

REPAIR MANUAL 2005-2006



WP SHOCK ABSORBER

5018 DCC

5018 SXS

5018 SMR

REPARATURANLEITUNG

MANUALE DI RIPARAZIONE

MANUEL DE RÉPARATION

MANUAL DE REPARACIÓN

ART.NR.: 3211.139-E

suspension
WP

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EXPLANATION - UPDATING

**3.211.0139-E Repair Manual WP PDS 2006 5018-DCC and
5018 SXS/SMR 2005/06
Basicversion Modelyear 2005/06**

11/2005

INTRODUCTION

This repair manual offers extensive repair-instructions and is an up-to-date version that describes the latest models of the series. However, the right to modifications in the interest of technical improvement is reserved without updating the current issue of this manual.

A description of general working modes common in work shops has not been included. Safety rules common in the work shop have also not been listed. We take it for granted that the repairs are made by qualified professionally trained mechanics.

Read through the repair manual before beginning with the repair work.

⚠ WARNING ⚠

STRICT COMPLIANCE WITH THESE INSTRUCTIONS IS ESSENTIAL TO AVOID DANGER TO LIFE AND LIMB.

! CAUTION !

NON-COMPLIANCE WITH THESE INSTRUCTIONS CAN LEAD TO DAMAGE OF MOTORCYCLE COMPONENTS OR RENDER MOTORCYCLES UNFIT FOR TRAFFIC !

„NOTE” POINTS OUT USEFUL TIPS.

Use only **ORIGINAL KTM/WP SPARE PARTS** when replacing parts.

The KTM high performance shock absorber is only able to meet user expectations if the maintenance work is performed regularly and professionally.



REG.NO. 12 100 6061

In accordance with the international quality management ISO 9001 standard, KTM uses quality assurance processes that lead to the highest possible product quality.

KTM Sportmotorcycle AG reserves the right to modify any equipment, technical specifications, colors, materials, services offered and rendered, and the like so as to adapt them to local conditions without previous announcement and without giving reasons, or to cancel any of the above items without substituting them with others. It shall be acceptable to stop manufacturing a certain model without previous announcement. In the event of such modifications, please ask your local KTM dealer for information.

KTM Sportmotorcycle AG
5230 Mattighofen, Austria

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REPLY FAX FOR REPAIR MANUALS

We have made every effort to make our repair manuals as accurate as possible but it is always possible for a mistake or two to creep in.

To keep improving the quality of our repair manuals, we request mechanics and shop foremen to assist us as follows:

If you find any errors or inaccuracies in one of our repair manual – whether these are technical errors, incorrect or unclear repair procedures, tool problems, missing technical data or torques, inaccurate or incorrect translations or wording, etc. – please enter the error(s) in the table below and fax the completed form to us at 0043/7742/6000/5349.

NOTE to table:

- Enter the complete item no. for the repair manual in column 1 (e.g.: **3.211.139-E**).
You will find the number on the cover page or in the left margin on each right page of the manual.
- Enter the corresponding page number in the repair manual (e.g.: **2-3**) in column 2.
- Enter the current text (inaccurate or incomplete) in column 3 by quoting or describing the respective passage of the text. If your text deviates from the text contained in the repair manual, please write your text in German or English if possible.
- Enter the correct text in column 4.

Your corrections will be reviewed and incorporated in the next issue of our repair manual.

Item no. of repair manual	Page	Current text	Correct text

Additional suggestions, requests or comments on our Repair Manuals (in German or English):

Name mechanic/shop foreman

Company/work shop

SPECIAL TOOLS

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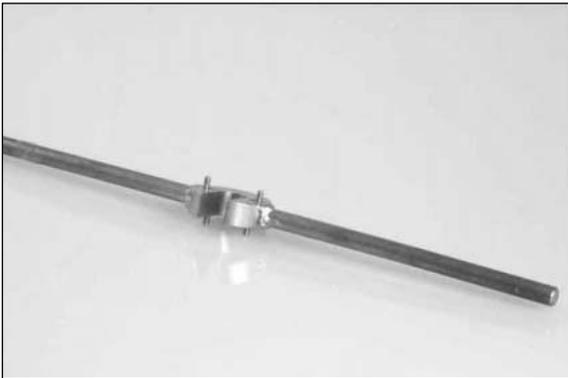
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T 107S
Depth Stop



T 120
Dismounting/mounting tool



T 125S
Pin wrench



T 132
Loctite 2701



T 145S
Dismounting/mounting tool



T 146
Dismounting/mounting tool



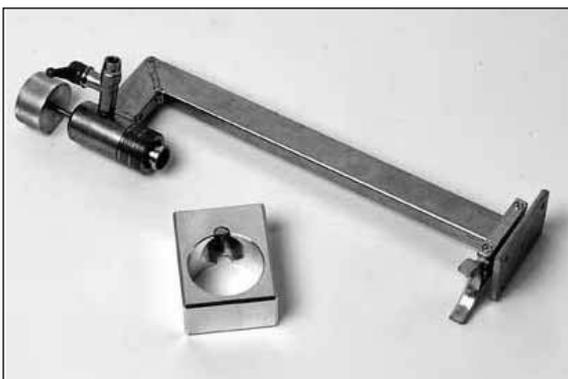
T 152
Lubricant



T 158
O-Ring Grease



T 159
Water-resistant grease



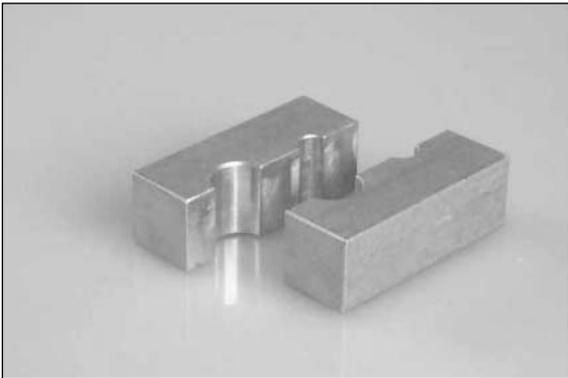
T 170S1
Nitrogen Filling Device



T 625
Lubricant



T 1201
Bushing



T 1202S
Clamping Blocks



T 1204
Mounting tool for dust boot



T 1205
Calibration pin



T 1206
Mounting tool



T 1207S
Dismounting/mounting tool (A+B)



T 1208
Dismounting/mounting tool



T 1209
Dismounting/mounting tool



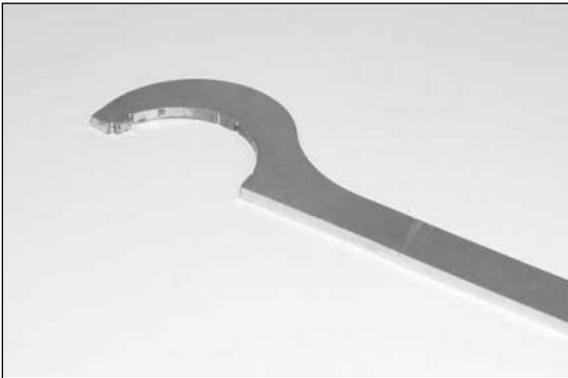
T 1214
Centering bushing



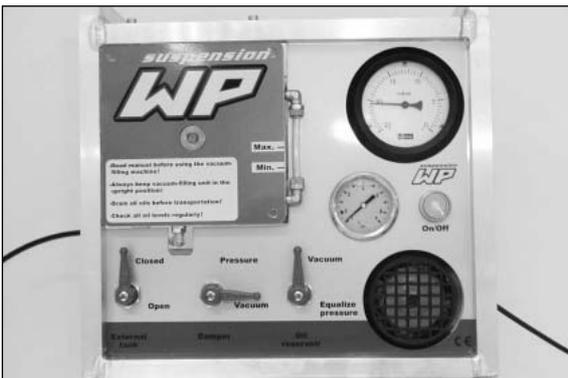
T 1215
Mounting tool



T 1216
Dismounting/mounting tool



T 1233
Hook Wrench



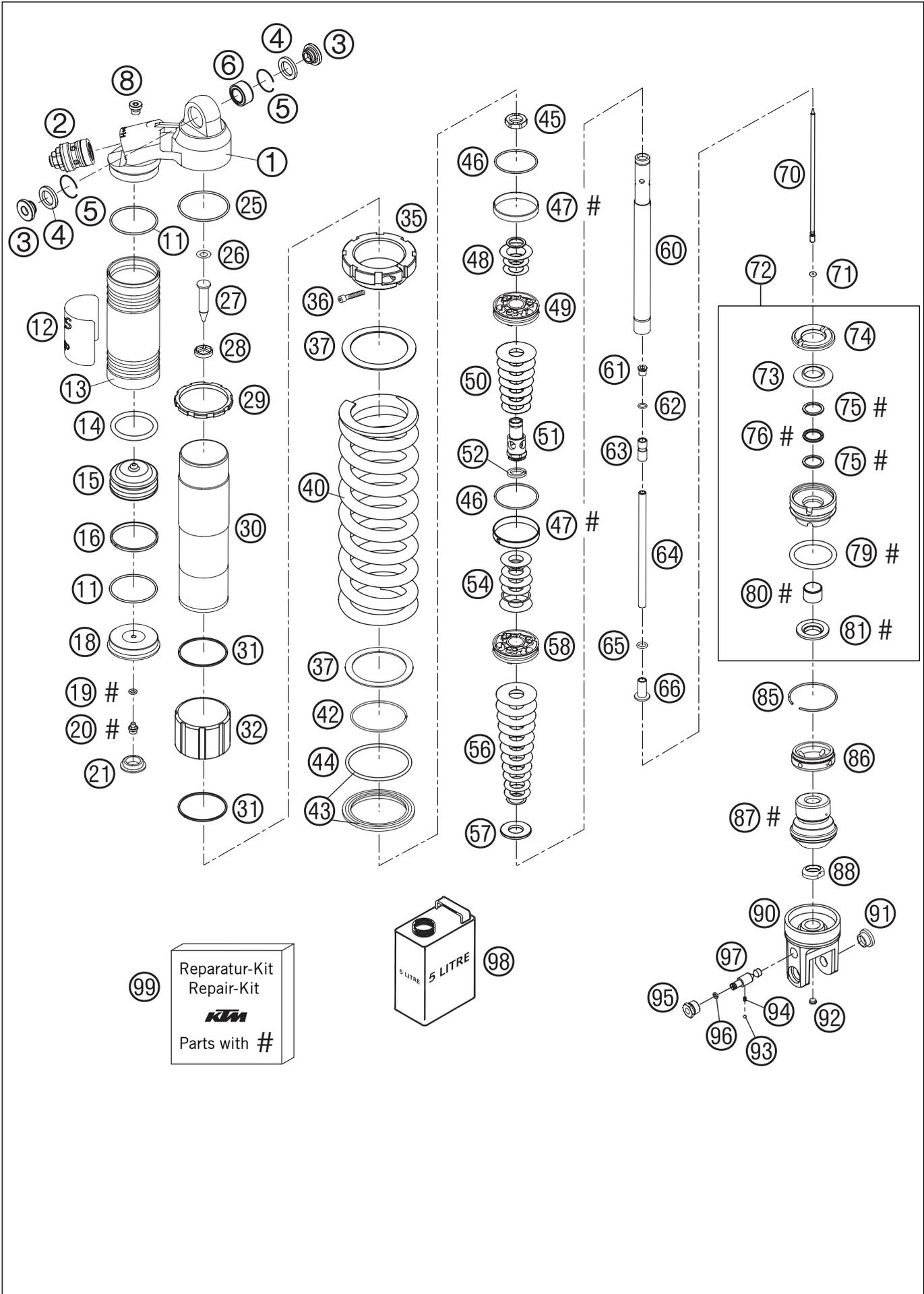
T 1240S
Vacuum filling device

GENERAL INFORMATION

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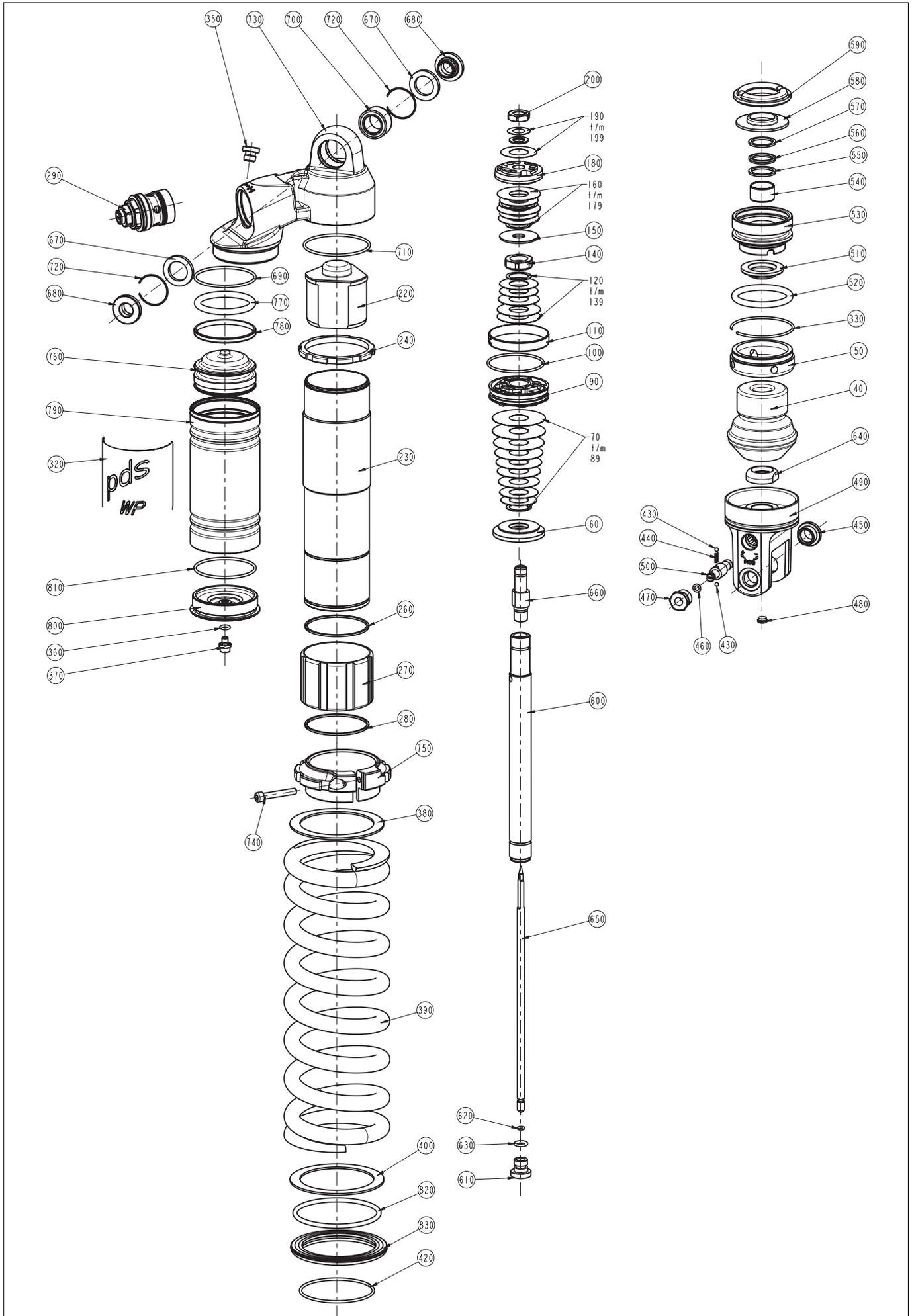
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Item	Description		
1	Upper shock absorber case	56	Shim 16x34x0.15
2	DCC (dual compression control)	56	Shim 16x34x0.20
3	Distance bushing 12x24	56	Shim 16x36x0.20
4	Seal ring D=25	56	Shim 16x38x0.20
5	Lock ring	56	Shim 16x40x0.20
6	Bearing	56	Shim 16x42x0.20
8	Bleeder screw	56	Shim 16x44x0.20
11	O-ring 48x2	56	Shim 16x28x0.25
12	WP Caution (PDS KTM)	56	Shim 16x30x0.25
13	Reservoir	56	Shim 16x32x0.25
14	O-ring 41x5	56	Shim 16x34x0.25
15	Dividing piston	56	Shim 16x36x0.25
16	Piston ring 3.9x1.5x156	56	Shim 16x38x0.25
18	Reservoir cap	56	Shim 16x44x0.25
19	O-ring 5.28x1.78	56	Shim 16x40x0.25
20	Plug	56	Shim 16x42x0.25
21	Rubber cap "Do not open"	57	Shim for rebound damping D=34; H=8
25	O-ring 52x2	58	Piston 6+6x7/4.5 Vb 1.0
26	Shim 16x8.2x0.6	60	Piston rod
27	Needle	61	Bushing M8x1
28	Screw cap	62	O-ring 7x1.5
29	Lock ring	63	Needle seat
30	Pipe	64	Pipe
31	Circlip	65	O-ring 8x2
32	Spring guide	66	Tube adapter
35	Adjusting ring	70	Needle
36	AH screw	71	O-ring 2.2x1.6
37	Spacer	72	Adapter
40	Spring	73	Steel washer 18.5x43.7x6
42	Spring ring	74	Rebound rubber
43	Spring retainer	75	Safety ring 22.55x1.5
44	O-ring 66.27x3.53	76	Quad seal ring 18x2.62
45	Piston rod nut	79	O-ring 41x5
46	O-ring 44.17x1.78	80	Distance bushing
47	Piston ring	81	Dust boot
48	Spacer plate	85	Lock ring
48	Shim 16x30x0.20	86	Cover
48	Shim 16x32x0.20	87	Rubber buffer plug
48	Shim 16x34x0.20	88	Nut
48	Shim 16x36x0.20	90	Fork part
48	Shim 16x21x1	91	Threaded bushing
49	Piston 6+6x3.5/4.5	92	Rubber plug
50	Spacer plate 16x21x0.30	93	Steel ball
50	Spacer plate 16x22x0.30	94	Spring
50	Shim 16x23x0.30	95	Reservoir cap
50	Shim 16x40x0.25	96	O-ring 4x1.5
50	Shim 16x30x0.30	97	Adjusting screw
50	Shim 16x32x0.30	98	Shock absorber oil
50	Shim 16x34x0.30	99	Seal ring repair kit 5018 PDS
50	Shim 16x36x0.30		
50	Shim 16x38x0.30		
50	Shim 16x40x0.30		
51	Holder D=16 M16x1 L=48		
52	Spacer plate D=23 D=16 H3		
54	Spacer plate 16x20x0.30		
54	Shim 16x28x0.15		
54	Shim 16x30x0.20		
54	Shim 16x28x0.20		
54	Shim 16x32x0.20		
54	Shim 16x34x0.20		
54	Shim 16x36x0.25		

Exploded view PDS 5018 SXS/SMR 2005/2006



Part list SXS/SMR 2006

Pos.	Part description	Part number	
Pieces			
40	Bump rubber	5018.0480	1
50	Reservoir cap	5018.0473	1
60	Rebound disc	5018.0483	1
90	Piston 6+6x7/4,5	5018.0197	1
100	O-ring 44,17x1,78	5018.0099	1
110	Piston ring	5018.0135	1
140	Piston rod nut	5018.0496	1
150	Support disc	5018.0477	1
180	Piston	5018.0476	1
200	Piston rod nut	5018.0470	1
220	Sleeve	5018.0469	1
230	Tube	5018.0467	1
240	Lock washer tube	5018.0241	1
260	Circlip	5018.0133	1
270	Spring guide	5018.0081	1
280	Circlip	5018.0133	1
290	DCC complete	5018.0213S6	1
320	Wp Caution (PDS Ktm)	5200.0041	1
330	Circlip Stainl.steel	5018.0126	1
350	Bleed plug	5018.0095	1
360	O-ring 5,28x1,78	4681.0893	1
370	Nitrogen plug	3612.0151	1
380	Interm. ring screw spring ret.	5018.0114	1
400	Interm. ring screw spring ret.	5018.0114	1
420	Circlip	5018.0273	1
430	Ball-steel	4054.0603	2
440	Spring	4860.0028	1
450	Mount.f.adapt.	5018.0105	1
460	O-ring	5018.0222	1
470	Reservoir cap Reb.	5018.7039	1
480	Rubber plug	5018.0297	1
490	Mount	5018.0502	1
500	Adj.screw reb.	5018.0434	1
510	Dust seal	5018.0082	1
520	O-ring	5018.0103	1
530	Adaptor	5018.0435	1
540	DU-bush	4618.0119	1
550	Backup ring	5018.0102	1
560	Quad ring	5018.0101	1
570	Backup ring	5018.0102	1
580	Disc steel	5018.0113	1
590	Rebound rubber	5018.0107	1
600	Piston rod	5018.0471	1
610	Needle guiding	5018.0482	1
620	O-ring	4681.0339	1
630	O-ring	4618.0018	1
640	Nut	5018.0481	1
650	Needle	5018.0478	1
660	Tap piston rod	5018.0472	1
670	Oil seal	4618.0003	2
680	Adaptor bush	4618.0007	2
690	O-ring	4681.0016	1
700	Heim joint	5018.0005	1
710	O-ring	5018.0097	1
720	Lock washer	5018.0168	2
730	Shock absorber housing	5018.0468	1
740	Allen screw M5x30	5018.0327	1
750	Spring ret. (adjust)	5018.0474	1
760	Separation piston	4618.0002	1
770	O-ring	4618.0014	1
780	Piston rin	4618.0015	1
790	Reservoir	5018.0479	1
800	Reservoir cap	5018.0236	1
810	O-ring	4681.0016	1
820	O-ring	5018.0352	1
830	Spring ret.	5018.0319	1

Setting list PDS 5018 BAVP Shock absorber 12.18.7A.10 and 12.18.7B.10 KTM 125 SXS 2005/2006
Compression damping piston 1

Item	Part description	Parts. No.	Pieces
70	Spacer plate 16x22x0,30	5018.0036	1
71	Spacer plate 16x24x0,25	5018.0031	1
72	Spacer plate 16x26x0,25	5018.0033	1
73	Shim 16x28x0,25	5018.0063	1
74	Shim 16x30x0,25	5018.0064	1
75	Shim 16x32x0,25	5018.0065	1
76	Shim 16x34x0,20	5018.0057	1
77	Shim 16x36x0,20	5018.0058	1
78	Shim 16x38x0,20	5018.0059	1
79	Shim 16x40x0,20	5018.0060	1
80	Shim 16x42x0,20	5018.0061	1
81	Shim 16x28x0,10	5018.0041	1
82	Shim 16x44x0,20	5018.0062	3

Rebound damping piston 1

120	Shim 16x36x0,20	5018.0058	3
121	Shim 16x28x0,10	5018.0041	1
122	Shim 16x34x0,20	5018.0057	1
123	Shim 16x32x0,20	5018.0056	1
124	Shim 16x28x0,20	5018.0054	1
125	Spacer plate 16x20x0,30	5018.0034	1

Compression damping piston 2

160	Spacer plate 10x18x0,30	3612.0314	1
161	Shim 10x19x0,30	3612.0349	1
162	Shim 10x21x0,30	3612.0350	1
163	Shim 10x23x0,25	3612.0343	1
164	Shim 10x25x0,25	3612.0344	1
165	Shim 10x27x0,25	3612.0345	1
166	Shim 10x29x0,20	3612.0338	1
167	Spacer plate 10x18x0,10	3612.0286	1
168	Shim 10x31x0,20	3612.0339	2
169	Shim 10x33x0,20	3612.0340	4

Rebound damping piston 2

190	Shim d10xd16x1	5018.0395	1
191	Shim 16x30x0,25	5018.0064	1
192	Shim 10x19x0,25	3612.0341	1

Spring

390	Spring (62) 80-250 N/mm	9121.0040	1
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Adjustments

Code	12.18.7A.10
Rebound damping position open	25
Length complete (mm)	405
Gas pressure (bar)	10
Stroke (mm)	101,5
Compression damping position open	LS 12 / HS 2
Spring preload (mm)	5

Setting list PDS 5018 BAVP Shock absorber 12.18.7A.11 KTM 250 SXS 2005

Compression damping piston 1

Item	Part description	Parts. No.	Pieces
70	Spacer plate 16x23x0,30	5018.0037	1
71	Spacer plate 16x24x0,30	5018.0038	1
72	Spacer plate 16x25x0,30	5018.0039	1
73	Spacer plate 16x26x0,25	5018.0033	1
74	Shim 16x28x0,25	5018.0063	1
75	Shim 16x30x0,25	5018.0064	1
76	Shim 16x32x0,25	5018.0065	1
77	Shim 16x34x0,20	5018.0057	1
78	Shim 16x36x0,20	5018.0058	1
79	Shim 16x38x0,25	5018.0068	1
80	Shim 16x40x0,25	5018.0069	1
81	Shim 16x42x0,20	5018.0061	1
82	Shim 16x30x0,10	5018.0042	1
83	Shim 16x44x0,20	5018.0062	4
84	Shim 16x44x0,15	5018.0053	2

Rebound damping piston 1

120	Shim 16x36x0,20	5018.0058	3
121	Spacer plate 16x26x0,10	5018.0012	1
122	Shim 16x34x0,20	5018.0057	1
123	Shim 16x32x0,20	5018.0056	1
124	Shim 16x28x0,20	5018.0054	1
125	Spacer plate 16x21x0,30	5018.0034	4

Compression damping piston 2

160	Spacer plate 10x18x0,30	3612.0314	1
161	Shim 10x19x0,30	3612.0349	1
162	Shim 10x21x0,30	3612.0350	1
163	Shim 10x23x0,25	3612.0343	1
164	Shim 10x25x0,25	3612.0344	1
165	Shim 10x27x0,25	3612.0345	1
166	Shim 10x29x0,20	3612.0338	1
167	Spacer plate 10x18x0,10	3612.0286	1
168	Shim 10x31x0,20	3612.0339	2
169	Shim 10x33x0,20	3612.0340	4

Rebound piston 2

190	Shim d10xd16x1,0	5018.0395	1
191	Shim 16x30x0,25	5018.0064	1
192	Shim 10x19x0,25	3612.0341	1

Spring

390	Spring (62) 84-250 N/mm	9121.0041	1
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Adjustments

Code	12.18.7A.11
Rebound damping position open	25
Length complete (mm)	405
Gas pressure (bar)	10
Stroke (mm)	101,5
Compression damping position open	LS 12 / HS 2,0
Spring preload (mm)	5

Setting list PDS 5018 BAVP Shock absorber 12.18.7B.11 KTM 250 SXS/SXS-F 2006

Compression damping piston 1

Item	Part description	Parts. No.	Pieces
70	Spacer plate 16x23x0,30	5018.0037	1
71	Spacer plate 16x24x0,30	5018.0038	1
72	Spacer plate 16x25x0,30	5018.0039	1
73	Spacer plate 16x26x0,25	5018.0033	1
74	Shim 16x28x0,25	5018.0063	1
75	Shim 16x30x0,25	5018.0064	1
76	Shim 16x32x0,25	5018.0065	1
77	Shim 16x34x0,25	5018.0066	1
78	Shim 16x36x0,25	5018.0067	1
79	Shim 16x38x0,25	5018.0068	1
80	Shim 16x40x0,25	5018.0069	1
81	Shim 16x42x0,20	5018.0061	1
82	Shim 16x30x0,10	5018.0042	1
83	Shim 16x44x0,20	5018.0062	4
84	Shim 16x44x0,15	5018.0053	2

Rebound damping piston 1

120	Shim 16x36x0,20	5018.0058	3
121	Spacer plate 16x26x0,10	5018.0012	1
122	Shim 16x34x0,20	5018.0057	1
123	Shim 16x32x0,20	5018.0056	1
124	Shim 16x28x0,20	5018.0054	1
125	Spacer plate 16x21x0,30	5018.0035	4

Compression damping piston 2

160	Spacer plate 10x18x0,30	3612.0314	1
161	Shim 10x19x0,30	3612.0349	1
162	Shim 10x21x0,30	3612.0350	1
163	Shim 10x23x0,25	3612.0343	1
164	Shim 10x25x0,25	3612.0344	1
165	Shim 10x27x0,25	3612.0345	1
166	Shim 10x29x0,20	3612.0338	1
167	Spacer plate 10x18x0,10	3612.0286	1
168	Shim 10x31x0,20	3612.0339	2
169	Shim 10x33x0,20	3612.0340	4

Rebound damping piston 2

190	Shim d10xd16x1,0	5018.0395	1
191	Shim 16x30x0,25	5018.0064	1
192	Shim 10x19x0,25	3612.0341	1

Spring

390	Spring (62) 84-250 N/mm		1
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Adjustments

Code	12.18.7B.11
Rebound damping position open	25
Length complete (mm)	405
Gas pressure (bar)	10
Stroke (mm)	101,5
Compression damping position open	LS 12 / HS 2
Spring preload (mm)	5

Setting list PDS 5018 BAVP Shock absorber 12.18.7A.12 KTM 450/540 SXS 2005

Compression damping piston 1

Item	Part description	Parts. No.	Pieces
70	Spacer plate 16x23x0,30	5018.0037	1
71	Spacer plate 16x24x0,30	5018.0038	1
72	Spacer plate 16x25x0,30	5018.0039	1
73	Spacer plate 16x26x0,25	5018.0033	1
74	Shim 16x28x0,25	5018.0063	1
75	Shim 16x30x0,25	5018.0064	1
76	Shim 16x32x0,25	5018.0065	1
77	Shim 16x34x0,25	5018.0066	1
78	Shim 16x36x0,25	5018.0067	1
79	Shim 16x38x0,25	5018.0068	1
80	Shim 16x40x0,25	5018.0069	1
81	Shim 16x42x0,20	5018.0061	1
82	Shim 16x30x0,10	5018.0042	1
83	Shim 16x44x0,20	5018.0062	5
84	Shim 16x44x0,15	5018.0053	3

Rebound damping piston 1

120	Shim 16x36x0,20	5018.0058	3
121	Spacer plate 16x26x0,10	5018.0012	1
122	Shim 16x34x0,20	5018.0057	1
123	Shim 16x32x0,20	5018.0056	1
124	Shim 16x28x0,20	5018.0054	1
125	Spacer plate 16x21x0,30	5018.0034	4

Compression damping piston 2

160	Backpl 10x18x0,30	3612.0314	1
161	Shim 10x19x0,30	3612.0349	1
162	Shim 10x21x0,30	3612.0350	1
163	Shim 10x23x0,25	3612.0343	1
164	Shim 10x25x0,25	3612.0344	1
165	Shim 10x27x0,25	3612.0345	1
166	Shim 10x29x0,20	3612.0338	1
167	Spacer plate 10x18x0,10	3612.0286	1
168	Shim 10x31x0,20	3612.0339	2
169	Shim 10x33x0,20	3612.0340	4

Rebound damping piston 2

190	Shim d10xd16x1,0	5018.0395	1
191	Shim 16x30x0,25	5018.0064	1
192	Shim 10x19x0,25	3612.0341	1

Spring

390	Spring (62) 88-250 N/mm	9121.0042	1
-----	-------------------------	-----------	---

Adjustments

Code	12.18.7A.12
Rebound damping position open	25
Length complete (mm)	405
Gas pressure (bar)	10
Stroke (mm)	101,5
Compression damping position open	LS 12 / HS 2
Spring preload (mm)	5

Setting list PDS 5018 BAVP Shock absorber 12.18.7B.12 KTM 450/540 SXS 2006

Compression damping piston 1

Item	Part description	Parts. No.	Pieces
70	Spacer plate 16x23x0,30	5018.0037	1
71	Spacer plate 16x24x0,30	5018.0038	1
72	Spacer plate 16x25x0,30	5018.0039	1
73	Spacer plate 16x26x0,25	5018.0033	1
74	Shim 16x28x0,25	5018.0063	1
75	Shim 16x30x0,25	5018.0064	1
76	Shim 16x32x0,25	5018.0065	1
77	Shim 16x34x0,25	5018.0066	1
78	Shim 16x36x0,25	5018.0067	1
79	Shim 16x38x0,25	5018.0068	1
80	Shim 16x40x0,25	5018.0069	1
81	Shim 16x42x0,20	5018.0061	1
82	Shim 16x30x0,10	5018.0042	1
83	Shim 16x44x0,20	5018.0062	5
84	Shim 16x44x0,15	5018.0053	3

Rebound damping piston 1

120	Shim 16x36x0,20	5018.0058	3
121	Spacer plate 16x26x0,10	5018.0012	1
122	Shim 16x34x0,20	5018.0057	1
123	Shim 16x32x0,20	5018.0056	1
124	Shim 16x28x0,20	5018.0054	1
125	Spacer plate 16x21x0,30	5018.0034	4

Compression damping piston 2

160	Spacer plate 10x18x0,30	3612.0314	1
161	Shim 10x19x0,30	3612.0349	1
162	Shim 10x21x0,30	3612.0350	1
163	Shim 10x23x0,30	3612.0343	1
164	Shim 10x25x0,25	3612.0344	1
165	Shim 10x27x0,25	3612.0345	1
166	Shim 10x29x0,20	3612.0338	1
167	Spacer plate 10x18x0,10	3612.0286	1
168	Shim 10x31x0,20	3612.0339	2
169	Shim 10x33x0,20	3612.0340	4

Rebound damping piston 2

190	Shim d10xd16x1,0	5018.0395	1
191	Shim 16x30x0,25	5018.0064	1
192	Shim 10x19x0,25	3612.0341	1

Spring

390	Spring (62) 88-250 N/mm	9121.0042	1
-----	-------------------------	-----------	---

Adjustments

Code	12.18.7B.12
Rebound damping position open	25
Length complete (mm)	405
Gas pressure (bar)	10
Stroke (mm)	101,5
Compression damping position open	LS 12 / HS 2
Spring preload (mm)	5

Setting list PDS 5018 BAVP Shock absorber 12.18.7B.15 KTM 450/560 SMR 2006**Compression damping piston 1**

Item	Part description	Parts. No.	Pieces
70	Spacer plate 16x22x0,30	5018.0036	1
71	Shim 16x30x0,20	5018.0055	1
72	Shim 16x32x0,20	5018.0056	1
73	Shim 16x34x0,20	5018.0057	1
74	Shim 16x36x0,20	5018.0058	1
75	Shim 16x38x0,25	5018.0068	1
76	Shim 16x40x0,25	5018.0069	1
77	Shim 16x42x0,25	5018.0070	1
78	Shim 16x44x0,25	5018.0071	3

Rebound damping piston 1

120	Shim 16x36x0,20	5018.0058	1
121	Spacer plate 36x32,25x0,30	4681.1637	1
122	Shim 16x32x0,20	5018.0056	1
123	Shim 16x36x0,20	5018.0058	3
124	Spacer plate 16x21x0,30	5018.0035	1

Compression damping piston 2

160	Shim 16x32x0,30	5018.0074	1
161	Shim 16x34x0,30	5018.0075	1
162	Shim 16x36x0,30	5018.0076	1
163	Shim 16x38x0,30	5018.0077	1
164	Shim 16x40x0,30	5018.0078	1
165	Shim 16x42x0,30	5018.0079	1
166	Shim 16x44x0,30	5018.0080	1

Rebound damping piston 2

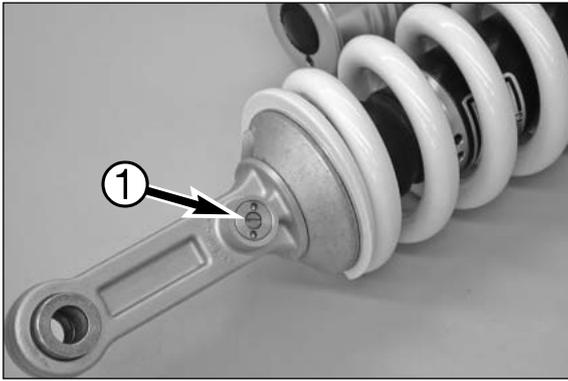
190	Shim d16xd21x1,0	5018.0210	1
191	Shim 21x36x0,25	5018.0209	1
192	Shim 16x28x0,20	5018.0054	1

Spring

390	Spring (62) 88-250 N/mm	9121.0050	1
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Adjustments

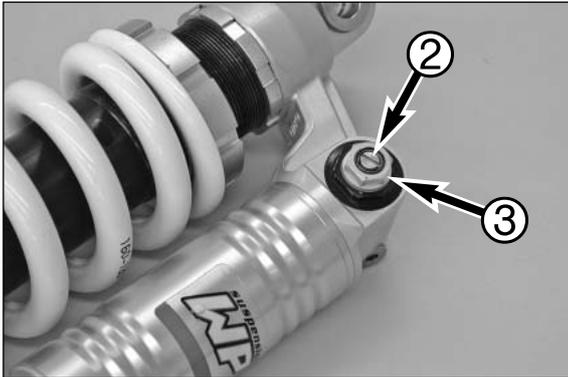
Code	12.18.7B.15
Rebound damping position open	19
Length complete (mm)	397
Gas pressure (bar)	10
Stroke (mm)	93,5
Compression damping position open	LS 13 / HS 2
Spring preload (mm)	5



Adjusting the position of the compression and rebound damping

Rebound damping:

- Turn in the adjusting screw ❶ in a clockwise direction all the way to the stop.
- Turn back the respective number of clicks in a counterclockwise direction.

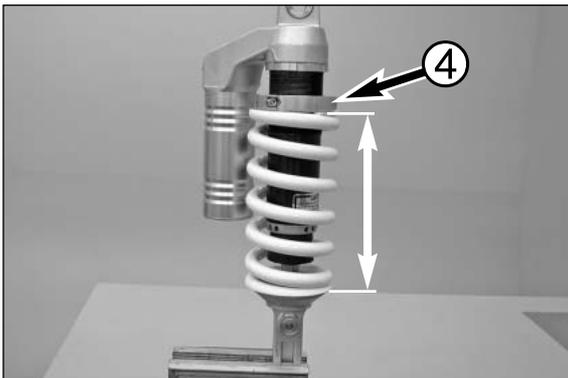


Compression damping, low speed:

- Turn in the adjusting screw ❷ in a clockwise direction all the way to the stop.
- Turn back the respective number of clicks in a counterclockwise direction.

Compression damping, high speed:

- Turn in the adjusting screw ❸ in a clockwise direction all the way to the stop.
- Turn back the respective number of clicks in a counterclockwise direction.



Adjusting the spring preload

NOTE: the spring preload is the difference between the unloaded and preloaded length of the spring.

- Tighten the adjusting nut ❹ with the special tool T106 until you have the prescribed spring preload.
- Tighten the lock screw on the adjusting nut.

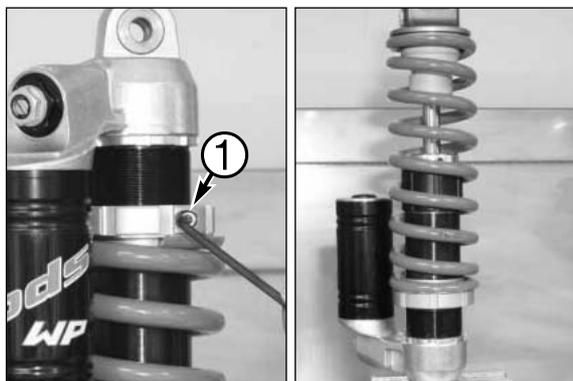
Recommended periodic maintenance and inspection of the 5018 SXS/SMR Shock absorber

A 100 liter fuel consumption is equivalent to approx. 15 operating hours	10 hours 65 liter	20 hours 130 liter	30 hours 200 liter	40 hours 260 liter	50 hours 325 liter	60 hours 400 liter	70 hours 455 liter	80 hours 520 liter	90 hours 600 liter	100 hours 665 liter
Check the bearing in the shock absorber top / replace if necessary				●				●		
Check the piston rod on scratches / leakage	●	●	●	●	●	●	●	●	●	●
Check the static sag - before riding										
Check the spring					●					●
Check the bump rubber					●					●
Check the O-ring of the spring retainer / replace if necessary	●		●		●		●		●	
Complete maintenance of the shock absorber		●				●				●

DISASSEMBLING AND ASSEMBLING THE SHOCK ABSORBER 3

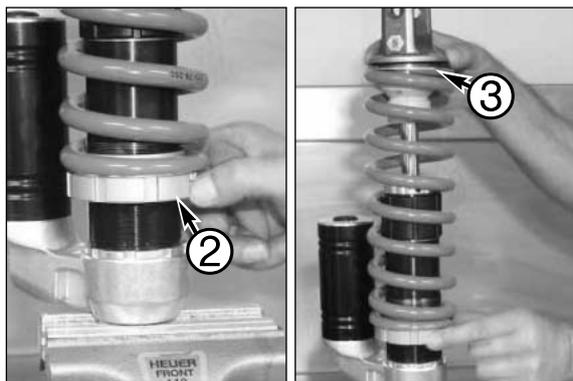
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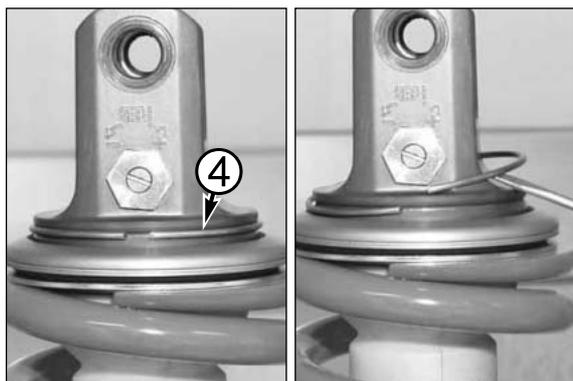


Disassembling the shock absorber

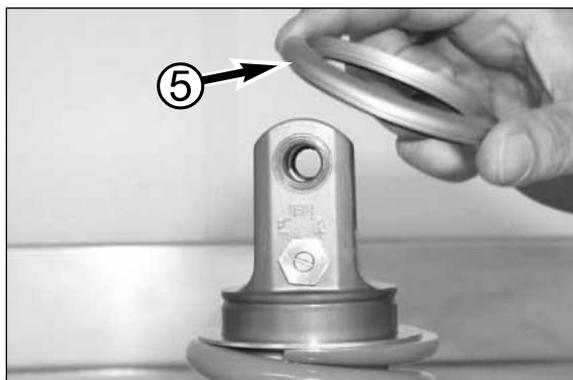
- Unscrew the Allen bolt **1** of the spring retainer (Size 5).
- Place the shock absorber in the vice according to the picture.



- Screw the spring retainer **2** downwards.
- Push the spring retainer **3** downwards so that you are able to remove the springring **4**.



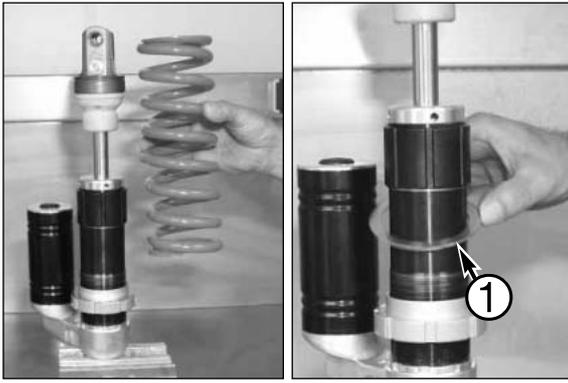
- Disassemble the spring ring.



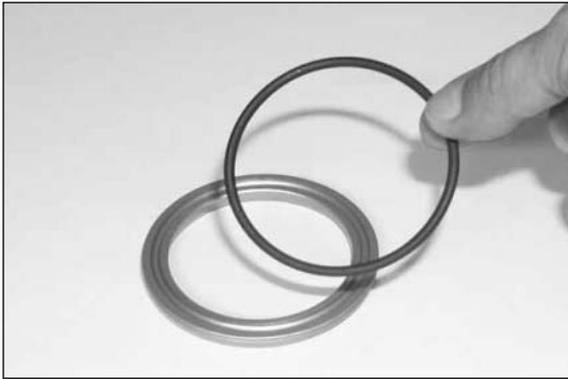
- Remove the spring retainer **5**.



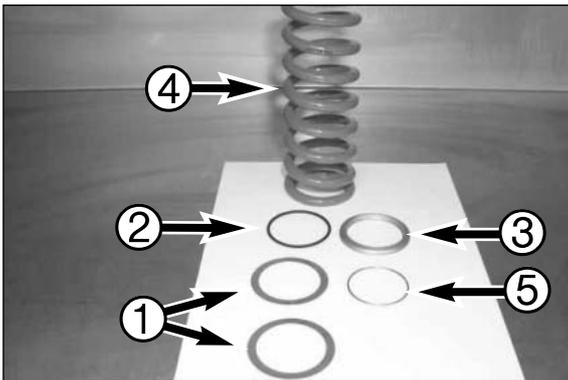
- Remove the washer.



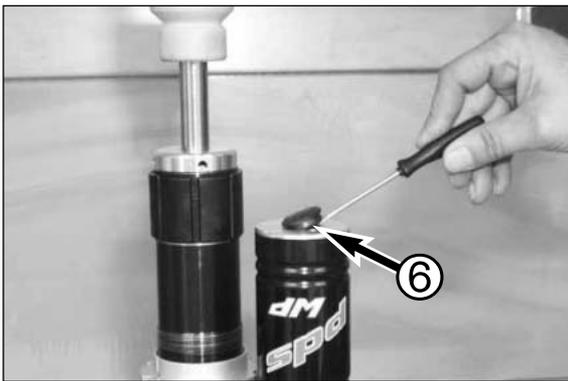
- Remove the spring.
- Remove the second washer ❶.



- Disassemble the O-ring out of spring retainer.

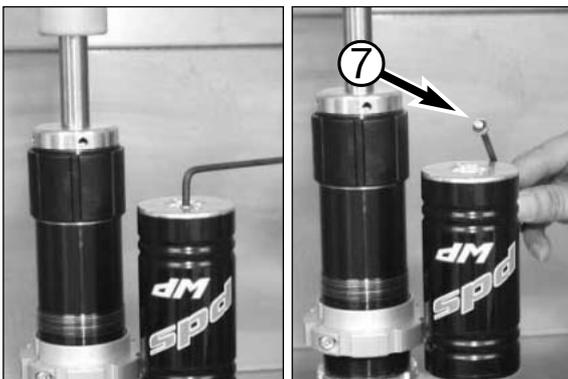


- Lock washer ❺
- Spring ❹
- Spring retainer ❸
- O-Ring ❷
- Washers ❶

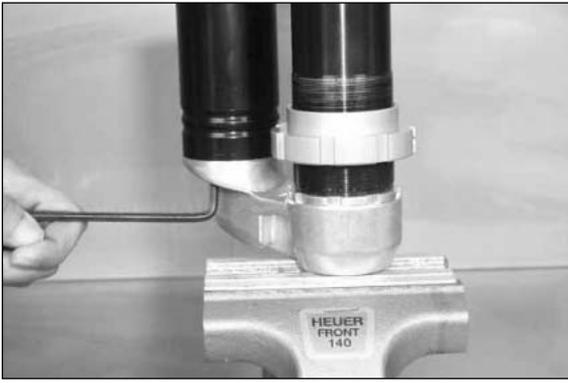


- Disassemble the rubber plug ❻ “do not open” out of the screw cap of the nitrogen reservoir.

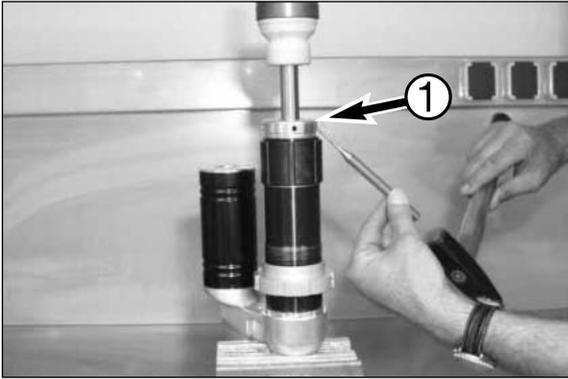
NOTE: the SXS/SMR shock absorber does not have a rubber cap.



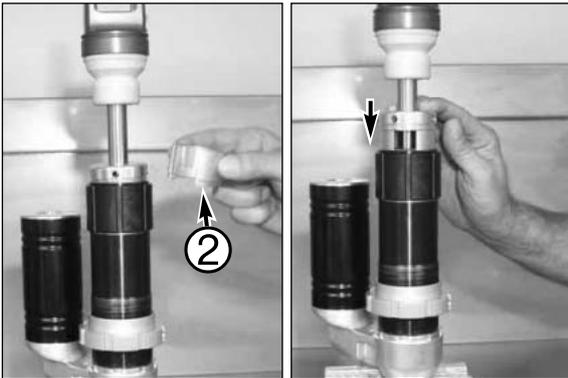
- Slowly loosen the nitrogen filling plug ❼ (Size 4). This will cause the nitrogen pressure to build up.
- Pay attention to the O-ring of the nitrogen filling plug.



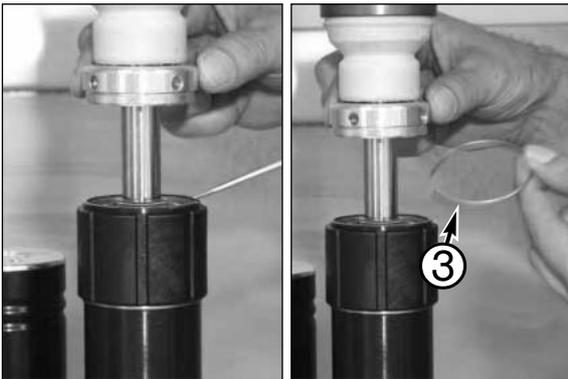
- Unscrew the oil filling plug for about two turns. (size 5)
This will help you later by removing the piston rod "complete" out of the shock absorber!



- Tap the cap ❶ from the tube.



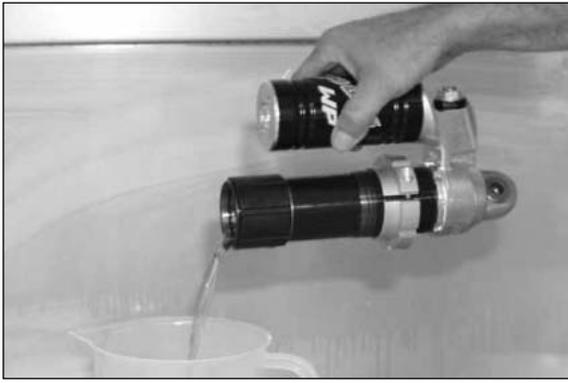
- Place disassembling bush T 1216 ❷ on the adaptor DU-bush and push the adaptor DU-bush downwards.



- Disassemble the spring ring ❸ out of the groove of the tube.



- Pull careful but firmly the piston rod "complete" out of the tube.
NOTE: usually takes a great deal of effort

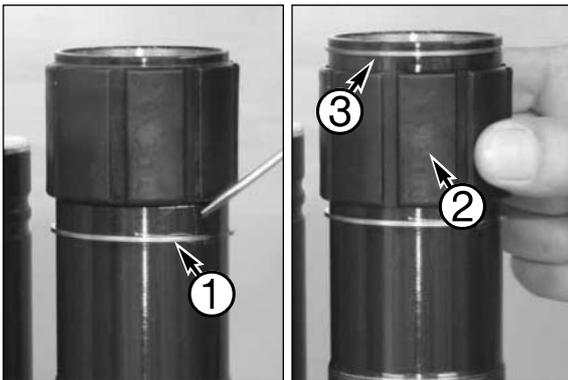


Disassembling the tube side

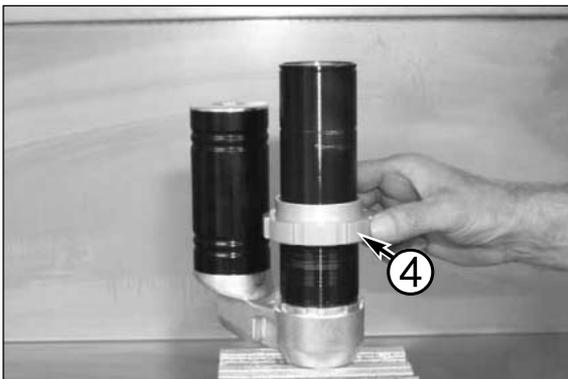
- Drain the oil out of the tube.



- Clamp the tube side in the vice according to the picture.



- Remove the spring ring ❶ out of the groove and slide it downwards.
- Slide the guiding bush ❷ downwards.
- Remove the upper spring ring ❸.
- Remove the guiding bush.
- Remove the springring.

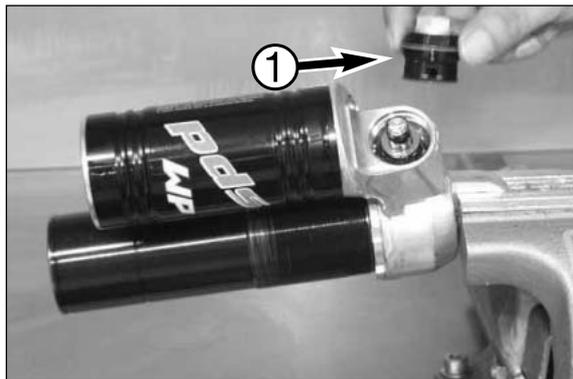


- Turn the screw retainer ❹ of the tube.



- Clamp the tube side in the vice according to the picture.
- Unscrew the screw cap ❶ of the DCC out of the shock absorber housing (size 24).

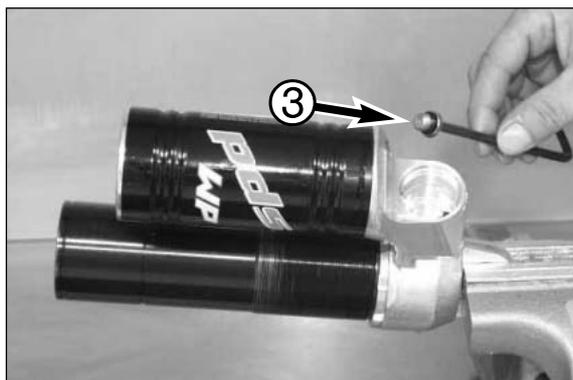
NOTE: DDC = Dual Compression Control.



- Remove the screw cap ❶.



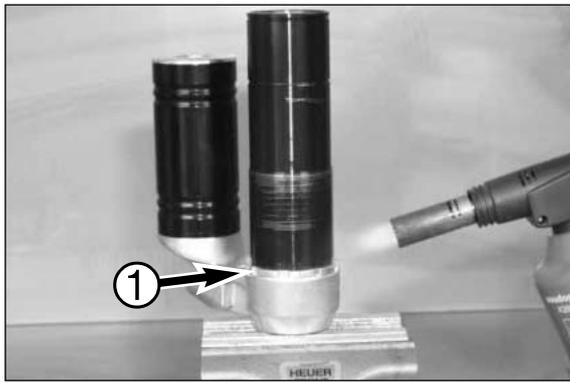
- Pull the DCC mechanism ❷ out of the shock absorber housing.



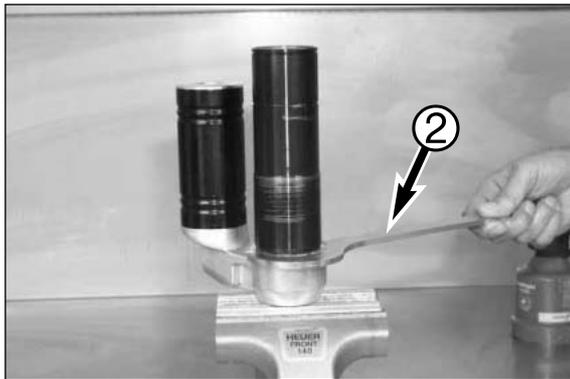
- Turn the oil filling plug ❸ out of the shock absorber housing (AH, Größe 5).



- Remove the sticker ❹.



- Heat the shock absorber housing ❶ near the tube.



- Unscrew the lock ring several turns with T 1233 ❷.



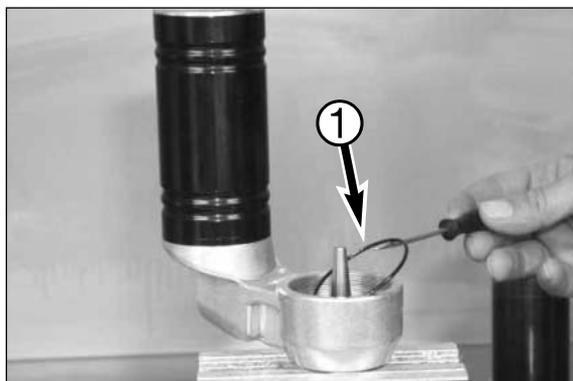
- Clean the tube with brake cleaner.
- Heat the shock absorber housing near the tube.
- Unscrew the tube out of the bottom with slide-spanner T 146 and bush T 1201.



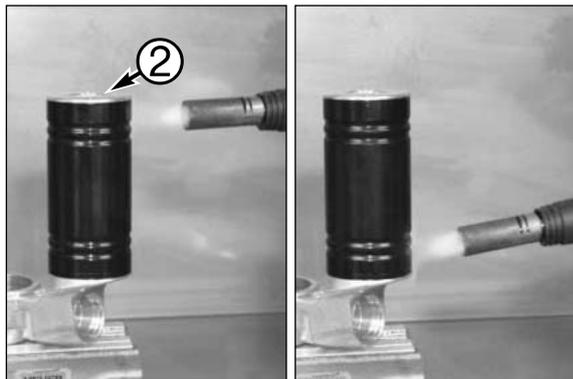
- Screw the tube out of the shock absorber housing.



- SXS/SMR models only: tap sleeve ❸ out of the pipe

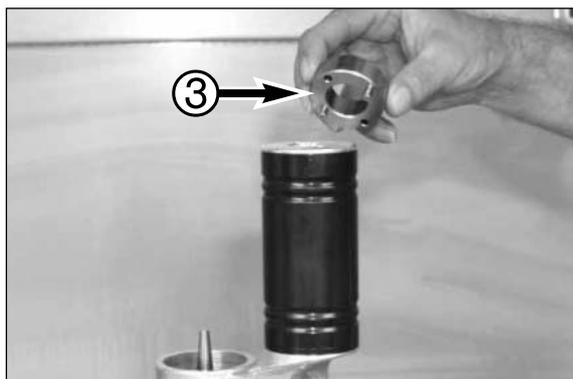


- Remove the O-ring **1** inside the shock absorber housing out of the groove.

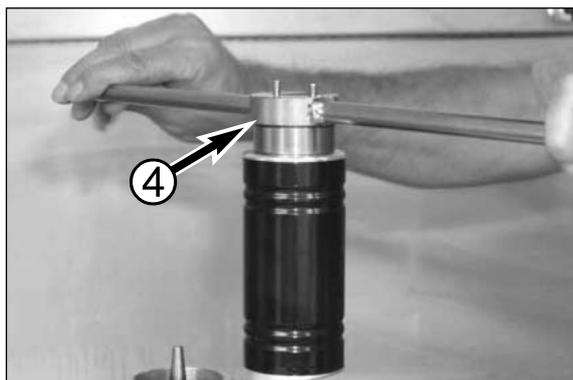


NOTE: only when you want to disassemble the screw cap of the nitrogen reservoir **2**!

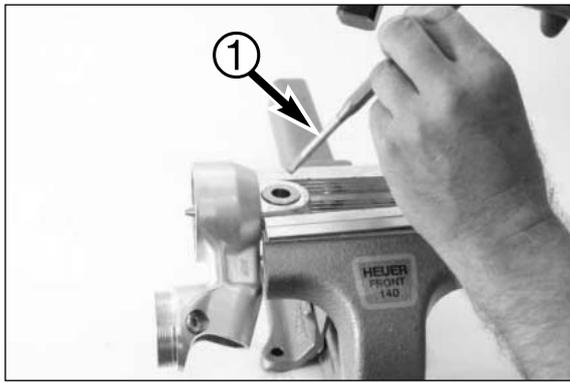
- Heat the nitrogen reservoir near the screw cap.



- Place T 145S **3** on the screw cap.

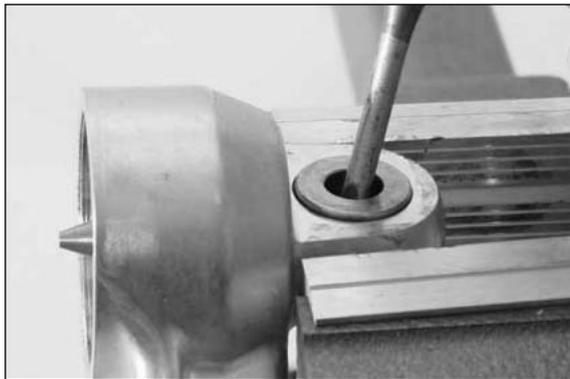


- Place T 125S **4** on T 145S and unscrew the nitrogen reservoir.
- Remove the O-ring.

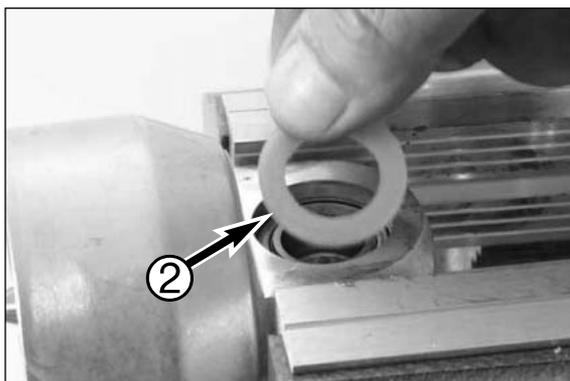


Disassembling adaptor bushes and heim joint

- Clamp the shock absorber housing in the vice.
- Use Disassembling tool T 120 ❶ for disassembling the adaptor bushes.



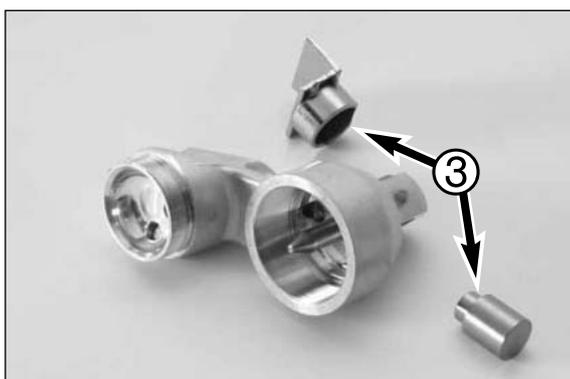
- Tap the adaptor bush out of the heim joint.



- Remove the seal ❷.



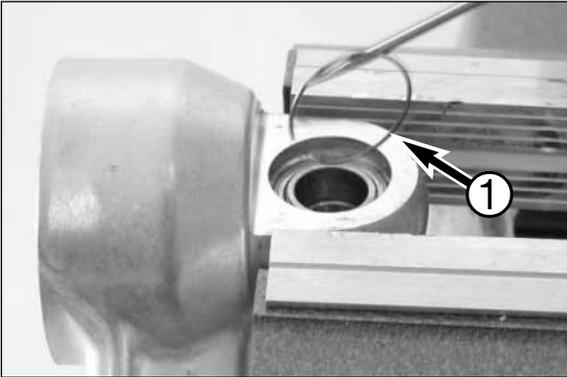
- Tap the other adaptor bush out of the shock absorber housing and remove the seal.



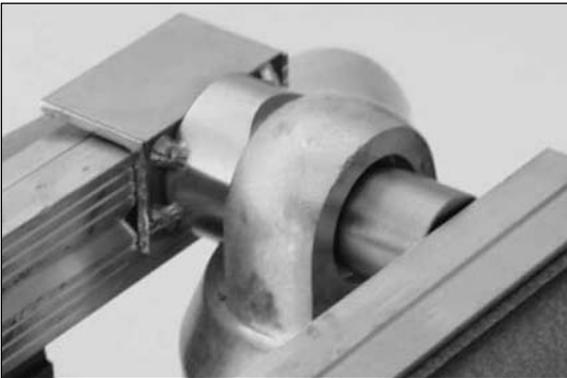
- Use dis- / assembling tool T 1207S (A+B) ❸.



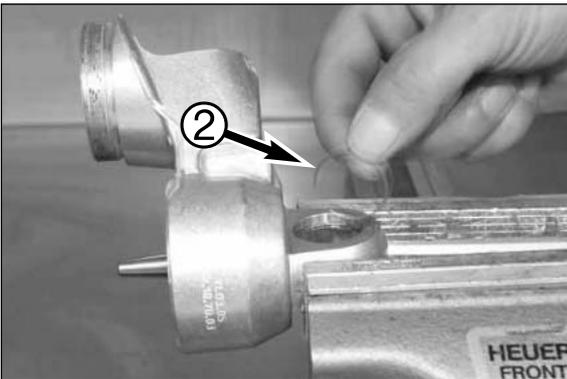
- Press the heim joint against the springring.



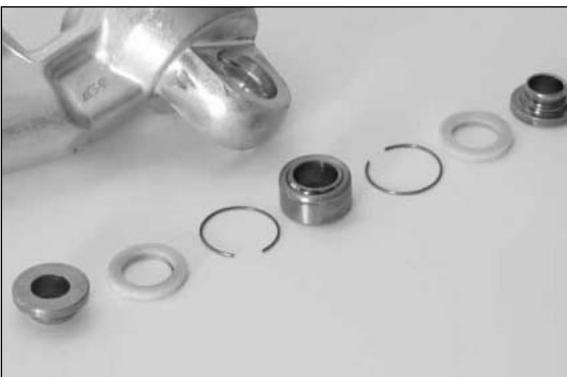
- Disassemble the springring ①.



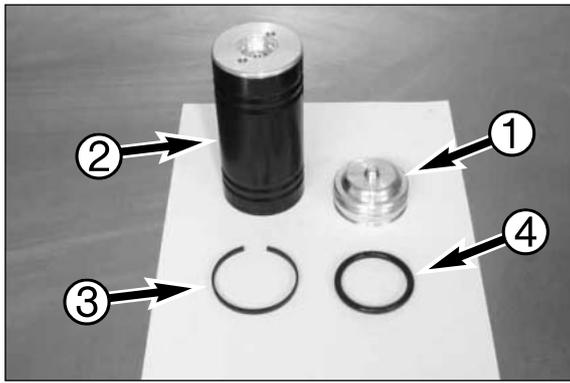
- Press the heim joint out of the shock absorber housing.



- Disassemble the other spring ring ②.



- Individual parts of the heim joint.



Disassembling the nitrogen reservoir

- Push the dividing piston ① out of the reservoir ②.
- Remove the piston ring ③.
- Remove the O-ring ④ out of the groove of the separation piston.



Assembling the nitrogen reservoir

- Check the inner side of the nitrogen reservoir for scratches.



- Apply the groove of the separation.
- Assemble the O-ring in the groove.
- Apply the O-ring with T 158.



- Apply the running surface of the nitrogen reservoir with a little bit of T158.
- Assemble the separation piston.

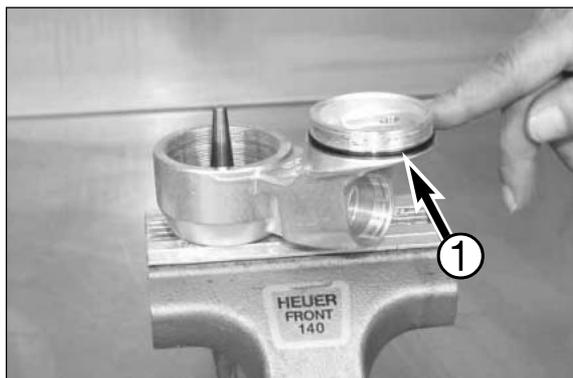
NOTE: the reservoir has an identification groove that must be mounted facing the shock absorber housing.

- Push the separation piston further into the nitrogen reservoir.

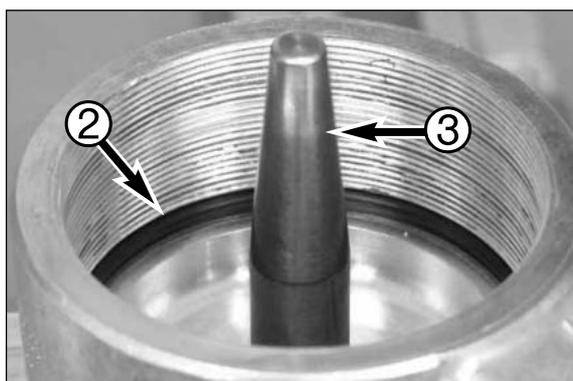


Assembling the tube side

- Clean the thread of the nitrogen reservoir.



- Place the new O-ring **1** in the groove of the shock absorber housing.

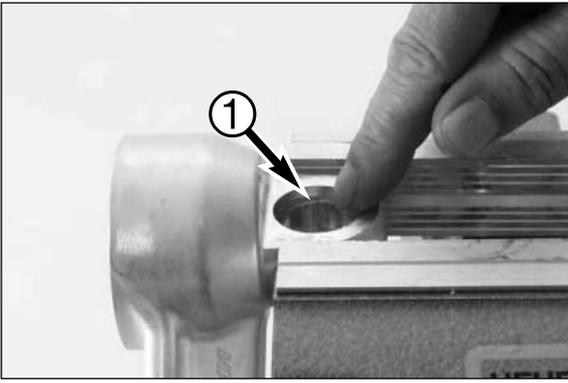


- Assemble the O-ring **2** inside the groove of the shock absorber housing.

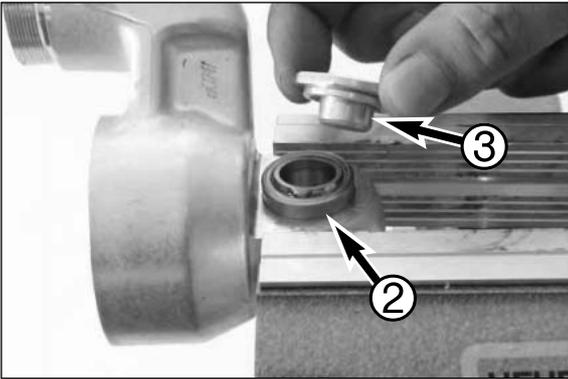
NOTE: the SXS/SMR shock absorber does not have the needle **3**.

Assembling adaptor bushes and heim joint

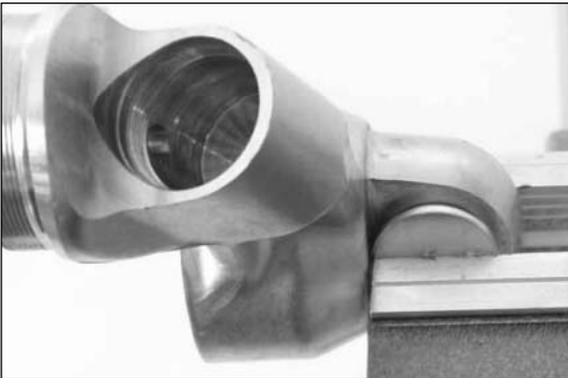
- Place the spring ring ① in the shock absorber housing.



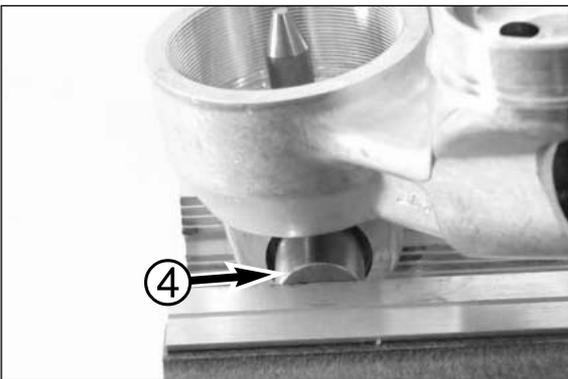
- Assemble the heim joint ② with the bevelled edge into the direction of the shock absorber housing with assembling tool T 1206 ③.



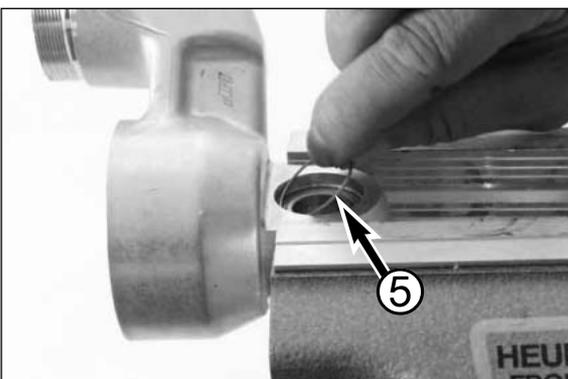
- Press the heim joint into the shock absorber housing.

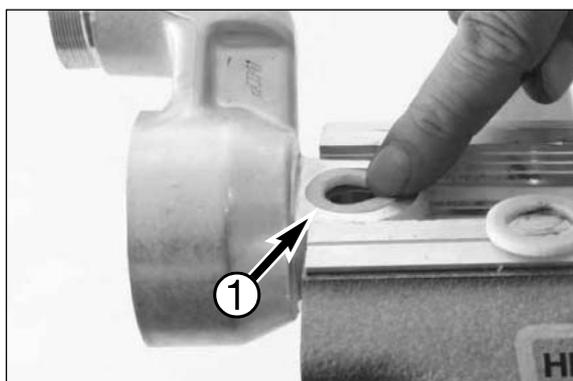


- Press with T 1207(A) the heim joint ④ against the spring ring.

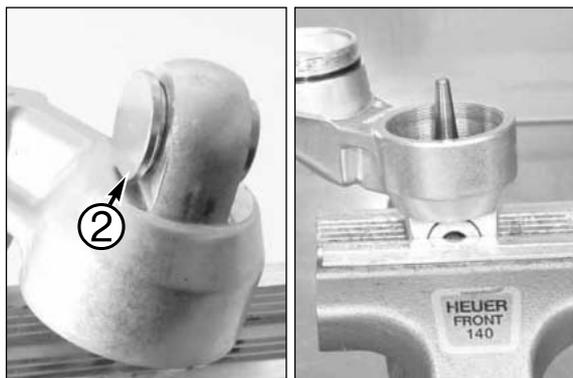


- Assemble the spring ring ⑤.





- Assemble both seals ①.

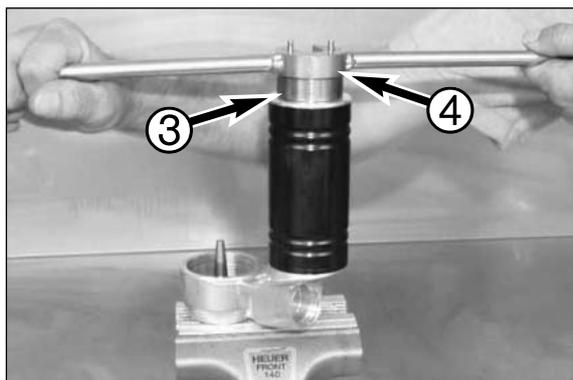


- Assemble one adaptor bush with support of T 1206 ② in the heim joint.
- Press the other adaptor bush with support of the vice in the heim joint.



Mounting the reservoir

- Wet the thread of the shock absorber housing with T 132.



- Screw the nitrogen reservoir on the shock absorber housing and tighten it with T 145S ③ and T 125S ④.



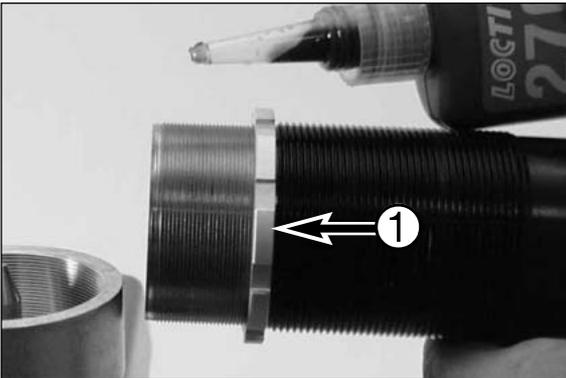
Inspection of the tube

- Inspect the running surface of the tube. If necessary polish the running surface with sandpaper 600.



- Measure the inner diameter at both ends and in the center of the pipe.

The maximum diameter is: 50,12mm



Mounting the pipe

- Screw the lock ring ❶ as far as possible on the thread or the tube.
- Wet the thread of the tube with T 132.

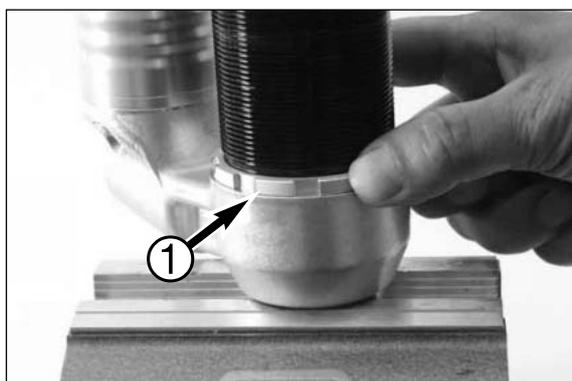


SXS/SMR shock absorber only:

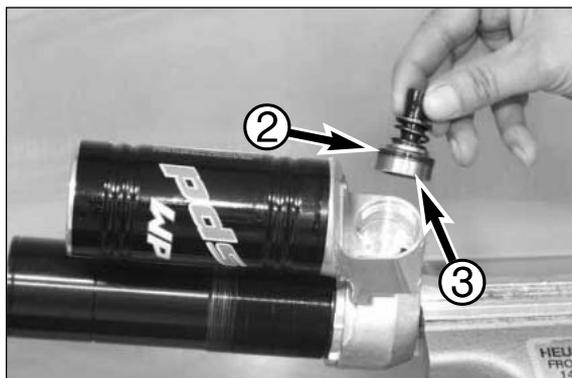
- Mount the sleeve ❷.



- Screw the tube into the shock absorber housing.
- Tighten the tube with T 146 and T 1201.



- Screw the lock ring ① against the shock absorber housing and tighten it with T 1233.

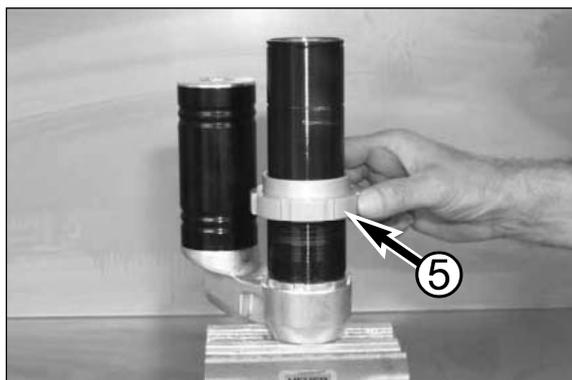


Mounting the DCC mechanism

- Wet the O-ring ② with T 158.
- Place the DCC mechanism ③ in the shock absorber housing.

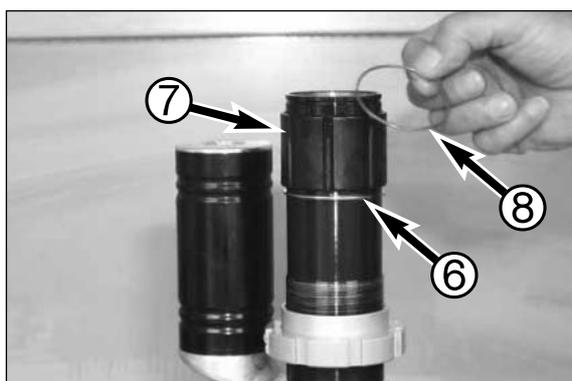


- Turn the screw cap ④ in the the shock absorber housing.
- Tighten the screw cap to a torque of 50 Nm.



Assembling the shock absorber body

- Screw the Allen bolt in the screw retainer ⑤ and assemble the screw retainer on the tube.



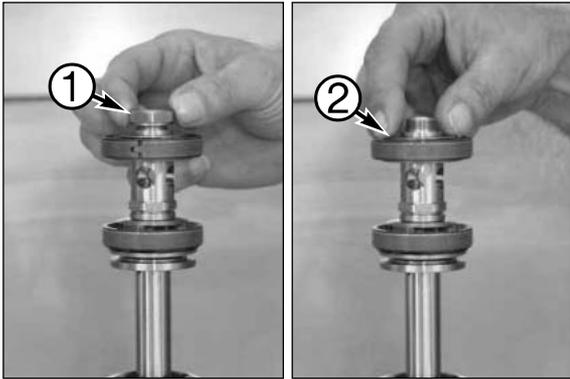
- Assemble the springing ⑥ past the second groove.
- Assemble the guiding bush ⑦.
- Assemble the spring ring ⑧ in the upper groove of the tube.
- Slide the guiding bush over the upper spring ring and place the second spring ring ⑥ in the groove.



Filling the shock absorber body

- Fill the tube till approximately 10 mm under the inner side spring ring groove of the tube.

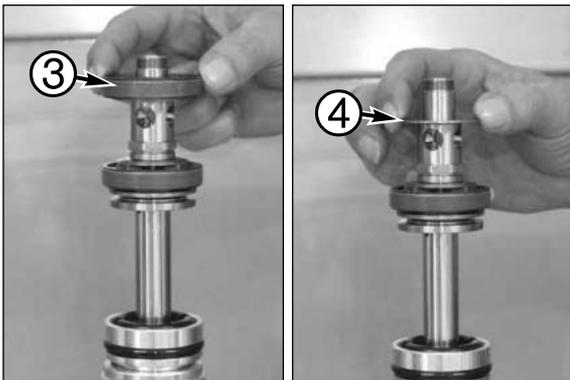
NOTE: only use the specified oil.



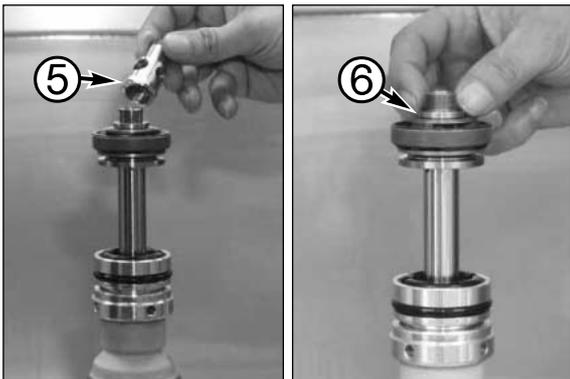
Disassembling the piston rod (does not apply to SXS/SMR)

- Untighten the piston rod nut ① with spanner size 22 mm.

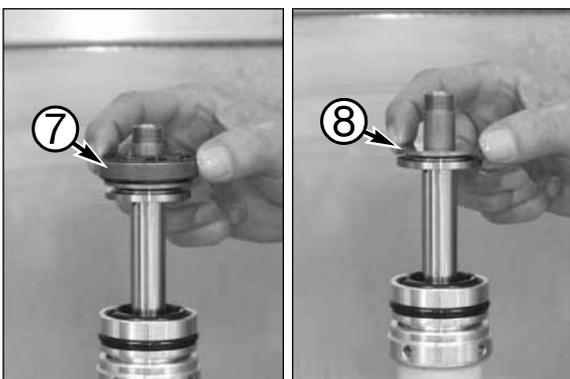
- Remove the piston rod nut.
- Remove the rebound setting ②.



- Remove the piston ③ (“piston 2”).
- Remove the compression setting ④.



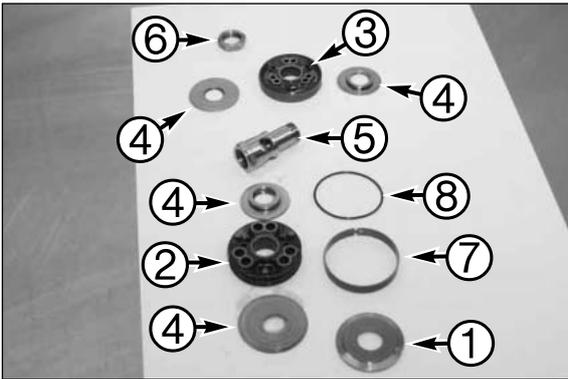
- Untighten the piston rod tap ⑤ (Size 22).
- Screw the piston rod tap of the piston rod.
- Remove the rebound setting ⑥.



- Remove the piston ⑦ (“piston 1”).
- Remove the compression setting ⑧.



- Remove the rebound disc **1**.



- Rebound disc **1**
- Piston 1 **2**
- Piston 2 **3**
- Settings **4** (rebound and compression)
- Piston rod tap **5**
- Piston rod nut **6**
- Piston ring(s) **7**
- O-ring(s) **8**

Disassembling the piston rod (for SXS/SMR only)

– Loosen the nut on the piston rod ❶ with a 17 mm wrench.

– Remove the nut from the piston rod.

– Remove the shims from the rebound ❷.

NOTE: the lower large shim is centered with a smaller shim

– Remove the piston ("piston 2") ❸.

NOTE: the compression shims usually stick to the piston.

– Remove the set of shims from the compression damping ❹ together with the compression disk.

– Loosen and remove the adapter ❺ (A/F 13).

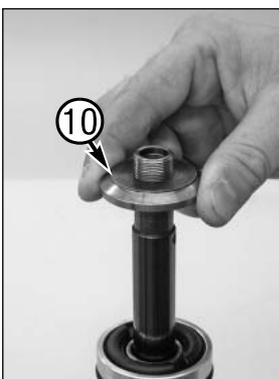
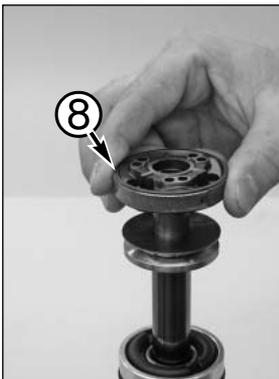
– Loosen and remove the piston rod nut ❻ (A/F 22).

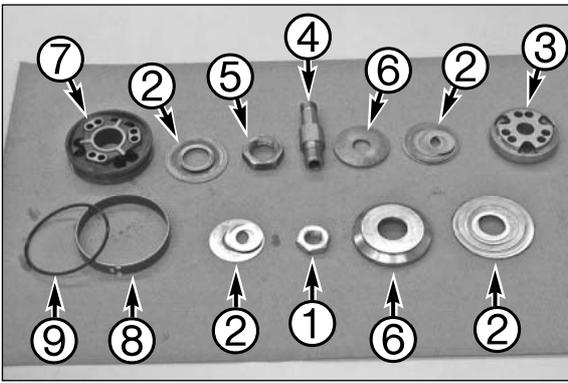
– Remove the set of shims from the rebound ❼.

– Remove the piston ("piston 1") ❽.

– Remove the set of shims from the compression ❾.

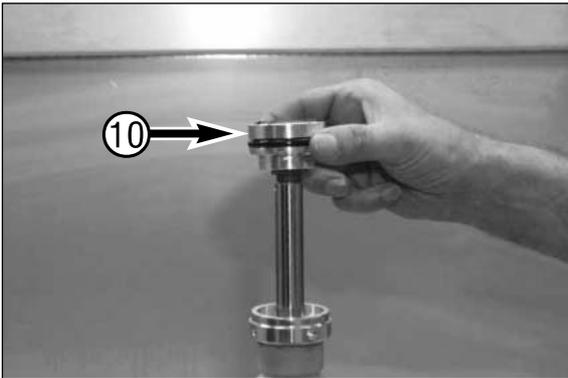
– Remove the rebound disk ❿.





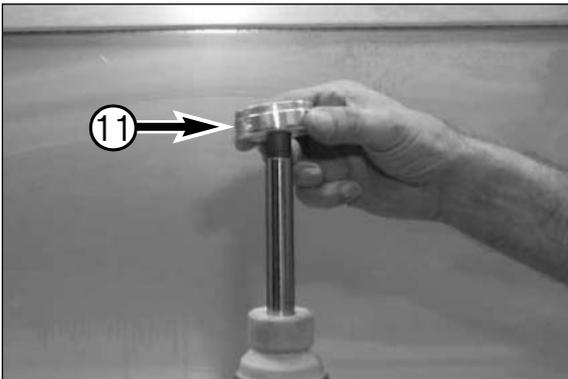
- Piston rod nut A/F 17 ❶
- Set of shims ❷ (rebound and compression damping)
- Piston ("2") ❸
- Adapter ❹
- Piston rod nut A/F 22 ❺
- Rebound disk ❻
- Piston ("1") ❼
- Piston ring ❽
- O-ring ❾

Art.Nr.: 3.211.139-E

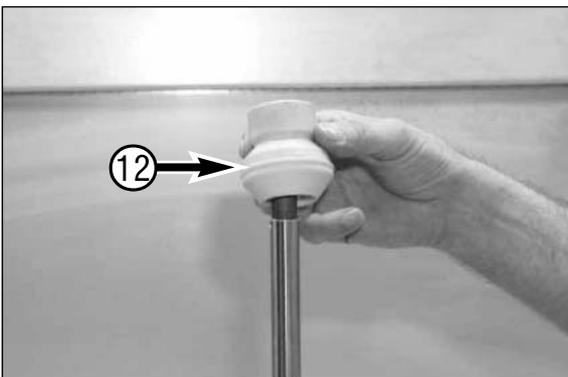


- Slide the DU-bush adaptor ❿ from the piston rod.

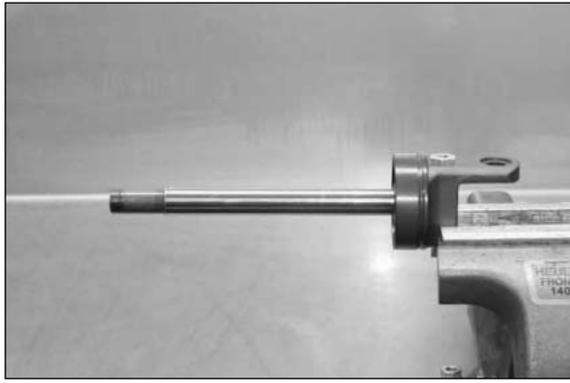
Workshop Manual WP 5018 DCC 2006 with SXS/SMR 2005/06



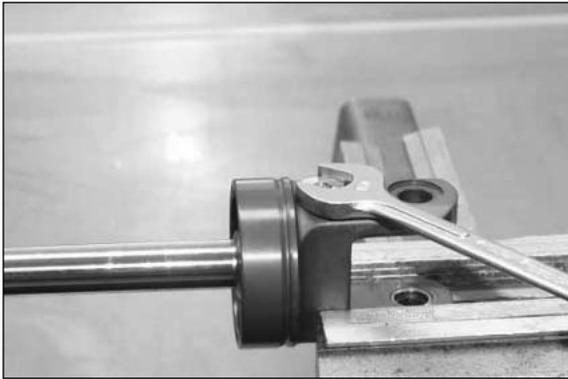
- Remove the cap ⓫.



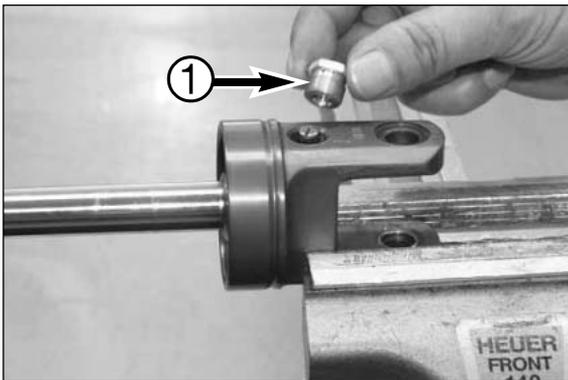
- Remove the bump rubber ⓬.



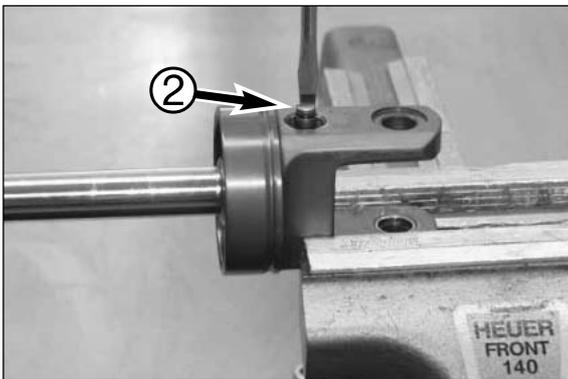
- Clamp the piston rod in the vice according to the picture.



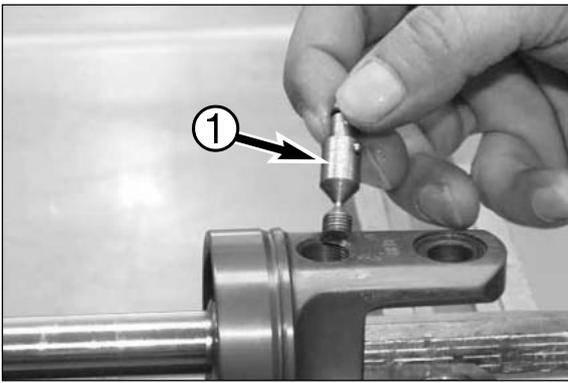
- Unscrew the screw cap ❶ of the rebound adjustment.



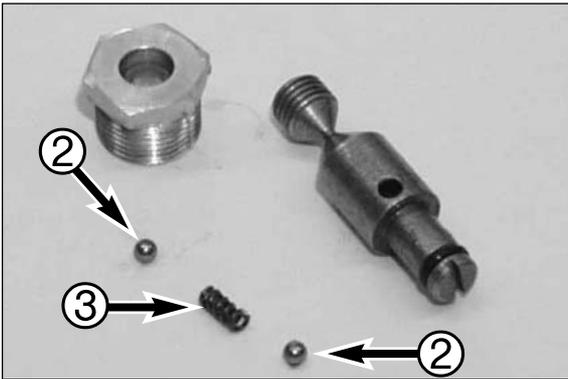
- Remove the screw cap ❶.



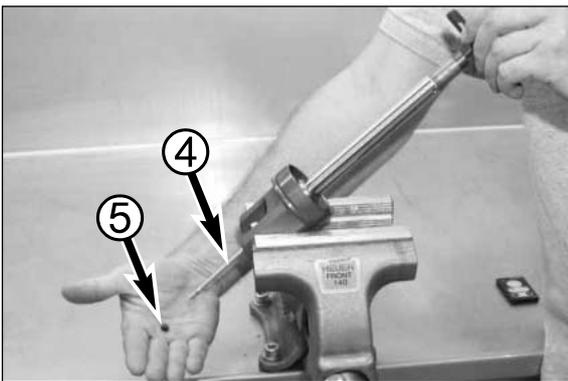
- Turn anti clockwise the rebound adjustment screw ❷ out of the mounting fork.



- Remove the rebound adjustment screw ①.
- Pay attention to the steel balls ② and spring ③.



- Parts of the rebound adjustment screw.



- Push with a pin (size 2,5mm) the rebound adjustment needle ④ through the mounting fork out of the piston rod.
- Pay attention to the rubber plug ⑤ of the mounting fork.

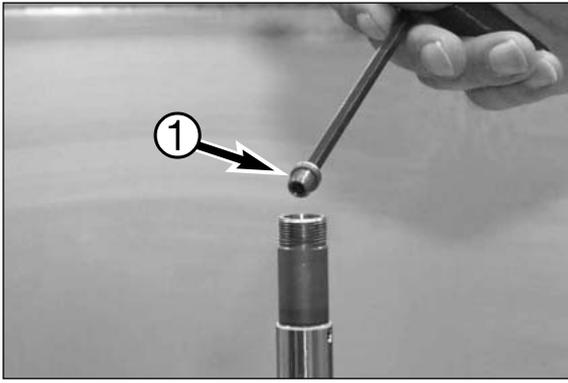


- Heat the top of piston rod according to the picture.



- Place Allen key (size 5) in the piston rod and unscrew the seat.

NOTE: SXS/SMR with HH, A/F 13



- Remove the seat ❶ - does not apply to SXS/SMR
- Always assemble a new O-ring on the seat.



- Heat the lock nut of the piston rod/mounting fork.



- Unscrew the lock nut, (Size 24)



- Clamp the piston rod in clamping block T 1202S.



- Heat the mounting fork.



- Untighten the mounting fork.



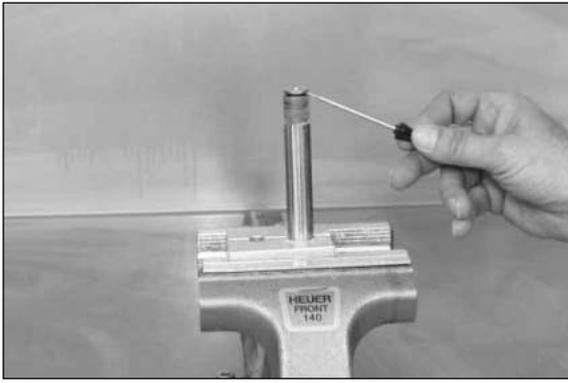
- Remove the mounting fork.



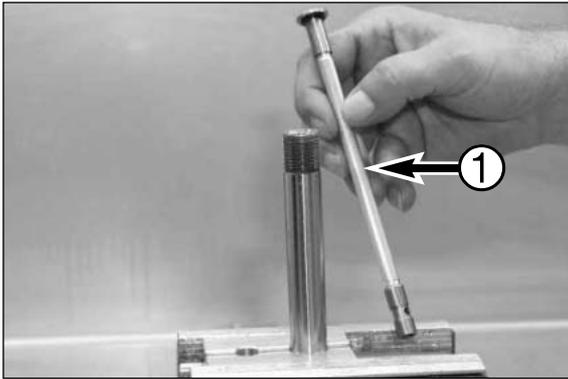
- Brush the thread of the piston rod clean.



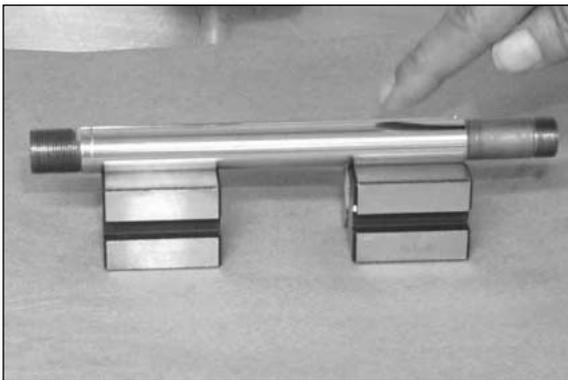
- Unscrew the lock nut.
- Remove the lock nut.



- Disassemble the rebound adjustment tube - does not apply to SXS/SMR
- Always assemble a new O-ring!

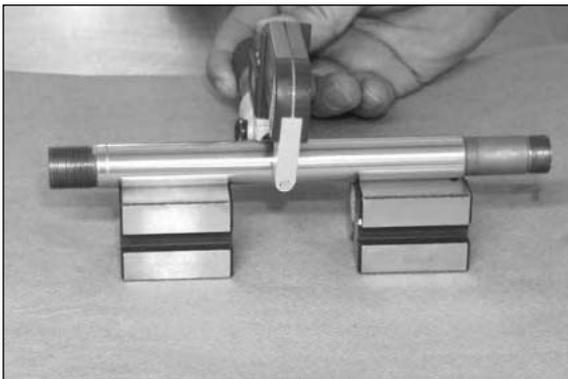


- Rebound adjustment tube. ❶



Inspection of the piston rod

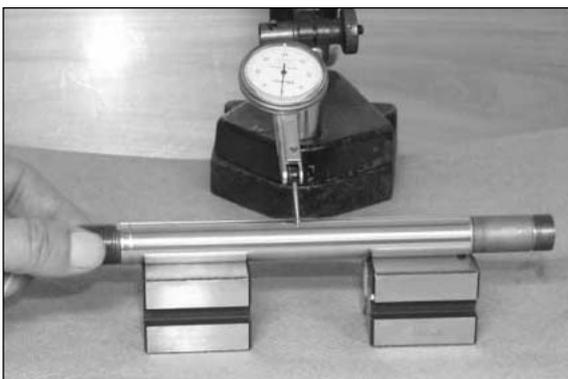
- Replace the piston rod if you have inspect that the running surface of the piston rod has scratches and or indentations.
- Always replace also the DU-bush of the DU-bush adaptor.



- Place the V-blocks as far as possible at the outside running surface of the piston rod!
- Measure the diameter of the piston rod, rotate the piston rod 90° and measure the diameter again.
- Repeat these measurements on several places of the piston rod.

The maximum diameter is: 17,98 mm

The minimum diameter is: 17,94 mm



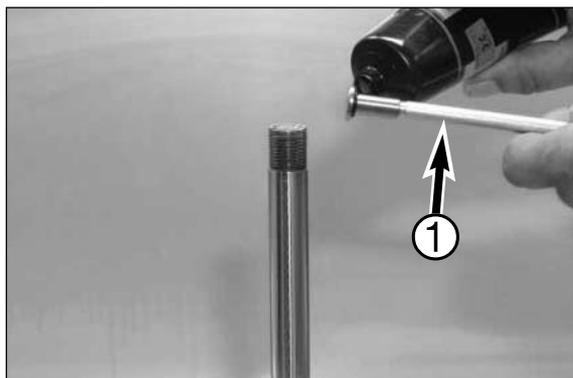
- Measure the straightness of the piston rod, rotate the piston rod 360°.

The maximum travel is: 0,06 mm.



Assembling piston rod side

- Clamp the piston rod in the clamping block T 1202S.

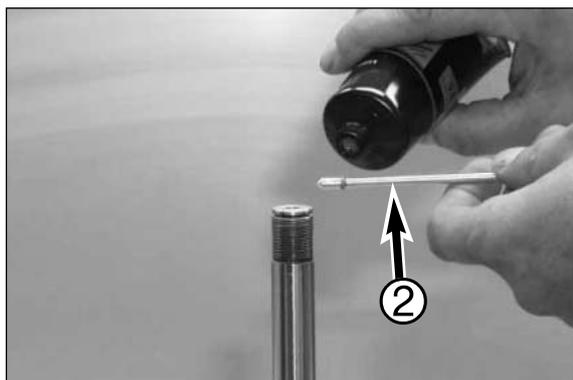


- Apply the new O-ring of the rebound adjustment tube ❶ with T 158.

NOTE: the shock absorber on SXS/SMR models does not have an adjusting pipe for the rebound damping.



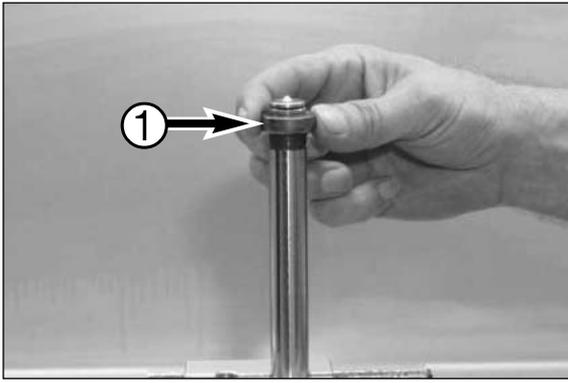
- Assemble the rebound adjustment tube in the piston rod.



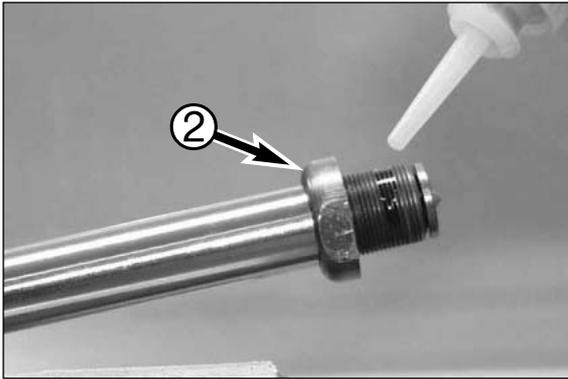
- Apply the O-ring of the rebound adjustment needle ❷ with T 158.



- Assemble the rebound adjustment needle in the piston rod.



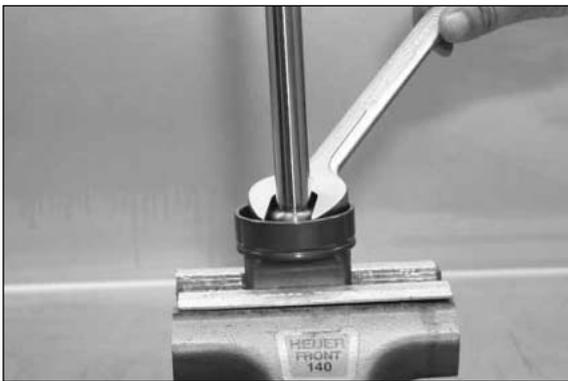
- Screw the lock nut ① on the piston rod.
- Pay attention to the assembling direction! The rounded side ② should face the center of the piston rod.
- Screw the lock nut fully on the thread of the piston rod.



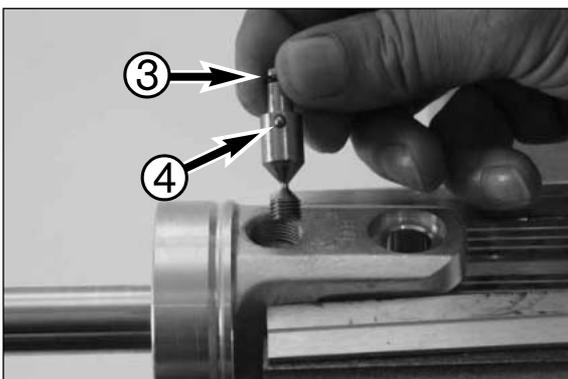
- Wet the thread of the piston rod with T 132.



- Clamp the piston rod in T 1202S and screw the mounting fork on the piston rod
- Tighten the mounting fork.



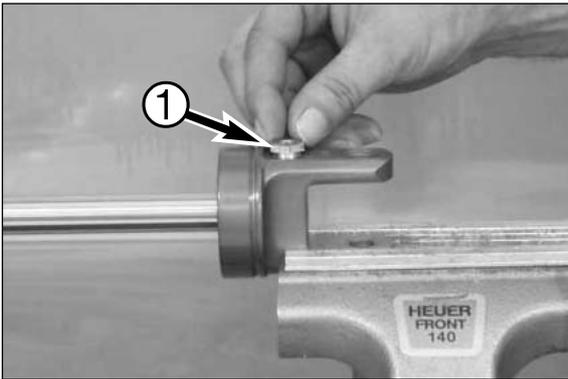
- Tighten the lock nut.



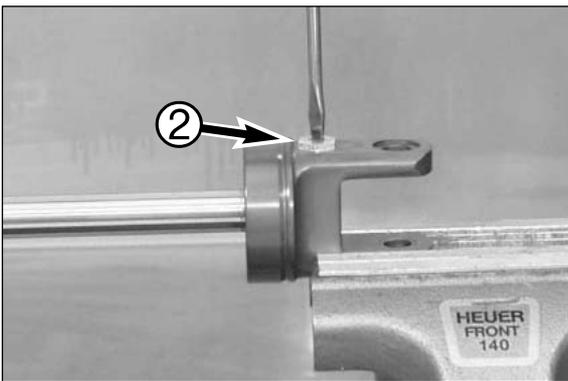
- Place the piston rod / mounting fork in the vice according to the picture.
- Grease the O-ring ③ and steel balls ④ of the rebound needle with water proof grease T 159.
- Assemble the rebound adjustment needle in the mounting fork.



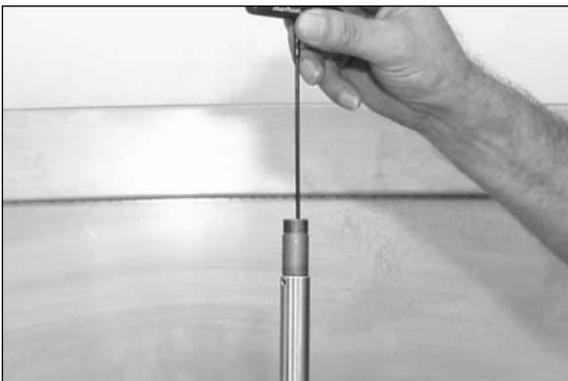
- Screw the rebound adjustment needle in the mounting fork.
- When you feel the clicks turn the rebound adjustment needle two turns further.



- Assemble the screw cap ❶ of the rebound adjustment.
- Tighten the screw cap.



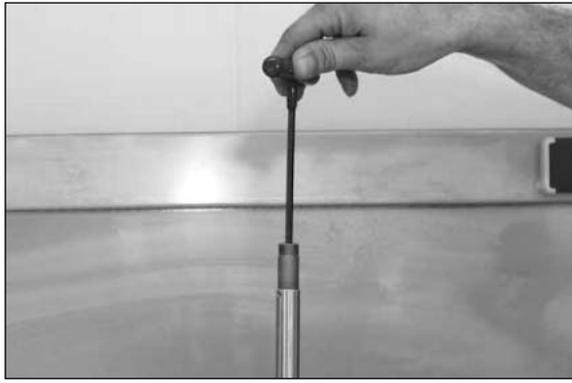
- Turn the rebound adjustment screw ❷ anti clockwise fully open.



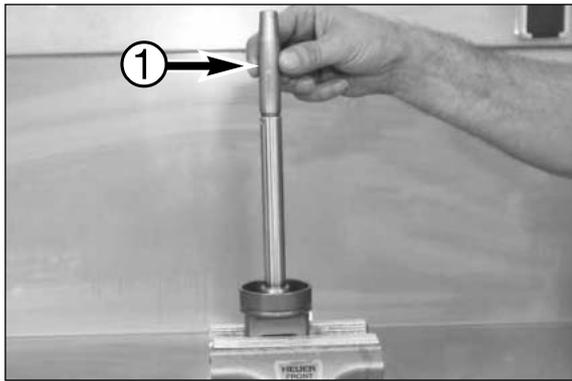
- Push the rebound adjustment needle fully downwards.



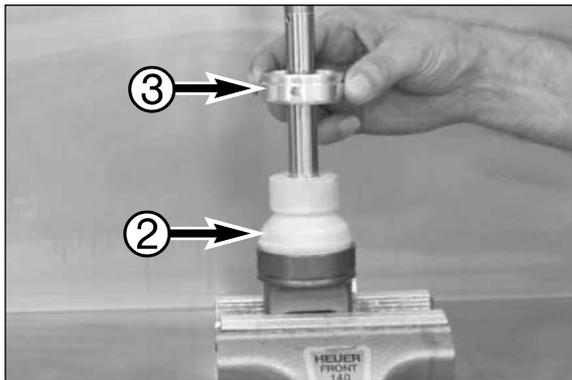
- Apply the thread of the seat with T 132.
- Grease the O-ring of the seat with T 158.



- Tighten the seat! (PDS 2006: AH 5 mm; SXS/SMR: A/F 13).

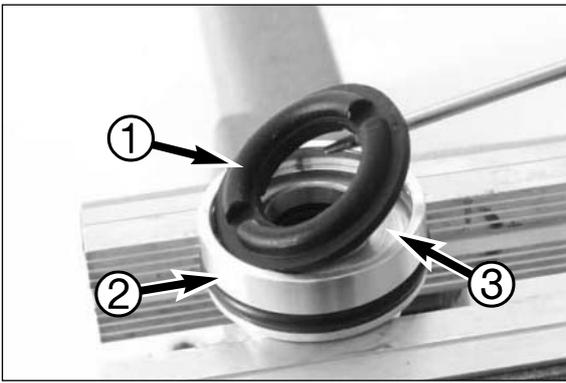


- Place assembling tool T 1215 ❶ on top of the piston rod.



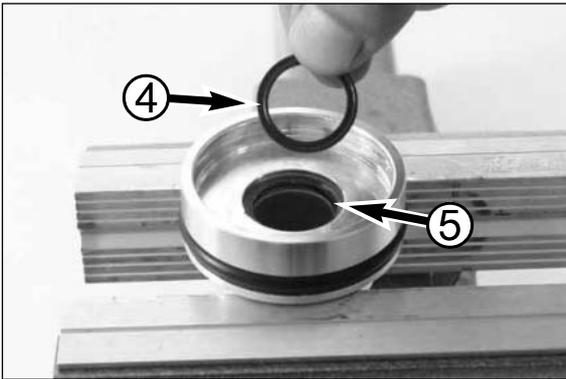
- Assemble the bump rubber ❷.

- Assemble the cap ❸.

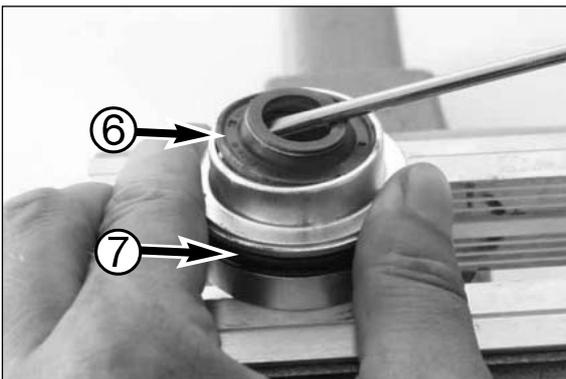


Disassembling adaptor DU-bush

- Lift the rebound rubber ① out of the DU-bush adaptor ②.
- Remove the steel plate ③.



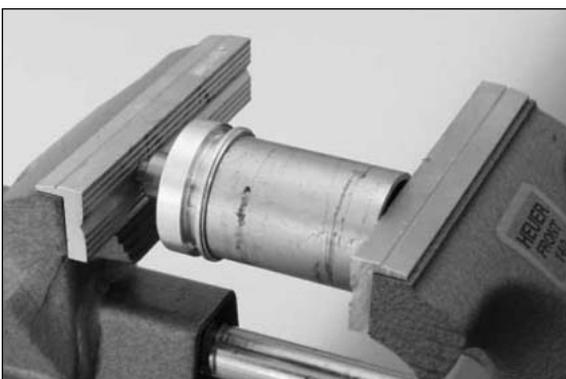
- Remove the back-up ring ④.
- Remove the quad ring ⑤.
- Remove the second back-up ring.



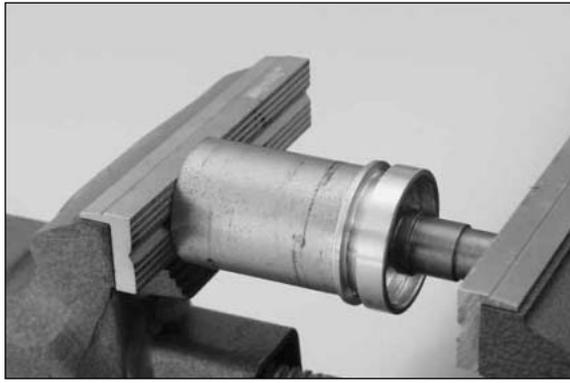
- Lift the dirt scraper ⑥ out of the DU-bush.
- Disassemble the O-ring ⑦ out of the groove of the adaptor DU-bush.



- Dis-/assembling tool T 1208, adaptor DU-bush and T 1209.

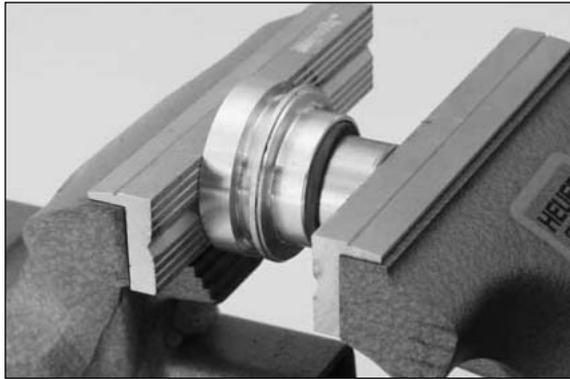


- Press the DU-bush out of the adaptor.

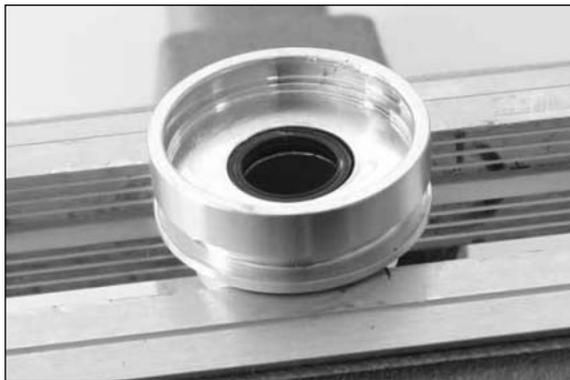


Assembling adaptor DU-bush

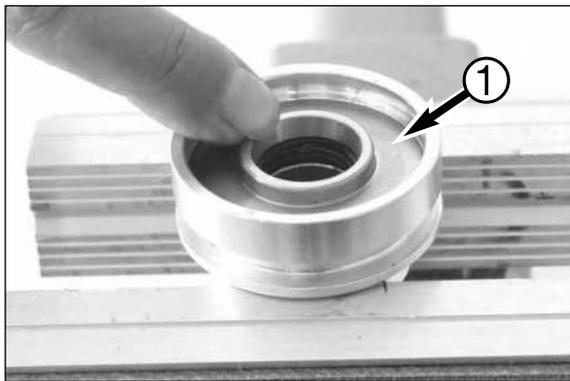
- Press the DU-bush into the adaptor DU-bush with T 1208 and T 1209.
- Wet the calibration thorn with shock absorber oil!
- Calibrate the DU-bush with calibration thorn T 1205 with support of T 1209.
- Press the calibration thorn completely through the DU bush.



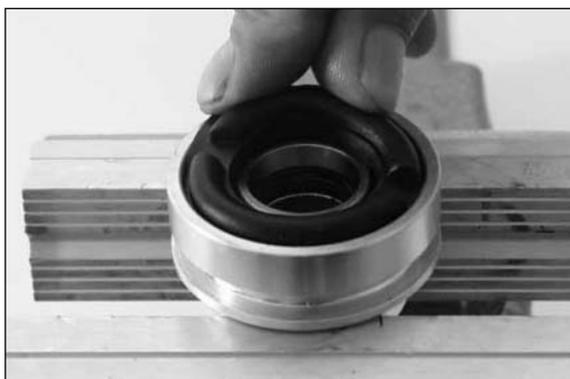
- Press the dirt scraper with T 1204 into the adaptor DU-bush.



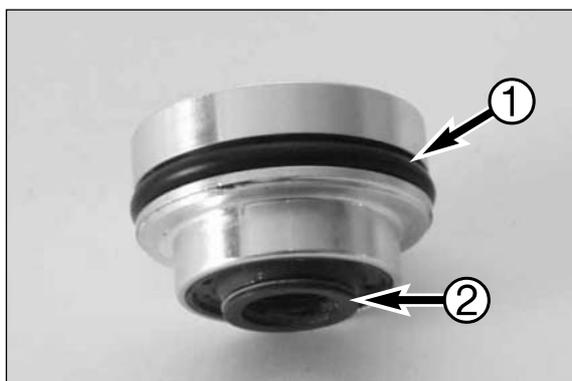
- Assemble in correct order the back-up rings and quad ring!!! See disassembling.



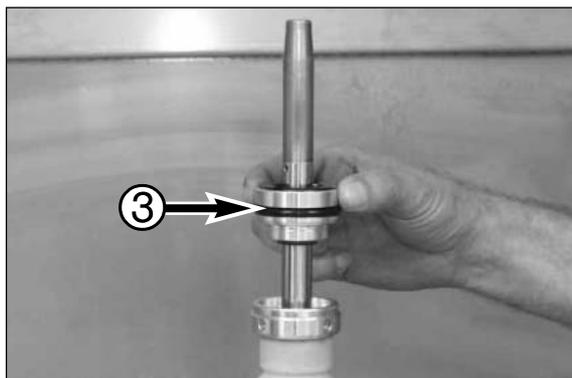
- Assemble the steel plate ❶.



- Assemble the rebound rubber ❷.
- Ensure that you can rotate the rebound rubber in the adaptor DU-bush.



- Grease the groove of the adaptor DU-bush with T158.
- Assemble the O-ring ①.
- Grease the inside lip of the dirt scraper ② with T625.

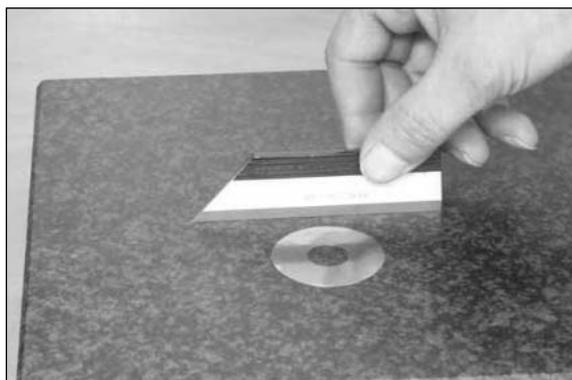


- Slide carefully the adaptor DU-bush ③ over the tool on the piston rod.

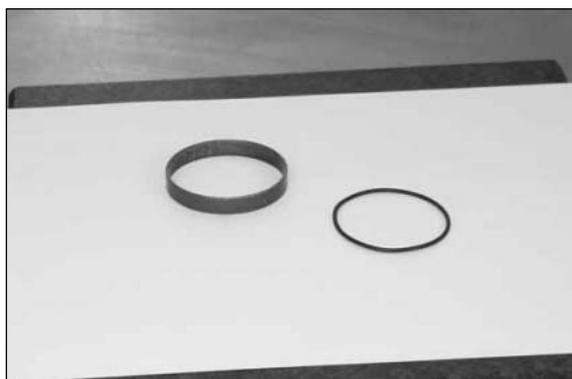


Checking the parts

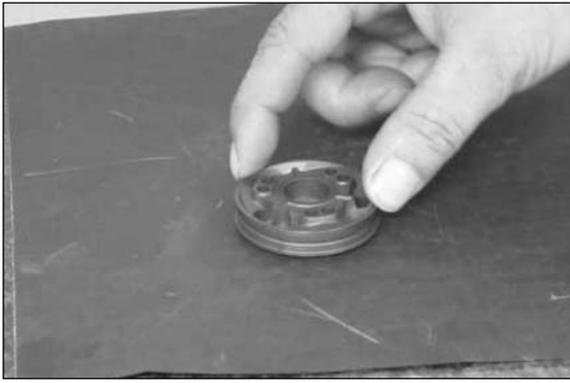
- Inspect the surface of the rebound disc.
- If necessary polish the surface of the rebound disc with sandpaper 600 on a flat plate.



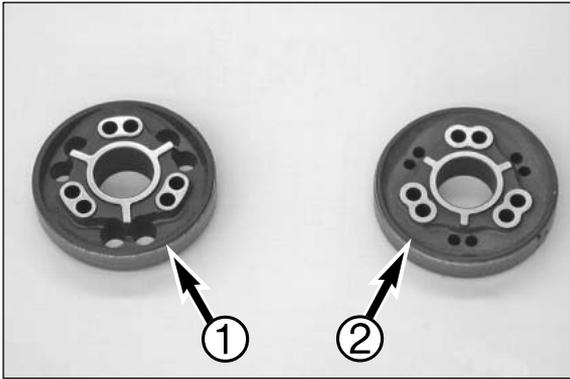
- Always check the first shim that is assembled on the piston if it is not bended. If bended check the second shim and so on.



- Disassemble the piston ring and the O-ring of the piston.
- Inspect the surface of the piston ring.
- Replace the piston ring when you see through the surface a bronze color. Also replace the piston ring if the surface is feeling rough. The best way to do this is to compare it with a new one!



- Polish the surface of both sides of the pistons on a flat plate with sandpaper 600.

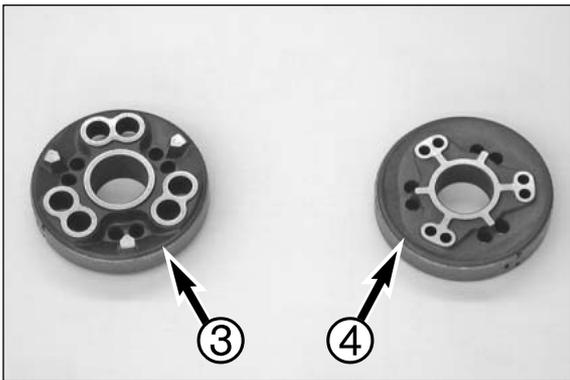


Pistons

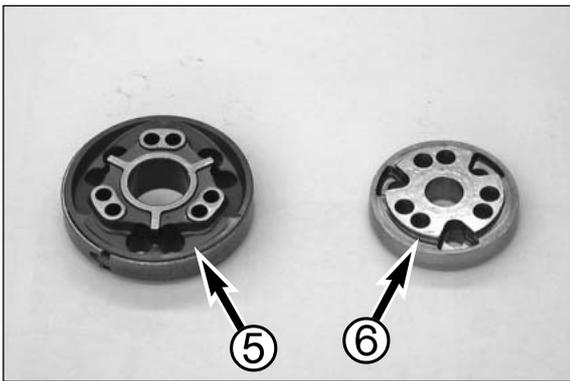
NOTE:

- The "piston 1" and "piston 2" designations refer to assembling, i.e. the piston mounted on the piston rod first will be designated "piston 1".
- Since pistons are mounted on the piston rod from above, "upper view" will refer to the side of the piston facing up after mounting before the respective set of shims is mounted.

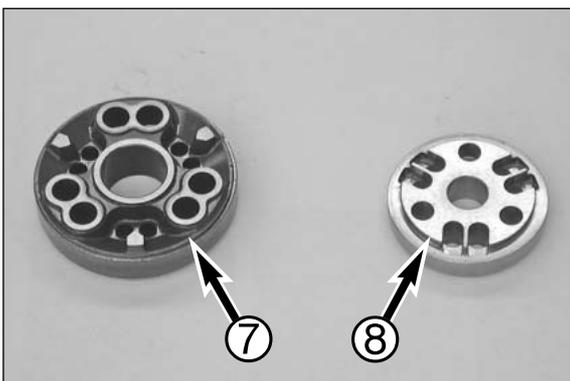
- ❶: Piston 1, upper view for PDS 5018 2006, not for SXS/SMR
- ❷: Piston 2, upper view for PDS 5018 2006, not for SXS/SMR



- ❸: Piston 1, lower view for PDS 5018 2006, not for SXS/SMR
- ❹: Piston 2, lower view for PDS 5018 2006, not for SXS/SMR



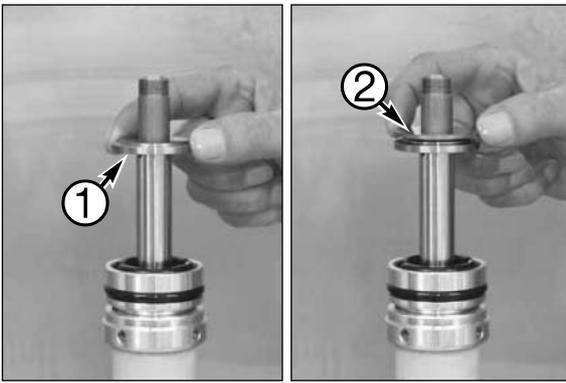
- ❺: Piston 1, upper view for PDS 5018 SXS/SMR
- ❻: Piston 2, upper view for PDS 5018 SXS/SMR



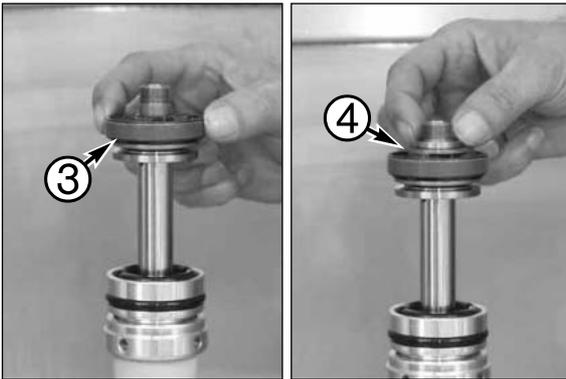
- ❼: Piston 1, lower view for PDS 5018 SXS/SMR
- ❽: Piston 2, lower view for PDS 5018 SXS/SMR

Continuing to assemble the piston rod (does not apply to SXS/SMR)

- Assemble the rebound disc ①.
- Assemble the compression setting ②.

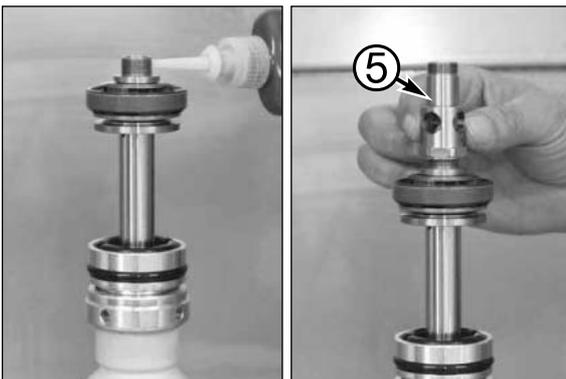


- Place the piston ("piston 1") ③.
- Assemble the rebound setting ④.

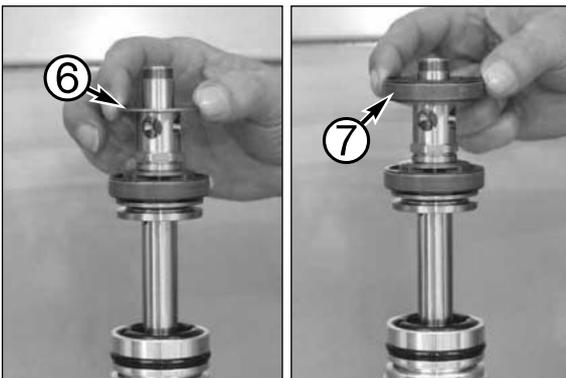


- Wet the thread of the piston rod with T 132.
- Screw the piston rod tap ⑤ on the piston rod.

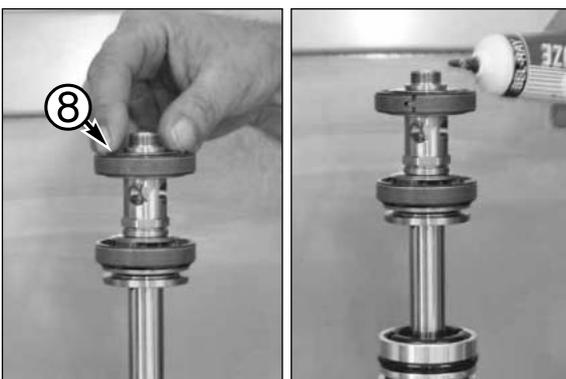
NOTE: Screw the piston rod tap on the piston rod so far as that the piston can still be rotate!

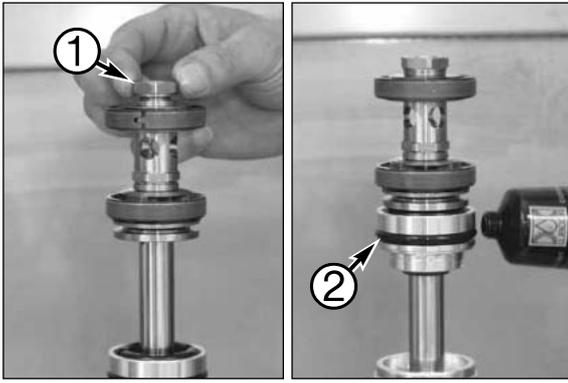


- Place the second "compression" setting ⑥.
- Assemble the second piston ("piston 2") ⑦.

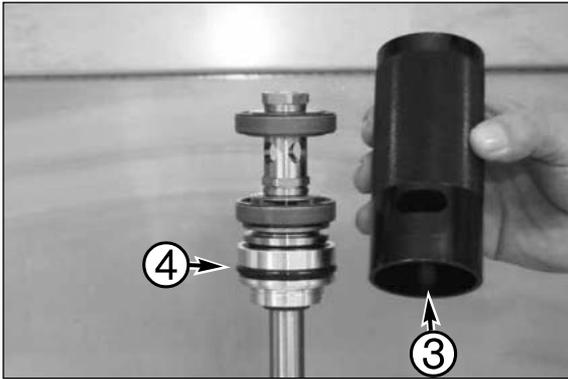


- Assemble the second rebound setting ⑧.
- Grease the thread of the piston rod tap with T 152.

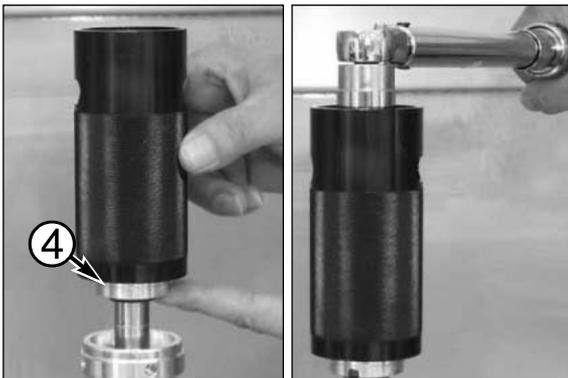




- Screw the piston rod nut **1** on the piston rod tap.
- Grease the O-ring **2** of the adaptor DU-bush with T 158.



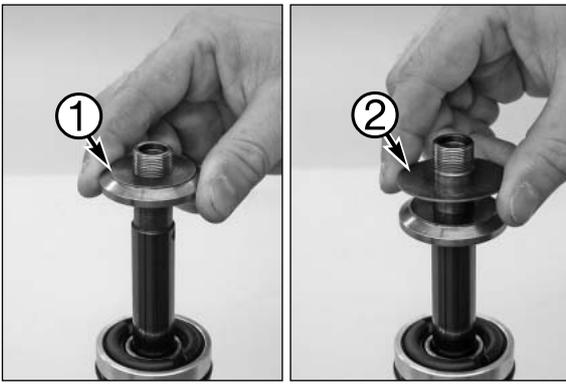
- Place center sleeve T 1214 **3** over both pistons and push the adaptor DU-bush **4** in the center sleeve.



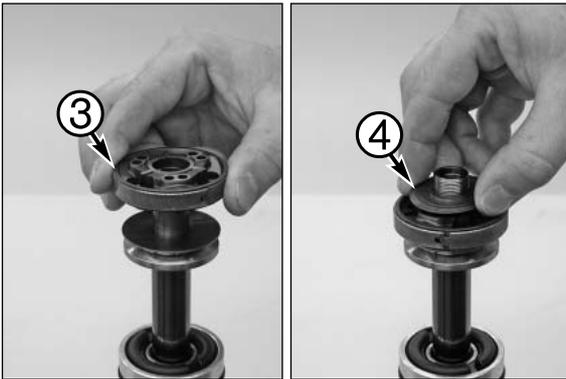
- Tighten the piston rod nut to a torque of 40 Nm and remove the centering sleeve T 1214 again.

Continuing to assemble the piston rod (applies to SXS/SMR only)

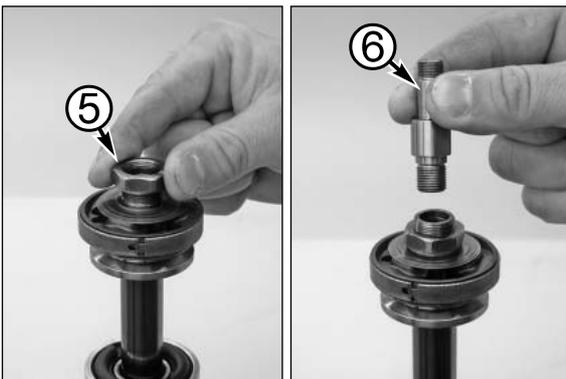
- Mount the rebound disk ①.
- Mount the set of shims for the compression ②.



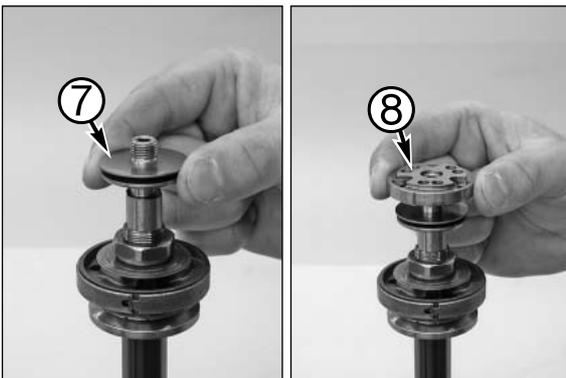
- Mount the piston ("piston 1") ③.
- Mount the set of shims for the rebound damping ④.



- Apply T 132 to the thread of the piston rod, screw on the nut (A/F 22) ⑤ and tighten to 40 Nm.
- Apply T 132 to the thread of the adapter ⑥ and screw on.



- Mount the set of shims for the compression damping ⑦ together with the compression damping disk.
- Mount the piston ("piston 2") ⑧.



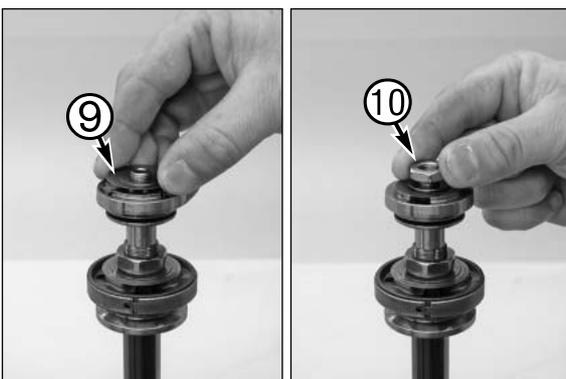
- Mount the shims for the rebound damping ⑨.

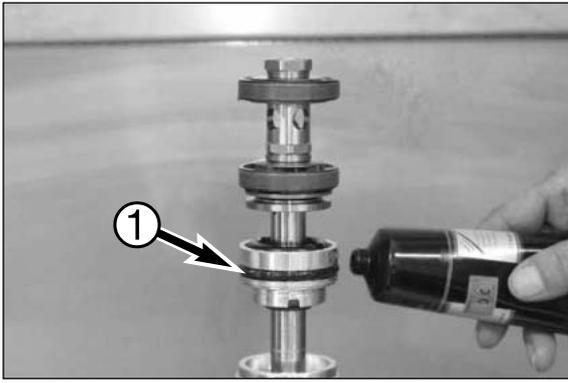
NOTE: the lower large shim is centered with a smaller shim.

- Apply T 132 to the thread of the piston rod and screw on the piston rod nut.

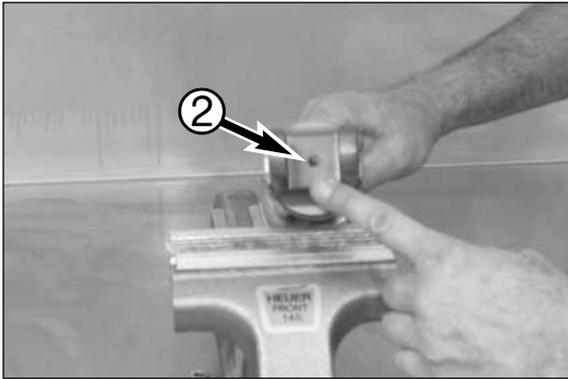
NOTE: mount the piston rod nut with the collar facing down.

- Tighten the piston rod nut (A/F 17) ⑩ to 25 Nm.





- Grease again the O-ring ❶ of the adaptor DU-bush with T 158.

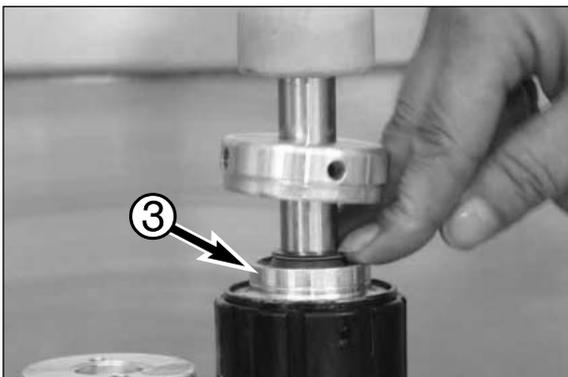


- Assemble the rubber plug ❷ into the mounting fork.



Assembling the shock absorber

- Assemble the piston rod "complete" into the tube.



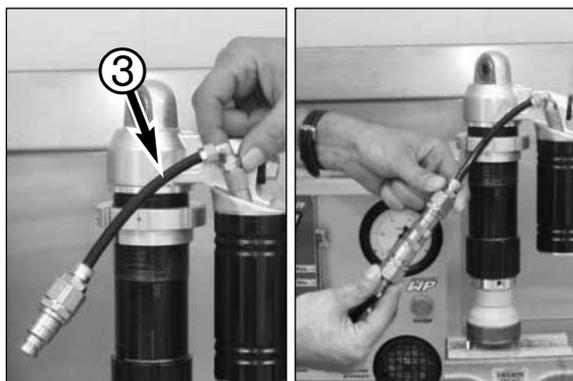
- Push the adaptor DU-bush ❸ beyond the springing groove of the tube.



- Assemble the spring ring ❶ first with the closed side into the groove.



- Pull the piston rod “complete” fully out.
- Tap the cap ❷ with a plastic hammer in the tube.

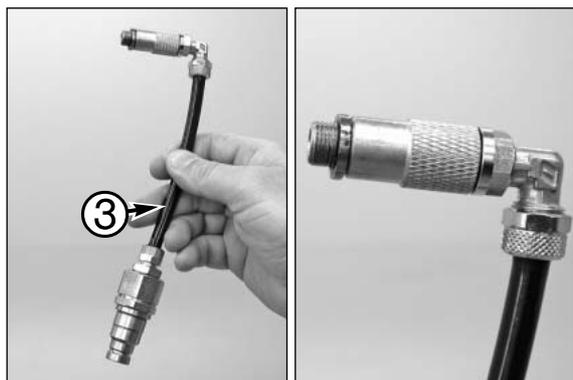


Evacuating and filling the shock absorber

! CAUTION !

BEFORE YOU START TO WORK WITH THE VACUUM/FILLING DEVICE, CAREFULLY READ THE INSTRUCTIONS PROVIDED IN CHAPTER 4 (OWNER'S MANUAL) TO AVOID MAKING ANY ERRORS WHEN FILLING THE SHOCK ABSORBER.

- Loosen all adjusting screws in a counterclockwise direction.
- Screw the filling adapter ❸ in the opening in the shock absorber, tighten by hand and attach to the connector on the vacuum filling device T 1240S.

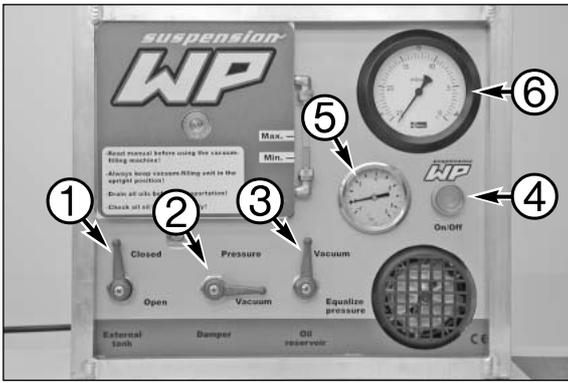


- Hold the shock absorber as shown in the photo. The filling connection with the adapter must be in the highest position.

⚠ WARNING ⚠

DO NOT HOLD THE PISTON ROD SINCE IT WILL MOVE IN AND OUT DURING THE FILLING PROCESS.





1. Ventilation/filling process

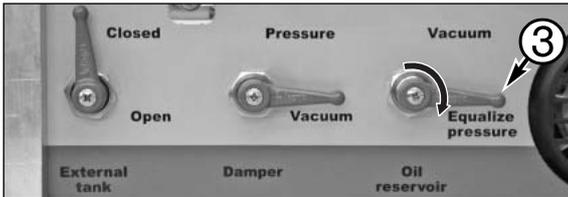
– Move the control levers into the positions shown in the photo.

NOTE: "External tank" control lever ① to "Closed", "Damper" ② to "Vacuum" and "Oil reservoir" ③ to "Vacuum".

– Press the "On/Off" ④ switch to start the ventilation process.

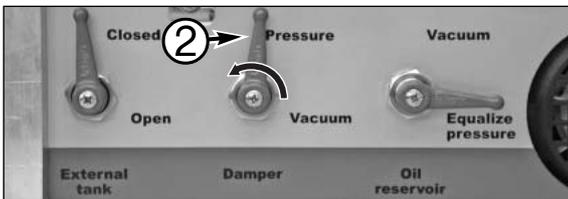
NOTE:

– The pressure gauge ⑤ (bar) will drop below 0 bar (almost -1).
 – The vacuum gauge ⑥ (mbar) will drop to 4 mbar.



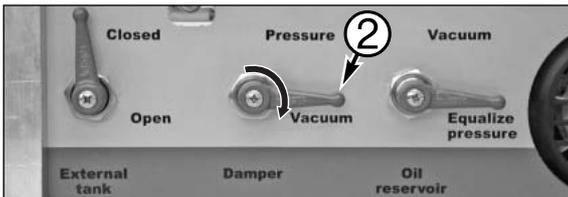
– As soon as the vacuum gauge ⑥ (mbar) reaches approx. 4 mbar, turn the "Oil reservoir" control lever ③ to "Equalize Pressure".

NOTE: the pressure gauge ⑤ (bar) will rise to 0 bar.



– As soon as the pressure gauge ⑤ (bar) reaches 0 bar, turn the "Damper" control lever ② to "Pressure".

NOTE: oil will be pumped into the shock absorber, the pressure gauge ⑤ (bar) will rise to approx. 3 bar; this value is preset (see Chapter 4).



– As soon as the pressure gauge ⑤ (bar) reaches approx. 3 bar, turn the "Damper" control lever ② back to "Vacuum".

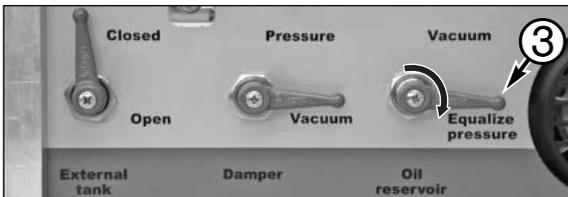
NOTE: the pressure gauge ⑤ (bar) will drop to 0 bar.



2. Ventilation/Filling process

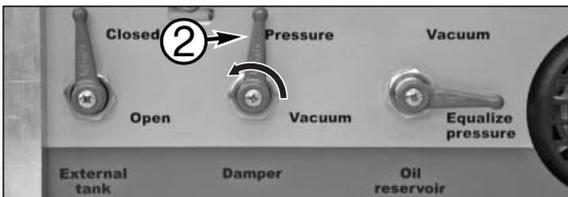
– As soon as the pressure gauge ⑤ (bar) reaches 0 bar, turn the "Oil reservoir" control lever ③ to "Vacuum".

NOTE: the vacuum gauge ⑥ (mbar) will drop to 8 mbar.



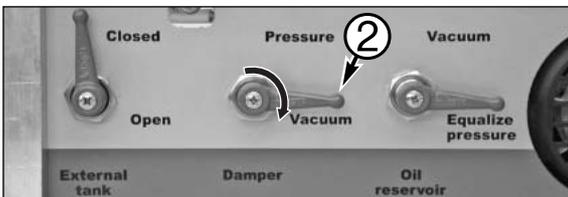
– As soon as the vacuum gauge ⑥ (mbar) reaches 8 mbar, turn the "Oil reservoir" control lever ③ to "Equalize Pressure".

NOTE: the pressure gauge ⑤ (bar) will drop to 0 bar.



– As soon as the pressure gauge ⑤ (bar) reaches 0 bar, turn the "Damper" control lever ② to "Pressure".

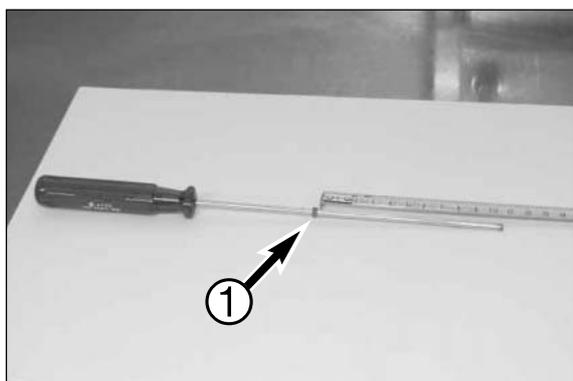
NOTE: oil will be pumped into the shock absorber, the pressure gauge ⑤ (bar) will rise to approx. 3 bar; this value is preset (see Chapter 5).



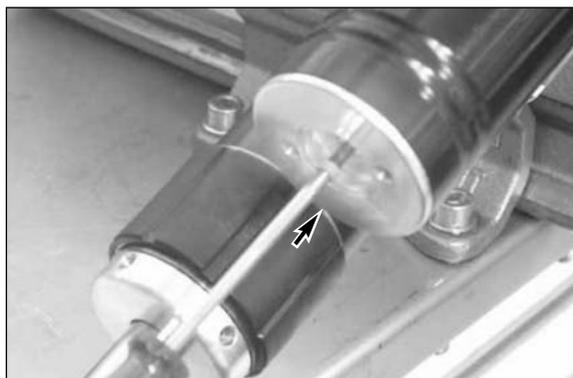
– As soon as the pressure gauge ⑤ (bar) reaches approx. 3 bar, turn the "Damper" control lever ② to "Vacuum".

NOTE: the pressure gauge ⑤ (bar) will drop to 0 bar.

– As soon as the pressure gauge ⑤ (bar) reaches 0 bar, actuate the "On/Off" ④ switch. The shock absorber is filled.



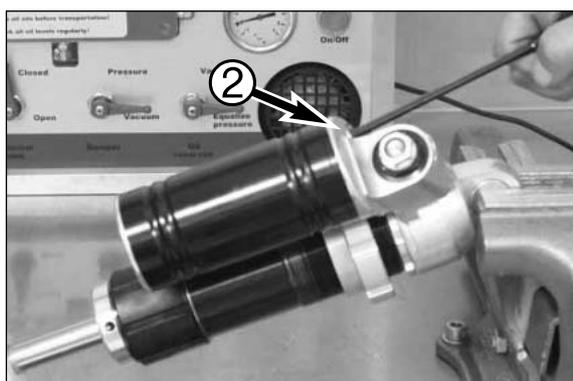
- Adjust the O-ring ❶ on the shaft of T 107S to 106mm.



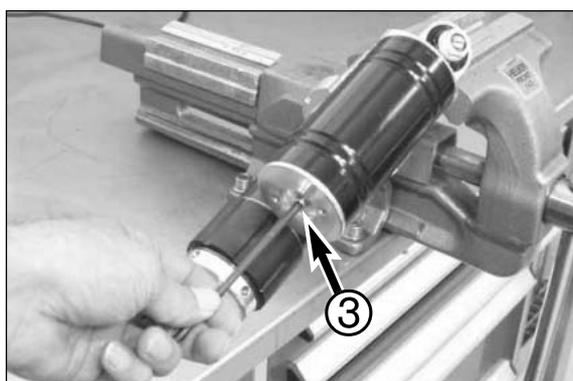
- Push the separation piston with T 107S to the correct position, the O-ring must have a distance for about 10 mm from the screw cap.



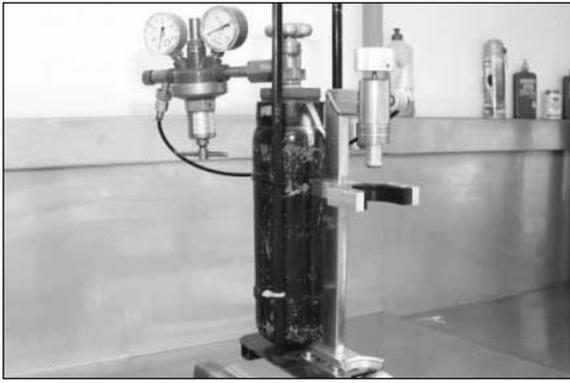
- Unscrew the adapter from the opening in the shock absorber.



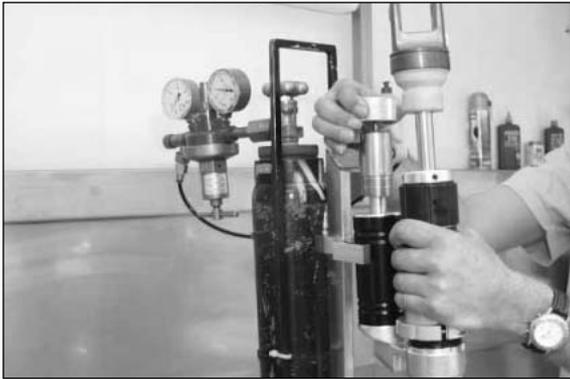
- Screw the oil filling plug ❷ in the shock absorber housing and tighten it.



- Screw the nitrogen filling plug ❸ with O-ring several turns in the screw cap of the nitrogen reservoir.

**On pressure with nitrogen**

- Nitrogen charging device T 170S1. Adjust the nitrogen gas pressure to 10 - 11 bar.



- Place the shock absorber in the Nitrogen charging device and ensure that the Allen key is fitting in the nitrogen filling plug.



- Open the tap for about 20 seconds.



- Close the nitrogen filling plug.



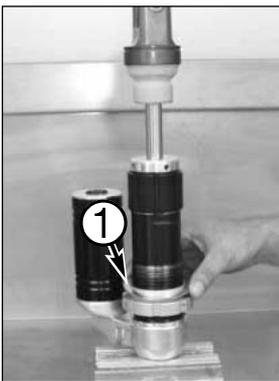
- Close the tap and pull the Allen key of the nitrogen charging device out of the nitrogen filling plug.



- Remove the shock absorber out of the nitrogen charging device.

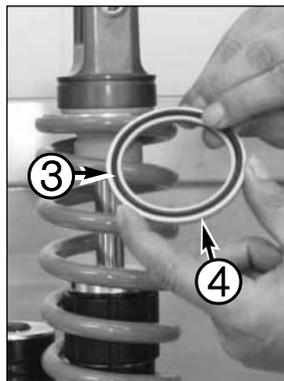
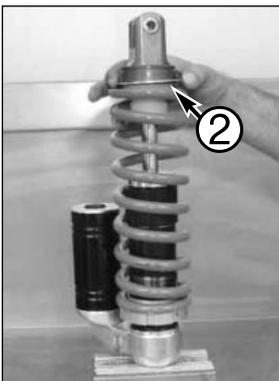


- Place the rubber plug 'do not open'.

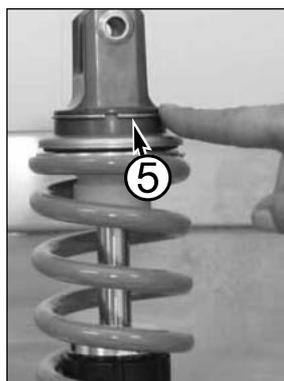
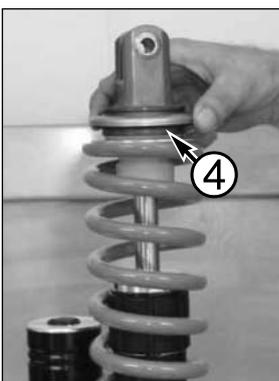


Assembling the spring

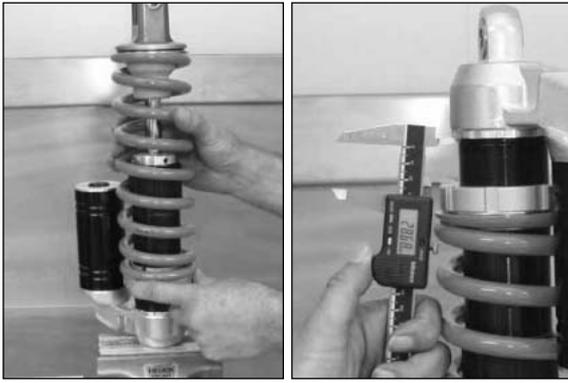
- Place the washer ❶.
- Place the spring.



- Place the first washer ❷.
- Assemble the (new) O-ring ❸ in the groove of the spring retainer ❹.



- Place the spring retainer ❹.
- Place the spring ring ❺ in the groove of the mounting fork.



- Adjust the spring to the correct spring preload as noticed before.



- Tighten the Allen bolt of the screw retainer to a torque of 5 Nm.



- Clean the nitrogen reservoir.
- Assemble a new sticker.

- Set the shock absorber in the correct mounting position.

NOTE: adjustments of the rebound and compression damping should be on the same side.

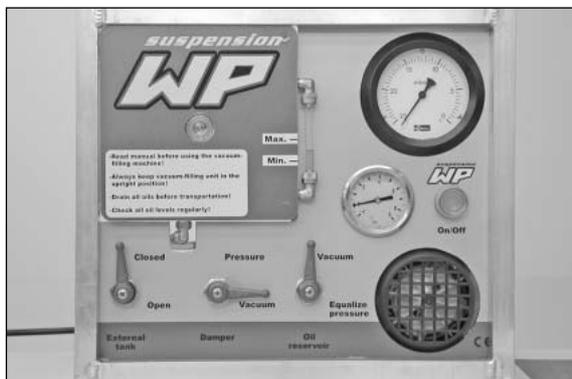
- Move the rebound and compression damping adjustments in the right position.

MANUAL FOR VACUUM-/FILLING DEVICE

4

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Introduction

The WP Suspension vacuum-filling device is designed specially for the filling of shock absorbers. The filling device enables you to fill a shock absorber with no air inside the shock absorber. The layout of the system was chosen to allow maximum flexibility for the filling of shock absorbers and to create a compact, lightweight construction. The filling device has two main parts; the vacuum filling unit and an external tank. The configuration, vacuum- and pressure values as well as filling adapters that have to be used, depend on the type of damper that has to be filled.

Each vacuum filling device has been put through a test before delivery to customers.

Because of this test, there might be a small amount of oil left in the vacuum pump. The vacuum filling device is delivered without compressed air nipple, because of the wide variety of nipples used. Before taking the filling device into service, a nipple ① has to be mounted to the pressure regulator (thread size G $\frac{1}{4}$).

Supplied parts

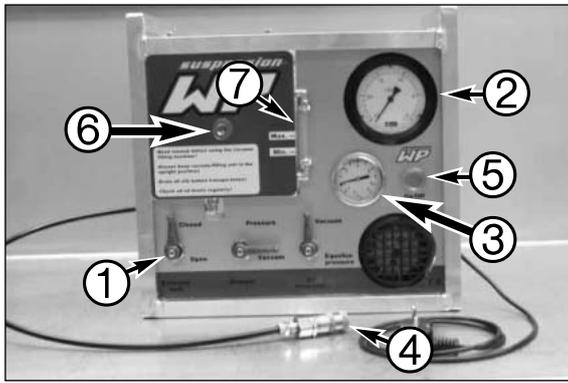
- Owners manual vacuum filling device
- Filling adapter A (Competition and PDS (G1/8))
- Filling adapter B (For filling trough CC- mechanism)
- Filling adapter C (Steering dampers)
- 1 Litre vacuum pump oil Vm22
- Vacuum filling unit
- External tank
- Connecting hose external tank

Technical features

- Vacuum pump PB 0003 A :
- Nominal displacement: 3 m 3 /h (50Hz), 3,6 m 3 /h (60Hz)
- Ultimate pressure : 2mbar
- Nominal motor rating : 0,1 Kw (50Hz), 0,12 Kw (60Hz)
- Nominal motor speed : 3000 min $^{-1}$ (50Hz), 3600 min $^{-1}$ (60Hz)
- Sound level (DIN 45635) : 59 dB (A)
- Oil filling : 0,06 l

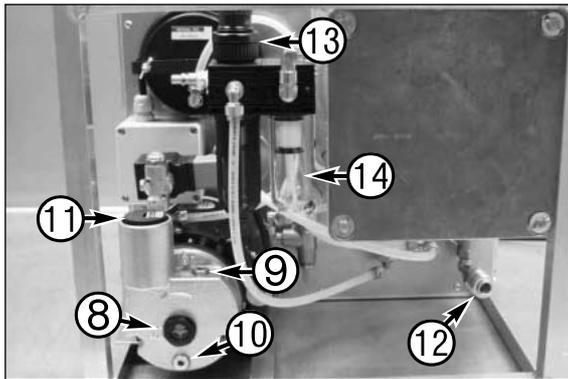
- Vacuum filling unit :
- Width : 400mm
- Depth : 255mm
- Height : 380mm
- Dry weight : 14,5Kg
- Max oil quantity : $\pm 1,8$ l

- External Tank :
- Width : 220mm
- Depth : 220mm
- Height : 695mm
- Weight : 9,9Kg

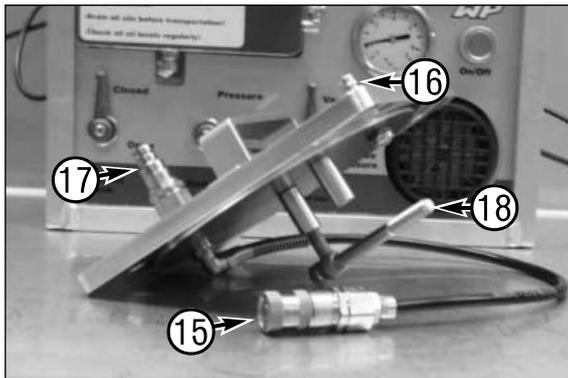


Overview of vacuum filling device

- Control levers ①
- Vacuum gauge (mbar) ②
- Pressure gauge (bar) ③
- Damper connector ④
- Main power switch ⑤
- Filling plug ⑥
- Oil level indicator ⑦



- Vacuum pump oil level indicator ⑧
- Vacuum pump filling plug ⑨
- Vacuum pump draining plug ⑩
- Exhaust filter ⑪
- External tank connector (air) ⑫
- Pressure regulator ⑬
- Oil separator ⑭



- Damper connector ⑮
- External tank connector (air) ⑯
- External tank connector (oil) ⑰
- Damper hanging hook ⑱

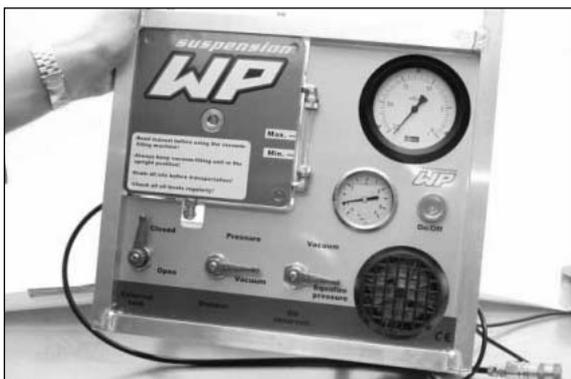
General handling information

CAUTION

- ONLY PEOPLE WHO HAVE READ AND UNDERSTOOD THE MANUAL ARE ALLOWED TO OPERATE THE VACUUM-FILLING DEVICE.
- THE INSTRUCTIONS GIVEN IN THIS MANUAL MUST BE FOLLOWED CAREFULLY. ANY DEVIATION FROM THE INSTRUCTIONS COULD RESULT IN A DANGEROUS SITUATION FOR THE USER OF THE FILLING INSTALLATION. DEVIATION FROM THE INSTRUCTIONS MAY ALSO CAUSE A BAD VACUUM FILLING OF THE DAMPER, AND WILL RESULT IN DANGEROUS SITUATIONS WHEN USING THIS DAMPER.
- THE OIL IN THE VACUUM PUMP AND THE DAMPER-OIL IN THE OIL RESERVOIR SHOULD ALWAYS BE DRAINED BEFORE TRANSPORTATION!
- NEVER USE THE VACUUM-FILLING DEVICE FOR OTHER PURPOSES THAN MENTIONED IN THIS MANUAL.
- IT IS NOT ALLOWED TO LET THE DEVICE (TRAIL)RUN WITH DISCONNECTED SAFETY FEATURES OR SAFETY COVERS.
- THE VACUUM PUMP MUST NEVER BE USED WITHOUT OIL!
- ONLY USE BUSCH VM22 VACUUM PUMP OIL!



- THE OIL LEVEL OF THE VACUUM PUMP SHOULD NEVER EXCEED MAX LEVEL AND SHOULD NEVER BE LOWER THAN THE MIN LEVEL. KEEP THE OIL LEVEL CLOSE TO THE MAX LEVEL TO ENSURE GOOD FUNCTION AND COOLING OF THE PUMP.



- THE VACUUM-FILLING DEVICE SHOULD BE IN UPRIGHT POSITION AT ALL TIMES! PLACE THE VACUUM-FILLING DEVICE ON A STABLE FLAT AND HORIZONTALLY SURFACE IN THE UPRIGHT POSITION.

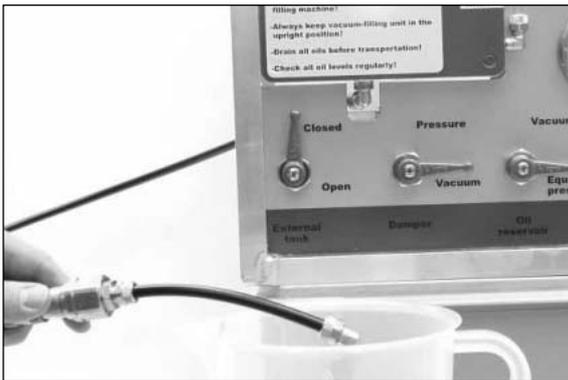
- THE AREA SURROUNDING THE VACUUM PUMP WILL BE WARM, DO NOT TOUCH THE VACUUM PUMP DURING OR SHORTLY AFTER OPERATION, AS THE PUMP WILL BE HOT!
- BE AWARE OF THE EXHAUST GASSES COMING FROM THE OUTLET OF THE PUMP. THE TEMPERATURE OF THESE GASSES CAN RUN UP TO 90°C!
- THERE HAS TO BE AN UNDISTURBED FRESH AIRFLOW AROUND THE VACUUM-FILLING DEVICE, TO ENSURE SUFFICIENT COOLING OF THE PUMP.
- THE OUTLET OF THE PUMP SHOULD BE FREE AT ALL TIMES TO AVOID DAMAGE TO THE PUMP. EXHAUST GAS MUST BE ALLOWED TO ESCAPE FROM THE VICINITY OF THE PUMP TO AVOID OVERHEATING.
- FILL THE OIL RESERVOIR UNTIL THE LEVEL INDICATOR REACHES MAX LEVEL. THE OIL LEVEL SHOULD NEVER BE LOWER THAN MIN LEVEL TO ENSURE CORRECT VACUUM FILLING OF THE DAMPER.
- ALWAYS CONNECT THE filling device to a GROUNDED POWER SUPPLY (220 Volts).
- ALWAYS MAINTAIN THE VACUUM-FILLING UNIT ACCORDING TO MAINTENANCE INSTRUCTIONS. TO ENSURE SAFE, LONG-TIME AND HIGH QUALITY APPLICATION.
- DO NOT STICK OBJECTS THROUGH THE PROTECTIVE CAP OF THE PUMP FAN.
- THE PUMP IS PROTECTED AGAINST THERMAL OVERLOAD OF THE MOTOR BY A THERMAL-LAG SWITCH. WHEN THE MOTOR HAS COOLED DOWN, THE VACUUM PUMP STARTS AGAIN AUTOMATICALLY.
- THE AMBIENT TEMPERATURE WHEN USING THE VACUUM-FILLING DEVICE SHOULD BE BETWEEN 12 AND 30°C.

- THE PENETRATION OF DIRT INSIDE OF THE EXTERNAL TANK MUST BE AVOIDED AS MUCH AS POSSIBLE. THE DIRT MAY CLOG UP THE FILTER IN THE LID OF THE EXTERNAL TANK, CAUSING A MALFUNCTION OF THE VACUUM FILLING INSTALLATION.
- BE CAREFUL WHEN LOWERING A DAMPER INTO THE EXTERNAL TANK. DAMAGING THE TOP OF THE TANK MAY RESULT IN AIR LEAKAGE, AND THUS A MALFUNCTION OF THE VACUUM FILLING INSTALLATION.
- NEVER HANG A DAMPER FROM THE DAMPER CONNECTOR OF THE VACUUM FILLING DEVICE!
- THE INSTALLATION CAN BE CLEANED WITH A MILD SOAP, DO NOT USE AGGRESSIVE PRODUCTS AS THESE MIGHT DAMAGE THE STICKERS ON THE INSTALLATION.
- IF AT ANY TIME YOU FEEL UNCERTAIN OF THE VACUUM FILLING OF A DAMPER, START OVER AGAIN TO ENSURE SAFETY.

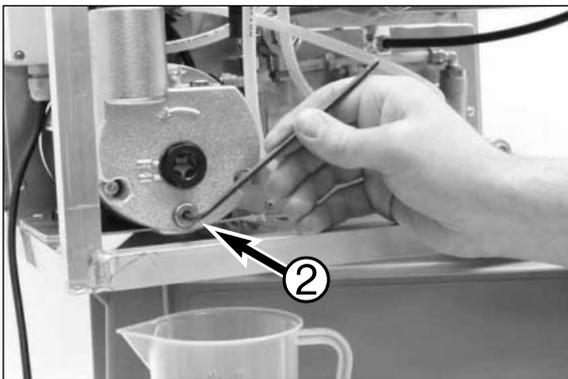


Before / during transportation

- Disconnect the power and air supply. The oil in the vacuum pump and the damper-oil in the oil reservoir should always be drained before transportation. For draining the oil reservoir, connect filling adapter A ① to the damper connector of the filling unit while holding the adapter above a measuring cup.



- Let the oil run out of the reservoir. When there is no more oil flowing, disconnect the filling adapter.



- For draining the vacuum pump-oil, unscrew the draining plug ② and let the oil flow into a measuring cup. When the oil is drained, place back the draining plug.

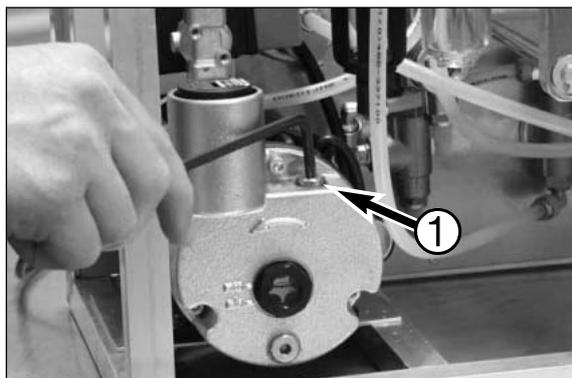
! CAUTION !

THE INSTALLATION MUST BE TRANSPORTED IN AN UPRIGHT POSITION AND MUST BE PROTECTED AGAINST EXTERNAL FORCES. THE FILLING DEVICE CONTAINS SENSITIVE PARTS SO HANDLE WITH CARE, PROTECT THE INSTALLATION AGAINST SHOCKS ETC.



Preparing vacuum filling device for use (after transportation)

- Place the vacuum-filling device on a stable flat and horizontally surface in the upright position. There has to be an undisturbed fresh airflow around the vacuum-filling device, to ensure sufficient cooling of the pump.

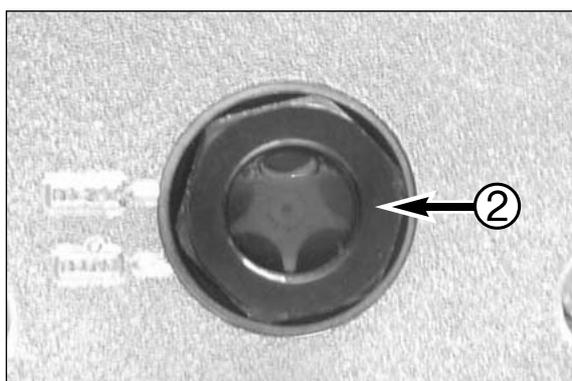


Filling vacuum pump oil

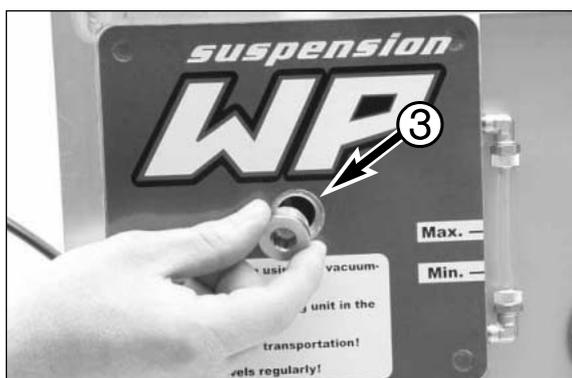
- Remove the filling plug ❶ of the vacuum pump.



- Fill up the vacuum pump with oil to the max level on the level indicator ❷.



- The oil level should never exceed max level and should never be lower than the min level. Only use Busch Vm22 vacuum pump oil! Keep the oil level close to the max level to ensure good function and cooling of the pump. Place back the filling plug.



Filling damper oil

- Remove the filling plug ❸ of the oil reservoir.



- Fill the oil reservoir until the level indicator reaches max. level. Place back the filling plug using a torque wrench. The filling plug has to be fastened with a torque of 10 Nm. The vacuum-filling unit should always be in the upright position, to avoid oil spreading through the entire system! This will cause serious damage to the vacuum filling device. Only use oil approved by WP Suspension!



- Place back the filling plug using a torque wrench. The filling plug has to be fastened with a torque of 10 Nm.

Connecting power

- Connect the filling device to a grounded power supply 220 Volts.

Connecting air

- Connect the filling device to an air supply 2-8 bar.

Vacuum air bleeding of damper oil

- Before the unit can be used, the oil in the oil reservoir should be put under vacuum in order to get rid of the air inside of the oil. The control levers should be in the following positions:



- The control levers should be in the following positions (after new oil filling):

External tank	Closed
Damper	Vacuum
Oil reservoir	Vacuum



- Now switch the power on and let the filling device run for about 2 minutes, switch off the power. The vacuum-filling device is now ready for use.



Using the filling adapters

Filling adapter A

- Screw the filling adapter into the filling hole of the damper. The nose of the filling adapter is able to rotate in relation to the rest of the filling adapter.



Filling adapter B

- Turn the shell anti clockwise, in relation to the pin, until it hits the fixed stop. The slot in the shell should be lined up with the slot in the pin. Now gently shove the adapter into the CC-housing of the damper. Turn the shell clockwise while holding the top of the pin until the shell can not be turned further. Check if the filling adapter is placed securely by pulling the pin, the filling adapter should be locked in the CC-housing.



Filling adapter C

- Screw the filling adapter into the filling hole of the damper. The nose of the filling adapter is able to rotate in relation to the rest of the filling adapter.



General operation instructions

As is mentioned earlier, the vacuum-filling device enables the user to fill a damper in different manners. A main possibility to fill a damper is with or without an external tank. This general description will mention both ways. The following descriptions are discussed only to give a general understanding of the operation of the vacuum-filling device. The procedure may vary on details when filling a specific damper, for instance certain dampers have to be filled using an external tank, while others might not need to be filled in an external tank. Also the filling pressures vary with each type of damper, this concerns the vacuum pressure as well as the overpressure (most dampers 3 bar). The manual will include a list with the correct filling pressures, configuration and filling adapters that have to be used. The procedure for filling of a steering damper is different to the filling of other dampers. Other dampers are filled with overpressure, this is not the case for a steering damper. The general operation instructions for steering dampers will also be mentioned.

For illustration of the operating procedures we will use the following pressures:

- Overpressure: 3 bar
- Pressure 1st cycle: 4mbar
- Pressure 2nd cycle: 8mbar

!

CAUTION

!

IF AT ANY TIME YOU FEEL UNCERTAIN OF THE VACUUM FILLING OF A DAMPER, START OVER AGAIN TO ENSURE SAFETY!

General preparation procedures

The damper must be filled with as much oil as possible, when assembling. This operation minimizes the amount of air in the damper and allows the vacuum-filling device to give a good result. The damper will have a bad filling if this guideline is not followed! When vacuum filling, the damper should not have a spring on it. If the damper was properly serviced, the nitrogen pressure has been released.

! CAUTION !

MAKE SURE THAT THERE IS NO NITROGEN PRESSURE LEFT IN THE DAMPER BEFORE USING THE VACUUM-FILLING DEVICE AND LEAVE THE NITROGEN FILLING BOLD OUT. COMPRESSION AND REBOUND ADJUSTERS SHOULD ALL BE IN THE FULLY OPEN POSITION (-). SCREW THE FILLING ADAPTER IN THE FILLER OPENING OF THE DAMPER.

Before filling a damper the oil level in the oil reservoir has to be checked, it should not exceed the max. level and should never be under min. level before filling a damper. Correct the level if necessary.

Check if the overpressure value corresponds with the instructions for the particular damper. The pressure that has been adjusted before shipment should be 3 bar, because this is the overpressure used for most dampers.

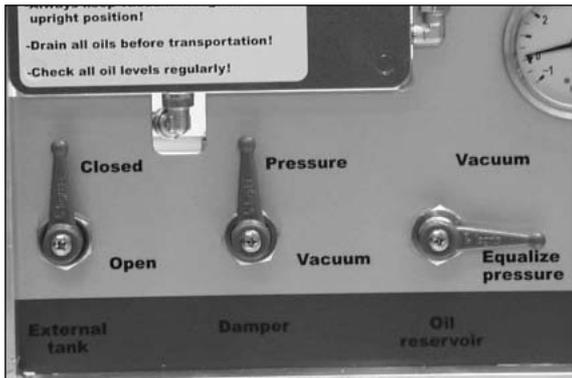


! CAUTION !

DURING THE FOLLOWING PROCEDURE THE PUMP MUST NOT BE TURNED ON.

- Make sure the control levers are in the following positions:

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure



- Now move lever Damper to the Pressure position.

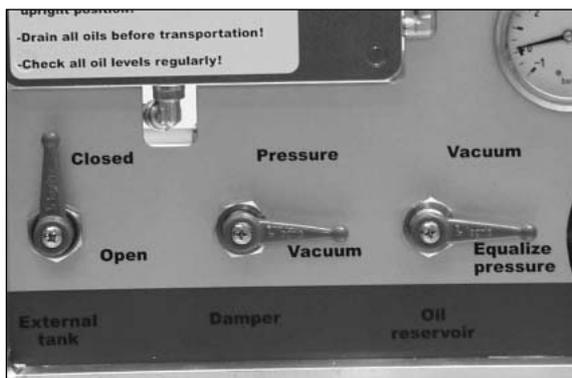
External tank	Closed
Damper	Pressure
Oil reservoir	Equalize pressure



- The pressure gauge will show the current overpressure



- The pressure can be adjusted by pulling up and turning the knob of the pressure regulator. For increasing pressure turn knob clockwise and for lowering pressure turn knob anti clockwise.



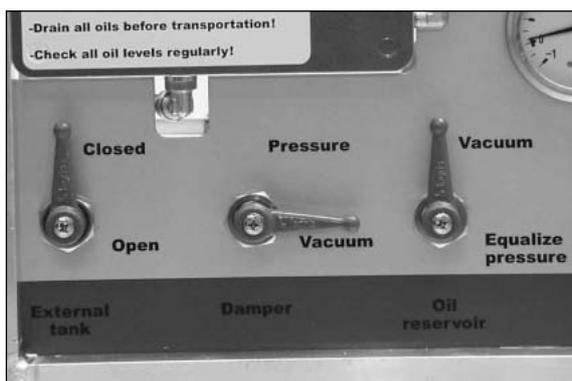
- When the correct pressure has been set, press knob of pressure regulator down and release the pressure by moving lever Damper to the Vacuum position.

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure



Filling procedure without external tank

- The damper can now be connected to the vacuum-filling device.



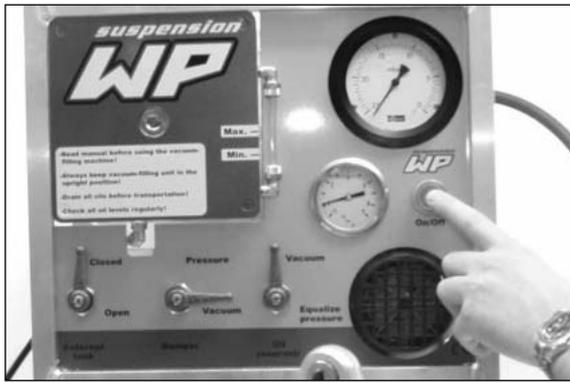
- Put the control levers in the following positions;

External tank	Closed
Damper	Vacuum
Oil reservoir	Vacuum

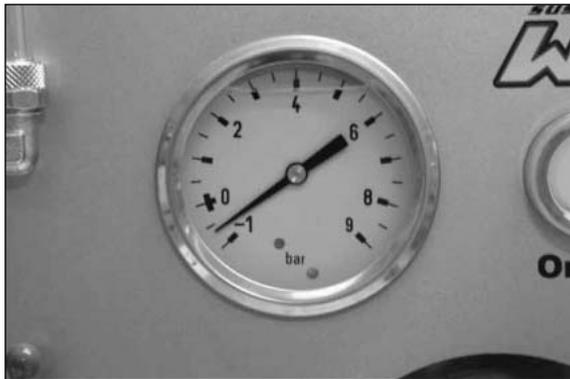


! CAUTION !

THE DAMPER SHOULD BE HELD IN A MANNER THAT YOUR HAND WILL NOT BE CLOSE TO THE SPINDLE AS THE SPINDLE MOVES DURING THE PROCESS. ALSO THE DAMPER MUST BE HELD UNDER THE LEVEL OF THE OIL RESERVOIR, TO LET THE AIR BE DRAWN FROM THE DAMPER. BE SURE TO KEEP AWAY FROM THE SPINDLE, BECAUSE THE SPINDLE MOVES DURING THE PROCESS! THE SPINDLE MUST BE ALLOWED TO MOVE UNRESTRICTED. IT IS ALSO POSSIBLE TO HANG THE DAMPER FROM THE UPPER MOUNTING, IN THIS WAY IT IS NOT NECESSARY TO HOLD THE DAMPER IN YOUR HAND. NEVER HANG THE DAMPER FROM THE DAMPER CONNECTOR!



- Now the main power can be turned on and the vacuum process will start.



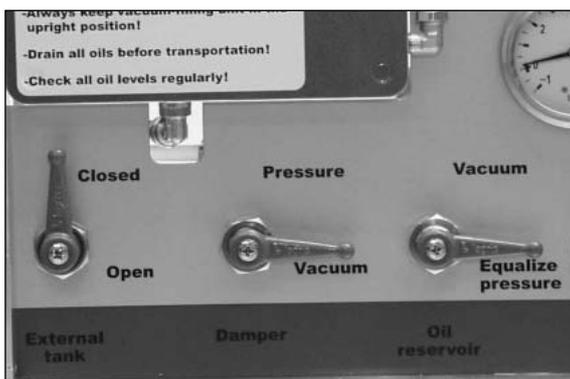
- First you will see the pressure gauge moving to a negative pressure.



- As soon as the pressure reaches 25 mbar the vacuum gauge will also start moving to a lower pressure.



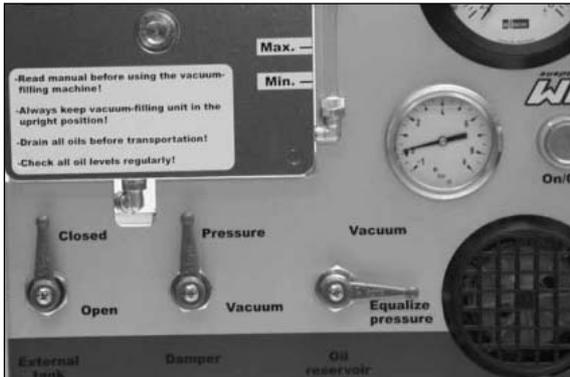
- As soon as the vacuum gauge reaches the specified pressure, in this example 4 mbar, the lever Oil reservoir should be moved to Pressure equalize.



External tank Closed
 Damper Vacuum
 Oil reservoir Equalize pressure



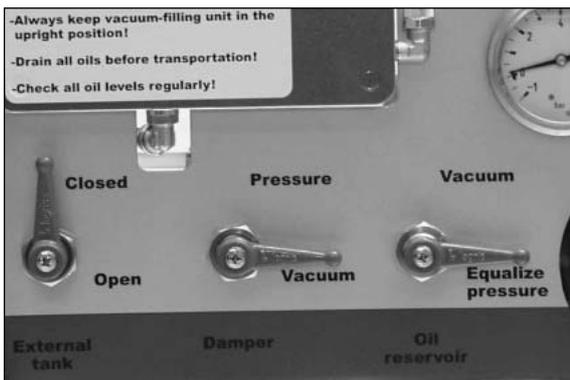
- Now the vacuum will be released, and you will see the pressure rising on both gauges.
- Shortly after this the vacuum gauges starts to run to a low pressure. This is happening because the pump is now working in a small volume witch includes the vacuum gauge. When the pressure gauge has reached 0 bar, the lever Damper can be moved to Pressure.



External tank	Closed
Damper	Pressure
Oil reservoir	Equalize pressure



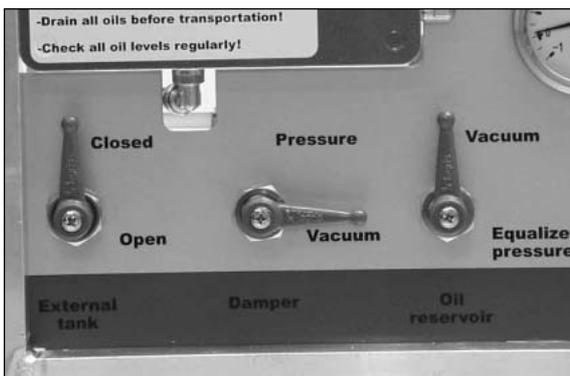
- This will start the forcing of oil into the damper, you will see the pressure gauge move to the pressure that has been set earlier, in this case 3 bar.



- As soon as the pressure has been reached, the lever Damper can be moved to the Vacuum position.

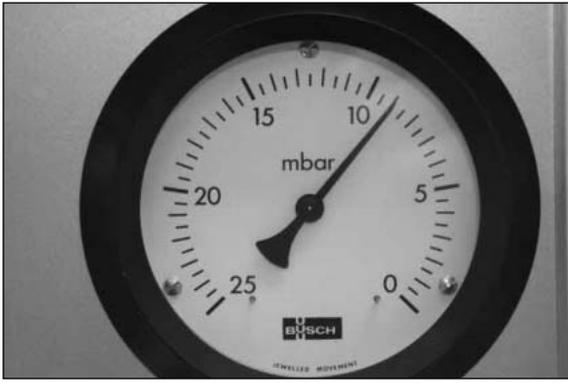
External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- This will release the pressure and the pressure gauge will move back to 0 bar.

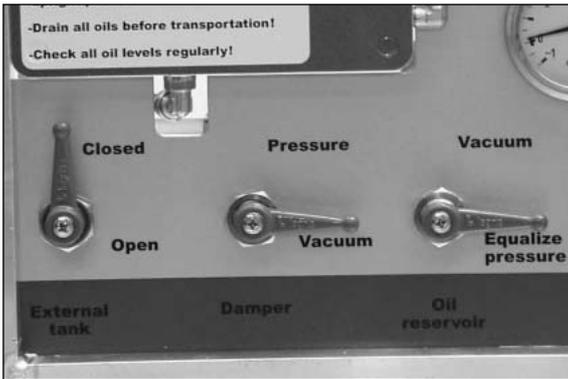


- When the pressure gauge reaches 0 bar, the lever Oil reservoir can be moved to Vacuum, this will start the 2nd cycle of vacuum.

External tank	Closed
Damper	Vacuum
Oil reservoir	Vacuum

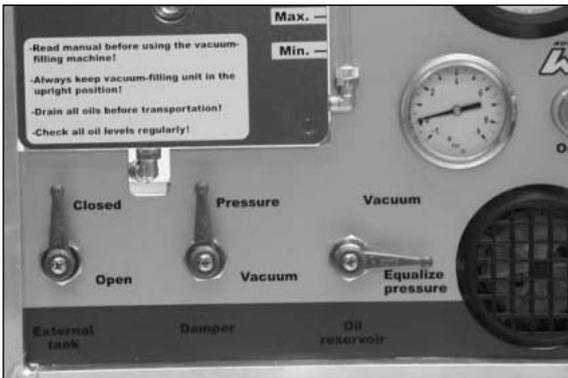


- Now you will see the pressure gauge moving to a negative pressure, as soon as the pressure reaches 25 mbar the vacuum gauge will also start moving to a lower pressure.
- As soon as the vacuum gauge reaches the specified pressure (2nd cycle), in this example 8 mbar, the lever Oil reservoir should be moved to Pressure equalize.



External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

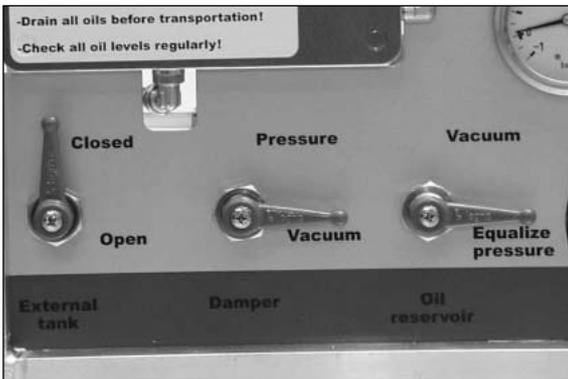
- Now the vacuum will be released, and you will see the pressure rising on both gauges, shortly after this the vacuum gauges starts to run to a low pressure. This is happening because the pump is now working in a small volume which includes the vacuum gauge.



- When the pressure gauge has reached 0 bar, the lever Damper can be moved to Pressure.

External tank	Closed
Damper	Pressure
Oil reservoir	Equalize pressure

- This will start the forcing of oil into the damper, you will see the pressure gauge move to the pressure that has been set earlier, in this case 3 bar.



- As soon as the pressure has been reached, the lever Damper can be moved to the Vacuum position.

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- This will release the pressure and the pressure gauge will move back to 0 bar. As soon as the pressure gauge reaches 0 bar, the main power switch can be turned off. This ends the vacuum filling process.

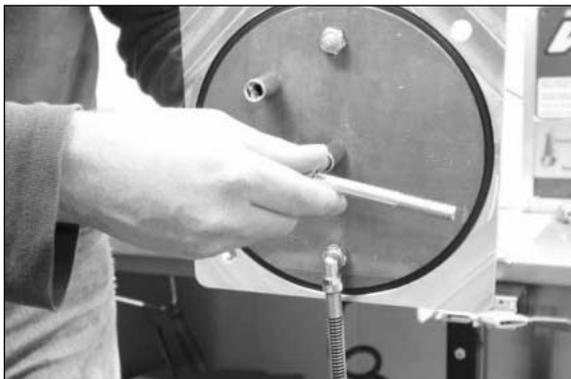
! CAUTION !

THE SEPARATION PISTON SHOULD BE PRESSED INTO THE CORRECT POSITION USING TOOL T107S. THE DAMPER CAN NOW BE DISCONNECTED FROM THE VACUUM-FILLING DEVICE. THE FILLING ADAPTER CAN BE REMOVED, SOME OIL MAY LEAK WHEN YOU ARE REMOVING THE FILLING ADAPTER.



Filling procedure using the external tank

- Remove the lid of the external tank and connect the damper to the quick release connector under the lid.



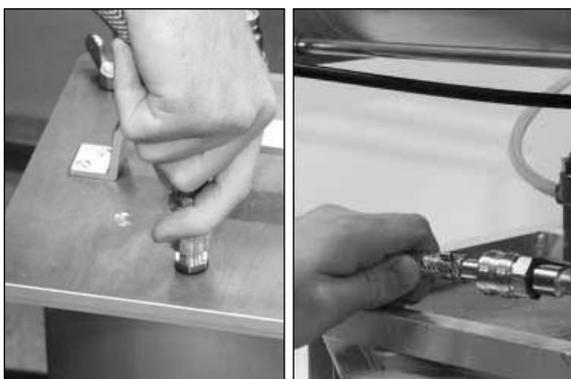
- The hook can be placed on several places on the lid, you might have to move the hook to another position in order to hang up a certain damper.



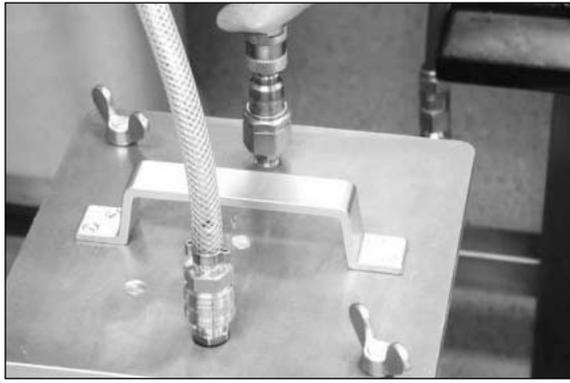
- Hang the damper on the hook under the lid.



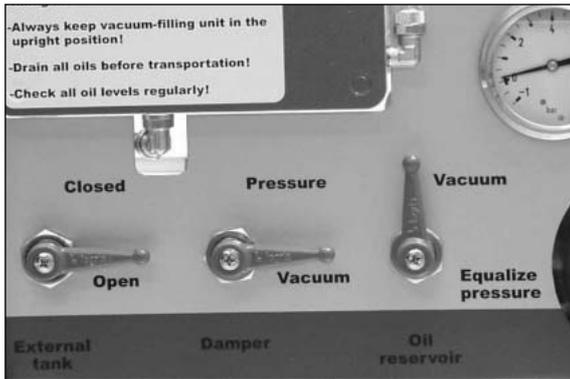
- Lower the damper into the external tank, be careful not to damage the top of the cylinder as this is the place where the seal works. Damaging the top of the cylinder may result in leakage, when this occurs the vacuum-filling device will no longer function. Carefully guide the hose into the external tank to avoid kink of the hose.
- Put the lid on the external tank and apply a light pressure to the lid. The external tank should be used in the upright position, and the tank should always be placed lower than the vacuum filling unit.
- Tighten both wing nuts slightly



- And you also need to connect the damper connection to the external tank.
- Now the vacuum filling unit has to be connected to the external tank, this means connecting the connection hose external tank.

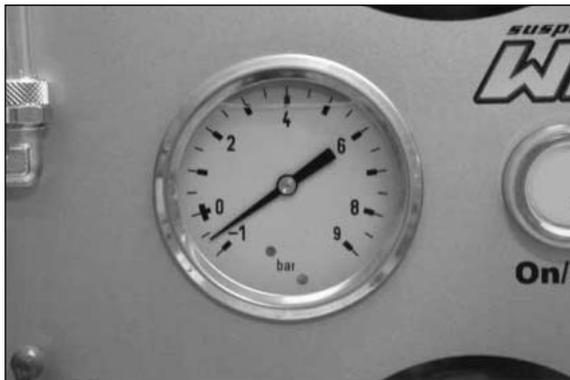


- You also need to connect the damper connection to the external tank.

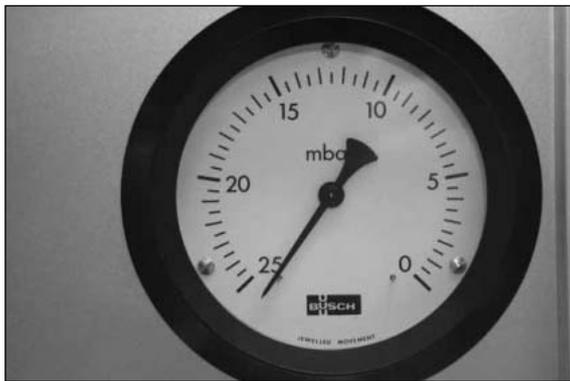


- Put the control levers in the following positions.

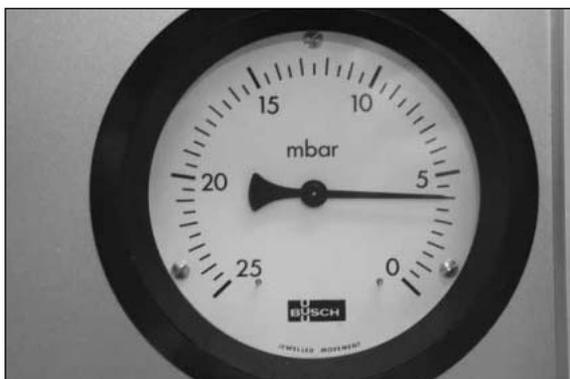
External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum



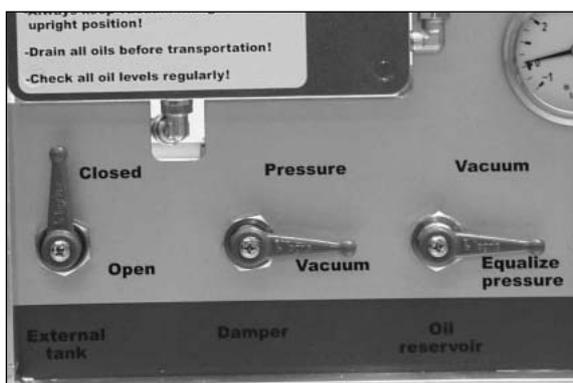
- Now the main power can be turned on and the vacuum process will start. First you will see the pressure gauge moving to a negative pressure.



- As soon as the pressure reaches 25 mbar the vacuum gauge will also start moving to a lower pressure.



- As soon as the vacuum gauge reaches the specified pressure, in this example 4 mbar the lever External tank should be moved to Closed position and the lever Oil reservoir should be moved to Equalize pressure.

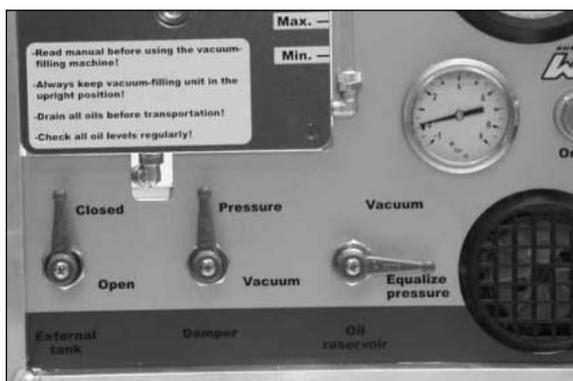


External tank Closed
Damper Vacuum
Oil reservoir Equalize pressure

- Now the vacuum will be released, and you will see the pressure rising on both gauges.



- Shortly after this the vacuum gauge starts to run to a low pressure. This is happening because the pump is now working in a small volume which includes the vacuum gauge. When the pressure gauge has reached 0 bar.

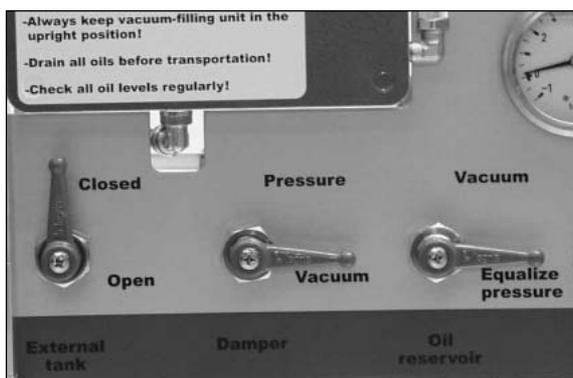


- The lever Damper can be moved to Pressure.

External tank Closed
Damper Pressure
Oil reservoir Equalize pressure



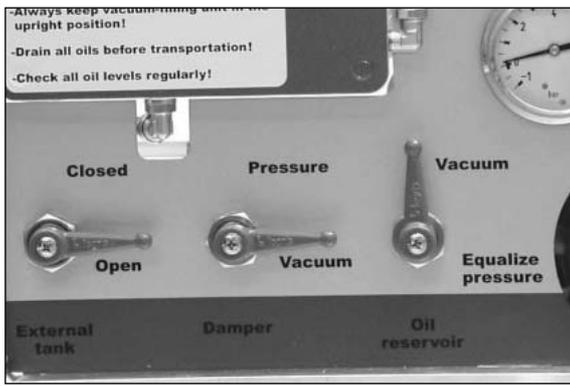
- This will start the forcing of oil into the damper, you will see the pressure gauge move to the pressure that has been set earlier, in this case 3 bar.



- As soon as the pressure has been reached, the lever damper can be moved to the Vacuum position.

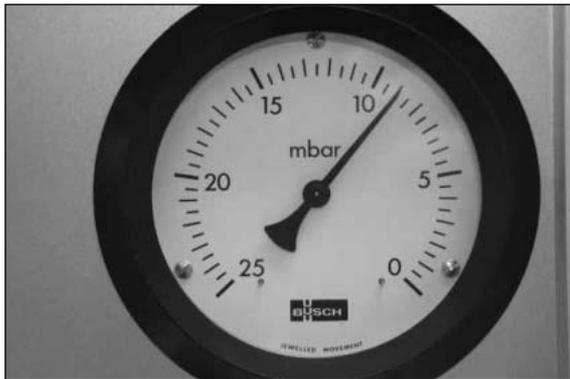
External tank Closed
Damper Vacuum
Oil reservoir Equalize pressure

- This will release the pressure and the pressure gauge will move back to 0 bar.



- When the pressure gauge reaches 0 bar, the lever Oil reservoir can be moved to Vacuum and the lever External tank must be moved to Open position, this will start the 2nd cycle of vacuum.

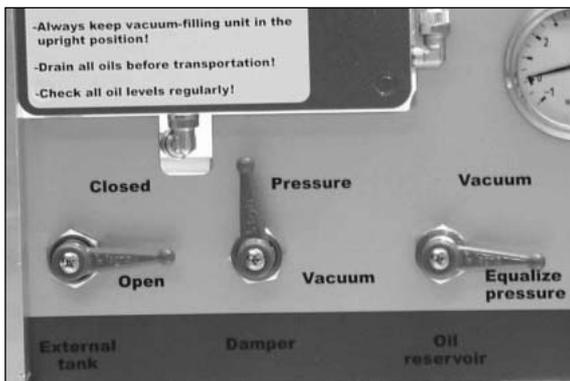
External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum



- Now you will see the pressure gauge moving to a negative pressure, as soon as the pressure reaches 25 mbar the vacuum gauge will also start moving to a lower pressure. As soon as the vacuum gauge reaches the specified pressure (2nd cycle), in this example 8 mbar, the lever Oil reservoir should be moved to Equalize pressure.



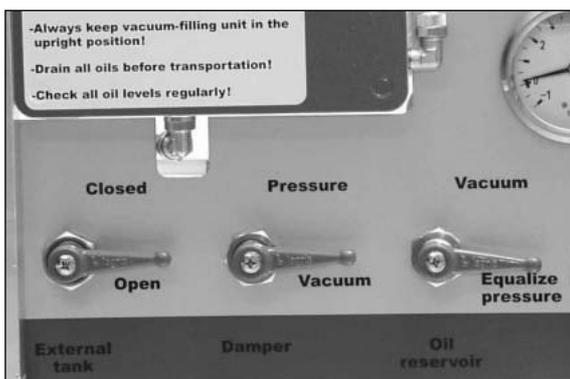
External tank	Open
Damper	Vacuum
Oil reservoir	Equalize pressure



- When the pressure gauge has reached 0 bar, the lever Damper can be moved to Pressure.

External tank	Open
Damper	Pressure
Oil reservoir	Equalize pressure

- This will start the forcing of oil into the damper, you will see the pressure gauge move to the pressure that has been set earlier, in this case 3 bar. As soon as the pressure has been reached the lever Damper can be moved to the Vacuum position.



External tank	Open
Damper	Vacuum
Oil reservoir	Equalize pressure

- This will release the pressure and the pressure gauge will move back to 0 bar.
- As soon as the pressure gauge reaches 0 bar, the main power switch can be turned off. This ends the vacuum filling process.

! CAUTION !

THE LID OF THE EXTERNAL TANK CAN BE REMOVED (LEAVE THE HOSES CONNECTED) AND THE SEPARATION PISTON SHOULD BE PRESSED INTO THE CORRECT POSITION USING TOOL T107S. THE DAMPER CAN NOW BE DISCONNECTED FROM THE VACUUM-FILLING DEVICE. THE FILLING ADAPTOR CAN BE REMOVED, SOME OIL MAY LEAK WHEN YOU ARE REMOVING THE FILLING ADAPTOR.

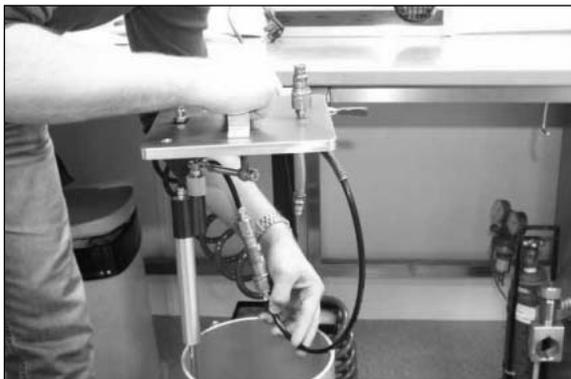


Filling procedure steering dampers

! CAUTION !

STEERING DAMPERS GENERALLY USE DIFFERENT OIL THAN NORMAL DAMPERS. FOR THIS REASON IT IS NECESSARY TO DRAIN AND CLEAN THE OIL RESERVOIR, AS DESCRIBED IN "MAINTENANCE". MAKE SURE THAT IT IS CLEAR TO EVERYONE THAT THE OIL RESERVOIR CONTAINS STEERING DAMPER OIL! THERE MIGHT BE A SMALL AMOUNT OF OIL LEFT IN THE CONNECTOR UNDER THE LID OF THE EXTERNAL TANK.

- Connect the filling adaptor to the filling connector under the lid of the external tank and let the oil flow into a measuring cup.



- Remove the lid of the external tank and connect the damper to the quick release connector under the lid. Hang the damper on the hook under the lid, using a tie wrap. Lower the damper into the external tank.



! CAUTION !

BE CAREFUL NOT TO DAMAGE THE TOP OF THE CYLINDER AS THIS IS THE PLACE WHERE THE SEAL WORKS. DAMAGING THE TOP OF THE CYLINDER MAY RESULT IN LEAKAGE, WHEN THIS OCCURS THE VACUUM-FILLING DEVICE WILL NO LONGER FUNCTION. PUT THE LID ON THE EXTERNAL TANK AND APPLY A LIGHT PRESSURE TO THE LID. THE EXTERNAL TANK SHOULD BE USED IN THE UPRIGHT POSITION, AND THE TANK SHOULD ALWAYS BE PLACED LOWER THAN THE VACUUM FILLING UNIT.

- Now the vacuum filling unit has to be connected to the external tank, this means connecting the connection hose external tank.

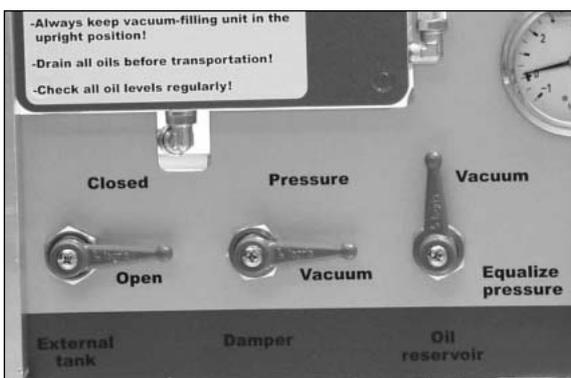


- And you also need to connect the damper connection to the external tank.



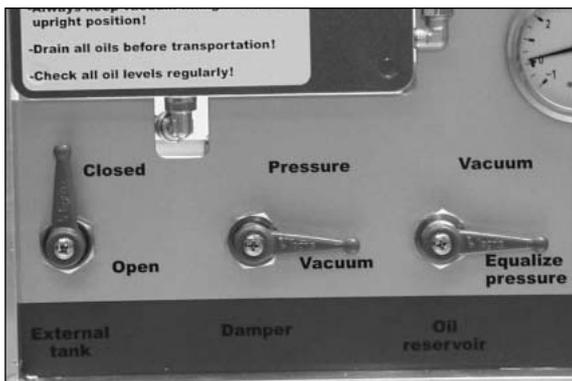
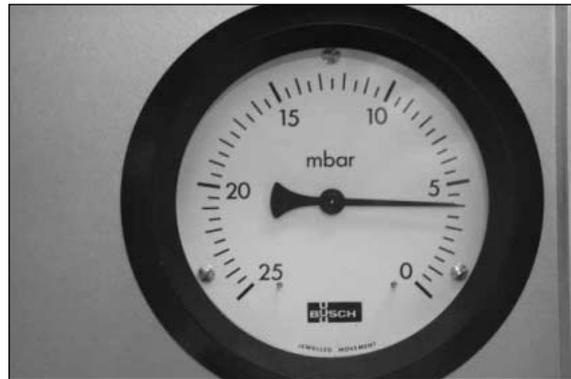
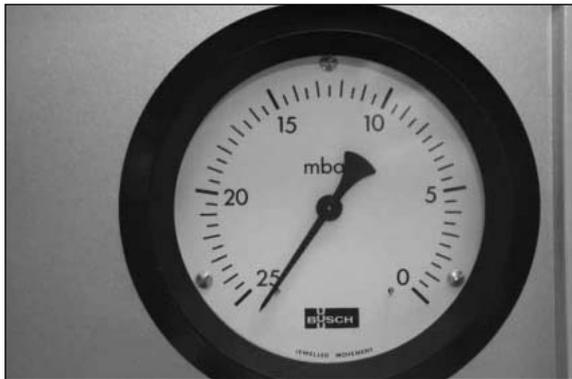
- Put the control levers in the following positions;

External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum





- Now the main power can be turned on and the vacuum process will start.
- First you will see the pressure gauge moving to a negative pressure as soon as the vacuum gauge reaches the specified pressure, in this example 4 mbar as soon as the pressure reaches 25 mbar the vacuum gauge will also start moving to a lower pressure.



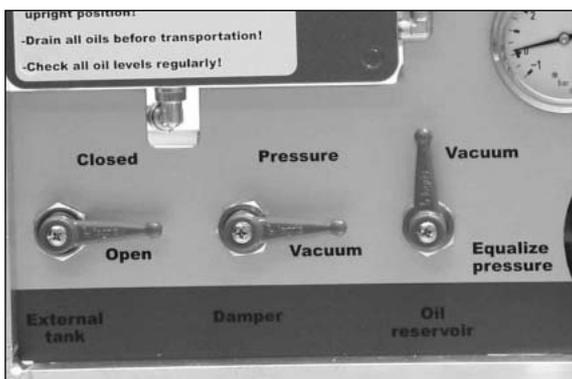
- The lever External tank should be moved to Closed position and the lever Oil reservoir should be moved to Equalize pressure. The lever Oil reservoir can be moved to Vacuum and the lever External tank must be moved to Open position.

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- Now the vacuum will be released, and you will see the pressure rising on both gauges.

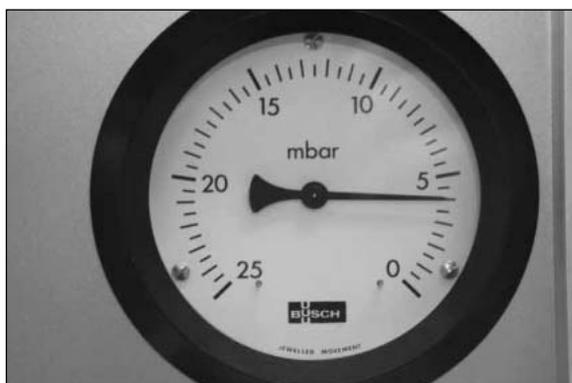


- Shortly after this the vacuum gauge starts to run to a low pressure. This is happening because the pump is now working in a small volume which includes the vacuum gauge.

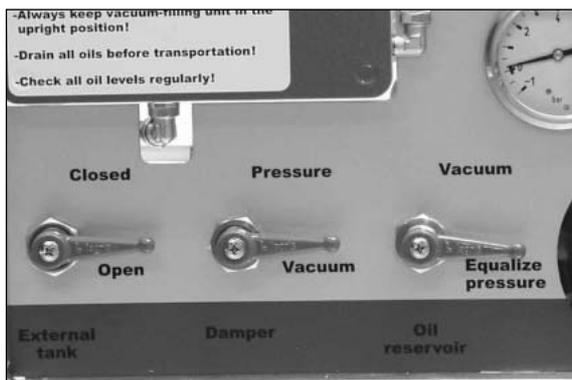


- When the pressure gauge has reached 0 bar the lever Oil reservoir can be moved to Vacuum and the lever External tank must be moved to Open position, this will start the 2nd cycle of vacuum.

External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum



- Now you will see the pressure gauge moving to a negative pressure, as soon as the pressure reaches 25 mbar the vacuum gauge will also start moving to a lower pressure.



- As soon as the vacuum gauge reaches the specified pressure (2nd cycle), in this example 4 mbar the lever Oil reservoir should be moved to Equalize pressure.

External tank	Open
Damper	Vacuum
Oil reservoir	Equalize pressure

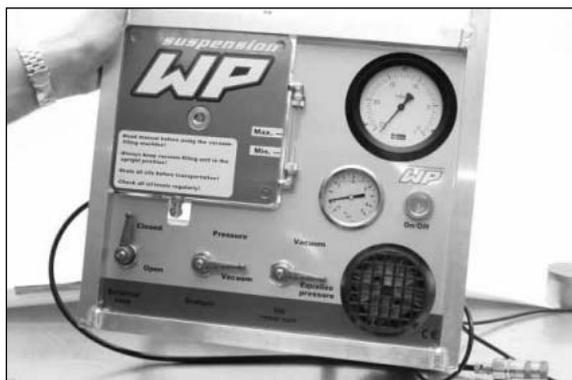
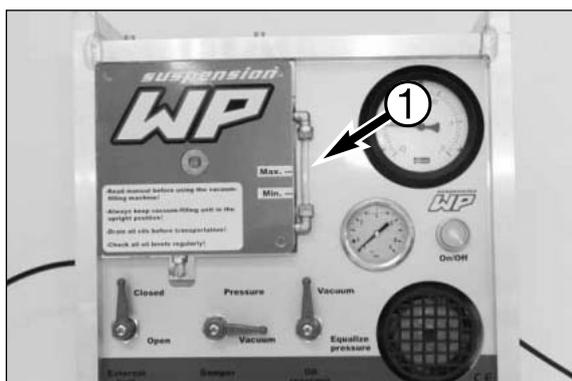
- Now the vacuum will be released, and you will see the pressure rising on both gauges, shortly after this the vacuum gauges starts to run to a low pressure. This is happening because the pump is now working in a small volume witch includes the vacuum gauge.

- The lid of the external tank can be removed and the filling adaptor can be disconnected. The filling adaptor can be removed from the steering damper, some oil may leak when you are removing the filling adaptor.

- Drain the small amount of oil left in the connector by connecting the filling adaptor to the filling connector under the lid of the external tank and letting the oil flow into a measuring cup. If the vacuumfilling device is no longer used for filling steering dampers, the oil reservoir has to be drained and cleaned, as described in "maintenance".

Frequent checks

- Checking / filling up oil reservoir
- Check the oil level ❶ in the oil reservoir, it should never be lower than min level to ensure correct vacuum filling of the damper.



! CAUTION !

THE VACUUM-FILLING UNIT SHOULD ALWAYS BE IN THE UPRIGHT POSITION TO AVOID OIL SPREADING TROUGH THE ENTIRE SYSTEM!!! THIS WILL CAUSE SERIOUS DAMAGE TO THE VACUUM FILLING DEVICE! ONLY USE OIL APPROVED BY WP SUSPENSION!



- Remove the filling plug of the oil reservoir.



- Fill the oil reservoir until the level indicator reaches max. level.



- Place back the filling plug using a torque wrench. The filling plug has to be fastened with a torque of 10 Nm.



- Before the unit can be used, the oil in the oil reservoir should be put under vacuum in order to get rid of the air inside of the oil.
- The control levers should be in the following positions (after correction of oil level):

External tank	Closed
Damper	Vacuum
Oil reservoir	Vacuum



- Now switch the power on and let the filling device run for about 1 minute, switch off the power.
- The vacuum-filling device is now ready for use.



Checking / adjusting oil level vacuum pump

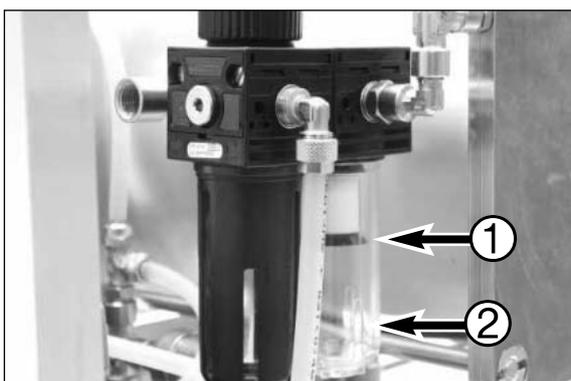
- The oil level of the vacuum pump should never exceed max level and should never be lower than the min level. Keep the oil level close to the max level to ensure good function and cooling of the pump.



- Remove the filling plug of the vacuum pump.

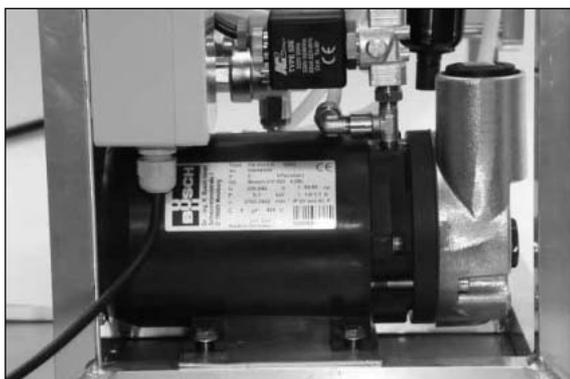
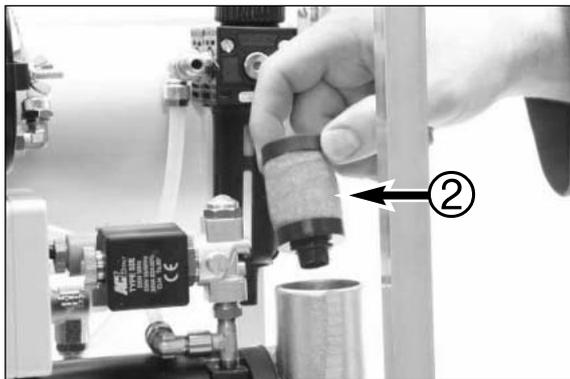
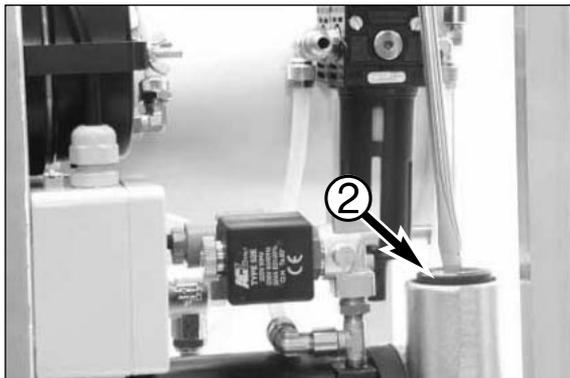
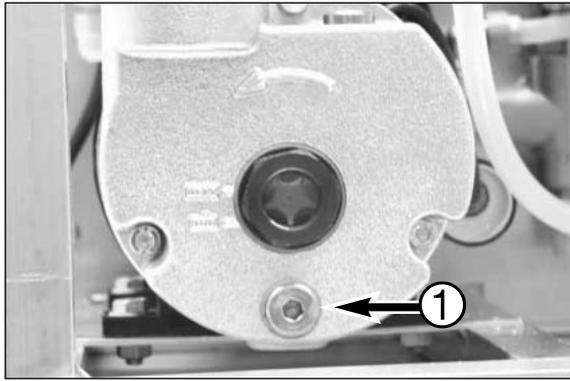


- Fill up the vacuum pump with oil to the max. level on the level indicator. Only use Busch Vm22 vacuum pump oil! Place back the filling plug.



Checking / cleaning oil separator

- The oil level in the oil separator has to be checked regularly, to avoid the oil from being sucked into the system causing damage. If the level is close to 2 cm away from the black ring ① inside of the oil separator, the oil must be drained.
- Turn the glass cap ② under the oil separator anti clockwise and remove the glass cap.
- Clean the cap ③ and screw it back on the oil separator.



Maintenance

! **CAUTION** !

DURING MAINTENANCE THE VACUUM-FILLING DEVICE SHOULD ALWAYS BE DISCONNECTED FROM BOTH AIR AND ELECTRICAL SUPPLY!

Maintenance vacuum pump

- The vacuum pump oil must be changed after the first 100 hours of operation. Further oil changes depend on operating conditions. The oil must be changed after 500-2000 hours of operation, but at least semi-annually. If there is considerable pollution or water in the sump oil (either as pure water or as an emulsion) oil changing is required as soon as possible.
- To change the oil, the warm pump must be switched off. Drain the oil through the oil drain plug ❶.
- Refasten the oil drain plug and fill fresh oil through the fill plug.
- Use only Bush Vm22 vacuum pump oil.

! **CAUTION** !

USED OIL SHOULD BE DISPOSED OF ACCORDING TO ENVIRONMENTAL LAWS.

- The exhaust filter must be changed every 500 hours of operation. If there is considerable pollution causing increased power consumption, increased temperature and/or decreased separation of oil in exhaust gas, it must be changed earlier. For changing of the exhaust filter unscrew the filter ❷ with a screwdriver and take it out of the housing.

- Place the new filter ❷ and fasten the filter hand tight, using a screwdriver.

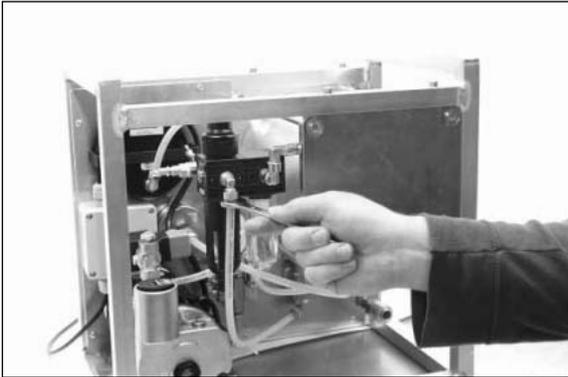
- The pump should be checked regularly for excessive dirt build-up on the surface of the pump. The dirt may cause the pump to thermally fail.
- The installation can be cleaned with a mild soap, do not use aggressive products as these might damage the stickers on the installation.



- The fan cover should also be checked regularly for dirt. Spoiling the fan cover prevents cool air intake and may lead to overheating of the vacuum pump.

Cleaning oil reservoir

- The oil reservoir should be disassembled and cleaned at least every 6 months. When the vacuumfilling installation is used intensively, the reservoir has to be cleaned more often. During filling of dampers a small amount of assembling dirt of the damper is coming into the oil reservoir. The dirt sinks down in the reservoir and gets caught behind a ridge in the reservoir. This prevents the dirt from (re)entering the damper. When too much dirt is collected, the dirt will be able to enter the damper. For this reason regular cleaning is necessary.



- For draining the oil reservoir, connect filling adaptor A to the damper connector of the filling unit and place the adaptor above a measuring cup. Let the oil run out of the reservoir. When there is no more oil flowing, the filling adaptor can be disconnected.
- Clean separators before taking out oil reservoir, according to description under "frequent checks".

- Remove the pressure pipe from the pressure regulator.



- Remove the vacuum pipe from the oil separator.

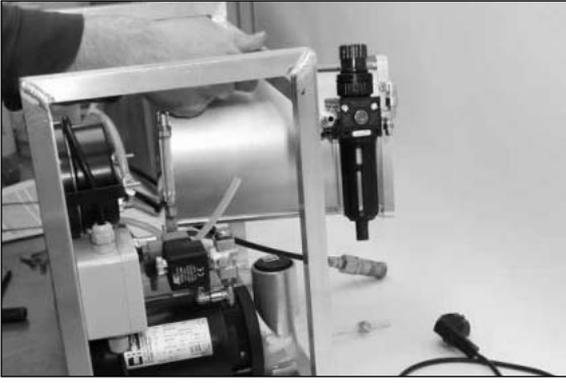


- Remove the 4 bolts of the oil reservoir, while supporting the reservoir to prevent it from falling.

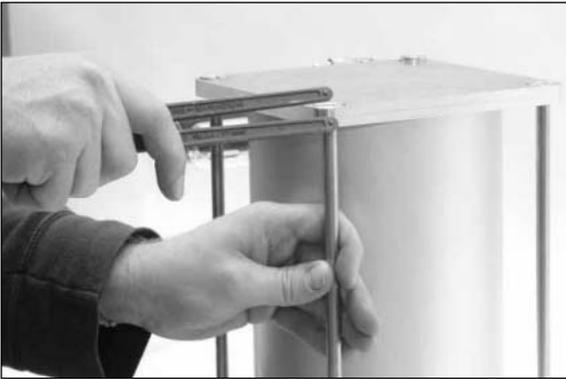


- When the bolts have been removed, gently move the backside of the reservoir inwards. This way the oil level indicator will not get stuck behind the backplate of the installation.





- The oil reservoir can now be taken out of the frame through the backside of the installation. Guide the damper connector pipe to avoid kink.



- Place the oil reservoir on the front lid and remove the nuts from the rear lid using tool T103. Hold the threaded rod while unscrewing the nuts, to avoid the rods from piercing the front sticker of the oil reservoir.



- Now hold the front lid and the aluminium tube down and gently pull the rear lid upwards. Be careful as the lid might suddenly pop loose.



- Now clean the inside of the oil reservoir with a degreaser and make sure there is no dirt or degreaser left inside of the oil reservoir.



- Grease the O-ring of the rear lid with special O-ring grease (PP300 T158).



- Replace the rear lid carefully.



- Be sure that the front and rear lid are correctly lined up.



- Screw the nuts on the threaded rod and tighten them with the adjustable pin spanner T103.
- Hold the threaded rod while screwing the nuts, to avoid the rods from piercing the front sticker of the oil reservoir.
- Now place back the oil reservoir in the reversed order.



Filling damper oil

- Remove the filling plug of the oil reservoir.
- Fill the oil reservoir until the level indicator reaches max. level. Place back the filling plug using a torque wrench. The filling plug has to be fastened with a torque of 10 Nm.

! CAUTION !

THE VACUUM-FILLING UNIT SHOULD ALWAYS BE IN THE UPRIGHT POSITION, TO AVOID OIL SPREADING THROUGH THE ENTIRE SYSTEM! THIS WILL CAUSE SERIOUS DAMAGE TO THE VACUUM FILLING DEVICE. ONLY USE OIL APPROVED BY WP SUSPENSION!



Vacuum air bleeding of damper oil

- Before the unit can be used, the oil in the oil reservoir should be put under vacuum in order to get rid of the air inside of the oil.
- The control levers should be in the following positions (after new oil filling):

External tank	Closed
Damper	Vacuum
Oil reservoir	Vacuum

- Now switch the power on and let the filling device run for about 2 minutes, switch off the power. The vacuum-filling device is now ready for use.

Spare parts

	Partnumber
Exhaust filter vacuum pump	T1254
O-ring oil reservoir	T1253
Vacuum pump oil Vm22, 1 litre	T1255
O-ring lid external tank	T1258
Quick release hydraulic connector male	T1262
Quick release hydraulic connector female	T1263
Filling adapter A	T1245S
Filling adapter B	T1246S
Filling adapter C	T1247S
Connecting hose external tank	T1259
Seal (filling adapter A)	T1248
O-ring 18x2 Viton (filling adapter C)	T1256
O-ring 17.12x2.62 UP Viton (filling adapter B)	T1257
Filling plug oil reservoir	T1252
Complete oil reservoir	T1250
Sticker front lid oil reservoir	T1251
Manual vacuum-filling device	5300.0074
Hose PU 100 8x6 black (1 meter)	T1260
Hose PU 100 8x6 transparent (1 meter)	T1261

Filling list

Component	External tank	Filling adaptor	Pressure 1st cycle	Pressure 2nd cycle	Overpressure
3612 PGB/CC	Yes	A or B **	4 mbar	8 mbar	3 bar
3612 Emulsion *					
4681 PGB/CC	Yes	A or B **	4 mbar	8 mbar	3 bar
4681 Emulsion *					
4618 Competition	No	A	4 mbar	4 mbar	3 bar
5018 Competition	No	A	4 mbar	8 mbar	3 bar
5018 PDS 1998	Yes	B	4 mbar	8 mbar	3 bar
5018 PDS 1999	Yes	B	4 mbar	8 mbar	3 bar
5018 PDS 2000	Yes	B	4 mbar	8 mbar	3 bar
5018 PDS 2001	Yes	B	4 mbar	8 mbar	3 bar
5018 PDS 2002	No	A	4 mbar	8 mbar	3 bar
5018 PDS 2003	No	A	4 mbar	8 mbar	3 bar
5018 PDS 2004	No	A	4 mbar	8 mbar	3 bar
2010 Steering damper *					
1508 Steering damper	Yes	C	4 mbar	4 mbar	-

* = not possible

** = If the shock absorber is supplied with a plug R1/8 you can use filling adaptor "A".

Short operation instruction for vacuum filling unit

! CAUTION !

IF AT ANY TIME YOU FEEL UNCERTAIN OF THE VACUUM FILLING OF A DAMPER, START OVER AGAIN TO ENSURE SAFETY.

Procedure without external tank

- Begin situation

External tank	Closed
Damper	Vacuum
Oil reservoir	Vacuum

- Switch the pump on

- At 1st cycle pressure (mbar)

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- At 0 bar

External tank	Closed
Damper	Pressure
Oil reservoir	Equalize pressure

- At required pressure

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- At 0 bar

External tank	Closed
Damper	Vacuum
Oil reservoir	Vacuum

- At 2nd cycle pressure (mbar)

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- At 0 bar

External tank	Closed
Damper	Pressure
Oil reservoir	Equalize pressure

- At required pressure

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

When pressure has dropped back to 0 bar, the pump can be shut down.

Procedure using the external tank

- Begin situation

External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum

- Switch the pump on

- At 1st cycle pressure (mbar)

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- At 0 bar

External tank	Closed
Damper	Pressure
Oil reservoir	Equalize pressure

- At required overpressure

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- At 0 bar

External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum

- At 2nd cycle pressure (mbar)

External tank	Open
Damper	Vacuum
Oil reservoir	Equalize pressure

- At 0 bar

External tank	Open
Damper	Pressure
Oil reservoir	Equalize pressure

- At required overpressure

External tank	Open
Damper	Vacuum
Oil reservoir	Equalize pressure

When pressure has dropped back to 0 bar, the pump can be shut down.

Procedure steering damper

- Begin situation

External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum

- Switch the pump on

- At 1st cycle pressure (mbar)

External tank	Closed
Damper	Vacuum
Oil reservoir	Equalize pressure

- At 0 bar

External tank	Open
Damper	Vacuum
Oil reservoir	Vacuum

- At 2nd cycle pressure (mbar)

External tank	Open
Damper	Vacuum
Oil reservoir	Equalize pressure

When pressure has dropped back to 0 bar, the pump can be shut down.