

Operating Manual Voith Retarder 115 CT

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Operating Manual | Voith Retarder 115 CT | Contents

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1. Preface

Anyone who is on the road worldwide transporting passengers or tons of goods is familiar with the demand placed on man and machine. Driving on the highest level!

And anyone who wants to drive safely, economically, environmentally friendly, and also comfortably, greatly appreciates the advantages provided by a Voith Retarder:

Up to 90% of all braking actions can be carried out free of wear with a retarder. Safety takes top priority as the service brakes are protected and are hence fully operational in emergency situations. Immobilization times are reduced and service intervals extended - thus increasing the economic efficiency.

Moreover, Voith Retarders make an important contribution to the environment - they reduce the brake dust emission of a vehicle many times over.

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Operating Manual | Voith Retarder 115 CT | Preface

This Operating Manual contains important information required for the safe, proper and economic operation of the Voith Retarder 115 CT.

Please read the Operating Manual through before embarking on the first drive. You will thus avoid danger to yourself and others.

The term "Retarder" in this Operating Manual stands for the Voith Retarder 115 CT.

Use as a supplementary braking system for commercial vehicles is considered proper and correct use of the retarder.

It is imperative that the intended use and the guidelines for proper and correct usage of the retarder are observed by the persons in charge, especially by the staff involved in operation and servicing. The user is liable for any hazardous situation and damage resulting from improper use.

Observe the safety and warning information and perform the specified maintenance work regularly, in time and using the specified fuels and fluids.

Any further maintenance work which is not described in this Operating Manual may only be performed by trained, qualified staff in accordance with the service manual.

Voith reserves the right for modifications in the form, equipment and technology.

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2. General

2.1 Imprint

For questions and work procedures not described in these documents, contact the respective organization for your area.

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2.2 Copyright

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The same applies to reproduction, revision, disclosure, translation, microfilming and read-in into electronic systems, including databases and online services.

2.3 Symbols and identifications

Structure of safety information

LEVEL OF DANGER

Type and source of danger!

Possible consequences in case of non-observance.

⇒ Measures for the prevention of danger and its consequences.

Classification of safety information

Safety information is classified as follows:

NOTICE

Potentially imminent danger that, if not avoided, could result in minor damage to property.



CAUTION

Potentially imminent danger that, if not avoided, could result in minor or moderate injury.



WARNING

Potentially imminent danger that, if not avoided, could result in death or most serious injury.



DANGER

Imminent danger that, if not avoided, will result in death or most serious injury.

Distinctions

⇒ One-step action instruction.

Product safety

1. First step of an action instruction. Other steps follow and are numbered consecutively.

Notes

Useful additional information for proper handling of the product.

2.4 Product safety

The retarder has been designed and manufactured according to the state of the art in technology and approved safety regulations.

Nevertheless, hazardous situations and property damage may occur as a result of improper use and repair.

- ⇒ Observe safety and warning information.
- ⇒ Keep the Operating Manual together with the vehi-

cle's operating manual in the vehicle.

- ⇒ Replace immediately any incomplete or illegible operating manual.

Precedence has the vehicle's operating manual.

2.5 Staff qualification

- ⇒ Allow only qualified staff to carry out maintenance and repair work.

2.6 Safety-conscious working

Voith does not assume any liability for personal injury and/or damage to property caused by improper and unprofessional work.

- ⇒ Observe the following regulations:
 - Regulations for the prevention of accidents
 - Other generally approved safety

regulations and occupational health

- Motor vehicle regulations
- Safety regulations for handling chemical substances such as oils and greases

We are not capable of warning users about any situation conceivable in which they may suffer injuries and/or cause damages to property.

2.7 Environmental protection

- ⇒ Dispose of drained fuels and fluids, consumables and old parts properly.

2.8 Diagnosis and troubleshooting

Voith assumes warranty or provides a goodwill settlement for defective parts only.

- ⇒ Do not replace parts on mere speculation.

2.9 Product care

Danger of burns by hot parts!

Components of the retarder may be hot.

- ⇒ Work carefully.
- ⇒ Wear safety gloves or use cloth.

Danger of burns and scalding by splashing oil!

The oil in the retarder may be hot.

- ⇒ Work carefully.
- ⇒ Wear safety gloves or use cloth.

Basic driving modes

Danger of burns and scalding by hot coolant

The coolant may be hot.

- ⇒ Work carefully.
- ⇒ Wear safety gloves or use cloth.

Damage to property due to soiled parts!

Considerable damage or malfunctions may occur due to soiling.

- ⇒ Always pay attention to cleanliness.

Damage to property due to improper cleaning!

- ⇒ Do not aim the jet of a high-pressure cleaner (steam-jet cleaner) at valves, sensors or the ventilations of the retarder.

2.10 Basic driving modes

- ⇒ Check the following to ensure that the retarder is

fully functional for all vehicle maneuvers, i.e.:

- Retarder pilot light (if existing) is checked for proper function
- Retarder is properly filled with oil
- Retarder electronics is connected and functional
- Pneumatic control is connected and functional
- Retarder is connected to the vehicle's cooling circuit

CAUTION

Unsafe road conditions (glaze ice, snow, gravel, risk of aquaplaning, etc.)!

An uncontrollable operating state of the vehicle could result.

- ⇒ Operate the retarder carefully and gradually only.
- ⇒ In an extreme case, do not activate the retarder.

For vehicles without ABS system and in case of unsafe road conditions:

- ⇒ Turn the retarder main switch to "OFF" position (if existing - see the vehicles's operating manual).

For vehicles with pedal and in case of unsafe road conditions:

- ⇒ Turn the retarder main switch or the switch for the pedal to "OFF" position (if existing - see the vehicle's operating manual), Page 25.

For vehicles in idle mode or vehicles without body (e.g. for transfer drives)

- ⇒ Operate the retarder carefully only!

Towing

- ⇒ Check the following to ensure that the retarder is fully functional for all vehicle maneuvers (see Page 12).
- ⇒ Tow the vehicle with the retarder rotating for max. 100 km at max. 40 km/h.

- ⇒ Recommended by Voith: Remove the prop shaft.
- ⇒ Do not operate the retarder.

Parking

- ⇒ Do **not** use the retarder as a parking brake, as it does not have any braking effect when the vehicle stands still.

Warranty**Failure or performance reduction while driving**

In case the retarder fails, or while temperature adaptation is active:

- ⇒ Adjust the speed of the vehicle with the engine/service brake.
- ⇒ Engage the lowest possible gear in order to achieve a high engine speed.
- ⇒ During a temperature adaptation continue driving until the retarder is again available with full power.

Complaint/Fault

In case of complaint/fault in the retarder operation, e.g. insufficient braking effect, oil loss, the retarder pilot light indicates faults:

- ⇒ Consult a qualified workshop.

2.11 Warranty

Voith does not assume any liability for damages caused by changes to the retarder, or the use of oils, lubricants, spare parts, accessories, attachments and special equipment not tested and approved by Voith.

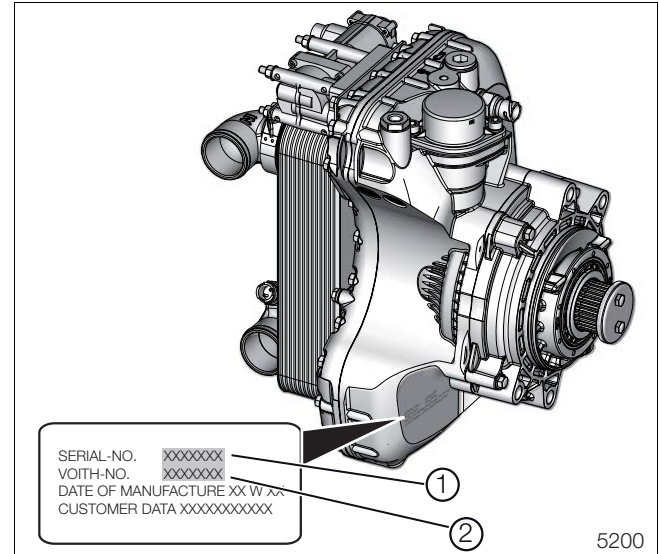
- ⇒ Use only parts and operating media approved by Voith to ensure the safety of the vehicle and functioning of the retarder.
- ⇒ Use only oils and lubricants approved by Voith to ensure the safety of the vehicle and functioning of the retarder.

2.12 Retarder identification

In case of questions or for ordering spare parts, please indicate the following data (marked in gray) which are shown on the nameplate:

Item No.	Designation
----------	-------------

- | | |
|---|-------------------------------|
| 1 | SERIAL NO. |
| 2 | VOITH NO. (Voith Article No.) |

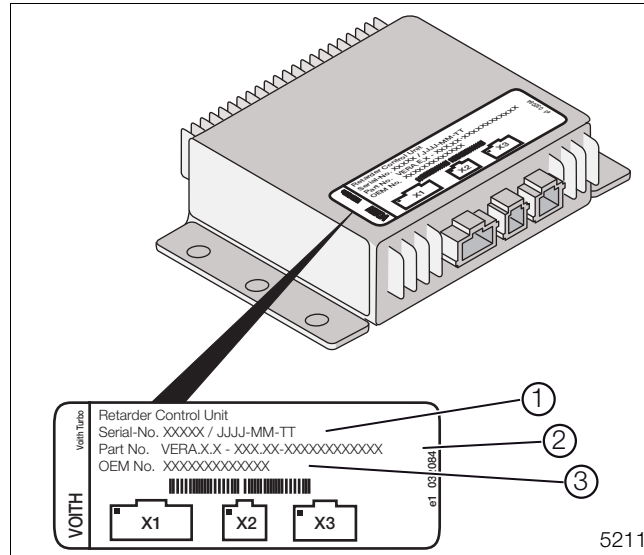


Controller identification

2.13 Controller identification

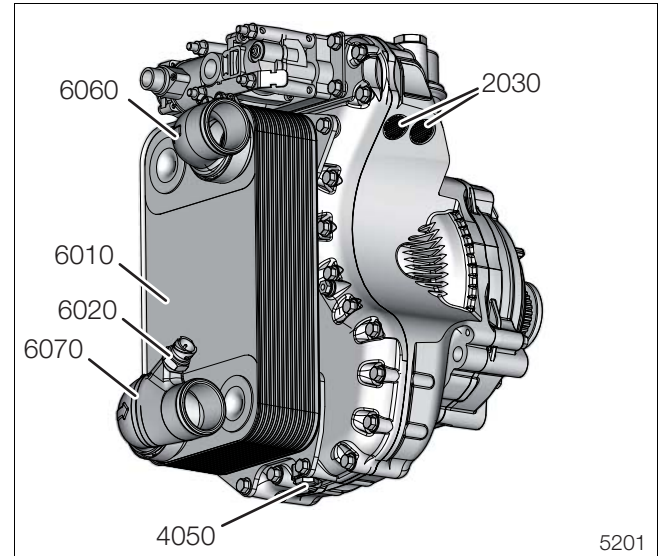
In case of questions or for ordering spare parts, please indicate the following data shown on the nameplate (illustration serves as an example):

Item No.	Designation
1	Serial number
2	Voith Article (Part) No.
3	OEM No. (if available)



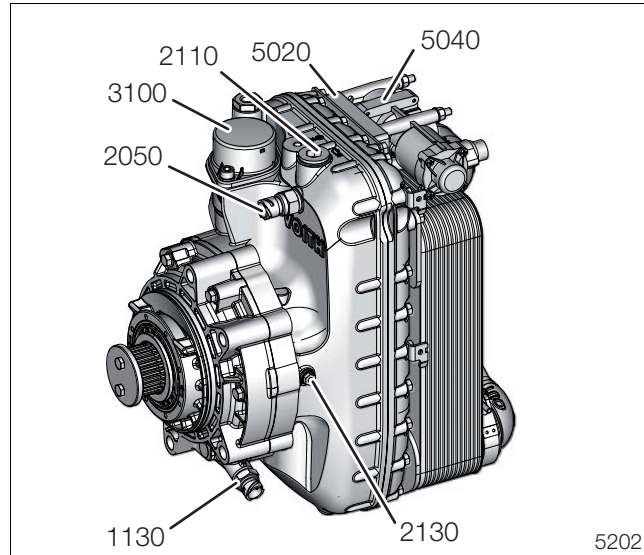
2.14 Overview of the Assemblies Voith Retarder 115 CT

Item No.	Designation
2030	Retarder ventilation
4050	Oil drain plug
6010	Heat exchanger
6020	Coolant temperature sensor
6060	Water neck (inlet)
6070	Water neck (outlet)



Overview of the Assemblies Voith Retarder 115 CT

Item No.	Designation
1130	Oil temperature sensor
2050	Pressure sensor
2110	Oil filler plug/ Test connection for constant-air pressure p_y
2130	Test connection for dynamic pressure p_{dyn}
3100	Oil separator assembly
5020	Damping plate
5040	Proportional valve



2.15 General functional description

Depending on the vehicle, the retarder can be actuated via a stage switch, the brake pedal or other systems in the vehicle (for instance the active cruise control). Compressed air taken from the air reservoir for accessories, serves as control medium.

The pressure necessary for the required braking torque to the oil sump of the retarder is controlled via a proportional valve. This causes that a certain amount of oil is pressed into the working chamber of the retarder between rotor and stator dependent on the vehicle speed.

The rotor is connected to the prop shaft of the vehicle, the stator fixed with the retarder housing.

The oil is accelerated by the rotary movement of the rotor and circulates in the closed circuit between rotor and stator. The energy required for accelerating the operating medium is taken from the vehicle's kinetic energy and has therefore a braking effect.

The kinetic energy generated during retarder braking actions is converted into heat. In order to dissipate this heat, a part of operating medium being in the working chamber is pumped through the heat exchanger by the rotor and then returned into the circuit.


In the heat exchanger, the heat of the operating medium is dissipated to the vehicle's coolant and emitted through the vehicle's cooling circuit.

The coolant and oil temperatures are monitored by one temperature sensor each. Such information is passed on to the controller. This ensures that the maximal permissible temperatures for coolants and oils are not exceeded.

3. Operation

3.1 General information

The retarder is activated by the retarder stage switch or by the foot pedal. Before activating the retarder, the accelerator pedal has to be released.



CAUTION

In order to increase the braking torque:

- ⇒ Operate the retarder stage switch stage-by-stage only (do not just "skip the gears")!

In an emergency situation it is permitted to "skip gears" when operating the retarder stage switch.

To reduce the set braking torque, it is possible to skip several stages at one time with the retarder stage switch.

i

In case of very low operating temperatures, the braking effect of the first retarder braking after starting to drive sets in with a delay.

For "constant speed" function and braking with the retarder stage switch:

- For vehicles with idling switch, the "constant speed" function (see Page 23) or the active brake stage is cleared on application of the gas pedal. After releasing the accelerator pedal, the new current "constant speed" is stored or the previously applied braking stage is reactivated.
- On activation of ABS, the "constant speed" function (see Page 23) or the active braking stage is cleared. After deactivating ABS, the new current "constant speed" is stored or the previously applied braking stage is reactivated.
- The "constant speed" function is cleared on application of the foot pedal (brake pedal). After the foot pedal (brake pedal) is released, the new current "constant speed" is stored.



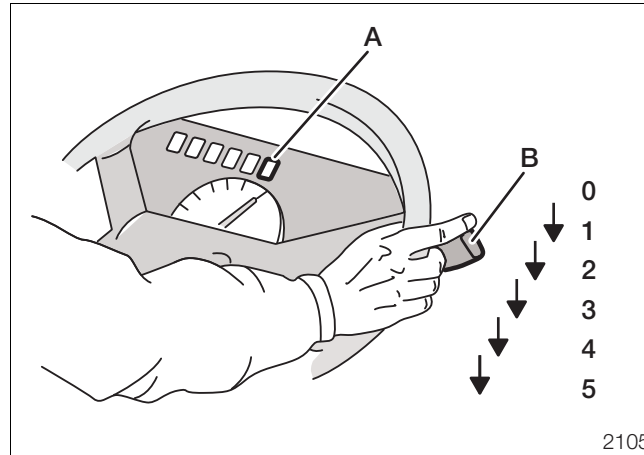
Further vehicle-specific versions are possible.

⇒ Please observe the vehicle's operating manual.

Retarder Stage Switch (Voith standard)

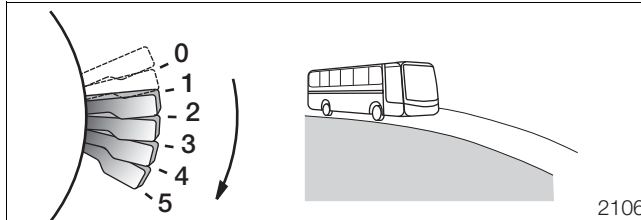
3.2 Retarder Stage Switch (Voith standard)

Lever position	Function
A	Retarder pilot light (installation point vehicle-specific)
B	Retarder stage switch (installation point vehicle-specific)
0	Retarder OFF
1	"Constant speed" function when driving downhill (see Page 23)
2	Braking stage 1 (25 % braking power)
3	Braking stage 2 (50 % braking power)
4	Braking stage 3 (75 % braking power)
5	Braking stage 4 (100 % braking power)



Further vehicle-specific versions are possible.
 ⇒ Please observe the vehicle's operating manual.

3.3 Function "constant speed" when driving downhill (Voith standard)



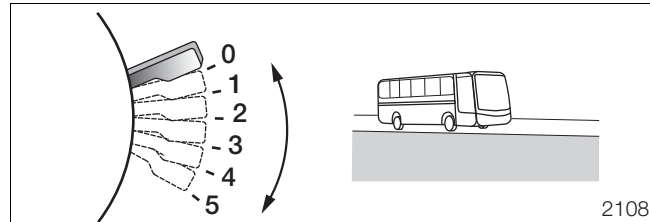
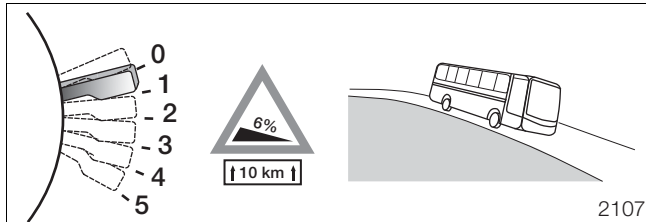
1. Adapt the speed with the braking stages in lever position 2 - 5.



For longer downhill stretches to increase the engine speed (> 1500 rpm), **shift back**, if appropriate, so that the vehicle's cooling output and thus the retarder availability are utilized optimally.

For automatic transmissions, downshifting is usually carried automatically, but not in manual mode.

Function "constant speed" when driving downhill (Voith standard)



2. At the desired speed, switch on the "constant speed" function in lever position 1 of retarder stage switch:

The retarder maintains the vehicle constantly at this speed within the limits of the maximum braking torque.

3. When leaving the lever position 1 "constant speed", automatic control is cleared immediately. Switch off the retarder or adjust your speed to the traffic situation by means of a braking stage.



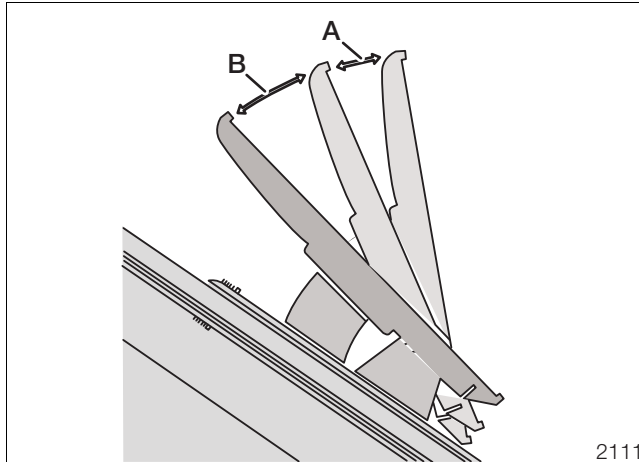
Further vehicle-specific versions are possible.
⇒ Please observe the vehicle's operating manual.

CAUTION

If the vehicle becomes faster in spite of "constant speed" function, the service brake has to be actuated in addition. The braking effect will not be increased when switching to the next braking stage.

3.4 Foot operation (Voith Standard)

Item No.	Designation
A	Retarder
B	Retarder and service brake



The retarder is operated via the foot pedal of the service brake.

The "Pedal actuation ON-OFF" switch is located in the dashboard.

- ON: Retarder is ready-to-operate
 - OFF: Retarder is switched off (e.g. in case of unsafe road conditions).
- ⇒ At simultaneous manual and foot actuation, the higher braking torque is activated. In case of very low operating temperatures, the braking effect of the first retarder braking sets in with a delay. The "constant speed" function cannot be selected via the foot pedal.

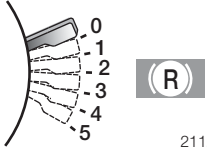
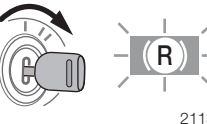
Foot operation (Voith Standard)

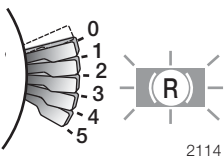
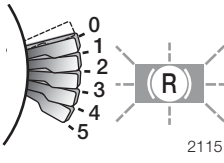
Further vehicle-specific versions are possible.

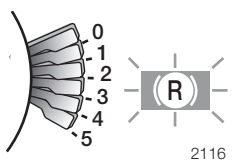
⇒ Please observe the vehicle's operating manual.

3.5 Retarder pilot light (Voith standard)

Symbol for retarder pilot light may deviate dependent on the vehicle type.

	Status	Cause / reason	Further information
	OFF		<p>Retarder not operated.</p> <p>The five-stage version is shown. Other vehicle-specific versions are possible.</p>
	Permanent light	Ignition ON Lamp test	<p>Retarder pilot light is permanently on for 5 seconds after turning the ignition on. There is an error if the pilot light does not go out after the lamp test (see Page 29).</p> <p>⇒ Consult a qualified workshop immediately!</p> <p>If the retarder pilot light does not light up during the lamp test, the lamp does not function properly.</p> <p>⇒ Consult a qualified workshop immediately!</p>

 <p>2114</p>	<p>Permanent light</p>	<p>Ignition ON and lever positions 1 to 5</p> <p>Retarder mode</p>	<p>Retarder actuation</p> <p>Lever position 1: "Constant speed" function.</p> <p>If the retarder pilot light does not light up in retarder mode, the lamp does not function properly.</p> <p>⇒ Consult a qualified workshop immediately!</p>
 <p>2115</p>	<p>Flashing light</p>	<p>Ignition ON and lever positions 1 to 5</p> <p>Temperature adaptation</p>	<p>The limit temperature for coolant and/or oil was exceeded. The retarder braking torque is reduced!</p> <p>Slow down the vehicle speed by means of the service brake and reach the maximum permissible engine speed by shifting the transmission down.</p> <p>⇒ Continue driving until the retarder is again available with full power.</p> <p>When the lamp does not function properly, a beginning temperature adaptation cannot be indicated to the driver.</p> <p>⇒ Consult a qualified workshop immediately!</p>

	<p>Permanent light</p>	<p>Ignition ON and lever position 0 to 5</p> <p>Fault message</p>	<p>Minor fault: Retarder braking actions are possible, partly with reduced braking torque.</p> <p>⇒ Consult a qualified workshop immediately!</p> <p>Severe fault: Retarder braking actions are no longer possible. Retarder is switched off.</p> <p>⇒ Continue driving with reduced speed only! ⇒ Use the service brake to adapt the vehicle speed! ⇒ Consult a qualified workshop immediately!</p> <p>If the lamp does not function properly, a suddenly occurring fault in the retarder electronics cannot be indicated to the driver.</p> <p>⇒ Consult a qualified workshop immediately!</p>
-----------------------------------------------------------------------------------	------------------------	----------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Operation

3.6 Operation

By driving or operating the retarder properly, you can use the vehicle's cooling performance and thus the retarder availability optimally.

How?

When braking with the retarder by downshifting the gear (1), reach the max. permissible engine speed (2) and actuate the retarder stage-by-stage (3).

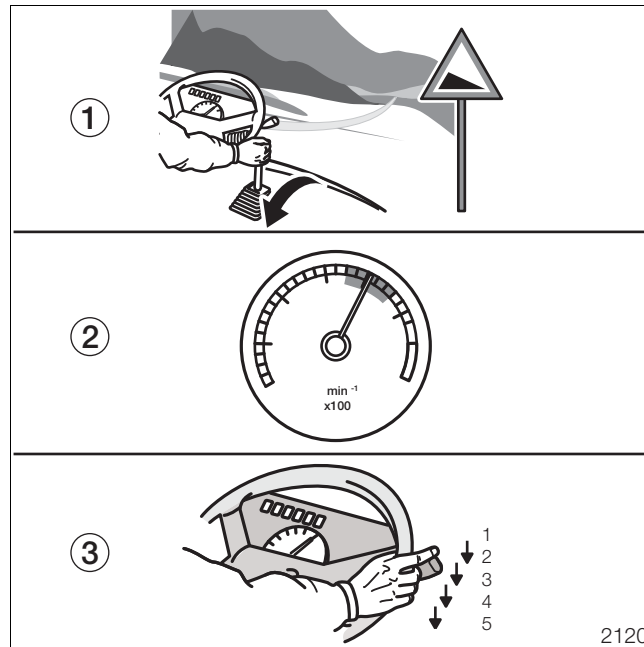
Resulting in:

- High delivery rate of the water pump
- High speed of the fan for heat dissipation

Outcome:

- The performance of the vehicle's cooling circuit can be used optimally.

The fuel consumption is not influenced by the high engine speed as the fuel injection system is at zero delivery in overrun mode.



2120

4. Maintenance and Service

4.1 Other applicable documents

Document	Information	Voith Article (Part) No.
Voith Retarder oil change intervals/oil selection list	Oil change intervals and approved oil types	153.004557xx
Coolant quality list	Approved coolants	H67.2224xx

4.2 Maintenance intervals

Request the oil selection list from Voith or download it from www.voith.com.

The maintenance intervals depend on the stress put on the retarder and the oil type used.

NOTICE

Exceeding the maintenance intervals/wrong type of oil!

Damage to/failure of the retarder.

- ⇒ Observe the maintenance intervals.
- ⇒ Use only approved oils.

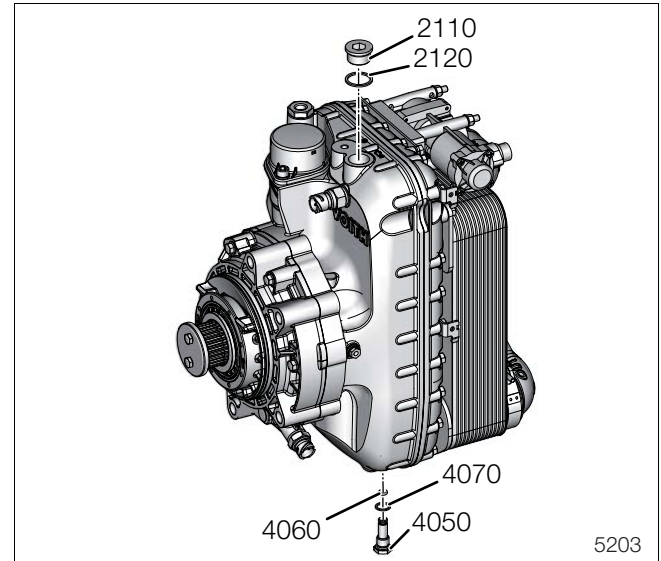
Activity	Interval	See
Changing the oil	<ul style="list-style-type: none"> ⇒ Observe the vehicle manufacturer's instructions. ⇒ If nothing is mentioned: Observe the Voith Retarder oil change intervals/oil specification list. 	Page 33
Checking the oil level	–	Page 39
Draining the coolant	⇒ Observe the vehicle manufacturer's instructions.	–

4.3 Oil change

⇒ Apply silicone-free and non-corrosive grease to sealing rings and O-rings before installation.

Item No. Designation

- | | |
|------|--------------------------------------------------------------------|
| 2110 | Screw plug M 30 x 1,5;
hexagon socket head, w.a.f. 17; 130 Nm |
| 2120 | Sealing ring A 30 x 36; to be replaced |
| 4050 | Oil drain plug M 16 x 1,5;
hexagon insert bit, w.a.f. 21; 30 Nm |
| 4060 | O-ring 7 x 2,5; to be replaced |
| 4070 | Sealing ring A 16 x 20; to be replaced |



Oil filling quantity

Service filling (oil level check, oil change) 6.4 l

Oil change**Maintenance work to be performed whenever the oil is changed**

- ⇒ Visual inspection of retarder for leaks before and after the oil change.

Additional maintenance work to be performed every other time the oil is changed

- ⇒ Replace the oil separator on the oil separator assembly (see Page 45ff).

Preconditions

- Vehicle in horizontal position
- Oil at operating temperature (>60°C)
- Retarder is switched off
- Ignition is switched off

Draining the oil

1. Put an oil pan under the retarder.

 **WARNING****Hot oil coming out!**

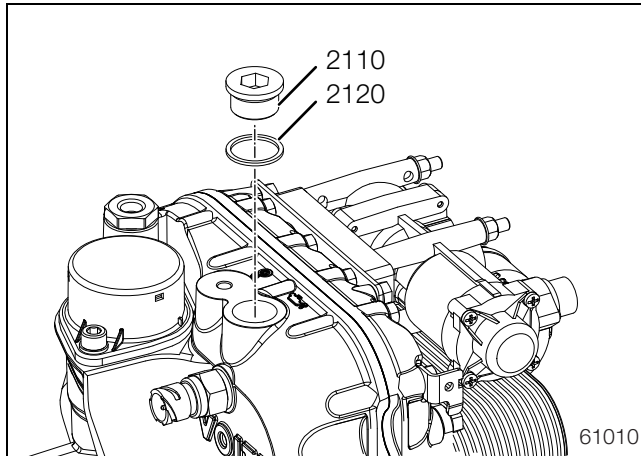
Face and hands could be burned.

- ⇒ Ensure that the retarder and the ignition are switched off.

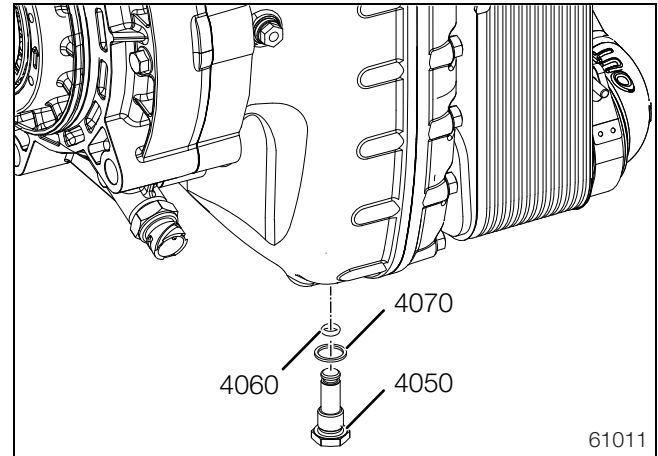
 **CAUTION****Hot screw plugs!**

Hands could be burned.

- ⇒ Work carefully.
⇒ Wear safety gloves or use cloth.



2. Screw out the screw plug (2110) with the sealing ring (2120).



3. Unscrew the oil drain plug (4050) with sealing ring (4070) and O-ring (4060).
4. Drain the oil into the oil pan and analyze the oil.

Oil change



If there is water in the oil (emulsion):

⇒ Please contact Voith.

If there are particles (shavings) in the oil:

⇒ Please contact Voith.

5. Apply silicone-free and non-corrosive grease to the new O-ring (4060) and pull it onto the screw plug (4050).
6. Apply silicone-free and non-corrosive grease to the new sealing ring (4070).
7. Screw in the oil drain plug (4050) with sealing ring (4070) and tighten to 30 Nm.

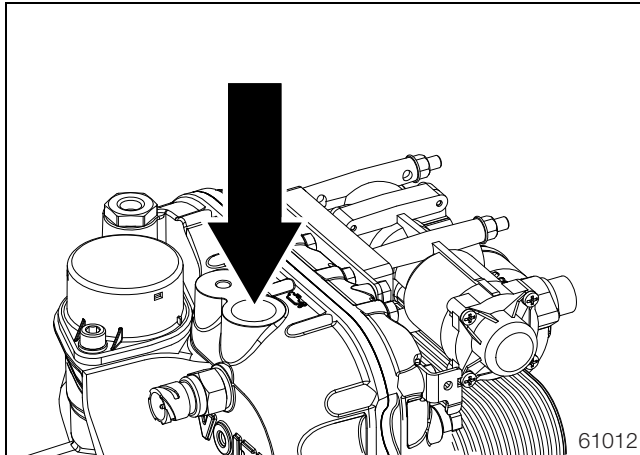
Filling with oil

NOTICE

Wrong oil type!

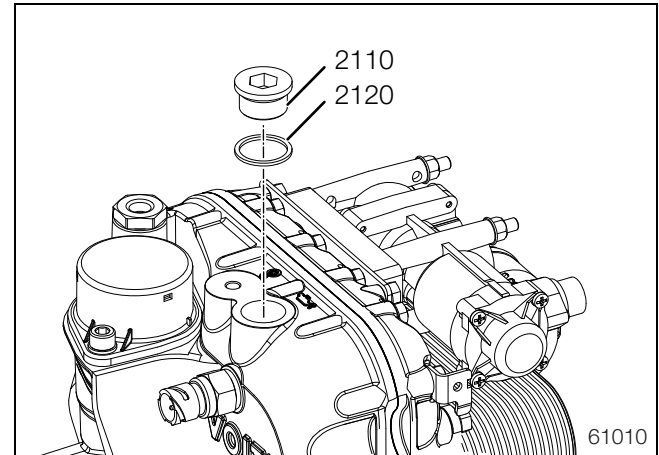
Damage to/failure of the retarder.

⇒ Fill in only approved oil (see Voith retarder oil change intervals/oil selection list).



1. **Slowly** fill in 4.0 l oil (> 2 minutes) through the borehole in the screw plug (2110) (see arrow in the illustration).
Ensure that the retarder can deaerate through the borehole.
2. Wait for about 2 minutes.

3. **Slowly** fill in 2.4 l oil (> 2 minutes) through the borehole in the screw plug (2110) (see arrow in the illustration).
Ensure that the retarder can deaerate through the borehole.



4. Apply silicone-free and non-corrosive grease to the new sealing ring (2120).

Oil change

5. Screw in the screw plug (2110) with sealing ring (2120) and tighten to 130 Nm.

Deaerating the retarder**NOTICE****Air mixes with the oil!**

Oil loss through retarder ventilation.

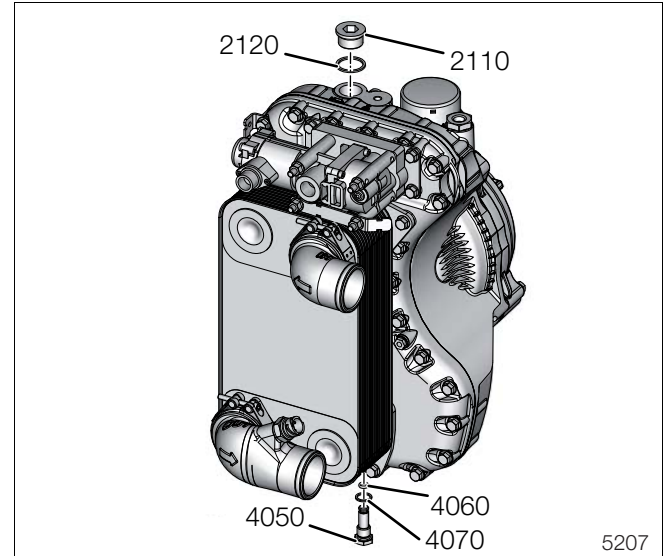
⇒ Deaerate the retarder.

1. If existing and the situation allows: Switch off the pedal control.
2. Move the vehicle with 50 km/h.
3. Activate the retarder in the first braking stage 5 times for 5 s each.

4.4 Checking the oil level

⇒ Apply silicone-free and non-corrosive grease to sealing rings and O-rings before installation.

Item No.	Designation
2110	Screw plug M 30 x 1,5; hexagon socket head, w.a.f. 17; 130 Nm
2120	Sealing ring A 30 x 36; to be replaced
4050	Oil drain plug M 16 x 1,5; hexagon insert bit, w.a.f. 21; 30 Nm
4060	O-ring 7 x 2,5; to be replaced
4070	Sealing ring A 16 x 20; to be replaced



Checking the oil level

Oil filling quantity

Service filling (oil level check, oil change) 6.4 l

Preconditions

- Vehicle in horizontal position
- Oil at operating temperature (>60°C)
- Retarder is switched off
- Ignition is switched off

Draining the oil

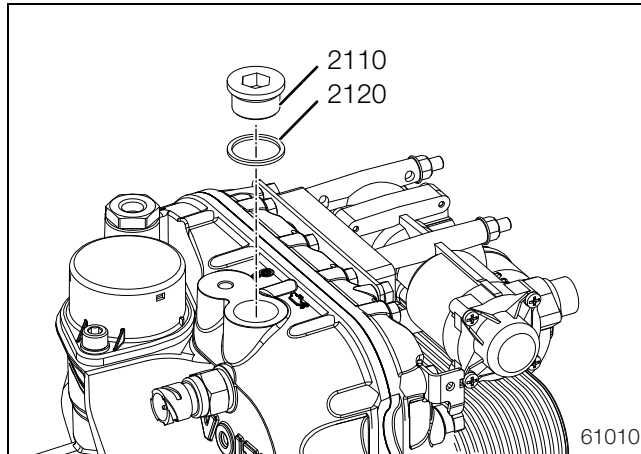
1. Put an oil pan under the retarder.

! CAUTION

Hot screw plugs!

Hands could be burned.

- ⇒ Work carefully.
- ⇒ Wear safety gloves or use cloth.



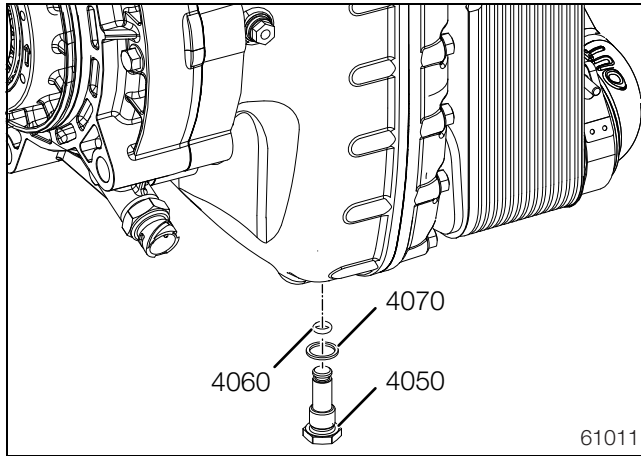
! WARNING

Hot oil coming out!

Face and hands could be burned.

- ⇒ Ensure that the retarder and the ignition are switched off.

2. Screw out the screw plug (2110) with the sealing ring (2120).



3. Unscrew the screw plug (4050) with sealing ring (4070) and O-ring (4060).
4. Drain the oil into an oil pan.

5. Apply silicone-free and non-corrosive grease to the new O-ring (4060) and pull it onto the screw plug (4050).
6. Apply silicone-free and non-corrosive grease to the new sealing ring (4070).
7. Screw in the screw plug (4050) with sealing ring (4070) and tighten to 30 Nm.

Checking the oil level**Measuring the volume**

If the retarder oil level is too low:

- ⇒ Check the retarder for leaks.
- ⇒ If necessary, contact Voith.

If the retarder oil level is too high and the transmission oil level is too low:

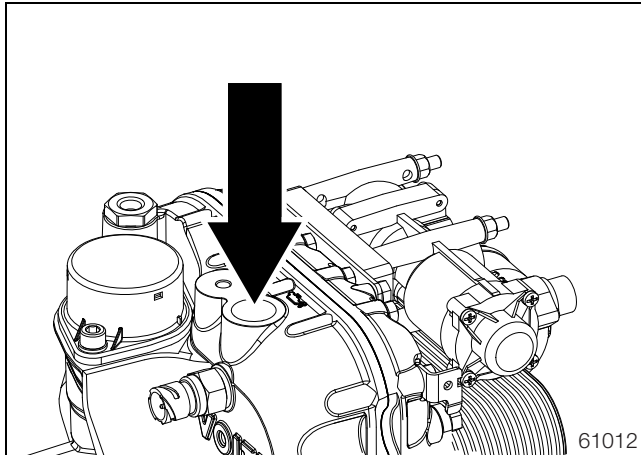
- ⇒ Check transmission ventilation and repair/clean, if necessary (see the vehicle manufacturer's instructions).

1. Measure the volume of the drained oil.
 - Residual oil is more than 3 l: analyze the oil
When oil is clean: top up with oil (see Page 36)
If dirt, particles or water are in the oil: please con-

tact Voith

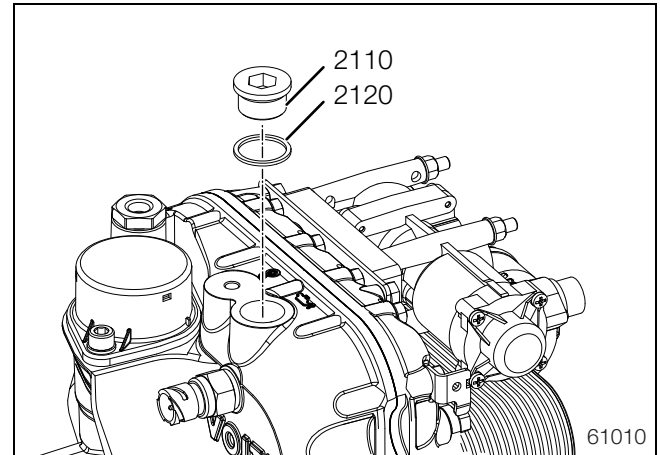
- Residual oil is less than 3 l: please contact Voith

Filling with oil



1. **Slowly** fill in 4.0 l oil (> 2 minutes) through the borehole in the screw plug (2110) (see arrow in the illustration).
Ensure that the retarder can deaerate through the borehole.
2. Wait for about 2 minutes.

3. **Slowly** fill in 2.4 l oil (> 2 minutes) through the borehole in the screw plug (2110) (see arrow in the illustration).
Ensure that the retarder can deaerate through the borehole.



4. Apply silicone-free and non-corrosive grease to the new sealing ring (2120).

Checking the oil level

5. Screw in the screw plug (2110) with sealing ring (2120) and tighten to 130 Nm.

Deaerating the retarder**NOTICE****Air mixes with the oil!**

Oil loss through retarder ventilation.

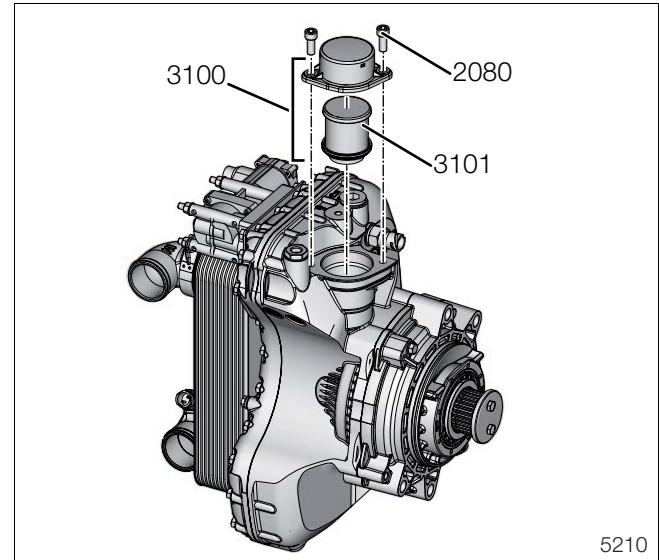
⇒ Deaerate the retarder.

1. If existing and the situation allows: Switch off the pedal control.
2. Move the vehicle with 50 km/h.
3. Activate the retarder in the first braking stage 5 times for 5 s each.

4.5 Oil separator assembly

Item No.	Designation
----------	-------------

2080	Socket head screw M 10 x 20; hexagon socket head, w.a.f. 8; 46 Nm
3100	Oil separator assembly
3101	Oil separator



Oil separator assembly**Preconditions**

- Retarder is switched off
- Ignition is switched off

 **CAUTION****Hot screw plugs!**

Hands could be burned.

- ⇒ Work carefully.
- ⇒ Wear safety gloves or use cloth.

5. Data Sheet

Max. possible braking torque at prop shaft $M_{(Br) \max.}$ (dependent on ratio i)	approx. 3200 Nm
Operating medium	see Page 32
Control medium	Compressed air
Supply-air pressure	6 to 11 bar
Aggregate weight (including flange and heat exchanger, but no operating medium), weight can deviate dependent on the attachment version	approx. 50 kg

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