AAG R-MAX

inspection & warranty manual

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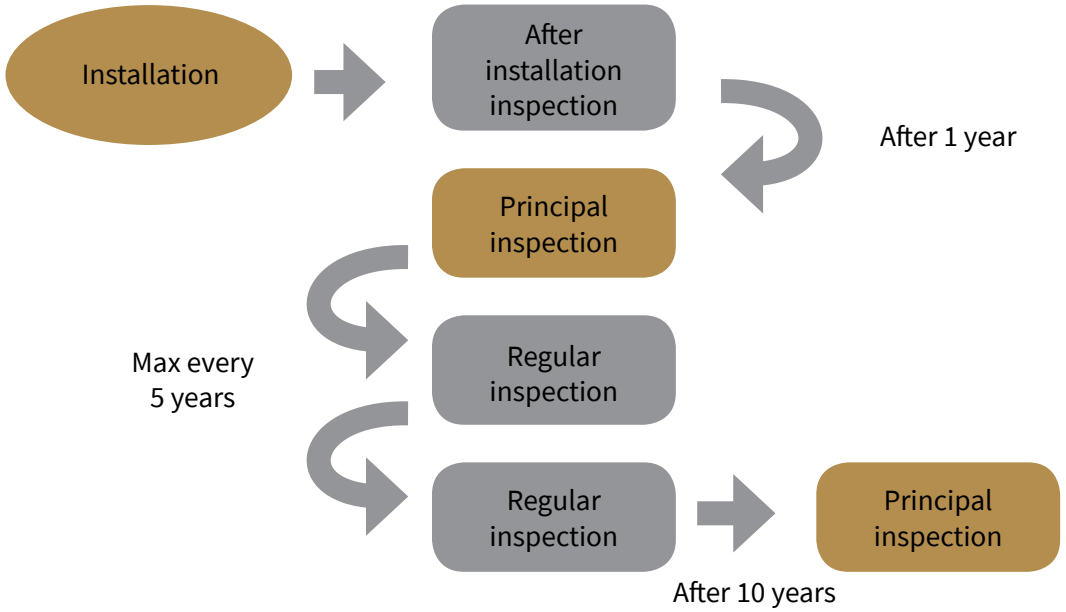
1. GENERAL

This procedure shows the inspection to be performed on the **AAG R-Max** bearings after the installation on the structure; the inspection criteria here shown are in accordance to the EN 1337-10: “Inspection and Maintenance” European code where two types of inspections are recommended.
The bearings have been designed and manufactured in order to reduce maintenance interventions to a minimum level.
It is however recommended a periodical inspection as described below.
The inspector that will carry out such inspection, shall have competent knowledge of the bearings; the inspection has to be performed in accordance to this procedure and to all the requirements given by the EN 1337-10: “Inspection and Maintenance” code.
The inspection items here shown are valid for all the **AAG R-Max** bearings whichever is the reference code used for their design.
If necessary the bearings shall be cleaned before the inspection.

The AAG bearing warranty is valid only if

- **Inspection After Installation**
- **Principal Inspection**
- **Regular Inspections**

have been regularly performed and inspections data have been recorded and transmitted to AAG with all the necessary pictures proving inspection results (see R-Max Bearings inspection report at the end of this document).



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2. AAG R-Max bearings warranty conditions

AAG R-Max spherical bearings are warranted to be free from defects in material and workmanship, and this express warranty is in lieu of and excludes all other warranties express or implied (including implied warranty of merchantability and implied warranty of fitness for a particular use).
The warranty covers only the products supplied by AAG for the period of 12 months if not expressly and differently stated in AAG Pro Forma Invoice and expires if the products are incorrectly stored, handled, installed and maintained.

The validity of the warranty is subjected to the following:

- the bearings have been correctly stored and handled;
- the bearings have been installed by expert installers or under supervision of AAG technician;
- the bearings have been installed according to AAG installation procedure (see the "R-Max installation & maintenance" manual that can be downloaded from AAG web site www.AAG.world);
- the inspection report of bearing installation (according to the previous paragraph) have been transmitted to AAG at the end of installation;
- the bearing' installation inspections are performed and recorded with the procedure and frequency shown in this document and after each inspection the report is sent to AAG within the necessary pictures showing the installed bearings and the inspection results.

For the correct storage, handling installation and maintenance, the client shall refer to the AAG "R-Max installation & maintenance" manual that can be downloaded from www.AAG.world .
Upon written notice only, not later than thirty (30) days after arrival of any product furnished hereunder, and after reasonable opportunity has been afforded Seller to investigate when such product is in the hands of the original purchaser and has been properly used for the purpose for which sold, Seller will replace any such product that fails to conform to the conditions of sales contract, or, at Seller's option, Seller will repay upon return of the nonconforming product, the price paid for such product being excluded any transportation charges paid by Buyer to and from Seller's plant.

Buyer's remedies with respect to any product furnished by Seller that is found not to be in conformity with the sales contract because of breach of express warranty (as defined in the next paragraph) or negligence shall be limited exclusively to the right of replacement thereof or to the repayment of the purchase price, as above provided.
In no event shall Seller be liable for claims (based upon breach of express warranty or negligence) for any other damages, whether direct, immediate, foreseeable, consequential or special or for any expense incurred by reasons of the use or misuse, sale or fabrication of products which do or do not conform to the terms and conditions of the sales contract.

3. Inspection after installation

At the end of the bearing installation, that must be executed in accordance to the AAG "R-Max installation & maintenance" manual, a careful inspection is required.

In the inspection immediately after the installation, the following points shall be checked:

a) check of the correct bearing positioning and bearing identification label;

b) check of the bearing orientation (guided and free sliding) according to the bearing layout drawing;

c) check of the bearing planarity, a maximum tolerance of ± 0,0025 radians of the intended inclination of the contact surfaces of the structure is allowed;

d) check of removal of the temporary red transportation devices to allow the bearing rotations and movements;

e) check of the steel parts coating; if some parts have been damaged during installation they must be repaired;

f) check of the preset orientation (if any) to verify that the bearing have the sufficient movement capacity in each direction;

g) check of the anchorages bolt connection.

The inspection results shall be recorded in the form printed at the end of this document.

The report shall be filed with plans and drawings of the structure and a copy shall be forward to AAG for warranty validity.

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4. Regular inspection

The regular inspection of the bearings shall take place at least as frequently as the structure is inspected but not less than every 5 years.

In the regular inspection the following properties shall be checked:

a) sufficient capacity for residual movement of the sliding bearings taking into account the temperature of the structure;

b) visible defects:
   - cracks;
   - incorrect position;
   - unforeseen movements and deformations;

c) condition of bedding and fixing;

d) condition of corrosion protection, dust protection and seals;

e) condition of sliding surfaces;

f) visible defects of adjoining structural parts.

The inspection results shall be recorded in the form printed at the end of this document.

The report shall be filed with plans and drawings of the structure and a copy shall be forward to AAG for warranty validity.

In case of visible defects or damage which are likely to affect the function, the principal inspection shall be carried out; if after the principal inspection the bearings require maintenance, all the operations must be done in accordance to the AAG "R-Max installation & maintenance" manual and an exact description and report of the maintenance executed shall be forward to AAG for warranty validity.

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5. Principal inspection

5.1 General

Principal inspections shall be carried out at less frequent intervals than regular inspections but not less than every 10 years and will normally replace one of these (this last requirement is given by EN1337-10 section 6.1).
They are intended to result in a precise record of the condition of the bearings and, if properly interpreted and acted upon, will ensure that the bearing will continue to function as intended until the next principal inspection.

The first principal inspection shall be carried out within one year of the structure being put into service.

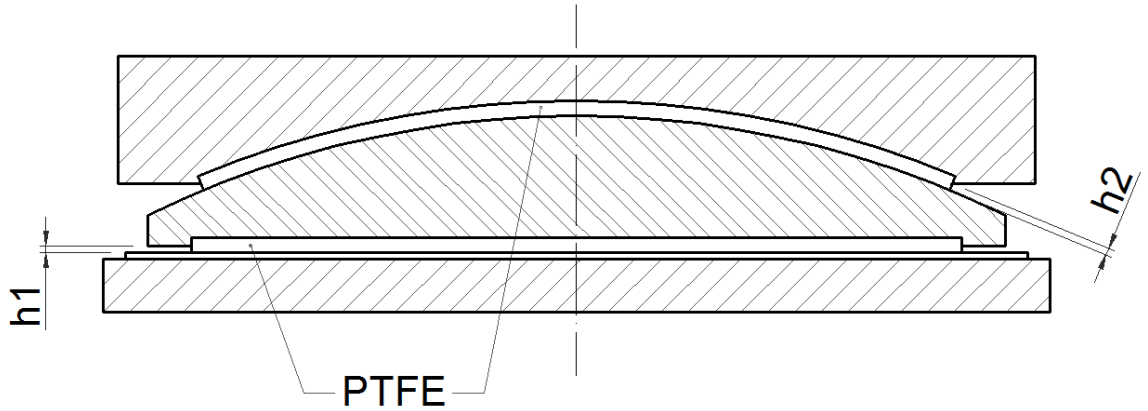
The principal inspection shall include the following checks, in addition to all the points covered by the general inspection.

5.2 Sliding part of spherical bearings

The clearance h between the sliding surface and the plate containing the PTFE sheet shall be measured with a feeler gauge at sufficient points to find the minimum value; the longitudinal and transversal displacement *x*, *y* and h_1 and h_2 to be recorded.

Where visible, the condition of the sliding surface and its fixings shall be reported.

No action is required if h_1 and h_2 are greater than 0.5 mm.



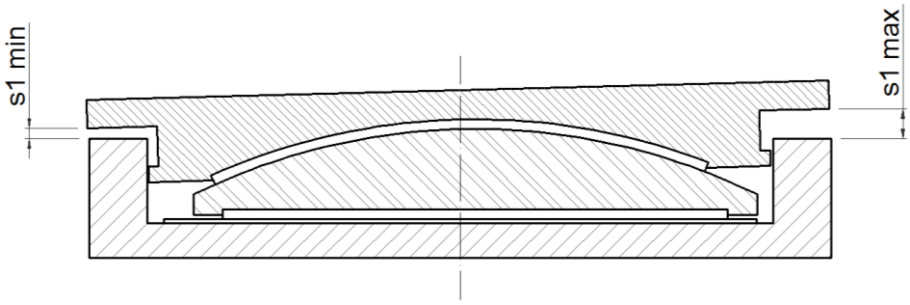
If the previous condition is not respected the bearing must be replaced by a suitable procedure, given by the structural designer, to ensure to avoid damage the structure and guarantee safety conditions during bearing replacement. In case of bearing replacement AAG technicians must be informed.

5.3 Basement part of spherical bearings

The values s_{1min} and s_{1max} shall be recorded (see fig.2).

No action is required if $s_{1min} \geq 5$ mm.

If the previous condition is not respected the bearing must be replaced by a suitable procedure, given by the structural designer, to ensure to avoid damage the structure and guarantee safety conditions during bearing replacement. In case of bearing replacement AAG technicians must be officially notified.



The report of the bearing inspection must be performed according to the EN1337-10 Annex B and the data recorded in the “Bearings inspection report” (see the following pages).

The “Bearings inspection report” must be fully written, and all the necessary pictures showing the bearings and their minor and/or major defects or damages (if any) attached.

The report shall be filed with plans and drawings of the structure and a copy shall be forward to AAG for warranty validity.

If after the principal inspection the bearings require maintenance, all the operations must be done in accordance to the AAG “R-Max installation & maintenance” manual and an exact description and report of the maintenance executed shall be forward to AAG for warranty validity.

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R-Max - Bearings Inspection Report

page #..... of .....

Structure:.....

Name of inspector: .....Company.....

Year of construction: .....

Date of the inspection: .....

Actual temperature of the structure:.....

Type of inspection performed:

- Inspection after installation □
- Principal Inspection □
- Regular inspection □

All the checked data have been recorded in the N. .....attached record cards.

Number ..... pictures proving the inspection results of each bearing are attached too.

AAG International surl	Signature of Inspector
..... (for receipt)	.....
date	date
.....	.....

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			Bearing 1 ……..	Bearing 2 ……..
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

			Bearing 3 ……	**Bearing 4** ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

			Bearing 5 ……	Bearing 6 ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			

			Bearing 7 ……	Bearing 8 ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

			Bearing 9 ……..	Bearing 10 ……..
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			

			Bearing 11 ……	**Bearing 12** ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

			Bearing 13 ……	**Bearing 14** ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

			Bearing 15 ……	**Bearing 16** ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

			Bearing 17 ……	**Bearing 18** ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
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		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

			Bearing 19 ……	**Bearing 20** ……
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
7	Pot part of spherical bearings:	s_{1min} (mm)		
		s_{1max} (mm)		
8	Protective cover	required		
		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
12	Damage to steel parts			
13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
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			Bearing … ……..	**Bearing …** …….
1	Location of bearing / Identification (see 7.3 of EN 1337-1)			
2	Type of bearing (see table 1 of EN 1337-1)			
3	Drawing No.			
4	Bearing movement and rotations			
	Translation longitudinal	v_x (mm)		
	Translation transverse	v_y (mm)		
	Rotation longitudinal	α_x (degree)		
	Rotation transverse	α_y (degree)		
	Note: a positive sign indicates a direction away from the fixed point of the structure and downwards if referring to vertical movement			
5	Sliding part of sliding bearings: Clearance	h_1 (mm)		
		h_2 (mm)		
6	Sliding part of sliding bearings, fastening defects and condition of stainless steel sheet, contact to PTFE			
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		s_{1max} (mm)		
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		in place		
9	Movement indicator	required		
		in place		
10	Protection against corrosion			
11	Position and condition of outer plates / anchorages			
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13	Condition of adjacent structural elements (structure, mortar, sockets)			
14	Remarks (e.g. unexpected noise, dirt, …)			
15	Results of inspection, required actions (correction, replacement, repair etc.) (if necessary, use another adequate sheet)			
16	Following inspection (year)			
17	Pictures attached	from / to	/	/

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