

# Guides, Brakes and Valves for Modular Linear Drive Systems OSP

## Appendix to the Operating Instructions

All personnel who have anything to do with the OSP fitted with guides, brakes or valves must read and understand this Appendix to the Operating Instructions!

This Appendix to the Operating Instructions is to be used only in conjunction with the Operating Instructions "OSP-P Pneumatic Linear Drive", "OSP-E Belt-Driven Linear Actor" or "OSP-E Screw-Driven Linear Actor"

Keep for future use in conjunction with  
the Operating Instructions  
of the Linear Drive!



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# Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

## Contents

	Page
Introduction, User's Responsibilities, Copyright .....	2
Assembly Instructions for Slideline (SL16 – SL25 – SL32 – SL40 – SL50 – SL63 – SL80) .....	3
Assembly Instructions for Slideline with brake (SL25 – SL32 – SL40 – SL50) .....	5
Assembly Instructions for Powerslide (PS16/25 - PS25/25 - PS25/35 - PS25/44 - PS32/35 - PS32/44 - PS40/44 - PS40/60 - PS50/60 - PS5076) .....	7
Assembly Instructions for Guideline (GDL25 - GDL32 – GDL40 - GDL50) .....	9
Assembly Instructions for Proline (PL16 – PL25 – PL32 – PL40 – PL50) .....	11
Assembly Instructions for Proline with brake (PL25 – PL32 – PL40 – PL50) .....	12
Assembly Instructions for Active Brake (AB25 - AB32 - AB40 - AB50 - AB63 - AB80).....	15
Assembly Instructions for Multi-Brake Slideline (MB-SL25 – MB-SL32 – MB-SL40 – MB-SL50 – MB-SL63 – MB-SL80) .....	17
Assembly Instructions for Multi-Brake Proline (MB-PL16 – MB-PL25 – MB-PL32 – MB-PL40 – MB-PL50).....	20
Assembly Instructions for Integrated 3/2 Valve VOE (OSP-P25 – OSP-P32 - OSP-P40 – OSP-P50 .....	23

## Introduction

This Appendix to the Operating Instructions is to be used only in conjunction with the Operating Instructions “OSP-P Pneumatic Linear Drive” or “OSP-E Belt-Driven Linear Actor” or “OSP-E Screw-Driven Linear Actor”. Please observe the Safety Notes carefully. For the repair of the basic cylinder unit please see also the Operating Instructions “OSP-P Pneumatic Linear Drive or “OSP-E Belt-Driven Linear Actor” or “OSP-E Screw-Driven Linear Actor”

The service life of the OSP cylinder and of its guides and brakes has been optimized by advanced material pairing and design which has been thought through to the smallest detail. However, excessive loads and difficult environmental conditions can reduce service life, therefore occasional careful maintenance work is recommended.

For technical data, permissible loads and calculation of service life of guides and brakes please see the Catalogue:

“ORIGA SYSTEM PLUS - Modular Pneumatic Linear Drive Systems” or  
“ORIGA SYSTEM PLUS - Modular Electric Linear Drive Systems”

## User's Responsibilities

**It is assumed that the following are the responsibility of the user:**

- **compliance with EN89/655 and its national version,**
- **compliance with current national work safety regulations,**
- **approved use of the OSP with its guides and brakes.**

## Copyright

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## Assembly Instructions for Slideline (SL16 - SL25 - SL32 - SL40 - SL50 - SL63 - SL80)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

### Dismantling of the Guide Carriage

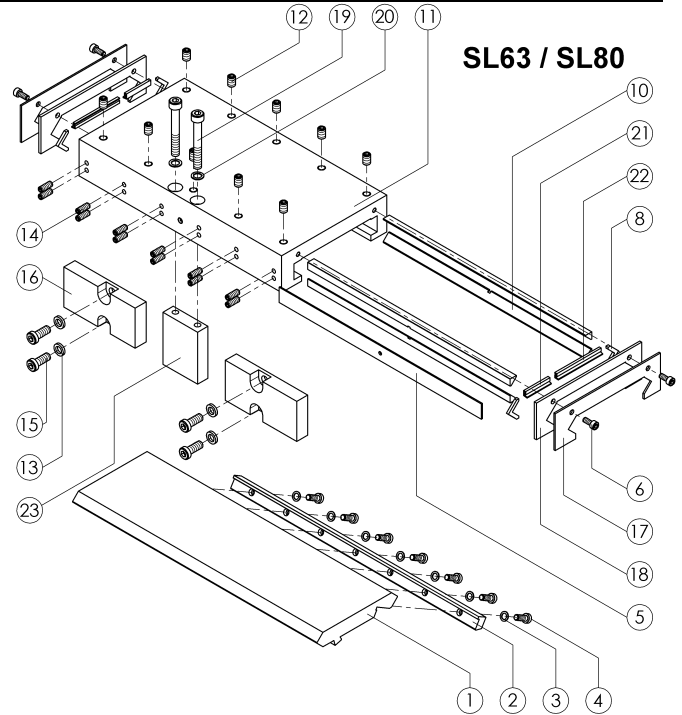
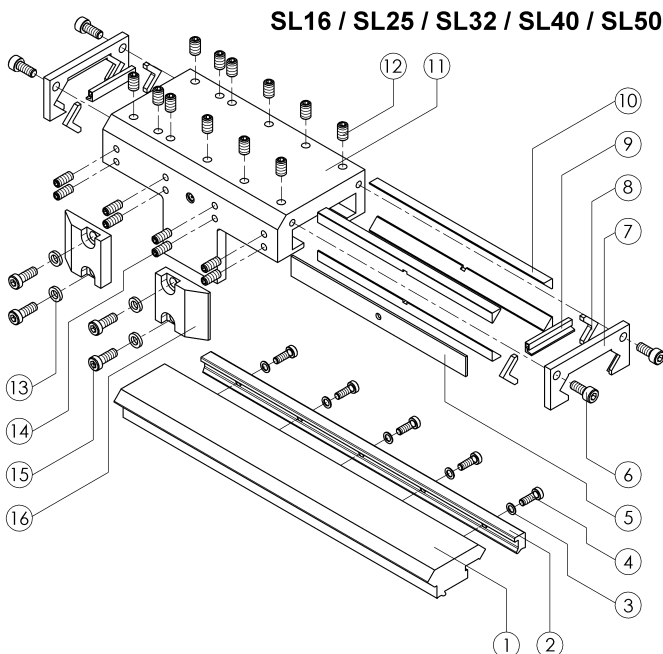
1. Depressurize the cylinder and switch off all electrical power supply.
2. Remove all parts mounted externally on the guide carriage (11).
3. Unscrew one drive block (16) from piston of OSP, so that the guide carriage can be moved.
4. For the OSP-P40, OSP-P50, OSP-E50, OSP-P63 and OSP-P80 only: unscrew one end cap from the cylinder.
5. Loosen screws (6) on wiper cover (17).
6. Slide the complete guide carriage off the guide rail.
7. Unscrew wiper cover (7) (or 17+18 for SL63 and SL80) from both ends of the guide carriage (11).
8. Inspect the parts – replace damaged or worn parts such as: wiper (9), slide profile (10) and felt (8) (service kit).

### Dismantling and Reassembly of the Guide Rail

1. To dismantle the guide rail (1) remove the screws (4) with their washers (3). Remove the guide rail (1) and clamping rail (2) from the cylinder profile.
2. Clean all the parts.
3. Centre the guide rail on the cylinder profile.
4. Fit the clamping rail (2) to the guide rail (1) and screw in the screws (4) with their washers (3) (use the specified torque).

### Reassembly of the Guide Carriage

1. Clean all the parts.
2. Grease the felts (8) with guide grease (Order No. 10550).
3. Lay the wipers (9) or (21+22) and felts (8) in the wiper covers. The sealing lip of the wiper must be outwards (see drawing).
4. Back off the adjusting screws (14) in the guide carriage.
5. Lay in the support strip (5) on the same side as the adjusting screws.
6. Place 2 slide profiles (10) per side in the guide carriage. The edges of the slide profiles in which grooves are cut (to allow grease from the grease nipples to get to the guide rail) must touch each other.
7. Screw on the two wiper covers (7) or (17+18) loosely with the screws (6).



### Remounting the Reassembled Guide Carriage on the Guide Rail

1. Push the complete guide carriage assembly carefully onto the guide rail with the side with the adjusting screws towards the piston.
2. If necessary move the felt wiper carefully into its correct position with a screwdriver.

### Adjustment of Play and Final Assembly

1. Tighten the self-locking adjusting screws (14), individually from the middle working outwards, with the specified torque. If non-self-locking screws are used (14), use a locking medium (Loctite low-strength is recommended) and tighten the screws from the middle working outwards until the guide carriage can no longer be moved by hand.
2. Tap the sides of the guide carriage (11) gently with a rubber hammer until the slide profiles (10) have settled into position and then tighten all the adjusting screws (14) again (see above).
3. Loosen all the adjusting screws (14) about 1/4 to 1/2 turn individually from the middle working outwards. When correctly adjusted the guide carriage should be easily movable by hand but with no play.
4. Tighten the screws (6) in the wiper cover (7) or (17+18) with the specified torque.
5. Position the guide carriage centrally over the cylinder piston and secure the drive blocks (16) with the washers (13) and screws (15).

**Note:** The drive blocks (16) must be fitted against the guide carriage with no play (11) !!! Note the high torque required !!!

6. Refit the end cap of the OSP if applicable.

## Appendix to Operating Instructions for Pneumatic Linear Drive OSP-P

### Lubrication

All unused threaded holes in the guide carriage (11) must be plugged with set screws (12) to prevent escape of lubricant. The grease nipples on both sides of the guide

carriage (11) should be filled with guide grease (Order No. 10550) until a thin film of grease can be seen on the guide rail when the guide carriage is moved by hand.

### Torques for Screws

Item	SL16	SL25	SL32	SL40	SL50	SL63	SL80	
4	3 Nm	3 Nm	3 Nm	10 Nm	10 Nm	10 Nm	10 Nm	
6	3 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	
14	1.2 Nm	3.5 – 4 Nm	3.5 – 4 Nm	3.5 – 4 Nm	3.5 – 4 Nm	3.5 – 4 Nm	3.5 – 4 Nm	<b>(only self-locking screws)</b>
15	4.5 Nm	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm	35 Nm	40 Nm	
19	---	---	---	---	---	20 Nm	20 Nm	

### Modules for OSP

		Order No.						
	Description	SL16	SL25	SL32	SL40	SL50	SL63	SL80
	Slideline plain bearing guide	20341	20342	20196	20343	20195	20853	21000
	Slideline plain bearing guide, stainless	20344	20345	20346	20347	20348	20854	21001

### Replacement Parts

Item	Description	SL16	SL25	SL32	SL40	SL50	SL63	SL80
1	Guide rail	10912	10913	10914	10915	10916	10939	10941
2	Clamping rail	10917	10918	10919	10920	10921	10940	10942
3	Washer	---	3954	3954	3789	3789	3789	3789
3	Washer, stainless	---	4395	4395	3792	3792	3792	3792
4	Screw	10680	10810	10810	10610	10610	10610	10610
4	Screw, stainless	10681	10811	10811	10683	10683	10683	10683
5	Support strip	10552	10571	10590	10570	10798	11547	11547
6	Screw	3278	2742	2742	1062	2742	2742	2742
6	Screw, stainless	10167	3716	3716	1063	3716	3716	3716
7	Wiper cover	10183	1661	1681	10487	10504	---	---
8	Felt	3329	1619	1665	10665	10665	11543	11543
9	Wiper	3327	1663	1683	10471	10472	---	---
10	Slide profile	10553	10177	10591	10569	10797	11546	11546
11	Guide carriage	11469	11470	11471	11472	11473	11739	11739
11	Guide carriage, stainless	11469	11478	11479	11480	11481	11739	11739
12	Set screw	0429	1116	1116	1116	1116	1117	1117
12	Set screw, stainless	0429	1093	1093	1093	1093	1038	1038
13	Washer	11607	11608	11609	11609	11609	11610	11830
13	Washer, stainless	11607	11611	11612	11612	11612	11613	11831
14	Set screw	11916	10281	10281	2262	11918	11550	11550
14	Set screw, stainless	11917	10682	10682	2255	11919	11550	11550
15	Screw	11614	11615	11616	11616	11616	11617	11256
15	Screw, stainless	11614	11615	11616	11616	11616	11617	11257
16	Drive block	10642	10643	10644	10644	10645	11541	11828
17	Wiper cover, outer	---	---	---	---	---	11545	11545
18	Wiper cover, inner	---	---	---	---	---	11544	11544
19	Screw	---	---	---	---	---	1251	1251
19	Screw, stainless	---	---	---	---	---	1229	1229
20	Washer	---	---	---	---	---	4374	4374
20	Washer, stainless	---	---	---	---	---	4397	4397
21	Wiper	---	---	---	---	---	1663	1663
22	Wiper	---	---	---	---	---	10471	10471
23	Carrier	---	---	---	---	---	11542	11829

### Replacement Assemblies

Item	Description	SL16	SL25	SL32	SL40	SL50	SL63	SL80
5, 6, 7, 8, 9, 10, 11, 12, 14	Guide carriage, complete	11399	11401	11404	11407	11410	---	---
	Guide carriage, complete, stainless	11400	11402	11405	11408	11411	---	---
5, 6, 8, 10, 11, 12, 14, 17, 18, 21, 22	Guide carriage, complete	---	---	---	---	---	11888	11888
	Guide carriage, complete, stainless	---	---	---	---	---	11889	11889



## Appendix to Operating Instructions for Pneumatic Linear Drive OSP-P

Item	Description	SL16	SL25	SL32	SL40	SL50	SL63	SL80
8, 9, 10	Service kit	11066	11067	11068	11069	11070	---	---
8, 10, 21, 22	(inc. guide grease, 8ml tube)	---	---	---	---	---	11094	11094

Lubrication	
Guide grease, 8 ml tube	10550
Guide grease, 0.5 kg	11606

### Assembly Instructions for Slideline with Brake (SL25 - SL32 - SL40 - SL50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

#### Dismantling of the Guide Carriage

1. Depressurize the cylinder and brake lines and switch off all electrical power supply.
2. Remove all parts mounted externally on the guide carriage (15).
3. Unscrew drive block (20) from piston of OSP-P, so that the guide carriage can be moved.
4. For the OSP-P40 and OSP-P50 only: unscrew one end cap of the cylinder.
5. Loosen the screws (10) on the wiper cover (11).
6. Slide the complete guide carriage off the guide rail.
7. Unscrew the wiper cover (11) from both ends of the guide carriage (15).
8. Inspect the parts – replace damaged or worn parts such as: wiper (13), slide profile (14) and felt (12) (service kit).

#### Dismantling of the Brake

1. Remove screws (5) and remove the plates (6) and springs (7) from the guide carriage.
2. To remove the brake piston (21), apply compressed air to its air connection and blow it out (do not use sharp tools on the piston!).  
**Danger:** hold the brake piston while blowing it out!
3. Remove screws (23) and remove the brake lining (22) from the brake piston (21) and the O-ring (8).
4. Inspect the parts – replace damaged or worn parts such as: O-ring (8) and brake lining (22).

#### Dismantling and Reassembly of the Guide Rail

1. Remove the screws (4) with their washers (3). Remove the guide rail (1) and clamping rail (2) from the cylinder profile.
2. Clean all the parts.
3. Centre the guide rail on the cylinder profile.
4. Secure the guide rail (1) and clamping rail (2) with the screws (4) and their washers (3) (use the specified torque).

#### Reassembly of the Brake

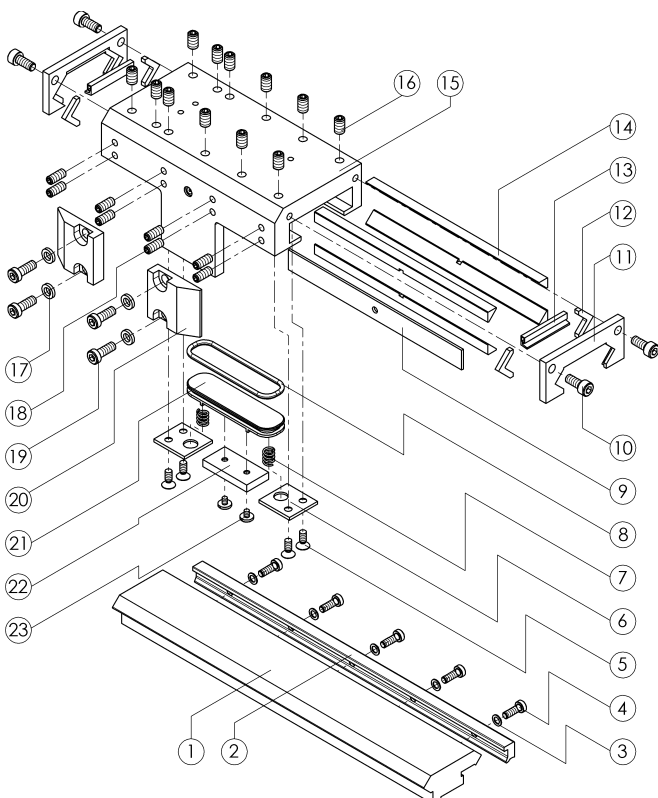
1. Clean all the parts, the inside of the brake piston chamber and the brake air connection.
2. Fit the brake lining (22) to the brake piston (21). Apply a locking medium (Loctite low-strength is recommended) to the screws (23) and tighten them.
3. Grease the walls of the brake piston chamber and the groove in the brake piston lightly with guide grease (Order No. 10550).  
**Note:** The brake lining must be grease-free.
4. Locate the O-ring (8) in the brake piston (21) and grease the O-ring lightly.
5. Fit the brake piston (21) into the guide carriage (15).
6. Fit the springs (7) and plates (6). Apply a locking medium to the screws (5) and tighten them.

#### Reassembly of the Guide Carriage

1. Clean all the parts.
2. Grease the felts (12) with guide grease (Order No. 10550).
3. Lay the wipers (13) and felts (12) in the wiper covers. The sealing lip of the wiper must be outwards (see drawing).
4. Back off the adjusting screws (18) in the guide carriage.
5. Lay in the support strip (9) on the same side as the adjusting screws.
6. Place 2 slide profiles (14) per side in the guide carriage. The edges of the slide profiles in which grooves are cut (to allow grease from the grease nipples to get to the guide rail) must touch each other.
7. Screw on the two wiper covers (11) loosely with the screws (10).

#### Remounting the Reassembled Guide Carriage on the Guide Rail

1. Push the complete guide carriage assembly carefully onto the guide rail with the side with the adjusting screws towards the piston.
2. If necessary move the felt wiper carefully into its correct position with a screwdriver.



# Appendix to Operating Instructions for Pneumatic Linear Drive OSP-P

## Adjustment of Play

1. Tighten the self-locking adjusting screws (18), individually from the middle working outwards, with the specified torque. If non-self-locking screws are used (18), use a screw locking system (Loctite low-strength is recommended) and tighten the screws from the middle working outwards until the guide carriage can no longer be moved by hand.
2. Tap the sides of the guide carriage (15) gently with a rubber hammer until the slide profiles (14) have settled into position and then tighten all the adjusting screws (18) again (see above).
3. Loosen all the adjusting screws (18) about 1/4 to 1/2 turn individually from the middle working outwards. When correctly adjusted the guide carriage should be easily movable by hand but with no play.
4. Tighten the screws (10) in the wiper cover (11) with the prescribed torque.

## Lubrication

All unused threaded holes in the guide carriage (15) must be plugged with set screws (16) to prevent escape of

lubricant. The grease nipples on both sides of the guide carriage (15) should be filled with guide grease (Order No. 10550) until a thin film of grease can be seen on the guide rail when the guide carriage is moved by hand.

## Final Assembly

1. Position the guide carriage centrally over the cylinder piston and secure the drive blocks (20) with the washers (17) and screws (19).

**Note:** The drive blocks (20) must be fitted against the guide carriage with no play (15) !!! See the table for the correct torque !!!

2. Refit the end cap of the OSP-P, if applicable.

## Torques for Screws

Item	SL25	SL32	SL40	SL50
4	3 Nm	3 Nm	10 Nm	10 Nm
5	3 Nm	3 Nm	3 Nm	3 Nm
10	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm
18	3.5 - 4 Nm	3.5 - 4 Nm	3.5 - 4 Nm	3.5 - 4 Nm
<b>(only self-locking screws)</b>				
19	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
23	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm

## Modules for OSP

### Order No.

Description	SL25	SL32	SL40	SL50
Slideline plain bearing guide with brake	20409	20410	20411	20412

## Replacement

### Parts

Item	Description	SL25	SL32	SL40	SL50
1	Guide rail	10913	10914	10915	10916
2	Clamping rail	10918	10919	10920	10921
3	Washer	3954	3954	3789	3789
4	Screw	10810	10810	10610	10610
5	Screw	1549	1549	1549	1549
6	Plate	11207	11207	11207	11207
7	Spring	1121	1121	1121	1128
8	O-ring	11218	11219	11220	11221
9	Support strip	10571	10590	10570	10798
10	Screw	2742	2742	1062	2742
11	Wiper cover	1661	1681	10487	10504
12	Felt	1619	1665	10665	10665
13	Wiper	1663	1683	10471	10472
14	Slide profile	10177	10591	10569	10797
15	Guide carriage	11474	11475	11476	11477
16	Set screw	1116	1116	1116	1116
17	Washer	11608	11609	11609	11609
18	Set screw	10281	10281	2262	11918
19	Screw	11615	11616	11616	11616
20	Drive block	10643	10644	10644	10645
21	Brake piston	11205	11209	11212	11215
22	Brake lining	11206	11210	11213	11216
23	Screw	11217	11217	11217	11217

## Replacement Assemblies

Item	Description	SL25	SL32	SL40	SL50
5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 21, 22, 23	Guide carriage, complete	11403	11406	11409	11412
8, 12, 13, 14, 22	Service kit (inc. guide grease, 8 ml tube)	11095	11096	11097	11098

## Lubrication

	Guide grease, 8 ml tube	10550
	Guide grease, 0.5 kg	11606

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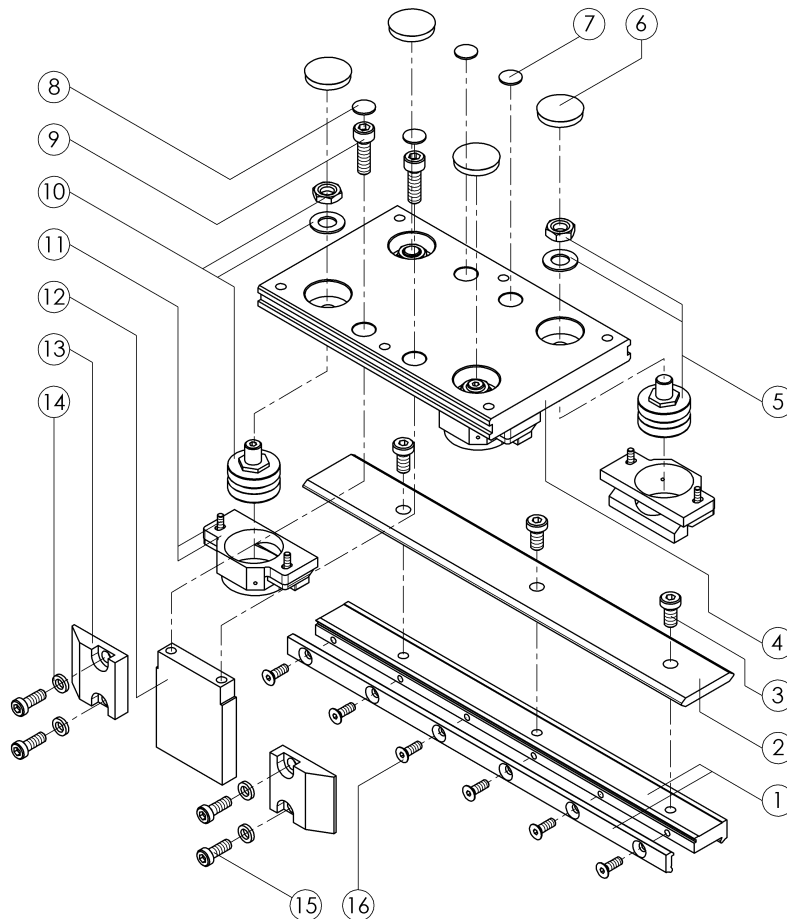
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## Assembly Instructions for Powerslide (PS16/25 - PS25/25 - PS25/35 - PS25/44 - PS32/35 - PS32/44 - PS40/44 - PS40/60 - PS50/60 - PS5076)

All the parts of the guide system mounted on the Powerslide are factory-adjusted and checked. Further adjustment is not necessary. If adjustment is required after some operating time, please follow these instructions.

### Adjustment of the Guide System

1. Depressurize the cylinder air lines and switch off all electrical power supply.
2. Remove all parts mounted externally on the guide carriage (4).
3. Remove the drive block (13) from the piston of the OSP so that the guide carriage can be moved.
4. For the OSP-P50 and OSP-E50 only : unscrew one end cap of the cylinder.
5. Slide the complete guide carriage off the guide rail (2).
6. Unscrew the cover (11) and slide the guide carriage back onto the guide rail.
7. Remove the caps (6).
8. Loosen the locknuts of the two eccentric rollers (10) with a box spanner. The eccentric roller (10), unlike the centric roller (5), has a hexagon socket in its axle.
9. Turn the two eccentric rollers with an Allan key or spanner until there is no play. Only minimal force should be used. Tighten the nuts, taking care not to turn the eccentric rollers any further.
10. Check the play on the guide: when the guide carriage is moved it should still be possible to hold the roller still with the fingers.
11. Check the play at several points on the guide over the whole stroke as described above.



12. Slide the complete guide carriage off the guide rail.
13. Lubricate the cover (11)
14. Fit the cover (11) with its screws and washers (do not tighten them yet).
15. Slide the guide carriage back onto the guide rail, ensuring that the carrier is on the same side as the cylinder piston.
16. Adjust the covers (11) so that there is light contact with the guide rail. This ensures reliable lubrication of the system in operation.

**Note:** too heavy a contact increases friction.

17. Position the guide carriage centrally over the piston of the cylinder and fit the drive blocks (13) with the washers (14) and screws (15).

18. Fit the caps (6).

**Note:** See the table for the correct torques !!!

The drive blocks (13) must be fitted against the carrier (12) with no play !!!

19. Lubricate the cover (11) with a grease gun.

**Note:** Too heavy pressure of the rollers on the guide rail should be avoided at all times, as this shortens the service life of the guide.

20. Refit the end cap of the OSP, if applicable.

### Torques for Screws

Item	PS16/25	PS25/25
3	10 Nm	10 Nm
5	13 Nm	13 Nm
9	3 Nm	10 Nm
15	4.5 Nm	9 Nm
16	2.6 Nm	2.6 Nm

Item	PS25/35	PS25/44
3	10 Nm	10 Nm
5	13 Nm	25 Nm
9	10 Nm	10 Nm
15	9 Nm	9 Nm
16	3 Nm	3 Nm

Item	PS32/35	PS32/44
3	10 Nm	10 Nm
5	13 Nm	25 Nm
9	10 Nm	10 Nm
15	14.5 Nm	14.5 Nm
16	3 Nm	3 Nm

Item	PS40/44	PS40/60
3	10 Nm	20 Nm
5	25 Nm	25 Nm
9	10 Nm	10 Nm
15	14.5 Nm	14.5 Nm
16	5.5 Nm	10 Nm

Item	PS50/60	PS50/76
3	20 Nm	20 Nm
5	25 Nm	70 Nm
9	20 Nm	20 Nm
15	14.5 Nm	14.5 Nm
16	10 Nm	10 Nm

## Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

### Modules for OSP

### Order No.

	Description	PS16/25	PS25/25	PS25/35	PS25/44	PS32/35	PS32/44	PS40/44	PS40/60	PS50/60	PS50/76
	Powerslide roller guide for OSP-P and OSP-E- Screw	20285	20015	20016	20017	20286	20287	20033	20034	20288	20289
	for OSP-E- Belt	---	20304	20305	20306	20307	20308	---	---	20309	20310
	Powerslide roller guide, stainless	20294	20295	20296	20297	20298	20299	20300	20301	20302	20303

### Replacement Parts

Item	Description	PS16/25	PS25/25	PS25/35	PS25/44	PS32/35	PS32/44	PS40/44	PS40/60	PS50/60	PS50/76
1	Clamping rail for OSP-P and OSP-E- Screw	11001	11002	11003	11004	11005	11006	11007	11008	11009	11010
1	for OSP-E- Belt	---	11031	11032	11033	11034	11035	---	---	11036	11037
2	Guide rail for OSP-P and OSP-E- Screw	11011	11012	11013	11014	11015	11016	11017	11018	11019	11020
2	for OSP-E- Belt	---	11038	11039	11040	11041	11042	---	---	11043	11044
3	Screw	10610	10610	3275	10610	3275	10610	1879	10684	10684	10719
3	Screw, stainless	10683	10683	3717	10683	3717	10683	10779	10684	10684	10834
4	Guide carriage	10636	10637	10638	10639	10638	10639	10639	10640	10640	10641
5	Roller, centric	10620	10620	10620	10622	10620	10622	10622	10622	10622	10624
6	Cap	10658	10658	10658	10658	10658	10659	10659	10659	10659	10660
7	Cap	---	---	10184	10184	10184	10184	10184	10657	10184	---
8	Cap	10656	10184	10184	10184	10184	10184	10184	10184	10657	10657
9	Screw	3278	10610	1273	1273	0666	1273	1273	1273	10685	10686
9	Screw, stainless	10167	10683	0394	0394	0667	0394	0394	0394	10685	10686
10	Roller, eccentric	10619	10619	10619	10621	10619	10621	10621	10621	10621	10623
11	Cover for rollers	4009	4009	4009	4017	4009	4017	4017	4017	4017	10627
12	Carrier	10646	10647	10648	10649	10650	10651	10652	10653	10654	10655
13	Drive block	10642	10643	10643	10643	10644	10644	10644	10644	10645	10645
14	Washer	11607	11608	11608	11608	11609	11609	11609	11609	11609	11609
14	Washer, stainless	11607	11611	11611	11611	11612	11612	11612	11612	11612	11612
15	Screw	11614	11615	11615	11615	11616	11616	11616	11616	11616	11616
15	Screw, stainless	11614	11615	11615	11615	11616	11616	11616	11616	11616	11616
16	Screw	2685	2685	10687	10687	10687	10687	10678	3256	3256	3256
16	Screw, stainless	2689	2689	10687	10687	10687	10687	10679	3715	3715	3715

### Replacement Assemblies

Item	Description	PS16/25	PS25/25	PS25/35	PS25/44	PS32/35	PS32/44	PS40/44	PS40/60	PS50/60	PS50/76
2, 4, 5, 10, 11	Guide unit, stainless	10700	10701	10702	10703	10704	10705	10706	10707	10708	10709
4, 5, 6, 7, 8, 10, 11	Guide carriage, complete	---	---	11415	11416	11415	11416	11416	11417	11417	---
4, 5, 6, 8, 10, 11		11413	11414	---	---	---	---	---	---	---	11418

## Assembly Instructions for Guideline (GDL25 - GDL32 – GDL40 - GDL50)

### Fitting the Guide

Clean the bearing surfaces for the guide. The accuracy of the guide depends on the accuracy of the bearing surfaces, which should therefore be as flat, parallel and undamaged as possible.

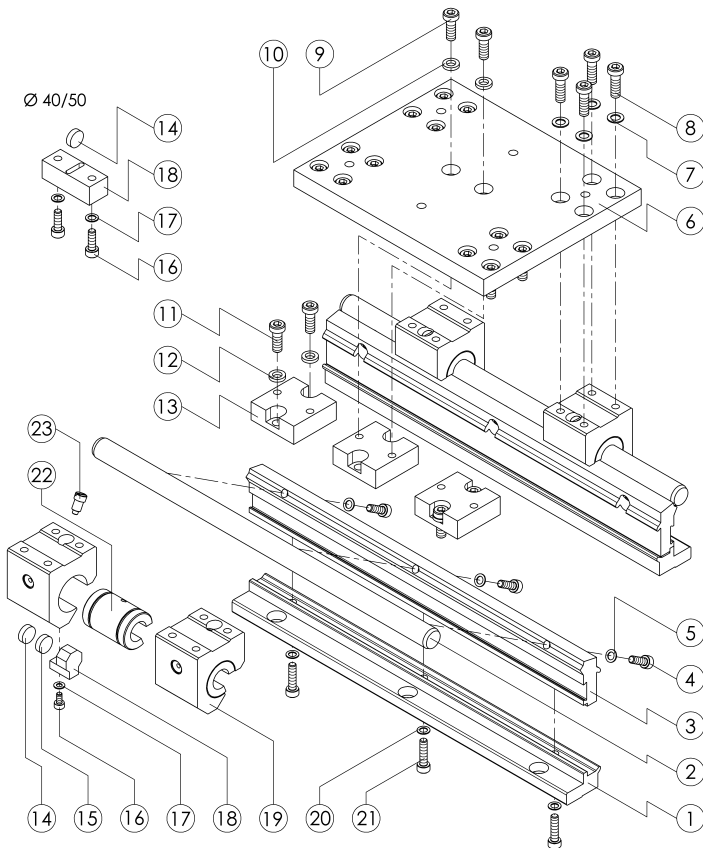
1. Place the guide unit on the substructure and secure it lightly with screws to DIN912-8.8.
2. If applicable, fit the clamping rail (1) and line it up correctly.
3. Tighten the screws with the following torques:  
GDL 25 / GDL 32: M5 - 5.5 Nm  
GDL 40 / GDL 50: M6 - 10 Nm

### Maintenance

If the ball bushings are damaged by overloads or worn out, we recommend replacement of both the ball bushings (22) and the guide shafts (2) at the same time. Use only genuine HOERBIGER-ORIGA replacement parts to ensure that the load values specified in the catalogue can be achieved again.

### Dismantling of the Guide Carriage

1. Depressurize the cylinder air lines and switch off all electrical power supply.
2. Remove all parts mounted externally on the guide carriage plate (6).
3. Loosen and remove the screws (9) with their washers (10).
4. For the GDL50 only: Remove one end cap of the OSP.
5. Slide the complete guide carriage off the guide shafts.
6. Loosen and remove the screws (8) with their washers (7) to separate the guide carriage plate (6) from the ball bushing housings (19).
7. Unscrew the set screw (23) from the ball bushing housing (19) and remove the ball bushing (22).



### Dismantling of the Guide Rail

1. Unscrew the guide rail from the bearing surface.
2. Remove the screws (21) and washers (20) and take the clamping rail (1) and mounting rail (3) off the OSP cylinder.
3. Unscrew the screws (4) with their washers (5) and remove the guide shaft (2) from the mounting rail (3).

### Reassembly of the Guide Rail

1. Inspect the guide shafts (2) and replace them if necessary.
2. Clean all the parts.
3. Secure the guide shaft (2) on the mounting rail (3) with the screws (4) and washers (5). Use only chamfered guide shafts.
4. Fit the mounting rail (3) and clamping rail (1) onto the OSP cylinder with the screws (21) and washers (20), centring the rails on the cylinder profile.

### Reassembly of the Guide Carriage

1. Inspect the ball bushings and replace damaged or worn ones.
  2. Clean all the parts.
  3. Install the ball bushing (22) in the ball bushing housing (19) and secure it with the set screw (23), applying a locking medium to the screw (Loctite low-strength is recommended).
  4. Slide the individual ball bushing housings (19) onto the guide shaft. **Take care not to tilt them!!**
- Note:** Never slide the completely assembled guide carriage onto the rail, as this could damage the ball bushings !!!
5. Position the guide carriage plate (6) on the ball bushing housings (19) and secure it with the screws (8) and washers (7) using the specified torque.
  6. Centre the guide carriage over the piston of the cylinder and secure the middle drive block (13) with the washers (10) and screws (9).

**Note:** See the correct torque in the table !!!  
The three drive blocks (13) must be mounted together with no play !!!

7. Refit the end cap of the OSP cylinder, if applicable.

### Position of the Sensor

1. The magnet housing (18) can be mounted on any one of the four ball bushing housings (19).
2. The sensor must then be positioned accordingly.

### Lubrication

1. Use only roller bearing grease for the ball bushings.
2. Grease nipples are provided on the four ball bushing housings (19) for easy lubrication.
3. Lubricate the ball bushings at regular intervals, depending on your application, so that there is always enough grease in the ball bushings.

### Torques for Screws

Item	GDL25	GDL32	GDL40	GDL50
4	3 Nm	3 Nm	5.5 Nm	5.5 Nm
8	5.5 Nm	5.5 Nm	10 Nm	10 Nm
9	9 Nm	10 Nm	14.5 Nm	10 Nm
11	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
16	1.2 Nm	1.2 Nm	3 Nm	3 Nm
21	3 Nm	3 Nm	10 Nm	10 Nm

## Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

### Modules for OSP

### Order No.

	Description	GDL25	GDL32	GDL40	GDL50
	Guideline ball bushing guide for OSP-P and OSP-E- Screw	20175	20180	20177	20183
	Kugelbuchsenführung Guideline for OSP-E- Belt	20315	20182	---	20316
	Guideline ball bushing guide, stainless (ball bushing housing (19) not stainless)	20176	20181	20178	20184

### Replacement Parts

Item	Description	GDL25	GDL32	GDL40	GDL50
1	Clamping rail for OSP-P and OSP-E- Screw	10900	10901	10902	10903
1	Clamping rail for OSP-E- Belt	10850	10851	---	10852
2	Guide shaft for OSP-P and OSP-E- Screw	10908	10909	10910	10911
2	Guide shaft for OSP-E- Belt	10856	10857	---	10858
2	Guide shaft, stainless	10934	10935	10936	10937
3	Mounting rail for OSP-P and OSP-E- Screw	10904	10905	10906	10907
3	Mounting rail for OSP-E- Belt	10853	10854	---	10855
4	Screw	2685	2685	10777	10777
4	Screw, stainless	2689	2689	10778	10778
5	Washer	3954	3954	4373	4373
5	Washer, stainless	4395	4395	4396	4396
6	Guide carriage plate	10668	10780	10669	10781
7	Washer	4373	4373	3789	3789
7	Washer, stainless	4396	4396	3792	3792
8	Screw	10774	10774	1879	1879
8	Screw, stainless	10775	10775	10779	10779
9	Screw	11615	11618	11616	11618
9	Screw, stainless	11615	11618	11616	11618
10	Washer	11608	11609	11609	11609
10	Washer, stainless	11611	11612	11612	11612
11	Screw	11615	11618	11616	11618
11	Screw, stainless	11615	11618	11616	11618
12	Washer	11608	11609	11609	11609
12	Washer, stainless	11611	11612	11612	11612
13	Drive block	10714	10715	10716	10715
14	Magnet	10056	10056	10056	10056
15	Bolt	10736	10736	---	---
16	Screw	0753	0753	2685	2685
16	Screw, stainless	4029	4029	2689	2689
17	Washer	3953	3953	3954	3954
17	Washer, stainless	10776	10776	4395	4395
18	Magnet housing	10734	10734	10735	10735
19	Ball bushing housing, complete (inc. 22 + 23)	10663	10663	10664	10664
20	Washer	3954	3954	3789	3789
20	Washer, stainless	4395	4395	3792	3792
21	Screw	0619	0803	1323	1283
21	Screw, stainless	10166	10782	3714	2692
22	Ball bushing	10808	10808	10809	10809
23	Set screw	10796	10796	10796	10796

### Replacement Assemblies

Item	Description	GDL25	GDL32	GDL40	GDL50
6, 7, 8, 19	Guide carriage, complete	11391	11393	11395	11397
6, 7, 8, 19	Guide carriage, complete, stainless (ball bushing housing (19) not stainless)	11392	11394	11396	11398

## Assembly Instructions for Proline (PL16 – PL25 - PL32 – PL40 - PL50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

### Dismantling of the Guide Carriage

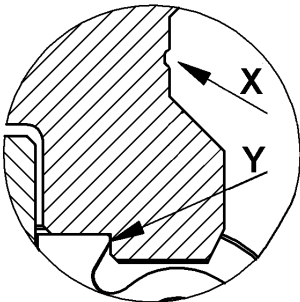
1. Depressurize the cylinder lines and switch off all electrical power supply.
2. Remove all parts mounted externally on the guide carriage (12).
3. Unscrew drive block (17) from the piston of the OSP, so that the guide carriage can be moved.
4. Loosen the screws (6) in the wiper cover (7).
5. For the PL40 / PL50 only: remove one end cap from the OSP cylinder.
6. Slide the complete guide carriage off the double rail (1).
7. Remove the wiper covers (7) with the felts (8) and wipers (9) from both ends of the guide carriage (12).
8. Loosen and remove the screws (10) and separate the pair of roller shoes (11) from the guide carriage (12).

### Dismantling of the Double Rail

1. Remove the cap plugs (5).
2. Remove the screws (4) and washers (3) and take the double rail (1) off the OSP cylinder.
3. If necessary: remove the end caps of the OSP cylinder and push the clamping profile out of the slot in the cylinder profile.

### Reassembly of the Double Rail

1. Inspect the double rail (1) and replace it if necessary.
2. Clean all the parts.
3. If necessary: remove the end caps of the OSP cylinder and push the clamping profile into the slot in the cylinder profile.
4. Fit the double rail (1) and clamping profile (2) to the OSP cylinder with the screws (4) and washers (3) (note the maximum torque), centring the rails on the cylinder profile. The groove (X) on the side of the double rail (1) must be on the piston side. The bearing surface (Y) of the double rail (1), which is on the same side as the groove (X), must be positioned against the dovetail profile of the OSP cylinder profile.
5. Insert new cap plugs (5) flush with or slightly below the surface of the double rail (1).

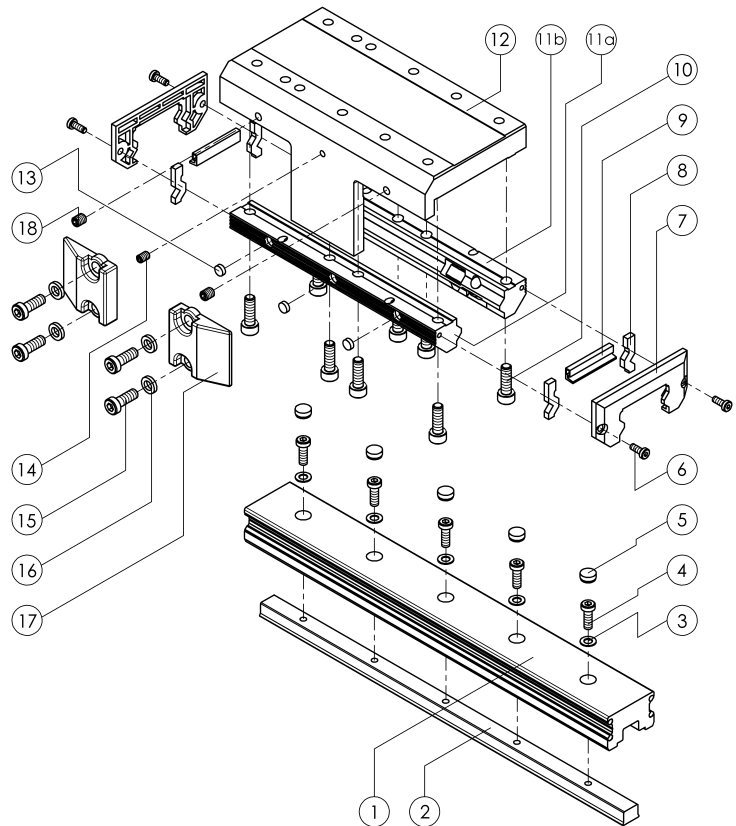


### Reassembly of the Guide Carriage

1. Inspect the components: the pair of roller shoes (11), wiper (9) and felt (8) and replace any damaged or worn parts.
2. Clean all the parts.
3. For adjustment of the roller shoes there is a fixed side and an adjustment side. The roller shoe on the fixed side (11b) is secured firmly to the underside of the guide carriage (12) with the screws (10).
4. Place the three washer (13) in the roller shoe (11a) on the adjustment side and fit it against the guide carriage (12) with the screws (10). Tighten the screws (10) until the roller shoe lies fully on the guide carriage but can still be moved.
5. Slide the complete guide carriage carefully onto the guide rail with the side with the adjusting screw (14) towards the piston of the OSP
6. Adjust the roller shoes (11) with the set screw (14). The roller shoes must be adjusted in the unloaded condition and there should be no play at the loosest point on the double rail (1). At the tightest point on the double rail

the resistance to movement must not exceed the maximum value. The correct and maximum resistance to movement are as follows:

Size	PL16	PL25	PL32	PL40	PL50
Correct ≤	0.5 N	1 N	1.5 N	2 N	3.0 N
Maximum ≤	3 N	6 N	9 N	10 N	12 N



7. First tighten the screws (10) with the specified torque and afterwards tighten the both set screws (18) with the specified torque.
  8. Fit the wiper covers (7), felts (8) and wipers (9) with the screws (6).
  9. Position the guide carriage (12) centrally over the piston of the cylinder and secure the drive blocks (17) with the washers (16) and screws (15).
- Note:** The drive blocks (17) must be fitted against the guide carriage (12) with no play !!! See the correct torque in the table !!!
10. Refit the end caps of the OSP, if applicable.

### Lubrication

The Proline roller guide is lifetime-lubricated.

### Torques for Screws

Item	PL16	PL25	PL32	PL40	PL50
(OSP-P) 4	3 Nm	3 Nm	10 Nm	10 Nm	10 Nm
(OSP-E) 4	---	1 Nm	7 Nm	---	10 Nm
6	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
10	3 Nm	5.5 Nm	10 Nm	10 Nm	20 Nm
15	4.5 Nm	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
18	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm

# Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

## Modules for OSP

## Order No.

	Description	PL16	PL25	PL32	PL40	PL50
	Proline roller guide for OSP-P and OSP-E Screw	20855	20856	20857	20858	20859
	Proline roller guide for OSP-E Belt	---	20874	20875	---	20876
	Proline roller guide, stainless	20956	20934	20935	20936	20937

## Replacement Parts

Item	Description	PL16	PL25	PL32	PL40	PL50
1	Double rail for OSP-P and OSP-E Screw	10951	10943	10944	10945	10946
1	Double rail for OSP-E Belt	---	10868	10869	---	10870
1	Double rail, stainless	10952	10953	10954	10955	10956
2	Clamping profile	10957	10947	10948	10949	10950
3	Washer	11884	11884	11885	11885	11885
3	Washer, stainless	11947	11947	11948	11948	11948
4	Screw	10810	10810	10610	3275	3275
4	Screw, stainless	10811	10811	10683	3717	3717
5	Cover	20524	20524	20526	20526	20526
6	Screw	11886	11886	11886	11886	11886
6	Screw, stainless	4539	4539	4539	4539	4539
7	Wiper cover	11930	11841	11842	11843	11844
8	Felt	11931	11875	11876	11877	11878
9	Wiper	11932	11880	11881	11882	11883
10	Screw	0619	0234	1273	1323	11227
10	Screw, stainless	10166	0235	0394	3714	10686
11	Pair of roller shoes	11784	11785	11786	11787	11788
11	Pair of roller shoes, stainless	11937	11938	11939	11940	11941
12	Guide carriage	11702	11703	11704	11705	11706
13	Washer	11929	11929	11929	11929	11929
14	Set screw	0429	0429	0429	0429	0429
15	Screw	11614	11615	11616	11616	11616
16	Washer	11607	11608	11609	11609	11609
16	Washer, stainless	11607	11611	11612	11612	11612
17	Drive block	10642	10643	10644	10644	10645
18	Set screw	2744	2744	2744	2744	2744

## Replacement Assemblies

Item	Description	PL16	PL25	PL32	PL40	PL50
6, 7, 8, 9, 10, 11, 12, 13, 14	Guide carriage, complete	11985	11899	11900	11901	11902
6, 7, 8, 9, 10, 11, 12, 13, 14	Guide carriage, complete, stainless	11986	11950	11951	11952	11953

## Assembly Instructions for Proline with Brake (PL25 - PL32 – PL40 - PL50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

### Dismantling of the Guide Carriage

1. Depressurize the cylinder lines and switch off all electrical power supply.
2. Remove all parts mounted externally on the guide carriage (16).
3. Unscrew drive block (20) from piston of OSP-P so that the guide carriage can be moved.
4. Loosen screws (10) in wiper cover (11).
5. For PL40 / PL50 only: remove one end cap of the OSP.
6. Slide the complete guide carriage off the double rail (1).

7. Remove the wiper covers (11) with felts (12) and wipers (13) from both ends of the guide carriage (16).
8. Loosen and remove the screws (14) and separate the pair of roller shoes (15) from the guide carriage (16).

### Dismantling of the Brake

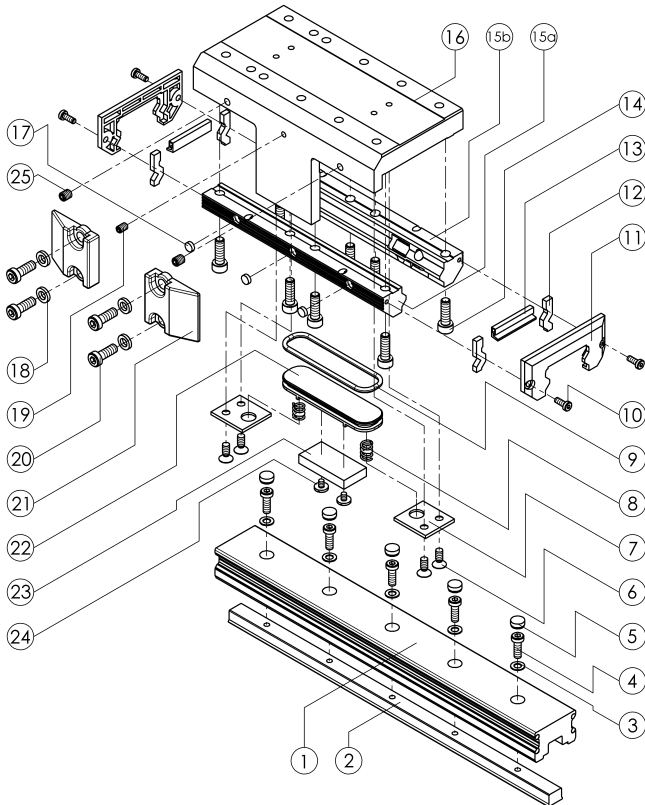
1. Remove the screws (6) and remove the plates (7) and springs (8) from the guide carriage.
2. To remove the brake piston (22), apply compressed air to its air connection and blow it out (do not use sharp tools on the piston!).  
**Danger: hold the brake piston while blowing it out!**
3. Remove the screws (24) and remove the brake lining (23) and O-ring (9) from the brake piston (22).
4. Inspect the parts – replace any damaged or worn parts, e.g. the O-ring (9) and the brake lining (23).

### Dismantling of the Double Rail

1. Remove the cap plugs (5).
2. Remove the screws (4) and washers (3) and take the double rail (1) off the OSP cylinder.



## Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

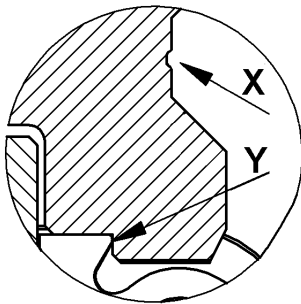


3. If necessary: remove the end caps of the OSP cylinder and push the clamping profile out of the slot in the cylinder profile.

### Reassembly of the Double Rail

1. Inspect the double rail (1) and replace it if necessary.
2. Clean all the parts.
3. If necessary: remove the end caps of the OSP cylinder and push the clamping profile into the slot in the cylinder profile.

4. Fit the double rail (1) and clamping profile (2) onto the OSP cylinder with the screws (4) and washers (3) (note the maximum torque), centring the rails on the cylinder profile. The groove (X) on the side of the double rail (1) must be on the piston side. The bearing surface (Y) of the double rail (1), which is on the same side as the groove (X), must be positioned against the dovetail profile of the OSP



cylinder profile.

5. Insert new cap plugs (5) flush with or slightly below the surface of the double rail (1).

### Reassembly of the Brake

1. Clean all the parts, the inside of the brake piston chamber and the brake air connection.
2. Fit the brake lining (23) to the brake piston (22). Apply a locking medium (Loctite low-strength is recommended) to the screws (24) and tighten them.
3. Grease the walls of the brake piston chamber and the groove in the brake piston lightly with guide grease (Order No. 10550).

**Note:** The brake lining must be grease-free.

4. Locate the O-ring (9) in the brake piston (22) and grease the O-ring lightly.
5. Fit the brake piston (22) into the guide carriage (16).
6. Fit the springs (8) and plates (7). Apply a locking medium to the screws (6) and tighten them.

### Reassembly of the Guide Carriage

1. Inspect the components: the pair of roller shoes (15), wiper (13) and felt (12) and replace any damaged or worn parts.
2. Clean all the parts.
3. For adjustment of the roller shoes there is a fixed side and an adjustment side. The roller shoe on the fixed side (15b) is secured firmly to the underside of the guide carriage (16) with the screws (14).
4. Place the three washers (17) in the roller shoe (15a) on the adjustment side and fit it against the guide carriage (16) with the screws (14). Tighten the screws (14) until the roller shoe lies fully on the guide carriage but can still be moved.
5. Slide the complete guide carriage carefully onto the guide rail with the side with the adjusting screw (19) towards the piston of the OSP
6. Adjust the roller shoes (15) with the set screw (19). The roller shoes must be adjusted in the unloaded condition and there should be no play at the loosest point on the double rail (1). At the tightest point on the double rail the resistance to movement must not exceed the maximum value. The correct and maximum resistance to movement are as follows:

Size	PL25	PL32	PL40	PL50
Correct ≤	1 N	1.5 N	2 N	3.0 N
Maximum ≤	6 N	9 N	10 N	12 N

7. First tighten the screws (14) with the specified torque and afterwards tighten the both set screws (25) with the specified torque.
8. Fit the wiper covers (11), felts (12) and wipers (13) with the screws (10).
9. Position the guide carriage (16) centrally over the piston of the cylinder and secure the drive blocks (21) with the washers (18) and screws (20).  
**Note:** The drive blocks (21) must be fitted against the guide carriage (16) with no play !!! See the correct torque in the table !!!

10. Refit the end caps of the OSP-P, if applicable.

### Lubrication

The Proline roller guide is lifetime-lubricated.

### Torques for Screws

Item	PL25	PL32	PL40	PL50
4	3 Nm	10 Nm	10 Nm	10 Nm
6	3 Nm	3 Nm	3 Nm	3 Nm
10	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
14	5.5 Nm	10 Nm	10 Nm	20 Nm
20	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
24	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm
25	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm

## Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

### Modules for OSP

### Order No.

	Description	PL25	PL32	PL40	PL50
	Proline roller guide with brake	20860	20861	20862	20863
	Proline roller guide with brake, stainless	20938	20939	20940	20941

### Replacement Parts

Item	Description	PL25	PL32	PL40	PL50
1	Double rail FDK	10943	10944	10945	10946
1	Double rail FDK, stainless	10953	10954	10955	10956
2	Clamping profile	10947	10948	10949	10950
3	Washer	11884	11885	11885	11885
3	Washer, stainless	11947	11948	11948	11948
4	Screw	10810	10610	3275	3275
4	Screw, stainless	10811	10683	3717	3717
5	Cover	20524	20526	20526	20526
6	Screw	1549	1549	1549	1549
6	Screw, stainless	1549	1549	1549	1549
7	Plate	11207	11207	11207	11207
8	Spring	1121	1121	1121	1128
8	Spring, stainless	4775	4775	4775	11988
9	O-ring	11218	11219	11220	11221
10	Screw	11886	11886	11886	11886
10	Screw, stainless	4539	4539	4539	4539
11	Wiper cover	11841	11842	11843	11844
12	Felt	11875	11876	11877	11878
13	Wiper	11880	11881	11882	11883
14	Screw	0234	1273	1323	11227
14	Screw, stainless	0235	0394	3714	10686
15	Pair of roller shoes FEK	11785	11786	11787	11788
15	Pair of roller shoes FEK, stainless	11938	11939	11940	11941
16	Guide carriage	11731	11732	11733	11734
17	Washer	11929	11929	11929	11929
18	Washer	11608	11609	11609	11609
18	Washer, stainless	11611	11612	11612	11612
19	Set screw	0439	0439	0439	0439
20	Screw	11615	11616	11616	11616
21	Drive block	10643	10644	10644	10645
22	Brake piston	11205	11209	11212	11215
23	Brake lining	11206	11210	11213	11216
24	Screw	11217	11217	11217	11217
24	Screw, stainless	11949	11949	11949	11949
25	Set screw	2744	2744	2744	2744

### Replacement Assemblies

Item	Description	PL25	PL32	PL40	PL50
6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 23, 24, 25	Guide carriage, complete	11903	11904	11905	11906
	Guide carriage, complete, stainless	11954	11955	11956	11957

## Assembly Instructions for Active Brake (AB25 - AB32 - AB40 - AB50 - AB63 - AB80)

Usually it is not necessary to remove the cylinder from the machine or plant.

### Dismantling of the Active Brake

1. Depressurize the cylinder and brake lines and switch off all electrical power supply.
2. Remove the compressed air line from the brake air connection.
3. Remove the screws (7 + 8) with their washers (5) and take the brake housing (1) off the cylinder piston (15).
4. Unscrew the screws (10) and remove the plates (9) and springs (13) from the brake housing (1).
5. To remove the brake piston (4), apply compressed air to its air connection and blow it out (do not use sharp tools on the piston!).  
**Danger:** hold the brake piston while blowing it out!
6. For AB40 / AB50 / AB63 / AB80 only: loosen the screws (11) and remove the brake lining (12) from the brake piston (4).
7. Remove the O-ring (2) from the brake piston (4).
8. Inspect the parts – replace any damaged or worn parts: O-ring (2) and brake lining (12) or brake piston with brake lining (4 + 12) on AB25 and AB32.

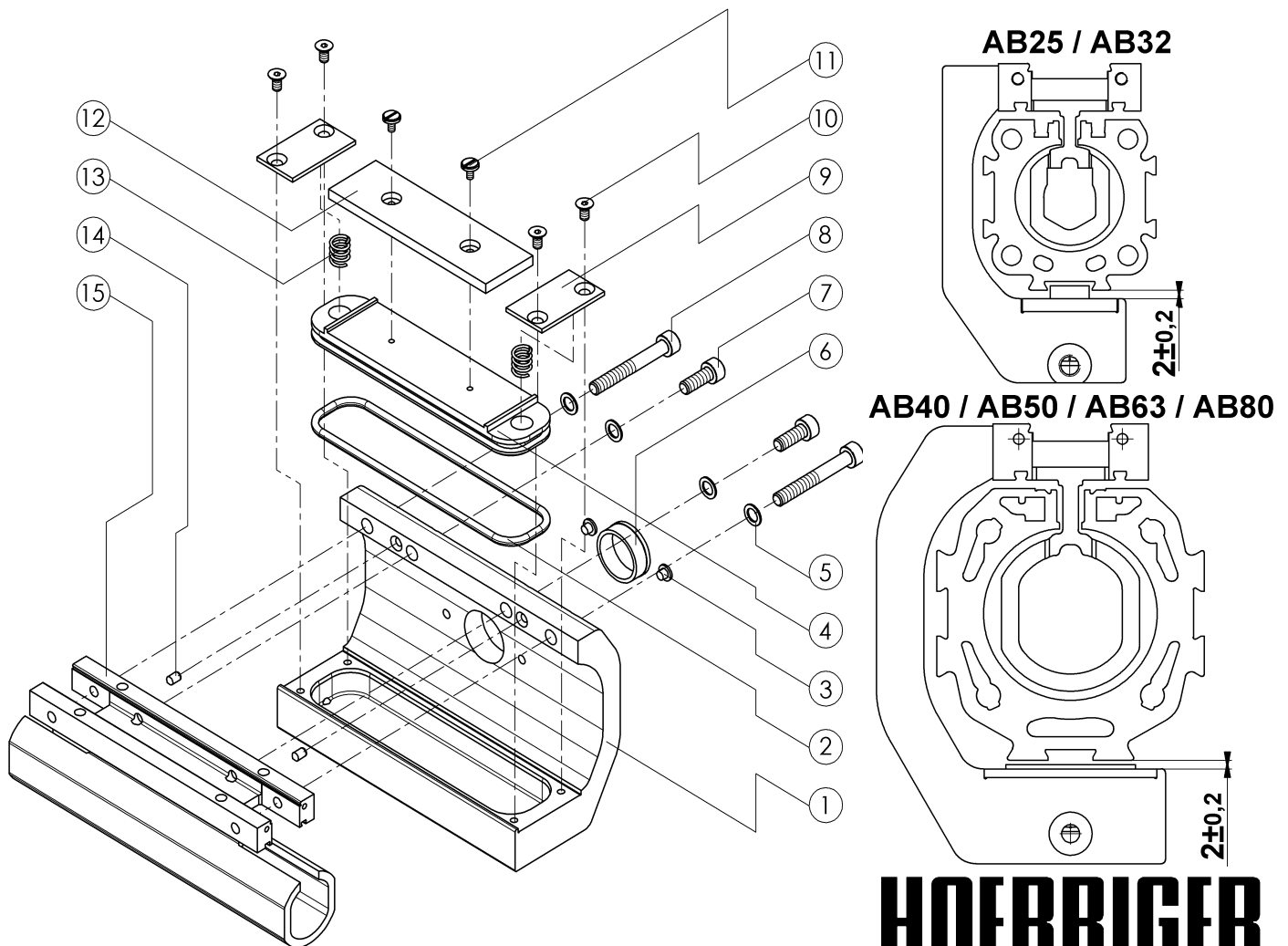
### Reassembly of the Brake

1. Clean all the parts, the inside of the brake piston chamber and the brake air connection.
2. For AB40 / AB50 / AB63 / AB80 only: fit the brake lining (12) onto the brake piston (4). Apply a locking medium (Loctite low-strength is recommended) to the screws (11).
3. Grease the walls of the brake piston chamber and the groove in the brake piston lightly with grease (Order No. 1598).  
**Note:** The brake lining must be grease-free.
4. Place the O-ring (2) in the brake piston (4) and grease the O-ring lightly.
5. Fit the brake piston (4) into the brake housing (1).
6. Fit the springs (13) and plates (9). Apply a locking medium to the screws (10) and tighten them..
7. Fit the brake housing (1) onto the cylinder piston (15) with the screws (7 + 8) and washers (5). Additionally for the AB40 and AB50 use locating pins(14).

**Note:** When reinstalling the brake housing, adjust the clearance between the cylinder profile and the plate (9) to  $2\text{ mm} \pm 0.2\text{ mm}$  with a feeler gauge (see diagram).

### Torques for Screws

Item	AB25	AB32	AB40	AB50	AB63	AB80
7 + 8	5.5 Nm	9.7 Nm	9.7 Nm	9.7 Nm	23 Nm	47 Nm
10	2.9 Nm	2.9 Nm	2.9 Nm	2.9 Nm	5.5 Nm	5.5 Nm
11	---	---	0.8-1Nm	0.8-1Nm	0.8-1Nm	0.8-1Nm



## Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

### Modules for OSP

### Order No.

	Description	AB25	AB32	AB40	AB50	AB63	AB80
	Active Brake	20806	20807	20808	20809	20810	20811

### Replacement Parts

Item	Description	AB25	AB32	AB40	AB50	AB63	AB80
1	Brake housing	11462	11485	11464	11487	11583	11584
2	O-ring	11643	11565	11645	11646	11647	11648
3	Plug	10674	10674	10674	10674	10674	10674
4	Brake piston	---	---	11466	11632	11633	11634
4 + 12	Brake piston with brake lining	11649	11650	---	---	---	---
5	Washer	4396	3792	3792	3792	4397	4398
6	Plug	11933	11933	11933	11934	11934	11934
7	Screw	3716	667	667	394	10686	11653
8	Screw	11640	11641	11641	11642	---	---
9	Pressure plate	11635	11635	11636	11637	11638	11638
10	Screw	11651	11651	11651	11651	11652	11652
11	Screw	---	---	11596	11596	11596	11596
12	Brake lining	---	---	11460	11483	11585	11586
13	Spring	11728	11728	11728	11729	11730	11730
14	Locating pin	---	---	2242	2242	---	---
15	Piston yoke	11625	11626	11627	11628	11629	11630

### Service Kits

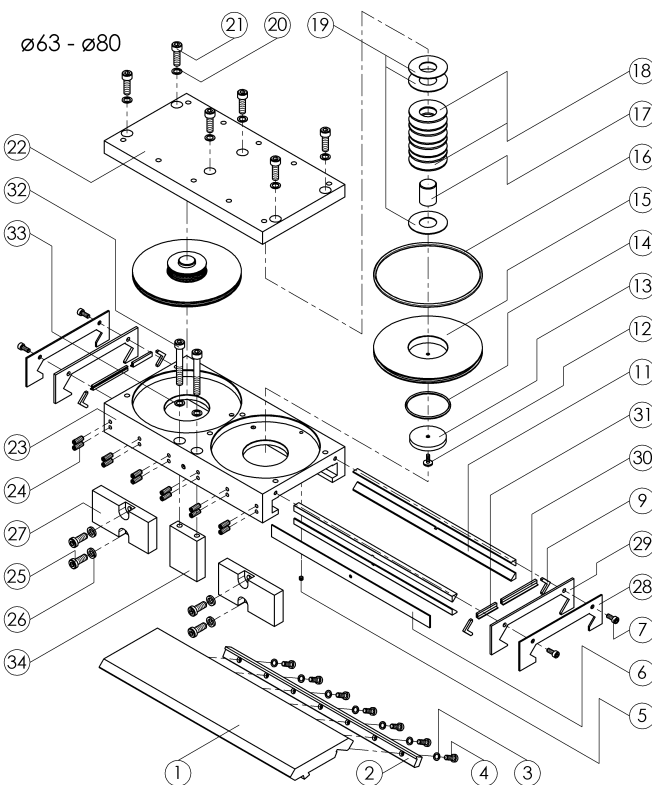
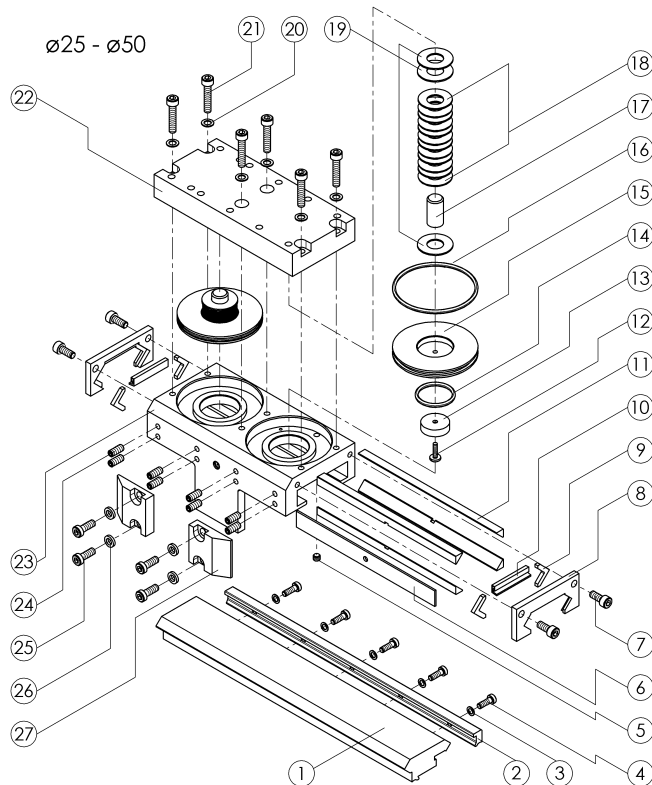
Item	Description	AB25	AB32	AB40	AB50	AB63	AB80
2, 4, 12	Service kit (inc.grease, 8ml tube)	11822	11823	---	---	---	---
2, 12	Service kit (inc.grease, 8ml tube)	---	---	11824	11825	11826	11827

### Lubrication

	Description	AB25	AB32	AB40	AB50	AB63	AB80
	Grease, 8ml tube	1598					

## Assembly Instructions for Multi-Brake Slideline

**(MB-SL25 -- MB-SL32 -- MB-SL40 -- MB-SL50 -- MB-SL63 -- MB-SL80)**



For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

### Dismantling of the Guide Carriage

1. Depressurize the cylinder and brake lines and switch off all electrical power supply.
2. Remove all parts mounted externally on the plate (22).
3. Unscrew the screws (21) with their washers (20), backing off each screw a little at a time, so that the plate (22) does not tip and jam when it is removed from the guide carriage (23).
4. Remove the plate (22) from the guide carriage (23).
5. Unscrew one drive block (27) from the piston of the OSP-P so that the guide carriage can be moved.
6. Loosen the screws (7) in the wiper cover (8 or 28 + 29).
7. For the OSP-P40, OSP-P50, OSP-P63 and OSP-P80 only: remove one end cap of the cylinder.
8. Slide the complete guide carriage (23) off the guide rail (1).
9. Unscrew the wiper covers (8 or 28 + 29) from both ends of the guide carriage (23).
10. Inspect the parts – replace damaged or worn parts such as: wiper (10 or 30 + 31), slide profile (11) and felt (9) (service kit).

### Dismantling of the Brake

1. Remove the saucer springs (18) and pressure plates (19) and press the brake piston (15) out of the guide carriage (23) from the brake lining side.
2. Remove the screws (12) and remove the brake lining (13) and guide pin (17) from the brake piston (15), and also the O-rings (14) and (16).
3. Inspect the parts – replace damaged or worn parts such as: O-rings (14) and (16) and brake lining (13).

### Dismantling and Reassembly of the Guide Rail

1. Unscrew the screws (4) with their washers (3). Remove the guide rail (1) and clamping rail (2) from the cylinder profile.
2. Clean all the parts.
3. Centre the guide rail (1) on the cylinder profile. Secure the guide rail (1) and clamping rail (2) with the screws (4) and their washers (3) (use the specified torque).

### Reassembly of the Brake

1. Clean all the parts, the inside of the brake piston chamber and the brake air connection.
2. Centre the guide pin (17) on the brake piston with the help of the pressure plate (19) and fit the brake lining (13) on the brake piston (15), applying a locking medium (Loctite low-strength is recommended) to the screw (12) and tightening it.
3. Grease the walls of the brake piston chamber and the groove in the brake piston lightly with guide grease (Order No. 10550).
4. Locate the O-rings (14) and (16) in the brake piston (15) and grease the O-rings lightly.
5. Fit the brake piston (15) into the guide carriage (23)

**Note:** The brake lining must be grease-free.

## Appendix to Operating Instructions for Pneumatic Linear Drive OSP-P

### Reassembly of the Guide Carriage

1. Clean all the parts.
2. Grease the felts (9) with guide grease (Order No. 10550).
3. Lay the wipers (10 or 30 + 31) and felts (9) in the wiper covers. The sealing lip of the wiper must be outwards (see drawing).
4. Back off the adjusting screws (24) in the guide carriage.
5. Lay in the support strip (6) on the same side as the adjusting screws.
6. Place 2 slide profiles (11) per side in the guide carriage. The edges of the slide profiles in which grooves are cut (to allow grease from the grease nipples to get to the guide rail) must touch each other.
7. Screw on the two wiper covers (8 or 28 + 29) loosely with the screws (7).

### Remounting the Reassembled Guide Carriage on the Guide Rail

1. Push the complete guide carriage assembly carefully onto the guide rail with the side with the adjusting screws towards the piston.
2. If necessary move the felt wiper carefully into its correct position with a screwdriver.

### Adjustment of Play

1. Tighten the self-locking adjusting screws (24), individually from the middle working outwards, with the specified torque. If non-self-locking screws are used (24), use a locking medium (Loctite low-strength is recommended) and tighten the screws from the middle working outwards until the guide carriage can no longer be moved by hand.
2. Tap the sides of the guide carriage (23) gently with a rubber hammer until the slide profiles (11) have settled into position and then tighten all the adjusting screws (24) again (see above).
3. Loosen all the adjusting screws (24) about 1/4 to 1/2 turn individually from the middle working outwards. When correctly adjusted the guide carriage should be easily movable by hand but with no play.

4. Tighten the screws (7) in the wiper cover (8 or 28 + 29) with the prescribed torque.

### Lubrication

The grease nipples on both sides of the guide carriage (23) should be filled with guide grease (Order No. 10550) until a thin film of grease can be seen on the guide rail when the guide carriage is moved by hand.

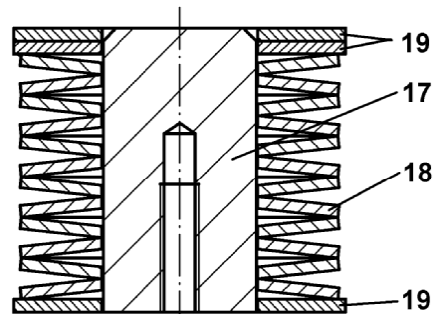
### Final assembly

1. Position the guide carriage centrally over the cylinder piston and secure the drive blocks (27) with the washers (26) and screws (25).

**Note:** The drive blocks (27) must be fitted against the guide carriage (23) or carrier (34) with no play !!! See the table for the correct torque !!!

2. Push the saucer springs (18) and pressure plates (19) onto the guide pin.

**Note:** See the diagram for the correct arrangement of the saucer springs and pressure plates. Depending on the brake type the numbers of saucer springs (18) and pressure plates (19) are different.



3. Lay the plate (22) on the pressure plates (19).
4. Tighten the screws (21) with their washers (20) gradually and evenly until the plate (22) lies completely flat on the guide carriage (23).
5. Refit the end cap of the OSP-P, if applicable.

### Torques for screws

Item	MB-SL25	MB-SL32	MB-SL40	MB-SL50	MB-SL63	MB-SL80
4	3 Nm	3 Nm	10 Nm	10 Nm	10 Nm	10 Nm
7	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm
12	0.8 – 1 Nm	0.8 – 1 Nm	0.8 – 1 Nm	0.8 – 1 Nm	0.8 – 1 Nm	0.8 – 1 Nm
21	5.5 Nm	10 Nm	10 Nm	10 Nm	20 Nm	20 Nm
24	3.5 - 4 Nm	3.5 - 4 Nm	3.5 - 4 Nm	3.5 - 4 Nm	3.5 - 4 Nm	3.5 - 4 Nm
<b>(only self-locking screws)</b>						
25	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm	35 Nm	40 Nm
32	---	---	---	---	20 Nm	20 Nm

### Modules for OSP

Description	Order No.						
	MB-SL25	MB-SL32	MB-SL40	MB-SL50	MB-SL63	MB-SL80	
Multi-Brake with Slideline plain bearing guide	20796	20797	20798	20799	20800	20846	

### Replacement Parts

Item	Description	MB-SL25	MB-SL32	MB-SL40	MB-SL50	MB-SL63	MB-SL80
1	Guide rail	10913	10914	10915	10916	10939	10941
2	Clamping rail	10918	10919	10920	10921	10940	10942
3	Washer	4395	4395	3792	3792	3792	3792
4	Screw	10811	10811	10683	10683	10683	10683

## Appendix to Operating Instructions for Pneumatic Linear Drive OSP-P

Item	Description	MB-SL25	MB-SL32	MB-SL40	MB-SL50	MB-SL63	MB-SL80
5	Set screw	11301	11301	11301	11301	11301	11301
6	Support strip	10571	10590	10570	10798	11547	11547
7	Screw	3716	3716	1063	3716	3716	3716
8	Wiper cover	1661	1681	10487	10504	---	---
9	Felt	1619	1665	10665	10665	11543	11543
10	Wiper	1663	1683	10471	10472	---	---
11	Slide profile	10177	10591	10569	10797	11546	11546
12	Screw	11548	11548	11548	11549	11549	11549
13	Brake lining	11515	11516	11517	11518	11519	11519
14	O-ring	2526	11559	11560	11561	11562	11562
15	Brake piston	11510	11511	11512	11513	11514	11514
16	O-ring	11563	11564	11565	11566	11567	11567
17	Guide pin	11520	11521	11522	11523	11524	11524
18	Saucer spring	11533	11534	11535	11536	11537	11537
19	Pressure plate 0.5 mm	11525	11525	11527	11529	11531	11531
19	Pressure plate 1.0 mm	11526	11526	11528	11530	11532	11532
20	Washer	4396	3792	3792	3792	4397	4397
21	Screw	4607	3714	3714	3714	10686	10686
22	Plate	11505	11506	11507	11508	11509	11509
23	Guide carriage	11500	11501	11502	11503	11504	11504
24	Set screw	10682	10682	2255	11919	11550	11550
25	Screw	11615	11616	11616	11616	11617	11257
26	Washer	11611	11612	11612	11612	11613	11831
27	Drive block	10643	10644	10644	10645	11541	11828
28	Wiper cover, outer	---	---	---	---	11545	11545
29	Wiper cover, inner	---	---	---	---	11544	11544
30	Wiper	---	---	---	---	1663	1663
31	Wiper	---	---	---	---	10471	10471
32	Screw	---	---	---	---	1229	1229
33	Washer	---	---	---	---	4397	4397
34	Carrier	---	---	---	---	11542	11829

### Replacement Assemblies

Item	Description	MB-SL25	MB-SL32	MB-SL40	MB-SL50	MB-SL63	MB-SL80
5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24	Guide carriage, complete	11684	11685	11686	11687	---	---
5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24	Guide carriage, complete	---	---	---	---	11688	11688
9, 10, 11, 13, 14, 16	Service kit (inc. guide grease, 8ml tube)	11089	11090	11091	11092	---	---
9, 11, 13, 14, 16, 30, 31	Service kit (inc. guide grease, 8ml tube)	---	---	---	---	11093	11093

### Lubrication

Guide grease, 8 ml tube	10550
Guide grease, 0.5 kg	11606

## Assembly Instructions for

### Multi-Brake Proline

**(MB-PL25 – MB-PL32 – MB-PL40 – MB-PL50)**

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

#### Dismantling of the Guide Carriage

1. Depressurize the cylinder and brake lines and switch off all electrical power supply.
2. Remove all parts mounted externally on the plate (22).
3. Unscrew the screws (20) with their washers (21), backing off each screw a little at a time, so that the plate (22) does not tip and jam when it is removed from the guide carriage (23).
4. Remove the plate (22) from the guide carriage (23).
5. Unscrew the drive block (27) from the piston of the OSP-P so that the guide carriage can be moved.
6. Loosen the screws (7) in the wiper cover (8).
7. For the OSP-P40, OSP-P50 only: remove one end cap of the cylinder.
8. Slide the complete guide carriage off the double rail (1).
9. Remove the wiper covers (8) with the felts (6) and wipers (9) from both ends of the guide carriage (23).
10. Loosen and remove the screws (10) and separate the pair of roller shoes (19) from the guide carriage (23).

#### Dismantling of the Brake

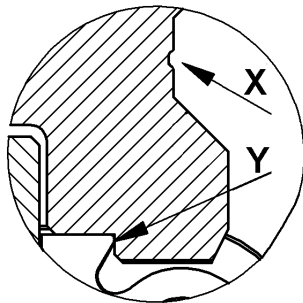
1. Remove the saucer springs (17) and pressure plates (18) and press the brake piston (14) out of the guide carriage (23) from the brake lining side.
2. Remove the screw (11) and remove the brake lining (12) and guide pin (16) from the brake piston (14), and also the O-rings (13) and (15).
3. Inspect the parts – replace any damaged or worn parts such as the O-rings (13) and (15) and brake lining (12).

#### Dismantling of the Double Rail

1. Remove the cap plugs (5).
2. Remove the screws (4) and washers (3) and take the double rail (1) off the OSP cylinder.
3. If necessary: remove the end caps of the OSP cylinder and push the clamping profile out of the slot in the cylinder profile.

#### Reassembly of the Double Rail

1. Inspect the double rail (1) and replace it if necessary.
2. Clean all the parts.
3. If necessary: remove the end caps of the OSP cylinder and push the clamping profile into the slot in the cylinder profile.
4. Fit the double rail (1) and clamping profile (2) onto the OSP cylinder with the screws (4) and washers (3) (note the maximum torque),



centring the rails on the cylinder profile. The groove (X) on the side of the double rail (1) must be on the piston side. The bearing surface (Y) of the double rail (1), which is on the same side as the groove (X), must be positioned against the dovetail

profile of the OSP cylinder profile.

5. Insert new cap plugs (5) flush with or slightly below the surface of the double rail (1).

#### Reassembly of the Brake

1. Clean all the parts, the inside of the brake piston chamber and the brake air connection.
2. Centre the guide pin (16) on the brake piston with the help of the pressure plate (18) and fit the brake lining (12) onto the brake piston (14). Apply a locking medium to the screw (11) (Loctite low-strength is recommended) and tighten it.
3. Grease the walls of the brake piston chamber and the groove in the brake piston lightly with guide grease (Order No. 10550).  
**Note:** The brake lining must be grease-free.
4. Locate the O-rings (13) and (15) in the brake piston (14) and grease the O-rings lightly.
5. Fit the brake piston (14) into the guide carriage (23).

#### Reassembly of the Guide Carriage

1. Inspect the parts: the pair of roller shoes (19), wiper (9) and felt (6) and replace any damaged or worn parts.
2. Clean all the parts.
3. For adjustment of the roller shoes there is a fixed side and an adjustment side. The roller shoe on the fixed side (19b) is secured firmly to the underside of the guide carriage (23) with the screws (10).
4. Place the three washers (28) in the roller shoe (19a) on the adjustment side and fit it against the guide carriage (23) with the screws (10). Tighten the screws (10) until the roller shoe lies fully on the guide carriage but can still be moved.
5. Slide the complete guide carriage carefully onto the guide rail with the side with the adjusting screw (24) towards the piston of the OSP.
6. Adjust the roller shoes (19) with the set screw (24). The roller shoes must be adjusted in the unloaded condition and there should be no play at the loosest point on the double rail (1). At the tightest point on the double rail the resistance to movement must not exceed the maximum value. The correct and maximum resistance to movement are as follows:

Size	MB-PL25	MB-PL32	MB-PL40	MB-PL50
Correct ≤	1 N	1.5 N	2 N	3.0 N
Maximum ≤	6 N	9 N	10 N	12 N

7. First tighten the screws (10) with the specified torque and afterwards tighten the both set screws(29) with the specified torque.
8. Fit the wiper covers (8), felts (6) and wipers (9) with the screws (7).

#### Lubrication

The Proline roller guide is lifetime-lubricated.

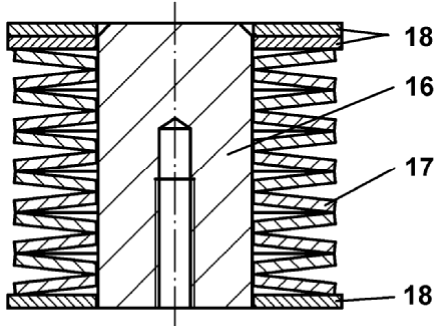
## Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

### Final Assembly

1. Position the guide carriage (23) centrally over the piston of the cylinder and secure the drive blocks (27) with the washers (25) and screws (26).

**Note:** The drive blocks (27) must be fitted against the guide carriage (23) with no play !!! See the correct torque in the table !!!

2. Push the saucer springs (17) and pressure plates (18) onto the guide pin.

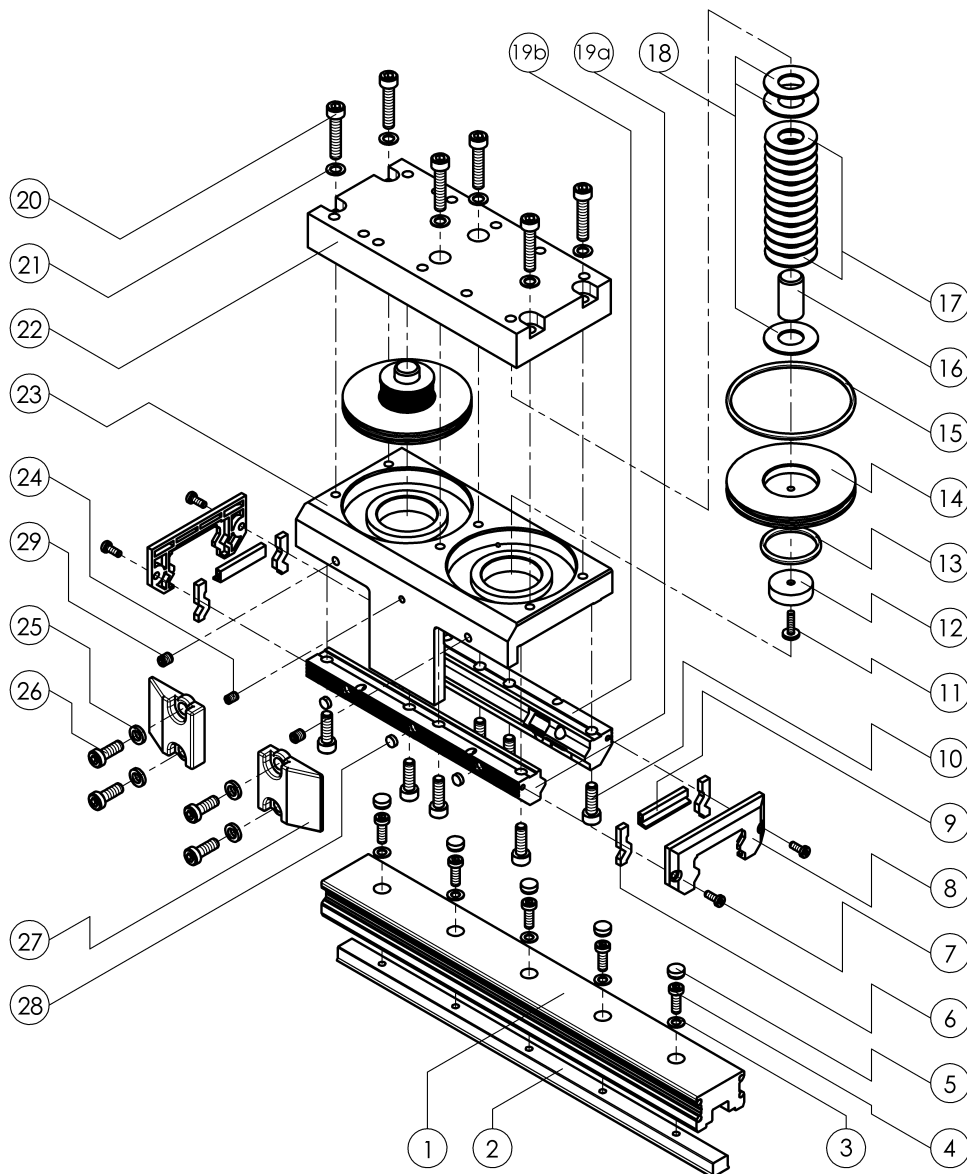


**Note:** See the diagram for the correct arrangement of the saucer springs and pressure plates. According to the brake type the numbers of saucer springs (17) and pressure plates (18) are different.

3. Lay the plate (22) on the pressure plates (18).
4. Tighten the screws (20) with their washers (21) gradually and evenly until the plate (22) lies flat on the guide carriage (23).
5. Refit the end caps of the OSP-P, if applicable.

### Torques for Screws

Item	MB - PL25	MB - PL32	MB - PL40	MB - PL50
4	3 Nm	10 Nm	10 Nm	10 Nm
7	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
10	5.5 Nm	10 Nm	10 Nm	20 Nm
11	0.8 – 1 Nm	0.8 – 1 Nm	0.8 – 1 Nm	0.8 – 1 Nm
20	5.5 Nm	10 Nm	10 Nm	10 Nm
26	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
29	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm



## Appendix to Operating Instructions OSP-P / OSP-E Linear Drive

### Modules for OSP

### Order No.

	Description	MB-PL25	MB-PL32	MB-PL40	MB-PL50
	Multi-Brake with Proline roller guide	20864	20865	20866	20867
	Multi-Brake with Proline roller guide, stainless	20942	20943	20944	20945

### Replacement Parts

Item	Description	PL25	PL32	PL40	PL50
1	Double rail FDK	10943	10944	10945	10946
1	Double rail FDK, stainless	10953	10954	10955	10956
2	Clamping profile	10947	10948	10949	10950
3	Washer	11884	11885	11885	11885
3	Washer, stainless	11947	11948	11948	11948
4	Screw	10810	10610	3275	3275
4	Screw, stainless	10811	10683	3717	3717
5	Cover	20524	20526	20526	20526
6	Felt	11875	11876	11877	11878
7	Screw	11886	11886	11886	11886
7	Screw, stainless	4539	4539	4539	4539
8	Wiper cover	11841	11842	11843	11844
9	Wiper	11880	11881	11882	11883
10	Screw	0234	1273	1323	11227
10	Screw, stainless	0235	0394	3714	10686
11	Screw	11548	11548	11548	11549
12	Brake lining	11515	11516	11517	11518
13	O-ring	2526	11559	11560	11561
14	Brake piston	11510	11511	11779	11780
15	O-ring	11563	11564	11565	11887
16	Guide pin	11520	11521	11522	11523
17	Saucer spring	11533	11534	11535	11536
18	Pressure plate 0.5 mm	11525	11526	11527	11529
18	Pressure plate 1.0 mm	11526	11526	11528	11530
19	Pair of roller shoes FEK	11785	11786	11787	11788
19	Pair of roller shoes FEK, stainless	11938	11939	11940	11941
20	Screw	1848	1323	1323	1323
20	Screw, stainless	4607	3714	3714	3714
21	Washer	4373	3789	3789	3789
21	Washer, stainless	4396	3792	3792	3792
22	Plate	11505	11506	11507	11508
23	Guide carriage	11912	11913	11914	11915
24	Set screw	0429	0429	0429	0429
25	Washer	11608	11609	11609	11609
25	Washer, stainless	11611	11612	11612	11612
26	Screw	11615	11616	11616	11616
27	Drive block	10643	10644	10644	10645
28	Washer	11929	11929	11929	11929
29	Set screw	2744	2744	2744	2744

### Replacement Assemblies

Item	Description	MB-PL25	MB-PL32	MB-PL40	MB-PL50
6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 28	Guide carriage, complete	11907	11908	11909	11910
	Guide carriage, complete, stainless	11958	11959	11960	11961



## Assembly Instructions Integrated 3/2 Way Valves VOE (OSP-P25 – OSP-P32 – OSP-P40 – OSP-P50)

### Fault-Finding (only with machine switched off)

If faulty valve is suspected:

1. Check actuating signal and voltage at solenoid.
2. Check functioning with manual override (red turnbutton on pilot valve). If valve works, only replace solenoid coil (28).
3. If cylinder speed is reduced: unscrew throttle silencer (35) and wash it or replace it.

If the above does not solve the problem:

### Dismantling of Valve's Internal Parts

1. Depressurize cylinder; switch off power supply to cylinder.
  2. Remove cylinder from machine (if necessary).
  3. For OSP-P25 and OSP-P32: remove screws (29) and remove pilot valve (25) with O-rings (23 + 24).
  4. Remove screws (22) and remove pilot valve cover (21) with O-ring (20). Remove O-ring (32) from valve housing (1).
  5. Using a tool (e.g. an Allan key), push pilot piston (18) out of valve housing from opposite side (through air connection port).
  6. For OSP-P40 and OSP-P50: carefully remove O-ring (17) from valve housing (1).
- Note:** take care not to damage valve housing.
7. Carefully remove screws (11), as spring (8) exerts force on connection cap (12), and remove connection cap (12).
  8. Remove valve's internal parts (5 – 10).

9. For OSP-P32, OSP-P40 and OSP-P50: carefully remove O-ring (9) from valve housing (1). **Note:** take care not to damage valve housing.
10. Clean all parts and valve housing (1) with a lint-free cloth.
11. Inspect seals and replace any worn parts.

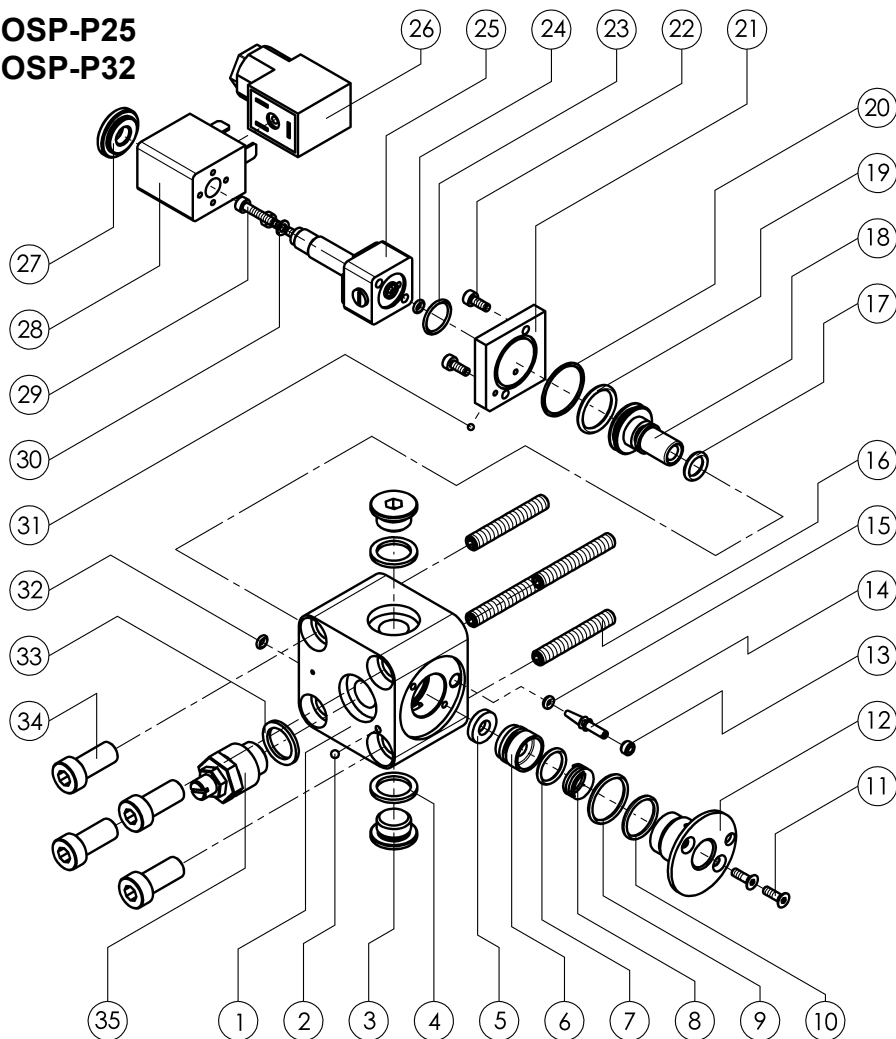
### Lubrication

1. During reassembly, lightly grease all seals and their running surfaces (grease: Order No.: 1598).

### Reassembly of Valve's Internal Parts

1. For OSP-P25 and OSP-P32: put O-ring (17) on pilot piston. For OSP-P40 and OSP-P50: put O-ring (17) in groove in valve housing (1).
  2. Put O-ring (19) on pilot piston.
  3. Slide pilot piston (18) into housing.
  4. Lay O-ring (32) in valve housing (1). Lay O-ring (20) in pilot valve cover (21) with pressed-in ball bearing (31) and fit cover to valve housing (1) with screws (22). Take care that O-ring (32) is fitted over corresponding hole in valve housing (1).
  5. For OSP-P32, OSP-P40 and OSP-P50: lay O-ring (9) in groove in valve housing.
  6. Fit O-ring (7) on bush (6). Lay polyurethane washer (5) in bush (6).
  7. Fit O-ring (10) on connection cap (12).
  8. For OSP-P32, OSP-P40 and OSP-P50: lay bush (6) with spring (8) in connection cap (12) and fit these into valve housing (1) with screws (11). For OSP-P25: push bush (6), then spring (8) and then connection cap (12) into housing (1) and secure with screws (11).
- For OSP-P25 and OSP-P32: take care that connection cap (12) is so fitted that valve needle (14) remains

### OSP-P25 OSP-P32



## Appendix to Operating Instructions for Pneumatic Linear Drive OSP-P

accessible through hole in connection cap.

9. For OSP-P25 and OSP-P32: lay O-rings (23 + 24) in pilot valve (25) and screw it onto pilot valve cover (21) with screws (29) and, if applicable, washer (30).

### Rotating the Valve

The VOE valve can be rotated 4 x 90° to position the air connection as required.

1. Remove end cap screws (34).
2. Rotate valve housing to desired position.
3. Refit end cap screws (34) and tighten to specified torque. Take care that the two O-rings between valve housing and cushioning spigot are not damaged.

### Rotating the Pilot Valve and Solenoid

The pilot valve of the VOE valve can be rotated 180° to position the manual override turnbutton as required.

1. Remove screws (29).
2. Rotate pilot valve (25) to desired position.
3. Refit screws (29) and tighten to specified torque. Take care that the two O-rings (23) and (24) are not damaged.
4. Solenoid (28) can be rotated 4 x 90° to position connector (26) as required: to do this, remove knurled nut (27), turn solenoid (28) to desired position and retighten knurled nut.

### Speed Regulation

1. The throttle silencer (35) can be exchanged with either of the screw plugs (3) to improve the accessibility of the adjusting screw. The adjusting screw is used to regulate the speed of the cylinder. The plug screws (3) can if desired be replaced by a second or third throttle silencer (35) to increase exhaust air flow rate and thereby the speed of the piston
2. If the piston speed is changed, the end cushioning must

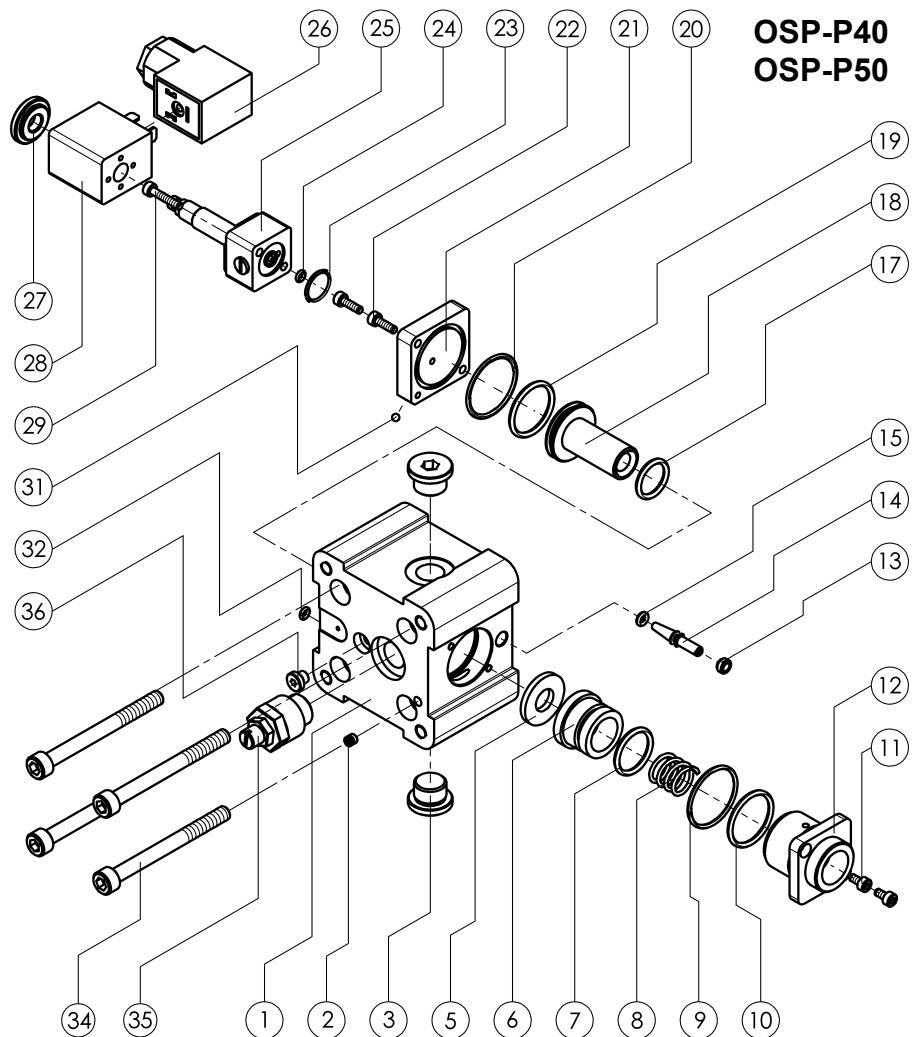
be adjusted accordingly with the valve needle (14). See "Chapter 5 – Commissioning" in the OSP-P Operating Instructions.

### Air Connection V6

- For OSP-P40 and OSP-P50:  
The air connection with screw plug (36) provides direct connection to the cylinder chamber, e.g. for an external valve or a pressure sensor.

### Torques for Screws

Item	OSP-P25	OSP-P32	OSP-P40	OSP-P50
11	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
22	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
29	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
34	8 Nm	10 Nm	10 Nm	10 Nm



## Appendix to Operating Instructions for Pneumatic Linear Drive OSP-P

### Components of OSP

Item	Description	Order No.			
		OSP-P25	OSP-P32	OSP-P40	OSP-P50
	Integrated 3/2 way valve VOE 24V	20914	20916	20918	20920
	Integrated 3/2 way valve VOE 220V	20915	20917	20919	20921

### Replacement Parts

Item	Description	OSP-P25	OSP-P32	OSP-P40	OSP-P50
1	Valve housing	11832	11862	11845	11856
2	Plug	0589	0589	1161	1161
3	Screw plug	KW0426	0099	KW0427	KW0427
4	Seal ring	---	KW0355	---	---
5	Polyurethane washer	11967	11967	11968	11968
6	Bush for polyurethane washer	11965	11965	11966	11966
7	O-ring	11838	11838	11850	11850
8	Spring	0717	0717	11854	11854
9	O-ring	---	3614	11853	11853
10	O-ring	0807	0806	11851	11851
11	Screw	10724	10724	0753	0753
12	Connection cap	11834	11864	11847	11847
13	Insert nut	10043	10043	10100	10100
14	Valve needle	10041	10041	10098	10098
15	O-ring	10042	10042	1211	1211
16	Headless screw (screw depth in tube: 15.5 mm)	---	0249	---	---
17	O-ring	0805	0805	11852	11852
18	Pilot piston	11835	11865	11848	11848
19	O-ring	11837	11837	11851	11851
20	O-ring	11839	11879	11853	11853
21	Pilot valve cover	11833	11863	11846	11846
22	Screw	0753	10105	3419	3419
23	O-ring	0631	0631	0631	0631
24	O-ring	0628	0628	0628	0628
25	Pilot valve	11890	11890	11890	11890
26	Connector 10-50 V	11894	11894	11894	11894
26	Connector 70-250 V	11895	11895	11895	11895
27	Knurled nut	0651	0651	0651	0651
	Spring washer	0652	0652	0652	0652
28	Solenoid coil for 24 V= and 60 V~ / 50-60 Hz	KZ3673	KZ3673	KZ3673	KZ3673
28	Solenoid coil for 110 V= and 220 V~ / 50-60 Hz	KZ3672	KZ3672	KZ3672	KZ3672
29	Screw	10107	10107	10107	10107
30	Screw	---	3953	---	---
31	Ball bearing	0589	KC8217	0589	0589
32	O-ring	0631	0631	0631	0631
33	Seal ring	---	KW0355	---	---
34	End cap screw	1621	1006	1521	1521
35	Screw-in throttle	KY6952	KY6953	KY6953	KY6953
36	Screw plug	---	---	KW0425	KW0425

### Replacement Assemblies

Item	Description	OSP-P25	OSP-P32	OSP-P40	OSP-P50
Complete but without: 16, 26, 27, 28, 34	Integrated 3/2 way valve VOE (without connector, knurled nut, solenoid and end cap screws)	11840	11866	11855	11857

### Lubricants

Item	Description	OSP-P25	OSP-P32	OSP-P40	OSP-P50
	Grease, 8 ml tube	1598			





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