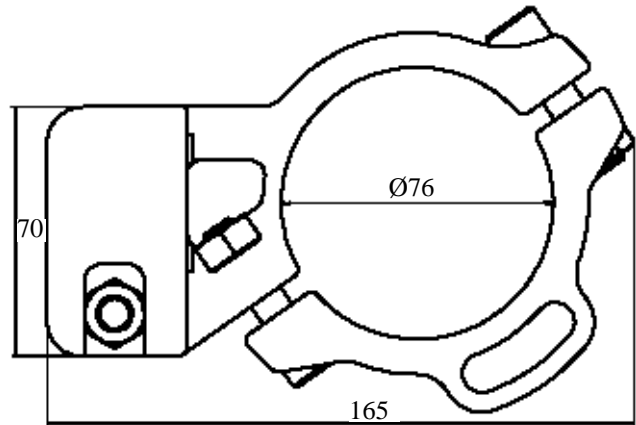
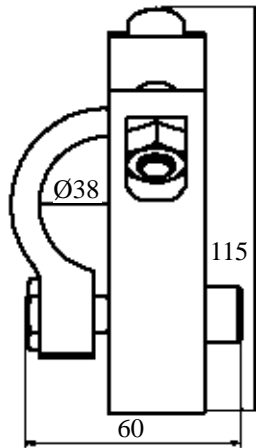
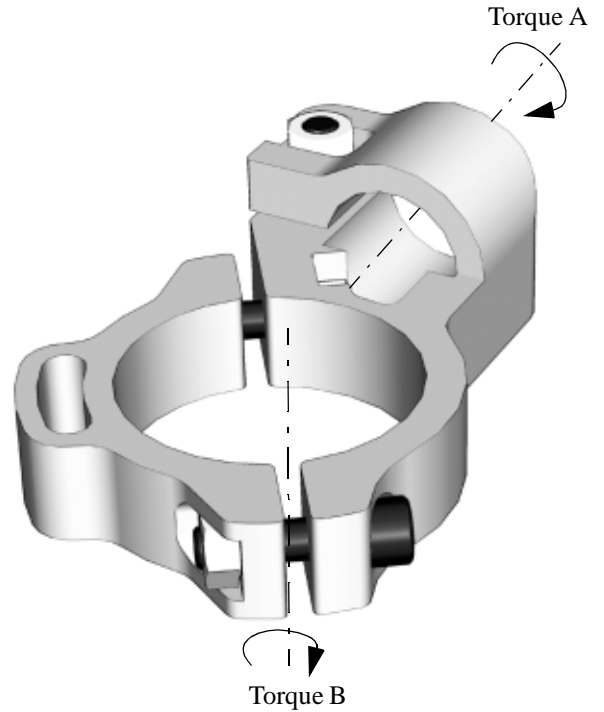
Weight.....542 g
 MaterialAluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque A for Ø38 Tube..... 400 Nm
 Maximum Torque B for Ø76 Tube..... 440 Nm



6.13 Wrist Extension Ø76 mm split

Part No. 91110322

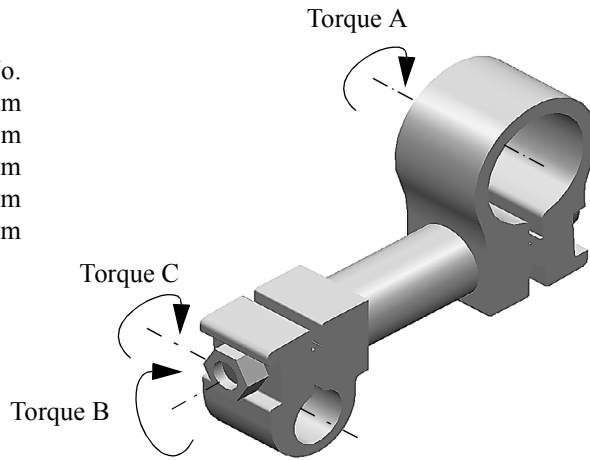
Weight..... 606 g
 Material Aluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque A for Ø38 Tube..... 400 Nm
 Maximum Torque B for Ø76 Tube..... 400 Nm



Filename: Kap6.fm, Mod date: 2005 04 07

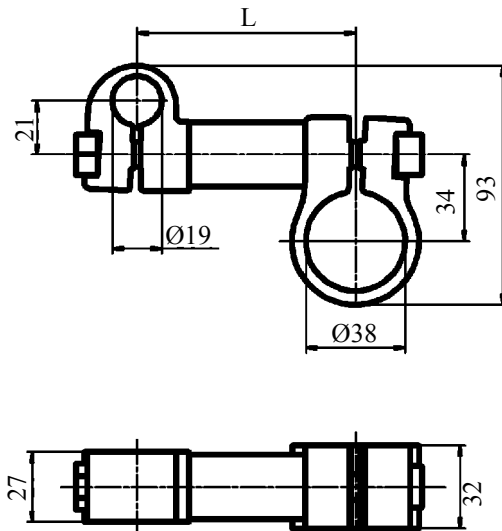
6.14 Swivel Arm

Length & Weight See Part No.
 Material Aluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque A for Ø38 tube 352 Nm
 Maximum Torque B for Ø25 tube 48 Nm
 Maximum Torque C for Ø19 tube 120 Nm



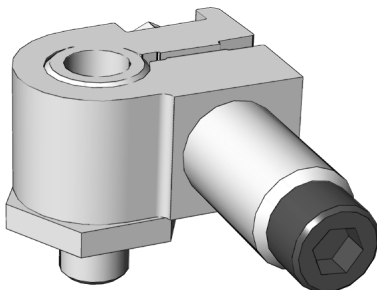
Swivel Arm

Part No.	Length	Weight
9934860	85 mm	312 g
9934861	125 mm	354 g
9934862	165 mm	390 g
9934863	205 mm	436 g



Option

Suction cup attachments are not included with the Swivel Arm.

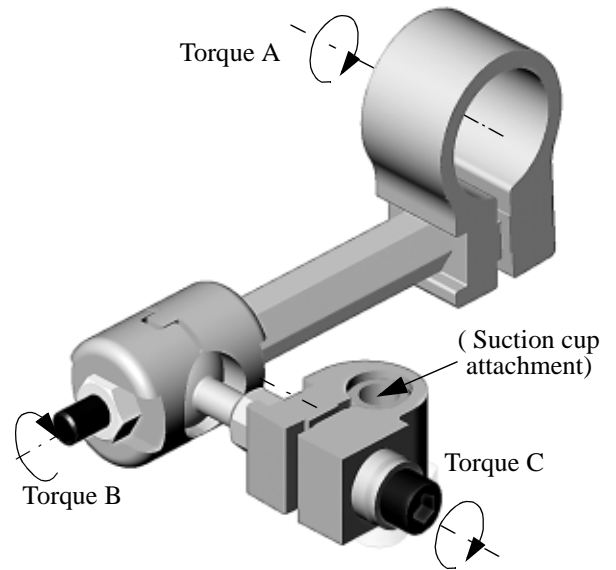


See 6.18 Suction Cup Attachment
 pages 48 - 49.

Filename: Kap6.fm, Mod date: 2005 04 14

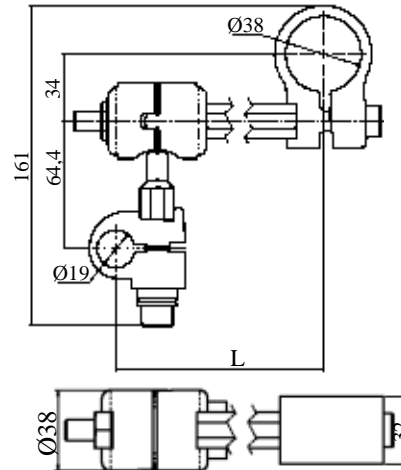
6.15 Swivel Arm

Length & Weight See Part No.
 Material Aluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque A for Ø38 tube 352 Nm
 Maximum Torque B 40 Nm
 Maximum Torque C for Ø19 tube 40 Nm



Swivel Arm

Part No.	L=Length	Weight
91110800	85 mm	557 g
91110801	125 mm	598 g
91110802	165 mm	639 g
91110803	205 mm	680 g



Option

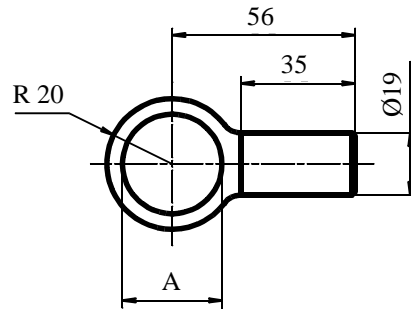
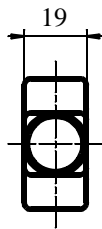
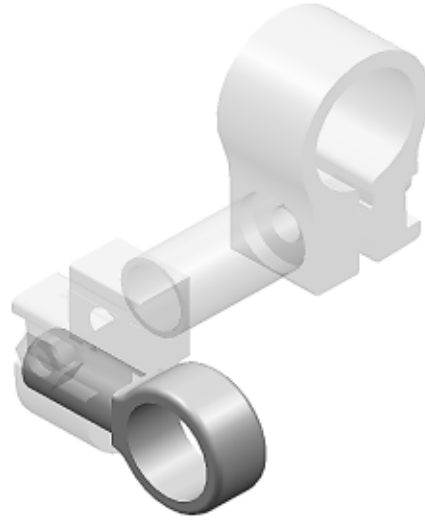
Suction cup attachments are not included with the Swivel Arm.

Part No.	9937111		9939387		91108683		91108684	
	Suction cup	Air connect.	Suction cup	Air connect.	Suction cup	Air connect.	Suction cup	Air connect.
Thread type	Female	Female	Female	Female	Male	Female	Male	Female
Thread	G 3/8"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 3/8"	G 1/4"
Weight	46 g		82 g		76 g		84 g	
Material	Steel		Steel		Steel		Steel	

6.16 Proximity Switch Mount

Weight.....See Part No.
 Material.....Aluminum

Part No.	A	Weight
9934076	Ø30.5 mm	60 g
9934077	Ø18.5 mm	80 g
9934078	Ø12.5 mm	90 g



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6.17 Attachment Ø19 / Ø19

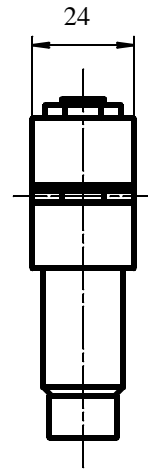
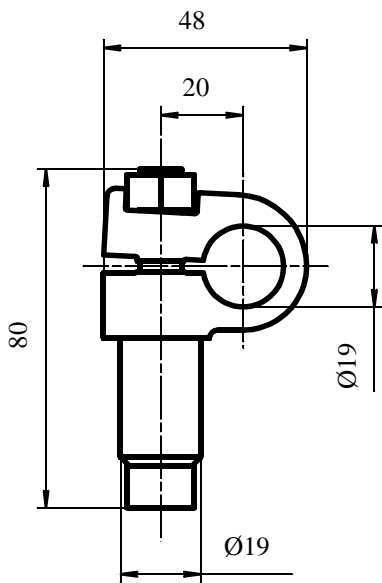
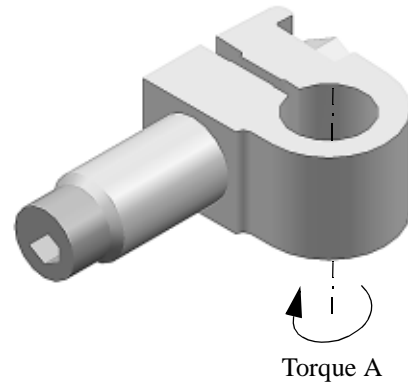
Part No. 9936312

Weight..... 132 g

MaterialAluminum

Tightening Torque for M10 47 Nm

Maximum Torque A for Ø19 tube 152 Nm

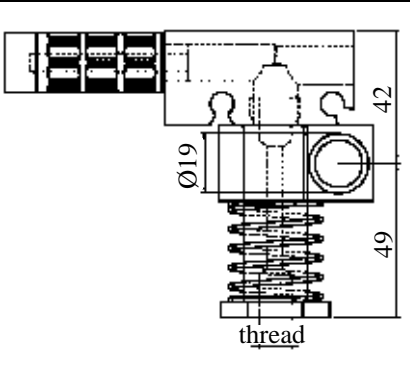
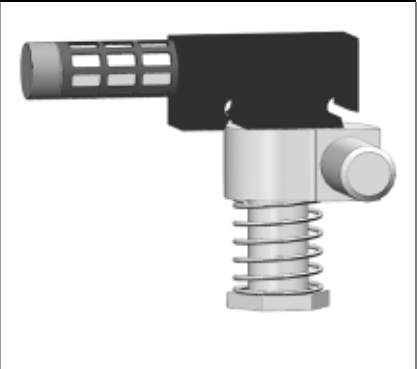


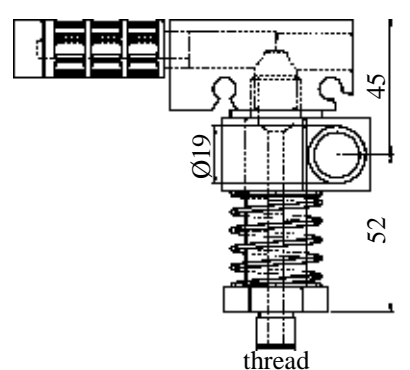
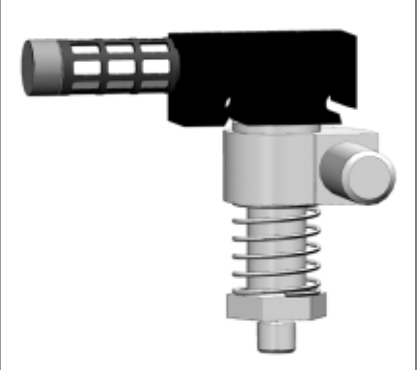
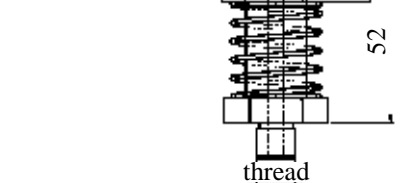
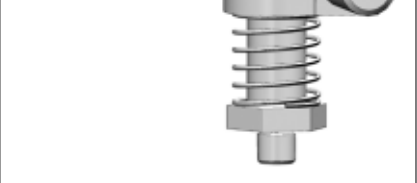
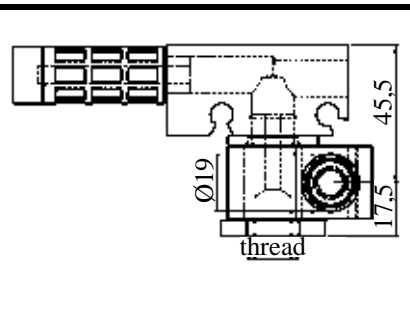
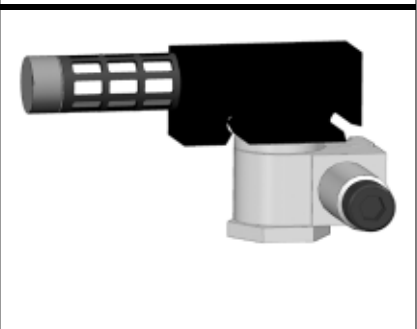


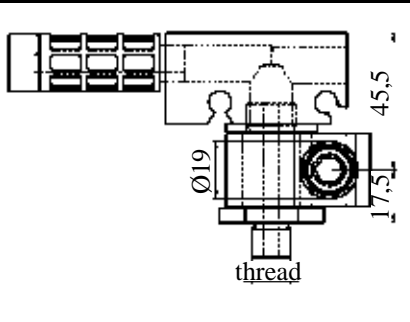
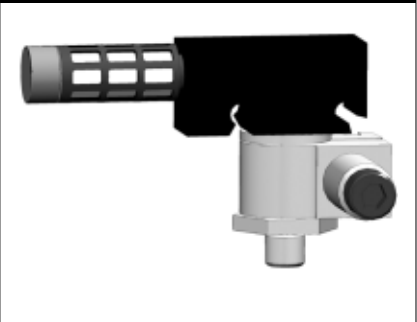
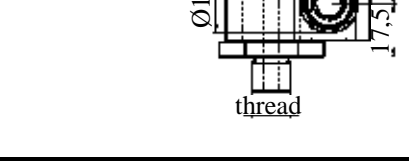



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6.18 Suction Cup Attachment

Type: Suction Cup Attachment R 1/4" Female Thread Spring Part number: 91110230 Thread: R 1/4" Weight: 290 g Material: Aluminum/Steel		
Type: Suction Cup Attachment R 3/8" Female Thread Spring Part number: 91110231 Thread: R 3/8" Weight: 260 g Material: Aluminum/Steel		
Type: Suction Cup Attachment R 1/4" Male Thread Spring Part number: 91110232 Thread: R 1/4" Weight: 310 g Material: Aluminum/Steel		
Type: Suction Cup Attachment R 3/8" Male Thread Spring Part number: 91110233 Thread: R 3/8" Weight: 280 g Material: Aluminum/Steel		
Type: Suction Cup Attachment Female Thread Part number: 91110234 Thread: R 1/4" Weight: 216 g Material: Aluminum/Steel		
Type: Suction Cup Attachment Female Thread Part number: 91110235 Thread: R 3/8" Weight: 180 g Material: Aluminum/Steel		
Type: Suction Cup Attachment Male Thread Part number: 91110236 Thread: R 1/4" Weight: 210 g Material: Aluminum/Steel		
Type: Suction Cup Attachment Male Thread Part number: 91110237 Thread: R 3/8" Weight: 218 g Material: Aluminum/Steel		

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<p>Type: Suction Cup Attachment R 1/4" Female Thread Spring</p> <p>Part number: 91110238</p> <p>Thread: R 1/4"</p> <p>Weight: 440 g</p> <p>Material: Aluminum/Steel</p>		
<p>Type: Suction Cup Attachment R 3/8" Female Thread Spring</p> <p>Part number: 91110239</p> <p>Thread: R 3/8"</p> <p>Weight: 420 g</p> <p>Material: Aluminum/Steel</p>		
<p>Type: Suction Cup Attachment R 1/4" Male Thread Spring</p> <p>Part number: 91110240</p> <p>Thread: R 1/4"</p> <p>Weight: 470 g</p> <p>Material: Aluminum/Steel</p>		
<p>Type: Suction Cup Attachment R 3/8" Male Thread Spring</p> <p>Part number: 91110241</p> <p>Thread: R 3/8"</p> <p>Weight: 450 g</p> <p>Material: Aluminum/Steel</p>		
<p>Type: Suction Cup Attachment R 1/4" Female Thread</p> <p>Part number: 91110242</p> <p>Thread: R 1/4"</p> <p>Weight: 265 g</p> <p>Material: Aluminum/Steel</p>		
<p>Type: Suction Cup Attachment R 3/8" Female Thread</p> <p>Part number: 91110243</p> <p>Thread: R 3/8"</p> <p>Weight: 275 g</p> <p>Material: Aluminum/Steel</p>		
<p>Type: Suction Cup Attachment R 1/4" Male Thread</p> <p>Part number: 91110244</p> <p>Thread: R 1/4"</p> <p>Weight: 285 g</p> <p>Material: Aluminum/Steel</p>		
<p>Type: Suction Cup Attachment R 3/8" Male Thread</p> <p>Part number: 91110245</p> <p>Thread: R 3/8"</p> <p>Weight: 295 g</p> <p>Material: Aluminum/Steel</p>		

6.19 Support Anglemount

<p>Only for PS2 shuttler</p> <p>Type: Cross Boom Adaptor Part number: 9937892 Drawn</p> <p>Part number: 9937893, Symmetrical Opposite</p> <p>Weight: 514 g. Material: Aluminum Torque A: 248 Nm Torque B: 248 Nm Tightening torque: 47 Nm</p>		
<p>Type: Support Anglemount Part number: 9938198 Weight: 385 g. Material: Aluminum Torque M10: 47 Nm Torque A for Ø38 tube: 300 Nm Torque B for Ø38 tube: 300 Nm</p>		<p>For attaching two Ø38 tubes at 90° angle</p>

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<p>Only sold as spare part</p> <p>Type: Angle Mount 90°</p> <p>Part number: 39915121</p> <p>Weight: 468 g</p> <p>Material: Aluminum</p> <p>Torque M10: 47 Nm</p> <p>Torque A for Ø38 tube: 112 Nm</p> <p>Torque B for Ø38 tube: 160 Nm</p>		
<p>Type: Angle Mount 90° (Split)</p> <p>Part number: 39915122</p> <p>Weight: 568 g</p> <p>Material: Aluminum</p> <p>Torque M10: 47 Nm</p> <p>Torque A for Ø38 tube: 100 Nm</p> <p>Torque B for Ø38 tube: 168 Nm</p>		

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6.20 Part Localisers for Lower Tooling

<p>Type: Support Part number: 9937042 Weight: 162 g Material: Steel</p>		
<p>Type: Part Guiding L-Type Part number: 9937039 Weight: 234 g Material: Steel</p>		
<p>Type: Part Guiding V-Type Part number: 39915120 Weight: 408 g Material: Steel</p>		

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6.21 Bayonet Attachment for Wrist Extension Ø76 mm

Part No 91696092

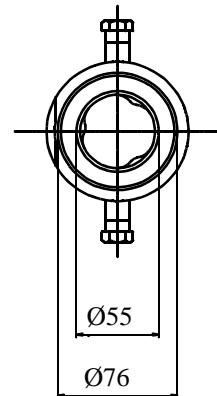
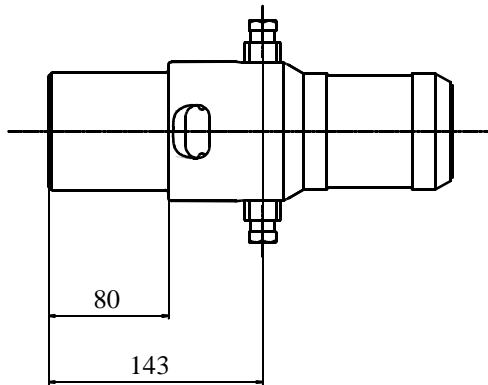
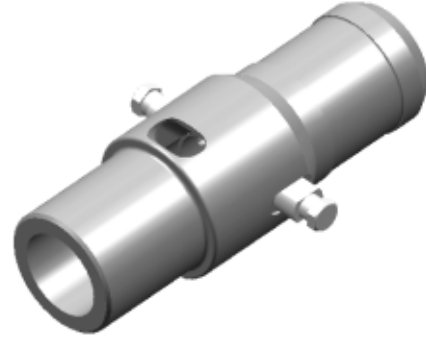
Including End Plate for Push-in Fittings, **3** holes.

Part No 91110821

Including End Plate for Push-in Fittings, **6** holes.

Weight..... 2600 g

Material Aluminum



Option

End Plates and corresponding Push-in Fittings	End Plate for Push-in Fittings, 3 holes	End Plate for Push-in Fittings, 6 holes
End Plate part No. Included	9939374	9939375
Weight of End Plate	198 g	170 g
Push-in Fittings 8 mm tube. Part No. Push-in Fittings NOT included.	G3/8 - 8 91207662	G1/8 - 8 91204069
Push-in Fittings 10 mm tube. Part No. Push-in Fittings NOT included.	G3/8 - 10 91205003	-

6.22 Wrist Extension Ø80 mm

(Only sold as spare part)

Part No. 9938392

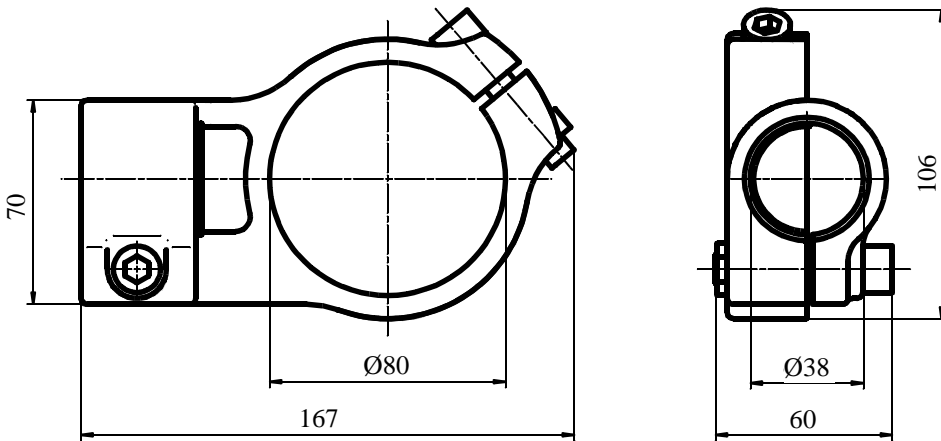
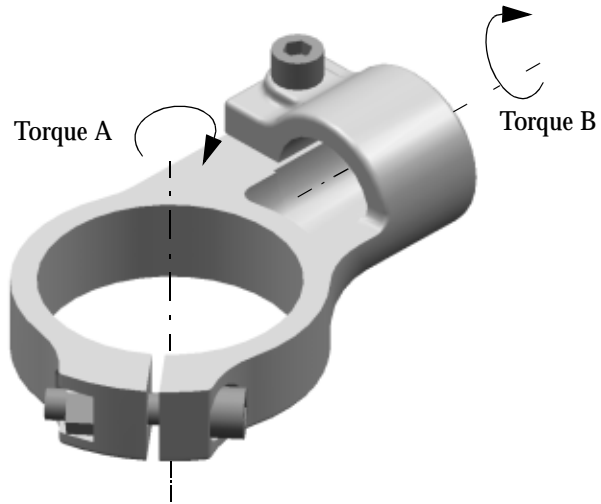
Weight..... 544 g

Material Aluminum

Tightening Torque for M10 47 Nm

Maximum Torque A for Ø80 440 Nm

Maximum Torque B for Ø38 112 Nm



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6.23 Gripper Mount for type B

(Only sold as spare part)

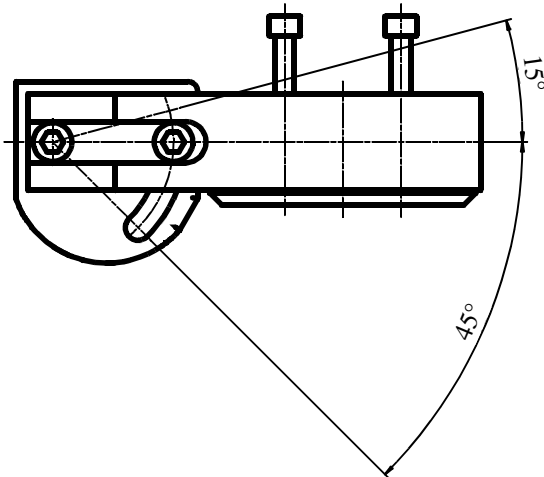
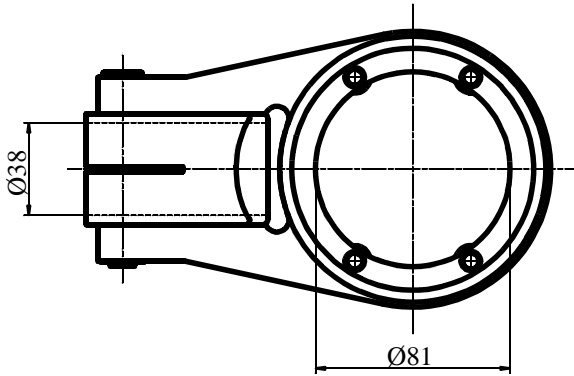
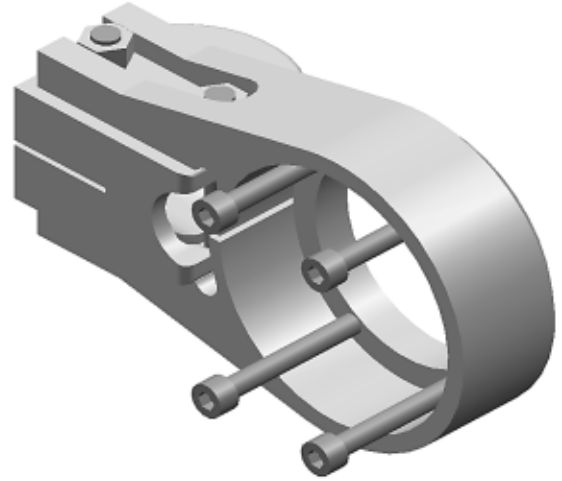
Part No. 9938390

Weight..... 1430 g

Material..... Aluminum

Tightening torque for M10..... 47 Nm

Tightening torque for M8..... 24 Nm

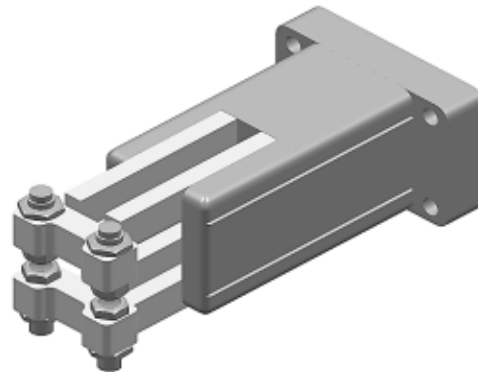
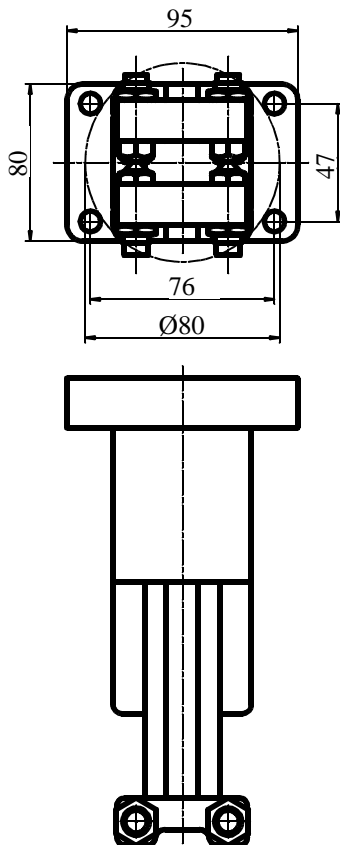


6.24 Gripper ISI for type B (180°)

(Only sold as spare part)

Part No. 3046776

Weight..... 1800 g

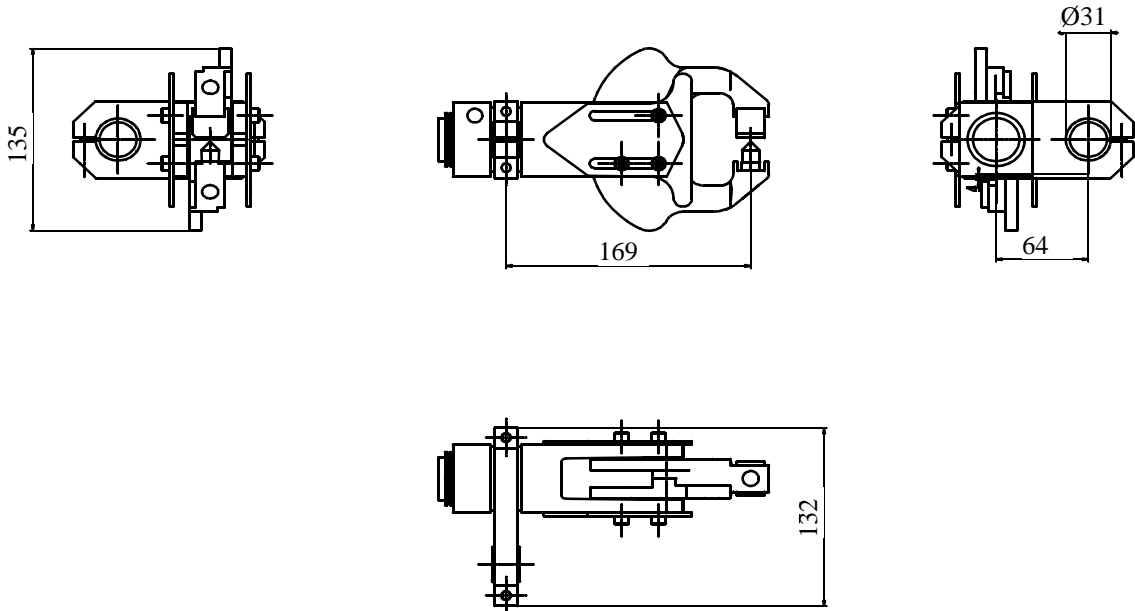
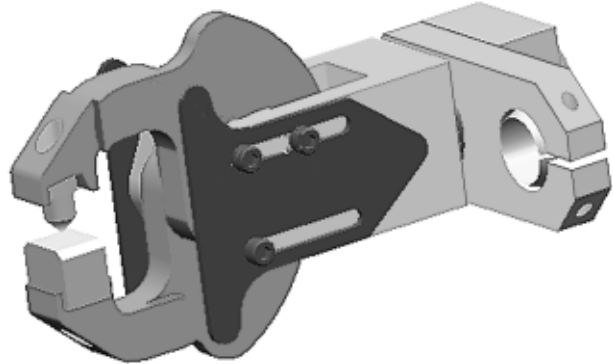


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6.25 Gripper type A

Part No.91204027

Weight:.....2000 g



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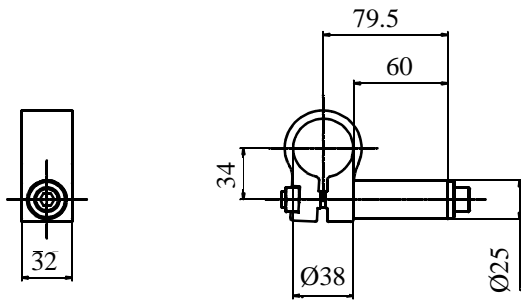
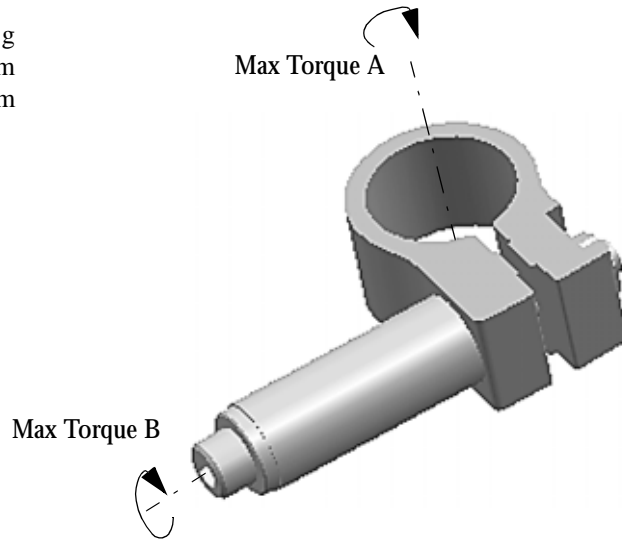
6.26 Gripper Mount for type A

Part No. 91697130

Weight: 244 g

Max Torque A 352 Nm

Max Torque B 50 Nm



6.27 Robot Attachment

<p>Type: Robot IRB 6400 Attachment Tube Ø76</p> <p>Part number: 9936313 Weight: 1408 g Material: Aluminum Torque M10: 47 Nm Max torque A for Ø76: 440 Nm</p>		
<p>Type: Robot IRB 6400 Attachment Tube Ø38</p> <p>Part number: 9936314 Weight: 1950 g Material: Aluminum Torque M10: 47 Nm Max torque A for Ø38: 76 Nm</p>		

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<p>Type: Robot IRB 6400 Attachment Tube Ø38</p> <p>Part number: 91110810 Weight: 1950 g Material: Aluminum Torque M10: 47 Nm Max torque A for Ø38: 76 Nm</p>		
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6.28 Anglemount Ø76 mm

Part No. 91109563

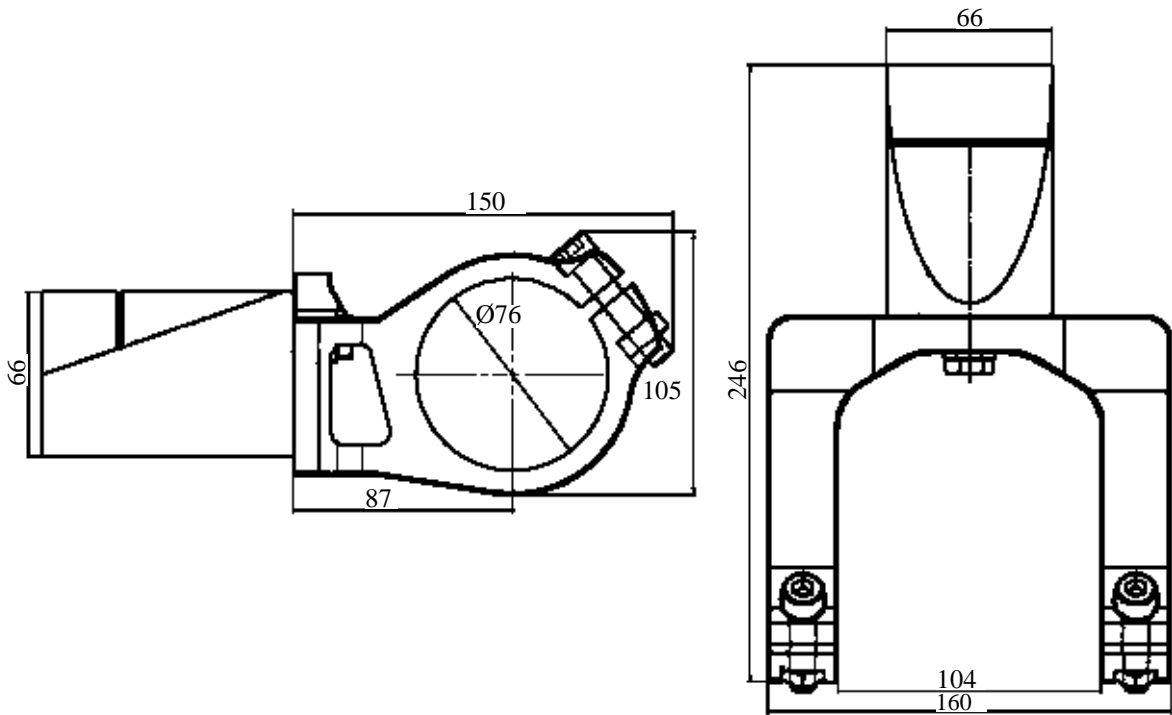
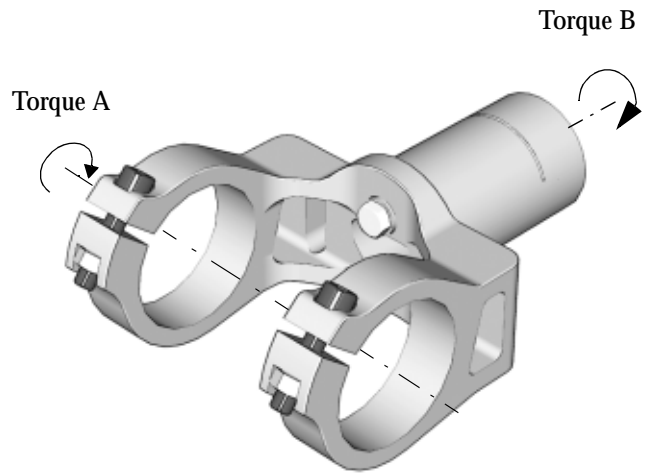
Weight..... 1700 g

Material.....Aluminum

Tightening Torque for M10 47 Nm

Maximum Torque A for Ø76..... 800 Nm

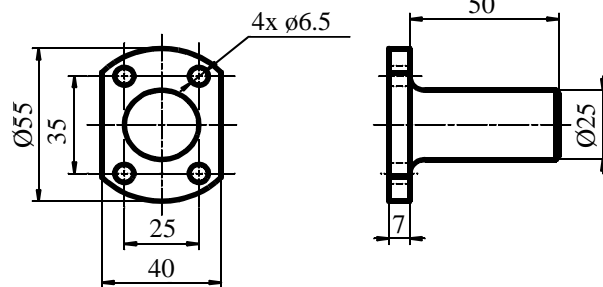
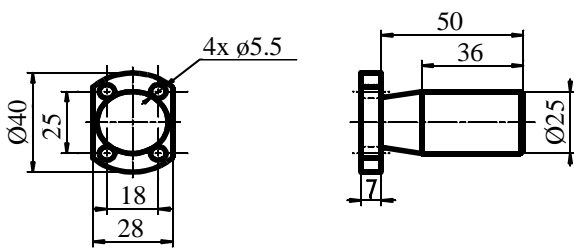
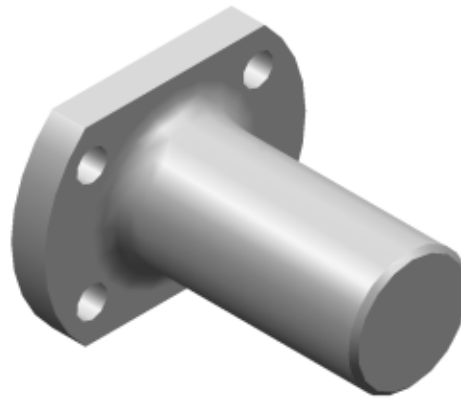
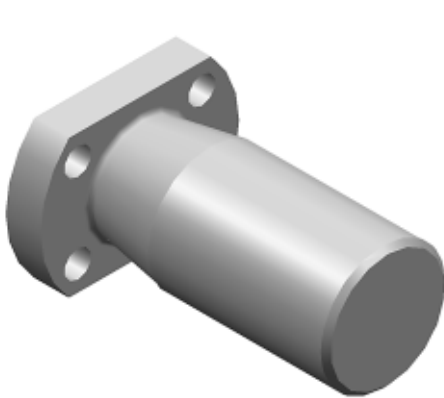
Maximum Torque B for Ø66..... 800 Nm



6.29 Tünger Attachment K25/Ø25 and K40/Ø25

Type: Tünger Attachment K25/Ø25
 Part No. 39915352
 Weight..... 30 g
 Material Aluminum
 Tightening Torque for M5 9,8 Nm

Type:..... Tünger Attachment K40/Ø25
 Part No..... 39915353
 Weight 105 g
 Material Aluminum
 Tightening Torque for M10..... 9,8 Nm

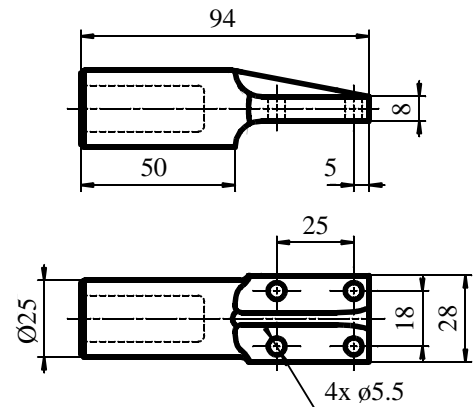
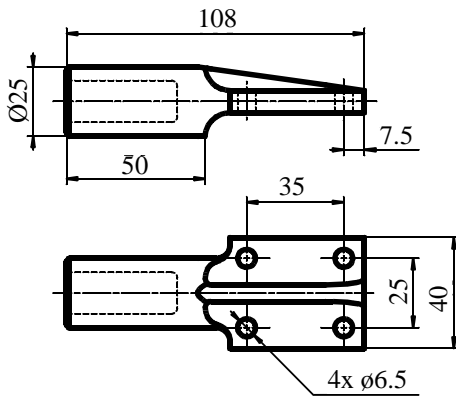
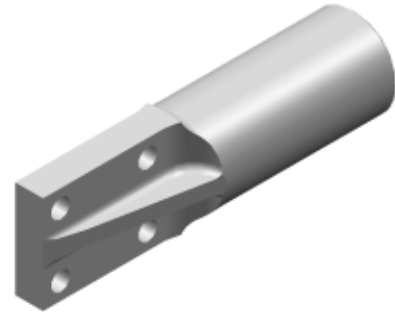
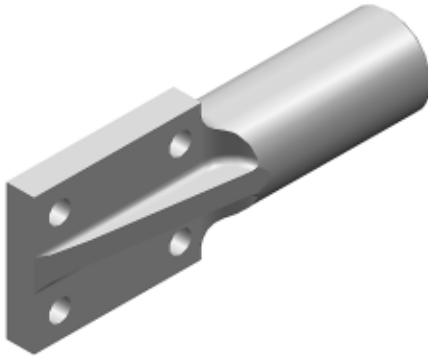


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6.30 Tünker Attachment K40/Ø25/90° and K25/Ø25/90°

Type: Tünker Attachment K40/Ø25/90°
 Part No. 39915355
 Weight 105 g
 Material Aluminum
 Tightening Torque for M5 9,8 Nm

Type: Tünker Attachment K25/Ø25/90°
 Part No. 39915356
 Weight 75 g
 Material Aluminum
 Tightening Torque for M10 9,8 Nm

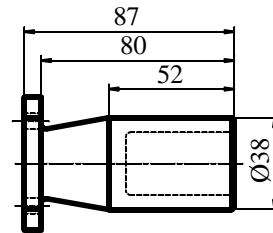
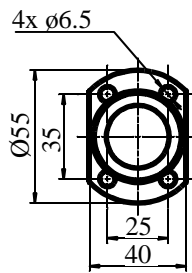
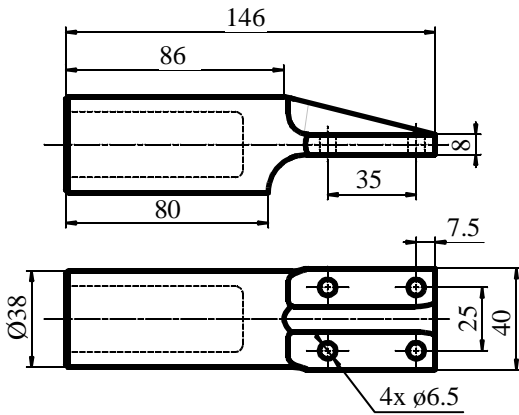
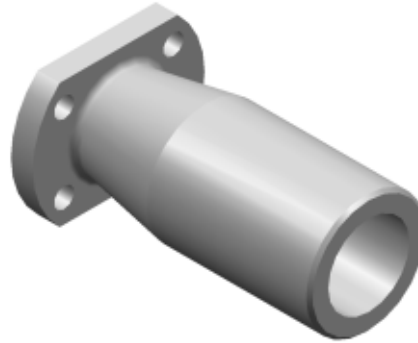


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6.31 Tünker Attachment K40/Ø38/90° and K40/Ø38

Type: Tünker Attachment K40/Ø38/90°
 Part No. 39915697
 Weight..... 230 g
 Material Aluminum
 Tightening Torque for M5 9,8 Nm

Type:..... Tünker Attachment K40/Ø38
 Part No..... 39915698
 Weight 205 g
 Material Aluminum
 Tightening Torque for M10..... 9,8 Nm

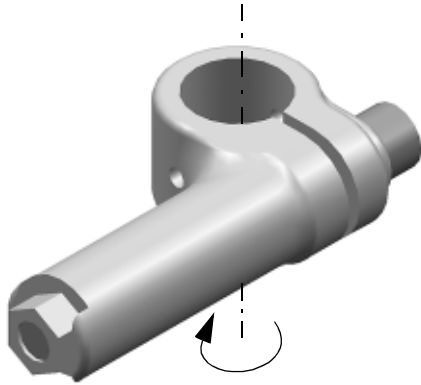


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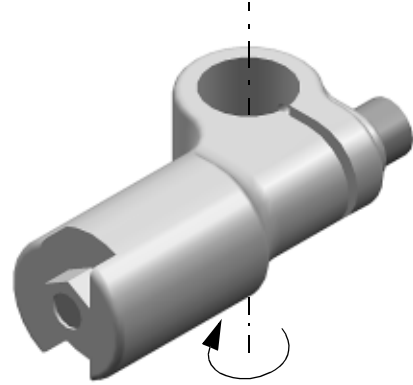
6.32 Attachment, Ø25/Ø25 and Ø25/Ø38

Type: Attachment Ø25/Ø25
 Part No. 39915706
 Weight 225 g
 Material Aluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque A 240 Nm

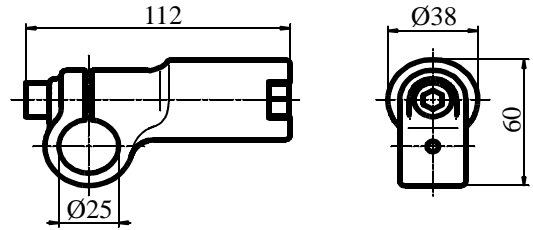
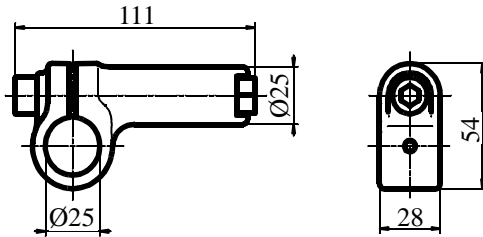
Type: Attachment Ø25/Ø38
 Part No. 39915708
 Weight 316 g
 Material Aluminum
 Tightening Torque for M10 47 Nm
 Maximum Torque A 240 Nm



Torque A



Torque A



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6.33 Angle mounts

<p>Type: Angle mount 90° Ø38/Ø38</p> <p>Part number: 91109687</p> <p>Weight: 480 g</p> <p>Material: Aluminum</p> <p>Torque M10: 47 Nm</p> <p>Max torque A for Ø38: 160 Nm</p> <p>Max torque B for Ø38: 110 Nm</p>		
<p>Type: Angle mount swivel type Ø38/Ø38</p> <p>Part number: 91110335</p> <p>Weight: 350 g</p> <p>Material: Aluminum</p> <p>Torque M10: 47 Nm</p> <p>Max torque A for Ø38: 352 Nm</p> <p>Max torque B for Ø38: 352 Nm</p> <p>Max torque C: 50 Nm</p>		

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6.34 Pneumatic connectors for air pressure and vacuum

<p>Type: Splicing Connector 10 mm Part number: 91207226 Material: Plastic Tube: Ø10 mm.</p>	
<p>Type: Air Quick Connector PLC 400-M8 Male Part number: 3045840 Material: Plastic Tube: Ø8 mm.</p> <p>Type: Air Quick Connector PLC 400-M10 Male Part number: 3045075 Material: Plastic Tube: Ø10 mm.</p>	 
<p>Type: L-Connector 8 mm -1/8" Part number: 3049183 Material: Plastic Tube: 1/8" - Ø8 mm.</p> <p>Type: L-Connector 6 mm -1/4" Part number: 3046066 Material: Plastic Tube: 1/4" - Ø6 mm.</p> <p>Type: L-Connector 8 mm -1/4" Part number: 3045896 Material: Plastic Tube: 1/4" - Ø8 mm.</p> <p>Type: L-Connector 10 mm -1/4" Part number: 91200543 Material: Plastic Tube: 1/4" - Ø10 mm.</p>	   
<p>Type: Y-Connector 6 mm Part number: 91204974 Material: Plastic Tube: Ø6 mm.</p> <p>Type: Y-Connector 8 mm Part number: 91204160 Material: Plastic Tube: Ø8 mm.</p> <p>Type: Y-Connector 10 mm Part number: 3049182 Material: Plastic Tube: Ø10 mm.</p>	  
<p>Type: Y-Connector 8 mm Part number: 3046064 Material: Plastic Tube: Ø8 - 6 mm.</p> <p>Type: Y-Connector 10 mm Part number: 91202392 Material: Plastic Tube: Ø10 - 8 mm.</p>	 
<p>Type: T-Connector 8 mm Part number: 91207328 Material: Plastic Tube: Ø8 mm.</p> <p>Type: T-Connector 10 mm Part number: 3046065 Material: Plastic Tube: Ø10 mm.</p>	 


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<p>Type: Distributor 1-4 8-6 mm Part number: 3046070 Material: Plastic Tube: Ø6 - Ø8 mm.</p>	
<p>Type: Shut-off Valve 8 mm Part number: 3045897 Material: Plastic Tube: Ø8 mm.</p> <p>Type: Shut-off Valve 10 mm Part number: 91207234 Material: Plastic Tube: Ø10 mm.</p>	
<p>Type: L-connector Slip-in Sleeve 10-10 mm Part number: 3048077 Material: Plastic Tube: Ø10 - Ø10 mm.</p> <p>Type: L-connector Slip-in Sleeve 10-8 mm Part number: 3046071 Material: Plastic Tube: Ø8 - Ø10 mm.</p>	
<p>Type: Plug 6 mm Part number: 3046068 Material: Plastic Tube: Ø6 mm.</p> <p>Type: Plug 8 mm Part number: 3046069 Material: Plastic Tube: Ø8 mm.</p> <p>Type: Plug 10 mm Part number: 3047019 Material: Plastic Tube: Ø10 mm.</p>	
<p>Type: Splicing Connector Slip-in Sleeve 6 mm Part number: 91207227 Material: Plastic Tube: Ø6 - Ø8 mm</p>	
<p>Type: Splicing Connector Slip-in Sleeve 8 mm Part number: 91207228 Material: Plastic Tube: Ø8 - Ø10 mm</p>	
<p>Type: Push-in Sleeve 8 mm Part number: 91207229 Material: Plastic Tube: Ø8 mm</p> <p>Type: Push-in Sleeve 10 mm Part number: 91207230 Material: Plastic Tube: Ø10 mm</p>	








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Type: Push-in fitting G1/8 - 8 Part number: 91204069 Material: PBT reinforced Tube: Ø8 mm Thread: 1/8"	
Type: Push-in fitting G3/8 - 8 Part number: 91207662 Material: PBT reinforced Tube: Ø8 mm Thread: 3/8"	
Type: Push-in fitting G3/8 - 10 Part number: 91205003 Material: PBT reinforced Tube: Ø10 mm Thread: 3/8"	






Tubes for air pressure and vacuum




Size	Part number	
6 mm x 1 mm	3046072	
8 mm x 1,25 mm	3045898	
10 mm x 1,5 mm	3045899	








6.35 Suction cups

<p>Main type: SAB circular bellow</p> <p>Type: Circular Suction cup Bellow SAB 40 -1/4" Female Thread</p> <p>Part number: 91206336</p> <p>Material: Perbunan (NBR)</p> <p>Dimension: 1/4" - Ø40 mm</p> <p>Weight: 14,3 g</p>	
<p>Type: Circular Suction cup Bellow SAB 40 -1/4" Male Thread</p> <p>Part number: 91207632</p> <p>Material: Perbunan (NBR)</p> <p>Dimension: 1/4" - Ø52 mm</p> <p>Weight: 19,6 g</p>	
<p>Type: Circular Suction cup Bellow SAB 50 -3/8" Female Thread</p> <p>Part number: 91207599</p> <p>Material: Perbunan (NBR)</p> <p>Dimension: 3/8" - Ø52 mm</p> <p>Weight: 32,3 g</p>	
<p>Type: Circular Suction cup Bellow SAB 50 -3/8" Male Thread</p> <p>Part number: 91207633</p> <p>Material: Perbunan (NBR)</p> <p>Dimension: 3/8" - Ø52 mm</p> <p>Weight: 45 g</p>	
<p>Type: Circular Suction cup Bellow SAB 60 -3/8" Female Thread</p> <p>Part number: 91206337</p> <p>Material: Perbunan (NBR)</p> <p>Dimension: 3/8" - Ø60 mm</p> <p>Weight: 40,0 g</p>	
<p>Type: Circular Suction cup Bellow SAB 60 -3/8" Male Thread</p> <p>Part number: 91207634</p> <p>Material: Perbunan (NBR)</p> <p>Dimension: 3/8" - Ø60 mm</p> <p>Weight: 50 g</p>	
<p>Type: Circular Suction cup Bellow SAB 80 -3/8" Female Thread</p> <p>Part number: 91206338</p> <p>Material: Perbunan (NBR)</p> <p>Dimension: 3/8" - Ø80 mm</p> <p>Weight: 63,0 g</p>	

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<p>Type: Circular Suction cup Bellow SAB 80 -3/8" Male Thread Part number: 91207635 Material: Perbunan (NBR) Dimension: 3/8" - Ø80 mm Weight: 75 g</p>	
<p>Type: Circular Suction cup Bellow SAB 100 -3/8" Female Thread Part number: 91206339 Material: Perbunan (NBR) Dimension: 3/8" - Ø100 mm Weight: 88,2 g</p>	
<p>Type: Circular Suction cup Bellow SAB 100 -3/8" Male Thread Part number: 91207636 Material: Perbunan (NBR) Dimension: 3/8" - Ø100 mm Weight: 100 g</p>	
<p>Type: Circular Suction cup Bellow SAB 125 -3/8" Female Thread Part number: 91206340 Material: Perbunan (NBR) Dimension: 3/8" - Ø125 mm Weight: 170,2 g</p>	
<p>Type: Circular Suction cup Bellow SAB 125 -3/8" Male Thread Part number: 91207640 Material: Perbunan (NBR) Dimension: 3/8" - Ø125 mm Weight: 182 g</p>	

<p>Main type: FSGA soft</p> <p>Type: Circular Suction cup Bellow FSGA 30 VU -1/4" Female Thread</p> <p>Part number: 91206341</p> <p>Material: Vulkollan (VU)</p> <p>Dimension: 1/4" - Ø30 mm</p> <p>Weight: 14,2 g</p>	
<p>Type: Circular Suction cup Bellow FSGA 50 VU -3/8" Female Thread</p> <p>Part number: 91206342</p> <p>Material: Vulkollan (VU)</p> <p>Dimension: 3/8" - Ø50 mm</p> <p>Weight: 30 g</p>	
<p>Type: Circular Suction cup Bellow FSGA 85 VU -3/8" Female Thread</p> <p>Part number: 91206343</p> <p>Material: Vulkollan (VU)</p> <p>Dimension: 3/8" - Ø85 mm</p> <p>Weight: 113 g</p>	

Main type: SAF circular flat		
Type: Circular Suction cup SAF 30 -1/4" Female Thread Part number: 91207600 Material: Perbunan (NBR) Dimension: 1/4" - Ø32 mm Weight: 25,5 g		
Type: Circular Suction cup SAF 40 -1/4" Female Thread Part number: 91207601 Material: Perbunan (NBR) Dimension: 1/4" - Ø42 mm Weight: 27,5 g		
Type: Circular Suction cup SAF 50 -3/8" Female Thread Part number: 91207602 Material: Perbunan (NBR) Dimension: 3/8" - Ø52 mm Weight: 30,7 g		
Type: Circular Suction cup SAF 60 -3/8" Female Thread Part number: 91206821 Material: Perbunan (NBR) Dimension: 3/8" - Ø60 mm Weight: 37,3 g		
Type: Circular Suction cup SAF 80 -3/8" Female Thread Part number: 91206822 Material: Perbunan (NBR) Dimension: 3/8" - Ø80 mm Weight: 50,0 g		
Type: Circular Suction cup SAF 100 -3/8" Female Thread Part number: 91206823 Material: Perbunan (NBR) Dimension: 3/8" - Ø100 mm Weight: 67,2 g		
Type: Circular Suction cup SAF 125 -3/8" Female Thread Part number: 91206824 Material: Perbunan (NBR) Dimension: 3/8" - Ø125 mm Weight: 146,0 g		

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<p>Main type: SAOB oval bellow</p>	
<p>Type: Oval Suction cup Bellow SAOB 30x60 -1/4" Female Thread Part number: 91207300 Material: Perbunan (NBR) Dimension: 1/4" - 30 x 60 mm Weight: 47,9 g</p>	
<p>Type: Oval Suction cup Bellow SAOB 30x60 -3/8" Female Thread Part number: 91207607 Material: Perbunan (NBR) Dimension: 3/8" - 30 x 60 mm Weight: 56,7 g</p>	
<p>Type: Oval Suction cup Bellow SAOB 40x80 -1/4" Female Thread Part number: 91206868 Material: Perbunan (NBR) Dimension: 1/4" - 40 x 80 mm Weight: 55,2 g</p>	
<p>Type: Oval Suction cup Bellow SAOB 40x80 -3/8" Female Thread Part number: 91207608 Material: Perbunan (NBR) Dimension: 3/8" - 40 x 80 mm Weight: 64,0 g</p>	
<p>Type: Oval Suction cup Bellow SAOB 40x80 -3/8" Male Thread Part number: 91207638 Material: Perbunan (NBR) Dimension: 3/8" - 40 x 80 mm Weight: 72 g</p>	
<p>Type: Oval Suction cup Bellow SAOB 55x110 -3/8" Female Thread Part number: 91207609 Material: Perbunan (NBR) Dimension: 3/8" - 55 x 110 mm Weight: 111,3 g</p>	
<p>Type: Oval Suction cup Bellow SAOB 70x140 -3/8" Female Thread Part number: 91207610 Material: Perbunan (NBR) Dimension: 3/8" - 70 x 140 mm Weight: 146,3 g</p>	

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Main type: SAOF oval flat	
Type: Oval Suction cup SAOF 16x50 -1/4" Female Thread Part number: 91207639 Material: Perbunan (NBR) Dimension: 1/4" - 16 x 50 mm Weight: 33,4 g	
Type: Oval Suction cup SAOF 23x60 -3/8" Female Thread Part number: 91207603 Material: Perbunan (NBR) Dimension: 3/8" - 23 x 60 mm Weight: 29,3 g	
Type: Oval Suction cup SAOF 30x90 -1/4" Female Thread Part number: 91207298 Material: Perbunan (NBR) Dimension: 1/4" - 30 x 90 mm Weight: 51,5 g	
Type: Oval Suction cup SAOF 30x90 -3/8" Female Thread Part number: 91207598 Material: Perbunan (NBR) Dimension: 3/8" - 30 x 90 mm Weight: 60,3 g	
Type: Oval Suction cup SAOF 40x80 -1/4" Female Thread Part number: 91207299 Material: Perbunan (NBR) Dimension: 1/4" - 40 x 80 mm Weight: 47,0 g	
Type: Oval Suction cup SAOF 40x80 -3/8" Female Thread Part number: 91207597 Material: Perbunan (NBR) Dimension: 3/8" - 40 x 80 mm Weight: 55,8 g	
Type: Oval Suction cup SAOF 40x80 -3/8" Male Thread Part number: 91207637 Material: Perbunan (NBR) Dimension: 3/8" - 40 x 80 mm Weight: 63 g	
Type: Oval Suction cup SAOF 50x100 -3/8" Female Thread Part number: 91207604 Material: Perbunan (NBR) Dimension: 3/8" - 50 x 100 mm Weight: 85,3 g	

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<p>Type: Oval Suction cup SAOF 60x120 -3/8" Female Thread Part number: 91207605 Material: Perbunan (NBR) Dimension: 3/8" - 60 x 120 mm Weight: 99,4 g</p>	
<p>Type: Oval Suction cup SAOF 70x140 -3/8" Female Thread Part number: 91207606 Material: Perbunan (NBR) Dimension: 3/8" - 70 x 140 mm Weight: 107,3 g</p>	



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