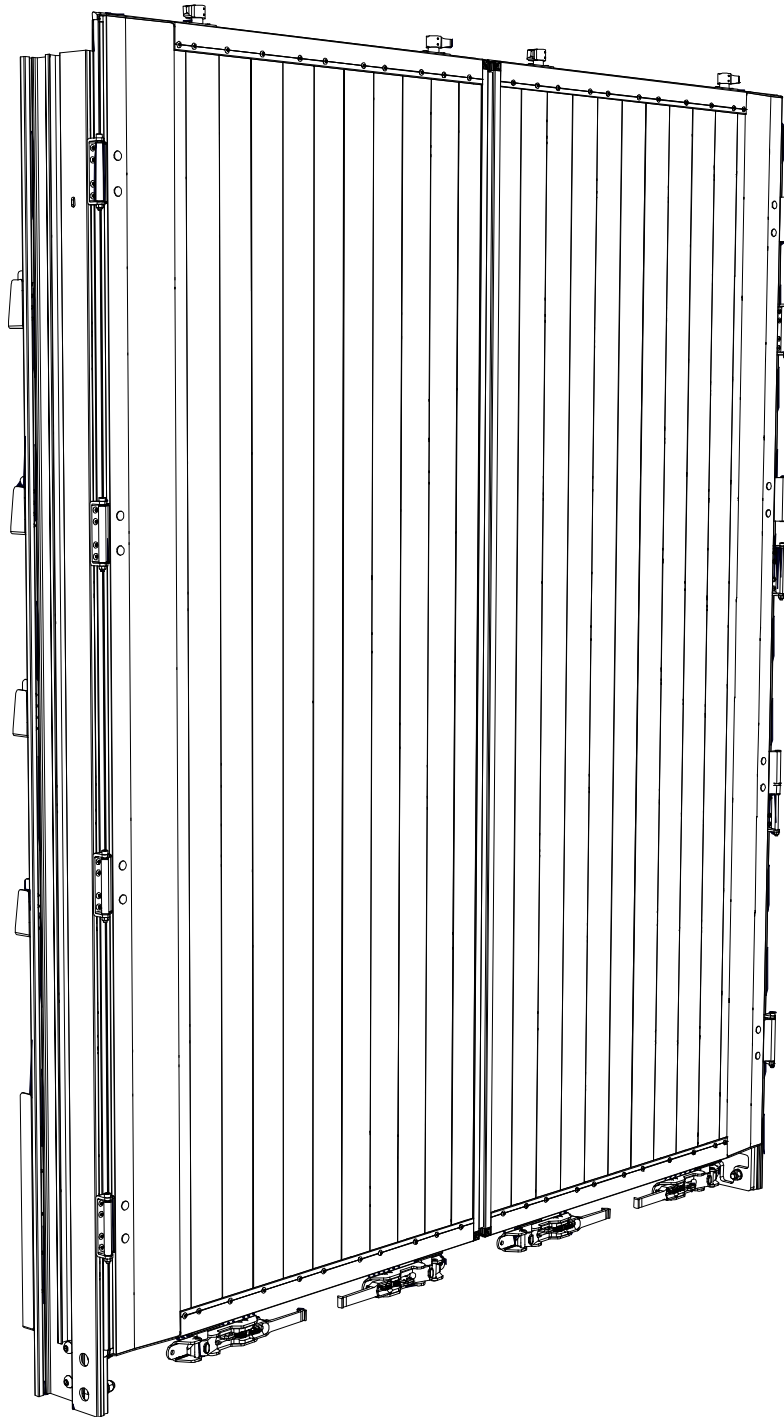


Mounting and repair instruction for sealing installation at rear door and double winged door



Translation of the original mounting instruction



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GENERAL REMARKS

Introduction to Mounting Instruction

Alteration service: Yes

Staff: According to curriculum for apprenticeship as a body and vehicle mechanic and a body and vehicle construction mechanic.

This Mounting Instruction is part of the delivery and an important help for successful mounting. Therefore, it must be available to the mechanic during the mounting works.

Furthermore, the assembly guidelines of the applicable vehicle producers must be obeyed.

Copyright:

The copyright for this mounting instruction is reserved by TSE Trailer System Engineering GmbH & Co. KG

If you need any further information, do not hesitate to contact us:

TSE Trailer System Engineering GmbH & Co. KG
Bei der Mühle 4
72365 Ratshausen
Germany
Phone: +49 (0)7427 / 92 33-0
Fax: +49 (0)7427 / 92 33-75
Email: verkauf@tse-trailersystems.de
Homepage: www.tse-trailersystems.de

Instruction and training support

As an employer, you are obliged to inform and instruct your personnel about existing legal and accident prevention regulations.

The personnel must have understood these instructions, and it must be safeguarded that the instructions are obeyed.

Only in this way you will reach safety and danger awareness of your personnel at work.

Example for training topics

1. About safety
 - Accident prevention regulations
 - General legislation
 - General safety hints
 - Measures in emergency cases
 - Personal protective equipment
2. Maintenance and repair regulations
 - Correct use of cleaning agents and lubricants
 - Special experience of the mechanic in maintenance, repair, cleaning and upkeep of the product

Hints



ATTENTION!

Texts with this symbol will warn you against possible mistakes in mounting and, therefore, against potential material damages.



HINT!

Texts with this symbol will give you tips or additional information.



TIGHTENING TORQUE

Texts with this symbol will give you the necessary tightening torques.

Safety

General

Although our products are in accordance with the state of the art, they may pose a risk if:

- they are mounted by unskilled personnel
- they are maintained improperly.

Safety hints

This safety instruction informs you about the products of TSE Trailer System Engineering GmbH & Co. KG. It contains information about maintenance and repair of the parts and their components. The service instruction has only been written for skilled personnel of qualified and authorized specialized companies in motor vehicle crafts. The service instruction is not applicable for other target groups.

We want to support specialized companies with the present mounting instruction during the mounting works with our products.

TSE Trailer System Engineering GmbH & Co. KG accepts no liability for the installation of inapplicable or unreleased parts in their products.

Defects due to wrong handling, use of force or subsequent changes of the delivered product or single components of it, as well as non-observance of the safety hints and consequential damages caused thereby, are not covered by our warranty.

Only use unchanged original parts and accessories supplied by the manufacturer.

We do not accept any warranty for the correctness, completeness or currency of the given information. The contents and information of this mounting instruction are neither a warranty or warranted characteristics within the meaning of German legislation, respectively the German Civil Code (Bürgerliches Gesetzbuch (BGB)), nor can they be interpreted as such.

No claims can be derived from provision of information, recommendation or consulting. Liability for damages is generally excluded as far as we are not responsible in the sense of intent or gross

negligence, or as far as this does not contradict mandatory legal provisions.

Texts and graphics are subject to our rights of use; copy rights or right of distribution in any form require our agreement.

Mentioned brand names, even if they are not marked as such in every case, are still subject to the regulations of the trade mark law.

If any disputes of legal nature occur from applying information found in this mounting instruction, they shall solely be subject to the regulations of German law.

The Amtsgericht Stuttgart (Local Court in Stuttgart) is deemed to be agreed on as place of jurisdiction. If some clauses of this declaration about limitation of liability do not or no longer comply with the applicable legal provisions, the validity of the other clauses shall remain unaffected thereof. Read the information in this mounting instruction carefully. Especially, obey the hints for your own safety.

All technical information, descriptions and pictures shall be valid from the day of their printing - respectively the day of any supplements hereto - on.

We reserve the right to make changes due to steady further development.

No claims can be derived from applications and explanations of this publication.

Safety hints for the technician:

Unauthorized people are not allowed to enter the vehicle and the area around it.

Your working area should be in good order.

Only works which you are commissioned and acquainted with have to be executed.

Increased caution is advisable in dangerous areas.

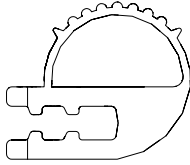
Obey the producer's information and safety hints for the applicable product when you deal with operation materials (oils, grease etc.).

Only applicable lifting devices may be used.

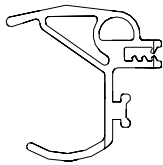
Dichtungsarten und Arbeitsmittel

1

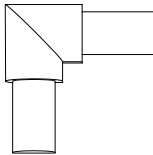
Sealing outside



Sealing door middle



Sealing brackets



Sealing outside
TSE-no.: 1214932

Sealing door middle
TSE-no.: 1215018

Sealing brackets
TSE-no.: 250-53.004

2



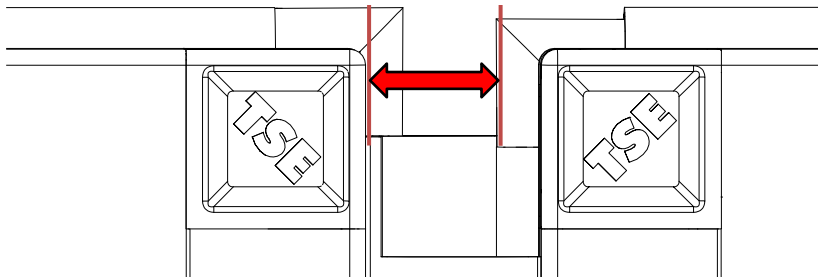
Optional:

- **Superglue**
TSE-no.: 1270913
- **Primer**
TSE-no.: 1270914
- **Cleaner**
TSE-no.: 1270915

Door crack set point

1

Door crack set point: 22-24mm



A correctly set door crack between the door wings is an important precondition so that the door sealing will not be damaged during the daily use.

The door crack **must be at least 22mm** in the upper area.

Sealing installation

1



Middle sealing with auxiliary bars



Remove auxiliary bars



Middle sealing without middle into the T-slot

Prepare the sealing door middle (TSE-no.: 1215018) for the installation at the left door wing and at the double wing door in the middle. Remove both auxiliary bars if this has not already been done in the factory.

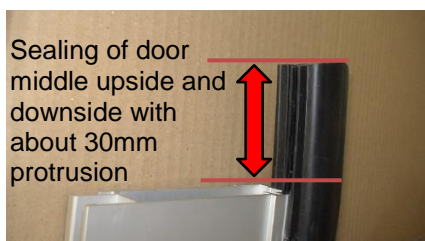
Now the auxiliary bars must be cut at the beginning of the sealing for about 5mm. Then they can easily be removed manually. They are only needed for making the sealing.

2

Insert the sealing of door middle into the T-slot



Use lubricant in the T-slot



Sealing of door middle upside and downside with about 30mm protrusion

Mount the sealing door middle (TSE-no.: 1215018) into the aluminium profile. For easier mounting it is recommended to moisten the T-slots in the aluminium profile with a lubricant.

Silicone spray or soap solution are very suitable for this purpose.

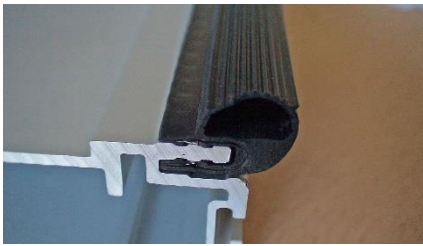
Let the sealing upside and downside protrude for about 30mm.

3

Press the lateral sealing lips into the slot



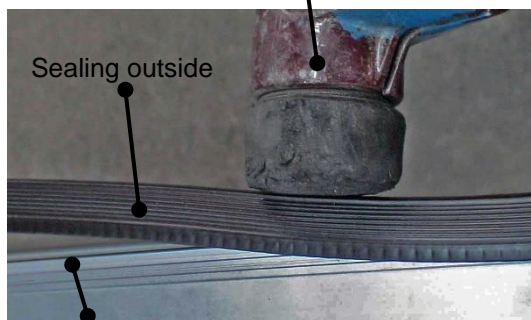
Auxiliary tools



As you can see in the pictures, press the door sealing middle into the lateral slot. Please check that the sealing lip has been pressed in evenly and along the entire depth. To facilitate the insertion of the sealing lip into the lateral slot, auxiliary tools can be used.

4

Auxiliary tools



Slot aluminium profile

Auxiliary tools



Manual locking lever downside

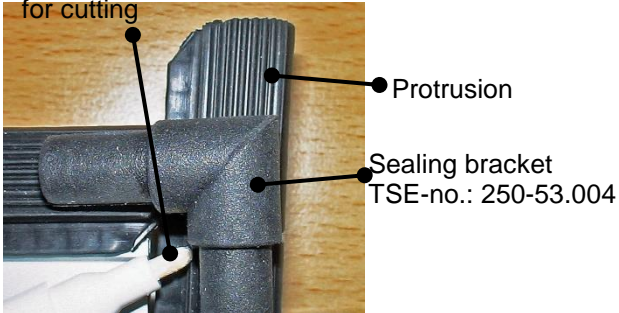
Press the sealing outside (TSE-no.: 1214932) into the slot of the aluminium profiles of the door manually. Let the sealing protrude for about 30mm for the later exact adjustment of the length.

To guarantee the correct fitting of the sealing, you can support pressing the sealing into the aluminium profile slot by using a rubber hammer as an auxiliary tool.

In the area of the locking cams upside and the manual locking lever downside, the correct fit of the sealing must be safeguarded with a piece of wood or a similar auxiliary tool which is not sharp-edged.

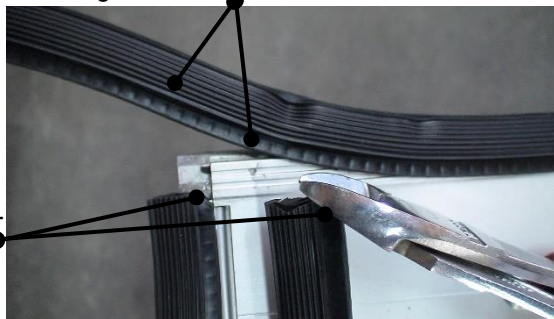
5

Mark the sealing outside
for cutting



Remove the protrusion for cutting from the
slot again.

Cut the edge for
about 3x45°

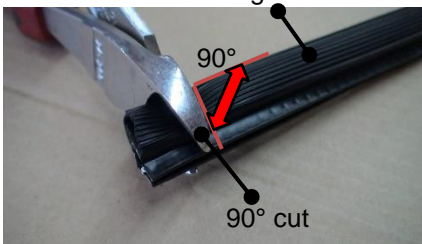


Mark the cutting length of the s
sealing outside by means of a
sealing bracket.

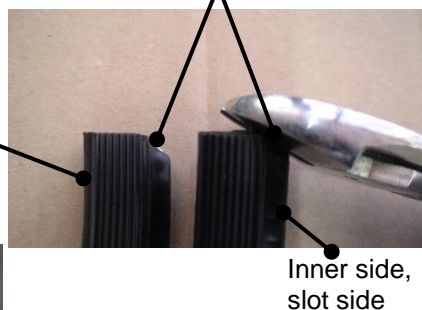
Pull out the sealing a little from
the aluminium profile to cut it.

6

Sealing outside



Cut the edge
for about 3x45°



Pull the protrusion out of
the slot for cutting.



Cut the edge
for about 3x45°

Cut the outer sealing in an
angle of 90° by means of a
side cutter.

The edge must be cut for
about 3x45° at the inside of the
sealing by means of a side
cutter so that the cutting ends
of the outer sealings do not
collide in the edge area.

After cutting, press the
sealings back into the
aluminium profile slot entirely.

7



Insert the sealing brackets

(**TSE-no.: 250-53.004**) entirely into the sealing door outside (**TSE-no.: 1214932**) and – at the left door wing - also into the sealing door middle. **NO** gap may occur between the sealing and the sealing bracket.



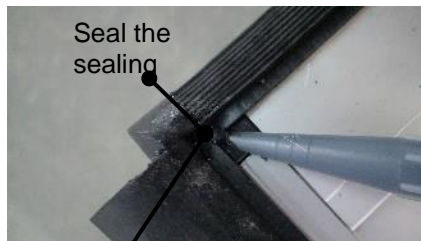
The glue (**TSE-no.: 1270913**) not be used to fix the sealings in the aluminium profile slots. It may only be used to glue the sealing brackets.

To glue the sealing brackets, we recommend to apply the superglue ERGO 5880 (**TSE-no.: 1270913**).

8



Smoothen the glue with soapy water

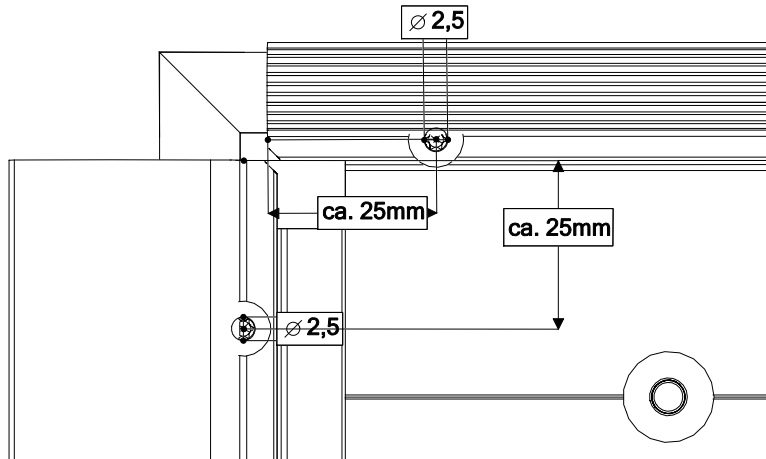


Smoothen the glue with soapy water

Seal the sealing brackets with the black glue (**TSE-Nr.: 000-06.101**), as you can see on the pictures.

The glue can be smoothed by means of soapy water.

9

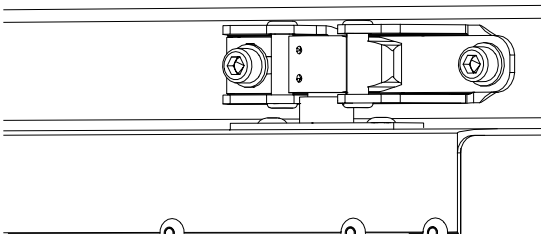


Flat-head tapping screw
 3.5x9.5mm
TSE-no.: 1287332

After gluing the sealing brackets, the boreholes are made ($\text{Ø}2.5\text{mm}$) and the screws are placed.

10

Counter bearing of locking upside



At the upper top crossbar, the counter bearings of locking are screwed with the sealings and the clamping plates.

Screw the counter bearing of locking downside.

Counter bearing of locking downside



12**View on middle sealing of door wing left downside**

Adjust the sealing by cutting

View on middle sealing of door wing left upside

Adjust the sealing by cutting

Cut the fixed sealing at the middle of the door and downside.

Annexes

Assembly preloads and tightening torques of screw connections according to VDI guideline 2230

Measure	Strength grade	Assembly preloads for mounting F_{Mtab} in kN for $\mu_g =$							Tightening torque M_A in Nm für / for $\mu_k = \mu_g =$						
		0,08	0,10	0,12	0,14	0,16	0,20	0,24	0,08	0,10	0,12	0,14	0,16	0,20	0,24
M 4	8.8	4,6	4,5	4,4	4,3	4,2	3,9	3,7	2,3	2,6	3,0	3,3	3,6	4,1	4,5
	10.9	6,8	6,7	6,5	6,3	6,1	5,7	5,4	3,3	3,9	4,6	4,8	5,3	6,0	6,6
	12.9	8,0	7,8	7,6	7,4	7,1	6,7	6,3	3,9	4,5	5,1	5,6	6,2	7,0	7,8
M 5	8.8	7,6	7,4	7,2	7,0	6,8	6,4	6,0	4,4	5,2	5,9	6,5	7,1	8,1	9,0
	10.9	11,1	10,8	10,6	10,3	10,0	9,4	8,8	6,5	7,6	8,6	9,5	10,4	11,9	13,2
	12.9	13,0	12,7	12,4	12,0	11,7	11,0	10,3	7,6	8,9	10,0	11,2	12,2	14,0	15,5
M 6	8.8	10,7	10,4	10,2	9,9	9,6	9,0	8,4	7,7	9,0	10,1	11,3	12,3	14,1	15,6
	10.9	15,7	15,3	14,9	14,5	14,1	13,2	12,4	11,3	13,2	14,9	16,5	18,0	20,7	22,9
	12.9	18,4	17,9	17,5	17,0	16,5	15,5	14,5	13,2	15,4	17,4	19,3	21,1	24,2	26,8
M 7	8.8	15,5	15,1	14,8	14,4	14,0	13,1	12,3	12,6	14,8	16,8	18,7	20,5	23,6	26,2
	10.9	22,7	22,5	21,7	21,1	20,5	19,3	18,1	18,5	21,7	24,7	27,5	30,1	34,7	38,5
	12.9	26,6	26,0	25,4	24,7	24,0	22,6	21,2	21,6	25,4	28,9	32,2	35,2	40,6	45,1
M 8	8.8	19,5	19,1	18,6	18,1	17,6	16,5	15,5	18,5	21,6	24,6	27,3	29,8	34,3	38,0
	10.9	28,7	28,0	27,3	26,6	25,8	24,3	22,7	27,2	31,8	36,1	40,1	43,8	50,3	55,8
	12.9	33,6	32,8	32,0	31,1	30,2	28,4	26,6	31,8	37,2	42,2	46,9	51,2	58,9	65,3
M10	8.8	31,0	30,3	29,6	28,8	27,9	26,3	24,7	36	43	48	54	59	68	75
	10.9	45,6	44,5	43,4	42,2	41,0	38,6	36,2	53	63	71	79	87	100	110
	12.9	53,3	52,1	50,8	49,4	48,0	45,2	42,4	62	73	83	93	101	116	129
M 12	8.8	45,2	44,1	43,0	41,9	40,7	38,3	35,9	63	73	84	93	102	117	130
	10.9	66,3	64,8	63,2	61,5	59,8	56,3	52,8	92	108	123	137	149	172	191
	12.9	77,6	75,9	74,0	72,0	70,0	65,8	61,8	108	126	144	160	175	201	223
M 14	8.8	62,0	60,6	59,1	57,5	55,9	52,6	49,3	100	117	133	148	162	187	207
	10.9	91,0	88,9	86,7	84,4	82,1	77,2	72,5	146	172	195	218	238	274	304
	12.9	106,5	104,1	101,5	98,8	96,0	90,4	84,8	171	201	229	255	279	321	356
M 16	8.8	84,7	82,9	80,9	78,8	76,6	72,2	67,8	153	180	206	230	252	291	325
	10.9	124,4	121,7	118,8	115,7	112,6	106,1	99,6	224	264	302	338	370	428	477
	12.9	145,5	142,4	139,0	135,4	131,7	124,1	116,6	262	309	354	395	433	501	558
M 18	8.8	107	104	102	99	96	91	85	220	259	295	329	360	415	462
	10.9	152	149	145	141	137	129	121	314	369	421	469	513	592	657
	12.9	178	174	170	165	160	151	142	367	432	492	549	601	692	769
M 20	8.8	136	134	130	127	123	116	109	308	363	415	464	509	588	655
	10.9	194	190	186	181	176	166	156	438	517	592	661	725	838	933
	12.9	227	223	217	212	206	194	182	513	605	692	773	848	980	1092
M 22	8.8	170	166	162	158	154	145	137	417	495	567	634	697	808	901
	10.9	242	237	231	225	219	207	194	595	704	807	904	993	1151	1284
	12.9	283	277	271	264	257	242	228	696	824	945	1057	1162	1347	1502
M 24	8.8	196	192	188	183	173	168	157	529	625	714	798	875	1011	1126
	10.9	280	274	267	260	253	239	224	757	890	1017	1136	1246	1440	1604
	12.9	327	320	313	305	296	279	262	882	1041	1190	1329	1458	1685	1877

Quelle: VDI-Richtlinie 2230 Blatt 1 S. 109

Assembly preload F_{Mtab} and tightening torque M_a with $v = 0,9$ for shank bolts with metric standard thread according to DIN ISO, 68, DIN ISO 724, DIN 13-19; head dimensions of hexagonal bolts according to DIN EN ISO 4014 to DIN EN ISO 4018 hexalobular external driving head bolts according to DIN 34 800 or cylindrical bolts according to DIN EN ISO 4762 and hole „medium“ according to DIN EN 20273

Revision levels

Revision level	Kind of change	Date	Name
00	New creation of mounting instruction	26 March 2019	Laib / Maier