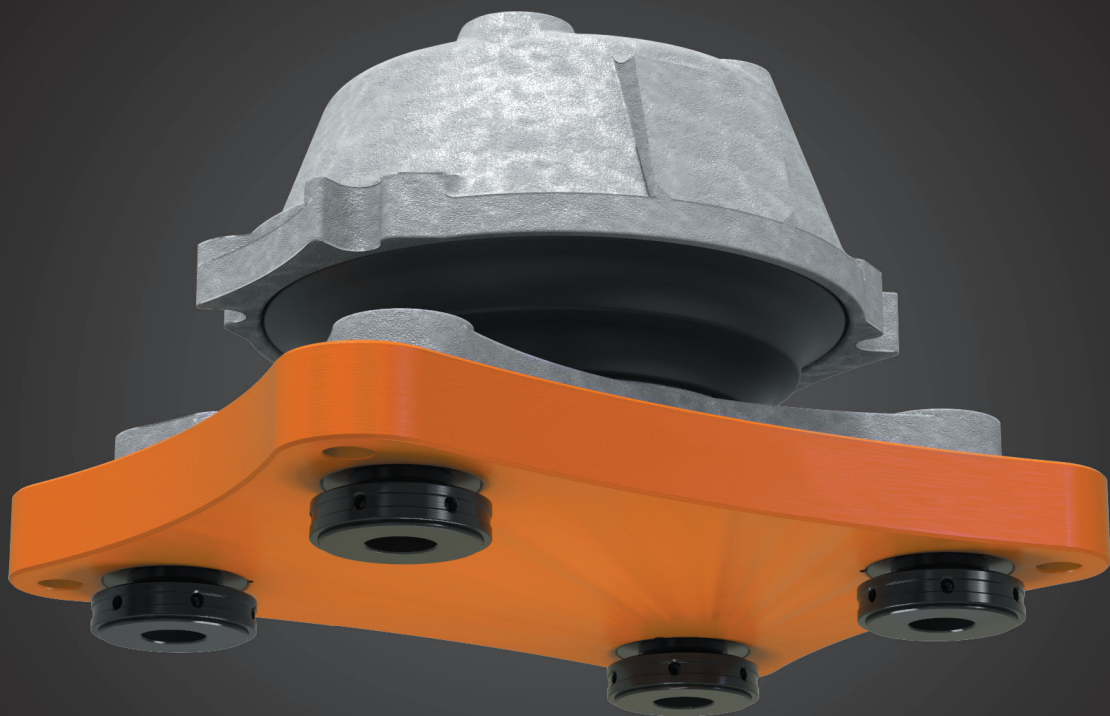


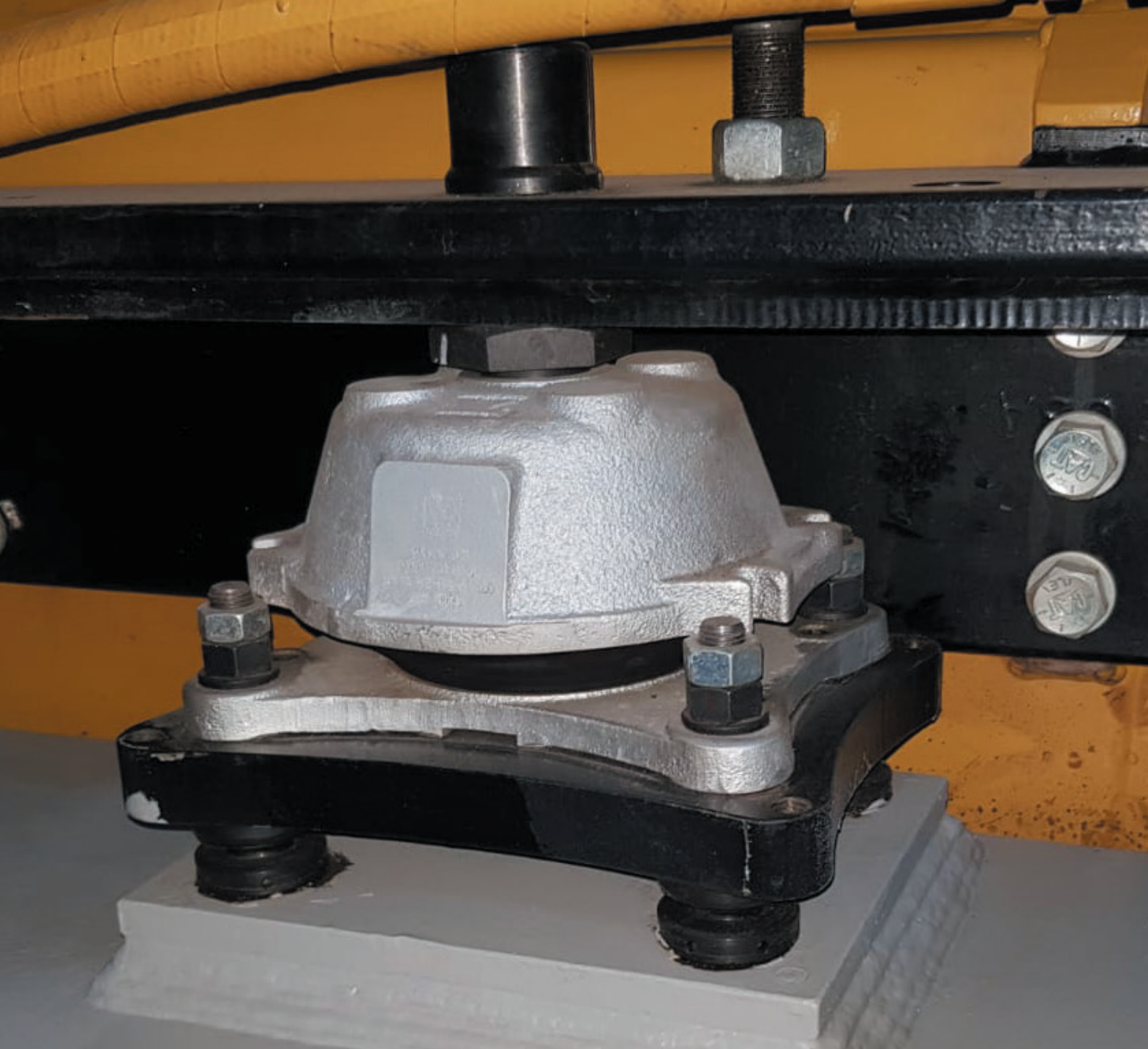


VULKAN



Installation manual of RotaChock Mounting Plate for VULKAN T-series

INSTALLATION OPTION B



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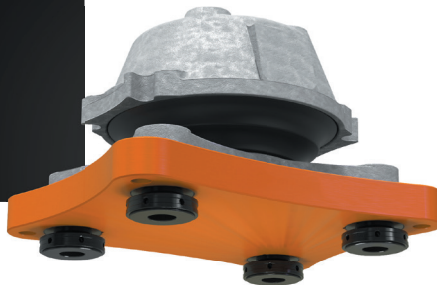
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Publication Installation manual of RotaChock Mounting Plate for VULKAN T-series

Edition 06/2022

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1 GENERAL

1.1 INFORMATION ABOUT THE OPERATING MANUAL

This assembly manual provides important instructions for handling the T-Series HA/DS T35/T60 _ T50/T90 _ T75/T140 _ T130/T170. The prerequisite for safe work is compliance with all specified safety instructions and handling instructions.

In addition, the applicable local accident prevention regulations and general safety regulations must be complied with for the specific area of implementation of the T-Series HA/DS T35/T60 _ T50/T90 _ T75/T140 _ T130/T170. The assembly manual must be carefully read prior to starting any task! It is a component of the product and must be kept in the vicinity of the elastic mounts where it is available to personnel at all times.

If the T-Series HA/DS T35/T60 _ T50/T90 _ T75/T140 _ T130/T170 is provided to a third party then this assembly manual must also be provided.

The graphic illustrations in this manual are provided for purposes of better presentation of content, they are not necessarily true to scale and can deviate slightly from the actual version of the T-Series HA/DS T35/T60 _ T50/T90 _ T75/T140 _ T130/T170.

The position numbers used in the illustrations and action steps correspond to the position numbers of the drawings. This assembly manual satisfies the requirements of DIN 82079. It is subject to a permanent revision process. Subject to change without notice. Errors and omissions excepted.

1.2 EXPLANATION OF SYMBOLS

Safety instructions are indicated by symbols in this operating manual. The safety instructions are introduced by signal words that express the scope of the hazard.

The safety instructions must be strictly complied with, you must act prudently to prevent accidents, personal injury, and material damage.

SYMBOLS



WARNING!

indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.



PROHIBITORY!



NOTE!

indicates useful tips and recommendations, as well as information for efficient and trouble-free operation.

1.3 LIMITATION OF LIABILITY

All information and instructions in this operating manual have been provided under due consideration of applicable guidelines, the current state of technology, as well as our many years of experience.

The manufacturer assumes no liability for damage due to:

- › Failure to comply with the instructions in the operating manual
- › Non-intended use
- › Deployment of untrained personnel
- › Unauthorized conversions
- › Technical changes
- › Use of non-approved spare parts
- › Use in case of recognizable defects

The current scope of delivery can vary from the explanations and graphic representations provided in this manual in the case of special versions, if supplemental order options are desired, or on the basis of the latest technical changes. The agreed obligations in the delivery contract, the general terms and conditions, as well as delivery conditions of the manufacturer, and the statutory regulations valid at the time the contract was concluded, apply.

1.4 SPARE PARTS

Order spare parts via authorized dealers or directly from customer service. See section "Customer service" for the contact address.

Specify the following information when ordering spare parts:

- › Order number or consignment number
- › Drawing number
- › Parts list number

1.5 CUSTOMER SERVICE

Our customer service organization is available for technical information. In addition our employees are always interested in new information and experiences associated with the application that could be valuable for the improvement of our products.



Incorrect or defective spare parts can cause damage, malfunction, or total failure; they can also impair safety.



Only use manufacturer's original spare parts.

1.6 WARRANTY TERMS

The warranty terms are included in the manufacturer's terms and conditions.

The responsible contact is always available at the following contact address:



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3011 AA Rotterdam
The Netherlands



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2 SAFETY

2.1 RESPONSIBILITY OF THE OWNER

This section provides an overview of all the important safety aspects for optimal protection of personnel, as well as for safe and trouble-free operation.

Significant hazards can occur if the handling instructions and safety instructions in this manual are not complied with.

The T-Series HA/DS T35/T60 _ T50/T90 _ T75/T140_T130/T170 is used in commercial operation. Consequently the owner of the T-Series HA/DS T35/T60 _ T50/T90 _ T75/T140_T130/T170 is subject to legal industrial safety obligations.

In addition to the occupational health and safety instructions in this assembly manual, generally valid safety and accident protection guidelines, and environmental protection guidelines must be complied with for the area of implementation of the T-Series HA/DS T35/T60 _ T50/T90 _ T75/T140_T130/T170 resilient mount.

In this regard the following particularly applies:

- › The owner must inform himself of applicable occupational health and safety regulations, and in a hazard analysis identify other hazards that may exist at the installation site of the resilient mounts due to the special work conditions. The owner must convert this information relative to hazards into operating instructions for operation of the resilient mounts.
- › The owner must ensure during the entire implementation period of the resilient mounts that the operating instructions created by the owner correspond to the current state of legislation, and if necessary the owner must adapt these operating instructions.
- › The owner must clearly regulate and specify responsibilities for installation, operation, maintenance, and cleaning.
- › The owner must ensure that all employees who handle the resilient mounts have read and understood the assembly manual. In addition, the owner must train personnel and inform them of hazards at regular intervals.
- › The owner must provide the required protective equipment for personnel.

Moreover, the owner is responsible for ensuring that the resilient mounts are always in technically faultless condition; consequently the following applies:

- › The owner must ensure that the maintenance intervals described in this assembly manual are complied with.
- › The owner must have all safety devices inspected regularly for function and for completeness.

2.2 INTENDED USE

The highly elastic mounts of the T Series have been specifically developed to do justice to the most stringent requirements with respect to insulation and comfort.

At the same time they offer a high degree of safety with their versatile designs. The load is borne by rubber elements with the help of shear and compression strain.

Several rubber compounds are available, as a result of which optimal adjustment of the vibration response of the mounted machine can be ensured.

Several versions are available in order to meet the requirements of a given system and all mounts have a built-in centralised limiter that restricts the vertical and radial displacements.

The centralised limiter protects the important connections of the system against extreme displacements that occur owing to the ship's movements

Claims of any type due to damage arising from non-intended use are excluded. The owner is solely liable for all damage in the case of non-intended use.



Any use that extends beyond intended use and/or other use of the coupling can cause hazardous situations.



Therefore:

- › *Use the resilient mounts as intended.*
- › *Strictly comply with all instructions in this operating manual.*
- › *Use outside of the originally intended application case.*
- › *Overloading the coupling by exceeding the limit values specified in the technical data.*
- › *Use of a resilient mount that does not bear an Ex designation, and thus is not designed for use in explosive atmospheres, in the Ex area.*

3 STRUCTURE AND FUNCTION

3.1 STRUCTURE OF RESILIENT MOUNT

The highly elastic mounts of the T series have been specifically developed to do justice to the most stringent requirements with respect to insulation and comfort. At the same time, they offer a high degree of safety with their versatile designs.

RUBBER ELEMENT

The load is borne by rubber elements with the help of shear and compression strain. Several rubber compounds are available, as a result of which optimal adjustment of the vibration response of the mounted machine can be ensured. Regarding the shape it has the ability to impact pressure and thrust load. The element is built from natural caoutchouc and can be dedicated from -20°C to 70°C.

PARTIBLE CENTRAL LIMITER

All mounts have a built-in centralized limiter that restricts the vertical and radial displacements. The centralized limiter protects the important connections of the system against extreme displacements that occur owing to the ship's movements. The T-series is unique in its design thanks to its partible central limiter, this greatly improves installation and service life as the mount can be easily placed without jacking the application.

PRE-TENSIONED DESIGN

Pre-tensioned delivered mounts assure a parallel position of top to base casting and reduce creep deformations during the alignment process. This results in a predictable creep behavior, saving time during alignment. The main benefits are thanks to the use of high-grade materials with standard features to assure cost-efficient installation and lifetime of the mounts. In addition, it results in a low cost of ownership aside from the excellent vibration reduction properties. Thanks to this unique pre-tensioned design, it's also possible to pre-tension the mount to meet a specific load for an application.

3.2 SYSTEM BENEFITS

- › Built-in centralized limiter to protect the system in extreme situations.
- › Selection of natural rubber compounds for optimal adjustment of the response to vibrations.
- › The cast parts and screws made of high-strength materials have been designed with a high factor of safety with respect to the nominal load.
- › Linear stiffness characteristic in the nominal load range.
- › Savings in time for installation with the help of pre-stressed bolts.
- › Type Approval by leading classification companies.

3.3 APPLICATIONS

The VULKAN T-series can be used in several applications and setups. A typical application can be drive motor mounts, Generator frame units or diesel-electric drive units.

These mounts can be used for all appliances that generate vibrations that must be isolated to the environment. Most of these mounts end us in single elastic suspension sets. But also, double suspensions are used to meet extremely high demands on vibration isolation at, for instance, mega yachts and research vessels.

These T-series are mainly used in marine applications thanks to the design with integrated displacement limiters and purpose-designed features like pre-tension devices and Type Approvals of all major classification societies.

3.4 CERTIFICATION

Both product lines are manufactured in ISO-certified machine shops, where modern CNC equipment and state of the art measurement tools are used to guarantee a constant and high-quality level. Production is assessed annually for approval by certification institutes and backed up by audits from users, who are industry leaders. With the quality systems in place, all markets can be served, from navy to nuclear.

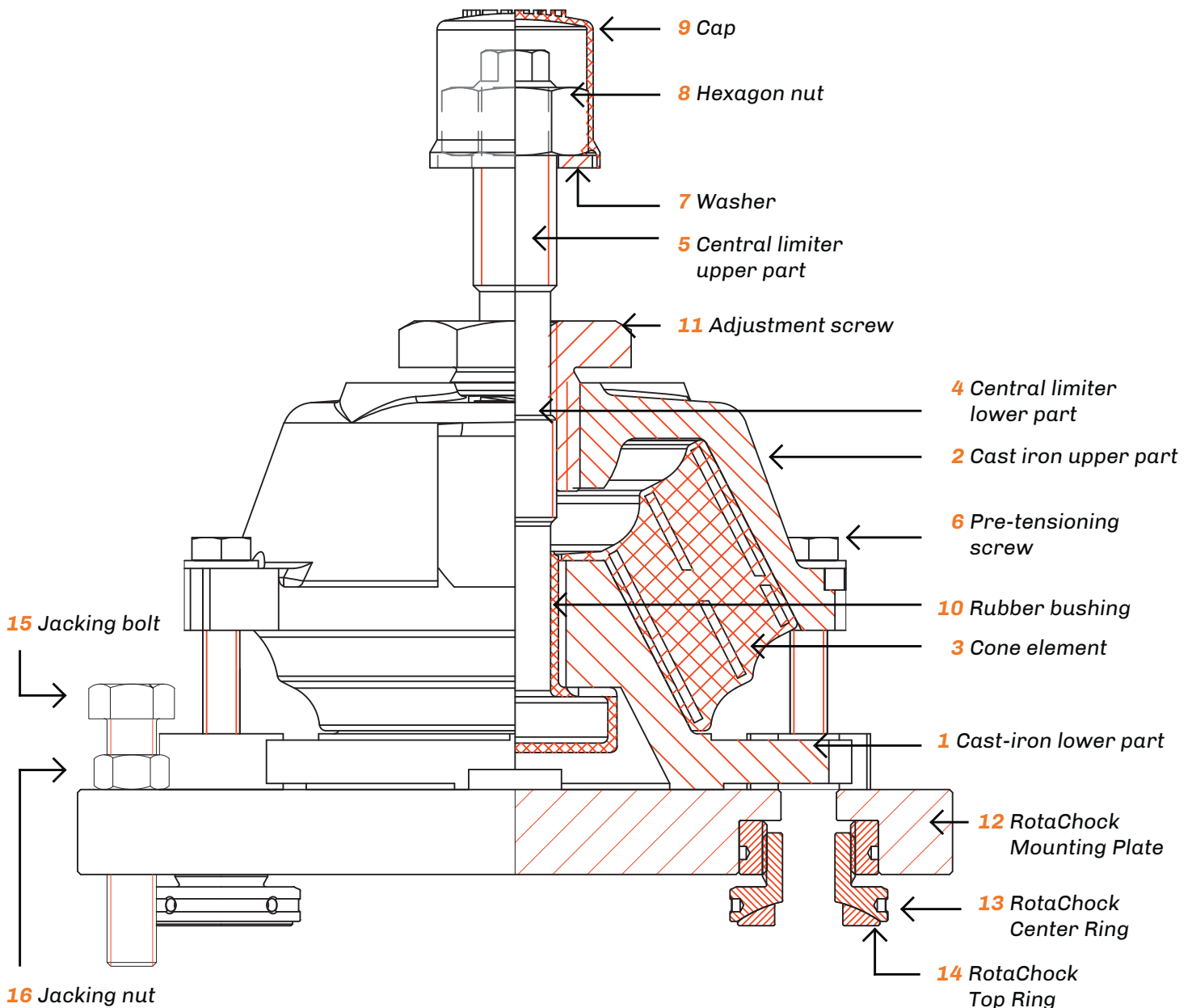
The two independent product lines have been approved by various classification authorities, enabling the use underneath propulsion machinery and auxiliary installations onboard ships without having to go through a lengthy plan approval application. The VULKAN T-series and RotaChock Mounting Plate have been "Type Approved" by all major classification societies, like:



4 EXPLODED DRAWING / SPARE PARTS LIST

4.1 PART LIST

- > 1 Cast-iron lower part
- > 2 Cast-iron upper part
- > 3 Cone element
- > 4 Central limiter lower part
- > 5 Central limiter upper part
- > 6 Pre-tensioning screw
- > 7 Washer
- > 8 Hexagon nut
- > 9 Cap
- > 10 Rubber bushing
- > 11 Adjustment screw
- > 12 RotaChock Mounting Plate
- > 13 RotaChock Center Ring
- > 14 RotaChock Top Ring
- > 15 Jacking bolt
- > 16 Jacking nut



5 PRACTICAL DATA

5.1 COMPATIBILITY

The RotaChock Mounting Plate was developed in close cooperation with leading developers of VULKAN T-series. For the full T-series range a standard design was made where we integrated four RotaChock in the corners of a stiff Mounting Plate. These designs are standardized and do not need any further engineering or selection. In table 1 you can find the compatibility.

Table 1

RotaChock Mounting Plate	Compatible with VULKAN T-series	Length	Width
		L_1 (mm)	L_2 (mm)
MP-RC2BT	T35/T60	190	140
MP-RC3BT	T50/T90	205	150
MP-RC4BT	T75/T130/T140/T170	310	240

5.2 DIMENSIONS AND WEIGHT

Table 2

VULKAN T-series	Length	Width	Weight
	L_3 (mm)	L_4 (mm)	m (kg)
T 35	230	180	~15
T 60	230	180	~15
T 50	245	190	~25
T 90	245	190	~25
T 75	370	300	~73,5
T 130	370	300	~73,5
T 140	370	300	~73,5
T 170	370	300	~73,5

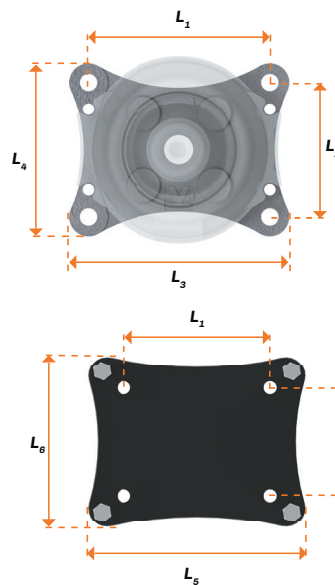


Table 3

RotaChock Mounting Plate	Length	Width	Weight
	L_5 (mm)	L_6 (mm)	m (kg)
MP-RC2BT	273	212	~ 12
MP-RC3BT	307	252	~ 18
MP-RC4BT	468	380	~ 55

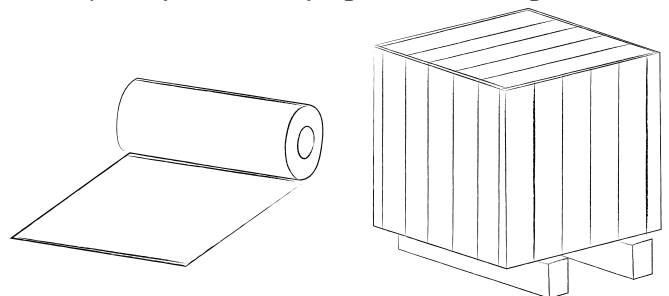
5.3 PACKAGING

ABOUT THE PACKAGING

We recommend not to destroy the original packaging and to remove it just prior to assembly. Deviant behaviour must not lead to premature product ageing, damage or restrictions in function and service life. The measures necessary for this must be realized effectively until the product is installed. Individual packed goods are packaged according to the expected transport conditions. Environmentally-friendly materials have been used exclusively for the packaging. Packaging should protect the specific components from transport damage, corrosion and other damage until assembly.

HANDLING PACKAGING MATERIALS

Dispose of packaging materials in accordance with the respectively valid statutory regulations and local guidelines.



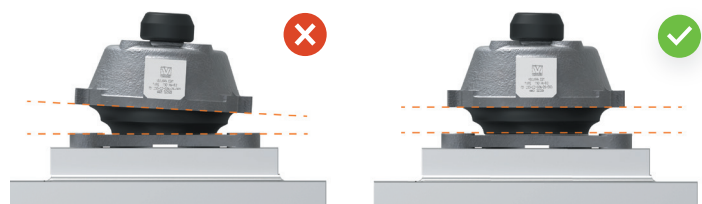
6 INSTALLATION OPTIONS

6.1 CHOCKING OPTIONS

A chock is the interface between the foundation and machine foot, or in this case, the resilient mount. You need to secure the flexible mounted machinery equipment to the foundation, and it must retain position after final alignment.

There are several options for chocks in the sector, like steel-fitted chocks, epoxy resin chocks or RotaChock.

In addition, for resilient mounts is important that the rubber mount's base plate must be aligned perfectly parallel to the machine foot to ensure optimal vibration damping.



STEEL-FITTED CHOCKS

After alignment, the height between VULKAN T-series and foundation is 3D measured, and a steel fitted block is produced in a high-end machine shop. After production, the steel fitted blocks are placed accurately between the resilient mount and foundation. You need to blue fit and adjust to have optimum contact surface because otherwise there is a high chance for Soft-Foot. After this lengthy and specialistic fitting process, the foundation's bolts can be torqued, and installation finalized.



Highly skilled craftsman are needed



Expensive equipment required for 3D machining



Blue fitting is a time-consuming process



There is no possibility to adjust after installation!



EPOXY RESIN CHOCKS

First you need to engineer and calculate the chocking plan to not overload the epoxy resin chock. After a fair amount of engineering work, you can start by bolting the VULKAN T-series to an pre-machined adapter plate. After alignment, the chocking area is dammed, and certified mechanics pour a two-component epoxy resin between the adapter plate and foundation. After the epoxy resin's lengthy hardening process, the foundation's bolts can be torqued, and installation finalized.



Certified personnel are needed



Extensive and complex engineering



Time-consuming process and curing time



There is no possibility to adjust after installation!



ROTACHOCK

The RotaChock Mounting Plate offers an economical alternative to epoxy resin or tailor-made steel fitted blocks. First, the jacking bolts in the Mounting Plate are used to eliminate any angle between the VULKAN T-series base plate and foundation. After that, the four RotaChock at the corners are adjusted to fill the gap. The VULKAN base plate, RotaChock Mounting Plate, and machine foundation are securely tightened together with four foundation bolts.



No special skills or tools required



Plug and play solution, no engineering



Save time during installation



You can adjust during service life!

6.2 ROTACHOCK OPTIONS

The selection of VULKAN T-series in combination with RotaChock Mounting Plate and its design option should already be made in preliminary design phase. You can download these standard design solutions in both 2D & 3D at www.rotachock.com or request them at customer service.

There are two standardized design options while using RotaChock Mounting Plates to install the VULKAN T-series.

- › **Option A** Drilling holes through the foundation for the foundation bolts
- › **Option B** Welding a threaded steel plate on top of the foundation

Again, this is up to the end-user to decide and should already be decided in preliminary phase. Each design options can have additional benefits when implementing the installation steps into the applications alignment procedure. Please contact the customer service to evaluate and possibly streamline your procedures together with our experienced team.

Starting in chapter 8 you can find the installation steps for Option B. The assembly manual for Option A can be downloaded at www.rotachock.com or request them at customer service. Please note that there are only minor changes in the visualization and below prescribed step 3. Both manuals are supported with installation videos that can be viewed by scanning the below QR-code or visiting the website.

In short, the installation steps for installing VULKAN T-series with RotaChock Mounting Plate are as following:

- 1 Assemble the T-mount and connect them to the unit
- 2 Preliminary alignment
- 3 **Option A** Drill the holes in the foundation
Option B Weld a threaded steel plate on top of the foundation
- 4 Position RotaChock Mounting Plate
- 5 Bring load into the T-mounts and wait at least 48 hours
- 6 Final alignment
- 7 Adjust the RotaChock Mounting Plate to fill the gap
- 8 Enter TB values
- 9 Install and tighten foundation bolts
- 10 The mounts are installed



7 DESIGN HEIGHTS

The rubber element must be aligned perfectly parallel to the machine foot to ensure optimal vibration damping and to reach its service life of 8 to 12 years. This can be monitored by checking the TB values as described in the assembly manual.

Both the T-mount and RotaChock Mounting Plate have the possibility to adjust in the parallel height. Only by adjusting the RotaChock Mounting Plate you can solve the angular gap.

VULKAN T-SERIES

The VULKAN T-mount has an adjustment screw for parallel correction. Please check pos. 11 in the exploded drawing on page 5 for reference. In the below table 4 you can find the maximum adjustment of this screw and the resulting minimum and maximum build in height of each VULKAN T-series type. In the assembly manual, at installation step 3, we advise to adjust this screw with only 2-3 mm. We do so because the rubber elements will creep during it's service life and you can use the maximum adjustment for corrections.

Table 4

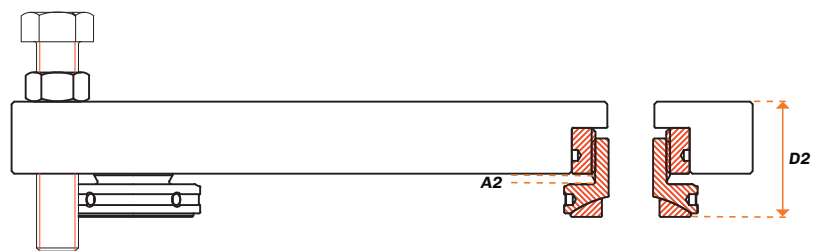
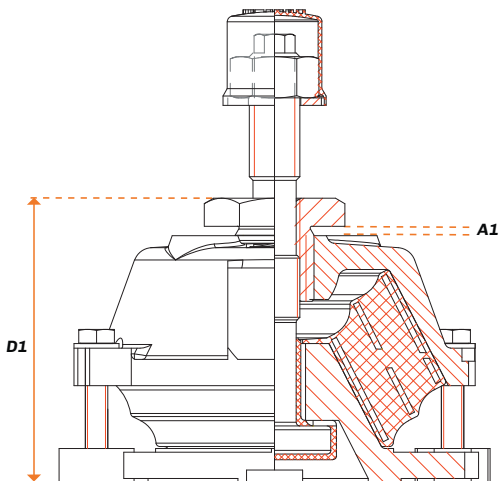
VULKAN T-series HA DS	HA DS adjustment =A1 (mm)	Min. height (mm)	Design height =D1 (mm)	Max. height (mm)
T35	10	146,5	148,5	156,5
T60	10	146,5	148,5	156,5
T50	10	190	192	200
T90	10	190	192	200
T75	12	232	235	242
T130	12	261	264	271
T140	12	232	235	242
T170	12	261	264	271

ROTACHOCK MOUNTING PLATE

While using RotaChock Mounting Plates you can correct both parallel and angular gap. Please check pos. 13, 14 & 15 in the exploded drawing on page 5 for reference. In this assembly manual we do all parallel/angular corrections by adjusting the jacking bolts (pos. 15) and fill the remaining parallel (pos. 13) and angular (pos. 14) gap with RotaChock.

Table 5

RotaChock Mounting Plate	RotaChock adjustment =A2 (mm)	Min. height (mm)	Design height =D2 (mm)	Max. height (mm)
MP-RC2BT	8	40	43	48
MP-RC2BT	8	40	43	48
MP-RC3BT	10	45	49	55
MP-RC3BT	10	45	49	55
MP-RC4BT	13	50	54	63
MP-RC4BT	13	50	54	63
MP-RC4BT	13	50	54	63
MP-RC4BT	13	50	54	63



It is essential to maintain the design heights as given in the below table in the design phase. The design height gives the maximum possibility of adjustment during service life.

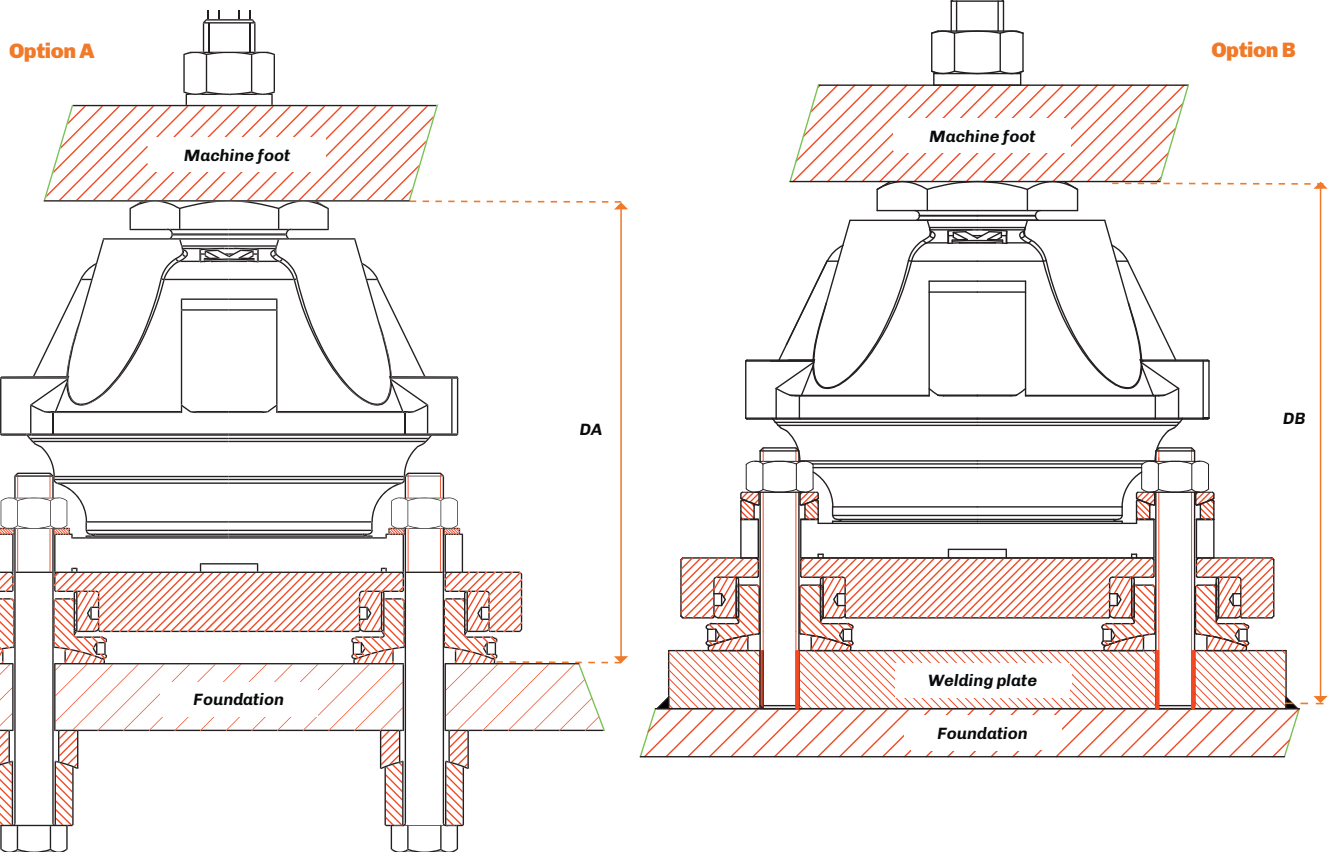


Table 6

Total adjustment (mm)	Min. height (mm)	Design height =DA (mm)	Max. height (mm)
18	186,5	191,5	204,5
18	186,5	191,5	204,5
20	235	241	255
20	235	241	255
25	282	289	305
25	311	318	334
25	282	289	305
25	311	318	334

Option A is preferred when there is access below the foundation for installing the foundation bolts. It's also possible to predrill the foundation with bigger holes resulting in maximum flexibility during placement/alignment. One of the functions of the spherical spacer below the foundation is to overbridge this bigger bolt hole.

Table 7

Welding plate (mm)	Total adjustment (mm)	Min. height (mm)	Design height =DB (mm)	Max. height (mm)
24	18	210,5	215,5	228,5
24	18	210,5	215,5	228,5
30	20	265	271	285
30	20	265	271	285
41	25	323	330	346
41	25	352	359	375
41	25	323	330	346
41	25	352	359	375

Option B is preferred when there is no access below the foundation for installing the foundation bolts. It's also possible to spotweld the welding plate on top of the foundation before the component's placement. This still gives the possibility to move the welding plate after alignment.

8 ASSEMBLY

8.1 PREPARING RESILIENT MOUNTS FOR ASSEMBLY

PREPARING RESILIENT MOUNTS FOR ASSEMBLY

1. The connection surfaces for the mount must be free of oil, rust and contamination.
2. Ensure that the mount is properly dimensioned.

8.2 ALIGNMENT

ALIGNMENT - AGGREGATES

1. Before the resilient mounts can be mounted, an alignment in X,Y,Z - direction of the arrangement is required.
2. **X-axis** Longitudinal direction of aggregate
3. **Y-axis** Transversal direction of aggregate
4. **Z-axis** Vertical direction of aggregate

8.3 ASSEMBLY OF RESILIENT MOUNT

1

6

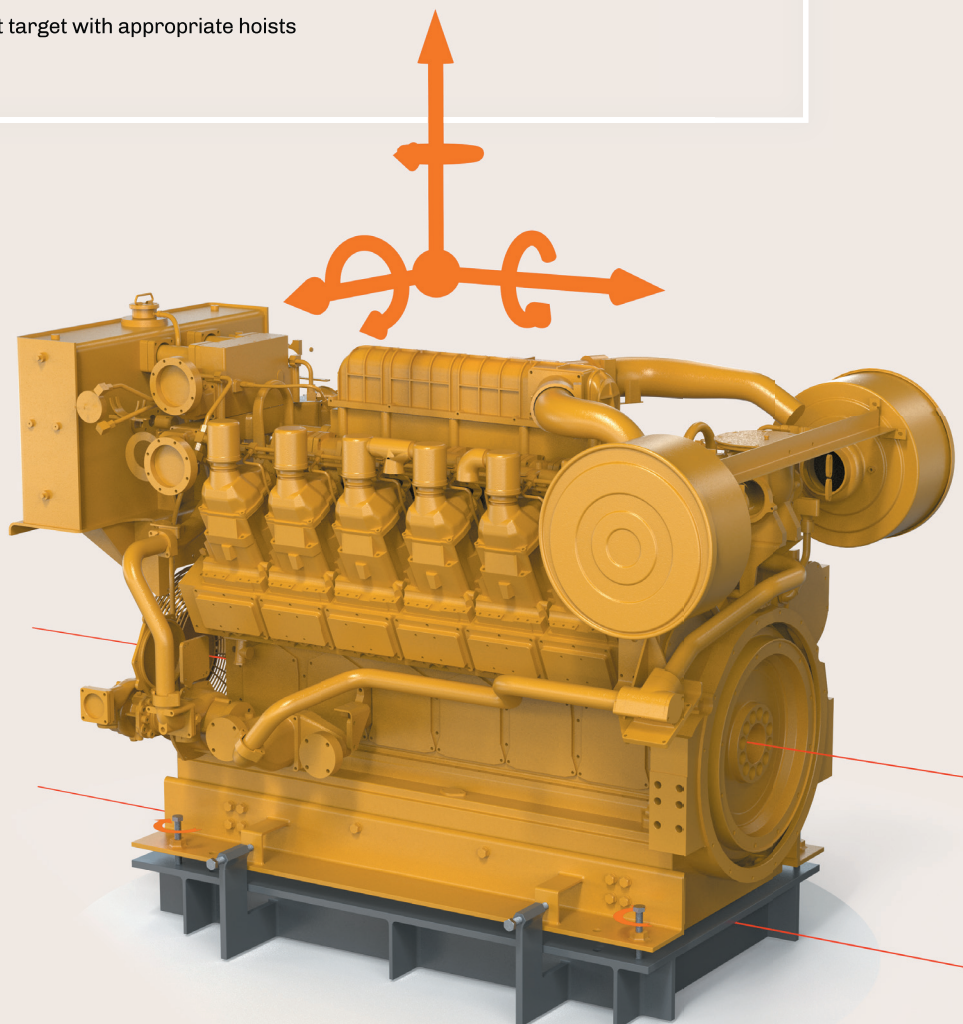
12

20

28

34

Position the motor per rough alignment target with appropriate hoists (e.g., hydraulic rams or jacking bolts).





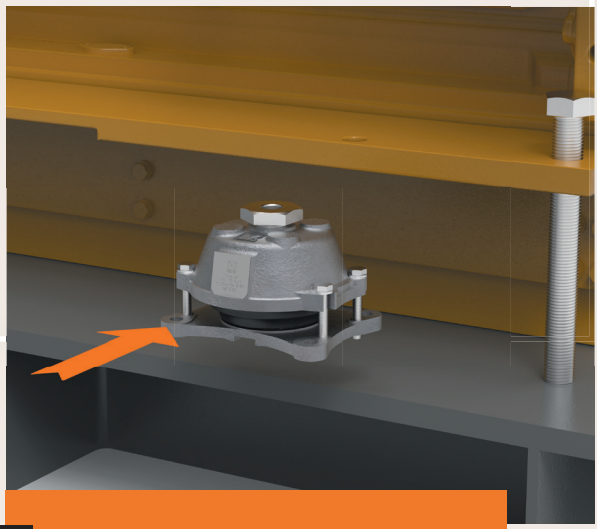
2

Remove the cap (9), the nut (8), the washer (7), and the upper part of the bolt (5) and keep them on hand.



4

Position the T-mounts between the motor and the foundation.



! The mount must be positioned in such a manner that the marking is legible in installed status.

3

Adjust the height adjustment nut (11). The appropriate adjustment dimension (H) is provided in the table below.



Table 8

Type	Adjustment dimension
	H (mm)
T 35/T 60	17
T 50/T 90	17
T 75/T 140	23
T 130/T 170	23

5

Screw the upper parts of the bolt (5) in the lower part of the bolt (4) and connect the T-mounts and the motor with the fastening elements, washer (7) and nut (8) and tighten the nut hand tight (8).



1

6

12

20

28

34

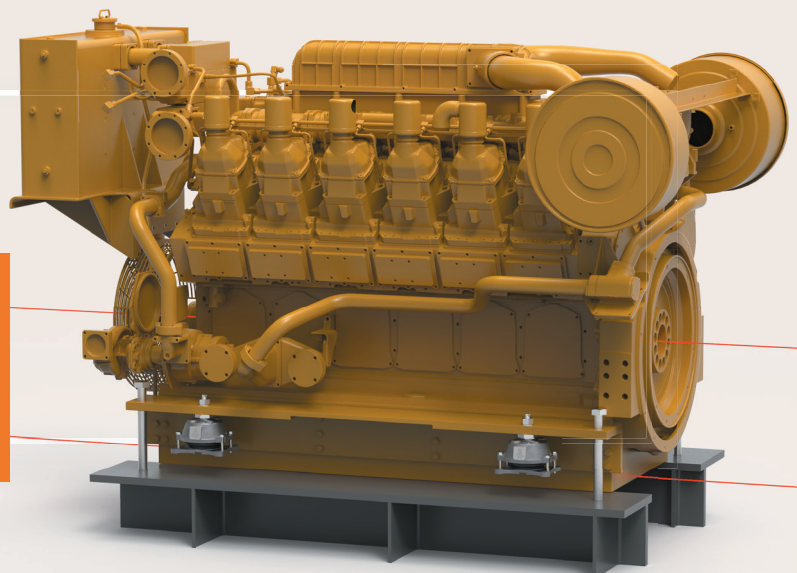
The T-mounts are now hanging under the motor and are connected with the nut.

7

Now, the motor (driver) must be aligned to the unit (driven).

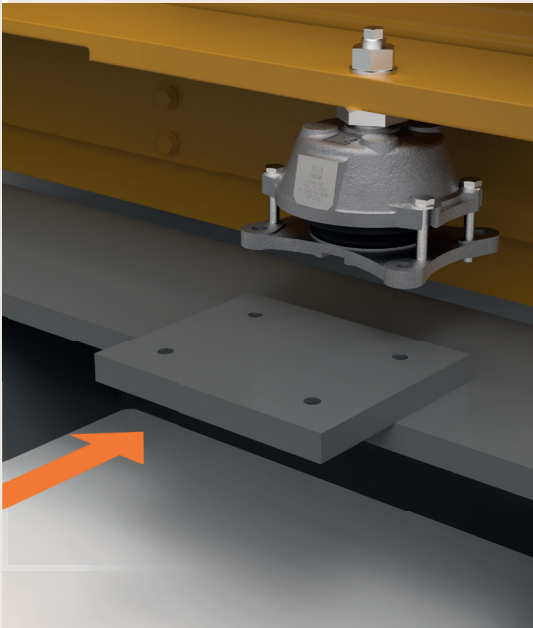


For the preliminary alignment of the unit, an allowance of 5 to 10 mm in the vertical direction (z-direction) must be taken into account relative to the driven machine.



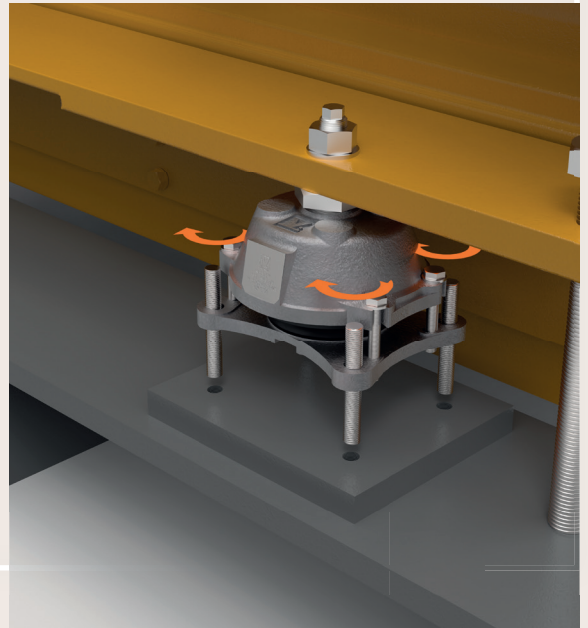
8

After motor alignment, while the motor is still on the jacking bolts, position the welding plate between the T-mount and foundation.



9

Line up the mounting holes and mount the stud bolt hand tight through the T-mount bolt hole.

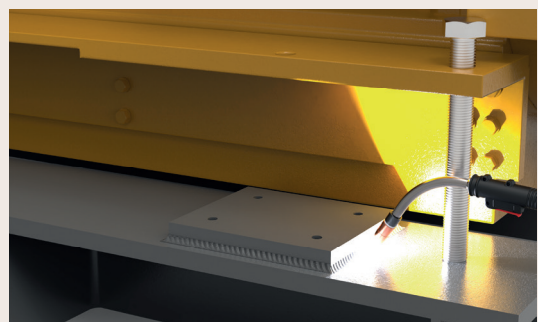
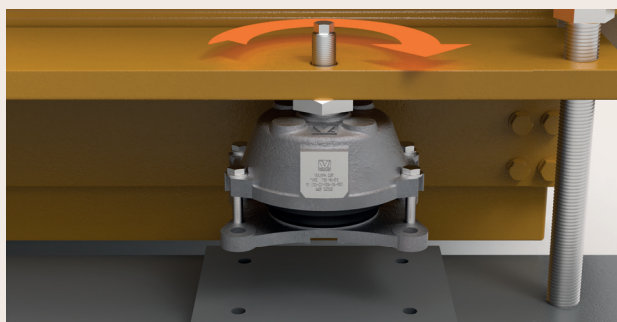
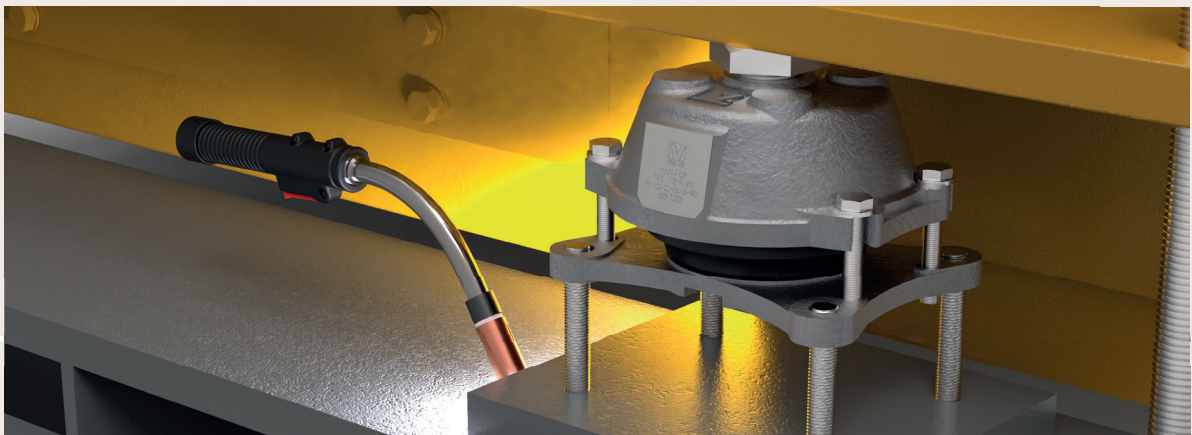


10

Tack-weld the welding plate to the foundation.

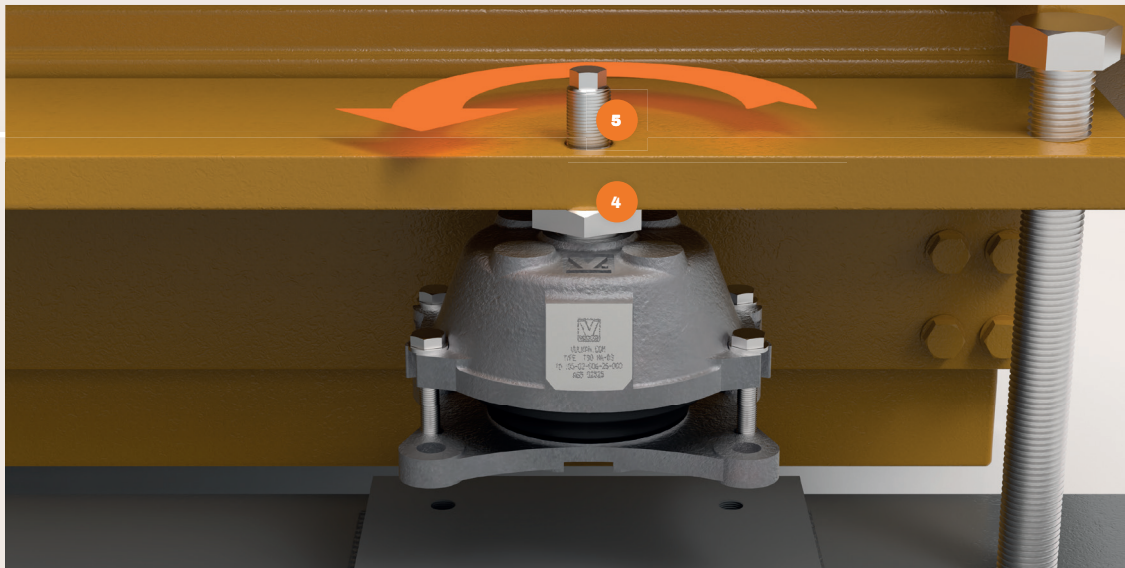
Remove the stud bolts and T-mount by removing the fastening elements, washer (7), and nut (8) and unscrewing the upper parts of the bolt (5) out of the lower part of the bolt (4).

Weld the plate to the foundation.



11

Reinstall the T-mount by screwing the upper parts of the bolt (5) in the lower part of the bolt (4). Connect the T-mounts and the motor with the fastening elements, washer (7) and nut (8), and tighten the nut hand tight (8).



1

6

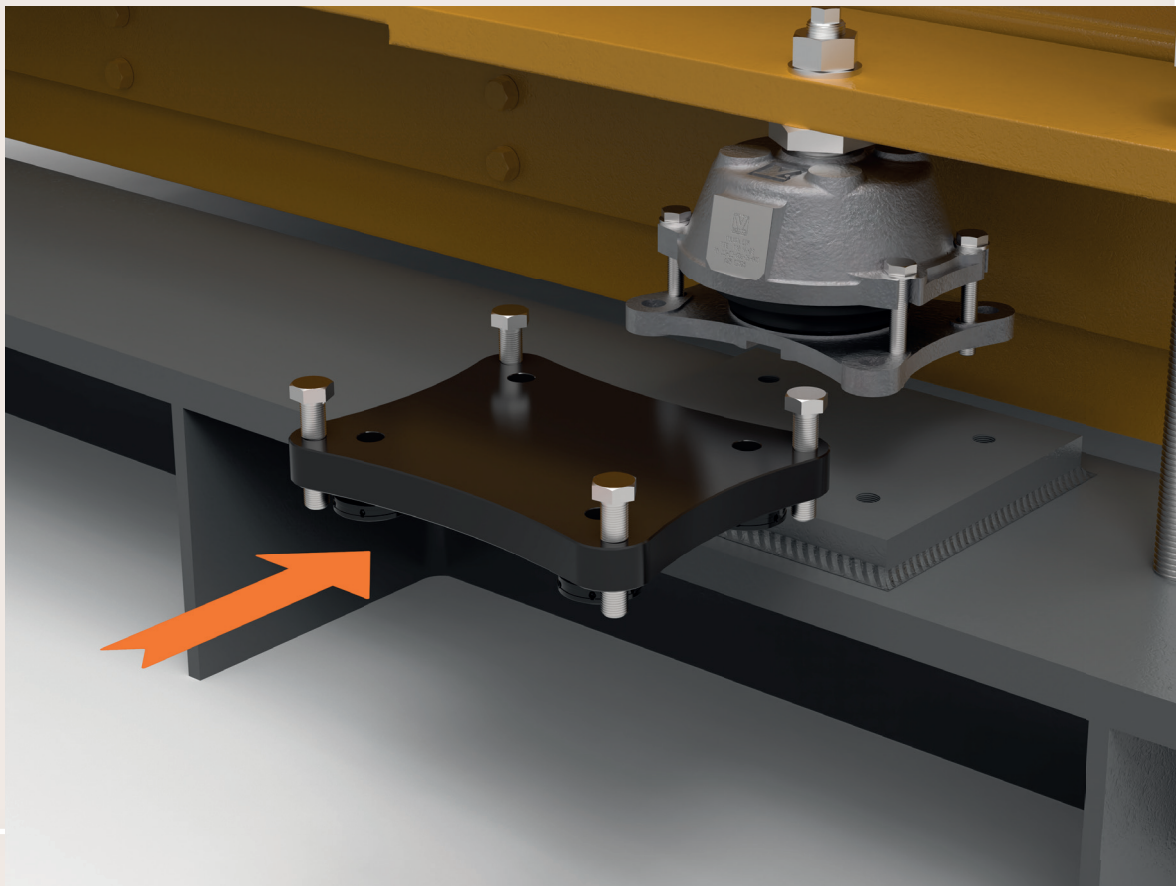
12

20

28

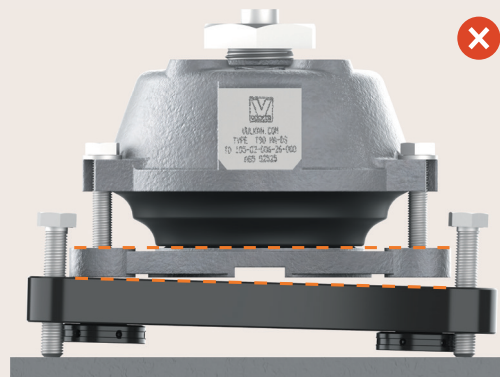
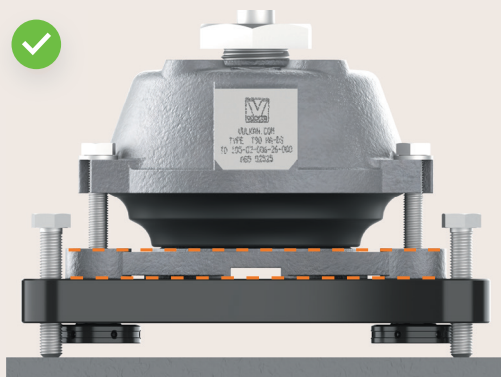
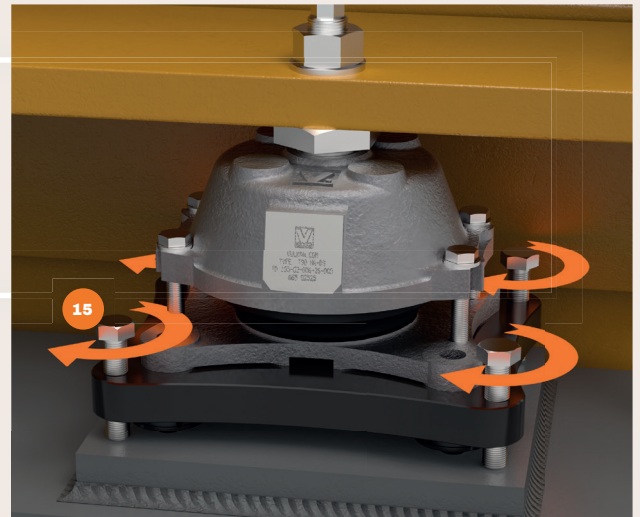
34

Place the RotaChock Mounting Plate between the T-mount and welding plate.



13

Screw down the jacking bolts (15) in the RotaChock Mounting Plate until the top of the RotaChock Mounting Plate contacts the bottom plate of the T-mount.



There should be no gap between the RotaChock Mounting Plate and the bottom plate of the T-mount. Be careful not to put the load on the T-mount while adjusting the jacking bolts.

14

Unscrew nut (8) and screw out the upper part of the bolt (5).

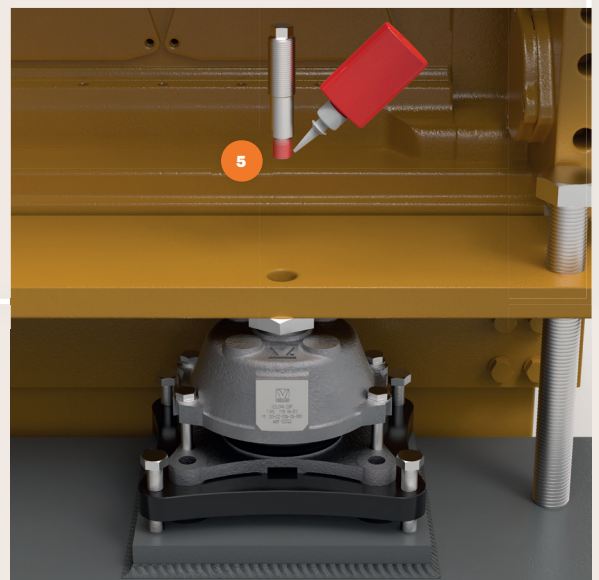


16

Let the Loctite harden for 10 minutes.

15

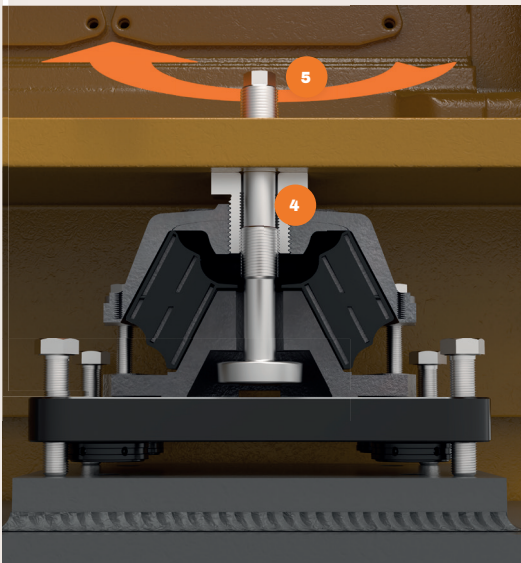
Coat the lower threads of the upper part of the bolt (5) with Loctite, and screw into the lower part of the bolt (4) and turn it clockwise until the central limiter (4) + (5) contacts the RotaChock Mounting Plate.



Turn the central limiter (4) + (5) counterclockwise according to below table.

Table 9

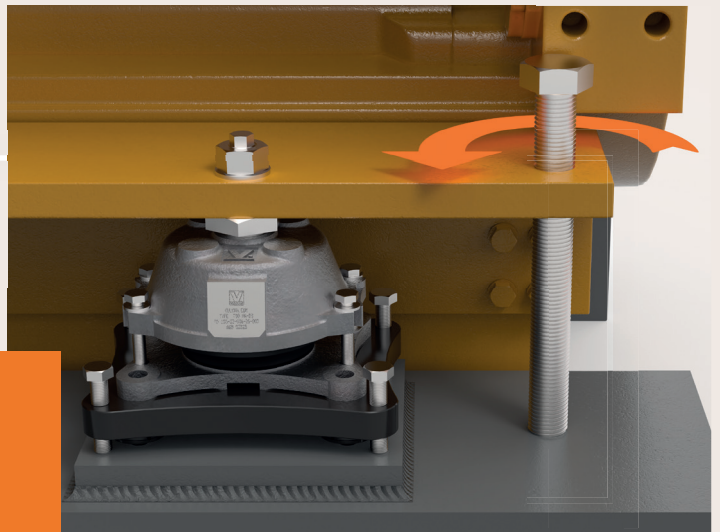
Type	Adjustment - central limiters
T 35/T 60	3x 360°
T 50/T 90	3x 360°
T 75/T 140	2x 360°
T 130/T 170	2x 360°



Now, slowly and uniformly, bring the load onto the mounts. To do this, offload the hydraulic rams or jacking bolts of the motor.



The weights of the oil-fill quantity and water-fill quantities must be taken into account. The weights of additional fittings must be taken into account. Ensure that the applied load represents the later load in real operation.



Tighten nut (8) on the central limiter, hand tight.



Check limiter clearance and let the motor remain in this status for at least 48 hours; 1 week would be preferable.



Do not continue with the alignment until this time has elapsed

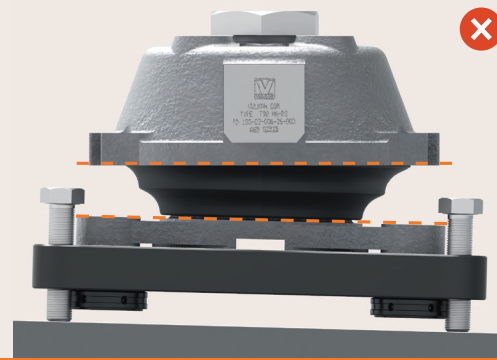
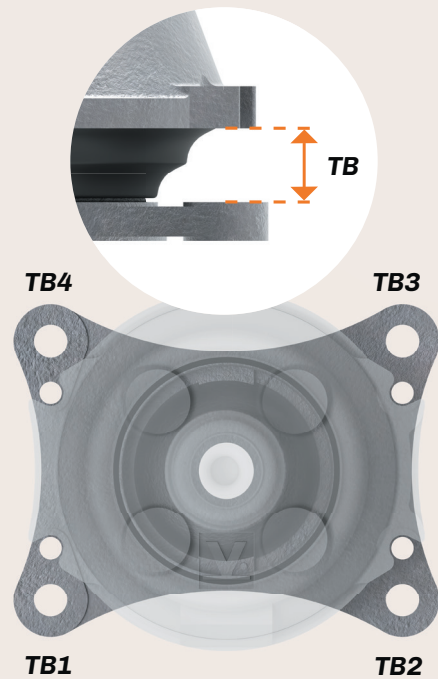
21

After 48 hours minimum, the load distribution over the individual T-mounts is checked via the positions TB1 to TB4.

Deviation of the averaged values (TB1, TB2, TB3, TB4 / 4) between the individual T-mounts must not exceed 3 mm. The maximum deviations within a T-mount are presented in the following table:

Table 10

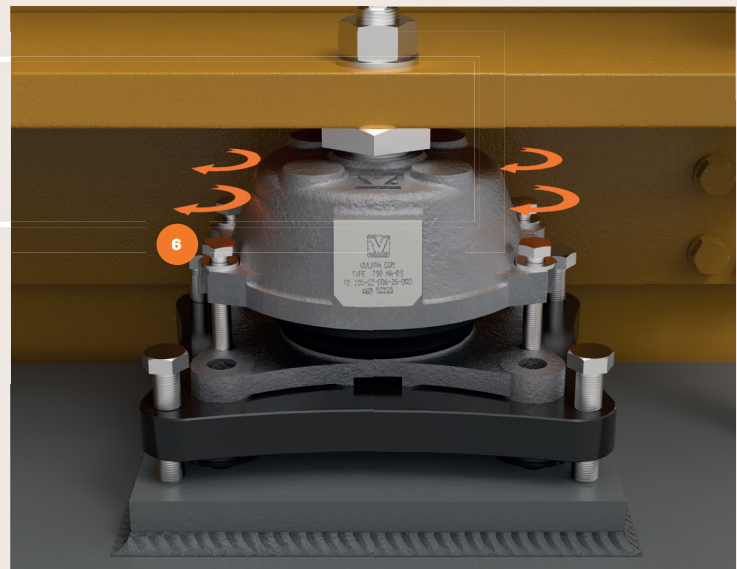
Type	Max. deviation	Max. deviation	Max. deviation
	TB1-TB2 TB3-TB4 (mm)	TB2-TB3 TB1-TB4 (mm)	TB1-TB3 TB2-TB4 (mm)
T 35/T 60	1,5	0,5	1,2
T 50/T 90	1,6	0,6	1,7
T 75/T 140	2,3	0,9	2,5
T 130/T 170	2,3	0,9	2,5



! *If the averaged deviation exceeds maximum deviation, correct with jacking bolts in RotaCheck Mounting Plate*

22

Tighten the pre-tensioning screws (6) hand tight in this position.

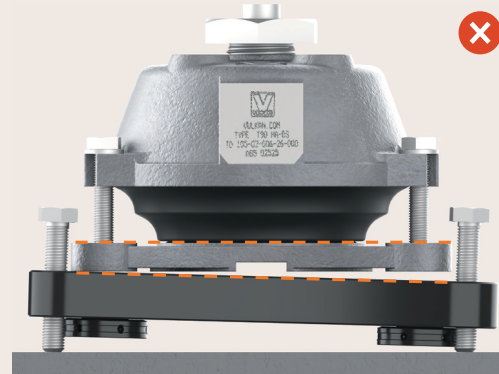
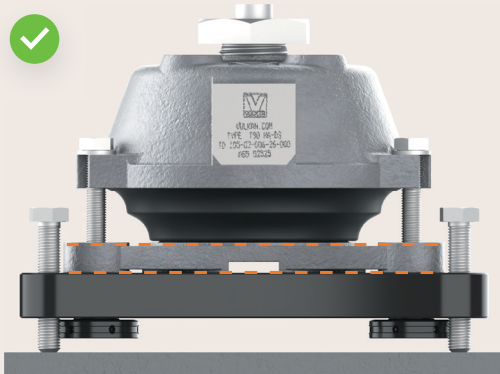
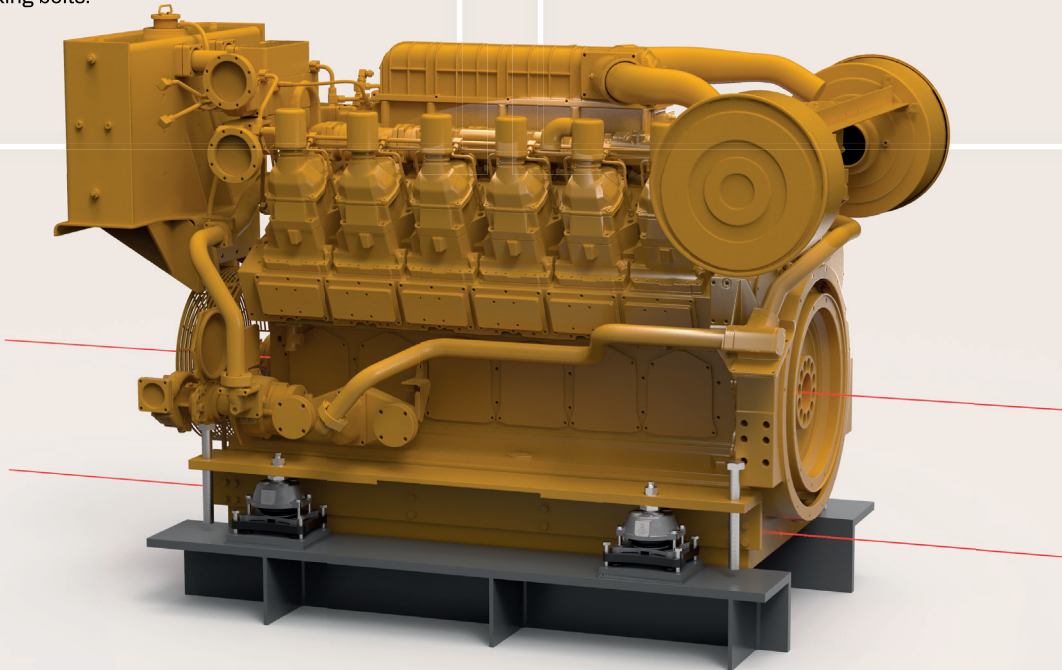


23

The vertical alignment of the motor can be done with the jacking bolts in the RotaChock Mounting Plate or use motor hydraulics/ jacking bolts.

24

Horizontal alignment can be achieved by sliding the motor in the x-direction and y-direction within the available space in the bolt holes.

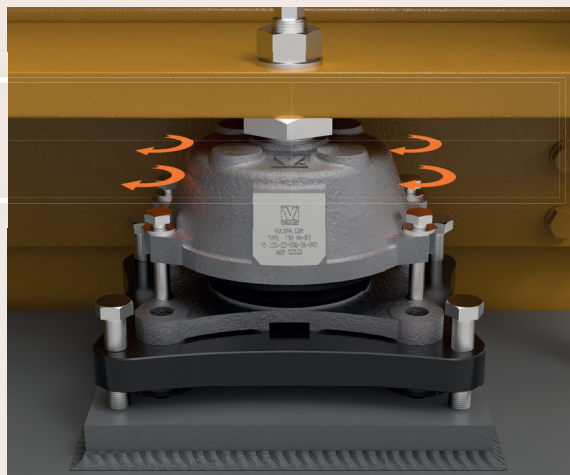


There should be no gap between the RotaChock Mounting Plate and bottom plate of the T-mount after alignment.



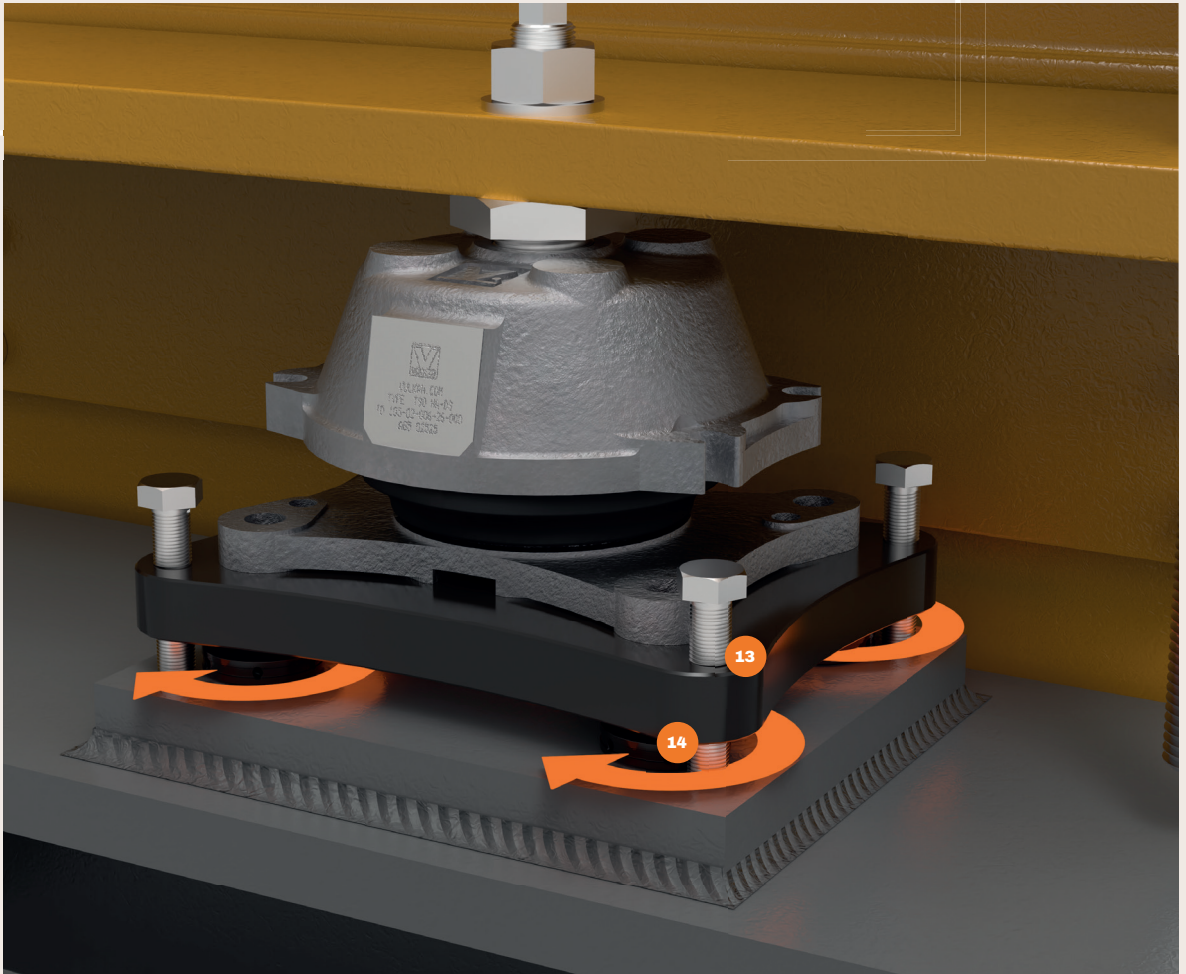
25

Unscrew and remove the pre-tensioning screws (6).



26

Screw the 4 RotaChock Center Rings (13) in the Mounting Plate downwards and ensure that that the RotaChock Top Rings (14) rest on top of the foundation.



If motor hydraulics/jacking bolts are used during vertical alignment in step 23, remove these, so all weight rests on the T-mounts.



27

Remove the jacking bolts of RotaChock Mounting Plate.



1

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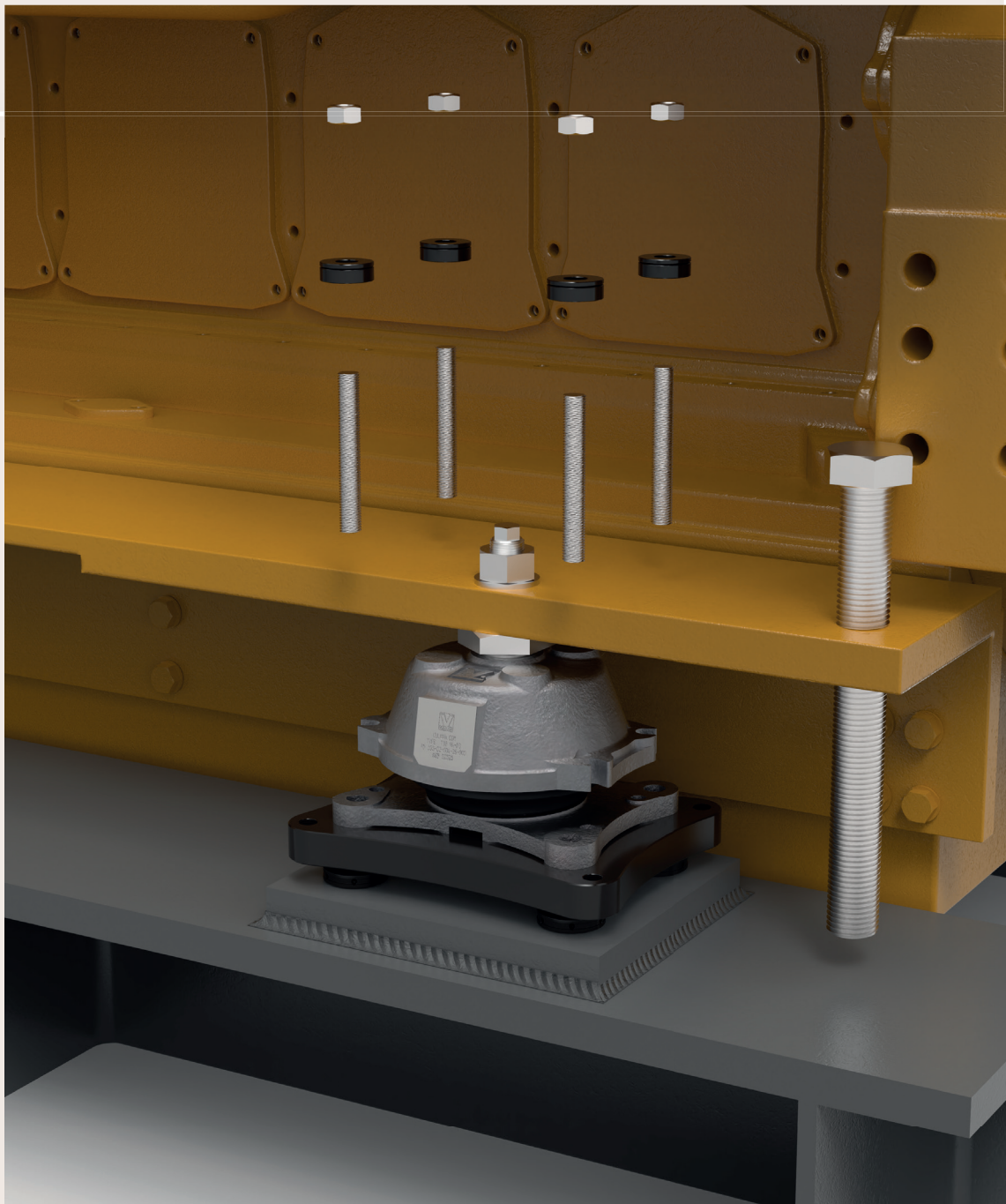
Enter the TB values in the attached measurement sheet on [page 28](#).

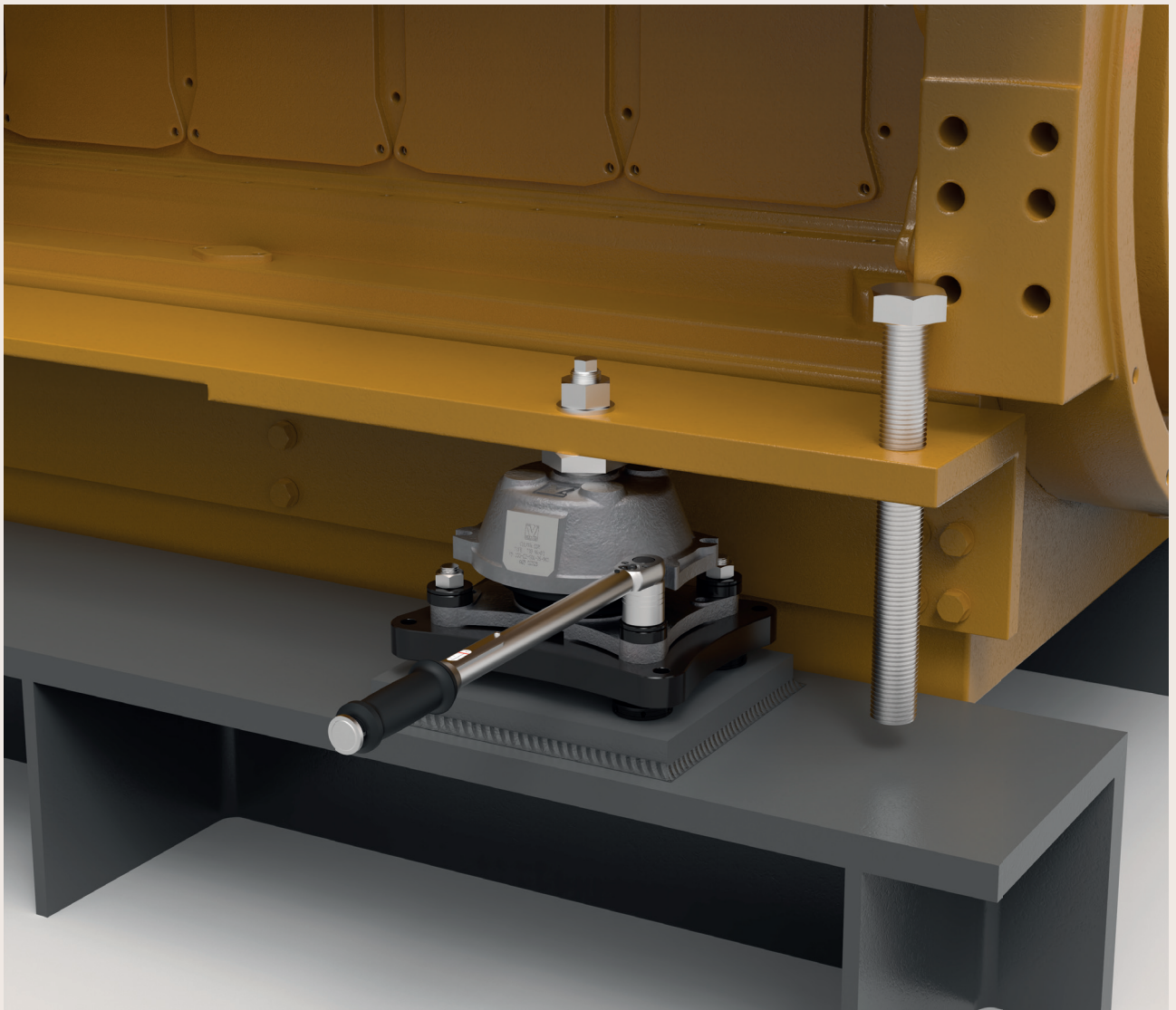
If the averaged deviation exceeds maximum deviation, correct by reinstalling jacking bolts (15) in RotaChock Mounting Plate or adjusting the 4 RotaChock Center Rings (13) in the Mounting Plate.



29

Mount the foundation bolt through the T-mount, the RotaChock Mounting Plate, and the foundation top plate, and torque.





*The table values are reference values.
The final values are determined by the
application.*



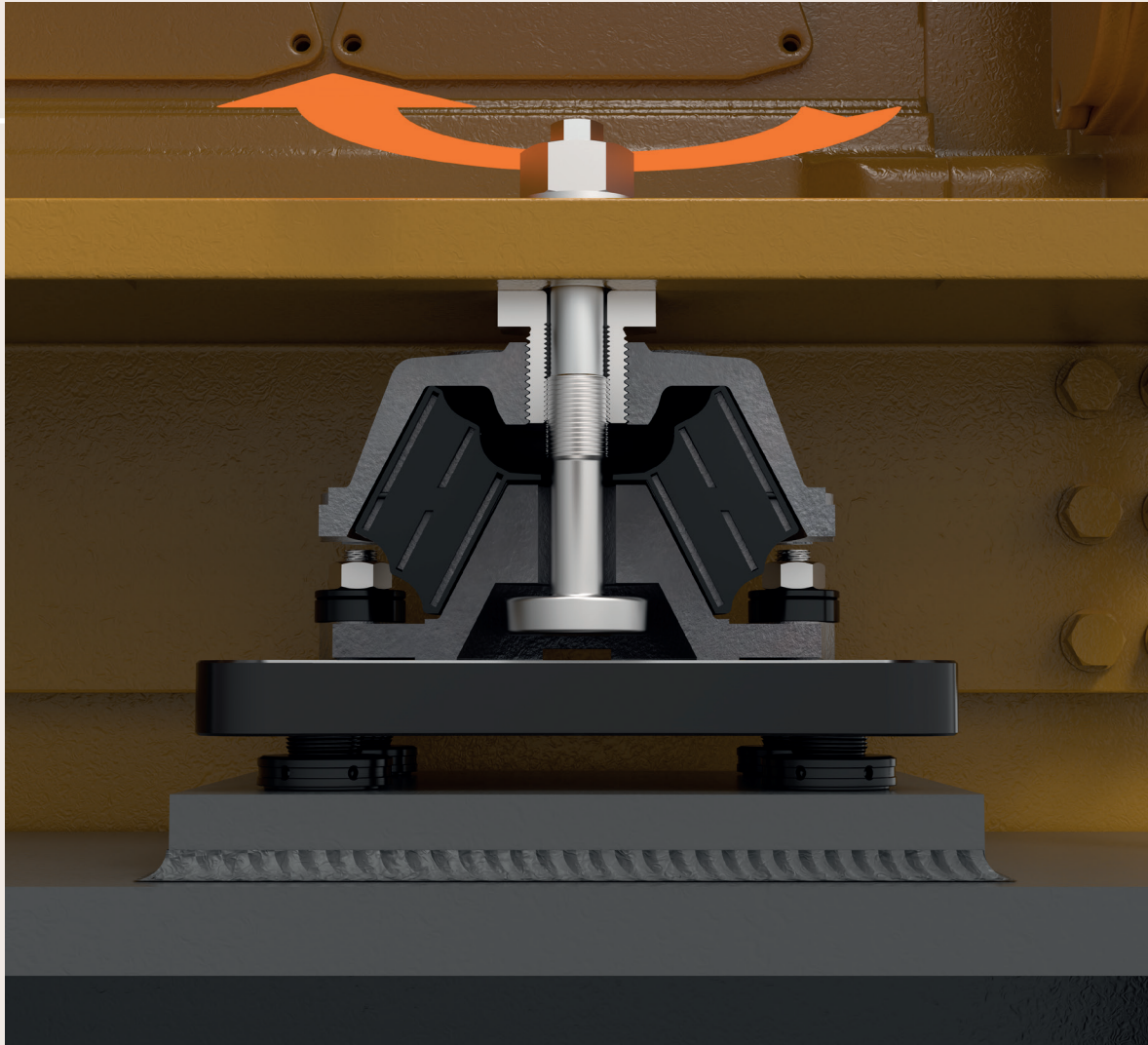
The dimensions, screw qualities, and tightening torques are provided in the attached table.

Table 11

Type	Dimensions / quality / tightening torque
T 35/T 60	M16 / 8.8 / 200 NM
T 50/T 90	M20 / 8.8 / 400 NM
T 75/T 140	M27 / 8.8 / 1000 NM
T 130/T 170	M27 / 8.8 / 1000 NM

30

Turn the central limiter (4) + (5) downward until there is contact with the RotaChock Mounting Plate.



31

Turn the central limiters counterclockwise according in the table.

Table 12

Type	Adjustment - central limiters
T 35/T 60	3x 360°
T 50/T 90	3x 360°
T 75/T 140	2x 360°
T 130/T 170	2x 360°

32

Tighten the nuts (8) with the specified tightening torque according to the drawing.

The dimensions, screw qualities, and tightening torques are provided in the attached table.

Table 13

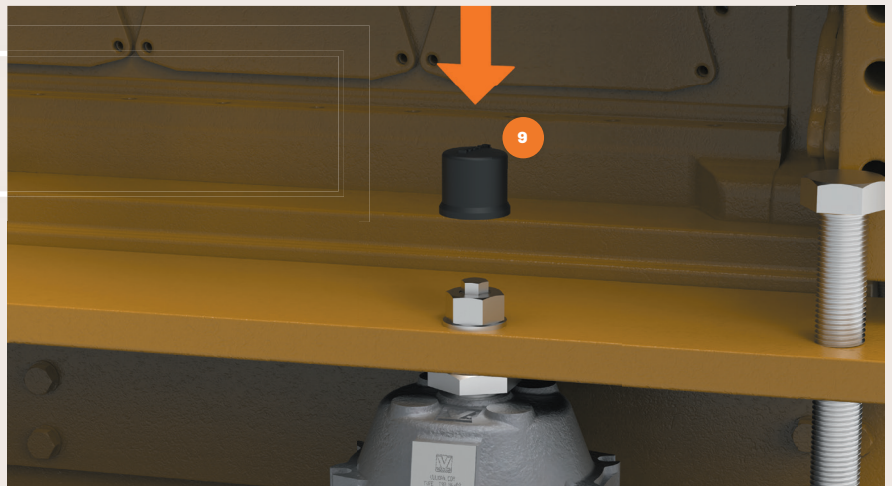
Type	Dimensions / tightening torque
T35	M27 / 435 NM
T60	M27 / 435 NM
T50	M42 / 1580 NM
T90	M42 / 1580 NM
T75	M48 / 2880 NM
T130	M48 / 2880 NM
T140	M48 / 2880 NM
T170	M48 / 2880 NM



The table values are reference values. The final values are determined by the application.

33

Fit on the cap (9).



1

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34

The mounts are installed.

9 SERVICE LIFE

9.1 MAINTENANCE

The maintenance tasks that are required for optimal and trouble-free operation are described in this chapter. Under normal work conditions and with professional configuration of the mounts system, the rubber element has a realistic service life of 8 to 12 years. The actual service life is naturally influenced by the (dynamic) loads and the ambient conditions.

The max. working elasticity at nominal load, creep behavior and thermal load that the mount arrangement can still tolerate is specified in the table below, for each type and each composite individually. The values specified below must be measured at a rubber temperature of 20°C.

Table 14

Type	Part number	TB without load	Maximum elasticity	TB min
		(mm)	(mm)	(mm)
T35	102-02-00x-21-000	33.5+1.5 / -1.0	17,0	16.5
T35	102-02-00x-22-000	33.5+1.5 / -1.0	17,0	16.5
T35	102-02-00x-23-000	33.5+1.5 / -1.0	17,0	16.5
T35	102-02-00x-24-000	33.5+1.5 / -1.0	17,0	16.5
T35	102-02-00x-25-000	33.5+1.5 / -1.0	17,0	16.5
T35	102-02-00x-26-000	33.5+1.5 / -1.0	16,0	17.5
T35	102-02-00x-27-000	33.5+1.5 / -1.0	16,0	17.5
T60	103-02-00x-22-000	33.5+1.5 / -1.0	17,0	16.5
T60	103-02-00x-23-000	33.5+1.5 / -1.0	17,0	16.5
T60	103-02-00x-24-000	33.5+1.5 / -1.0	17,0	16.5
T60	103-02-00x-25-000	33.5+1.5 / -1.0	16,0	17.5
T60	103-02-00x-26-000	33.5+1.5 / -1.0	15,0	18.5
T60	103-02-00x-27-000	33.5+1.5 / -1.0	14,0	19.5
T60	103-02-00x-27-000	33.5+1.5 / -1.0	14,0	19.5
T50	104-02-00x-22-000	52.0+1.5 / -1.0	24,0	28.0
T50	104-02-00x-24-000	52.0+1.5 / -1.0	22,0	30.0
T50	104-02-00x-26-000	52.0+1.5 / -1.0	18,0	34.0
T90	105-02-00x-22-000	52.0+1.5 / -1.0	23,0	29.0
T90	105-02-00x-23-000	52.0+1.5 / -1.0	21,0	31.0
T90	105-02-00x-24-000	52.0+1.5 / -1.0	19,0	33.0
T90	105-02-00x-25-000	52.0+1.5 / -1.0	18,0	34.0
T90	105-02-00x-26-000	52.0+1.5 / -1.0	17,0	35.0
T90	105-02-00x-27-000	52.0+1.5 / -1.0	16,0	36.0
T90Plus	115-02-00x-22-000	59.0+1.5 / -1.0	21,0	38.0
T90Plus	115-02-00x-23-000	59.0+1.5 / -1.0	20,0	39.0
T90Plus	115-02-00x-24-000	59.0+1.5 / -1.0	19,0	40.0
T90Plus	115-02-00x-25-000	59.0+1.5 / -1.0	18,0	41.0
T90Plus	115-02-00x-26-000	59.0+1.5 / -1.0	17,0	42.0

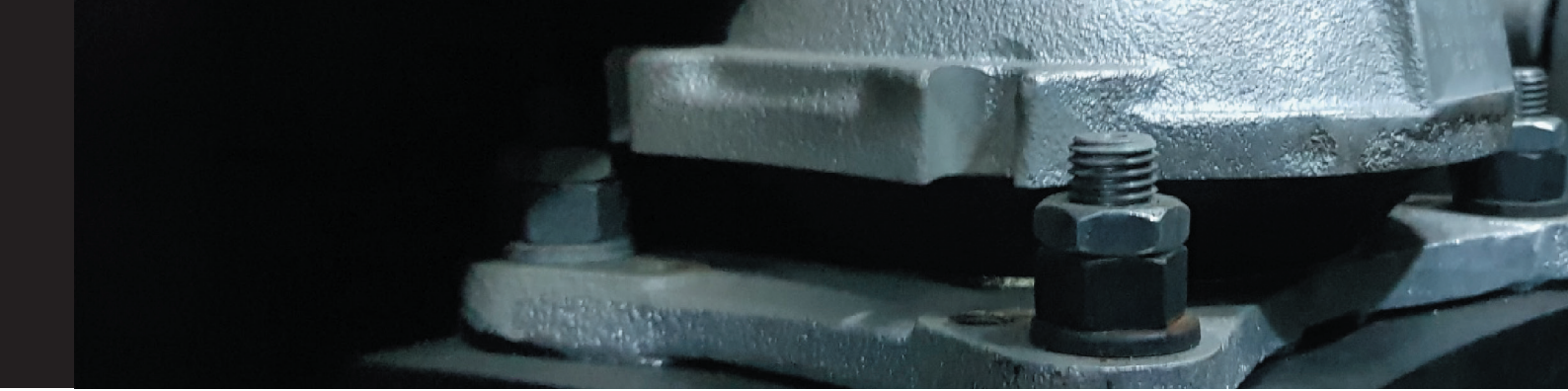
Type	Part number	TB without load	Maximum elasticity	TB min
		(mm)	(mm)	(mm)
T75	106-02-00x-22-000	54.0+1.5 / -1.0	24.0	30.0
T75	106-02-00x-23-000	54.0+1.5 / -1.0	23.0	31.0
T75	106-02-00x-24-000	54.0+1.5 / -1.0	20.0	34.0
T75	106-02-00x-25-000	54.0+1.5 / -1.0	20.0	34.0
T75	106-02-00x-26-000	54.0+1.5 / -1.0	17.0	37.0
T75	106-02-00x-27-000	54.0+1.5 / -1.0	17.0	37.0
T140	107-02-00x-22-000	54.0+1.5 / -1.0	19.0	35.0
T140	107-02-00x-23-000	54.0+1.5 / -1.0	17.0	37.0
T140	107-02-00x-24-000	54.0+1.5 / -1.0	15.0	39.0
T140	107-02-00x-25-000	54.0+1.5 / -1.0	15.0	39.0
T140	107-02-00x-26-000	54.0+1.5 / -1.0	14.0	40.0
T140	107-02-00x-27-000	54.0+1.5 / -1.0	14.0	40.0
T130	116-02-00x-22-000	83.0+ / - 2.0	40.0	43.0
T130	116-02-00x-23-000	83.0+ / - 2.0	40.0	43.0
T130	116-02-00x-24-000	83.0+ / - 2.0	38.0	45.0
T130	116-02-00x-25-000	83.0+ / - 2.0	37.0	46.0
T130	116-02-00x-26-000	83.0+ / - 2.0	36.0	47.0
T130	116-02-00x-27-000	83.0+ / - 2.0	33.0	50.0
T170	117-02-00x-22-000	83.0+ / - 2.0	31.0	52.0
T170	117-02-00x-23-000	83.0+ / - 2.0	31.0	52.0
T170	117-02-00x-24-000	83.0+ / - 2.0	31.0	52.0
T170	117-02-00x-25-000	83.0+ / - 2.0	30.0	53.0
T170	117-02-00x-26-000	83.0+ / - 2.0	27.0	56.0
T170	117-02-00x-27-000	83.0+ / - 2.0	27.0	56.0

9.2 CLEANING THE INSTALLATION

The environmental influence on the wear can be minimised through visual inspection of the rubber element, in this process look for oil contamination and damage! Oil residues must be removed with an off-the-shelf, mild household cleaner. The rubber element should be cleaned as specified in DIN 7716, to ensure the optimal service life.

Do not – under any circumstances – clean the rubber element with solvents!
If the surroundings of the rubber element are cleaned with these types of aggressive agents, the surroundings must then be re-cleaned again with a mild household cleaner.





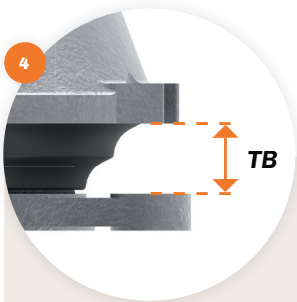
9.3 CHECKING THE INSTALLATION

Over time, the function of the T-mounts in implementation is influenced by various environmental conditions. If the assembly is executed as specified in this installation manual, only a periodic check is necessary, which must be logged.

Check criteria:

- 1 Identification number of the mounts
- 2 Temperatures of the mounts in implementation
- 3 Cleanliness of rubber surface (page 26)
- 4 Load distribution over the mounts (TB) (step 21 on page 18)
- 5 Play of the central limiter (step 31 on page 23)
- 6 Height of the height adjustment nut (step 3 on page 12)
- 7 Height of the adjustment of RotaChock (page 9)

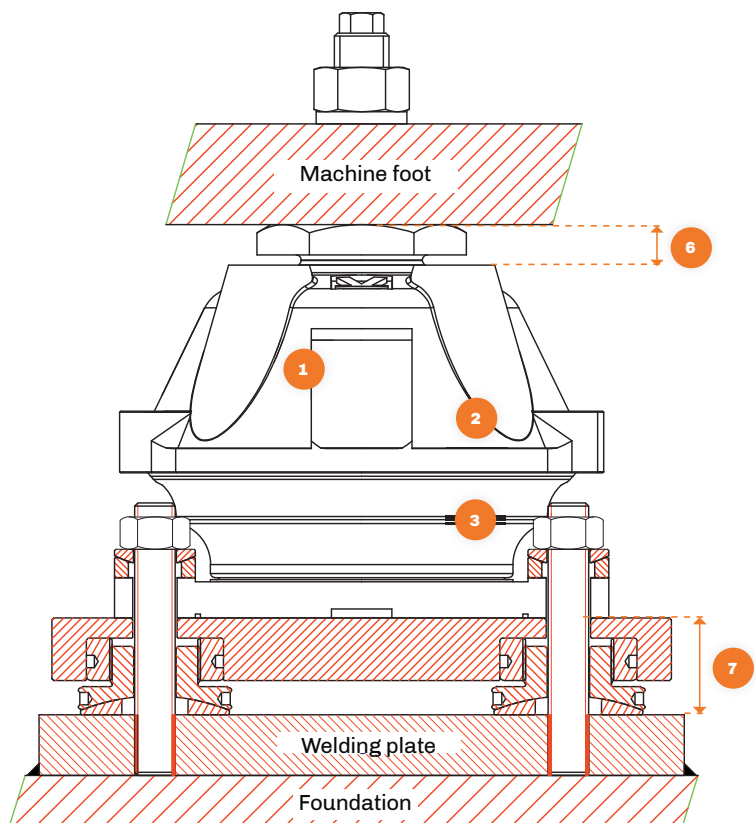
It is recommended to include the inspection in the normal maintenance instructions of the plant, however at least once a year. Additional checks should be executed as part of repair procedures. Contact the customer service if you have questions concerning replacement tasks and intervals.



Deviation of the averaged values (TB1, TB2, TB3, TB4 / 4) between the individual T-mounts must not exceed 3 mm. The maximum deviations within a T-mount are presented in table 10 on page 18.



- a Insert a feeler gauge through the slot of the base casting.
- b Increase the thickness of the feeler gauge stepwise about 0,5mm to determine the measure (min. 2mm - warm condition)



9.4 SHEET OF MEASUREMENT

Measurement ID:

Date:

Ship/project reference:

Type of mount:

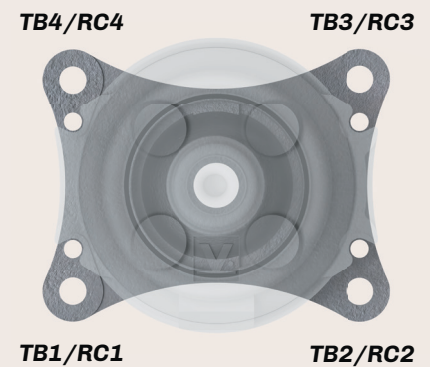
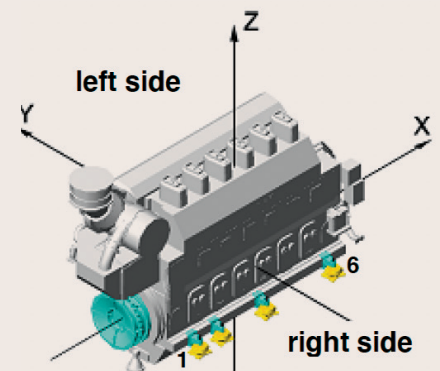
Application:

Amount of mounts installed:

Type:

Running hours:

Sheet of Measurement	Mount ID	Mount ID	Mount ID	Mount ID	Mount ID	Mount ID
Side R ● L ●	01	02	03	04	05	06
Temperature (C°)						
Rubber cleaned (yes/no)						
Play of central limiter (mm)						
Height adjustment nut (mm)						
TB1 (mm)						
TB2 (mm)						
TB3 (mm)						
TB4 (mm)						
RC1 (mm)						
RC2 (mm)						
RC3 (mm)						
RC4 (mm)						



You can request this sheet at customer service.





9.5 ALIGNMENT AND CORRECTION

The rubber element must be aligned perfectly parallel to the machine foot to ensure optimal vibration damping and to reach its service life of 8 to 12 years. This can be monitored by checking the TB values as described in [step 9.3 on page 27](#).

VULKAN T-MOUNT

The VULKAN T-mount has an adjustment screw for height correction. Please check pos. 11 in the exploded drawing on [page 5](#) for reference. In [table 4 on page 9](#) you can find the maximum adjustment of this screw and the resulting minimum and maximum build-in height of each VULKAN T-series type.

In the assembly manual, at installation step 3, we advise adjusting this screw with only 2-3 mm. We do so because the rubber elements will creep during its service life, and you can use the maximum adjustment for corrections.

ROTACHOCK MOUNTING PLATE

While using RotaChock Mounting Plates you can correct both parallel and angular gap. Please check pos. 13, 14 & 15 in the exploded drawing on [page 5](#) for reference. In this assembly manual, we do all parallel/angular corrections by adjusting the jacking bolt.

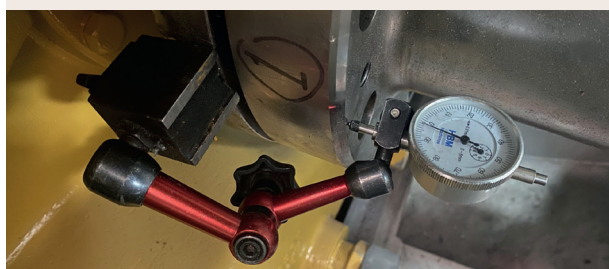
As described in paragraph 7 -Design heights, both the T-mount and RotaChock Mounting Plate have the possibility to adjust in the parallel height. Only by adjusting the RotaChock Mounting Plate, can you solve the angular gap and correct TB values within limits.

The rubber elements will creep during service life, and you need to check two alignment values.

1. SHAFT / COUPLING ALIGNMENT

Due to creep, the centerline between components or alignment target will offset in time, and you need to correct it. You can do so by rotating the adjustment screw (pos. 11). Remember that the maximum allowed distance mentioned in [table 4 on page 9](#) must not be exceeded.

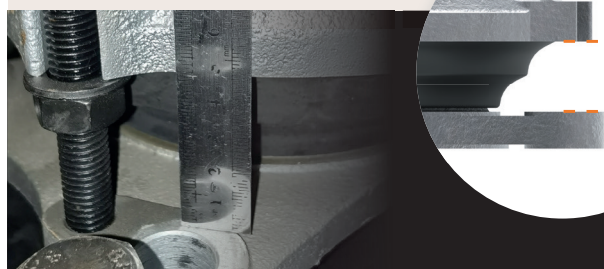
When realignment needs to be done and results in an out-of-range height of the adjustment screw, the first correction of 3 – 5 millimeters can be done with the RotaChock Mounting plate by adjustment as described on the right.



2. TB VALUES

When TB values are outside their recommended values; you can correct them by following steps:

- 1 Loosen foundation bolts [reverse step 29](#)
- 2 Reinstall jacking bolts in the mounting plate [reverse step 27](#)
- 3 Correct TB values by adjusting jacking bolts [see step 21](#)
- 4 When corrected; fill the gap with RotaChock [see step 26](#)
- 5 Remove jacking bolts [see step 27](#)
- 6 Tighten foundation bolts [see step 29](#)



It's recommended to check TB-values and, if needed, correction by adjustment after each realignment.



10 AFTER LIFE

10.1 DISMANTLING

Before dismantling, make sure that the machinery equipment is fixed and unable to move.

- 1 Assemble the pre-tensioning screws (6) and lock the mount height.
- 2 Remove the cap (9), the nut (8) and the washer (7) and keep them on hand.
- 3 Turn the central limiter (4) + (5) counter clockwise, until the bolt rests on top of the base casting (1).
- 4 Unload the mounts slowly and evenly 2-5 mm using a hydraulic piston.
- 5 Remove the upper bolt (5).

The upper bolt is fixed with Loctite to the lower part. We suggest heating the upper bolt to 100° C to soften the Loctite for easy disassembly.



- 6 Unscrew and remove the screws from the base casting (1).
- 7 Remove the mount.

10.2 DISPOSAL

If a return or disposal agreement has not been concluded, then recycle dismantled components:

- › Dispose of rubber mixtures in accordance with governmental guidelines.
- › Sort and dispose of remaining components in accordance with national regulations and with material condition.
- › Remove fuels and auxiliary materials, as well as residual processing materials and dispose of these items in an environmentally responsible manner.



Life-threatening danger due to incorrect dismantling! Incorrect dismantling can cause life-threatening situations. Therefore:

- *Strictly follow the dismantling sequence specified here.*

10.3 REPLACEMENT

The system needs to be replaced when the maximum allowed adjustment is reached. First, you replace and dispose of the mount per the given instructions. Then, when RotaChock Mounting Plates are used, you can build back on the same system. This is thanks to the unique readjustment capability of RotaChock. When other chocking systems like steel fitted blocks or epoxy resins are used, these need to be replaced entirely. You must start again from scratch; otherwise, it will be impossible to correct the new TB values, and the resilient system won't function properly.

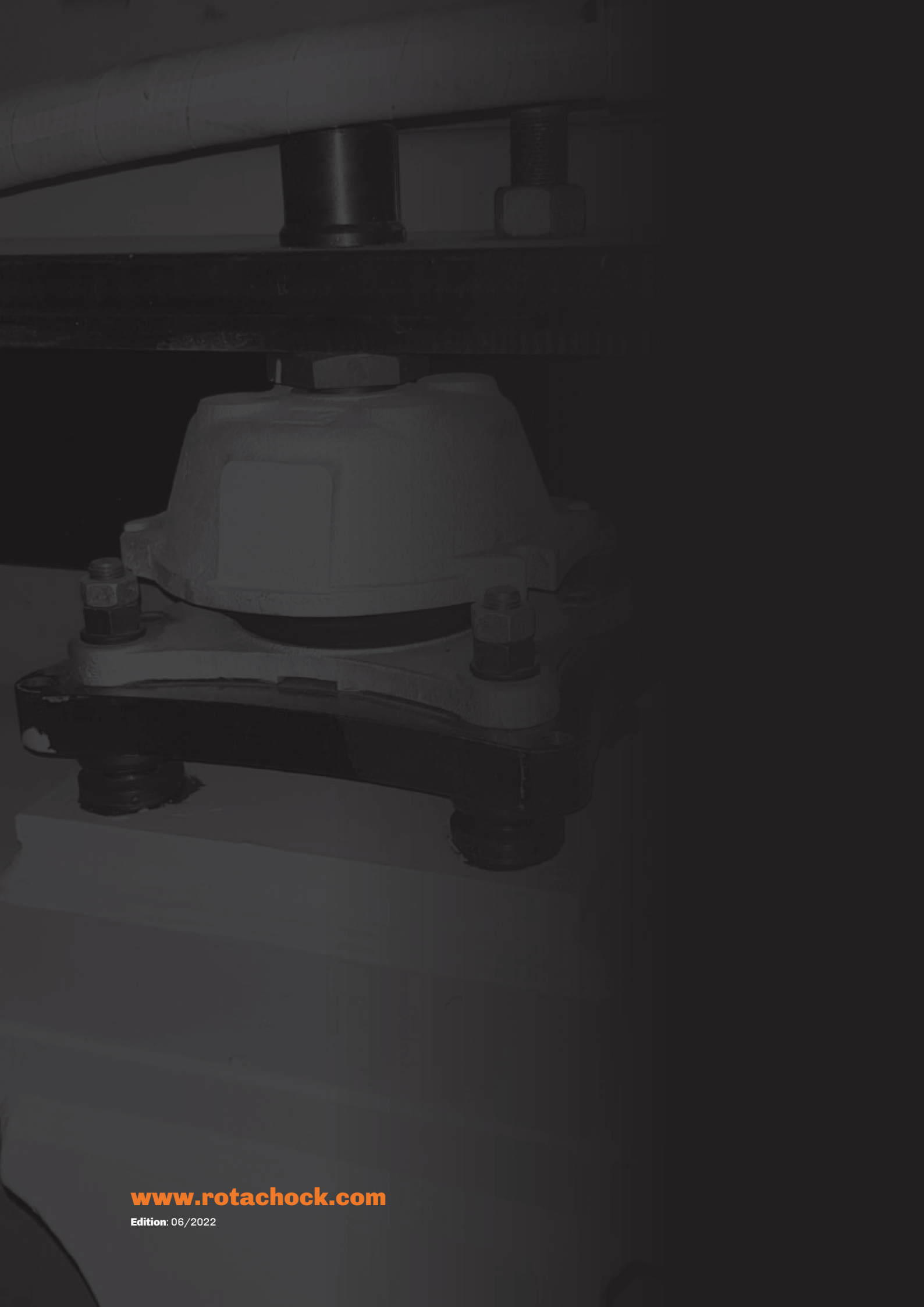
Our global covering service network can assist with this servicing. Our global network ensures access to a whole support team, from design engineers at the knowledge centers to service engineers in the field. With his local presence, we offer fast response time and the availability of experienced engineers. We have the expertise and equipment to assist you with a quick and trouble-free replacement.



Contact customer service if you need any support with the servicing of your system.

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