



# ČZ MOTORCYCLE CHAINS

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Assembly, disassembly and maintenance

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## CONTENT

1	Safe disassembly of the chain.....	3
1.1	Indicators of worn chain.....	3
1.2	Disassembly of the chain connection link.....	5
1.2.1	The Clip V type connection link.....	5
1.2.2	The Clip P type connection link .....	6
1.2.3	The Rivet type connection link.....	6
2	Assembly of new chain .....	7
2.1	How to proceed in installation of the chain .....	7
2.2	General principles for installation of the chain transmission .....	8
2.3	Options for linking of the ČZ chains.....	10
2.3.1	Chain closing with the Clip V type connection link.....	10
2.3.2	Chain closing with the Clip P type connection link .....	11
2.3.3	Chain closing with the Rivet type connecting link.....	12
2.4	Shortening of the chain.....	13
3	Maintenance and treatment of the chain.....	15
3.1	Cleaning of motorcycle chain .....	15
3.1.1	Cleaning of non-sealed ČZ chain.....	15
3.1.2	Cleaning of sealed ČZ chain.....	16
3.2	Lubrication – in general.....	17
3.2.1	Lubrication of non-sealed ČZ chain.....	18
3.2.2	Lubrication of sealed ČZ chain.....	18
4	Installation tools for ČZ chains.....	19
4.1	VZR 2.....	19
4.2	VZR 6.....	20



## 1 Safe disassembly of the chain

A motorcycle contains several components important for safety. Incorrect, inconsistent, or unprofessional assembly may cause not only breach and damage of the motorcycle but injury of the driver as well. One of these components is the chain that drives the rear wheel of the motorcycle.

All manufacturers pay attention to the chain maintenance in use in their motorcycle owner manuals, but the safe procedure for disassembly and assembly of the chain is specified almost nowhere. It does not matter whether the motorcycle user or an authorized service assemble the chain. Assembly knowledge, tools required, and some manual skills are always needed.

Various connecting link types are used in modern motorcycles. The assembly procedure must be followed for to work everything smoothly and safely. The chain manufacturer describes the assembly procedure for each closing type.

### 1.1 Indicators of worn chain

- the chain tensioning mechanism of the rear wheel is at the end of adjustment range
- the chain is noisy and operates restlessly
- there are cracks on the rolls or plates
- brick-coloured environment appears around some chain joints that represent seizing of the material
- some chain components are missing – roller, sealing ring
- the plates on the circumference are worn too much from the chain guides
- inspection gauge (if available) shows end of life
- the chain is too rusty



**Figure 1: Excessively worn inner and outer plates**



**Figure 2: Rusty chain ought to be replaced as soon as possible. There is a high risk of chain destruction with possible impacts on owner's safety.**



**Figure 3: Checking the chain wear level by the inspection tool**

The chain needs to be replaced if you find one or more defects listed above. Excessively worn chain poses a risk of sudden failure resulting in damage to the motorcycle or health. Replacement in time should be considered.

## 1.2 Disassembly of the chain connection link

ČZ offers three types of connection links to its customers. Each type differs from the other by its construction and dis/assembly procedure.

### Type V a type P



### Type RIVET



Figure 4: Connecting links usable for CZ chains

TYPE CLIP V	TYPE CLIP P	TYPE RIVET
415 S	428 OR	520 DZO
415 HT	428 MX	520 DZX
086	520 MX	520 SDZZ
420 S	520 EC	525 DZO
420 MX	520 ORM	525 DZX
428 S	520 RDO	525 SDZZ
520 M	520 ORH	530 DZO
	520 ORMX	530 DZX
		530 SDZZ

Table 1: Connecting links and their usage with associated motorcycle chain models

### 1.2.1 The Clip V type connection link

Use pliers to remove the spring and disassemble the connecting link by hand.

### 1.2.2 The Clip P type connection link

Use pliers to remove the spring, disassemble by tapping on the free pin ends to release the closing plate, and remove the connecting link from the chain. The VZR 6 tool may be used as well.

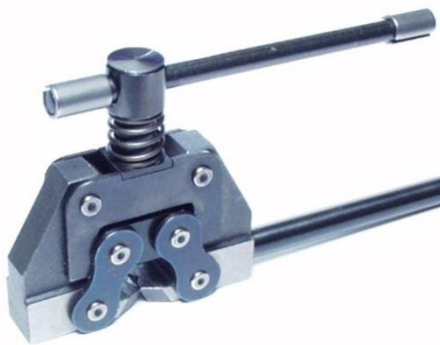
### 1.2.3 The Rivet type connection link

Disassembly is more demanding for the permanent connecting link (no connecting link with the spring is used but Rivet type link is used). The chain must be disassembled using the tool that forcibly presses out the riveted pin out of the outer plate. For the ČZ chains use the genuine tool type VZR 2 or VZR 6. The disassembly may be performed no matter where on the chain and no original connection point must be looked for.

Use the VZR 2 tool only when the disassembled chain is to be discarded. The VZR 2 tool may result in shifting of the bushes in the inner plate during pushing the pin out, i.e. in undesirable change to the chain size.

Various types of the destruction methods for disassembly of the chain are used in practice than those specified above, but they are not recommended at all due to potential damage of other components of the motorcycle. Use the recommended disassembly tool only.

**Type VZR 2**



**Type VZR 6**



**Figure 5: Original assembly/disassembly tools usable for ČZ motorcycle chains**



## 2 Assembly of new chain

Before proceeding to the assembly of the new chain, it is desirable and necessary for safe operation to check the technical condition of the components in contact with the chain such as sprocket wheels and various guides. These components as well as the chain must always be in perfect technical condition. For the motocross motorcycles or hard enduro type the components that come into contact with the chain and the chain itself must be replaced depending on their wear status. Due to specific environment where the motorcycles are used no replacement rule may be defined.

For the on-road and touring enduro motorcycles the decision about replacement of the chain and related components is easier. In case of the chain end life, the chain wheels are likely at their life end as well, and replacement is necessary including the guides.

Saving money on replacement of the chain wheels is not worth of it because worn sprocket wheels often reduce lifecycle of the new chain, and driving is restless. Worn guides also reduce durability of the chain because the worn grooves produce prongs that may either damage or destroy the sealing rings of the chain. Again, worn guides cause restless chain movement and drive. Considering the proportion of the chain price to the other components, replacement of all components with the new one is recommended.

### 2.1 How to proceed in installation of the chain

Following removal of the old chain and optional replacement of the other components associated with the chain you can proceed to installation of the chain.

Put the chain on the chain wheels so that the free chain ends are located in the biggest manipulation space on the motorcycle for the connection. For easier work, place the motorcycle so that the rear wheel is freely rotatable. The rear wheel axis must be released from the last adjusted position of the tensioning mechanism because the new chain is shorter than the demounted one, and connection of the new chain would not be feasible.





**Figure 6: To measure the chain length and to assemble the connection link, it is advisable to put the chain ends on the chain wheel.**

## **2.2 General principles for installation of the chain transmission**

As already mentioned, the chain transmission consists of the chain, chain wheels, and the chain guides. These components form a functional unit on which accuracy and correct adjustment is the final chain lifecycle and traffic safety depending. Make sure the transmission components in contact with the chain are aligned properly and cause no chain misalignment.

**The chain** slack of the free branch must be adjusted exactly according to the motorcycle manufacturer's values.

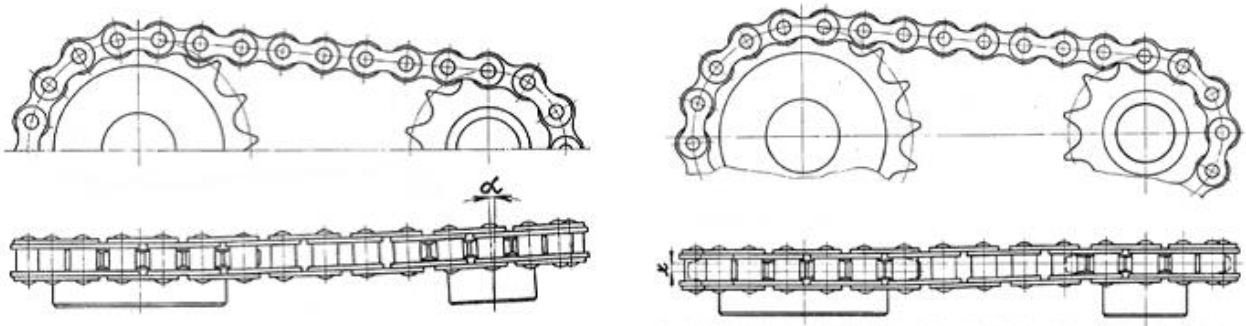
Precise adjustment is very important for some motorcycle types. Do never use slack lower than specified by the manufacturer for the new chain with the assumption the chain "will sit" after a few kilometres. This adjustment will cause excessive wear of the pin and bush contact surfaces, and reduction of the chain durability. Make sure the chain does not hit any obstacle on the motorcycle in use. Frequent and repeating impacts (seemingly negligible) reduce the dynamic strength of the chain and increase noise.

**The sprocket wheels** transfer the required power on the chain and are in direct contact with it. The chain link pitch and the chain wheel teeth pitch must coincide. Otherwise, excessive wear and tear occurs. This happens when worn chain wheels are combined with new chain, or vice versa. Check the condition of the chain and the chain wheels. Proper teeth width and proper axial alignment are important also for the chain wheels. The alignment should be checked in any change of the chain wheel to find out any potential incorrect setting during the



installation. The alignment also strongly influences the symmetrical rear wheel axis adjustment in the swing arm and therefore, you must make the adjustment with great care. If the chain not sit on the chain wheel teeth correctly when turning, the chain wheel teeth sides and the inner sides of the chain plates will be worn.

**The chain guides** are used for navigation and soothing of the chain in use. They must be in good technical condition as well. Worn guides may cause damage to the sealing rings and restless operation of the transmission.



**Figure 7:** For proper and long-term operation of the chain it is necessary so that the chain wheels are aligned and NOT installed as shown on left.



**Figure 8:** It is not permitted to install worn and damaged teeth of the chain wheel together with the new chain.



**Figure 10:** The chain was operated without regular lubrication, and the material seizure products of rusty colour have “powdered” on the chain wheel and engine. The chain damaged in this way had to be replaced long time ago.

## 2.3 Options for linking of the ČZ chains

### 2.3.1 Chain closing with the Clip V type connection link

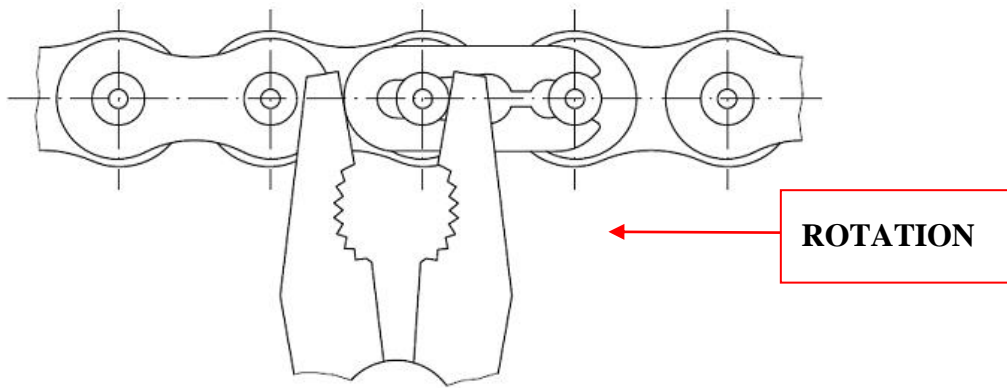
The Clip V type connecting link has been designed by ČZ only for the chains of non-sealed basic version as shown in the table. The main feature of the connection link is the closing plate with the holes that permit putting the plate on the pins freely without any force.

**Assembly procedure:** Slide in the connecting link into the holes of both free ends of the chain. The best way is sliding in from the wheel towards you. Spring assembly is then freely accessible and in use the connection can be then visually checked during common chain maintenance. Proceed with care when sliding the pins in the holes to avoid removal of the lubricant located in the bushes of the free ends of the chain. Over spraying with a spray lubricant is possible. The less lubricant remains in the joint the shorter lifecycle would be.

When the connecting link is slid, put the closing plate to the free ends of the chain and hand press as furthest as possible until the grooves in the pins for safety spring are seen. Then assemble the elastic safety spring into the pin grooves.

**IMPORTANT:** Following the assembly always check carefully perfect condition of the link, whether the spring sunk completely into the grooves, and whether the link is connected in correct direction of the chain movement. Then when in use, the best during regular chain lubrication check the connecting link.

The spring must always be perfectly snapped into the grooves of the pins, and the closed part of the spring must face in the direction of the chain movement.



**Figure 10: The assembly of Type V/P connection links**

### 2.3.2 Chain closing with the Clip P type connection link

The use of Clip P type connection link provides demountable but strong connection that is important for the sealed chains. This connection link prevents from the lubricant leak from the link in use. Another positive property of the Clip P type connection link is improved dynamic strength. For this reason is used for racing version of the non-sealed chains. The described properties are brought by the closing plate where the pins must be pressed slightly but not by hand as with the Clip V type. This closing requires manual skills and tools need to be used.

**Assembly procedure:** Lubricate properly the holes of the chain end bushes before assembly. Use a part of the grease in the attached sachet to lubricate (if available for the chain type) and apply the lubricant to the bushes holes using a thin object. Alternatively, quality commercial Vaseline for high pressures may be used.

During assembly of the sealed chain, put one of the sealing rings to each pin of the connecting link and lubricate well with the attached lubricant (or Vaseline). Only thereafter, slide in the connecting link into the holes of both free ends of the chain. The best way is sliding in from the wheel towards you. The assembly is simplified and the connection may be checked visually during common chain maintenance when in use. When sliding the pins to the holes proceed with care not to remove the lubricant in the holes. When the connection link is slid,



put the sealing rings in the free chain ends, and lubricate properly again. The next step is putting the closing plate on the edges of the pins. Use VZR 6 tool to push the plate to the proper position (flush with the bottom groove edge in the pin).

In emergency, the plate may be pushed to the pins with pliers, but this is not recommended in order to avoid excessive squeezing of the sealing ring for difficulty of keeping the exact plate position. When the method is used despite the problems described above, check distance of pushing in the plate using a gauge so that dimensions are equal to the link beside. The last assembly step is sliding on the connecting link spring clip into the pin grooves using the pliers in the manner identical to the Clip V type connecting link.

**IMPORTANT:** Following the assembly always check carefully perfect condition of the link, whether the spring sunk completely into the grooves, and whether the link is connected in correct direction of the chain movement. Then when in use, the best during regular chain lubrication, check the connecting link.

### 2.3.3 Chain closing with the Rivet type connecting link

The Rivet type connecting link is used for the sealed chains for demanding operation, and it produces **permanent** connection. The connection is manually the most difficult compared to the other types of the connecting links, and special mounting tool ČZ – VZR 6 must be used here.

**Assembly procedure:** Lubricate properly the holes of the chain end bushes before assembly. Use a part of the grease in the attached sachet to lubricate and apply the lubricant to the holes using a thin object. Do not use lubricant for the connecting links other than delivered with the chain.

Put one of the sealing rings to each pin of the connecting link and lubricate well with the attached lubricant. Only thereafter, slide in the connecting link into the holes of both free ends of the chain. For simpler manipulation, the best way is sliding in from the wheel towards you. When sliding the pins to the holes proceed with care not to remove the lubricant in the holes. When the connecting link is slid, put the sealing rings in the free chain ends, and lubricate properly again.



**Figure 11: Proper lubrication of pins, bushes and sealing rings guarantees long term reliability of the product. With regards on perfect connection we recommend to remove unnecessary amount of lube from the connection link before riveting.**

The next task is putting of the closing plate on the chain ends. The plate can be put behind the edge of the pins only. The mounting tool VZR 6 must be used to finish the chain closing procedure using the Rivet type link. For details about the steps, see the work procedure in the tool manual.



**Figure 12: For proper installation of Rivet connecting links use assembly tool CZ VZR 6 and included measurement tool.**

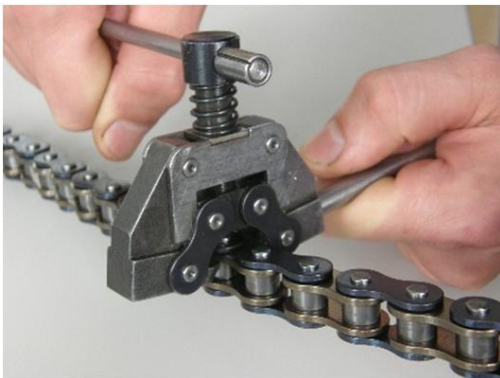
## 2.4 Shortening of the chain

Should the chain contain more links than you require, you must shorten the chain. Here is how to proceed without damaging the other components and production dimensions of the chain.



Prior to shortening, count the links on the old chain for replacement. Do not just compare the lengths between the old and new chain. The old chain is longer for wear and tear reasons compared to the new one, and the number of links could not be correct.

Mark the outer plate on the disconnection point. Use the VZR 6 tool to disconnect the chain according to the instructions for the tool. Another method for shortening of the chain is grinding off the riveted pin heads on the marked plate using a grinder down to flush with the outer plate. Put something under the outer plate on the opposite side of the pin and use the punch to tap out the pin from the outer plate. Repeat the procedure for the other pin. Disconnection is finished. You can put e.g. M8 nut under the plate in case of emergency. Any other procedure that uses various tools and methods may result in dimensional change to the chains, which is inadmissible.



**Figure 13: Shortening of the chain using the ČZ VZR 2 tool. Not suitable for reduction of the sealed chains.**



**Figure 14: The VZR 6 tool is suitable for shortening of all chain types with 15.875mm pitch.**



Figure 15: For alternate disconnection of the chain, see figure. For description of the procedure, see text.

### 3 Maintenance and treatment of the chain

The chain contains many components that form together high number of rotary joints. The pin and bush move in each joint in mutual relationship, and it is natural that wear and tear is obvious after some time. On the motorcycle, the chain is located on a place where it is easily contaminated in use by abrasive material from surface on which the motorcycle is driven. It is the abrasive material that increases wear and tear of the chain on all components. Obviously, we must maintain the chain in a certain way to benefit from its function.

#### 3.1 Cleaning of motorcycle chain

**WARNING:** It is prohibited to clean the chain with preparations based on acids – rust-removers, and more. Use of chemical products with pH value lower than neutral is prohibited. Not following of these instructions distorts the chain components due to hydrogen fragility of the material. De-icing salt in winter or battery acid leak on the chain are the hazards for the chain.

##### 3.1.1 Cleaning of non-sealed ČZ chain

The non-sealed chain has the benefit of small resistance in use but its joints are open and easily contaminated by dirt. The irony is that these chains are used under the harshest conditions for motocross and enduro. We must maintain the chain properly as well despite some chain types use very hard CRK coats on the pin surfaces to reduce the wear and tear.





The chains for the sport use – motocross/enduro feature specific conditions of use in mud and dust, and no exact maintenance and lubrication intervals can be specified.

Use a pressure washer with plain water to clean the chain contaminated by mud to remove it in addition to sand, dust from all components of the chain. The most effective is when the compressed water hits the gap between the inner and outer plate to clean the interior of the joint, anyway the joint cleaning is never absolutely perfect. Following water cleaning, it is advisable to remove the remaining water from the chain with compressed air. If you have no compressed air available, rotate sharply with the rear wheel several times so that water splashes out of the chain. The procedure described is the ideal one if you have time enough and the cleaning products available. However, if e.g. between the racing heats no time remains for proper maintenance, the chain can be cleaned from dry mud or dust with a steel wire brush and lubricated by a spray lubricant. When the chain is full of wet mud, it is better to skip the cleaning and maintain the chain only after the race.

Non-sealed chains for on-road use are used for the less powerful engines. The motorcycle moves on relatively clean roads here and contamination comes mainly from dust that sticks on the lubricant, or when driving in rain. Use spray cleaners or a rug and clean the chain mechanically after removal of the contaminated lubricant. Neither the cleaner nor the rug is the guarantee of full removal of the dirt inside the chain. The best way for removal of any contamination also inside the chain is submerging the chain in the degreasing bath. The disadvantage is the necessity of demounting of the chain from the motorcycle, and disposal of the used degreasing bath.

### **3.1.2 Cleaning of sealed ČZ chain**

For sealed chains, dirt is removed from the chain surface only because the joint is sealed. The main challenge in cleaning of the sealed chain is removal of the dirt while cleaning and avoiding the sealing rubber rings damage.

When the chain is contaminated by mud from enduro, washing with pressure water is the most effective way. Spray cleaners may be used for removal of the dust stuck on the lubricant in on-road use. A great disadvantage of the spray cleaners is that they contain an aggressive degreasing ingredient not usually rubber seal friendly. Huge differences were found in quality

of the spray cleaners; from the neutral ones up to highly aggressive cleaners. Over some time, the aggressive spray cleaners degrade the rubber sealing, and may sometimes damage galvanic coating of the chain plates. Another negative of strong degreasing effect is damage to the lubrication coat between the rubber seal and the plates, which increases friction and reduces sealing capacity of the seal.

We recommend that no aggressive products are used for cleaning of the chains from on-road use, and that no cleaning occurs too frequently. Lifecycle of the chain reduces. The best way of cleaning is with a rug.

Do not use gasoline, paraffin oil, solvents, and more for cleaning of the sealed chain. They cause heavy damage to the rubber seals. In no case use steel wire brushes and sharp objects for cleaning to avoid damage to the rubber rings. Do not use pressure steam cleaning.



**Figure 16: Motorcycle chain heavily soiled with mud is best and in the easiest way cleaned with cold pressure water without any chemicals.**

### **3.2 Lubrication – in general**

Regular and careful lubrication of the chain repays with long durability and safety. Non lubricated chain joints wear quickly and unevenly, the chain elongates works restlessly, and uselessly consumes the engine power.

There are many manufacturers of the lubricants and yet much more spray products for lubrication of chains on the market. Spray is an excellent choice because we can both dose and direct the lubricant where the chain needs it most. Most sprayed lubricants run well into the chain, cause no splashes and contamination of the other motorcycle components in use. There are some other alternatives for lubrication of the chain, e.g. oil dropping with oilcan or

coating the oil with a brush and oil. These alternatives are absolutely inappropriate for the powerful motorcycle chains and environment regulation

### 3.2.1 Lubrication of non-sealed ČZ chain

For non-sealed chain, inject (apply) the spray grease between the inner and outer plates so that the grease runs well into the joint to lubricate the joint space. Another important lubrication point is the space between the bush and roller. Inject the lubricant to the space between the roller and inner plate so that the roller rotates properly when receiving by the sprocket wheel. The lubrication interval for non-sealed chains is individual as it depends on the environment conditions under which the chain is used. Non-sealed chains need to be checked and lubricated frequently. After the lubrication, wait at least 10–15 minutes before driving so that the lubricant runs well into the chain and the solvent contained in the lubricant vaporizes.

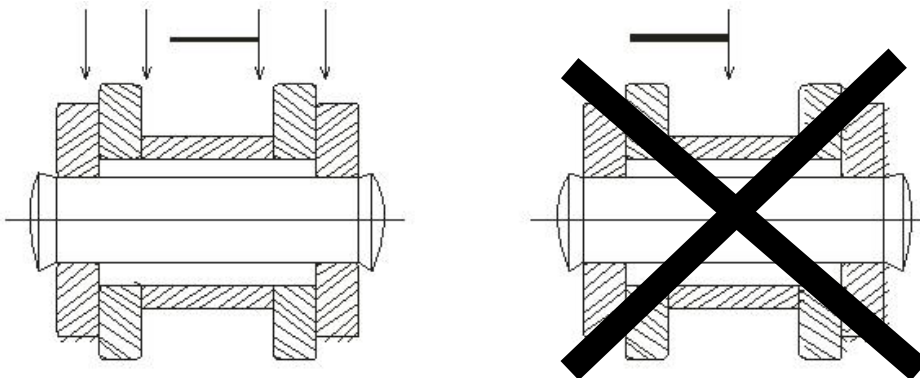


Figure 17: Example of proper application of lube between inner/outer plates and between bush and roller

### 3.2.2 Lubrication of sealed ČZ chain

Lubrication of the sealed chain means application of the lubricant to the roller spaces – identically to the non-sealed chains – lubrication of rolling away roller. Furthermore, it is necessary to lubricate the space where there are the sealing rubber rings. The lubricant forms a protective coat on the sealing rubber rings against sunshine, water, impurities, and reduces friction between the plate and the roller. Lubrication of the plates is not needed; you can overspray them slightly for improved corrosion resistance (particularly in winter operation).



Recommended interval 600–900km applies to the sealed chain for on-road use. The interval depends on the environment of use of the chain, and on quality of the spray lubricant.

For off-road use, the lubrication interval is individual and it may not be specified. After the lubrication, wait at least 10–15 minutes before driving so that the lubricant runs well into the chain and the solvent contained in the lubricant vaporizes.

To avoid contamination of the other motorcycle components or the space under the motorcycle by the spray contaminant, insert a barrier behind and under the chain in the place of the lubrication application, e.g. a piece of cardboard paper.

During the winter use of the motorcycle when there is de-icing salt on the road, consider shorter chain treatment intervals. The treatment consists in more frequent washing of the chain with water because only water can remove stuck salt away. Following washing, let the chain dry and lubricate well thereafter. Salt causes quick and strong corrosion on uncoated parts of the chain. The corrosion products may cause the rupture of the chain.

If you prepare your motorcycle for winter break, it is recommended that the chain is cleaned and lubricated to protect it against air corrosion.

When lubricating the chain, avoid spraying the lubricant on the brake discs because braking effects reduces substantially, and permanent damage to the friction segments function may occur.

Pay attention that no tyre is contaminated with the lubricant. A skid may occur in use.

## **4 Installation tools for ČZ chains**

ČZ provides two types of tools for assembly and disassembly of its product to facilitate working with the chains. Each tool has its specific properties as explained below.

### **4.1 VZR 2**

The VZR 2 tool is intended for disassembly of already worn chain only. It uses pliers principle of which jaws clasp the inner link and the rotary bolt with a point pushes the pin out. Whereas the jaws are in contact with the inner link, and the force for the pin removal

is transferred through the inner link, there is hazard of deformation of the inner link dimensions. Therefore, the tool may be used for disassembly of the chain to be discarded only. Working with the VZR 2 tool for disassembly is simple and quick. It could also be used for various pitches and inner widths of the chains.



Figure 18: Disassembly tool VZR 2

#### 4.2 VZR 6

The tool may be used for assembly and disassembly of the chain. Use of the tool for disassembly has no impact on the chain dimension and therefore, the VZR 6 tool can be used for reduction of the chain length. For working instructions applicable to each work tasks, see the attached instruction manual.

The VZR 6 tool is highly compact, working with it is simple and applicable for all types of the ČZ connection links with 15.875mm (5/8") pitch.



Figure 19: Assembly/Disassembly tool VZR 6