

MRT
Tilt&rotators

Tiltrotator user guide

MRT11 MRT19 MRT26

Rev.1.2.



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 www.mrttiltrotator.fi
 [mrttiltrotator](https://www.facebook.com/mrttiltrotator)
 [mrttiltrotator](https://www.instagram.com/mrttiltrotator)

Manufacturer:

MARTIINIMETAL

Martiini Metal Oy, Marttiinintie 3, FI-96300 Rovaniemi, Finland

Introduction

Congratulations on your choice!

Marttiini Metal OY has operated since 1967 as a Finnish family-owned company, which manufactures high-quality products to the construction and forest industry. Our products have been optimized to cope with extreme conditions, due to good protection and a solid welding structure. Each product undergoes a multi-stage final testing to guarantee the operation of the product from the very first moment.

Marttiini Metal OY has always been close to its customers and thus been able to develop solutions and services that meet the contractor's needs. For us, common sense is endurance, agility and understanding of Nordic conditions.

This manual contains important information about the features of the product you have purchased and how best to use it. It is important that you read and understand the contents of this manual, especially the sections on safety, before using the product.

In addition to this manual, you should also read and understand before use the safety instructions for the base machine and any other equipment. The instruction manual is accompanied by additional documentation which describes in more detail the the installation, assembly, operation and maintenance of the control system used, and customer adaptations.

The data, illustrations and specifications are based on the information available at the time of printing. The illustrations in this manual are examples and are not intended to be exact replicas of the various parts of the product. We reserve the right to make changes without prior notice.

Always keep the operating instructions together with all other information in a safe place and accessible at all times.

Best regards,
Team MRT

Recycling and end use.

Marttiini Metal oy - MRT is constantly striving to reduce its environmental impact. Our products are mainly manufactured from recyclable materials. All installation and maintenance in accordance with environmental, health and safety laws and regulations.

This includes all aspects of handling, storage and recovery of surplus materials and recovery of residual waste. Spillage must be prevented to avoid contamination of soil and water.

If spills do occur, they must be cleaned up properly. Hazardous waste must only be handled by those duly authorized to do so. All waste must be treated in accordance with applicable laws and regulations:

- Metals and plastics will be recycled.
- Hydraulic hoses are normally recovered for energy use (sorted as hazardous waste).
- Oil and grease are normally recovered for energy use (sorted as hazardous waste).
- Electrical components are recycled (sorted as hazardous waste).
- Packaging is sorted by source and recycled.
- Paper is sorted by source and recycled.

In the need of help, please contact Marttiini Metal OY.

Transport and storage

The tiltrotator has no lifting or attachment points.

During transport/transfer/handling of the tiltrotator it must be secured to the pallet.

Operating and storage temperature

Storage temperature -30 - +50 °C

Operating temperature -30 - +50 °C

Technical support and parts

Contact details for support and spare parts can be found at www.mrttiltrotator.com

EU Declaration of Conformity**MARTTIINI**METAL

In accordance with Machinery Directive 2006/42/EC. Appendix II A

Manufacturer:

Marttiini Metal OY

Marttiinintie 3

96440 Rovaniemi

FINLAND

declare under our sole responsibility that the following product:

Models: MRT11, MRT19, MRT26

a) is produced in compliance with, and meets all applicable regulations in, the European Parliament and European Council Machinery Directive 2006/42/EC of 17 May, 2006.

b) is manufactured in accordance with other applicable directives such as:

Directive 2014/30/EU of The European Parliament and Of The Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility

c) is manufactured in accordance with the following harmonized standards: ISO 12100:2010.

Name and signature of authorized person:


Miika Marttiini

Engr. CEO, Marttiini Metal OY



1. Safety Instructions

The purpose of these safety instructions is to ensure the safe and appropriate use of the device. It is extremely important that the user of the device, as well as the owner, has read and understood these safety precautions. This manual should always be available wherever the device is used. Safety conditions apply to the device regardless of basic machinery. Read the operation and maintenance instructions carefully, even if you have used the device before.



Installation, operation, and maintenance of the device is strictly prohibited before the user has read and understood all instructions and information related to the device. Read the safety instructions for the device very carefully.

We are not responsible for any damages caused by:

- Improper and/or careless use.
- Spare parts that are not original.
- Natural wear and tear.
- User errors.
- Changes in the structure and/or workings that are carried out without the permission of the manufacturer.
- Daily maintenance, inspections, and failure to lubricate (do not use 0.0 lubricant).

1.1. General Safety Precautions

- Get to know the operation of the instrument, as well as the controls.
- Be aware of the capacity and limitations of the instrument, do not exceed these limits.
- Using the machine is strictly prohibited, unless you are completely familiar with its use.
- The use of an inadequate and/or a defective unit is strictly prohibited.
- fastenings must always be checked before using the device.
- Incorrect installation can be life-threatening.
- **The safety distance is 15 meters from the device!**

1.2. Safe Maintenance Instructions

- Device maintenance and repairs must be made in accordance with the recommendations and instructions.
- The instrument should be serviced by qualified personnel only.
- Hydraulic and electrical damage to be repaired only by authorized, qualified personnel.
- Before maintenance, make sure that the hydraulic system is not under pressure.
- Before you start the electrical work, shut the machine off.
- Beware of hot hydraulic oil, do not look for hydraulic leaks by hand.
- Follow the instructions for greasing.

IMPORTANT

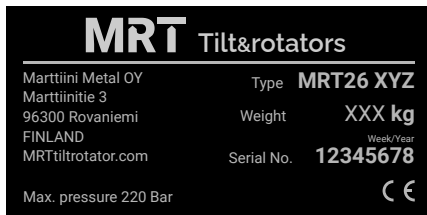
Ensure miscibility with base machine hydraulic oil before installation. If in doubt, contact your lubricant supplier. Incorrect mixing can damage the hydraulic components. An oil collection container should be kept available during installation.

T=Tank. max return pressure 2,5 Mpa (if possible use free pressure).

P=Pressure. max pressure 22 Mpa.

Certificate

Check that the information on your product's nameplate corresponds to the EC type-approval -Declaration of Conformity. If you notice a discrepancy, please contact the supplier before starting the first installation. The type plate is located on the Cylinder impact protection cover of the MRT tilt&rotator.



Type	Device model designation
Weight	Device weight in kilogram (kg)
Serial No.	Device serial number.
Max pressure	Maximum permitted hydraulic fluid pressure.

The ID plate is on the tilt cylinder impact cover

2. Technical Specifications

MRT11 S45*

Width A 371 mm (depending on the up part model)

Width B 307 mm (depending on the up part model)

Width C 235 mm

Overall length D 642 mm

Overall height E 416 mm (depending on the up part model)

Weight 380 kg (depending on the up part model)

Rotation unlimited

Tilt 2 x 40°

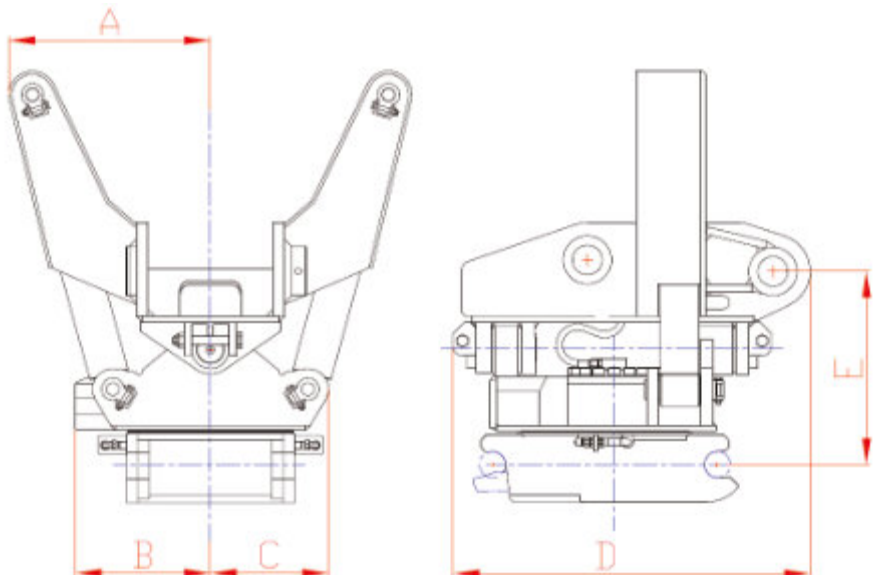
Flow requirement 60-80 l/min

Operating pressure max. 22 mPa

Hydraulic motor pressure max.160 mPa (direct installation).

Rotational speed 7,5 r/min

*Dimensions depends what kind of model, fitting and quick coupler .



2. Technical Specifications

MRT19 S60*

Width A 490 mm (depending on the up part model)

Width B 370 mm (depending on the up part model)

Width C 270 mm

Overall length D 780 mm

Overall height E 490 mm (depending on the up part model)

Weight 650 kg (depending on the up part model)

Rotation unlimited

Tilt 2 x 40°

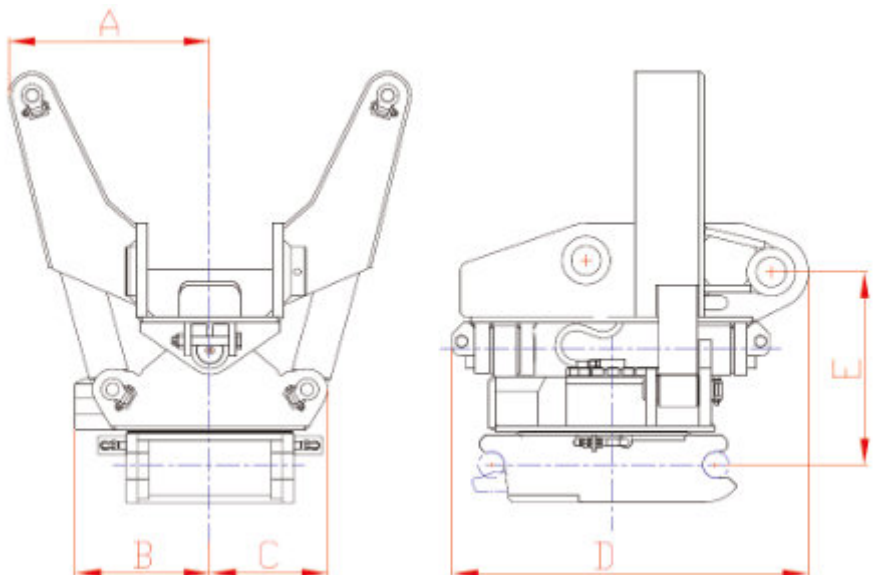
Flow requirement 80-120 l/min

Operating pressure max. 22 mPa

Hydraulic motor pressure max. 160 mPa (direct installation).

Rotational speed 7,5 r/min

*Dimensions depends what kind of model, fitting and quick coupler is.



2. Technical Specifications

MRT26 S70*

Width A 540 mm (depending on the up part model)

Width B 373 mm (depending on the up part model)

Width C 315 mm

Overall length D 847 mm

Overall height E 592 mm (depending on the up part model)

Weight 865 kg (depending on the up part model)

Rotation unlimited

Tilt 2 x 40°

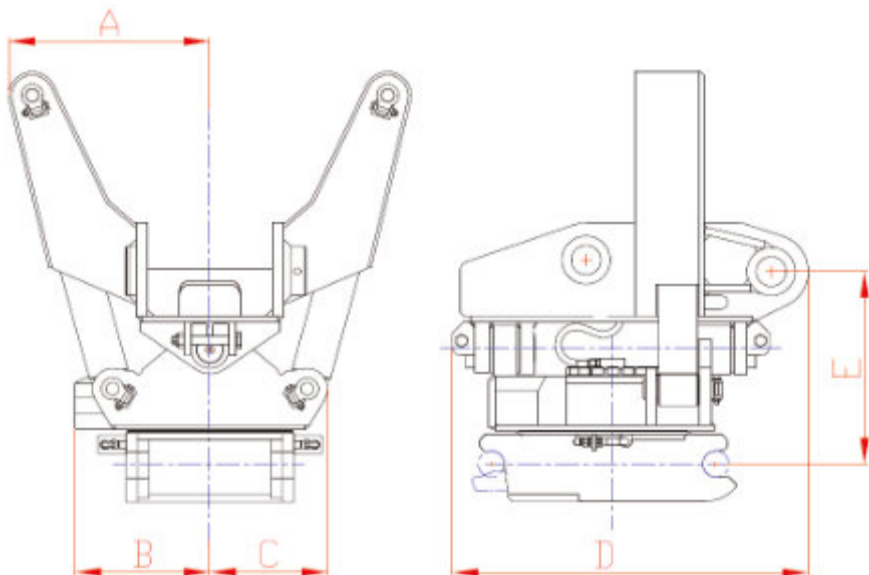
Flow requirement 80-120 l/min

Operating pressure max. 22 mPa

Hydraulic motor pressure max. 160 mPa (direct installation).

Rotational speed 7,5 r/min

*Dimensions depends what kind of model, fitting and quick coupler is.



3. Deploying the Device

WARNING

Installation, operation, and maintenance of the device is strictly prohibited before the user has read and understood the device and accessories information. Improper installation or use may endanger yours or an others safety!

DANGER

Do not exceed tipping limits. Product weight and increased dimensions may reduce stability. Risk of personal injury and damage to property.

WARNING

If you are unsure of your own capabilities, equipment or work from a safety point of view, please contact your dealer or Marttiini Metal OY. Incorrect installation compromises safety.

IMPORTANT

Installation must only be carried out by a workshop approved by the manufacturer. No changes may be made to the installation without the manufacturer's consent.

3.1. Installing the Device

Check before installation:

- Device cursory condition.
- Condition of hydraulic hoses.

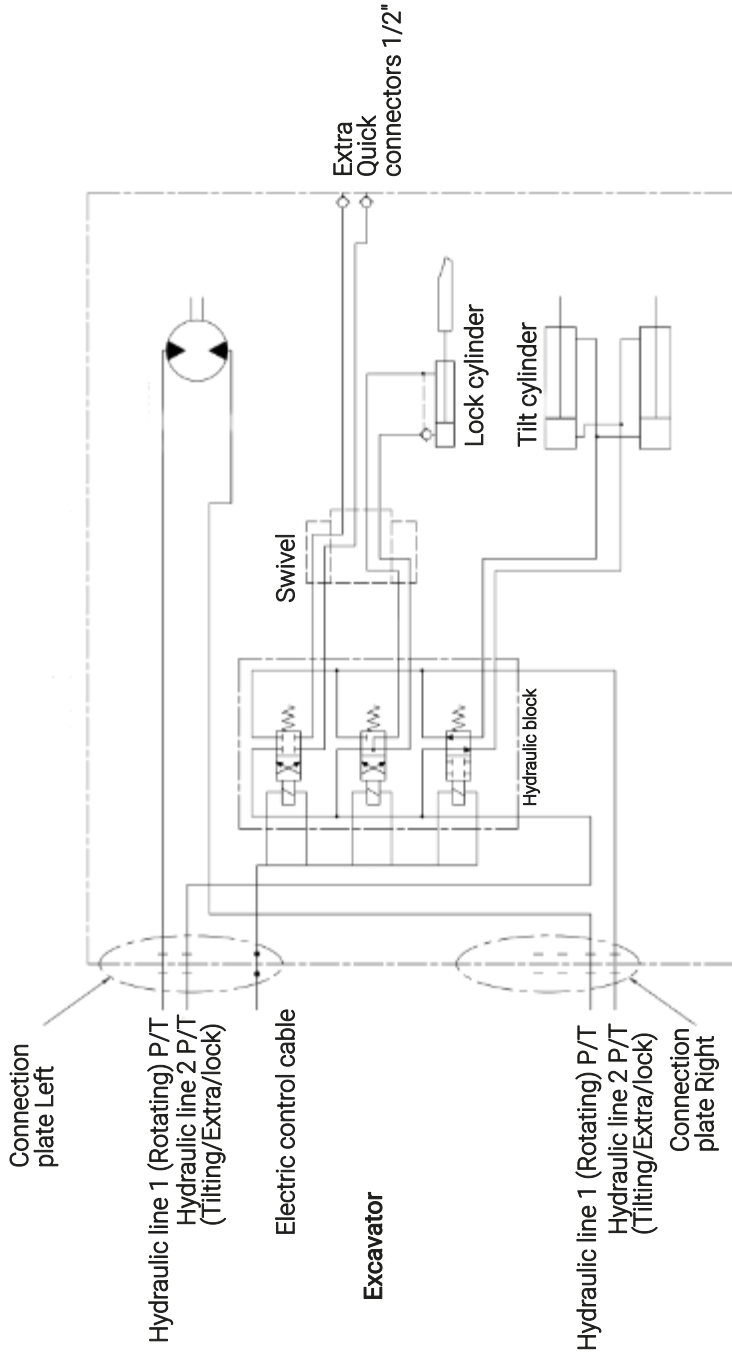
There is two possibilities to install the device:


1. direct fit on the excavator bucket arm.
2. connect the device to a quick coupler.
 1. The device is mounted directly to the machine with pins on the bucket arm. Install one pin through the bucket arm and device, then carefully align the second pin. If necessary, use the adapter plates for compact fitting. The bucket arm fitting must be tight! Finally, check the locks are locked securely!
 2. Connect the device to a quick coupler. Open the quick couplers lock and lift the device on it. Finally close the lock and check it is locked!

Notice

After MRT attachment is installed on the excavator:

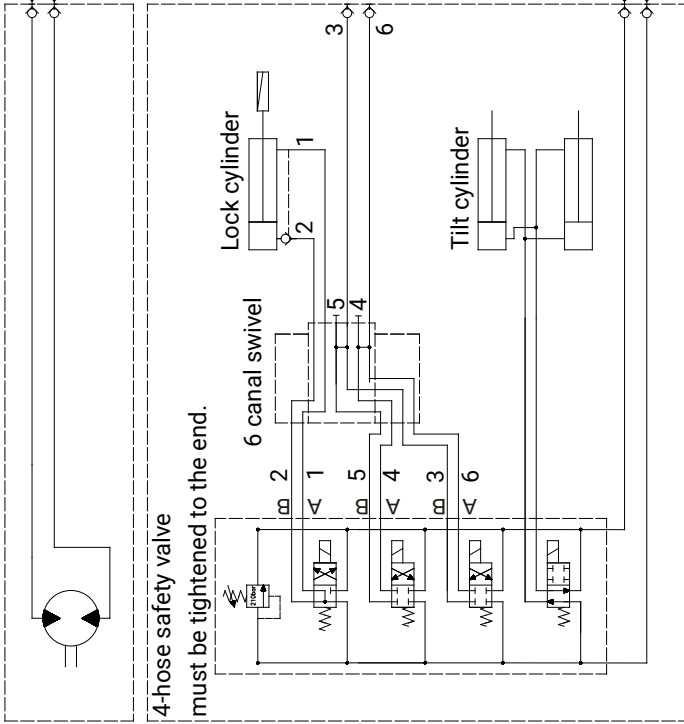
Do not exceed the tipping load limits. The weight of the product and the increased dimension may reduce stability. Risk of personal injury and property damage. Compensate it with a lighter tool/bucket.



		MRT11 Tiltrotator	
		MRT11 4-hose Hydraulic diagram	
Doc. no:	Rev:	Date:	08022022
100108	B		

4-hose version with MRT 4-hose ON/OFF controller.

Rotator and tilt will work without electricity. Tilt valve will close when lock or extra hydraulic is activated.



P/T 1. Proportional line for rotator.

P/T (Two way hydraulic, max. 160 bar).

High Flow extra hydraulic.
Quick connectors 1/2".

Basic connection MRT High Flow (over 100L/min.)

- with grapple, manual valves in grapple cylinders.

Optional connections:

- two independent extras (60-80L/min.)

- grapple + 1 independent extra. (60-80L/min.)

P/T 2. Proportional line for hydraulic block.

P/T (Two way hydraulic, max. 220 bar).

MRT

Tilt&rotators

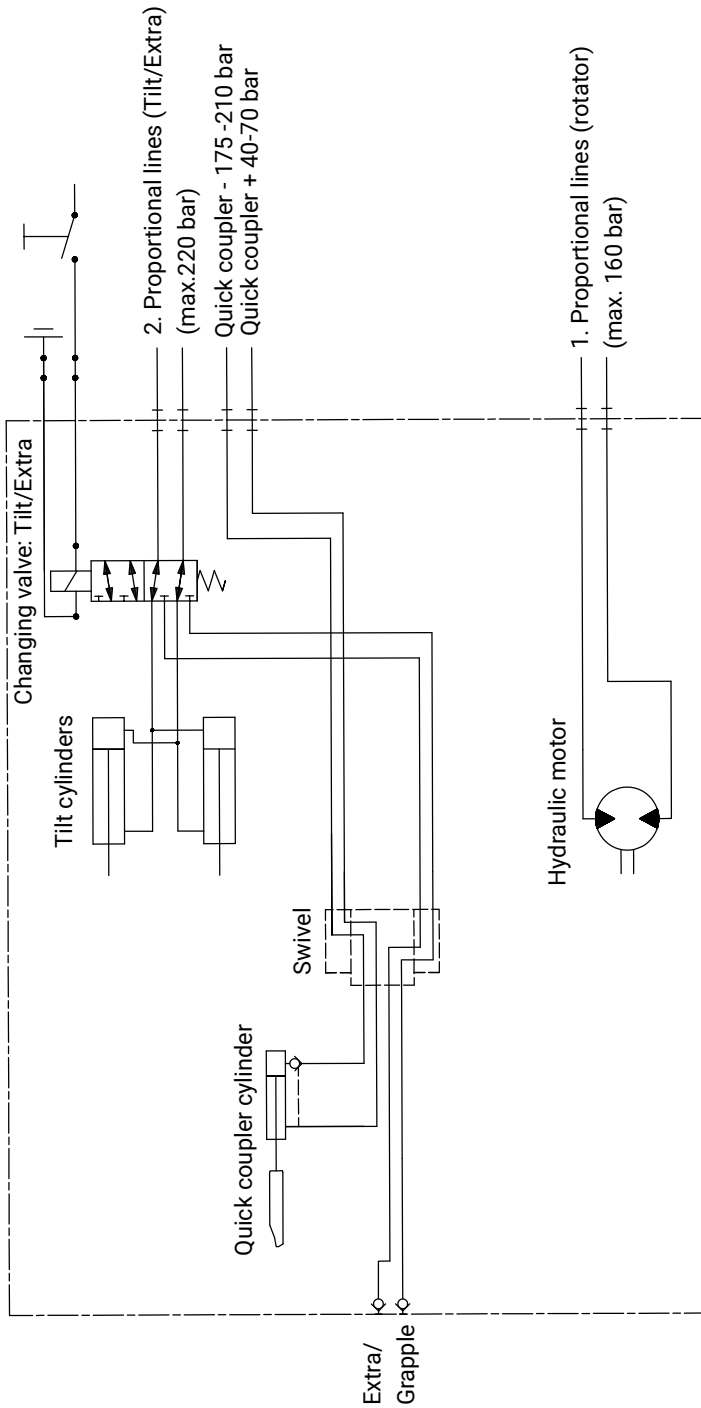
MRT19, MRT26, MRT32 Tiltrotators

MRT19,26,32 4-hose Hydraulic diagram

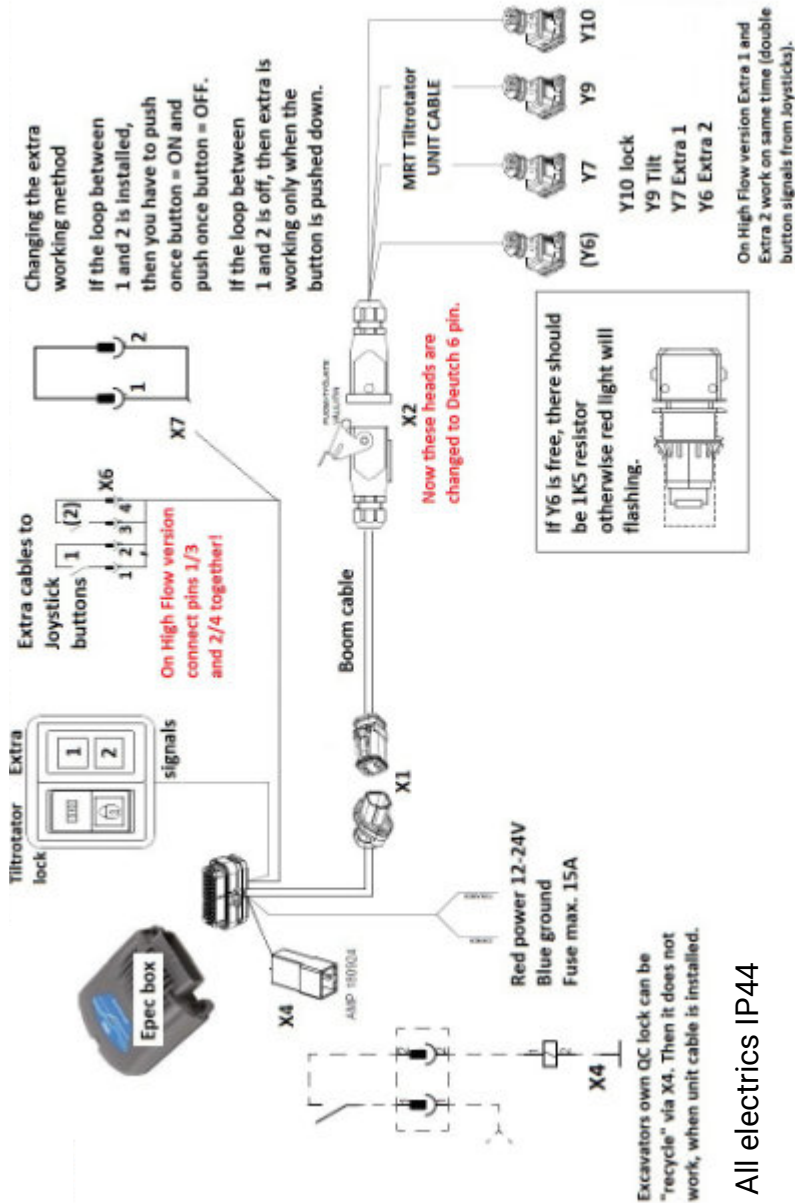
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Rev:
B

Date:
12102021



		MRT11, MRT19, MRT26, MRT32 Tiltrotators	
		6-hose Hydraulic diagram	
Doc. no: 100107	Rev: B	Date: 12102021	



All electrics IP44



3.3. MRT 4-hose on/off controller

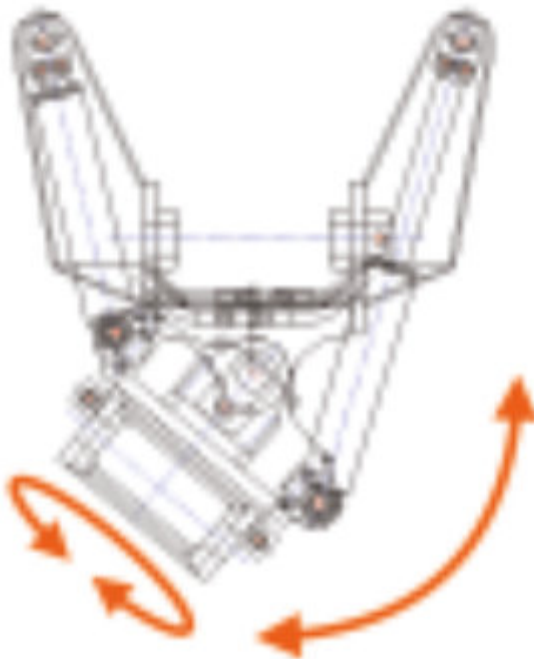
4. Use of Equipment

Always use this product sensibly, taking conditions and the machine base curb weight into account. For example, tearing rock hard ground with the force of the excavator can break the bolts of the gear ring.

Open and close the bucket/tool locking wedge daily, so the lock becomes flexible.

4.1. Device control

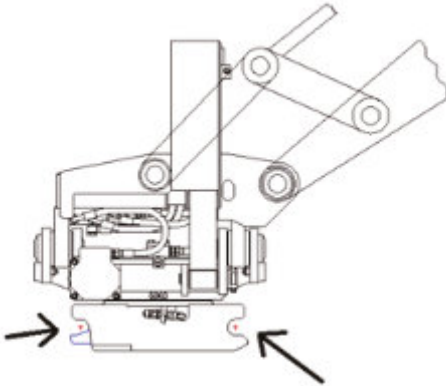
The steering of the device work with the buttons or rolls on the joysticks. See the control devices own instructions and electrical connections section in this manual for more information. Read also your excavators user manual carefully for extra information.



WARNING

The use of a defective device is strictly prohibited. Fastenings must always be checked before using the device.

4.2. Attachment and Removal of tools



1. Lower the front part of the MRT device to the corresponding tool.
2. Put the switch of the lock cylinder of the device into "ON" position. Now, the beeper starts and indicates the lock is open. At the same time give hydraulic pressure to the MRT device as well to keep it tight against the tool.
3. Lower the MRT device permanently in position against the tool.
4. Give some hydraulic pressure to the MRT device, so the wedge of the locking system lock the attachment secure. Put the lock switch into "OFF" position of the MRT device.
5. Check the MRT device attachment is safe.

Removal happen in reverse order.

4.3. Device Use Restrictions



The MRT device is not intended for use with a hydraulic breaker. The impact hammer can cause breakage of the machine and at worst, work interruption.

The MRT device is not intended for digging and tearing rock/big stones.



Use the lock cylinder with the switch in "ON" position only to attach and remove excavator tools. Always make sure the excavator tool is attached securely before you start working!

5. Maintenance



Device maintenance and repairs must be made in accordance with the recommendations and instructions.

Depressurize the hydraulic system before inspection and maintenance.

Avoid not to be in contact with hot hydraulic oil, may cause burn injury.

ATTENTION

It is very important to inspect for damage and lubricate the device every day!

5.1. Daily activities (Inspections)

- Inspect condition of device for cracks and other damage, and possible oil spills. Repair if needed.
- Inspect condition of hydraulic hoses, damaged hoses must be replaced.
- Inspect all bolts tightness, tighten them if necessary.
- In rare cases, sand and/or other impurities may enter into the machine cylinder, always remove the impurities before using the machine cylinder.
- **Lubricate** (do not use 0.0 vaseline!)
We recommend to use EP2/NLGI 2.0 vaseline, viscosity over 750 cST 40°C.
(Example: SKF LGLS 2/18).

5.2. Lubrication Instructions

On delivery, the device is pre-greased. When in use, the greasing should be carried out during every shift, every 6-8 hours. Use the tilt and rotation of the device, so that greasing is carried evenly on all sides. We recommend a lubricant, lithium-based grease, which has a hardness of 2.

Use high viscosity EP2/NLGI 2 class lubricant, viscosity over 750 cST 40°C. During freezing -10°C conditions we recommend to use grease of hardness (NLGI)1. Do not use lubrication that contain solid particles like molybden, graphite or copper. This can lead to pump failure.

The device is equipped with MRT progressive central lubrication system. For easy access and lubrication, there is only one greasing point on the device. The greasing point is beside the hydraulic hose connector. The grease unit distribute to the lubrication points in a row, so that no lubrication point is not dry. The MRT lubrication system can be connected to the main machine lubrication system.

Attention

check regularly that the correct amount of new grease is transferred to the attachment. During freezing winter the lubrication system need higher system pressure.

A blockage in one lubrication channel will block the entire lubrication system. During troubleshooting, contact your service partner or Marttiini Metal OY.

the grabs and the tool clamps below the tiltrotator have their own lubrication points and are not connected to the lubrication system. Lubricate these pumping 3-4 times the lubrication gun at each lubrication point.

Manual lubrication:

Dry the lubricating nipple and mouthpiece from dirt before connecting the lubricating gun. To lubricate the device, remove the lubricating cap and attach the lubricating gun. Lubricate the machine so that you can see grease coming out of all the shafts and bearings.

Lubrication amount gram / lubrication unit:
MRT11 12g | MRT19 15g | MRT26 20g |

5.3. Tightening Torques for Bolts

The table below represents recommended tightening torques for the bolts of the product. Tightening the bolts to the correct tightening torque is essential, to prevent loosening. The bolts should not be tightened past the greatest torque, in order to prevent damage to the threads. The cover of the M20 or M22 or M24 bolts should be tightened to 6-month intervals, to prevent them from loosening due to vibration.

Size	Torque [Nm]	
Strength	8.8	12.9
M5	5.9	10
M6	10	18
M8	25	43
M10	49	84
(M12)	85	145
M16	210	365
M20	-	670
M22	-	750
M24	-	800

These torques take into account the materials and the use of Nordlock washers.

5.4. Warning labels

Machine instructions, stickers and warning labels must be kept clearly readable. Damaged or illegible signs can lead to personal injury and property damage. You can order new ones from your dealer.



Warning is for overall risk of injury in the surroundings of the attachment.



Warning. Moving parts present a risk of crushing. Be careful close to rotating and tilting parts of the attachment.



WARNING
Hydraulic
Pressure

Warning. Hydraulic pressure. Bursting hydraulic part can cause serious hazard.



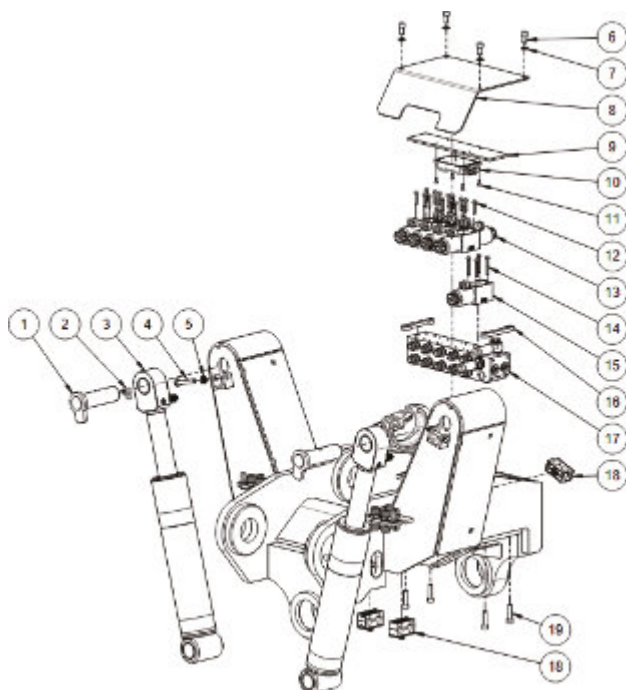
Always use NLGI
2-class vaselin.
Viscosity over
750 cSt 40°C.

Attention. Always use NLGI-2 class lubricant. Viscosity over 750 cST 40°C. It is very important to keep the attachment thoroughly lubricated

6. Spare partlist

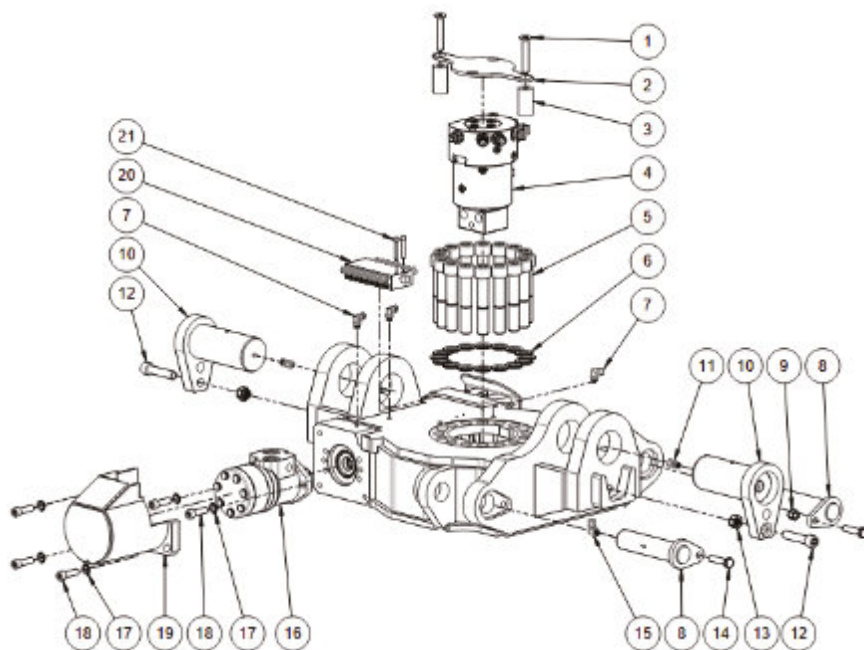
Please inform always the device model and serial number, when ordering spare parts! Parts may vary depending on the model/version of the product.

Up part list



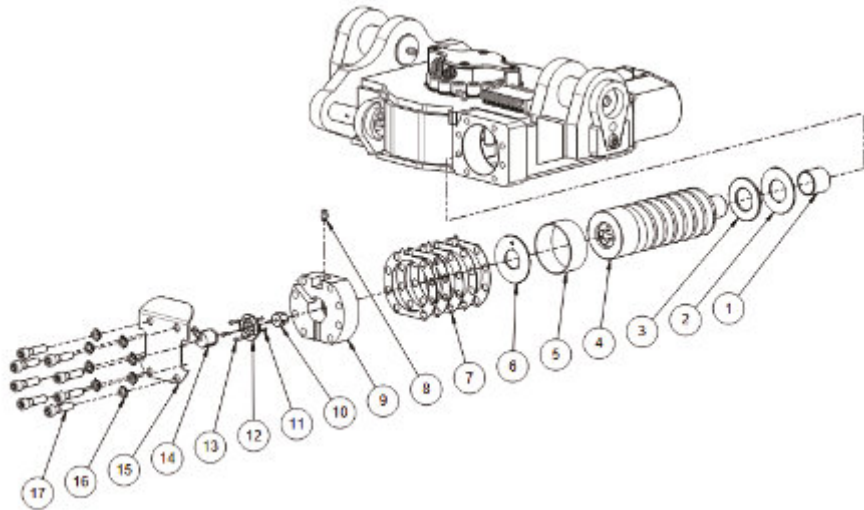
Position	Part no:	Position	Part no:
1	1386	11	3890
2	2669	12	2968
3	2837	13	3451
4	2841	14	3893
5	2840	15	3451
6	3882	16	2331
7	3187	17	4822
8	4908	18	5103
9	4916	19	2833
10	3890		

Gearbox part list



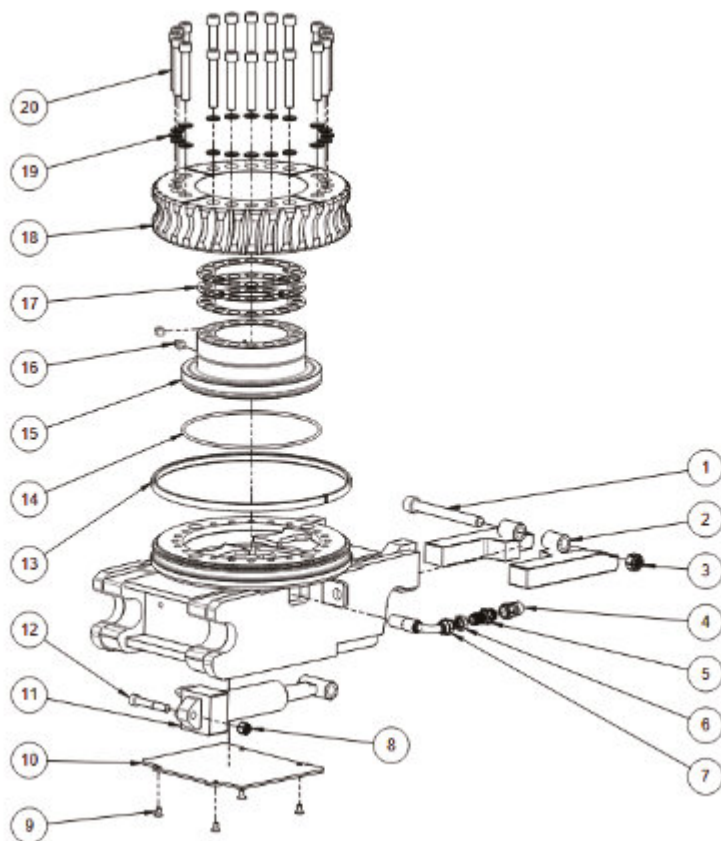
Position	Part no:	Position	Part no:
1	3075	11	2966
2	4588	12	3189
3	4335	13	2987
4	4063	14	3617
5	4349	15	2969
6	4348	16	3193
7	2967	17	3444
8	3582	18	3445
9	2957	19	4308
10	1399	20	4504
		21	3190

Gearscrew part list



Position	Part no:	Position	Part no:
1	2644	10	4346
2	3711	11	3905
3	2212	12	3907
4	44	13	3451
5	2643	14	3908
6	4518	15	4478
7	92	16	3185
8	2965	17	3189
9	651		

Underbody part list



Position	Part no:	Position	Part no:
1	3150	11	4300
2	1105	12	2854
3	3672	13	4263
4	2773	14	2998
5	2961	15	4324
6	2971	16	4502
7	4528	17	4175
8	2136	18	3902
9	2996	19	3185
10	1103	20	3189

7. Warranty

Marttiini Metal OY warrants this product as free of defects in material, design and workmanship for a period of 12 months from the first retail purchase or delivery. Repairs of the product under this warranty (with or without replacement of parts) does not lead to an extension or restart of the warranty period.

This warranty does not affect (and is provided in addition to) any consumer statutory rights or contractual rights that apply against the seller of the product.

This warranty does not cover defects caused by

- normal wear and tear
- misuse of the product
- damage to the product.
- Spare parts that are not original MRT parts.
- User errors.
- Changes/corrections without the permission of the manufacturer.
- Defects caused by poor maintenance.
- Failure of daily inspections and maintenance.
- Lubrication failures.

Proof of purchase and the serial number of the product are required. For ease of handling, please have the proof of purchase and the model and serial number of the product ready when contacting. Products may be repaired, replaced or refunded under this warranty at Marttiini Metal oy discretion.

The warranty does not cover consumable parts.

To obtain warranty service, please contact please your closest MRT service/MRT sale representative or Marttiini Metal OY.

For more information visit our website at
www.MRTiltrotator.com

Your MRT attachments serial number:

Date of MRT attachment purchase:

MRT

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