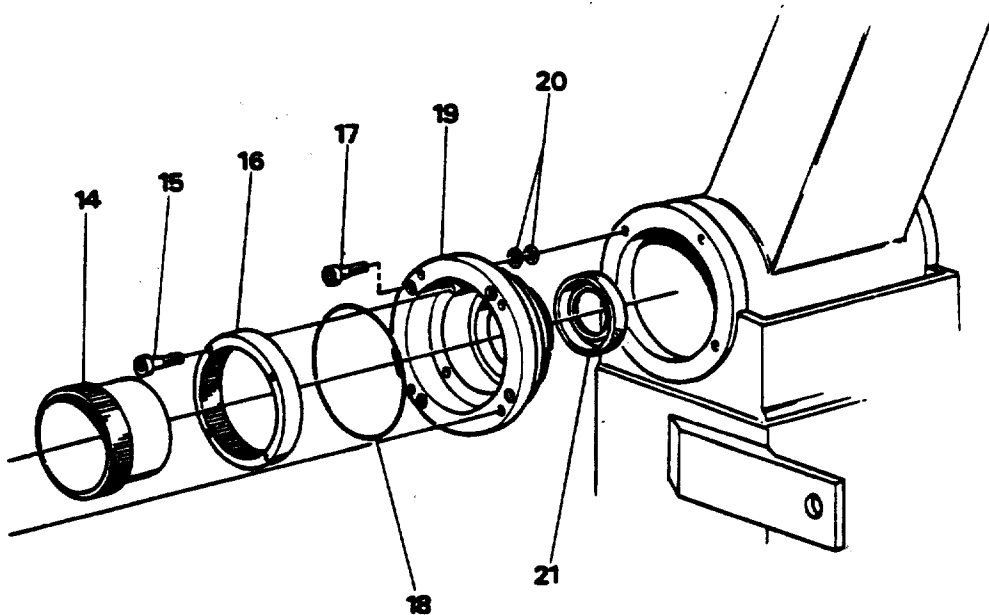


ASEA

INDUSTRIAL ROBOT SYSTEM IRB 6/2 IRB L6/2 IRB G6/2



SPARE PART SET SPARE PARTS

6397 017-101

CK09-1507E

SEP 86

Spare parts

SPARE PARTS

1 st Axis	1
Motor unit, 1 st to 5th axis.....	2
Main bearings.....	3.10
	3.20
	3.30
Motor and ball screw unit, 2nd and 3rd axis.....	4
Motor and gear box, 4th and 5th axis.....	5
Link rods and rod ends.....	6
Wrist unit.....	7
Sync and limit switches.....	8.20
Mechanical components.....	9
Cables and connections.....	10.10
Third wrist motion.....	10.20
	10.30
	10.40
	10.50
Special spare parts IRB G6.....	11
Spare parts set	12
Spare parts control cabinet dok CK09-1500E.....	13

1 st Axis

Item	Qty	Description	Article.No.	Comments
1	1	Intermediate plate	2164 0644-B	
2	1	Bearing	2213 4050-211	
4	1	Flexsplines	2353 001-D	
5	1	Pressure plate	2171 205-9	
6	7	Socket screw M8x55	2121 2518-462	
7	1	Seal	2216 261-4	
8	1	Part of item 2		
9	1	Seal	2116 262-1	Previous gear housing (item 10)
10	1	Gear housing	2326 060-B* 2326 063-A*	New version
11	1	Circular spline		Part of item 4
12	6	Socket screw M6x35	2121 2518-376	
13	1	O-ring	2152 2012-435	
14	1	Wave generator		Part of item 4
15	1	Seal	2216 299-1	
16	4	Socket screw M5x16	2121 2519-329	
17	4	Sealing washer	2152 2032-2	
18	1	Motor flange	2164 0608-1	
19	4	Socket screw M5x35	2121 2519-337	
20	1	Disc	2299 032-1	
22	1	Key	2157 2011-139	
23	1	Motor unit	6397 001-CS	
24	1	Hose clip	2529 2031-106	
25	1	Adjusting tube	2247 052-6	
27	1	Plug	2522 101-1	Previous gear housing (item 10)
28	1	Fitting	2528 404-1	
29	1	Plastic hose	1865 1019-26	∅ 8x1 L = 800
30	1	Fitting	2528 316-2	
31	1	Sealing washer	2152 2031-5	
32	1	Plug	2522 291-1	

Motor and ball screw unit, 2nd and 3rd Axis

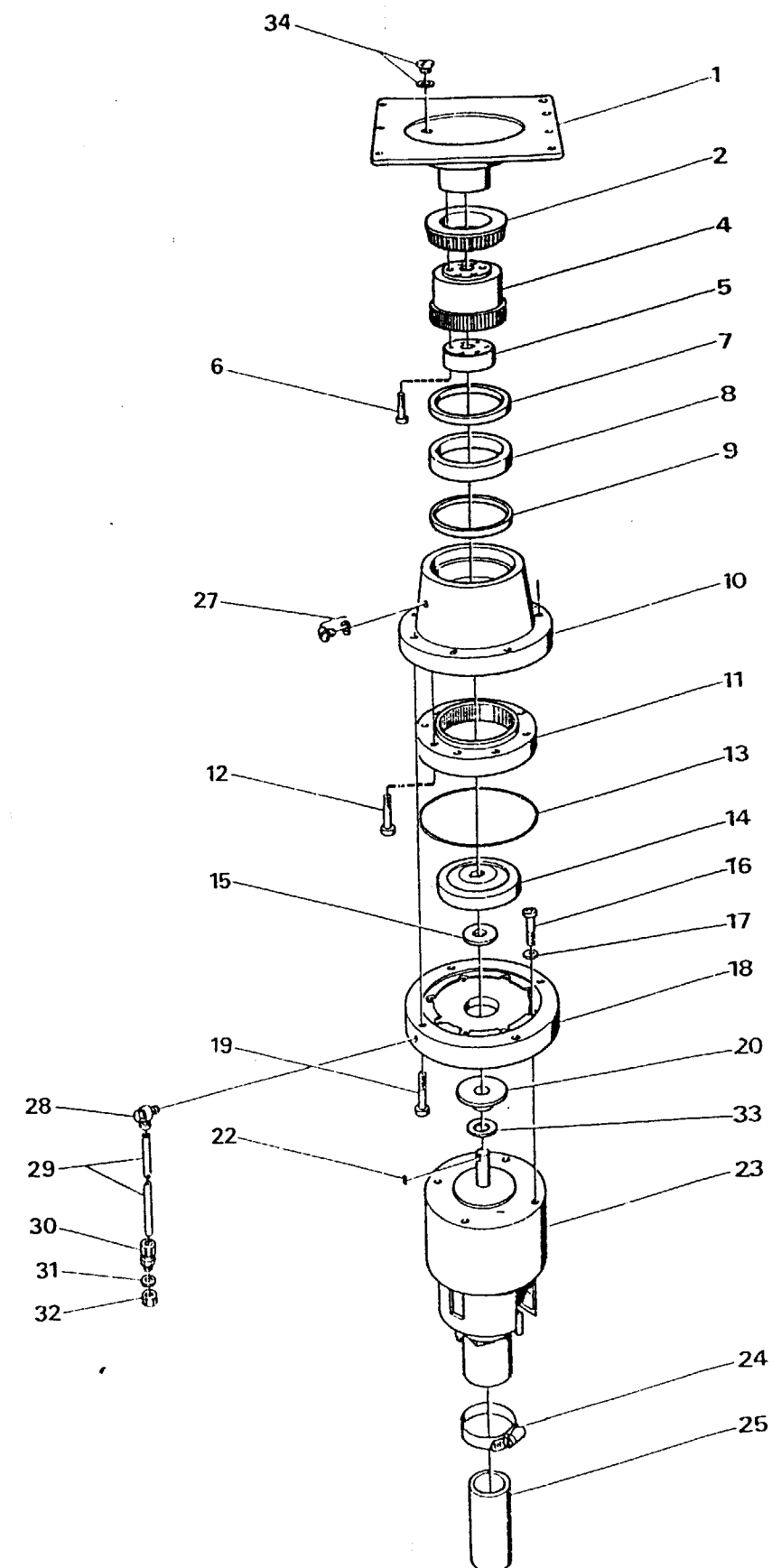
Item	Qty	Description	Article No.	Comments
1	1	Resolver cover	2158 355-A	
2	1	Motor unit	6397 001-CS*	Without brake
3-29	1	Ball screw unit, complete	6397 001-ACC	
3	2	Key	2157 2011-140	
4	1	Coupling	2245 219-1	
5	2	Grub screw M4x8	2122 2765-76	
6	2	Plug	2522 2101-9	
7	1	Bearing housing	2184 240-4	
8	1	Lock nut M15x1	2126 2851-102	
9	1	Lock washer	2154 2101-102	
10	1	Spacer	2151 0024-16	
11	2	Seal	2216 272-4	
11a	2	Distance ring	2151 0022-15	
12	1	Bearing	2213 0047-1	
13	1	Damper	2196 064-H	
14	12	C/S screw M6x12	2121 2852-366	
15	4	Strap L = 208	2166 2054-3	
16	4	Buffer		Part of item 13, 18 and 24
17	2	Bellows	2516013-1	
18	2	Damper	2196 064-D	
19	2	Screw SKRC M3x6	2121 2452-220	
20	1	Angle plate	2174 411-1	
21	1	Parallel pin	2111 2021-270	
22	1	Nut housing	2184 236-5	
23	1	Ball screw	2323 007-A	
24	1	Damper	2196 064-B	
25	1	Bearing	2213 6001-102	
26	1	Retaining ring	2154 2526-117	
27	1	Bracket	2172 0492-100	
28	4	Socket screw M3x25	2121 2452-232	

1 st Axis

Item	Qty	Description	Article No.	Comments
33	1	Washer	2152 398-4	
34	1	Plug	2522 101-1	New gear housing (item 10)

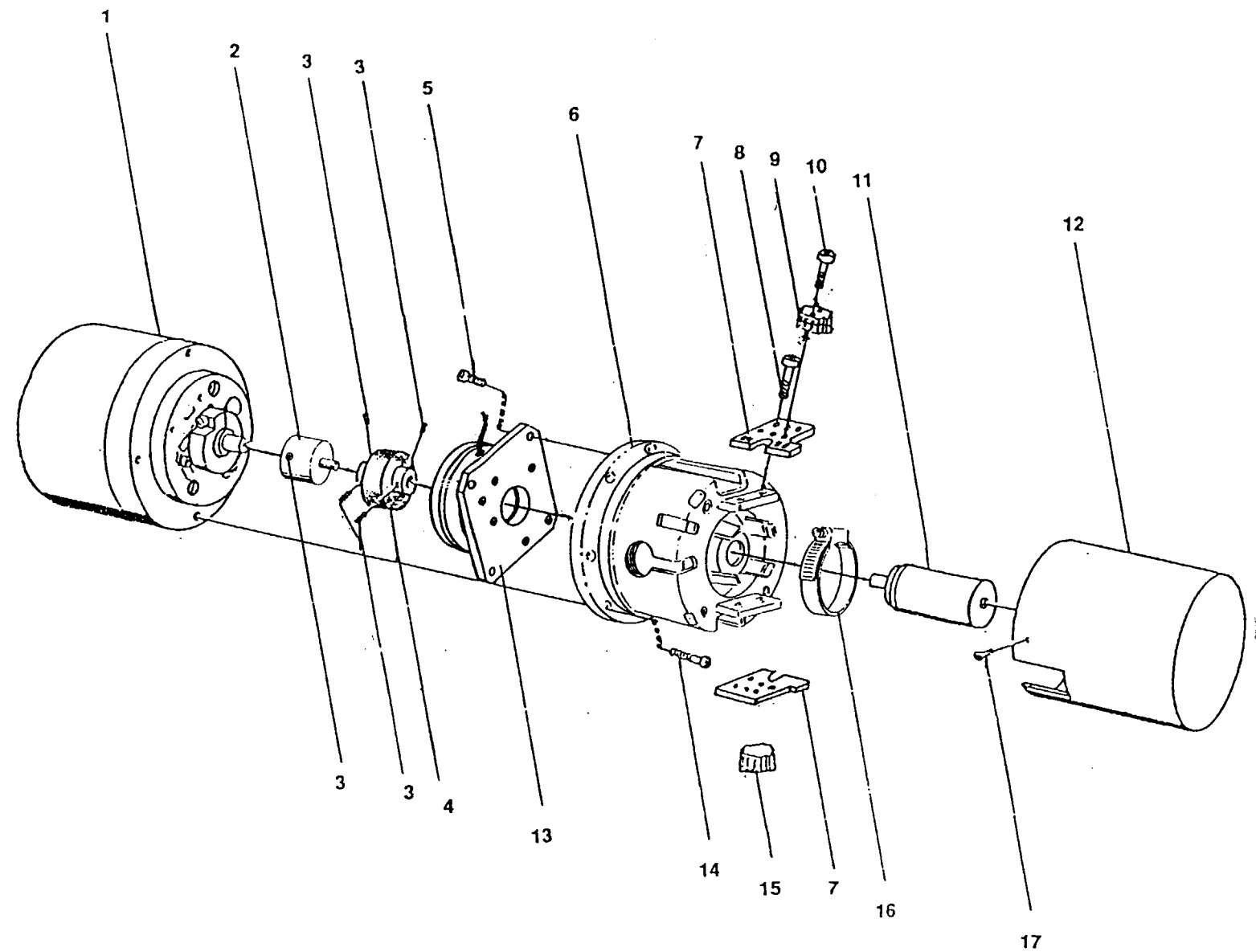
Note: Items 4, 11 and 14 comprise a complete H.D. gear box and can not be replaced individually

* = New versions are not interchangeable



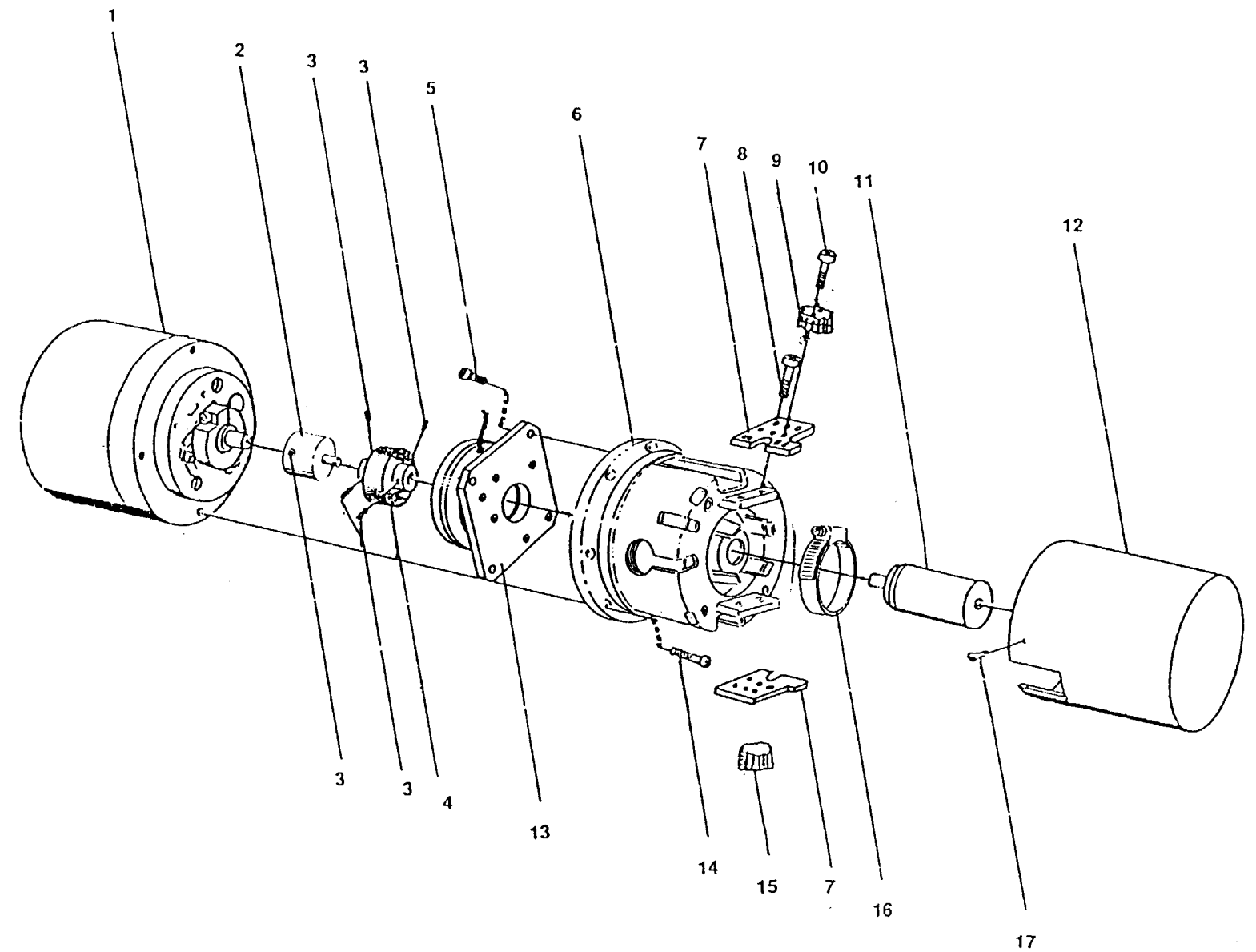
Motor unit				
Item	Qty	Description	Article No.	Comments
-	1	Motor unit, with brake	6397 001-LE	Axes 2-5 only
-	1	Motor unit, complete	6397 001-C	
1	1	Motor	4419 545-A	Including tacho
2	1	Reducer	2245 219-12	
3	5	Grubscrew	2122 2719-219	Part of item 4
4	1	Coupling	2245 219-2 *	
5	4	Screw M4x16	2121 2519-293	
6	1	Resolver flange	2158 0143-G	
7	2	Bracket	2172 0539-AE	
8	4	Screw M3x10	2121 2452-224	
9	2	Connector	2117 263-3	
10	4	Screw M2,5x16	2121 2452-119	
11	1	Resolver	5766 388-1	
12	1	Resolver cover	2158 355-A	
13	1	Brake	2284 260-B *	
14	4	Socket screw M3x40	2121 2452-238	
15	1	Connector	5217 263-2	
16	1	Hose clamp	2529 168-9	

*) Only for motor unit with brake



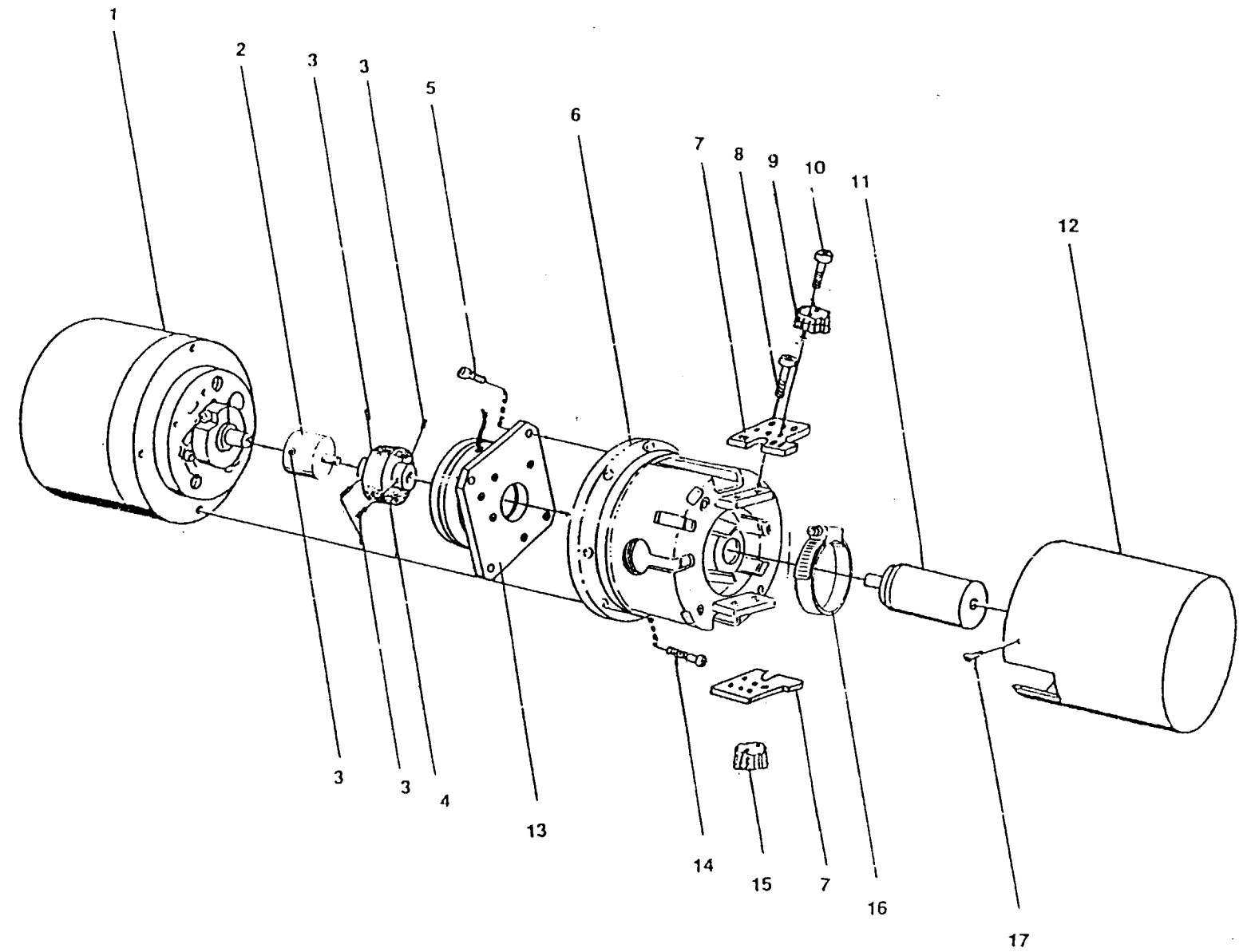
Motor unit				
Item	Qty	Description	Article No.	Comments
-	1	Motor unit, with brake	6397 001-NF	Axes 2-5 only
-	1	Motor unit, complete	6397 001-NG	Including tachometer
1	1	Motor	4419 545-B	
2	1	Reducer	2245 219-12	
3	5	Grubscrew	2122 2719-219	Part of item 4
4	1	Coupling	2245 219-2 *	
5	4	Screw M4x16	2121 2519-293	
6	1	Resolver flange	2158 0143-G	
7	2	Bracket	2172 0539-AE	
8	4	Screw M3x10	2121 2452-224	
9	2	Connector	2117 263-3	
10	4	Screw M2,5x16	2121 2452-119	
11	1	Resolver	5766 388-1	
12	1	Resolver cover	2158 355-A	
13	1	Brake	2284 260-B *	
14	4	Socket screw M3x40	2121 2452-238	
15	1	Connector	5217 263-2	
16	1	Hose clamp	2529 168-9	

*) Only for motor unit with brake



Motor unit				
Item	Qty	Description	Article No.	Comments
-	1	Motor unit, with brake	6397 001-ND	Axes 2-5 only
-	1	Motor unit, complete	6397 001-NE	
1	1	Motor	4419 545-C	Including tachometer
2	1	Reducer	2245 219-12	
3	5	Grubscrew	2122 2719-219	Part of item 4
4	1	Coupling	2245 219-2 *	
5	4	Screw M4x16	2121 2519-293	
6	1	Resolver flange	2158 0143-G	
7	2	Bracket	2172 0539-AE	
8	4	Screw M3x10	2121 2452-224	
9	2	Connector	2117 263-3	
10	4	Screw M2,5x16	2121 2452-119	
11	1	Resolver	5766 388-1	
12	1	Resolver cover	2158 355-A	
13	1	Brake	2284 260-B *	
14	4	Socket screw M3x40	2121 2452-238	
15	1	Connector	5217 263-2	
16	1	Hose clamp	2529 168-9	

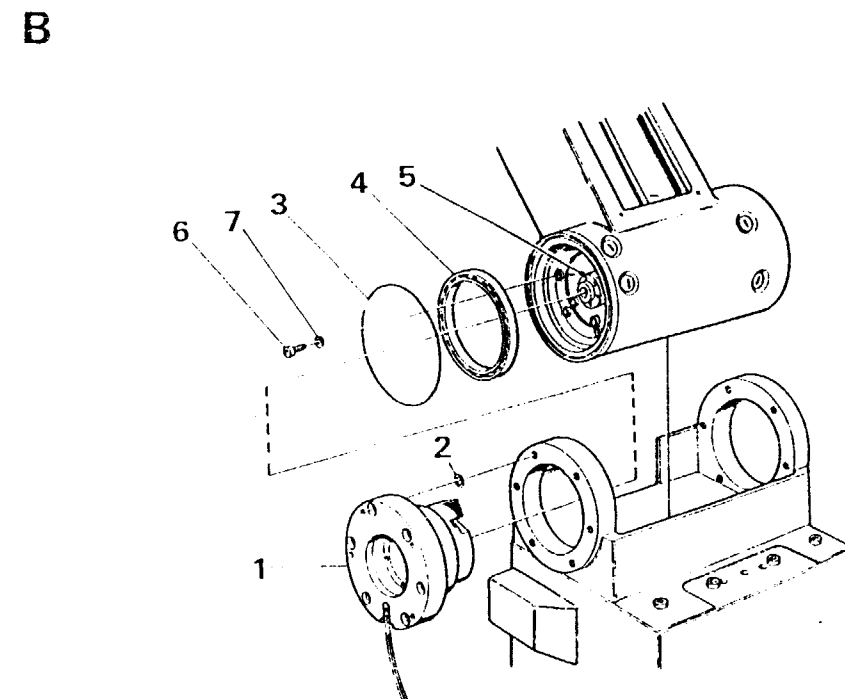
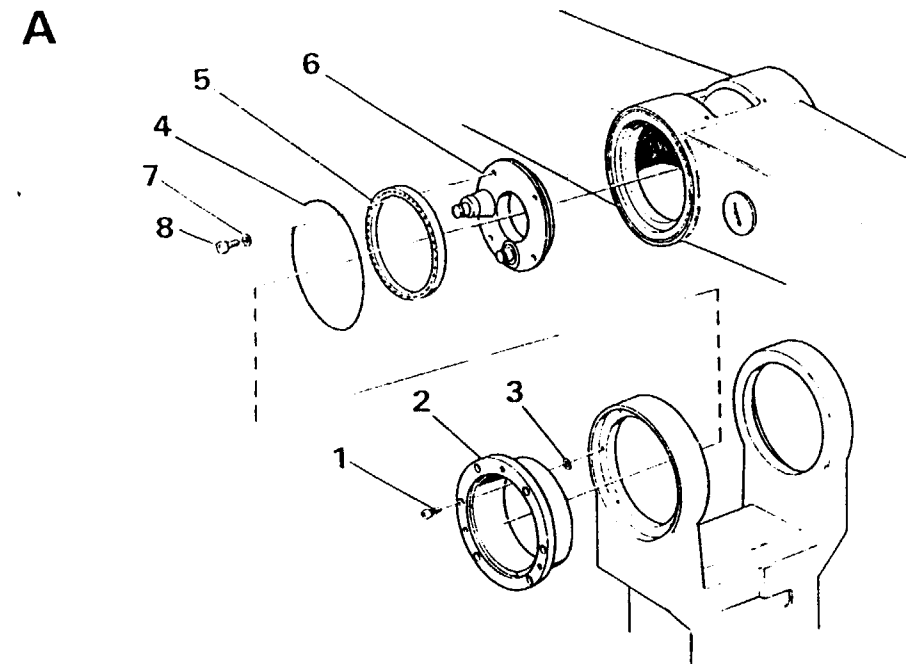
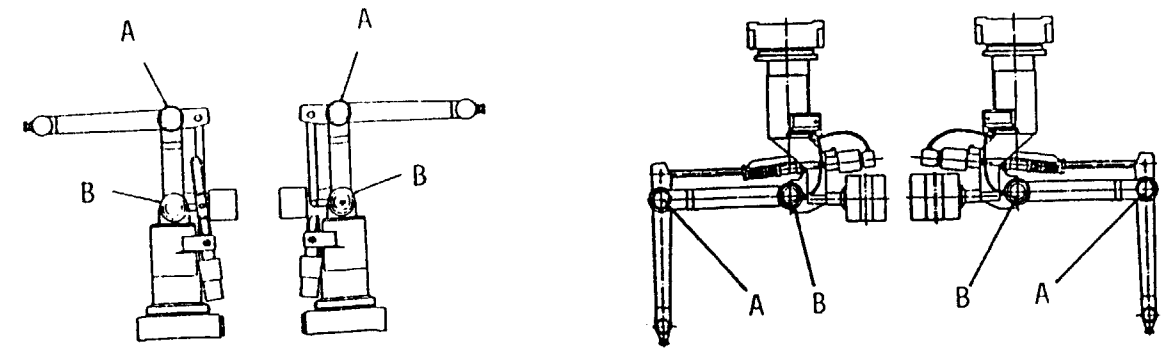
*) Only for motor unit with brake



Main bearings

Item	Qty	Description	Article No.	Comments
A				
1	6	Socket screw M6x16	2121 2519-368	
2	1	Hub	2295 220-1	
3	*	Spacer 0,1 mm	2151 0022-1	
	*	Spacer 0,5 mm	2151 0022-7	
4	1	Seal	2186 677-2	
5	1	Bearing	2213 257-2	
6	1	Linkage disc, complete	6397 001-PL	4th axis
			6397 001-PN	5th axis
-	1	Bearing	2213 257-1	Part of item 6
7	8	Washer	2151 0024-14	
8	8	Screw M3x8	2121 2711-222	
B				
1	1	Gear housing	6397 003-E	5th axis
1	1	Gear housing	6397 003-C	4th axis
2	*	Spacer 0,1 mm	2151 0022-2	
	*	Spacer 0,5 mm	2151 2086-38	
3	1	Seal	2186 677-2	
4	1	Bearing	2213 253-1	
5	1	Disc unit complete	6397 001-AM	5th axis
			6397 001-AL	4th axis
6	8	Screw M3x8	2121 2711-222	
7	8	Washer	2151 0024-14	

* = as required

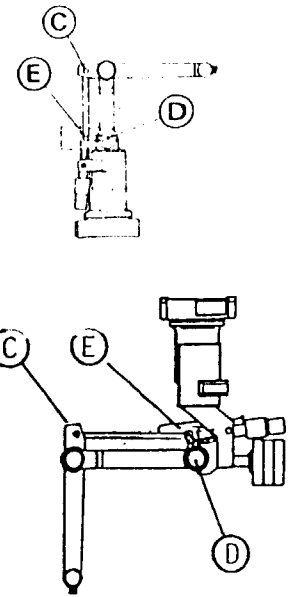
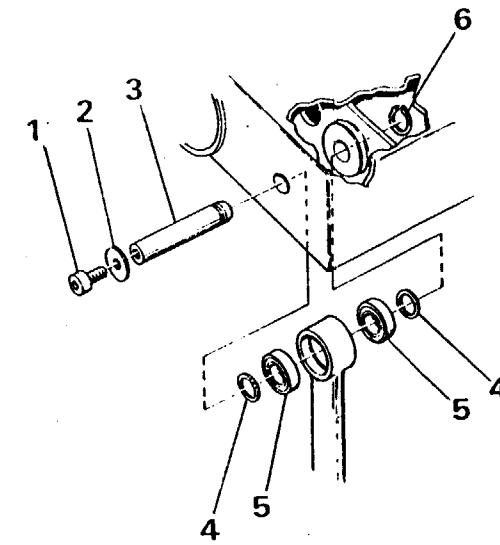


Main bearings

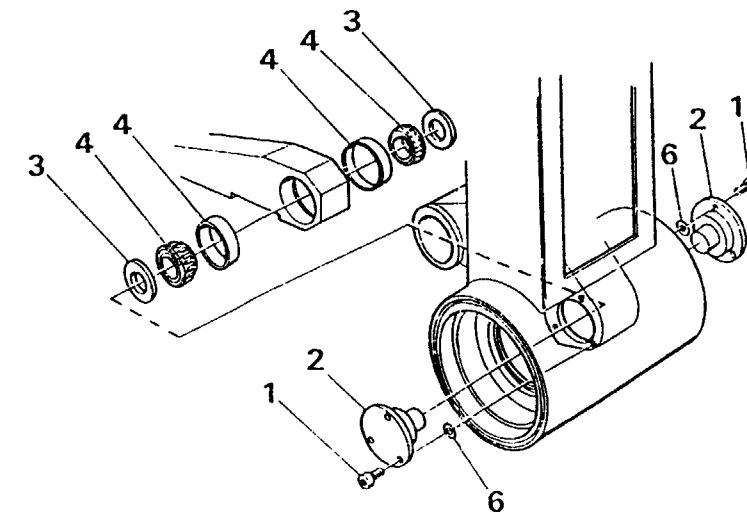
Item	Qty	Description	Article No.	Comments
C				
1	1	Socket screw M8x20	2121 2519-451	
2	1	Washer	2151 2082-153	
3	1	Cyl.pin	2238 047-5	
4	5	Spacer 0,1 mm	2151 0022-3	
	2	Spacer 0,5 mm	2151 0022-4	
5	2	Ball bearing	2213 6850-202	
6	1	Retaining ring	2154 2526-117	
D				
1	6	Socket screw M6x12	2121 2519-366	
2	2	Shaft journal	2238 049-2	
3	2	Grease seal	2216 264-1	
4	2	Taper roller bearing	2213 256-1	
6	*	Spacer 0,1 mm	2151 0022-1	
E				
1	1	Lock nut	2126 2851-102	
2	1	Lock washer	2154 2101-102	
3	4	Grease seal	2216 264-1	
4	4	Taper roller bearing	2213 256-1	
6	*	Spacer	2151 2082-51	
7	1	Shaft	2238 047-2	
8	1	Shaft plate	2164 0619-1	

* = as required

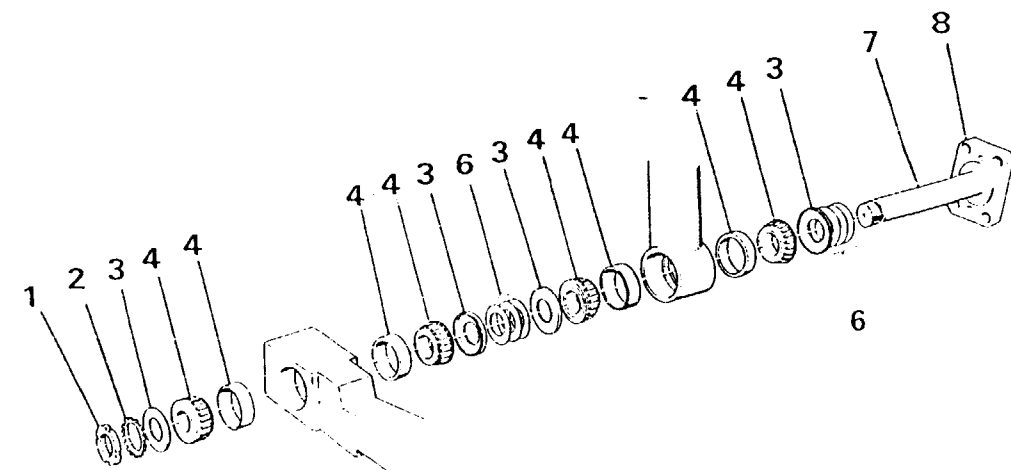
C



D



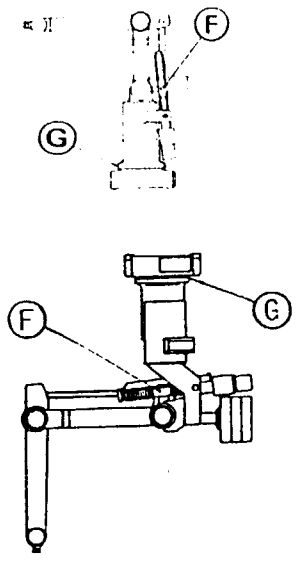
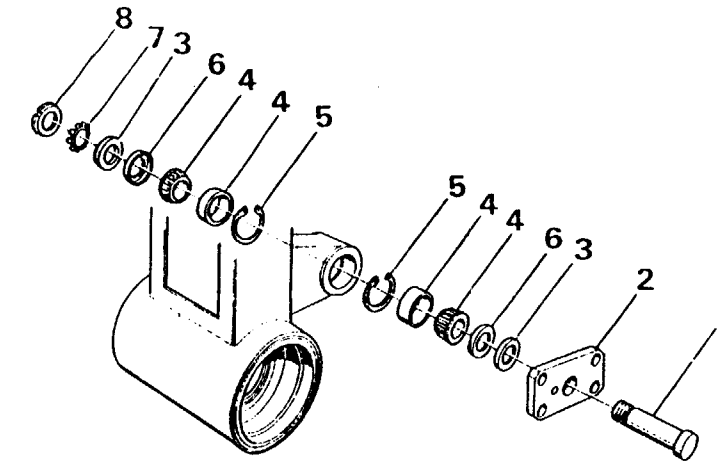
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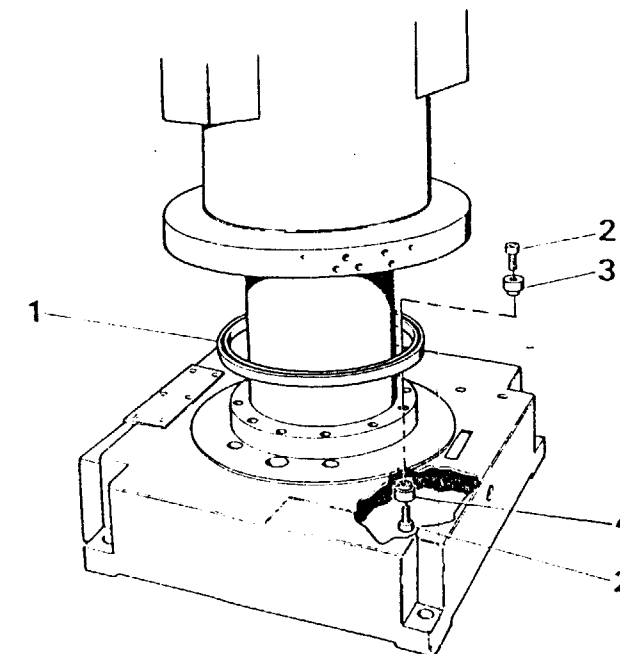
Main bearings

Item	Qty	Description	Article No.	Comments
F				
1	1	Shaft	2238 047-3	
2	1	Shaft plate	2164 0619-1	
3	2	Spacer	2151 2082-51	
4	2	Taper roller bearing	2213 256-1	
5	2	Retaining ring	2154 2527-133	
6	2	Grease seal	2216 264-1	
7	1	Lock washer	2154 2101-102	
8	1	Lock nut	2126 2851-102	
G				
1	1	Bearing	2213 844-1	
2	22	Socket screw M6x25	2121 2519-372	
3	10	Bearing retainer	2151 0024-17	
4	12	Bearing retainer	2151 0024-17	

F

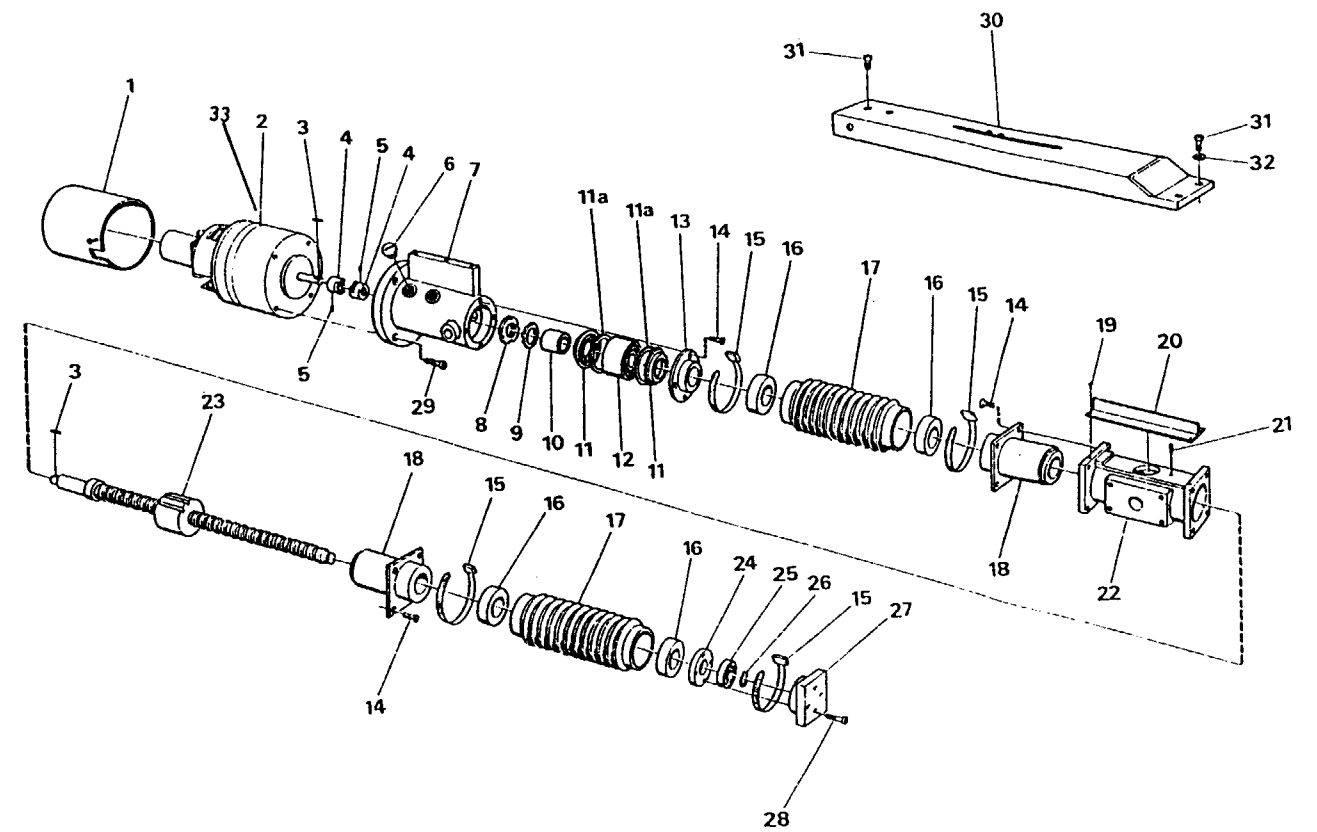


G



Motor and ball screw unit, 2nd and 3rd Axis

Item	Qty	Description	Article No.	Comments
29	4	Socket screw M5x12	2121 2519-327	
30	1	Bar	2163 235-H	3rd axis
	1	Bar	2163 235-H	3rd axis L 6/2
30a	1	Bar	2163 235-F	2nd axis
	1	Bar	2163 235-P	2nd axis L 6/2
31	4	Socket screw M8x20	2121 2519-451	
32	2	Washer	2151 2062-165	
33	1	Motor unit, with brake	6397 001-LE *	



*) From Robot No. 7494618

6397003-ND Without brake
6397003-NE Brake

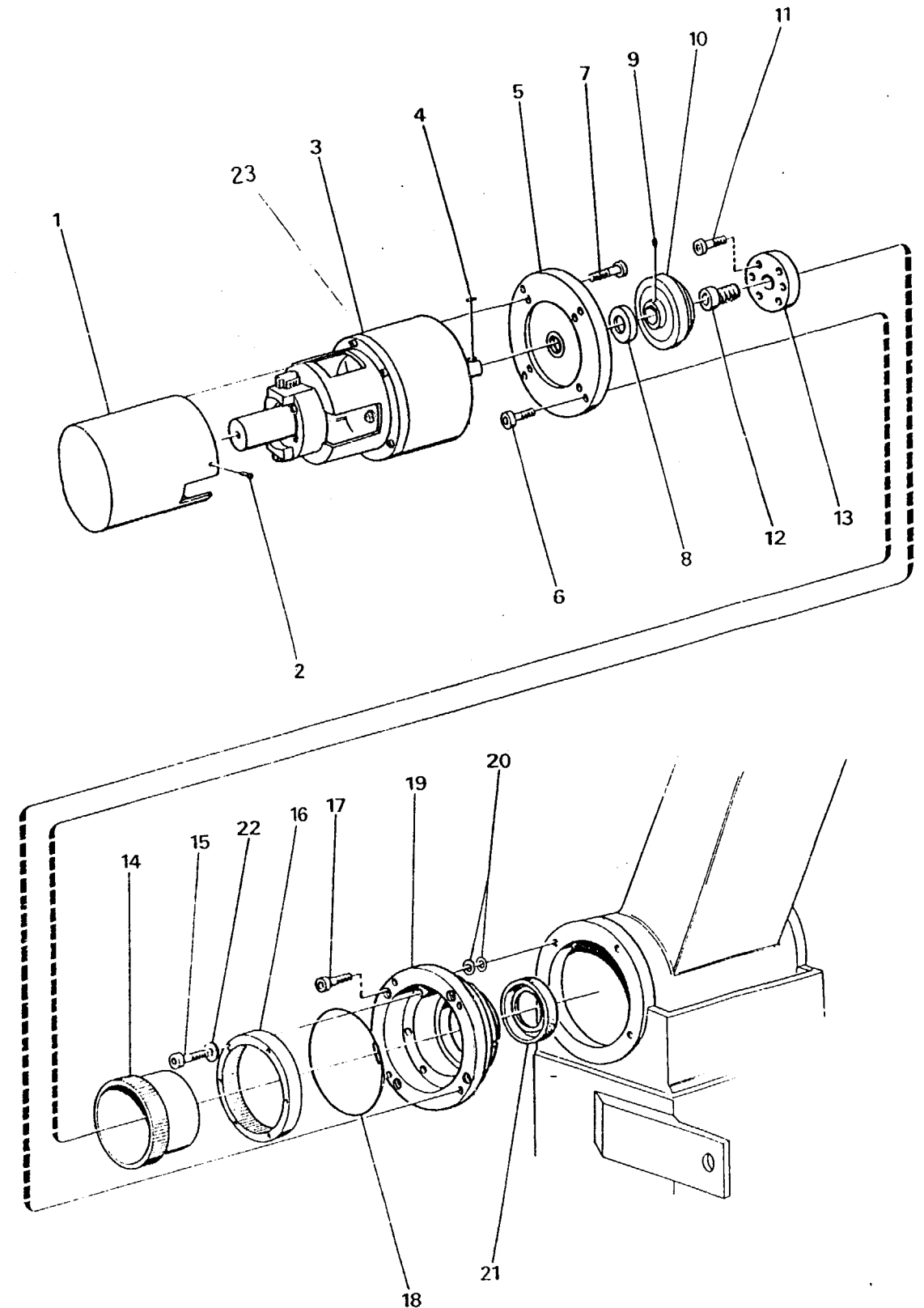
Motor and Gearbox, 4th and 5th Axis

Item	Qty	Description	Article No.	Comments
1	1	Resolver cover	2158 355-A	
2	4	Screw M3x6	2121 2452-220	
3	1	Motor unit	6397 001-CS**	Without brake
4	1	Key	2157 2011-139	
5	1	Motor flange	2164 0608-2	
6	4	Socket screw M6x25	2121 2519-372	
7	4	Socket screw M5x12	2121 2519-327	
8	1	Seal	2216 261-1	
9	1	Grub screw M4x5	2122 2711-284	
10	1	Wave generator		Part of item 14
11	6	Socket screw M5x30	2121 2518-335	
12	1	Socket screw M8x30	2121 2518-455	
13	1	Pressure plate	2171 205-14	
14	1	Flex splines	2353 001-E	
15	6	Socket screw M5x30	2121 2518-335	
16	1	Circular splines		Part of item 14
17	6	Socket screw M8x20	2121 2519-451	
18	1	O-ring	2152 2012-424	
19	1	Gear housing compl.	6397 003-C	4th axis shown in fig.
			6397 003-E	5th axis
20	*	Shims 0,1 mm	2151 0022-2	
	*	Shims 0,5 mm	2151 2086-38	
21	1	Seal	2216 261-2	
22	6	Washer	2151 0024-15	
23	1	Motor unit with brake	6397 001-LE**	

* = as required

Note: Items 10, 14 and 16 comprise a complete H.D. gearbox and cannot be replaced individually

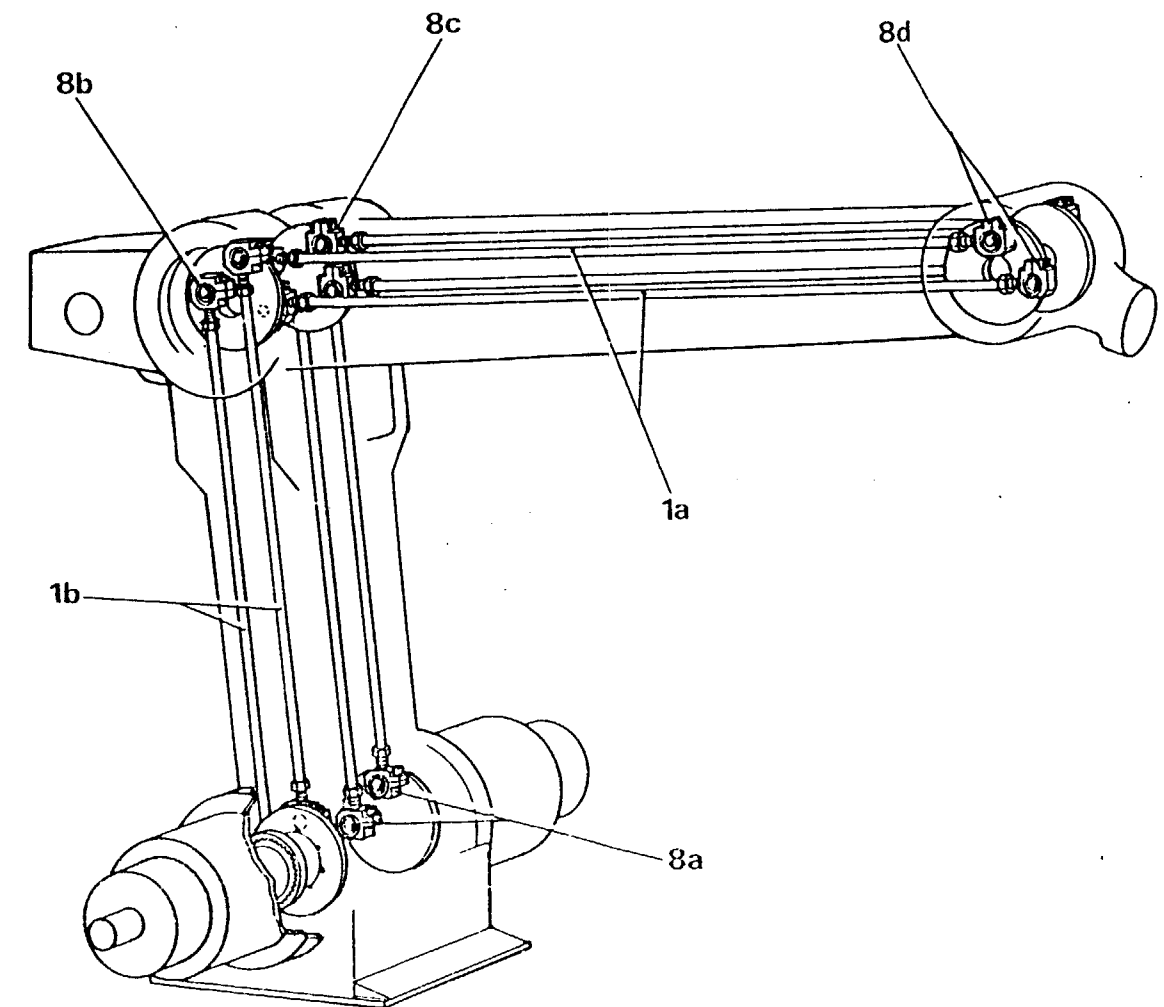
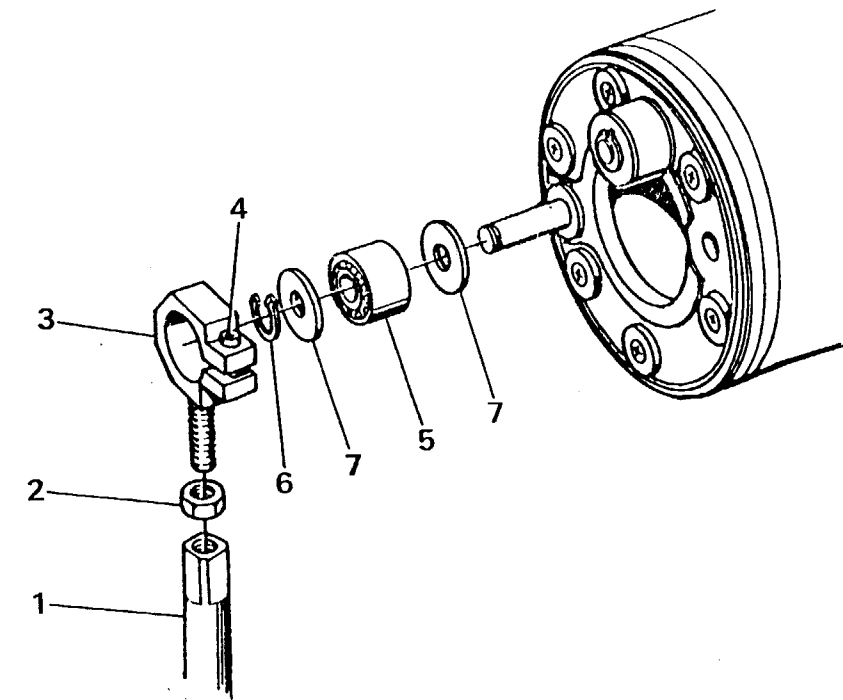
** From Robot No. 7494618 6397003-NF Without brake
6397003-NG Brake



Link rods and rod ends

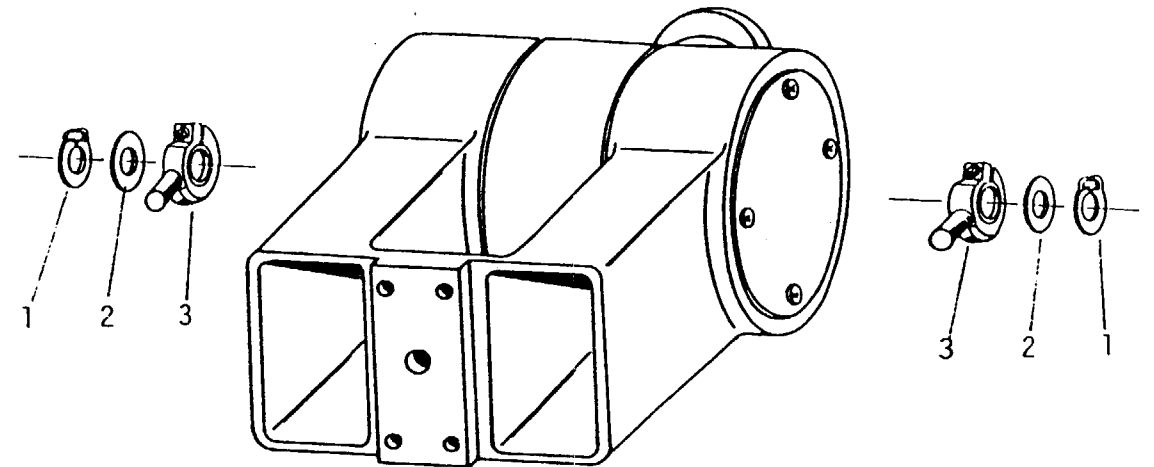
Item	Qty	Description	Article No.	Comments
1a	4	Link rod, upper arm	2184 241-A	
b	4	Link rod, lower arm	2184 241-B	IRB 6
c	4	Link rod, lower arm	2184 241-E	IRB L6, G6
2a	8	Lock nut, RH thread	2126 220-5	
b	8	Lock nut, LH thread	2126 220-1	
3a	4	Bearing housing RH	2219 238-2	
b	4	Bearing housing LH	2219 238-3	
c	4	Bearing housing LH, 2° bend	2219 238-5	
d	4	Bearing housing RH, 2° bend	2219 238-4	
4	1	Screw M4x20	2121 2518-295	
5	1	Needle bearing	2213 298-2	
6	1	Retaining ring	2154 2526-108	
7	2	Axial washer	2151 0026-4	
8a	4	Rod end straight, RH thread	2219 239-A	Complete
b	4	Rod end straight, LH thread	2219 239-B	Complete
c	4	Rod end 2° bend, RH thread	2219 240-A	Complete
d	4	Rod end 2° bend, LH thread	2219 240-B	Complete

Note: Item 8 includes item 3, 4 and 5



Wrist unit

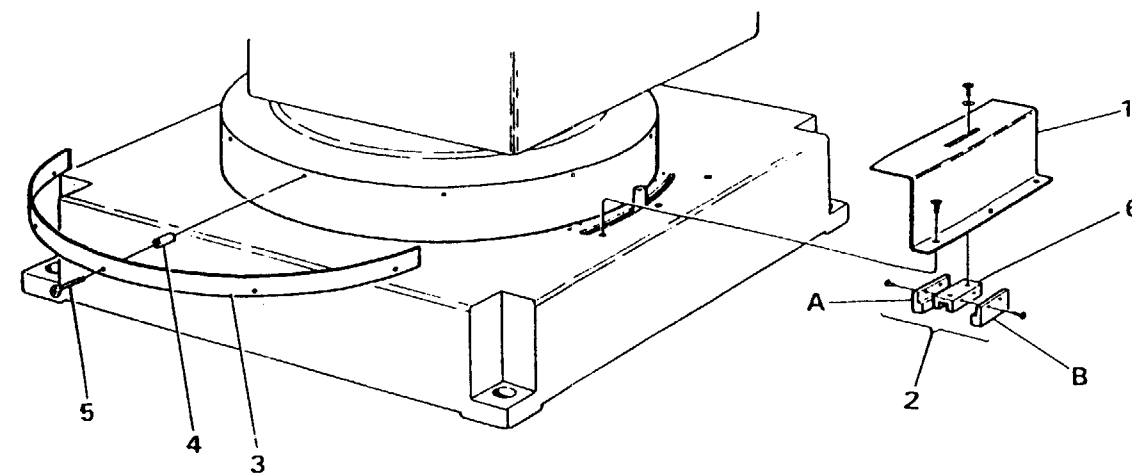
Item	Qty	Description	Article No.	Comments
-	-	Wrist unit complete	6397 003-MS	
1	4	Retaining ring	2154 2526-108	Part of item 3
2	8	Axial washer	2151 0026-4	Part of item 3
3	4	Rod end 2° bend LH thread	2219 240-B	Complete



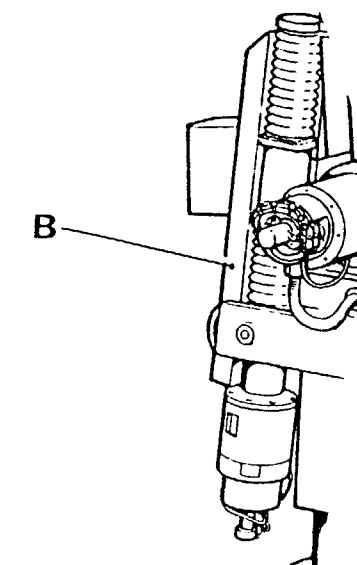
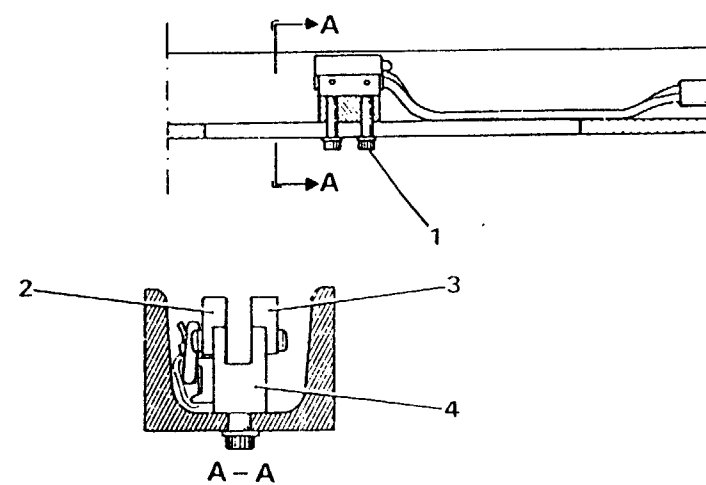
Synch and limit switches

Item	Qty	Description	Article No.	Comments
A				
1	1	Protection plate	2176 399-1	
2A	1	Reed switch	5633 794-1	
2B	1	Magnet	5633 794-2	
3	1	Sync. bar	2171 409-16	
3	1	Sync. bar (alternativ pos)	2171 409-17	(OPTION)
4	3	Spacer	2151 2082-386	
5	3	Screw, M6x25	2121 2519-372	
6	1	Holder	2176 0230-2	
B				
1	2	Socket screw, M5x16	2121 2519-329	
2	1	Magnet	5633 794-2	
3	1	Reed switch	5633 794-1	
4	1	Block	2175 0230-1	

A

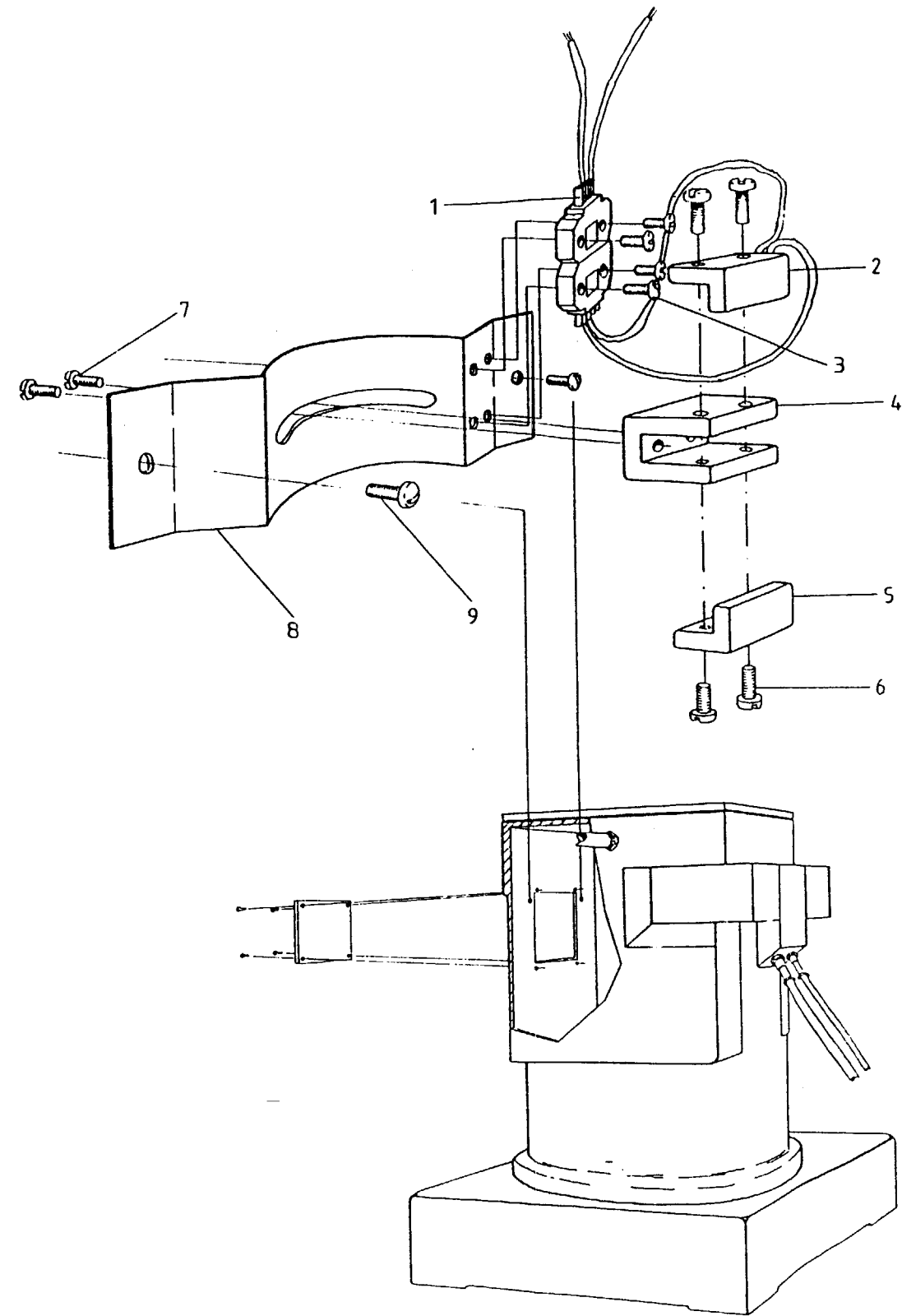


B



Synch and limit switches

Item	Qty	Description	Article No.	Comments
1	1	Cable	2626 010-EV	
2	1	Reed switch	5633 796-B	
3	4	Screw	2121 2452-220	
4	1	Holder	2175 0230-5	
5	1	Magnet	5633 794-2	
6	4	Screw	2121 2452-195	
7	2	Screw	2121 2452-224	
8	1	Bracket	2173 195-22	
9	2	Screw	2121 2452-224	



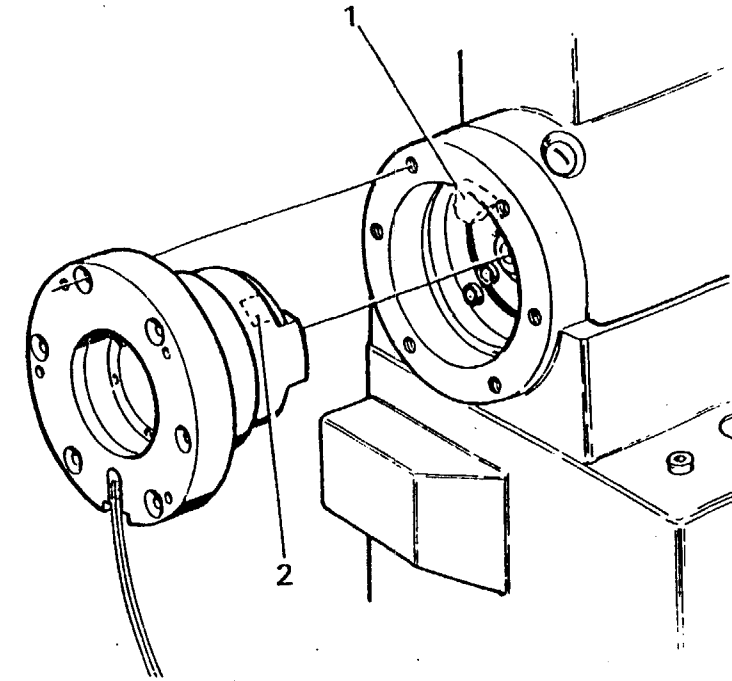
Synch and limit switches

Item	Qty	Description	Article No.	Comments
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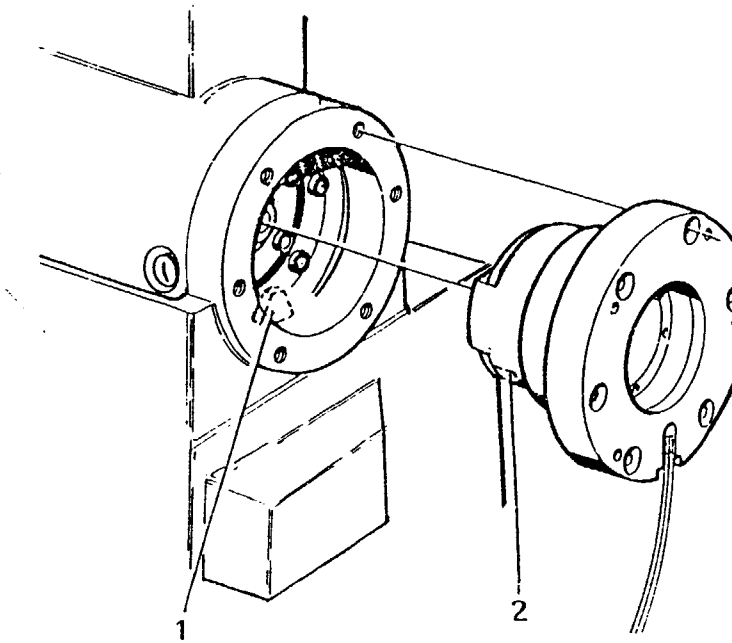
C				
1	1	Stop lug	2171 483-A	
2	1	Reed switch	5633 794-5	

Note: When replacing previous stop lug (5613 080-3) move the reed switch towards the fixed stop lug

C



C

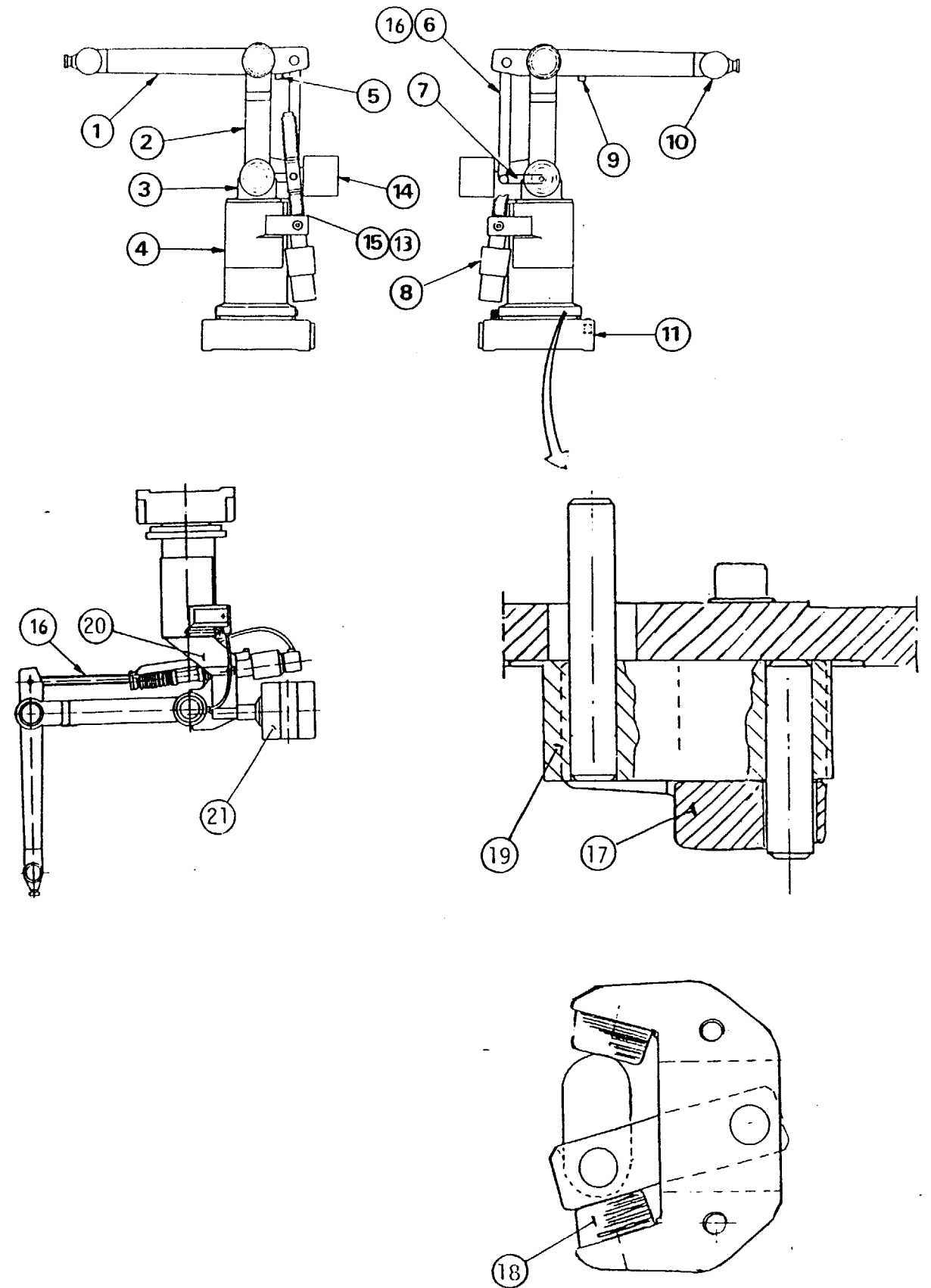


Mechanical components

Item	Qty	Description	Article No.	Comments
1	1	Upper arm 6/2 Upper arm L 6/2	2184 232-2 *) 2184 232-2	New version
2	1	Lower arm 6/2 Lower arm L 6/2	2184 234-4 *) 2184 1671-A	New version
3	1	Bearing bracket	2162 197-1	
4	1	Outer body 6/2- L 6/2	2162 195-4 *)	New version
5	1	Rubber buffer	2196 065-7	
6	1	Parallel bar	2184 2111-A	
7	1	Parallel arm	2184 248-A	
8	1	Screw unit without motor	6397 001-ACC	
9	2	Rubber buffer	2196 065-7	
10	1	Wrist unit	6397 003-MS	
11	1	Pedestal 6/2 - L 6/2	2161 358-3 *)	New version
13	1	Gas spring	6397003-HE **	suspended version
14	1	Balance weight	2189 055-1	
15	1	Balance spring	6397 001-ABS **	
16	1	Parallel bar	2184 2111-C	IRB L6 only
17	1	Stop	2167 0006-16	Mec. stop 360
18	2	Rubber buffer	2196 065-7	Mec. stop 360
19	1	Twist arm	2184 2111-F	Mec. stop 360
20	1	Bearing bracket	2163 125-23	IRB G6 only
21	-	Balance arm	-	See 12:13

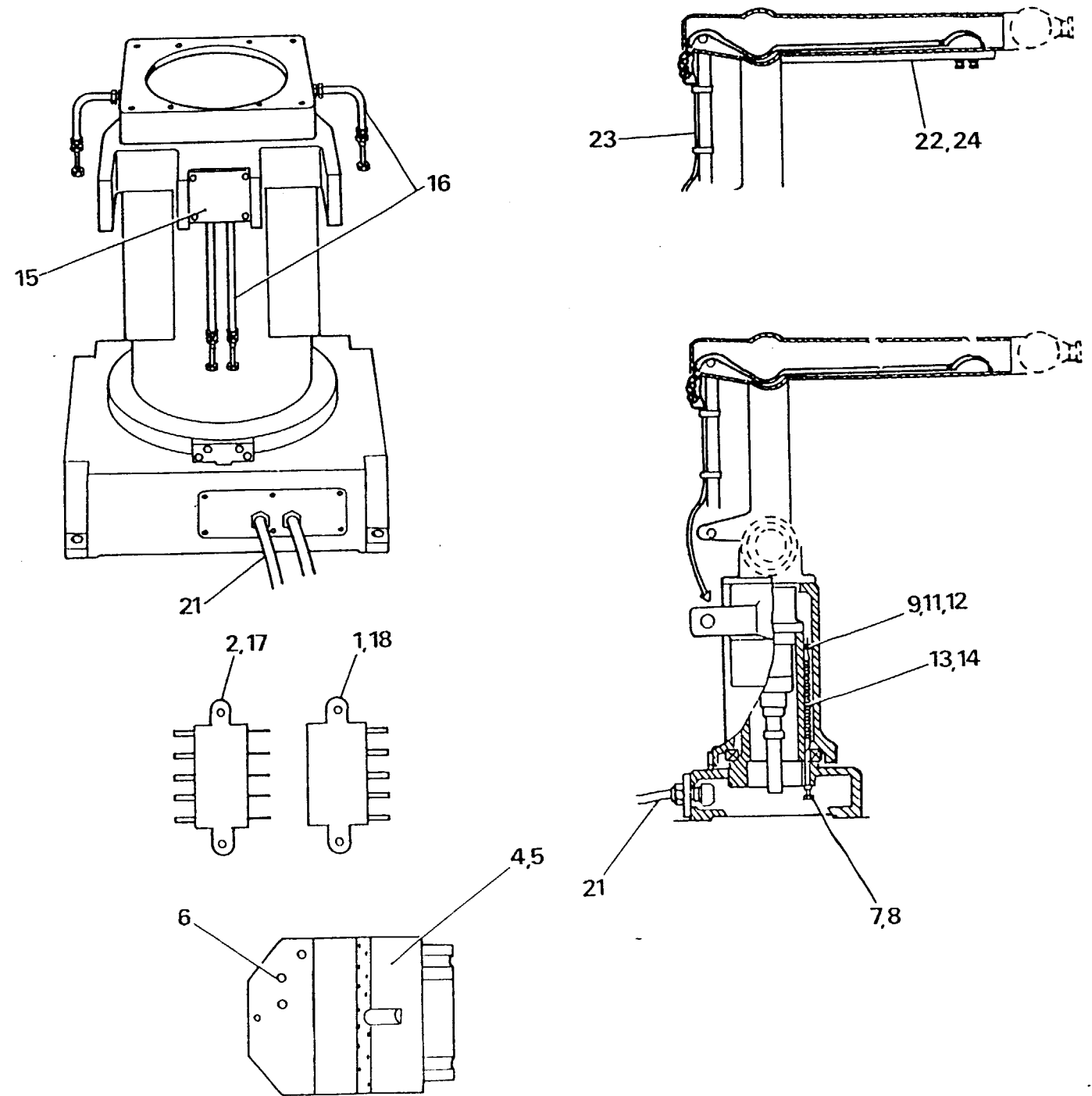
Note: *)- The new versions are not interchangeable with original version
In these cases consult ASEA-service

**) Expired after Robot No- 7494618 .



Cables and connections

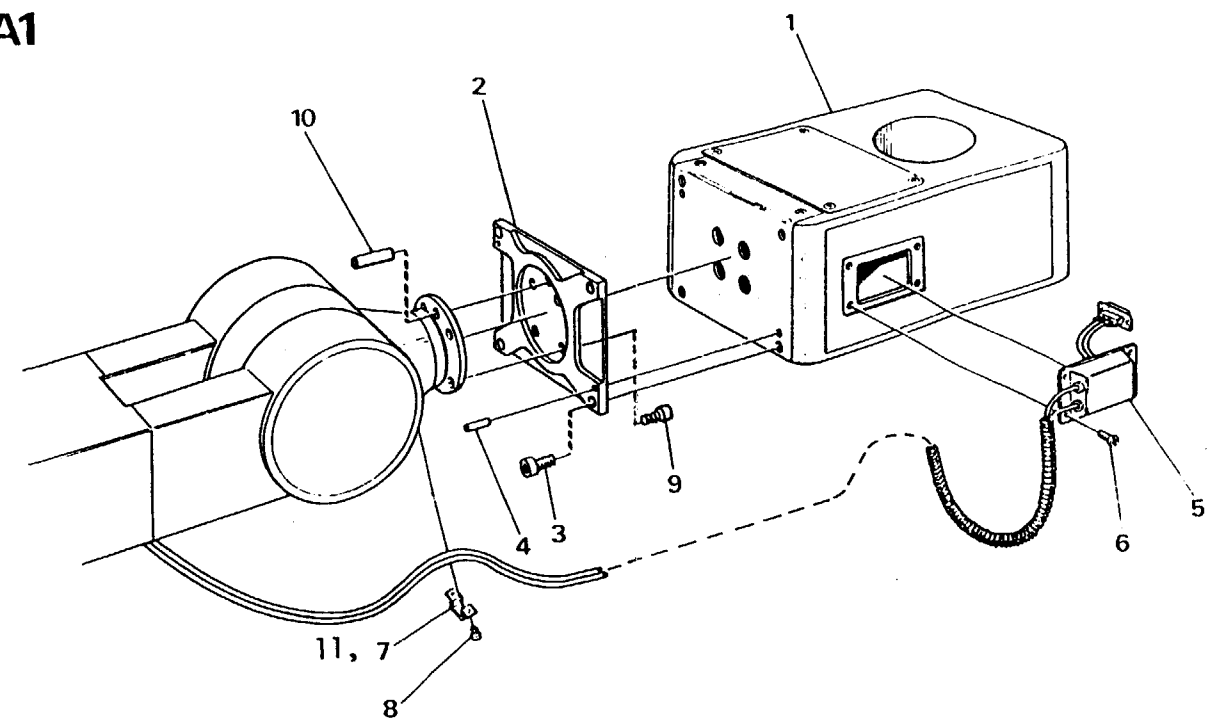
Item	Qty	Description	Article No.	Comments
1	18	Female connector	5217 262-3	5 pole
2	14	Male connector	5217 263-3	5 pole
4	7	RTXG-connector	RK924 008-AB	RTXG 16-0
5	60	Contact pin	RK924 0015	10 A fs
6	7	Cable holder	RK924 025-AA	
7	11	Cable fitting	SK170 7665	(2672 063-1)
8	11	Hose	1855 9183-141	D=11/8 L=70
9	11	Strap	2166 2054-3	
11	11	Hinge	2184 288-6	
12	1	Holder	2172 0539-C	
13	7	Cable	2626 010-Y	IRB 1-8
14	4	Cable	2626 010-AA	IRB 9-16
15	1	Connection unit	5238 203-A	
16	4	Cable	1368 1905-A	
17	10	Male connector	5217 263-2	3 pole
18	5	Female connector	5217 262-2	3 pole
21	1	Control cable 15 m	YB161 101-SY	
		Control cable 10 m	YB161 101-SV	
		Control cable 6 m	YB161 101-SU	
22	1	Connection unit	YB123 001-D	(OPTION)
23	2	Cable	2623 009-5	Part of item 22
24	1	Compressed air hose	1865 1905-1	L=1100 mm



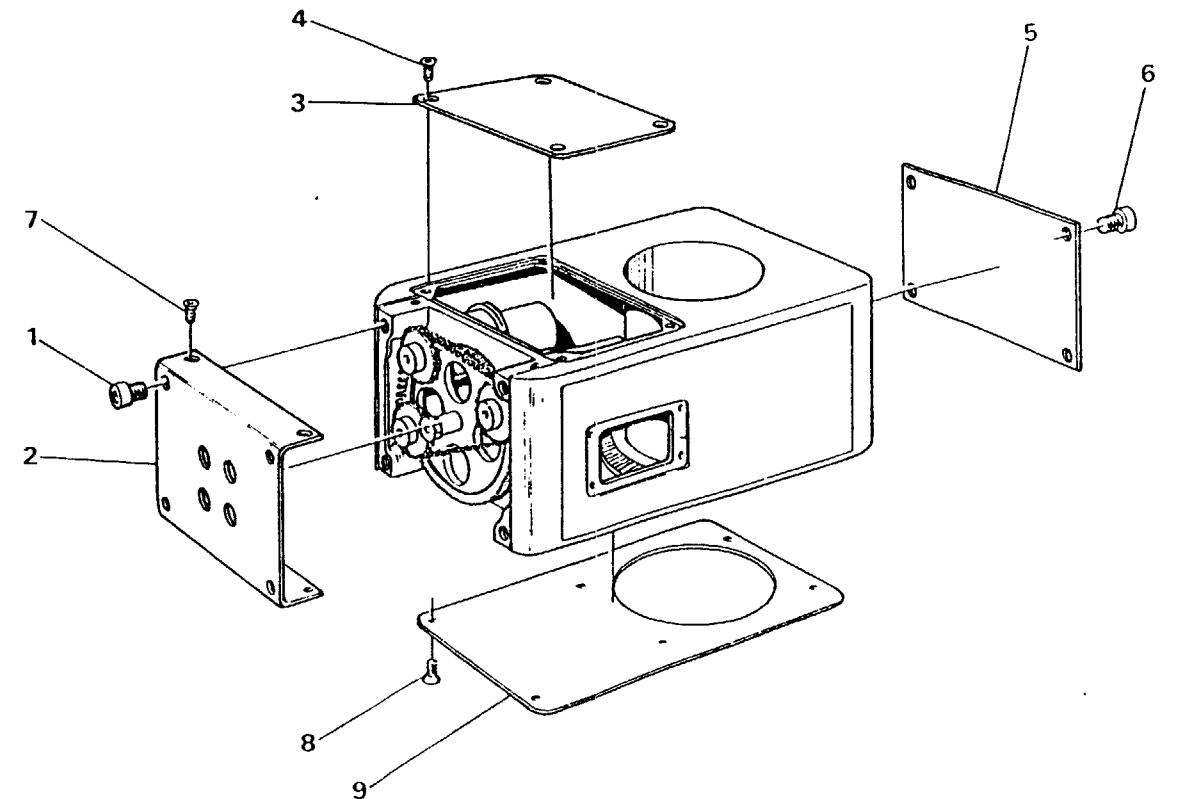
Third wrist motion

Item	Qty	Description	Article No.	Comments
A 1				
1	1	Motor unit	YB 123 001-Z	
2	1	Bracket	2172 0492-154	
3	4	Screw M6x10	2121 2519-364	
4	2	Parallel pin	2111 2021-270	
5	1	Cabling	2626 010-BN	
6	4	Screw M3x6	2121 2452-220	
7	2	Mounting base	2166 2058-2	
8	2	Screw M3x6	2121 2452-220	
9	4	Screw M6x10	2121 2519-364	
10	1	Cylindrical pin	2111 2021-351	
11	2	Cable straps	2166 2055-3	
A 2				
1	4	Screw M6x10	2121 2519-364	
2	1	Cover	2175 0034-26	
3	1	Cover	2172 0492-156	
4	4	Screw M3x6	2121 2711-220	
5	1	Cover	2172 0492-157	
6	4	Screw M6x10	2121 2519-364	
7	4	Screw M3x6	2121 2711-220	
8	6	Screw M3x6	2121 2711-220	
9	1	Cover	2172 0492-155	

A1

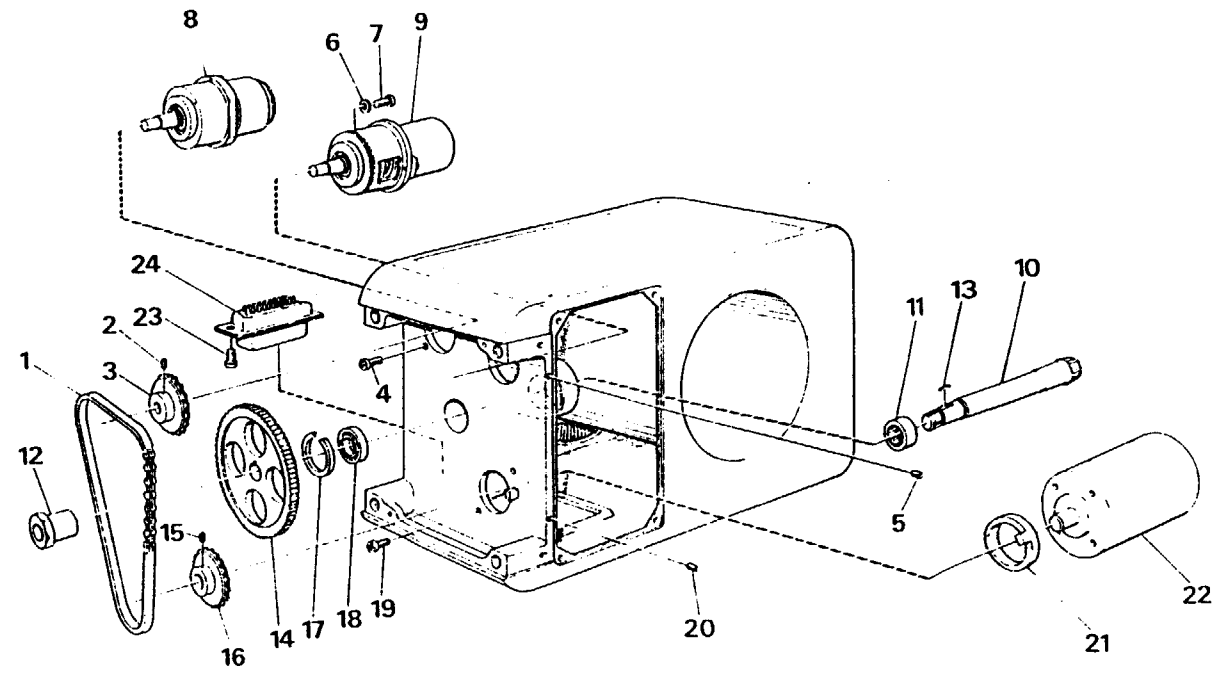


A2



Third wrist motion

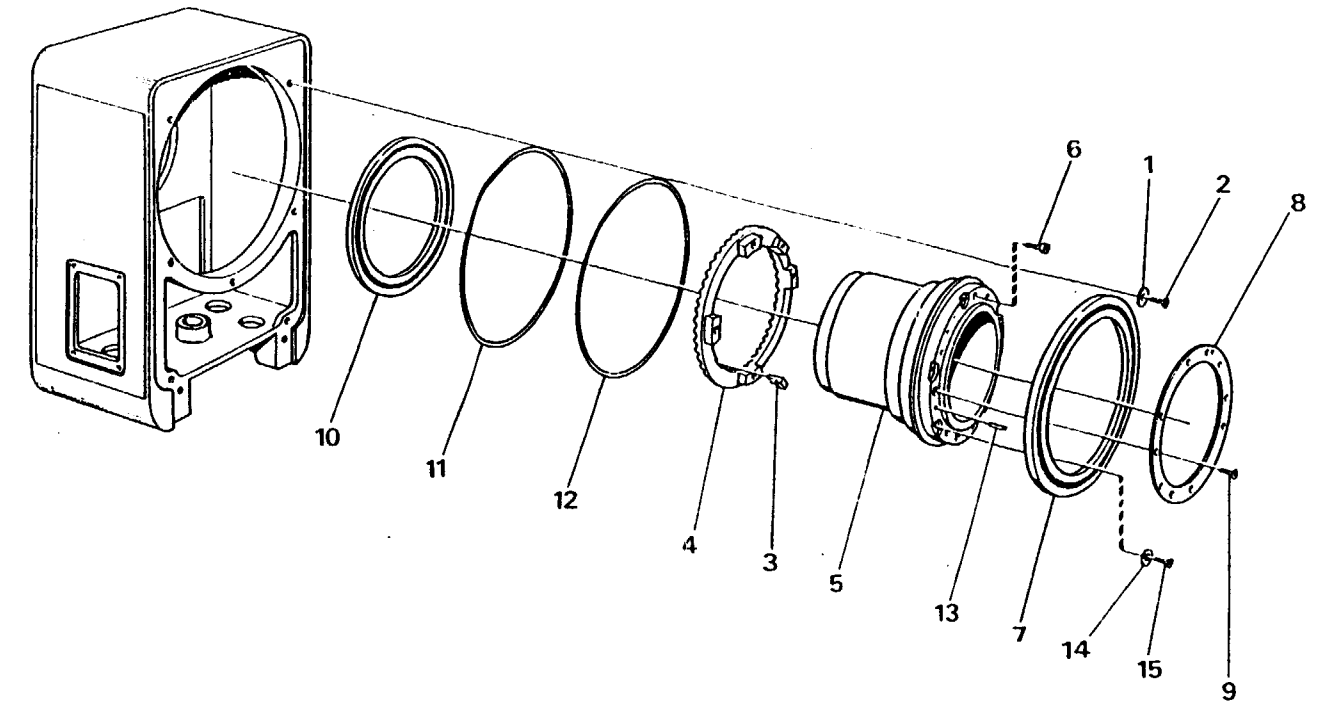
Item	Qty	Description	Article No	Comments
1	1	Chain	2182 007-1	
2	1	Set screw M3x4	2122 2719-218	
3	2	Chain sprocket	2257 165-2	
4	2	Screw M3x10	2121 2452-224	
5	1	Set screw M3x4	2122 2719-218	
6	2	Washer	2154 2033-5	
7	2	Screw M3x10	2121 2452-224	
8	1	Tacho unit	56 92 422-A	
9	1	Resolver unit	5766 393-A	
10	1	Pinion	2322 113-5	
11	1	Bearing	2213 1905-2	
12	1	Nut	2126 0102-3	
13	1	Key	2157 2021-102	
14	1	Gear	2321 0885-3	
15	1	Set screw M3x4	2122 2719-218	
16	1	Chain sprocket	2257 165-3	
17	1	Retaining ring	2154 343-4	
18	1	Bearing	2213 851-1	
19	2	Screw M3x10	2121 2454-224	
20	1	Set screw M3x4	2122 2719-218	
21	1	Excentric	2171 440-8	
22	1	Motor unit	4419 547-H	
23	2	Screw M3x10	2121 2454-224	
24	1	Connector	5217 520-36	



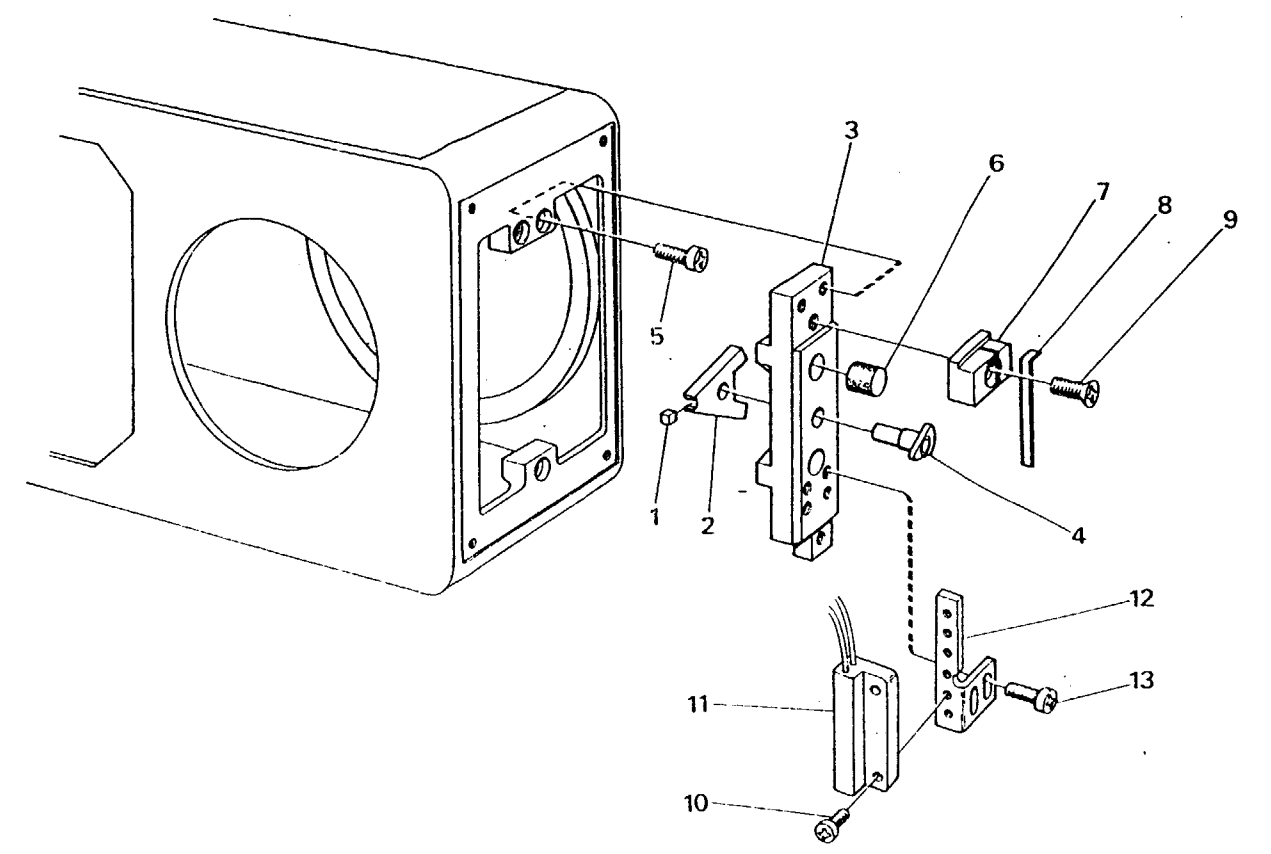
Third wrist motion

Item	Qty	Description	Article No.	Comments
A 1				
1	5	Lock washer	2151 0024-14	
2	5	Screw M3x6	2121 2711-220	
3	1	Cam	2172 0492-151	
4	1	Gear	2322 113-6	
5	1	Shaft	2239 055-8	
6	4	Screw M4x12	2121 2519-291	
7	1	Bearing	2213 257-2	
8	1	Cover	2172 0492-158	
9	4	Screw M3x6	2121 2711-220	
10	1	Bearing	2213 257-1	
11	2	Distance ring	2151 0241-1	
12	2	Distance ring	2151 0241-2	
13	1	Parallel pin 4x16	2111 2021-270	
14	6	Lock washer	2151 0024-14	
15	6	Screw M3x6	2121 2711-220	
A 2		Sync and stop unit	5891 065-A	
1	1	Magnet	5613 080-1	
2	1	Rocker	2173 195-21	
3	1	Bracket	2172 0492-149	
4	1	Shaft	2239 056-2	
5	3	Screw M4x12	2121 2519-291	
6	2	Shock absorber	1853 1010-3	
7	1	Key and spring holder	2172 0492-150	
8	1	Spring	2191 277-2	
9	1	Screw M5x16	2121 2711-329	
10	2	Screw M3x6	2121 2452-220	
11	1	Read switch	5633 794-1	
12	1	Bracket	2174 0022-48	
13	2	Screw M3x12	2121 2452-226	

A1

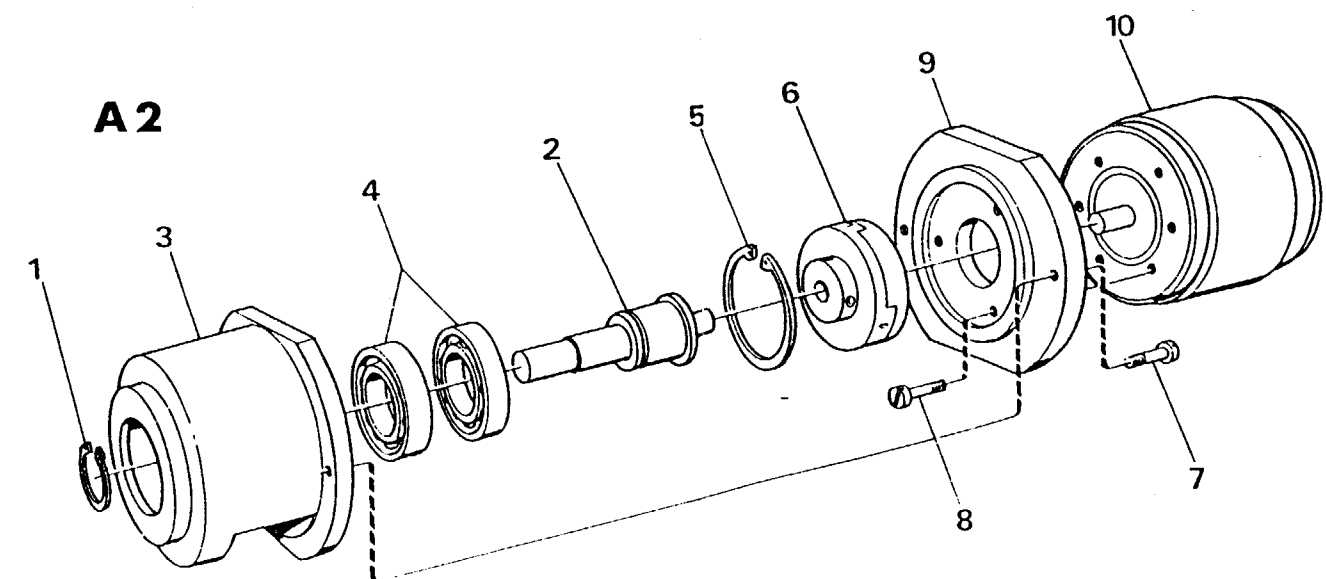
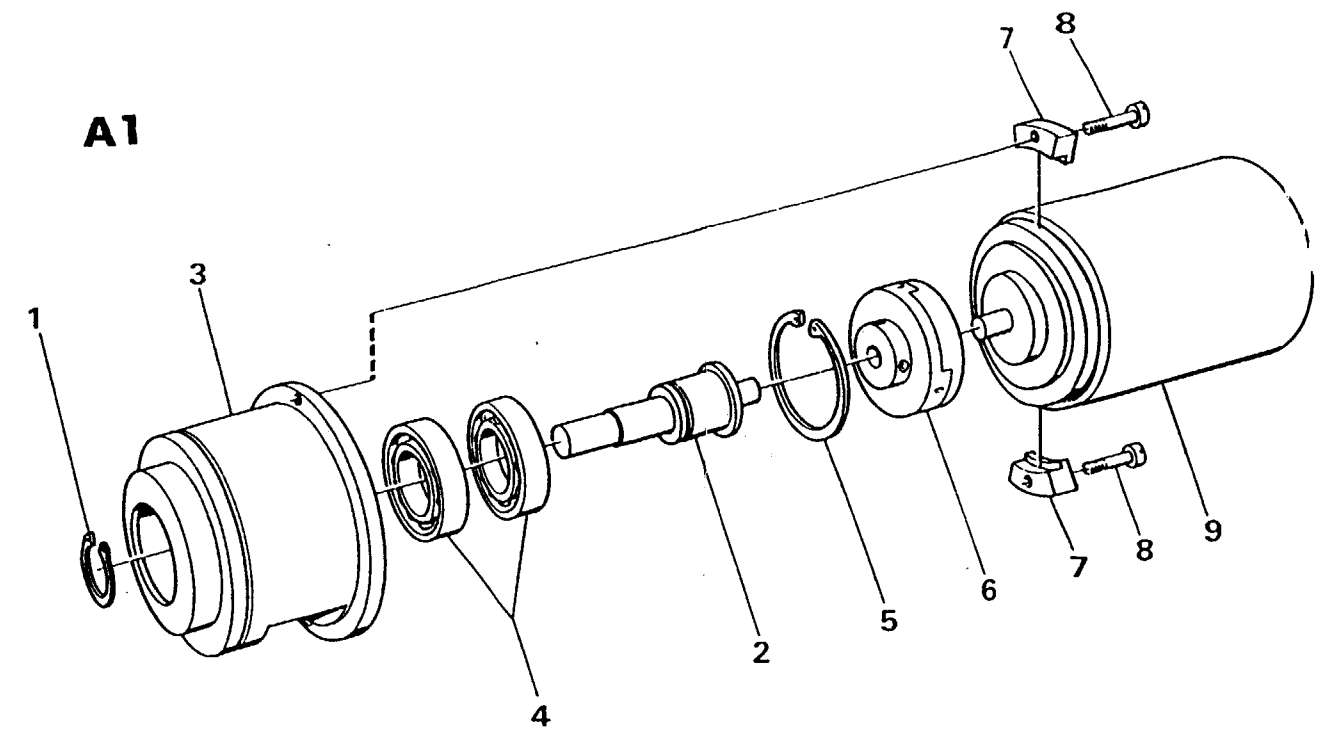


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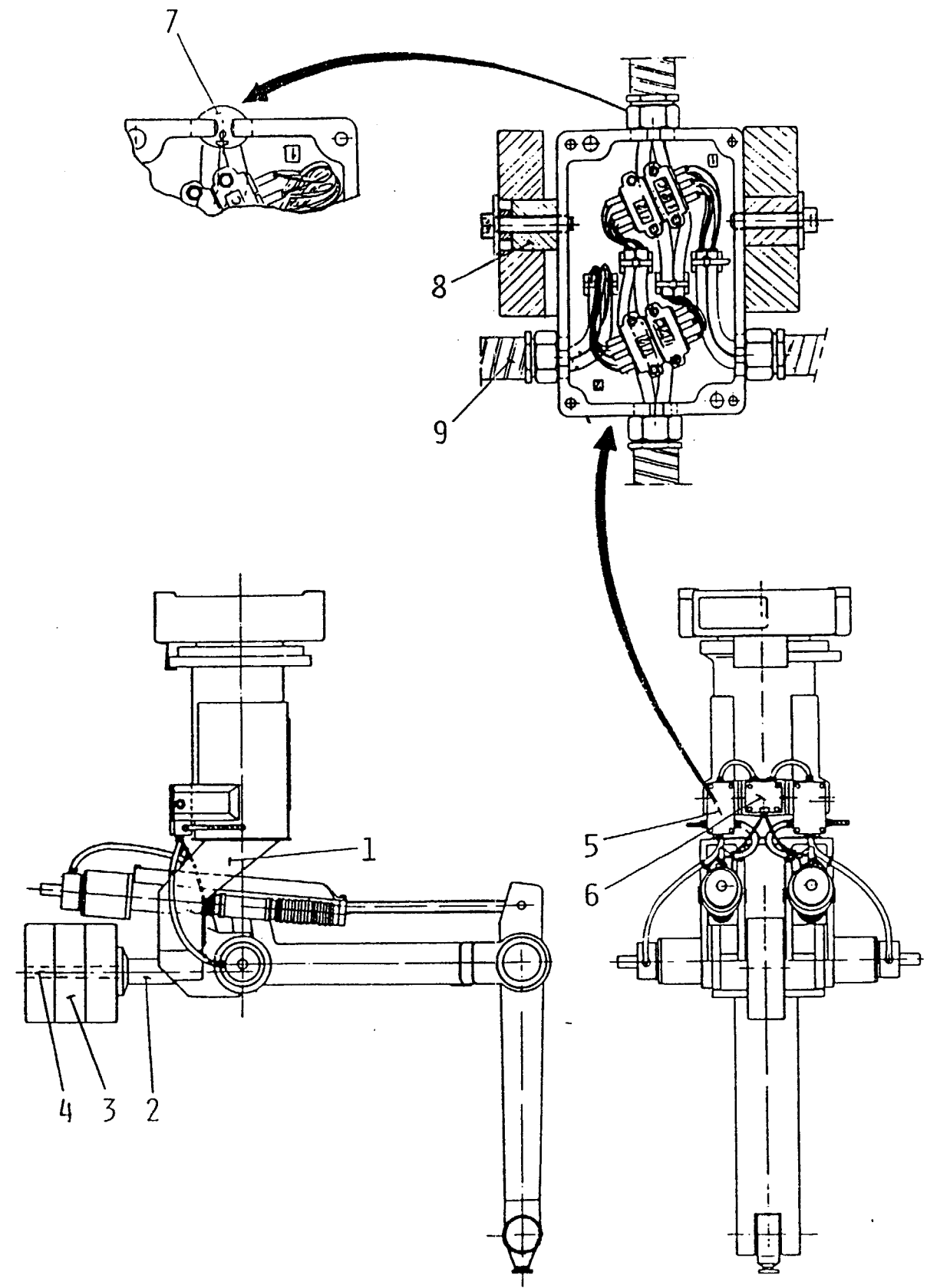
Third wrist motion

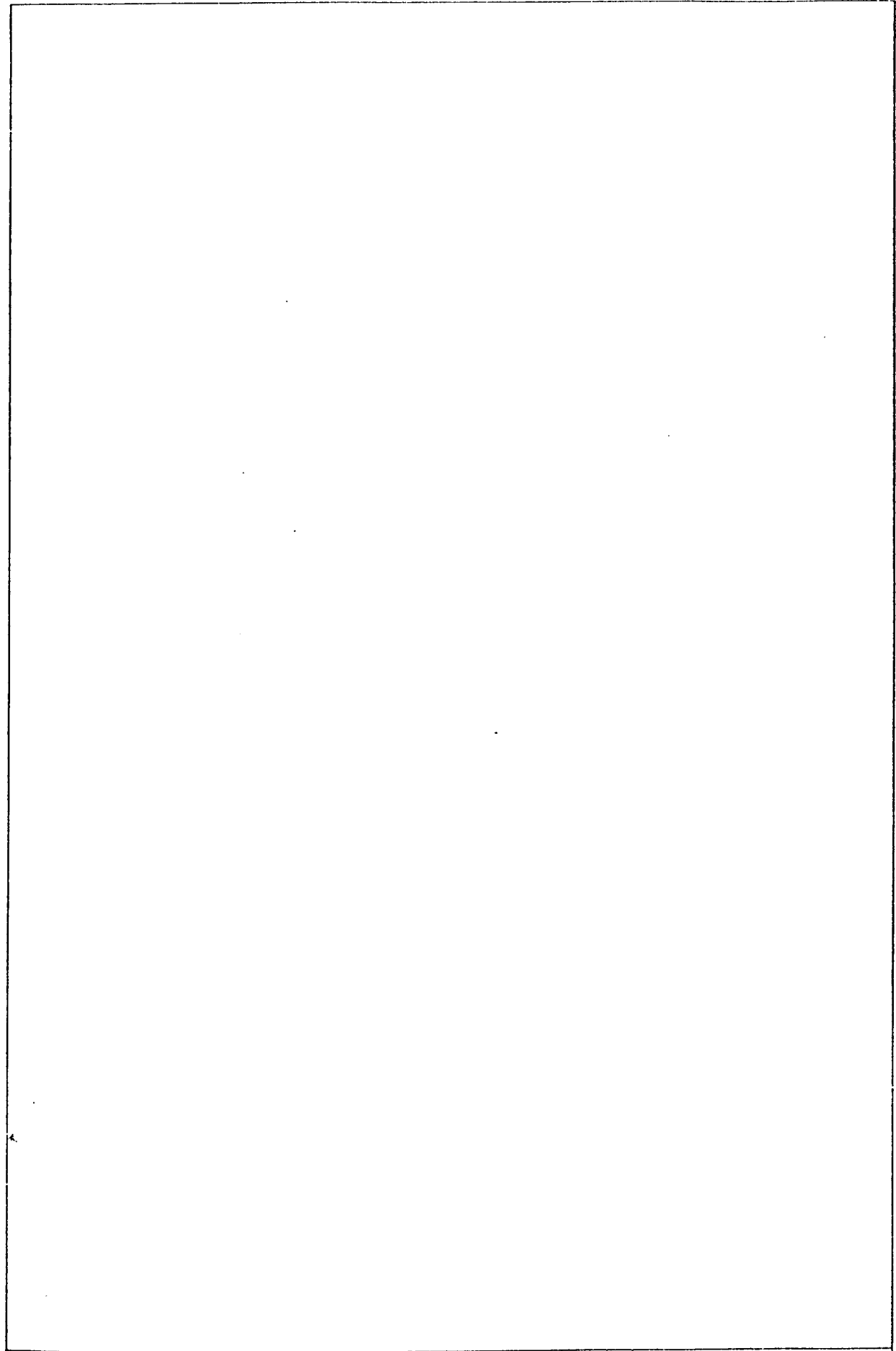
Item	Qty	Description	Article No.	Comments
A 1		Resolver unit	5766 393-A	
1	1	Retaining ring	2154 2526-110	
2	1	Shaft	2239 056-3	
3	1	Excentric	2171 440-6	
4	2	Bearing	2213 851-1	
5	1	Retaining ring	2154 2527-121	
6	1	Universal joint	2245 219-2	
7	2	Segment	2151 0024-45	
8	2	Screw M2x6	2121 2271-164	
9	1	Resolver	5766 388-2	
A 2		Tacho unit	5692 922-A	
1	1	Retaining ring	2154 2526-110	
2	1	Shaft	2239 056-3	
3	1	Tacho holder	2171 440-7	
4	2	Bearing	2213 851-1	
5	1	Retaining ring	2154 2527-121	
6	1	Universal joint	2245 219-2	
7	2	Screw M2x6	2121 2271-164	
8	3	Screw M2x6	2121 2271-164	
9	1	Tacho adapter	2171 440-9	
10	1	Tachometer	5692 334-2	



Special spare parts for IRB G6/2

Item	Qty	Description	Article No.	Comments
1	1	Bearing bracket	2163 125-23	
2	1	Balance arm	2184 233-8	
3	3	Counterweight	2189 055-4	
4	1	Stud	2111 0292-10	
5	2	Connection box	5388 043-E	
6	1	Cover	5237 594-A	
7	8	Sealing	2152 0400-1	
8	4	Guide tube	2151 0264-1	
9	4	Cable	2626 010-ES	

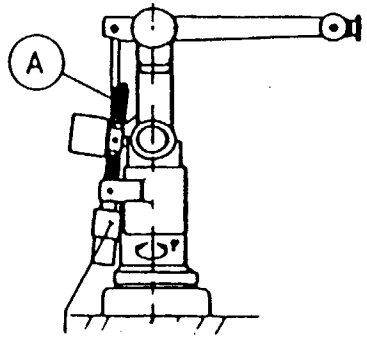
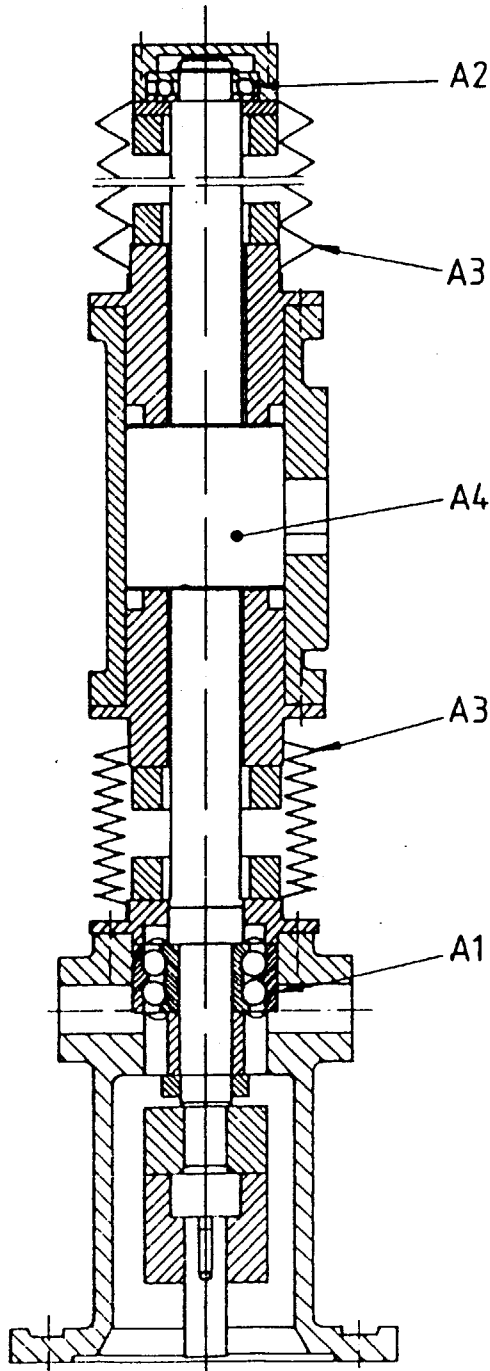


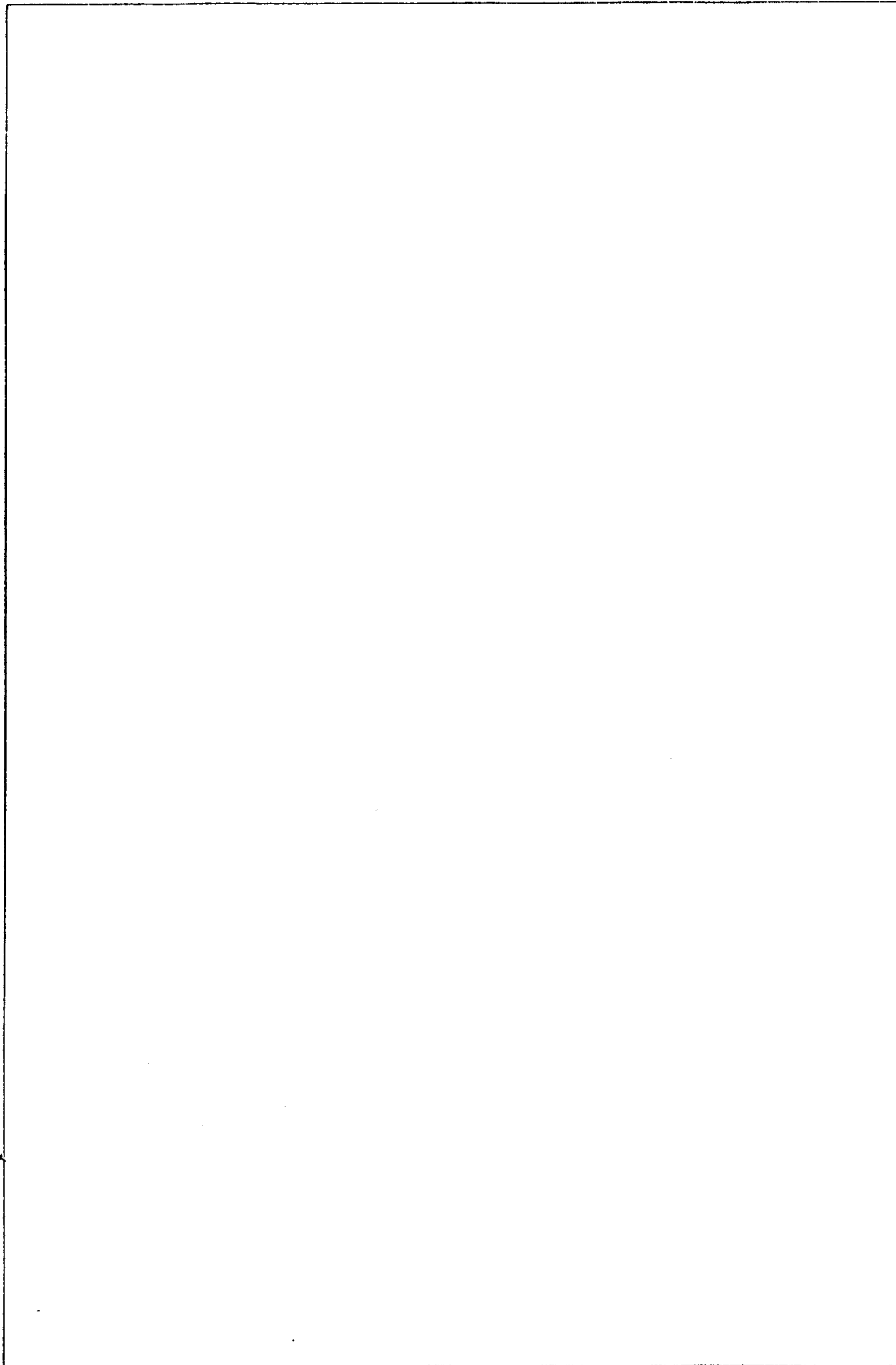


SPARE PARTS, FIGURES AND LOCATION

Ball Screw Unit IRB 6

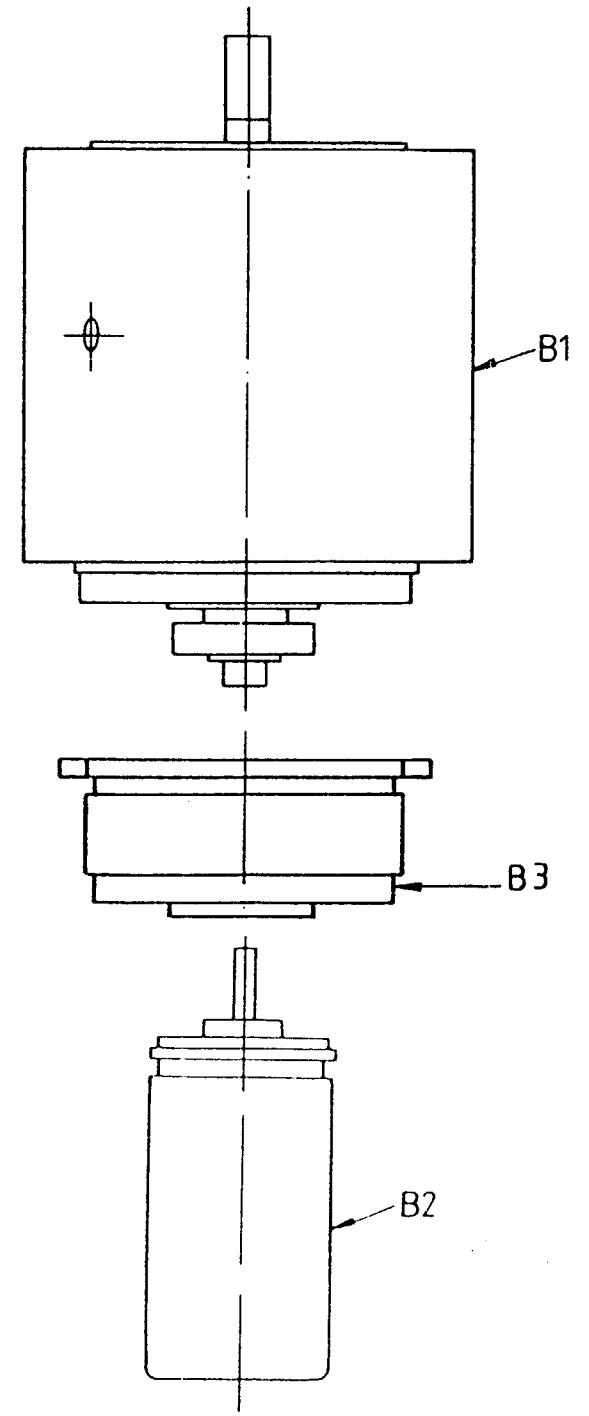
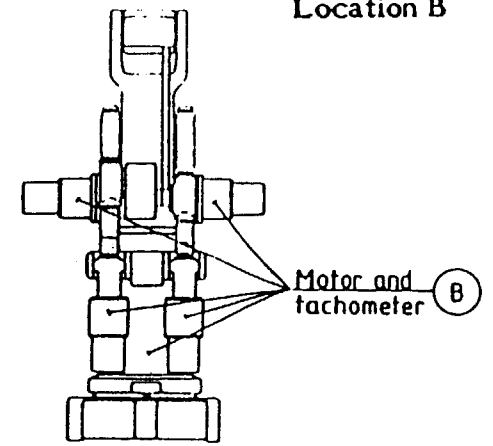
Location A

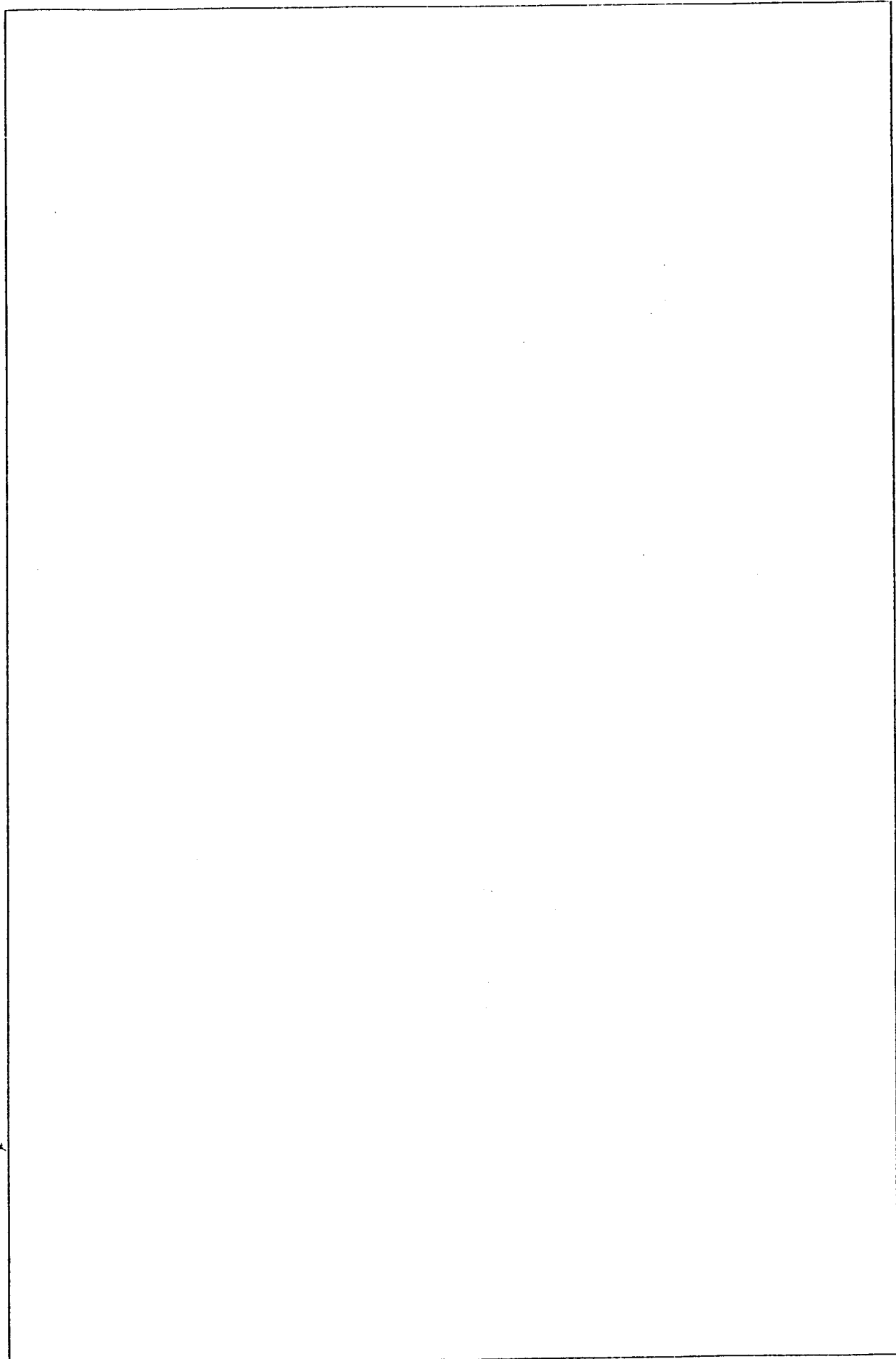




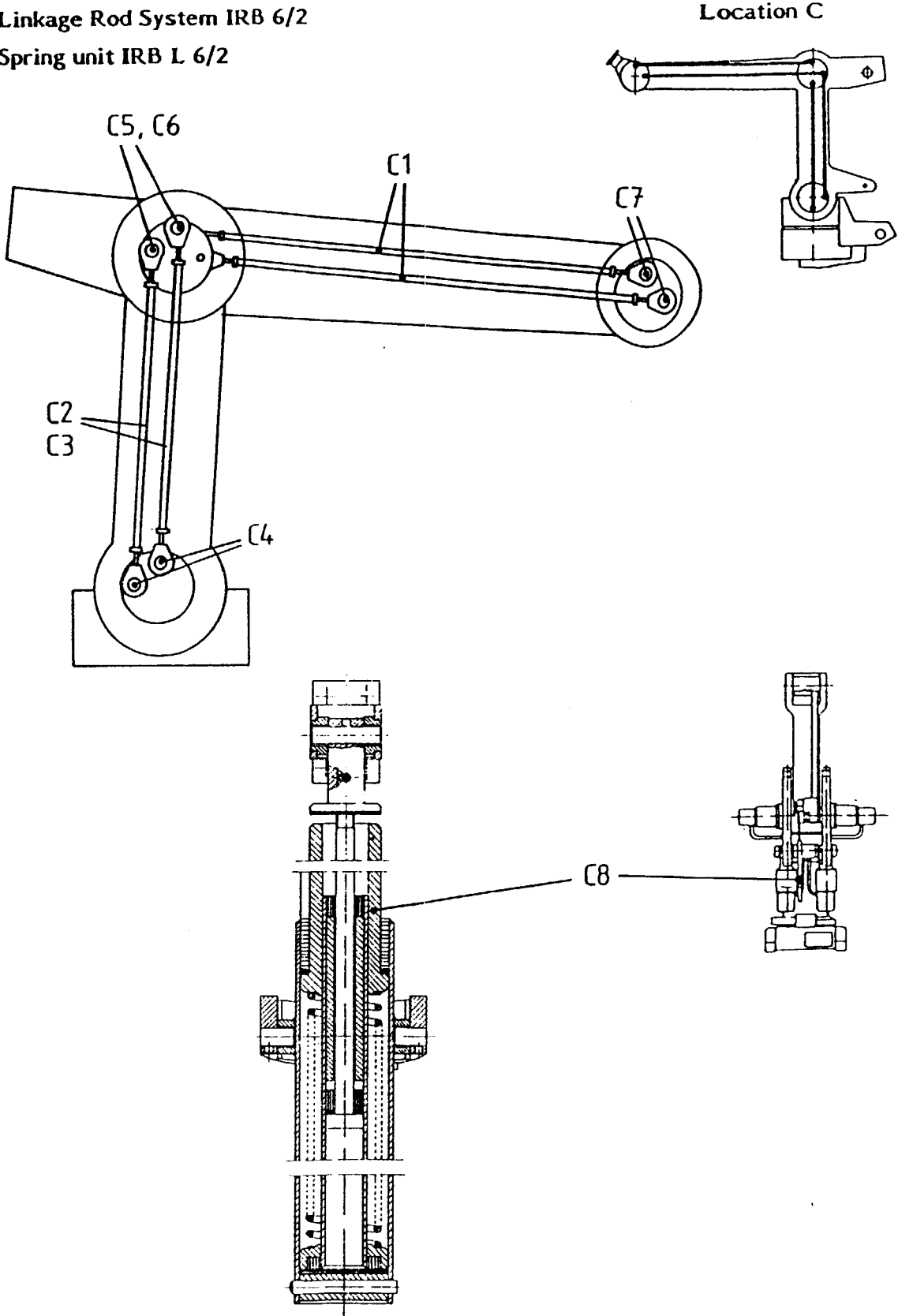
Motor and Tachometer IRB 6/2

Location B





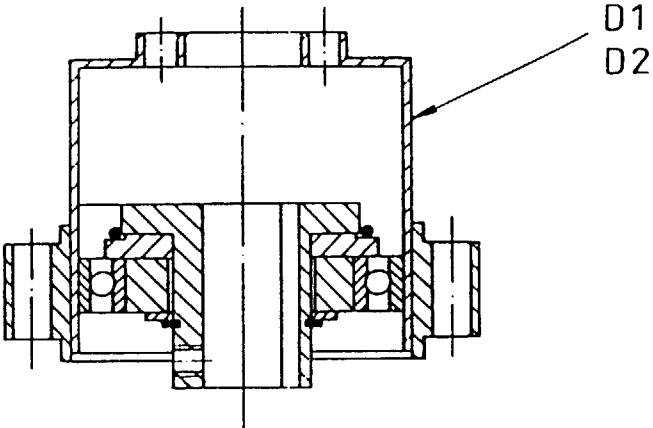
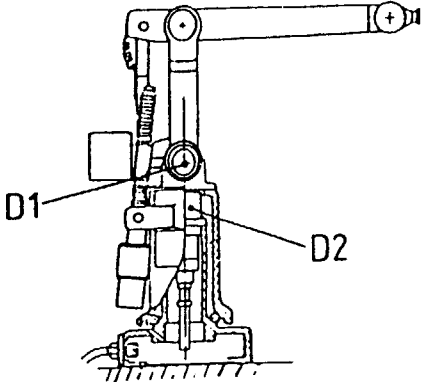
Linkage Rod System IRB 6/2
Spring unit IRB L 6/2

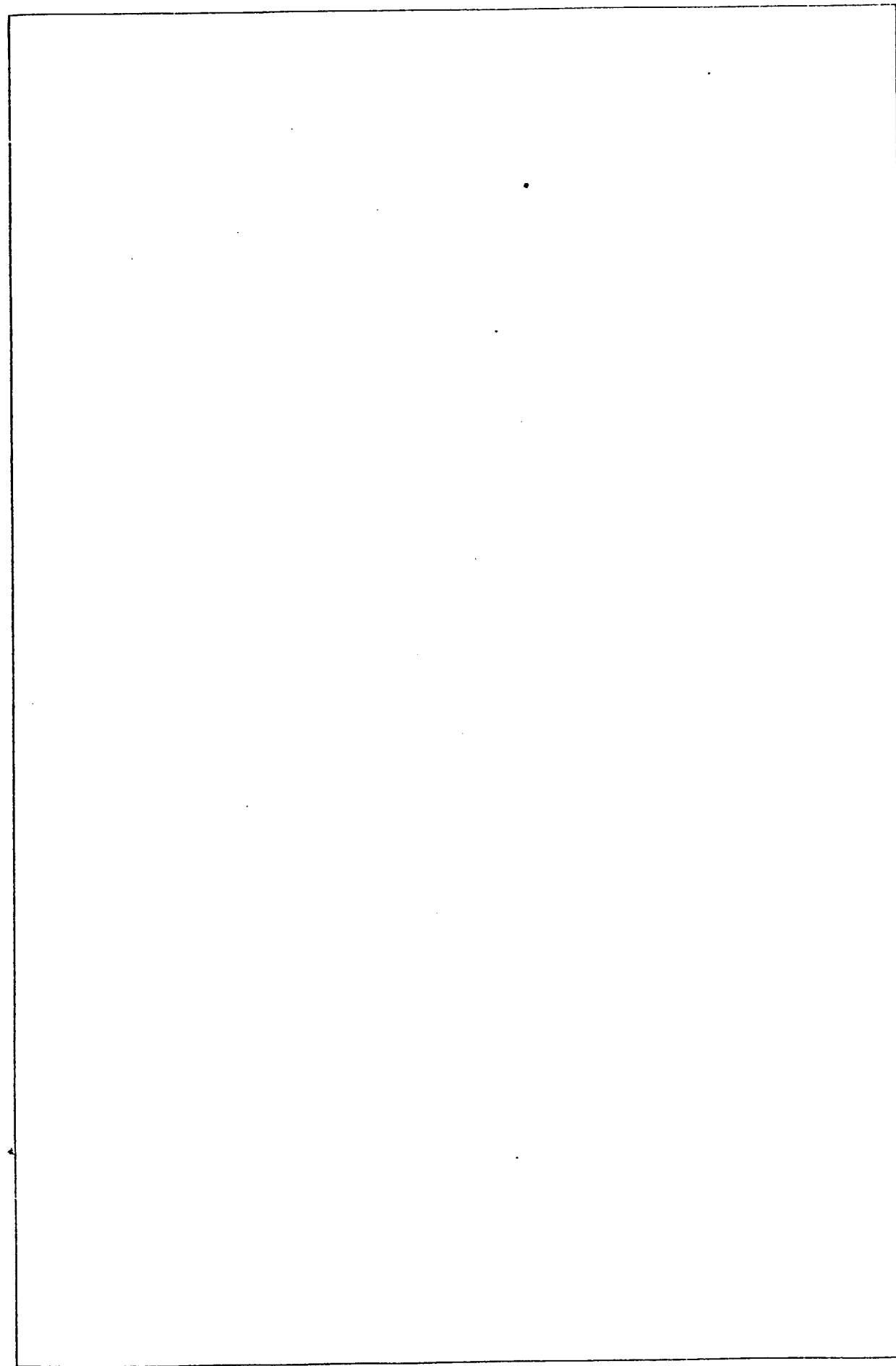




Gear Box IRB 6/2

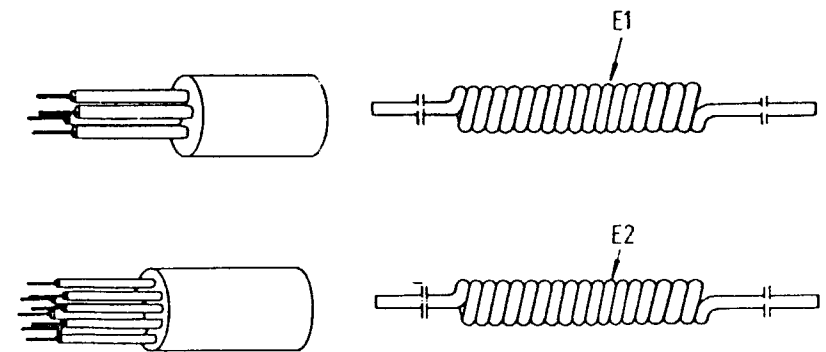
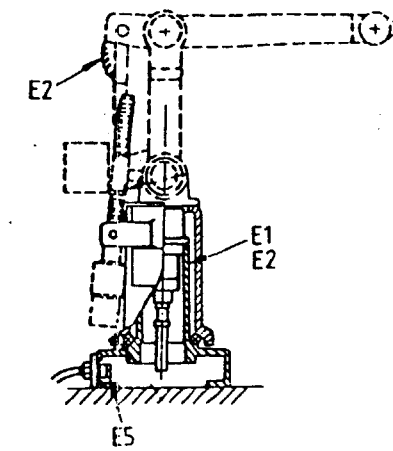
Location D





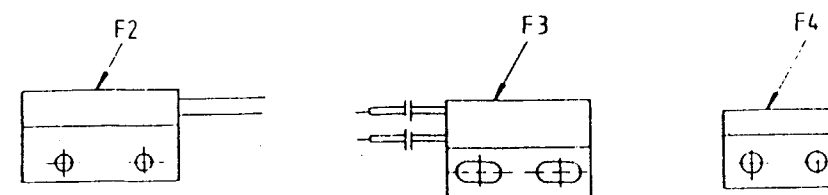
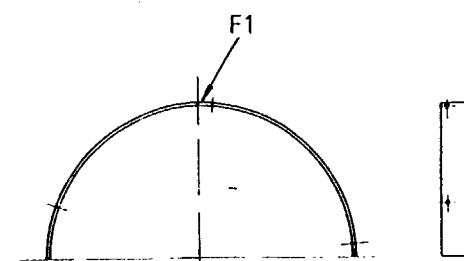
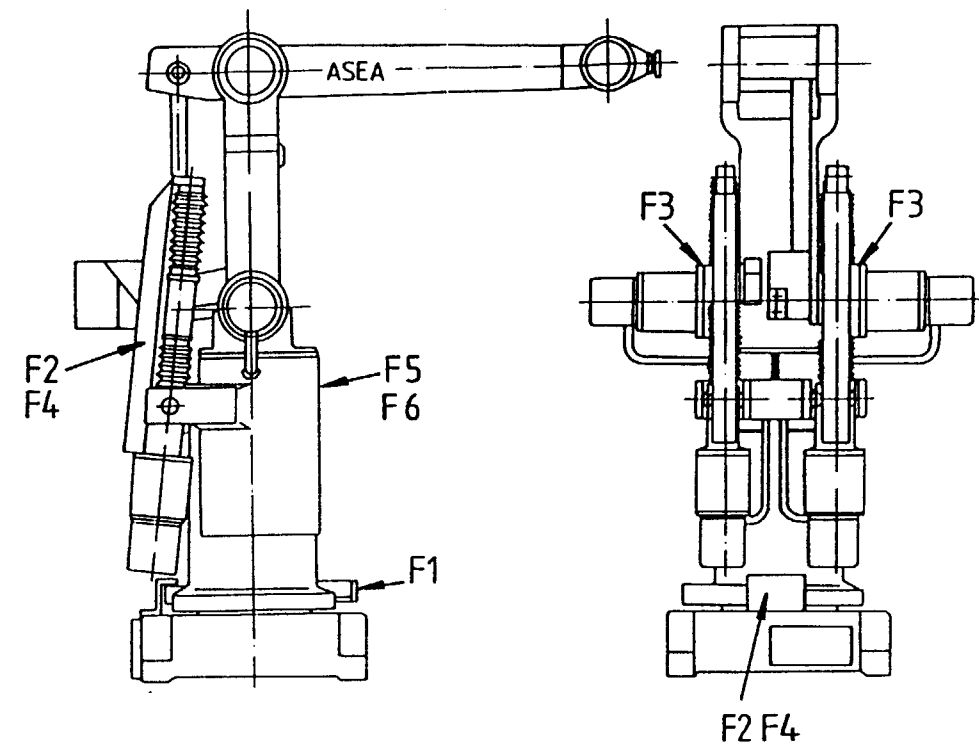
Cables IRB 6/2

Location E



Switches IRB 6/2

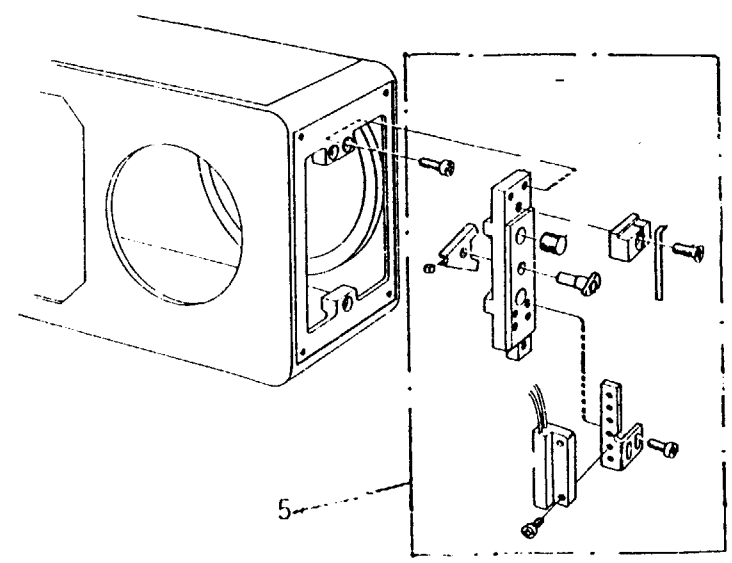
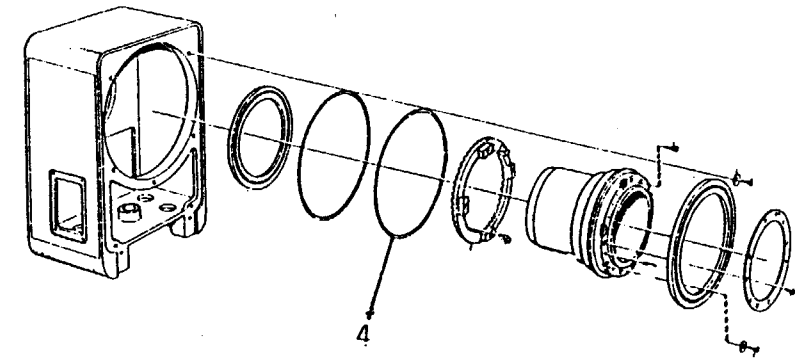
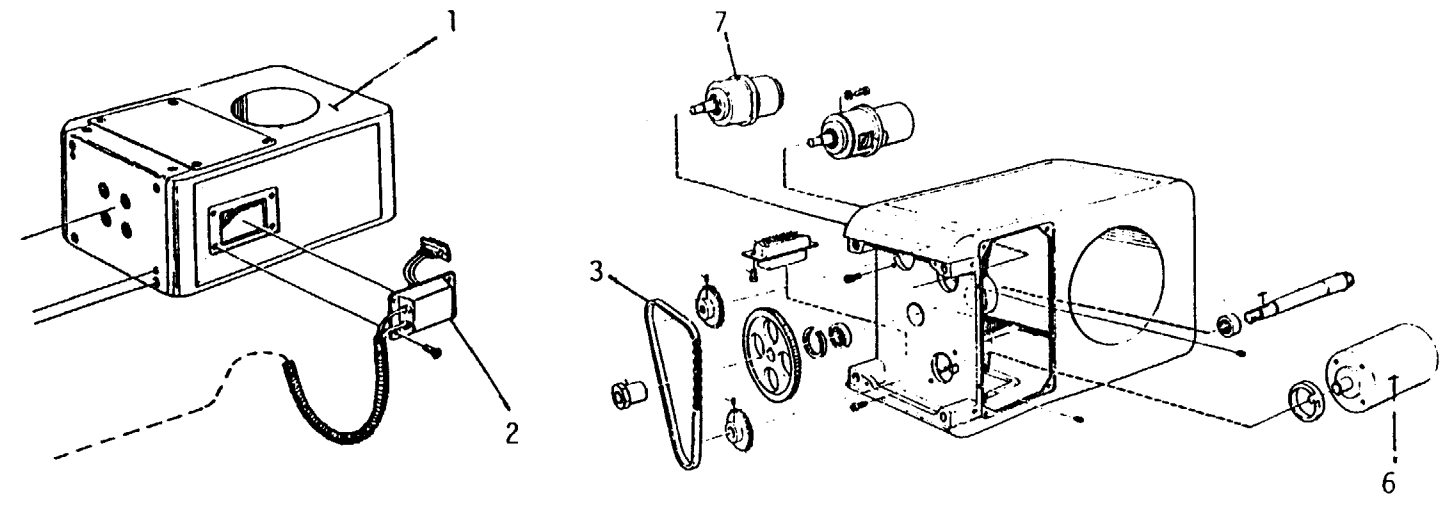
Location F



THIRD WRIST MOTION
SPARE PARTS SET IRB6, L6,G6

Large set YB121 002-CV
Small set YB121 002-CX

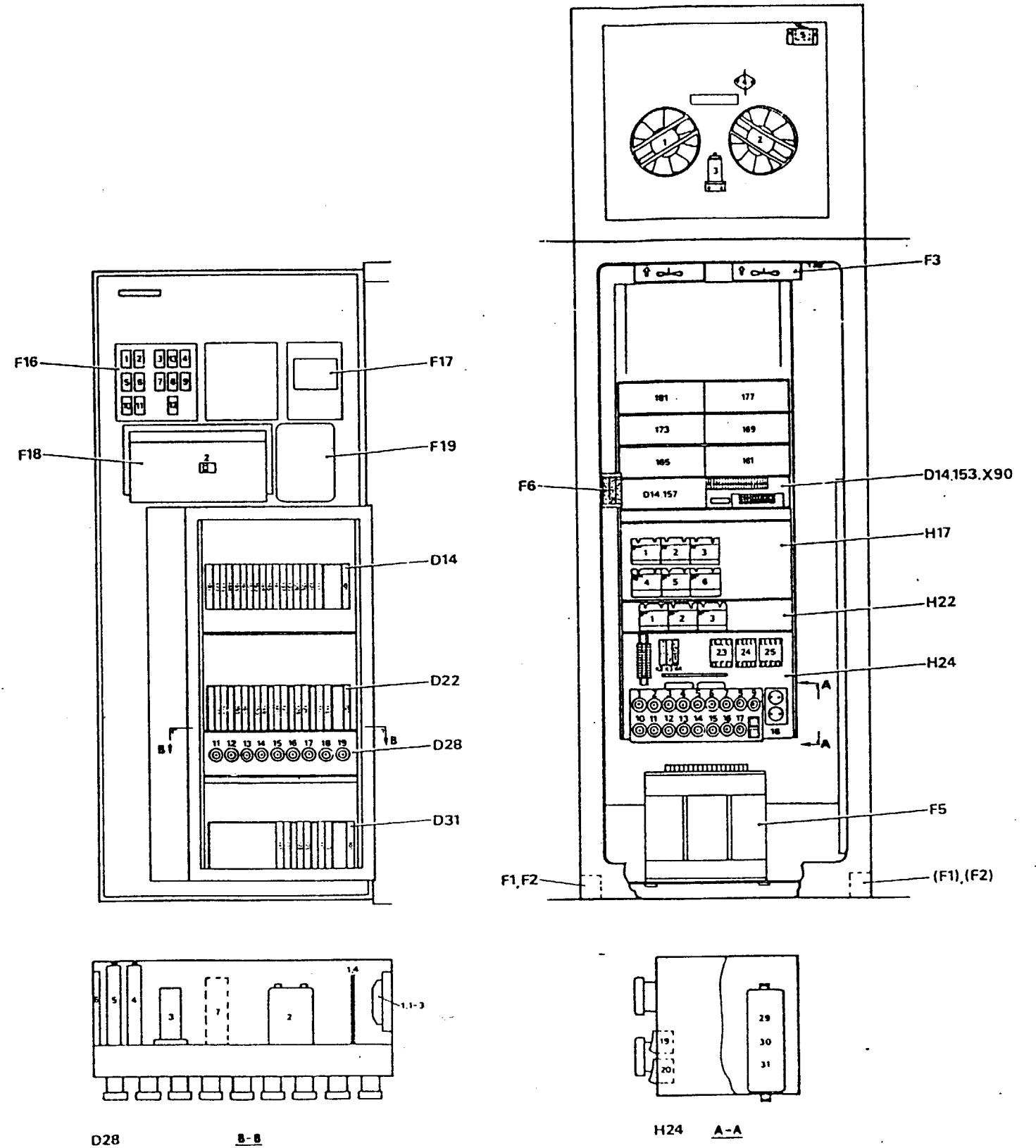
ITEM NO	DESCRIPTION	ARTICLE NO	LARGE SET	SMALL SET	REMARKS
1	Complete 6th axis	YB123001-Z	1	-	
2	Cabling	2626 010-BN	2	1	
3	Chain	2182 007-1	2	1	
4	Distance ring	2151 0241-2	2	2	
5	Sync. and stop unit	5891 065-A	1	1	
6	Motor unit	4419 547-H	-	1	
7	Tacho unit	5692 422-A	-	1	



Electrical Small set, D-type YB 161 100-DS
 Electrical Small set, US-type YB 161 100-DT
 Electrical Small set, Red Spot YB 161 100-DU

SPARE PARTS SETS, IRB G6/2, 6AW

Item	Article No.	D-type	US-type	Red spot	Location in cubicle	Remarks
Filament lamp	5911 069-10	10	10	10	F16	
Quick fuse 10 A	5672 2011-24	5	5	5		
" 8 A	5672 2011-23	5	5	5		
" 6.3 A	5672 2011-22	10	10	10		
" 3.15 A	5672 2011-19	5	5	5		
" 2 A	5672 2011-17	10	10	10		
" 1 A	5672 2011-14	5	5	5		
" 100 mA	5672 2011-4	5	5	5	D14	
Battery UDN 2983	4944 016-2	2	2	2		
	4855 351-2	5	5	5		Final test for DSDX 110, DSDO 110
Time fuse 20 A	SK 161 0043	5			H24	
" 16 A	SK 161 0041	10				
Fuse 16 A	SK 161 0009	5			H24	
" 10 A	SK 161 0007	5			H24/D28	
" 6 A	SK 161 0005	5			H24	
" 2 A	SK 161 0001	5			H24	
" 20 A	5672 830-15		5		H24	
" 15 A	5672 827-15		10		H24	
" 10 A	5672 827-10		5		H24/D28	
" 6 A	5672 827-6		5		H24	
" 2 A	5672 827-2		5		H24	
" 20 A	5671 516-19			5	H24	
" 16 A	5671 516-16			10	H24	
" 10 A	5671 516-15			5	H24/D28	
" 6 A	5671 516-14			5	H24	
" 2 A	5671 516-13			5	H24	



SPARE PARTS SET IRB 6, L6, G6

1. Introduction

The amount of productive time lost to an industry as a result of a mechanical breakdown and the subsequent repairs is always difficult to predict.

The time lost is naturally dependent to a great extent on the nature of the breakdown and the time taken in the actual repairs, but the greatest amount of time lost is usually that wasted in waiting for spare parts. To reduce such a time and production losses to a minimum, it is wise for the users having to hand, certain spare parts for the equipment in use.

For users of ASEA Industrial Robot Systems, ASEA has assembled different types of sets of spares of those parts known to need the most frequent replacement.

These spare parts sets are available in two sizes, large and small, and contain adequate material for all levels of reparation skill and resources.

Each set is intended for one robot. A combination of one large set and a number of small sets is suitable for an installation containing more than one robot.

This information pamphlet contains lists of the details and units contained in the spare parts sets and illustrations showing their location in the robot.

Instructions concerning dismantling of erroneous parts and re-assembling of spare parts are given in the Service Manual IRB 6/2.

ASEA reserves the right to change design, technical data and measurements without previous notice.

SPARE PARTS SET, IRB IRB L 6/2 1 Mechanical Large Set YB 121 002-CU
 IRB L 6/2 1 Mechanical Small Set YB 121 002-CT
 IRB 6/2 1 Mechanical Large Set YB 121 002-BK
 IRB 6/2 1 Mechanical Small Set YB 121 002-BH

Robot No --749461*

7494618 — See next page

ITEM	ARTICLE No	LARGE SET	SMALL SET	LOCATION IN ROBOT	RE-MARKS
Ball screw unit	6397 001-ACC	1	1	A	Foldout 12.1a
Bearing	2213 0047-1	1		A1	
Bearing	2213 6001-102	1		A2	
Bellows	2516 013-1	2	2	A3	
Ball screw	2323 007-A	1		A4	
Motor + tacho	4419 545-A	1	1	B1	Foldout 12.1b
Resolver	5766 388-1	1		B2	
Upper linkage rod	2184 241-A	2		C1	Foldout 12.1c
Lower linkage rod	2184 241-B	2		C2	For IRB 6/2 only
Lower linkage rod	2184 241-E	2		C3	For IRB L 6/2 only
Rod end bearing RH	2219 239-A	2		C4	Complete
Rod end bearing LH	2219 239-B	2		C5	"
Rod end bearing RH	2219 240-A	2		C6	"
Rod end bearing LH	2219 240-B	2		C7	"
Spring unit	6397 001-ABS	1		C8	For IRB L 6/2 only
Gear box	2353 001-E	1		D1	Foldout 12.1d
Gear box	2353 001-D	1		D2	
Seal	2216 299-1	3		D3	
Spiral cable	2623 009-1	6	2	E1	Foldout 12.1e
Spiral cable	2625 005-1	4	1	E2	
Socket connector	RK 924 008-AB	2		E5	
Sync. bar	2171 409-16	1		F1	Foldout 12.1f
Reed switch	5633 794-1	2	2	F2	
Reed switch	5633 794-5	1	1	F3	
Reed switch	5633 794-2	3	2	F4	

SPARE PARTS SET, IRB

IRB L 6/2 1 Mechanical Large Set YB 121 002-CZ
 IRB L 6/2 1 Mechanical Small Set YB 121 002-DA
 IRB G 6/2 1 Mechanical Large Set YB 121 002-DB
 IRB G 6/2 1 Mechanical Small Set YB 121 002-DC

Robot nr... 7494618

ITEM	ARTICLE No	LARGE SET	SMALL SET	LOCATION IN ROBOT	RE-MARKS
Ball screw unit	6397 001-ACC	1	1	A	Foldout 12.1a
Bearing	2213 0047-1	1		A1	
Bearing	2213 6001-102	1		A2	
Bellows	2516 013-1	2	2	A3	
Ball screw	2323 007-A	1		A4	
Motor + tacho	4419 545-A	1	1	B1	Foldout 12.1b
Motor + tacho	4419 545-C	1	1	B1	For IRB L 6/2 only
Motor + tacho	4419 545-B	1	1	B1	
Resolver	5766 388-1	1		B2	
Brake	2284 260-B	1	1	B3	
Diod	4854 083-24	1	1	B3	
Upper linkage rod	2184 241-A	2		C1	Foldout 12.1c
Lower linkage rod	2184 241-E	2		C3	
Rod end bearing RH	2219 239-A	2		C4	Complete
Rod end bearing LH	2219 239-B	2		C5	"
Rod end bearing RH	2219 240-A	2		C6	"
Rod end bearing LH	2219 240-B	2		C7	"
Gear box	2353 001-E	1		D1	Foldout 12.1d
Gear box	2353 001-D	1		D2	
Seal	2216 261-1	3		D3	
Spiral cable	2623 009-5	6	2	E1	Foldout 12.1e
Spiral cable	2625 005-1	4	1	E2	
Socket connector	RK 924 008-AB	2		E5	
Reed switch	5633 794-1	2	2	F2	
Reed switch	5633 794-5	1	1	F3	
Reed switch	5633 796-B	1	1	F5	
Reed switch	5633 796-C	1	1	F6	

SPARE PARTS SET

IRB L6/2, G6/2, IRB 60 1 Electrical Large set YB 161 100-HS

IRB L6AW, L6GL 1 Electrical Large set YB 161 100-HT

Item	Article No.	Large set	Location in cabinet	Remarks
PC relay	5633 890-3	1	D14.153.X90	
PC relay	5633 882-3	1	"	
PC relay	5633 923-3	1	"	
Contactor	SK 814 001-AB	1	H22	
Diode module	4858 226-3	1	H24	
Electrical capacitor	4987 070-307	1	H24	
Single board computer	5731 0001-GP	1	D14	
R/D convertor	YB 161 102-BV	1	D14	
Resolver exciter	YB 161 102-AD	1	D14	For YB 161 100-HS only
Resolver exciter	YB 161 102-BS	1	D14	For YB 161 100-HT only
I/O board	YB 161 102-AH	1	D14	
Axis processor	YB 161 102-AK	1	D14	
Servo control unit	YT 212 001-AC	1	D22	
Servo power unit	YT 212 001-AE	1	D22	
Adjusting set	YB 161 101-CZ	1		

PARTS LIST
CONTROL CABINET

S2

CK 09 - 1554 E

Sept 1986

13 SPARE PARTS, CONTROL CABINET

Fan assembly, all IRB	1
Reactor unit, IRB 6/2, IRB 60/2, IRB 90/2	2
Reactor unit, IRB 1000	3
Power unit, D:II-type fuses	4-5
Power unit, US-type fuses	6
Power unit, Red Spot fuses	7
Transformer, all IRB	8
Door, all IRB	9-10
Electronic boards, all IRB	11-13
Optional I/O boards, all IRB	14-16
Drive units, IRB 6/2	17
Drive units, IRB 60/2	18
Drive units, IRB 90/2	19
Drive units, IRB 1000	20-21
Rectifier unit, IRB 6/2	22-23
Rectifier unit, IRB 60/2	24-25
Rectifier unit, IRB 90/2	26-27
Rectifier unit, IRB 1000	28-29
Miscellaneous, all IRB	30
Programming unit, all IRB	31

Control cabinet, fan assembly, all IRB

Item	Qty	Description	Article No	Comments
F 3	1	Fan assembly	YB 161 101-BD	
F 3	.1-.2	2 Fan housing	5283 0116-A	
F 3	.1-.2	2 Fan	6480 026-3	
F 3	.3	1 Capacitor	4984 219-5	
F 3	.4	1 Thermostat	5665 132-3	62°C
F 3	.5	1 Microswitch	SK 652 0116	

Control cabinet, reactor unit, IRB 6/2, IRB 60/2, IRB 90/2

Item	Qty	Description	Article No	Comments
IRB 6/2				
H 17	1	Reactor unit	YB 161 101-AN	5 axes, complete
	1	Reactor unit	YB 161 101-AK	6 axes, complete
	1	Reactor	4782 016-GC	1 for each axis. Part of H17.
H 22	1	Reactor unit	YB 161 101-BB	Ext axes, complete (OPTION)
	1	Reactor	4782 016-GC	1 for each axis. Part of H22.
IRB 60/2				
H 17	1	Reactor unit	YB 161 101-AM	5 axes, complete
	1	Reactor unit	YB 161 101-AG	6 axes, complete
	1	Reactor	4782 016-GC	1 for each axis. Part of H17.
H 22	1	Contactora	SK 814 001-AB	24 V, 50-60 Hz
	1	Reactor unit	YB 161 101-BB	Ext axes, complete (OPTION)
	1	Reactor	4782 016-GC	1 for each axis. Part of H22.
IRB 90/2				
H 17	1	Reactor unit	YB 161 101-AE	6 axes, complete
	1	Reactor	4782 016-GD	1 for each of the axes 1-3. Part of H17.
	1	Reactor	4782 016-GC	1 for each of the axes 4-6. Part of H17.
H 22	1	Contactora	SK 814 001-AB	24 V, 50-60 Hz
	1	Reactor unit	YB 161 101-BB	Ext axes, complete (OPTION)
	1	Reactor	4782 016-GC	1 for each axis. Part of H22.

Control cabinet, reactor unit, IRB 1000

Item	Qty	Description	Article No	Comments
H 17	1	Reactor unit	YB 161 101-KL	6 axes, complete
	1	Reactor	4782 016-GD	1 for each axis 1-3. Part of H17.
	1	Contactoꝛ	SK 814 001-AB	24 V, 50-60 Hz
H 22	1	Reactor unit	YB 161 101-BB	Ext axes, complete for motor size 1 and 2 (OPTION)
	1	Reactor	4782 016-GC	1 for each axis. Part of H22.
	1	Reactor unit	YB 161 101-KM	Ext axes, complete for motor size 3 (OPTION)
	1	Reactor	4782 016-GC	2 in parallel for axis 7. 1 for each axis 8- 9. Part of H22.

Control cabinet, power unit, D:II-type fuses

Item	Qty	Description	Article No	Comments
H 24	1	Power unit, 50 Hz	YB 161 101-GE	IRB 6/2, D:II-type fuses.
	1	Power unit, 50 Hz	YB 161 101-GF	IRB 60/2, IRB 1000, D:II-type fuses.
	1	Power unit, 50 Hz	YB 161 101-GG	IRB 90/2, D:II-type fuses.
	1	Power unit board	YB 161 102-AC	
	1	Auxiliary contact	SK 819 001-B	
	1	Auxiliary relay	RK 214 002-AD	Only when brakes are provided.
H 24 .1-.3, .5-.17	16	Fuse base	SK 165 0129	
H 24 .1-.3, .5-.17	16	Fuse carrier	SK 164 5321	
H 24 .15-.17	3	Fuse	SK 161 0043	IRB 90/2, 20 A slow blow
H 24 .15-.17	3	Gauge piece	SK 161 0073	IRB 90/2, 20 A
H 24 .10-.14	5	Fuse	SK 161 0009	16 A quick blow
H 24 .15-.17	3	Fuse	SK 161 0041	IRB 6/2, IRB 60/2, IRB 1000, 16 A slow blow
H 24 .10-.14	5	Gauge piece	SK 161 0071	IRB 90/2, 16 A
H 24 .10-.17	8	Gauge piece	SK 161 0071	IRB 6/2, IRB 60/2, IRB 1000, 16 A
H 24 .1	1	Fuse	SK 161 0007	10 A quick blow
H 24 .1	1	Gauge piece	SK 161 0069	10 A
H 24 .2-.3, .7-.9	5	Fuse	SK 161 0005	6 A quick blow
H 24 .5-.6	2	Fuse	SK 161 0001	2 A quick blow
H 24 .2-.3, .5-.9	7	Gauge piece	SK 161 0067	2-6 A

Control cabinet, power unit, D:II-type fuses

Item	Qty	Description	Article No	Comments
H 24 .18	1	Wall socket	5385 387-1	Earthed
H 24 .19-.20	2	Rocker switch	5379 034-1	16 A / 250 V
H 24 .21	1	Auxiliary relay	RK 214 002-AD	RXMM 1
H 24 .23-.25	3	Contactor	SK 814 001-AB	24 V, 50/60 Hz
H 24 .25	1	Contact block	RK 741 111-AA	
H 24 .26-.27	2	Rectifier	4858 226-3	
H 24 .29-.31	3	Capacitor	4987 070-307	33 000 μ F / 40 V
H 24 .X2-.X3	2	Pin connector	RK 924 007-AA	RTXG 8-1
H 24 .X4	1	Pin connector	RK 924 008-AA	RTXG 16-1

Control cabinet, power unit, US-type fuses

Item	Qty	Description	Article No	Comments
H 24	1	Power unit, 60 Hz	YB 161 101-GH	IRB 6/2, US-type fuses.
	1	Power unit, 60 Hz	YB 161 101-GK	IRB 60/2, IRB 1000, US-type fuses.
	1	Power unit, 60 Hz	YB 161 101-GL	IRB 90/2, US-type fuses.
H 24 .1-.17	16	Fuse carrier	5677 726-2	
H 24 .15-.17	3	Fuse	5672 830-15	IRB 90/2, 20 A
H 24 .10-.14	5	Fuse	5672 827-15	IRB 90/2, 15 A quick blow
H 24 .10-.17	8	Fuse	5672 827-15	IRB 6/2, IRB 60/2, IRB 1000, 15 A quick blow
H 24 .1	1	Fuse	5672 827-10	10 A quick blow
H 24 .2-.3 .7-.9	5	Fuse	5672 827-6	6 A quick blow
H 24 .5-.6	2	Fuse	5672 827-2	2 A quick blow
H 24 .18	1	Wall socket	5385 387-1	Earthed
H 24 .19-.20	2	Rocker switch	5379 034-1	16 A / 250 V
H 24 .21	1	Auxiliary relay	RK 214 002-AD	RXMM 1
H 24 .23-.25	3	Contacto	SK 814 001-AB	24 V, 50/60 Hz
H 24 .25	1	Contact block	RK 741 111-AA	
H 24 .26-.27	2	Rectifier	4858 226-3	
H 24 .29-.31	3	Capacitor	4987 070-307	33 000 μ F / 40 V
H 24 .X2-.X3	2	Pin connector	RK 924 007-AA	RTXG 8-1
H 24 .X4	1	Pin connector	RK 924 008-AA	RTXG 16-1

Control cabinet, power unit, Red Spot fuses

Item	Qty	Description	Article No	Comments
H 24	1	Power unit, 50 Hz	YB 161 101-FK	IRB 6/2, without brakes, Red Spot fuses.
	1	Power unit, 50 Hz	YB 161 101-FH	IRB 6/2 with brakes, IRB 60/2, IRB 1000, Red Spot fuses.
	1	Power unit, 50 Hz	YB 161 101-FL	IRB 90/2, Red Spot fuses.
H 24 .15-.17	3	Fuse 20 A	5671 516-18	IRB 90/2
H 24 .10-.14	5	Fuse 16 A	5671 516-16	IRB 90/2
H 24 .10-.17	8	Fuse 16 A	5671 516-16	IRB 6/2, IRB 60/2, IRB 1000
H 24 .1	1	Fuse 10 A	5671 516-15	
H 24 .2-.4 .7-.8	5	Fuse 5 A	5671 516-14	
H 24 .6, .9	2	Fuse 2 A	5671 516-13	
H 24 .18	1	Wall socket	5385 452-1	110 V. Earthed
H 24 .19-.20	2	Rocker switch	5379 034-1	16 A / 250 V
H 24 .21	1	Auxiliary relay	RK 214 002-AD	RXMM 1
H 24 .23-.25	3	Contacto	SK 814 001-AB	24 V, 50/60 Hz
H 24 .25	1	Contact block	RK 741 111-AA	
H 24 .26-.27	2	Rectifier	4858 226-3	
H 24 .29-.31	3	Capacitor	4987 070-307	33.000 μ F / 40 V
H 24 .32	1	Transformer	4781 020-XH	220 / 110 V
H 24 .X2-.X3	2	Pin connector	RK 924 007-AA	RTXG 8-1
H 24 .X4	1	Pin connector	RK 924 008-AA	RTXG 16-1

Control cabinet, transformer, all IRB

Item	Qty	Description	Article No	Comments
IRB 6/2				
F 5	1	Transformer	4781 0631-E	380 V
	1	Transformer	4781 0631-F	415 - 475 V
	1	Transformer	4781 0631-G	500 - 600 V
	1	Transformer	4781 0631-H	220 V
IRB 60/2, IRB 90/2				
F 5	1	Transformer	4781 0637-C	380 V
	1	Transformer	4781 0637-D	415 - 475 V
	1	Transformer	4781 0637-E	500 - 600 V
	1	Transformer	4781 0637-G	220 V
IRB 1000				
F 5	1	Transformer	4781 0631-R	380 V
	1	Transformer	4781 0631-S	415 - 475 V
	1	Transformer	4781 0631-T	500 - 600 V
	1	Transformer	4781 0631-P	220 V

Control cabinet, door, all IRB

Item	Qty	Description	Article No	Comments
F 16	1	Control panel	YB 161 101-GM	Complete
	1	Control panel	YB 161 101-CA	External, 15 m cable
	1	Control panel	YB 161 101-BZ	External, 10 m cable
	1	Control panel	YB 161 101-BY	External, 6 m cable
F 16 .1	1	Pushbutton	SK 615 203-XA	Latching
	1	Connection block	SK 615 010-C	
F 16 .2, .6	2	Lamp/pushbutton	SK 615 202-CH	White
	2	Connection block	SK 615 011-D	
	2	Sealing ring	SK 615 512-1	
F 16 .3-.4	2	Lamp, red	SK 615 281-AA	
F 16 .5	1	Actuator, blue	SK 615 202-CD	
	1	Connection block	SK 615 010-D	
	1	Sealing ring	SK 615 512-1	
F 16 .7	1	Lamp/pushbutton	SK 615 219-AB	Green
	1	Connection block	SK 615 512-1	
F 16 .8	1	Lamp/pushbutton	SK 615 202-CH	White
	1	Connection block	SK 615 202-A	
	1	Sealing ring	SK 615 202-1	
F 16 .9	1	Lamp/pushbutton	SK 615 219-AC	Yellow
	1	Sealing ring	SK 615 512-1	
F 16 .10	1	Pushbutton	SK 615 244-EA	
F 16 .11	1	Lamp/pushbutton	SK 615 202-CH	White
	1	Connection block	SK 615 011-B	
	1	Sealing ring	SK 615 512-1	

Control cabinet, door, all IRB

Item	Qty	Description	Article No	Comments
F 16 .12	1	Pushbutton, red	SK 615 202-CA	
	1	Connection block	SK 615 010-A	
	1	Sealing ring	SK 615 512-1	
		Fil. lamp BA9S	5911 069-10	
F 16 .13	1	Pushbutton, black	SK 615 211-CF	
	1	Protection cover	SK 615 502-A	Blue
F 17	1	Mains switch assy.	YB 161 101-EE	
F 17 .1	1	Switch	SK 115 061-FC	
	1	Handle plus coupling	SK 115 970-FH	
F 18	1	P unit compartment	YB 161 101-BE	Complete
	1	P unit compartment	YB 161 101-BV	Complete external, 15 m cable
	1	P unit compartment	YB 161 101-BU	Complete external, 10 m cable
	1	P unit compartment	YB 161 101-BT	Complete external, 6 m cable
F 18 .2	1	Reed switch	5633 794-4	
F 19	1	Outer compartment	YB 161 101-CM	Without the inner compartment for the floppy disk drive
	1	Fan	6480 124-1	
	1	Inner compartment	YB 161 100-DH	Complete. Contains the floppy disk drive
	1	Inner compartment	YB 161 100-EK	Replaces YB 161 100-DH as from spring 1986
	1	Floppy disk drive	5736 037-1	BASF
	1	Floppy disk drive	5736 067-1	Mitsubishi. Replaces 5736 037-1 as from spring 1986
			Floppy disk	5736 038-1

Control cabinet, electronic boards, all IRB

Item	Qty	Description	Article No	Comments
D 14 .101	1	DSQC 116	YB161 102-BE	5 V regulator. (Replaces DSSR 110 /115 as from the spring 1985.)
D 14.101	1	DSSR 116	4899 0001-FK	5 V regulator, for absolute measurement robot systems.
D 14 .F201	1	Cartridge fuse	5672 2011-24	10 A quick blow
D 14 .F202	1	Cartridge fuse	5672 2011-19	3.15 A quick blow
D 14 .101	1	DSSR 115	4899 0001-FE	5 V regulator
D 14 .F101	1	Cartridge fuse	5672 2011-22	6.3 A
D 14 .F102	1	Cartridge fuse	5672 2011-24	10 A
D 14 .101	1	DSSR 110	4899 0001-E	5 V regulator
D 14 .F101	1	Cartridge fuse	5672 2011-22	6.3 A quick blow
D 14 .F102	1	Cartridge fuse	5672 2011-23	8 A quick blow
D 14 .117	1	DSMB 125	5736 0001-AN	Memory board. (OPTION up to the autumn 1985. Standard as from the autumn 1985.)
D 14 .117	1	DSMB 127	5736 0001-HG	Memory board. (OPTION as from the autumn 1986).
D 14.121	1	DSMB 124	5736 0001-U	Memory board
D 14 .121	1	DSMB 127	5736 0001-HG	Memory board as from the autumn 1986.
D 14 .125	1	DSPC 157	5731 0001-GP	Main processor without program. Can only be used together with PROM type 27256. Replaces DSPC 153/152/150 as from the autumn 1986.
D 14 .125	1	DSPC 150	5731 0256-AF	Main processor without program. Replaces DSPC 153/152 and DSCA 121 as from the spring 1985.
	1	DSPC 153	5731 0256-BA	Main processor without program
D 14 .129	1	DSPA 110	YB161 102-AK	Axis processor

Control cabinet, electronic boards, all IRB

Item	Qty	Description	Article No	Comments
D 14 .133	1	DSMC 110	5733 0001-N	Floppy disk board
D 14 .137	1	DSQC 103	YB161 102-AD	Resolver exciter board.
D 14 .137	1	DSQC 115	YB161 102-BS	Replaces DSQC 103 for IRB 6AW/2. Resolver exciter board with 2 analog outputs.
D 14 .137	1	DSQC 117	YB161 102-BG	Replaces DSQC 103 for IRB 90/2 provided with Servo Adaptivity. Resolver exciter board with 1 analog output.
D 14 .141, .145	2	DSQC 104	YB161 102-AE	R/D converter board
	2	DSQC 123	YB161 102-BT	R/D converter board. Replaces DSQC 104 as from autumn 1985. The board is not fully interchangeable with DSQC 104 as re-adjustment of the synch position of the axes concerned is required.
D 14 .149	1*	DSQC 104	YB161 102-AE	*When external axes. R/D converter board.
	1*	DSQC 123	YB161 102-BT	*When external axes. R/D converter board.
D 14 .153	1	DSDX 110	YB161 102-AH	Digital I/O board, 24 V DC. Some I/O channels are used internally in the system.
D 14 .153.X90	1	Terminal unit	YB 161 102-BU	DSQC 124, as from the autumn 1985
	1	Terminal unit	YB161 102-AB	DSQC 101, up to the autumn 1985
	1	Cable	2639 0603-A	
	4	Cartridge fuse	5672 2011-17	2 A quick blow
D 14 .153.X81	1	Socket connector	RK 924 043-AA	RTXR 42-0

Control cabinet, electronic boards, all IRB

Item	Qty	Description	Article No	Comments
D 14 .157	1	DSQC 121	YB 161 102-BN	Monitor board. Only together with main computer board DSPC 150. (OPTION as from the spring 1985).
D 14 .157	1	DSCA 121	5752 0001-U	PD bus board. Only together with main computer board DSPC 153
D 14 .161	1	DSCA 114	5751 0001-AA	Asynchronous communication unit (OPTION as from the autumn 1984)
D 14 .161-177	≤4	Optional I/O boards		Up to 4 optional I/O boards can be provided at the positions .161-.173 up to the spring 1984. Up to 4 optional I/O boards can be provided at the positions .165-.177 as from the spring 1984. See the following section "Optional I/O boards."
D 14 .161.X90- .177.X90	≤4	Terminal units		The terminal units are located in the back of the cabinet. The position designation of each terminal unit is the same as for the corresponding I/O board. See the following section "Optional I/O boards."
D 14 177	1	DSQC 114	YB 161 102-BD	Welding timer board IRB 90/2 provided with IWT. When present only ≤3 optional I/O boards can be provided.
D 14 .181	1	Test adapter	YB 161 100-AM	(OPTION)
F 40	1	DSQC 125	YB 161 102-BR	Relay unit, absolute measurement, 6 ax.
F 40	1	DSQC 126	YB 161 102-BM	Rel ut, abs m, 9 ax.

Control cabinet, optional I/O boards, all IRB

Item	Qty	Description	Article No	Comments
(D 14 .161-.177)				
	≤4	DSDI 110	5716 0001-A	Digital inboard, 24 V DC (OPTION)
	1*	Terminal unit	YB 161 102-BH	*For each board. DSQC 122 for DSDI 110, DSDO 110 and DSDX 110 (as from the autumn 1985)
	1*	Terminal unit	5716 0001-AZ	*For each board. DSTD 150 for DSDI 110 (up to the autumn 1985)
	4*	Cartridge fuse	5672 2011-17	*For each terminal unit. 2 A quick blow.
	1*	Cable	2639 0603-A	*For each terminal unit
	≤4	DSDI 130	5716 0001-AA	Digital inboard, 110 V DC / AC (OPTION)
	1*	Terminal unit	5716 0001-BT	*For each board. DSTD 140 for DSDI 130
	4*	Cartridge fuse	5672 2011-14	*For each terminal unit. 1 A.
	1*	Cable	2639 0582-6	*For each terminal unit

Control cabinet, optional I/O boards, all IRB

Item	Qty	Description	Article No	Comments
(D 14 .161-.177)				
	≤4	DSDO 110	5716 0001-K	Digital outboard, 24 V DC (OPTION)
	1*	Terminal unit	YB 161 102-BH	*For each board. DSQC 122 for DSDI 110, DSDO 110 and DSDX 110 (as from the autumn 1985)
	1*	Terminal unit	5716 0001-BH	*For each board. DSTD 110 for DSDO 110 (OPTION up to the autumn 1985)
	4*	Cartridge fuse	5672 2011-17	*For each terminal unit. 2 A quick blow.
	1*	Cable	2639 0603-A	*For each terminal unit
	≤4	DSDO 130	5716 0001-AP	Digital outboard, 110 V DC / AC (OPTION up to the autumn 1985)
	≤4	DSDO 131	5716 0001-KX	Digital outboard, 110 V DC / AC (OPTION replacing DSDO 130 as from the autumn 1985)
	1*	Terminal unit	5716 0001-AU	*For each board. DSTD 130 for DSDO 130 and DSDO 131 (OPTION)
	1*	Term. blade	2166 0559-N	*For each terminal unit
	1*	Cable	2639 0582-G	*For each terminal unit

Control cabinet, optional I/O boards, all IRB

Item	Qty	Description	Article No	Comments
(D 14 .161-.177)				
	≤4	DSDX 110	YB 161 102-AH	Digital I/O board, 24 V DC (OPTION)
	1*	Terminal unit	YB 161 102-BH	*For each board. DSQC 122 for DSDI 110, DSDO 110 and DSDX 110 (as from the autumn 1985)
	1*	Terminal unit	YB 161 102-AM	*For each board. DSTD 160 for DSDX 110 (OPTION up to the autumn 1985)
	4*	Cartridge fuse	5672 2011-17	*For each terminal unit. 2 A.
	1*	Cable	2639 0603-A	*For each terminal unit.
	≤1	DSAI 120	5712 0001-DK	Analog inboard, 0 - ±10.235 V (OPTION)
	1	Terminal unit	5712 0001-E	DSTA 121 for DSAI 120.
	1	Cartridge fuse	5672 2011-4	0.1 A.
	1	Cable	2639 0603-A	
	≤1	DSAO 110	5712 0001-AT	Analog outboard, 0 - ±10.235 V/ ±20.47 mA (OPTION)
	1	Terminal unit	5712 0001-AH	DSTA 160 for DSAO 110
	1	Cable	2639 0603-G	

Control cabinet, drive units IRB 6/2

Item	Qty	Description	Article No	Comments
D 22 .101	1	YYE 109 A	YT 212 001-AB	15 V regulator
D 22.113	1	YYT 102 N	YT 212 001-AX	Servo control unit for IRB G6/2, axis 1.
D 22 .113, .125, .137	3	YYT 102 D	YT 212 001-AL	Servo control unit for robot axes 1-3.
D 22 .149, .161	2	YYT 102 E	YT 212 001-AM	Servo control unit for robot axes 4-5.
D 22 .173	1	YYT 102 K	YT 212 001-AS	For optional third wrist motion.
D 22 .173	1	YYT 102 A	YT 212 001-AC	Servo control unit for optional external axes.
D 22 .117, .129, .141, .153, .165	5	YTEA 250-8	YT 212 001-AE	Servo power unit for axes 1-5
D 22 .177	1	YTEA 250-8	YT 212 001-AE	Servo power unit for optional third wrist motion, or optional track motion, axis 6
D 31 .101	1	YYE 109 B	YT 212 001-AG	Bus board for optional external axes 7-9.
D 31 .113, .125, .137	≤3*	DSQU 144	YB 161 101-DA	*1 for each optional external axis 7-9. Servo control unit
D 31 .117, .129, .141	≤3*	YTEA 250-8	YT 212 001-AE	*1 for each optional external axis 7-9. Servo power unit

Control cabinet, drive units, IRB 60/2

Item	Qty	Description	Article No	Comments
D 22 .101	1	YYE 109 A	YT 212 001-AB	15 V regulator
D 22 .113, .125, .137, .149, .161	3	YYT 102 C	YT 212 001-AK	Servo control unit for robot axes 1-5.
D 22 .173	1	YYT 102 C	YT 212 001-AK	Servo control unit for axis 6 on 6-axes IRB 60/2.
D 22 .173	1	DSQU 144	YB 161 101-DA	Servo control unit for optional external axis 6, 5- axes IRB 60/2.
D 22 .113, .125, .137, .149, .161	5	YYT 102 H	YT 212 001-AR	Servo control unit for robot axes 1-5, with soft servo.
D 22 .173	1	YYT 102 H	YT 212 001-AR	Servo control unit for axis 6, 6-axes IRB 60/2 with soft servo.
D 22 .117, .129, .141, .153, .165	5	YTEA 250-8	YT 212 001-AE	Servo power unit for axes 1-5
D 22 .177	1	YTEA 250-8	YT 212 001-AE	Servo power unit for axis 6, 6-axes IRB 60/2, or external axis 6, 5-axes IRB 60/2.
D 31 .101	1	YYE 109 B	YT 212 001-AG	Bus board for optional external axes 7-9.
D 31 .113, .125, .137	≤3*	DSQU 144	YB 161 101-DA	*1 for each optional external axis 7-9. Servo control unit
D 31 .117, .129, .141	≤3*	YTEA 250-8	YT 212 001-AE	*1 for each optional external axis 7-9. Servo power unit

Control cabinet, drive units, IRB 90/2

Item	Qty	Description	Article No	Comments
D 22 .101	1	YYE 109 A	YT 212 001-AB	15 V regulator
D 22 .113	1	YYT 102 G	YT 212 001-AP	Servo control unit for axis 1.
D 22 .125, .137	3	YYT 102 F	YT 212 001-AN	Servo control unit for robot axes 2-3.
D 22 .149, .161, 173	3	YYT 102 B	YT 212 001-AD	Servo control unit for robot axes 4-6.
D 22 .117, .129, .141	5	YTEA 250-15	YT 212 001-AF	Servo power unit for axes 1-3
D 22 .153, .165, .177	5	YTEA 250-8	YT 212 001-AE	Servo power unit for axes 4-6
D 31 .101	1	YYE 109 B	YT 212 001-AG	Bus board for optional external axes 7-9.
D 31 .113, .125, .137	≤3*	DSQU 144	YB 161 101-DA	*1 for each optional external axis 7-9. Servo control unit
D 31 .117, .129, .141	≤3*	YTEA 250-8	YT 212 001-AE	*1 for each optional external axis 7-9. Servo power unit

Control cabinet, drive units, IRB 1000

Item	Qty	Description	Article No	Comments
D 22 .101	1	YYE 109 A	YT 212 001-AB	15 V regulator
D 22 .113, .125, .137	3	YYT 102 L	YT 212 001-AT	Servo control unit for robot axes 1-3 up to autumn 1985. Can only be used together with software up to YB 161106-GL.
D 22 .113, .125, .137	3	YYT 102 Q	YT 212 001-AZ	Replaces YYT 102 L as from the autumn 1985.
D 22 .149, .161, .173	3	YYT 102 M	YT 212 001-AU	Servo control unit for robot axes 4-6.
D 22 .113, .125, .137	3	YYT 102 P	YT 212 001-AY	Servo control unit for robot axes 1-3 with soft servo.
D 22 .149, .161, .173	3	YYT 102 R	YT 212 001-DA	Servo control unit for robot axes 4-6 with soft servo.
D 22 .117, .129, .141	5	YTEA 250-15	YT 212 001-AF	Servo power unit for axes 1-3
D 22 .153, .165, 177	5	YTEA 250-8	YT 212 001-AE	Servo power unit for axes 4-6

Control cabinet, drive units, IRB 1000

Item	Qty	Description	Article No	Comments
D 31 .101	1	YYE 109 B	YT 212 001-AG	Bus board for optional external axes 7-9.
D 31 .113	1	DSQU 272	YB 161 101-LF	For optional external axis 7, motor size 1. Servo control unit
	1	DSQU 144	YB 161 101-DA	For optional external axis 7, motor size 2. Servo control unit
	1	YYT 102 Q	YT 212 001-AZ	For optional external axis 7, motor size 3. Servo control unit
D 31 .117	1	YTEA 250-8	YT 212 001-AE	For optional external axes 7, motor size 1 and 2. Servo power unit
	1	YTEA 250-15	YT 212 001-AF	For optional external axes 7, motor size 3. Servo power unit
D 31 .125, .137	1	DSQU 272	YB 161 101-LF	For optional external axes 8-9, motor size 1. Servo control unit
D 31 .125, .137	1	DSQU 144	YB 161 101-DA	For optional external axes 8-9, motor size 2. Servo control unit
D 31 .129, .141	1	YTEA 250-8	YT 212 001-AE	For optional external axes 8 and 9, motor size 1 and 2. Servo power unit

Control cabinet, rectifier unit, IRB 6/2

Item	Qty	Description	Article No	Comments
D 28	1	Rectifier unit	YT 212 001-R	6 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YT 212 001-BR	6 axes, 60 Hz, US-type fuses.
	1	Rectifier unit,	YT 212 001-CR	6 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-GU	6 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HG	6 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-FU	6 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.
	1	Rectifier unit	YB 161 101-GV	Option, 9 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HH	Option, 9 axes, 60 Hz, US-type fuses.
	1	Rectifier unit	YB 161 101-FV	Option, 9 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-GY	9 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HK	9 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-FY	9 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.

Control cabinet, rectifier unit, IRB 6/2

Item	Qty	Description	Article No	Comments
D 28 .1	1	Diode module	4858 226-3	
D 28 .2	1	Capacitor	4987 070-605	2.2 mF / 160 V
D 28 .3	1	Overload relay	SK 422 0029	1.5 - 2.5 A
D 28 .4-.5	2	Resistor	5245 2064-168	6.8 ohm / 100 W
D 28 .6	1	Voltage regulator	YT 212 001-BA	XYZ 149 B
D 28 .7	1	Earth prot. relay	RK 426 132-AC	Only if earth protected rectifier unit.
D 28 .11-.16	1*	Fuses complete	see below	*For each axis.
		Gauge piece 10 A	SK 161 0069	D:II
		Fuse	SK 161 0007	10 A quick blow, D:II
		Fuse cap	SK 164 5321	D:II
		Fuse holder	5677 726-2	US-Type
		Fuse	5677 828-10	10 A quick blow, US-Type
		Socket	5676 501-12	Red spot
		Fuse 10 A	5671 516-15	Red spot

Control cabinet, rectifier unit, IRB 60/2

Item	Qty	Description	Article No	Comments
D 28	1	Rectifier unit	YT 212 001-T	6 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YT 212 001-BT	6 axes, 60 Hz, US-type fuses.
	1	Rectifier unit	YT 212 001-CT	6 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-GZ	6 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HL	6 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-GA	6 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HA	Option, 9 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HM	Option, 9 axes, 60 Hz, US-type fuses.
	1	Rectifier unit	YB 161 101-GB	Option, 9 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HB	9 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HN	9 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-GC	9 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.

Control cabinet, rectifier unit, IRB 60/2

Item	Qty	Description	Article No	Comments
D 28 .1	1	Diode module	4858 258-8	
D 28 .2	1	Capacitor	4987 070-809	3.3 μ F / 350 V
D 28 .3	1	Overload relay	SK 422 0029	1.5 - 2.5 A
D 28 .4-.5	2	Resistor	5245 2064-168	6.8 ohm / 100 W
D 28 .6	1	Voltage regulator	YT 212 001-AA	XYZ 149 A
D 28 .7	1	Earth prot. relay	RK 426 132-AE	Only if earth protected rectifier unit.
D 28 .11-.16	1*	Fuses complete	see below	*F for each axis.
		Gauge piece 10 A	SK 161 0069	D:II
		Fuse	SK 161 0007	10 A quick blow, D:II
		Fuse cap	SK 164 5321	D:II
		Fuse holder	5677 726-2	US-Type
		Fuse	5677 828-10	10 A quick blow, US-Type
		Socket	5676 501-12	Red spot
		Fuse 10 A	5671 516-15	Red spot

Control cabinet, rectifier unit, IRB 90/2

Item	Qty	Description	Article No	Comments
D 28	1	Rectifier unit	YB 161 101-HC	6 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HP	6 axes, 60 Hz, US-type fuses.
	1	Rectifier unit	YB 161 101-GP	6 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HD	6 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HR	6 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-GR	6 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HE	Option, 9 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HS	Option, 9 axes, 60 Hz, US-type fuses.
	1	Rectifier unit	YB 161 101-GS	Option, 9 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HF	9 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-HT	9 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-GT	9 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.

Control cabinet, rectifier unit, IRB 90/2

Item	Qty	Description	Article No	Comments
D 28 .1	1	Diode module	4858 258-8	
D 28 .2	1	Capacitor	4987 070-809	3.3 mF / 350 V
D 28 .3	1	Overload relay	SK 422 0029	1.5 - 2.5 A
D 28 .4-.5	2	Resistor	5245 2064-168	6.8 ohm / 100 W
D 28 .6	1	Voltage regulator	YT 212 001-AA	XYZ 149 A
D 28 .7	1	Earth prot. relay	RK 426 132-AE	Only if earth protected rectifier unit.
D 28 .11-.13	1*	Fuses complete	see below	*For each of the axes 1-3, 16 A
		Gauge piece 16 A	SK 161 0071	D:II
		Fuse	SK 161 0009	16 A quick blow, D:II
		Fuse cap	SK 164 5321	D:II
		Fuse holder	5672 827-15	US-type
		Fuse, 16 A	5672 827-15	US-type
		Socket	5677 726-2	Red Spot
		Fuse, 16 A	5671 516-16	Red Spot
D 28 .14-.16	1*	Fuses complete	see below	*For each of the axes 4-6, 10 A
		Gauge piece 10 A	SK 161 0069	D:II
		Fuse	SK 161 0007	10 A quick blow, D:II
		Fuse cap	SK 164 5321	D:II
		Fuse holder	5677 726-2	US-Type
		Fuse	5677 827-10	10 A quick blow, US-Type
		Socket	5676 501-12	Red spot
		Fuse 10 A	5671 516-15	Red spot

Control cabinet, rectifier unit, IRB 1000

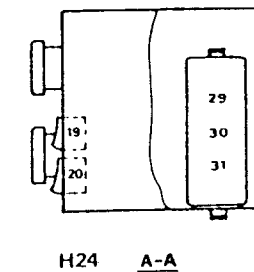
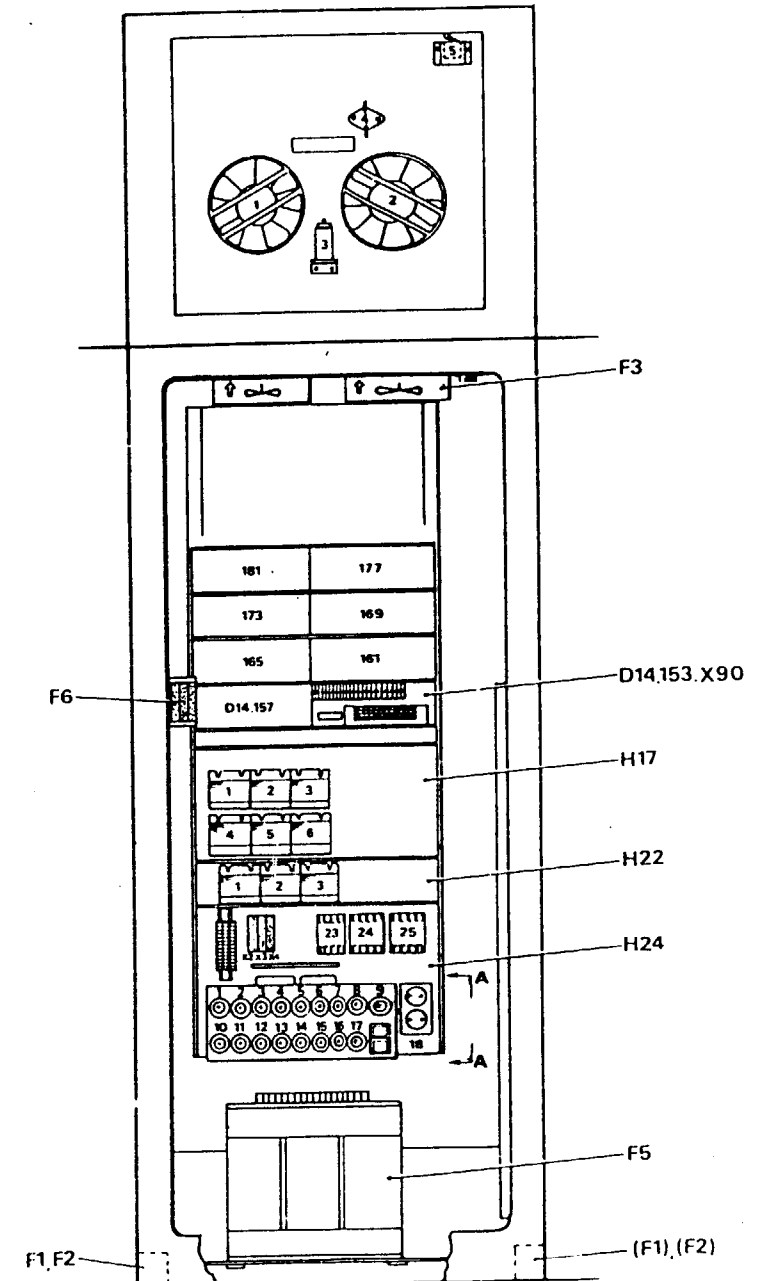
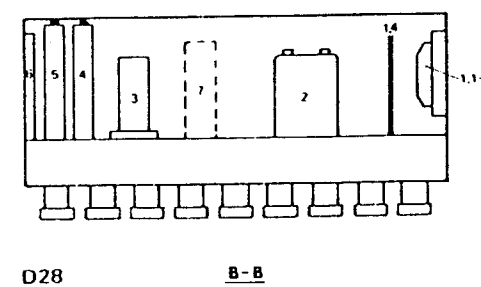
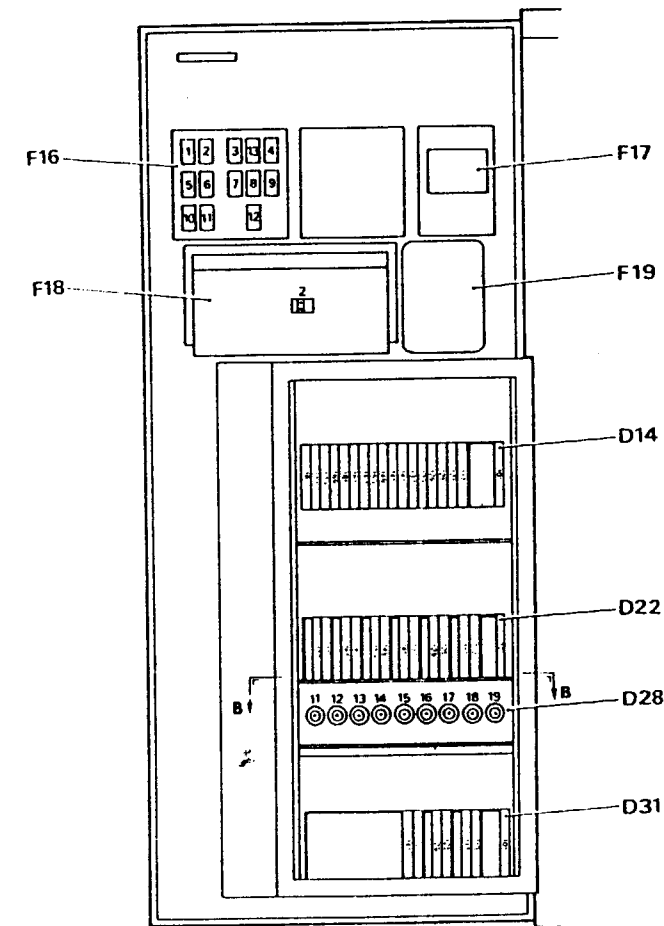
Item	Qty	Description	Article No	Comments
D 28	1	Rectifier unit	YT 212 001-S	6 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YT 212 001-BS	6 axes, 60 Hz, US-type fuses.
	1	Rectifier unit	YT 212 001-CS	6 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HV	6 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-KB	6 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-KF	6 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HY	Option, 9 axes, 50 Hz, D:II-type fuses.
	1	Rectifier unit	YB 161 101-KC	Option, 9 axes, 60 Hz, US-type fuses.
	1	Rectifier unit	YB 161 101-KG	Option, 9 axes, 50 Hz, Red Spot fuses.
	1	Rectifier unit	YB 161 101-HZ	9 axes, 50 Hz. Option with earth fault protection, D:II-type fuses.
	1	Rectifier unit	YB 161 101-KD	9 axes, 60 Hz. Option with earth fault protection, US-type fuses.
	1	Rectifier unit	YB 161 101-KH	9 axes, 50 Hz. Option with earth fault protection, Red Spot fuses.

Control cabinet, rectifier unit, IRB 1000

Item	Qty	Description	Article No	Comments
D 28 .1	1	Diode module	4858 226-3	
D 28 .2	1	Capacitor	4987 070-605	2.2 mF / 160 V
D 28 .3	1	Overload relay	SK 422 0029	1.5 - 2.5 A
D 28 .4-.5	2	Resistor	5245 2064-168	6.8 ohm / 100 W
D 28 .6	1	Voltage regulator	YT 212 001-AV	XYZ 149 C
D 28 .7	1	Earth prot. relay	RK 426 132-AC	Only if earth protected rec-tifier unit.
D 28 .11-.16	1*	Fuses complete	see below	*F or each axis.
		Gauge piece 10 A	SK 161 0069	D:II
		Fuse	SK 161 0007	10 A quick blow, D:II
		Fuse cap	SK 164 5321	D:II
		Fuse holder	5677 726-2	US-Type
		Fuse	5677 828-10	10 A quick blow, US-Type
		Socket	5676 501-12	Red spot
		Fuse 10 A	5671 516-15	Red spot

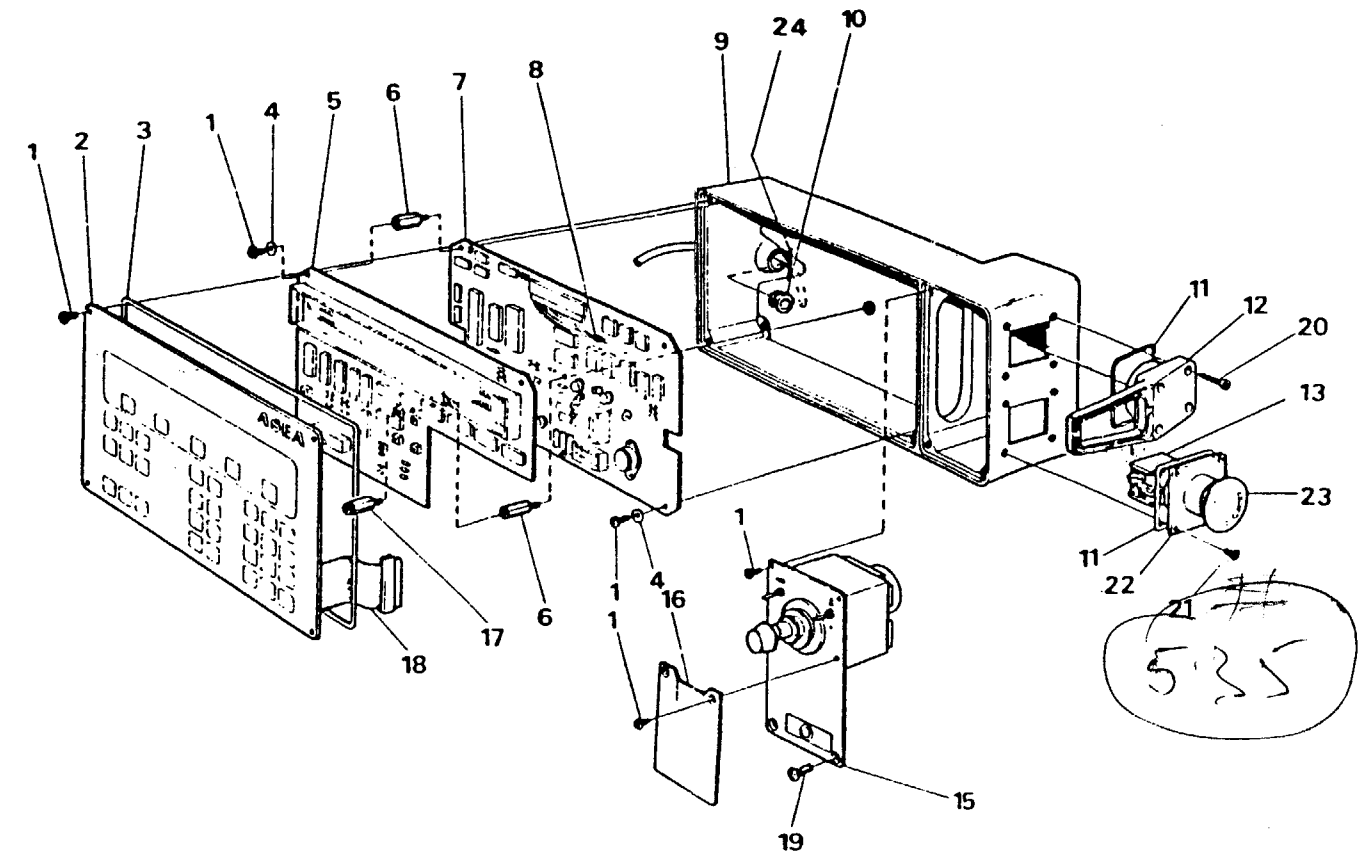
Control cabinet, miscellaneous, all IRB

Item	Qty	Description	Article No	Comments
F 6	.X1-X3	3 Pin connector	RK 924 008-AA	RTXG 16-1
		3 Socket connector	RK 924 008-AB	RTXG 16-0
F 2	.X1-X2	2 Socket connector	RK 924 007-AB	RTXG 8-0
F 2	.X3-X7	5 Socket connector	RK 924 008-AB	RTXG 16-0
F 1	.X1,.X6	≤2* Socket connector	RK 924 007-AB	*Depends on number of connected axes, RTXG 8-0
		≤2* Pin connector	RK 924 007-AA	*Depends on number of connected axes, RTXG 8-1
F 1	.X2-X5, .X7	≤5* Socket connector	RK 924 008-AB	*Depends on number of connected axes, RTXG 16-0
		≤5* Pin connector	RK 924 008-AA	*Depends on number of connected axes, RTXG 16-1
D 32	.X2	≤1* Socket connector	RK 924 043-AA	*Depends on number of connected axes, RTXR 42-0
D 22	.X2	≤1* Socket connector	RK 924 043-AA	*Depends on number of connected axes, RTXR 42-0
D 14	.X2	8 Socket connector	RK 924 043-AA	RTXR 42-0
D 14	.133.X2	1 Connector + cable	2639 0625-A	
D 14	.153.X2	1 Connector + cable	2639 0603-A	
		1 Terminal socket	RK 924 0010	
		1 Terminal pin	RK 924 0015	
		1 Cable holder	RK 924 025-AA	For RTXG
		1 Cable holder	RK 924 005-AA	For RTXR
		1 System program	Contact ASEA	5 axes
		1 System program	Contact ASEA	6 axes
		1 Servo program	Contact ASEA	



Control cabinet, programming unit, all IRB

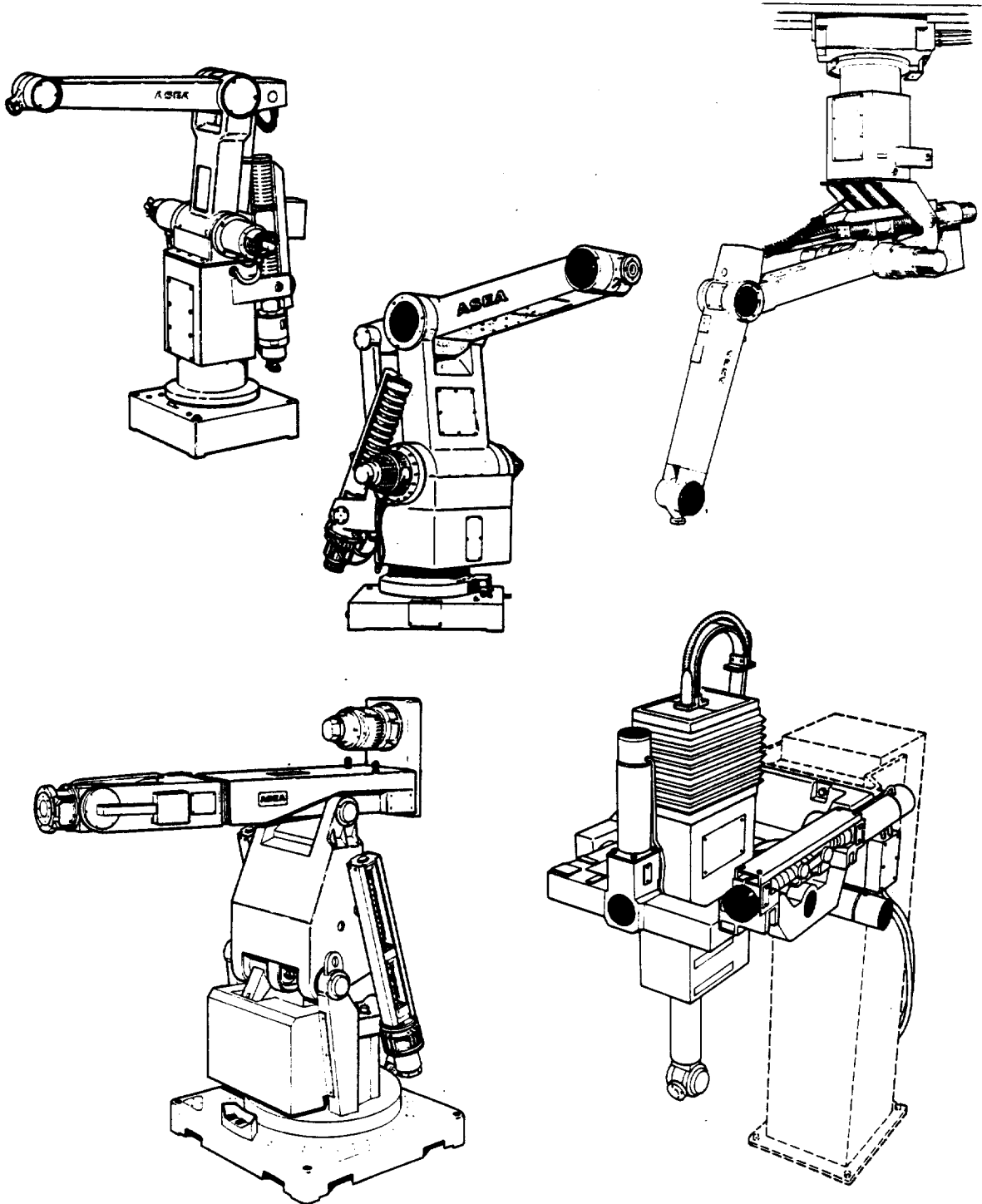
Item	Qty	Description	Article No	Comments
	1	Prog. unit complete	YB 161 100-DP	6 m cable
	1	Prog. unit complete	YB 161 100-DR	15 m cable
1	21	Screw M4x8	2121 2452-287	
2	1	Key board panel	5372 396-103	
3	1	Gasket	2152 0346-1	
4	9	Spring washer	2154 2022-2	4.3 mm
5	1	Display board	YB 161 102-AF	
6	5	Spacer M4X16	2125 2052-136	
7	1	Programming board	YB 161 102-BA	
8	1	Connecting cable	YB 161 105-CT	6 m cable
	1	Connecting cable	YB 161 105-CU	15 m cable
9	1	Box	5281 1886-H	
10	1	Bush	2166 0829-4	
11	2	Gasket	2152 0346-3	
12	1	Protective bow	2188 0286-3	
13	1	Emergency stop switch	5372 395-1	
15	1	Joystick unit	YB 161 101-DL	
16	1	Safety pad		Part of item 15
17	1	Spacer M4X12	2125 2052-134	
18	1	Ribbon cable	2639 0373-AM	
19	2	Screw M4x8	2121 2711-287	
20	4	Screw M4x20	2121 2518-295	
21	4	Screw M4x10	2121 0552-1	
22	1	Panel plate	2172 0932-10	
23	1	Emergency stop	5372 395-11	Button
24	1	Cable clamp	2172 0492-194	



Installation Service

New programming unit and adjustable end stops

IRB 6/60/90/1000



6397 014-113
February 1988

ABB
ASEA BROWN BOVERI

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General description

In order to satisfy the growing demands of industry in the field of individual and process safety, all industrial robots with control system S2 from ABB ROBOTICS have been equipped with additional safety functions, and these are described in this document.

The functions cover both hardware and software, control system and mechanical robot. The robot types covered by this update are:

- IRB L6, G6
- IRB 60
- IRB 90
- IRB 1000

all with control system S2.

The document deals with instructions for installation and servicing of the parts to which the update relates.

Other aspects of the robot systems are described in the standard documentation supplied with the robots.

2 Installation

2.1 Control cabinet

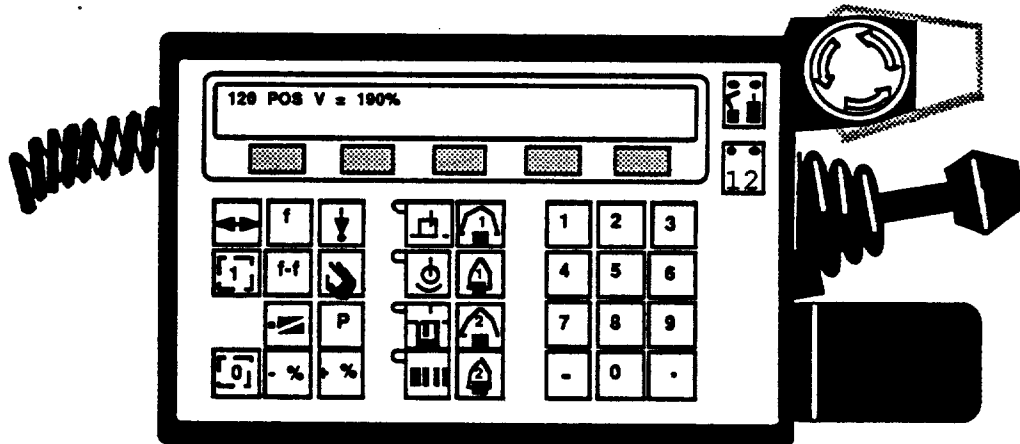
- *New programming unit with its compartment in door of control cabinet*
- *Safety unit (DSQC 136) to monitor:*
 - work hold
 - safety hold
 - programming unit safety pad
- *Revised lamp test function*
- *'Hold-to-run control' function*

These functions are described below.

2.1.1 Programming unit

In order to introduce two-circuit monitoring of the safety pad of the programming unit a new programming unit has been introduced in the S2 system. The new unit looks the same as the programming unit used in the S3 system, but is not identical. When connected to wrong system, the unit does not work, but does not suffer damage.

See illustration below.



If no programming unit is connected to the robot system, a dummy plug must be fitted to the before the robot can be operated.

2.1.2 Safety unit

Customer connections for the working stop and safety stop functions are introduced in the S2 system. These are located on safety unit DSQC 136 at position F12 (left-hand side wall of cabinet).

The functions are intended to cover the working range of a robot with peripherals. Contacts connected in series in the operating loop can be used to control the power supply to all machines and equipment in the working area. Any of the contacts cuts off loop, and:

- puts the robot system in the STANDBY mode with no electrical supply to the robot motors.
- cuts off the electrical supply to the motors of the peripheral equipment.

DSQC 136 is supplied internally from the robot system and has connections for the following signal functions:

- **Work hold**
Open loop gives STANDBY. The safety pad of the programming unit works as a holding device. When the safety pad is pressed, this gives RUN temporarily, but when the pad is released the returns to STANDBY.
- **Safety hold**
Open loop gives STANDBY. The safety pad of the programming unit cannot give RUN.
- **Connection to control peripherals**
The connection is floating and has one make and one break contact.
- **Remote control of RUN**
Switching of the robot system from STANDBY to RUN can be initiated by means of an external signal.

Work hold and safety hold are used to increase personal safety in normal operation. An example is when work is being done on the robot system within the risk area, and when it is not desirable to initiate an emergency stop.

Permanent resetting to RUN is made by pushing the RUN pushbutton on the control panel of the control cabinet or from a centrally located control panel. The control panel of the robot system must therefore always be located outside the risk area of the robot. The sections below deal with the above functions in detail.

2.1.2.1
Work hold

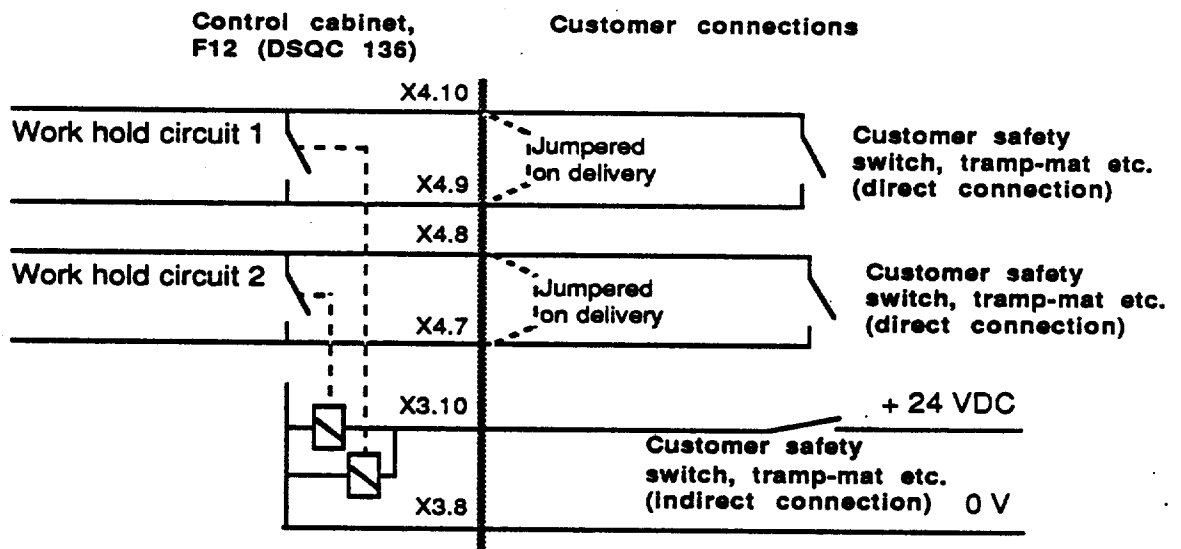
Peripheral equipment can be connected to the internal operating loop of the robot system to initiate work hold in the robot system. When the connection is open, the RUN contactor of the robot system drops out and the electrical supply to the motors is disconnected. Connection can be direct or indirect via a relay (giving DC isolation).

In the case of direct connection, the contact must be duplicated to ensure that both connections in the system (X4.7-8 and X4.9-10) are operated.

In the case of indirect connection, the input is connected in series with the customer's loop.

See diagram below.

Work hold



Technical data

Supply voltage, direct circuit	24 V DC from control cabinet
Supply voltage, indirect circuit	24 V DC external supply
Max permitted resistance in connected direct working stop loop	50 ohm
Consumption, coil in indirect circuit	15 mA

Connection table

Loop 1, direct circuit	F12.X4.9-10
Loop 2, direct circuit	F12.X4.8-7
Loops 1 and 2, indirect circuit	F12.X3.8-10

The connections above are made directly at the plug that is fitted in the relevant connector on delivery. Remove the strap and connect the cable.

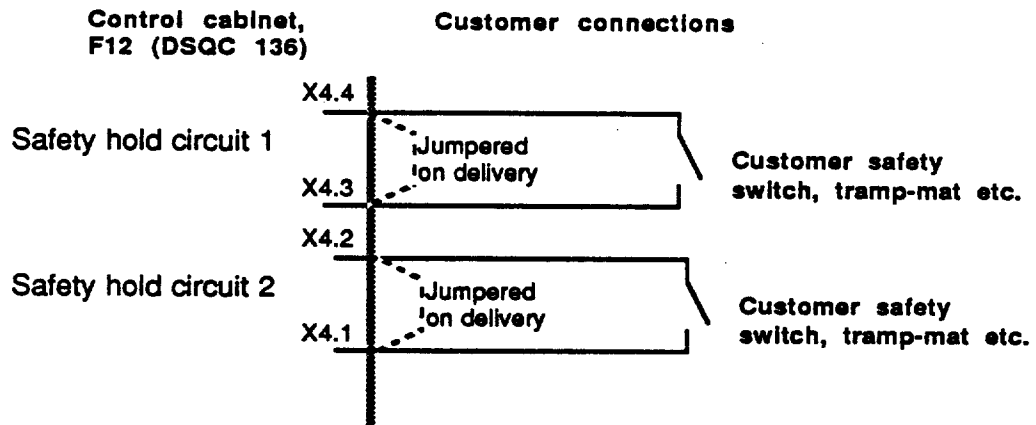
2.1.2.2
Safety hold

Peripheral equipment can be connected to the internal operating loop, where it can initiate safety stops in the robot system. When the contact is open, the RUN contactor of the robot system drops out and the electrical supply to the motors is disconnected.

Both connections in the system (X4.1-2 and X4. 3-4) must be operated.

See diagram below.

Safety hold



Technical data

Supply voltage, direct circuit	24 V DC from control cabinet
Max permitted resistance in connected direct working stop loop	50 ohm

Connection table

Loop 1	F12.X4.3-4
Loop 2	F12.X4.1-2

The connections above are made directly at the plug that is fitted in the relevant connector on delivery. Remove the strap and connect the cable.

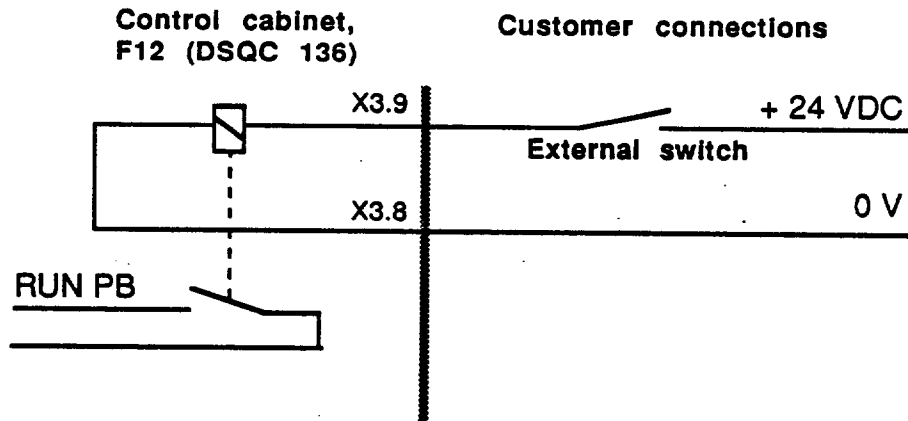
2.1.2.4

Remote control if RUN

With an external signal connected to unit DSQC 136, the robot system can be operated from STANDBY mode to RUN mode.

See diagram below.

Remote controlled RUN



Technical data

External power supply	24 V DC
Current, relay coil	10 mA

Connection table

External contact	F12.X3.8-9
------------------	------------

The connections above are made directly at the plug that is fitted in the relevant connector on delivery.

2.1.2.5

Test run with dead man's handle

When a connected programming unit is removed from its compartment (or on any other type of work hold), the robot can only be run if the safety plate on the programming unit is held down. The speed of the robot TCP is now normally reduced to 250 mm/s (or max 25% of max. speed). In systems equipped with unit DSQC 136, there is a keyswitch marked 100% in the programming unit holder. If this switch is set to 'On', the speed reduction is cancelled so that robot programs can be test run at full speed even though the programming unit is removed from its compartment.

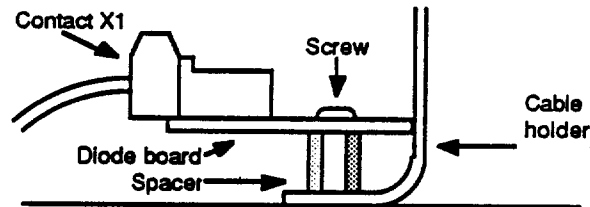
2.1.3

Revised lamp test function

In the new version of the control cabinet, the lamp test function has been redesigned. During the lamp test, the lamps are fed through a new diode board (DSQC137) mounted beside the control panel.

Internally mounted control panel

The diode board is mounted on the strip above the rear of the control panel. See diagram below.



Externally mounted control panel

Attach the diode board beside the control panel in such a way that it is prevented from rotating around the attachment screw. Plug connector X1 into the connector on the diode board.

To test the function:

1. Set the system to STANDBY.
2. Remove the programming unit from its compartment. Press the LAMP TEST pushbutton and check that
 - all lamps on the control panel light up,
 - the indicator diode for digital input 16 on board D14.153 does not light up.
3. Check that the indicator diode for digital input 16 on board D14.153 lights up when the programming unit is put back in the compartment and goes out when the unit is taken out of the compartment.

2.1.4
Parameters

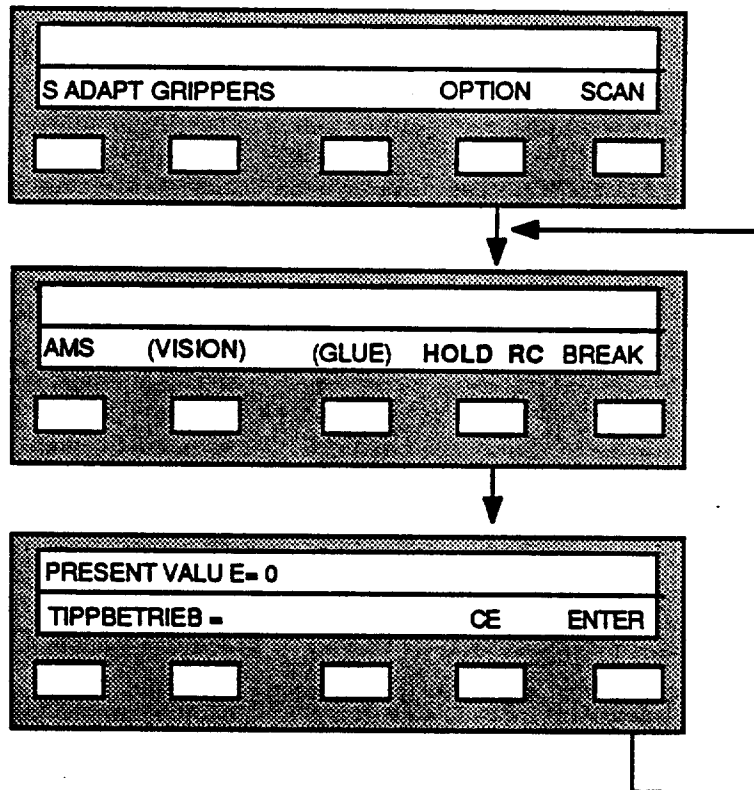
'Hold-to-run' control

Active parameter (=1) means that, when the programming unit is removed from its compartment, the function button controlling the program running (PROG ST, INST ST or EXEC BW) must be held down for execution of the program. When the button is released, the system stops with the robot in RUN mode, and when the button is pressed down again, program execution continues. The function does not affect the dead man's handle.

The function is described in detail in the programming manual.

The HOLD RC parameter can be set to 1 or 0. See diagram below.

Manual + Scan + Param + Change + 3x Scan



2.2

Mechanical robot IRB 6

The functions below are included in the adjustable stops kit:

- mechanical, removable end stops, axes 1-3
- limit switch, axis 1

2.2.1

Installing working range limitation, axis 1

Since limitation of the working range is defined as the need arises, and since it must be possible to change it easily, it is left to the customer to decide where the stop lugs are to be fitted. Installation instructions are given below.

See also the drawing (6897 003-UF) and the erection manual (6397 003-TX) that come with the add-on kit.

1. Fit the limitation unit to the robot base.
2. Fit the stop lugs to the robot body.
3. Run the cabling of the switch in through the hole in the contact plate on the robot base. Remove the strap between R1.X1.2B and R1.X1.3A. Connect the switch as follows.

<i>Connect</i>	<i>To</i>
R1.X1.2B	R1.X37.11
R1.X1.3A	R1.X37.12

4. Installation is now complete and the stop must now be tested to check whether it operates.
5. Make sure that the robot system is **not** in RUN mode.
6. For manual adjustment of robot position the brakes of the robot must **not** be on. Use the pushbutton on the robot control cabinet to release the brakes.

Manually adjust the distance from the point where the limit switch is activated to the point where the mechanical stop is engaged. This distance should be as great as possible without the limit switch bottoming.

Note: Check and if necessary adjust both stop lugs.

7. Set the robot system to RUN mode.
8. Run axis 1 of the robot up against the stops and check that the emergency stop is activated.

On certain earlier robots there is no predrilled hole in cover 5237 397-26 (Pr 18.6 mm diameter) for the cable bushing to electromechanical stops. When fitting the add-on kit to a robot that does not have this hole, a 17.4 mm hole can be drilled and tapped (Pr 18.6 mm).

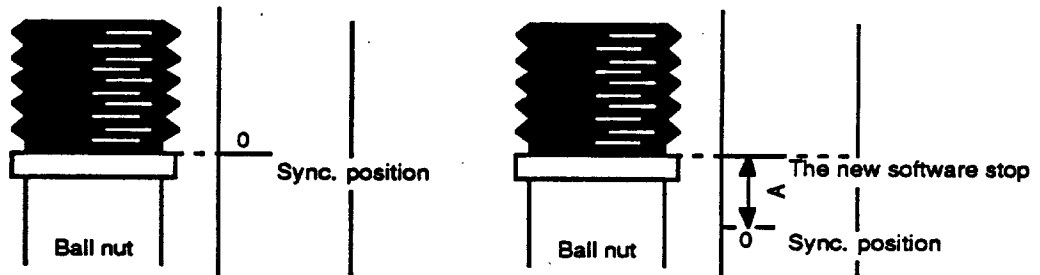
2.2.2

Installing working range limitation, axes 2-3

Since limitation of the working range is defined as the need arises, and since it must be possible to change it easily, it is left to the customer to decide where the stop lugs are to be fitted. Installation instructions are given below.

See also the drawing (6397 003-UF) and the erection manual (6397 003-TX) that come with the add-on kit.

1. Set the robot to the synchronization position.
2. Mark the sync. position according to the figure below.



Axis in sync. position

3. Determine the new working range. When the working range of an axis is limited, this also affects the working range of the other axes. To get an overall view of how great a limitation will be obtained, it is advised to test-fit the stops (using e.g. adhesive tape)
4. Measure the distance A. Use the table as a help
NB
 The stops may yield up to 8 mm upon impact.

	Degrees from the sync. position						
	5°	10°	15°	20°	25°	30°	35°
A2-	12	24	36	45	60	77	83
A2+	12	24	36	45	60	64	66
A3-	12	24	36	45	-	-	-
A3+	12	24	36	45	60	71	117

The table above is only valid when running the axes one by one with the other axes in their sync. position. However, the table may give some guidance even when the other axes are in any other position.

5. Look under the menu PARAM in the control program by means of the programming unit. Make the following selections: CHANGE, AXIS, ROBOT and WORK A.
NB
 If the robot system is equipped with the function COMPUTER LINK, the robot system must be set to the LOCAL mode.
6. Enter the new value for the software stop. ACTIVATE the value.
7. Fit the lug.
8. Check that the ballscrew unit is fitted with a locating pin between the bottom two fixing screws. If not, one is to be fitted.

2.3

Mechanical robot IRB 60

The adjustable stop kit includes the following functions:

- emergency brakes on all axes (with dead man's handle)
- new limit switches on axes 1-3.

Parts that are not fitted when the robot system is delivered must be fitted in accordance with the instructions that accompany the kit.

2.3.1

Installing working range limitation, axes 2-3

Remove the old magnetic switches and fit the new mechanical switches. The switches are fitted to the U-sections of the ball screws by means of a pair of holders. The existing screen angle piece is replaced with a breaking rail, which is mounted in the same position.

Connect the mechanical switch to the same cable as the magnetic switches were connected to.

2.4

Mechanical robot IRB 90

The functions listed below are included in the delivery as standard robot system features:

- End position switch, axis 1
- Mechanical, movable stop, axis 1
- Inductive limit switches, axes 2-3

Add-on kits are also offered:

- Extra mechanical, movable stop, axis 1 (YB 125 001-CC, 90.350)
- Mechanical, movable limit switches, axes 2-3 (YB 125 001-EC)
- Time limited brake, axis 1 (6397 100-PM)

Parts that are not fitted when the robot system is delivered must be fitted in accordance with section 2.4.1.

2.4.1

Installing working range limitation, axes 1-3

- Extra mechanical stop, axis 1 is fitted acc. to the IRB 90 Installation Manual, section 4.1.2.
- Time limited brake, axis 1 is fitted acc. to the IRB 90 Installation Manual, section 7.10.
- Mechanical limit switches, axes 2-3 are fitted acc. to the instructions that come with the add-on kit.

2.5 Mechanical robot IRB 1000

The adjustable stop kit includes the following functions:

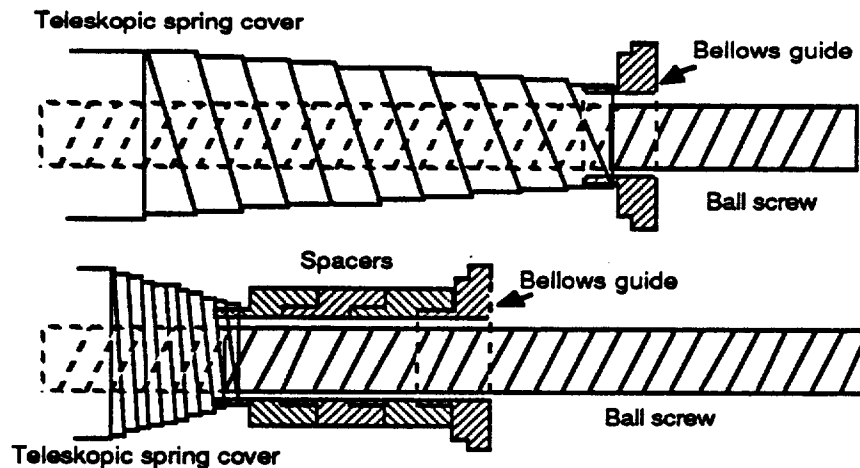
- spacers that restrict the working range by 10° steps, axes 1-2
- spacers that restrict the working range by 50 mm steps, axis 3

2.5.1

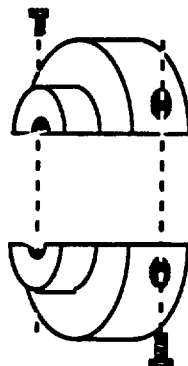
Installing working range limitation, axes 1 and 2

- Compress the telescopic spring guard of the relevant axis axially and hold it together with a cable tie.
- Fit the mechanical stop halves that are to be added.
- Screw the halves together
- Remove the cable tie from the telescopic spring guard
- Change the software limitation of the working range according to the fitted mechanical limitation of the working range.
- Go into the PARAM function (MANUAL menu) of the control system using the programming unit and select AXES. Reduce the software limit of the working range of axis 3 by the same number of millimetres as the length of the spacers fitted. (Check that the software limitation is made on the same side as the stops have been fitted.)

See also the diagram below, which shows how the spacers, once fitted, compress the telescopic spring cover.



The figure below shows how the spacers are built up of halves.



2.5.2 Installing working range limitation, axis 3

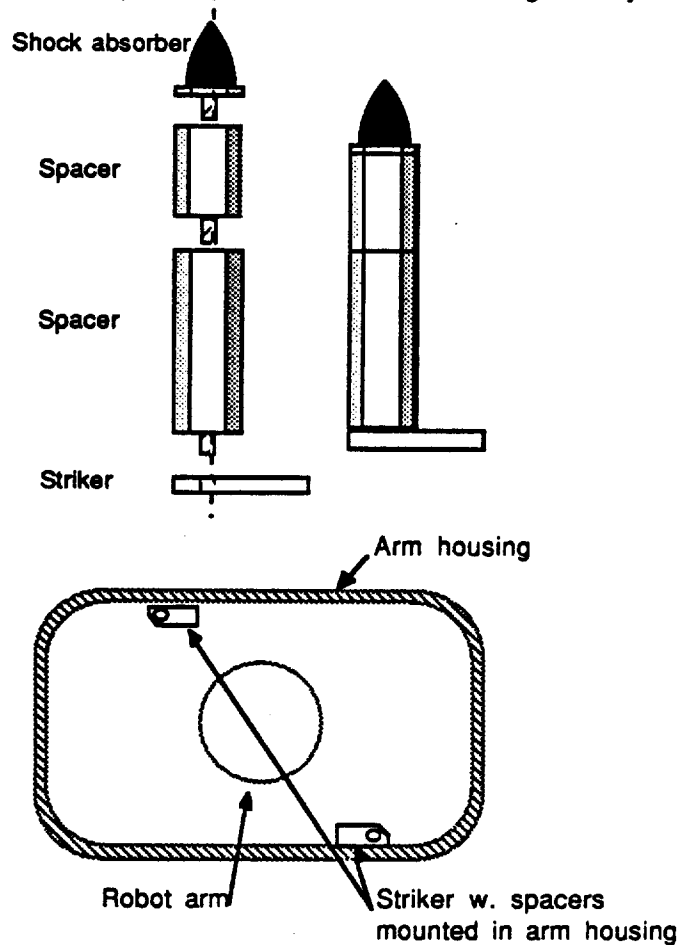
Numbers in < > refer to the FOLDOUTs in the standard service manual.

- Run axis 3 to its uppermost position.
- Unscrew the four screw <12.1.23> with washers <12.1.31> retaining end plate <12.1.26>.
- Remove the two stops <12.3.25> from the arm housing.
- Remove the shock absorbers <12.3.26> from the stops.
- Fit spacers as required.
Note: The lengths of spacers on both sides of the arm housing must be equal.
- Refit shock absorbers <12.3.26>.
- Refit stops <12.3.25> in arm housing.
- Refit end plate <12.2.26> with screws <12.1.32> and washers <12.1.31>.
- Go into the PARAM function (MANUAL menu) of the control system using the programming unit and select AXES. Reduce the software limit of the working range of axis 3 by the same number of millimetres as the length of the spacers fitted.

See also the diagram below, which shows the arrangement of the spacers to limit the working range of axis 3 and correct fitting of the strikers mounted in the arm housing.

Note:

These strikers must be positioned with the chamfers facing the way shown in the diagram.



3 SERVICE

3.1 Control cabinet

3.1.1 Maintenance

The routines for maintaining the control system is not affected by the modifications.

3.1.2 Unit description

See the installation part of the manual.

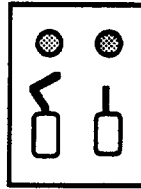
3.1.3 Fault finding

Diode board:

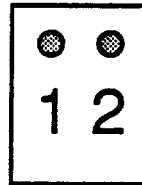
If the control panel lamps gives abnormal indications, the diode board DSQC 137 may be damaged. Check this by disconnecting the contact X1 from the diode board. If the correct indications return, the board must be replaced.

Programming unit:

The programming unit is equipped with built-in tests which are described in the system service manual. These tests are started by switching off the system, and then switching it back on while pressing the button:



Switching to the following test mode is made by pressing the button:



Safety unit:

The safety unit is equipped with two groups of relays with three relays each. One group monitors the work hold two-channel circuits, which can be broken by:

- the key switch 100%
- removing the programming unit from its compartment
- peripheral equipment (X4.7-8 and 9-10)

The other relay group monitors the two-channel circuits of the programming unit safety pad. These circuits can be broken by:

- safety hold from the peripheral equipment (X4.1-2 and 3-4)
- work hold if the safety pad is not depressed

Function control:

1. Reset any stops from the peripheral equipment (X4.1-2, 3-4, 7-8, 9-10)
2. Set the key switch 100% to the OFF position.
The programming unit must be kept in its compartment.
Switch the system to the RUN mode.
- 2.1 Keep the safety pad depressed while removing the programming unit from its compartment. The upper relay group will indicate that the unit is being removed. Note the corresponding indication on INP 16 of the first digital I/O board.
- 2.2 The safety pad will switch the system between the RUN and STANDBY modes by means of the lower relay group.
- 2.3 Keep the safety pad depressed while replacing the programming unit in its compartment.
- 3.1 Switch the key switch 100% to the ON position.
The system will go to the RUN mode.
Both relay groups will switch to OFF position.
INP 16 will indicate OFF regardless of whether the programming unit is located in its compartment or not.
- 3.2 The safety pad will switch the system between the RUN and STANDBY modes by means of the lower relay group.

In case of malfunction, check the following:

- 2.1 The micro switches in the programming unit compartment
- 2.1, 3.1 The key switch 100%
The safety unit DSQC 136
- 2.2, 3.2 The micro switches under the programming unit safety pad
The safety unit DSQC136

3.1.4 Repairs

If any unit is malfunctioning, the complete unit is to be replaced (see the spare part list below)

3.1.5 Adjustments

The routines for adjusting the system is not affected by the modifications.

3.1.6

Spare parts

The spare parts list below lists only those parts that differ from the earlier variants of the robot system. The spare part lists for the earlier systems appears in the standard documentation supplied with the robot.

Item	Quantity	Description	Article number
F16.100	1	Diode unit, lamp test	YB 161 102-CL
F18	1	Programming unit compartment For systems w. safety unit	YB 161 101-UY
	1	For systems w/o safety unit	YB 161 101-VT
.1,2	2	Micro switch	5397 038-1
.1,2	2	Sealing	2158 0132-158
.3	1	Key switch	
	1	Operating device	SK 615 203-XF
	1	Contact terminal	SK 615 010-C
	1	Contact terminal	SK 615 001-F
X	1	Dummy plug	YB 560 101-CZ
	1	Programming unit, 10 m cable	YB 161 100-KR
	1	Programming unit, 15 m cable	YB 161 100-KT
D14.153	1	Connection unit, version w/o diode V12	YB 161 101-CM
D14.100.1	1	Diode bridge	4858 267-2

3.1.7

Circuit diagram

The electrical circuit diagram with the functions described above appears in the February 1988 edition of the system circuit diagram.

3.2 Mechanical robot IRB 6

3.2.1 Maintenance

The maintenance routines for the robot are not affected by the presence of the mechanical stops.

3.2.2 Unit description

Mechanical end stops can be fitted as a hardware limitation on the working ranges of axes 1-3.

For axis 1, the stop is in the form of an electrical switch that detects the position of movable metal lugs mounted at the bottom of the robot body and a mechanical end stop. If the switch is activated, the robot system goes to emergency stop.

For axes 2 and 3 the stops are in the form of movable metal blocks mounted on the ball screw bar of the relevant ball screw unit. The software limitations of the axis concerned must be moved to the required position. The metal blocks must be fitted outside the robot working range. When the robot runs into these metal blocks, they are deformed in order to damp the impact force and must therefore be replaced after every impact.

3.2.3 Fault finding

The fault-finding routines of the robot are not affected by the presence of the mechanical stops.

3.2.4 Repairs

If any unit is malfunctioning, the complete unit is to be replaced (see the spare part list below).

3.2.5 Adjustments

When altering the work range limitation:

1. Remove the mechanical end stops.
2. Enter the software limitation according to Chapter 10 in the robot Installation Manual.
3. Refit the mechanical stops at their new positions.

3.2.6 Spare parts

The spare parts list below lists only those parts that differ from the earlier variants of the robot system. The spare part lists for the earlier systems appears in the standard documentation supplied with the robot.

Item	Quantity	Description	Article number
	1	Stop lug, axis 1	2171 205-80
	1	Stop lug, axes 2 and 3	2173 195-142
	1	Limit switch	5397 044-A
	1	Reducer	2686 015-9
	1	Spiral hose, steel	1368 1080-2

3.2.7
Circuit diagram

The electrical circuit diagram of the robot is not affected by the modifications described in this document.

3.3 Mechanical robot IRB 60

3.3.1 Maintenance

The maintenance routines of the mechanical robot are not affected by the fact that the robot is fitted limit switches with forced braking.

3.3.2 Unit description

The magnetic limit switches on axes 2 and 3 are replaced with mechanical limit switches to increase personal safety.

The working range limitation of axis 1 takes the form of two stop blocks mounted on the robot body. These limit the working range of the robot to the distance between the stops.

3.3.3 Fault finding

The fault-finding routines of the robot are not affected by the presence of the mechanical stops.

3.3.4 Repairs

If a limit switch malfunctions it must be replaced with the new unit. See the spare parts list, Section 3.3.6. Install the new switch as described in Section 2.3.1.

3.3.5 Adjustments

When changing the limit of the working range:

1. Specify the software working range limitation in accordance with Chapter 10 of the installation manual of the robot.
2. Remove the mechanical limit switches.
3. Fit the limit switches in their new positions on the contact bar.

3.3.6 Spare parts

The spare parts list below lists only those parts that differ from the earlier variants of the robot system. The spare part lists for the earlier systems appears in the standard documentation supplied with the robot.

Item	Quantity	Description	Article number
	4	Switches with cable	5397 034-6
	4	Holders for switches	
	2	Bar for cable	
	2	Stop block	2167 594-3
	2	Screw, M10 x 40	212 2519-499
	2	Screw, M10 x 20	212 2519-491

3.3.7 Circuit diagram

The electrical circuit diagram of the robot is not affected by the modifications described in this document.

3.4 Mechanical robot IRB 90

3.4.1 Maintenance

The maintenance routines of the mechanical robot are not affected by the fact that the robot is fitted limit switches with forced braking.

3.4.2 Unit description

On axes 2 and 3, the inductive limit switches are supplemented by working range limiting, mechanical limit switches to increase the personnel safety.

3.4.3 Fault finding

The fault-finding routines of the robot are not affected by the presence of the mechanical stops.

3.4.4 Repairs

Any malfunctioning unit must be replaced by a new unit. See the spare part list 3.4.6.

3.4.5 Adjustments

When changing the working range limitations for axes 2 and 3, new holes are to be drilled in the ball screw bar to enable fitting of the limit switches.

3.4.6 Spare parts

The spare parts list below lists only those parts that differ from the earlier variants of the robot system. The spare part lists for the earlier systems appears in the standard documentation supplied with the robot.

Item	Quantity	Description	Article number
	4	Switch with cables	5397 034-6

3.4.7 Circuit diagram

The connection of the limit switches of axes 2 and 3 is shown on a new sheet (7.8) in the March 1988 edition of the circuit diagram 6397 100-PR.

3.5 Mechanical robot IRB 1000

3.5.1 Maintenance

The maintenance routines of the mechanical robot are not affected by the fact that the robot is fitted with adjustable mechanical stops. However, if the stops are removed or modified, the relevant ball screw or rack/guides must undergo maintenance as described in the maintenance instructions in the service manual.

3.5.2 Unit description

The range of motion for axes 1, 2 and 3 can be limited in hardware by fitting spacers on the relevant axes. Axes 1 and 2 can be limited by 10° steps and axis 3 can be limited in 50 mm steps, 200 mm maximum.

3.5.3 Fault finding

The fault-finding routines of the robot are not affected by the presence of the mechanical stops.

3.5.4 Repairs

3.5.4.1 Dismantling, ball screw unit

Before parts are removed from the ball screw unit the mechanical stops must always be removed in accordance with the instructions below:

- Compress the telescopic spring cover axially and hold it together with a cable tie.
- Unscrew the screws holding together the halves of the mechanical stops.
- Remove the halves of the mechanical stops.
- Repair work on the ball screw unit from this point onwards is described in the service manual and does not differ from a robot equipped with mechanical stops.

3.5.4.2 Assembly, ball screw unit

- Before removing the cable tie from the telescopic spring cover after repair, the mechanical stops must be refitted.

3.5.4.3 Dismantling/assembly of complete arm

Dismantling/assembly of complete arm is not influenced by the mechanical stops for axis 3. Follow the instructions in the service manual.

3.5.5 Adjustments

3.5.5.1

Changing the working range limitation for axes 1 and 2

- Compress the telescopic spring guard axially and hold it together with a cable tie.
- Install or remove halves of the affected mechanical stops. The halves of the spacers are held together with screws.
- *Only when removing spacers:* carry out on the ball screw the maintenance operations described in the service manual.
- Remove the cable tie from the telescopic spring guard.
- Change the software working range limitation to comply with the change in the mechanical working range limitation.
- Using the programming unit, go into the PARAM (MANUAL menu) function in the control system and choose AXES. Reduce the working range for axes 1 and 2 by 10° per stop fitted. (Check that the software limitation is done on the same side as the side where the stops are fitted.

3.5.5.2

Changing the working range limitation of axis 3

Numbers in < > refer to the FOLDOUTs in the standard service manual.

- Run axis 3 to its uppermost position.
- Unscrew the four screw <12.1.23> with washers <12.1.31> retaining end plate <12.1.26>.
- Remove the two stops <12.3.25> from the arm housing.
- Remove the shock absorbers <12.3.26> from the stops.
- Fit/remove spacers as required.
- Refit shock absorbers <12.3.26>.
- Refit stops <12.3.25> in arm housing.
- Refit end plate <12.2.26> with screws <12.1.32> and washers <12.1.31>.
- On removal of spacers, carry out maintenance of rack <12.10.52> and guides <12.3.22> as described in the service manual.
- Change the software limitation of the working range.
- Go into the PARAM function (MANUAL menu) of the control system using the programming unit and select AXES. Reduce the software limit of the working range of axis 3 by the same number of millimetres as the length of the spacers fitted.

3.5.6

Spare parts

The spare parts list below lists only those parts that differ from the earlier variants of the robot system. The spare part list for the earlier systems appears in the standard documentation supplied with the robot.

Item	Quantity	Description	Article number
1	4	Spacers for axis 3, 50 mm	2125 0450-1
2	2	Spacers for axis 3, 100 mm	2125 0450-2
3	6	Spacers for axes 1 and 2, 10°	2151 0311-1

3.5.7

Circuit diagram

The electrical circuit diagram of the robot is not affected by the modifications described in this document.