CLS • Chain Lube Systems

INSTALLATION MANUAL

EVO PLUS

CLS EVO Chain Oiler
CLS Heat Heated Grips
CLS Connect Connection Adapter

5 year warranty!

INNOVATIVE MOTORCYCLE ACCESSORIES

Model-specific installation pictures can be found here:

www.cls-evo.eu

→ Installation Pictures

Editor
CLS – Chain Lube Systems, Heiko Höbelt e.K.

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Company Address
CLS – Chain Lube Systems
Heiko Höbelt e.K.
Unterer Maasweg 3
96484 Meeder | Germany
Tel: 0 95 66 / 80 84 34
Fax: 0 95 66 / 80 84 35
E-mail: info@cls-evo.de
Internet: www.cls-evo.de

Disclaimer
We take no responsibility or liability for damages attributed to the system, its installation or handling.

Warranty
The warranty period for the CLS EVO Plus is valid for 60 months from the date of purchase.

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Thank you for selecting a CLS product.

All CLS systems are crafted with handiwork at our home and are 100 % Made in Germany. They come with a 5 year warranty and first-class service by our qualified employees.

With your purchase of a CLS Plus system you get the latest state-of-the-art technology developed by CLS for your motorcycle.

Depending on the version, the electronics are responsible for the following units:
The CLS EVO chain oiler, the CLS Heat heated grips system and the connetion module CLS Connect.

By using proper installation and handling of your system, you will profit from many advantages:

CLS EVO Plus Chain Oiler
- perfectly lubricated chain
- very little soiling due to an extremely low oil consumption (50 ml will last for about 10.000 km)
- chain durability is 2 – 4 times higher than compared to using manual lubrication (depending on the quality of the chain and gears)
- no cleaning of the chain required
- no manual lubrication of the chain required – no more chain spray

CLS Heat Heated Grips system
- automatic adjustment of heat output according to the ambient temperature
- adjustable to your personal heat perception
- automatic preheating in low temperature
- perfectly warm hands, without the need for frequent adjustment

CLS Connect Connection Module
- quick and simple connection for your electronic accessories, such as navigation, intercom, auxiliary headlights, etc
- ideal for vehicles with CAN-bus systems
- adjustable shut-off delay

1 Safety

Read the installation manual before installation, commissioning and troubleshooting of the chain lubrication system.
Please follow all listed advice and instructions!

Safety instructions are marked as follows:

Risk of death, major injuries and property damage!

Risk of injuries and property damage!

Risk of malfunction and property damage!

Environmental hazard!

Useful advice or aid.

Disregarding the safety instructions can result in crashes, injuries, property damage or environmental hazard. Disregarding the safety instructions excludes all liability. All components and attachments are to be used as intended, i.e. in accordance with the installation manual.

- All included parts of the chain lubrication system are to be protected from being accessed by children. Small parts and oil carry the risk of being swallowed. Toying with the packaging material may cause children to suffocate on it. Therefore, pay extra attention during storage and installation.
- Instant adhesive may adhere body parts. Skin, eyelids or objects could become permanently bonded in short time. **Follow the instructions of the instant adhesive!** In case of bonded body parts, seek medical attention immediately!
- The chain oil in use is synthetic and toxicologically safe (non-toxic). Avoidance of contact to skin, mucous membranes and eyes is still advised. If swallowed seek medical attention!

- Oil must not be disposed with household waste. Disposal is only permitted at a facility for waste oil, e.g. petrol stations or disposal facilities. Oil spills are to be bound by customary means!
- If installed properly, the chain lubrication system does not affect the operational safety of your motorcycle. However, a short inspection of proper installation before every trip is ensuring. Check for the following:

  - Moving parts of the motorcycle must not be obstructed for proper function.
  - The oil line must not come in contact with moving/rotating parts (e.g. chain or rear wheel). Damage to the oil line can get pieces of it pulled into the drive train or cause a leak of lubricant.
  - Electrical wiring and oil line must be installed properly. Loose wiring or oil lines may impact the handling or be the cause of accidents.
  - The nozzle must be positioned at the sprocked according to the instructions. During the operation of the motorcycle oil must not get on the tyre tread or brakes.
  - The oil tank must be placed safe from damaging in case of overturning of the motorcycle. Oil must not be spilled.
  - The oil line must not come in contact with hot components of the vehicle (e.g. exhaust).

2 General Statement

2.1 Structure

The CLS EVO Plus is a multifunctional system, containing multiple elements.

You can utilize all its systems simultaneously, or just those you need. The features not included in your purchase are present, but not enabled. Should you subsequently wish to enable these features, please send us the control unit for activation.

The enabled features can be determined from the bottom of the control units housing.

P = CLS EVO Chain Oiler
H = CLS Heat Heated Grip Controls
C = CLS Connect Connection Module.

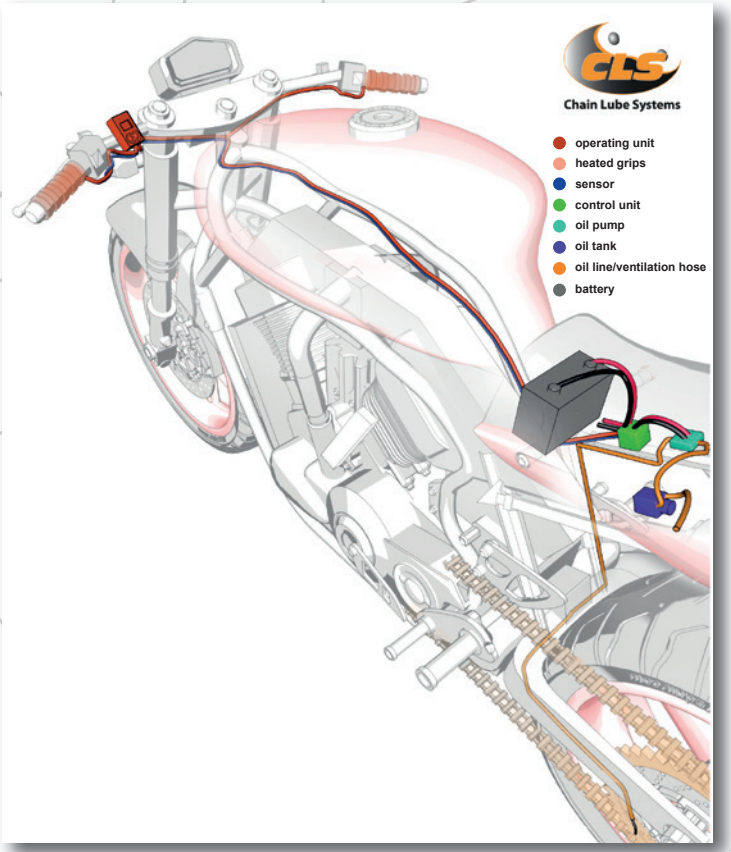


Image 1 Functional diagram

2.2 CLS EVO chain oiler function

In general, the system activates and deactivates by reading the waviness of the charging voltage. Thus, the control unit should have a direct connection to the battery. Upon activation, the blue LED on the narrow side of the control unit will start flashing and the green LED will light up, as soon as the pump starts feeding oil (for testing: once every 26 seconds in H∃). The oil is being pumped from the oil tank, through a filter and the pump to the nozzle at the sprocket. The pump's microprocessor controls the oil flow. The ambient temperature (oil viscosity) does not matter. The timing/discharged quantity depends on the CLS Control Display's set level.

With every stroke of the pump a single drop of oil is being ejected from the nozzle onto the sprocket. **For proper function it is highly important, that the nozzle's cut surface has a planar fit to the sprocket.**
The oil is being spread equally across the sprocket's rim during the ride by centrifugal force. From there it enters the gap between the chain's inner plate and the roller. The oil's capilary action allows it to traverse the space between the roller and the bush to the opposite side of the inner plate, while simultaneously leaving a thin, lubricating film of oil.

The space between the chain's bush and roller is the crutial area for lubrication on a roller chain. The area between the roller and the sprocket is secundary, but is automatically taken care of as well. The area between the bush and the pin contains lubricating grease, which is held in place by seals. If adjusted correctly, an anthracite-coloured oil film can be observed on the chain's rollers. Brushing over them with a finger, will leave a slightly moist oil film on it.

This thin oil film keeps the chain clean by eliminating almost all adhesion for dirt, thus reducing friction and extending the chain's durability.

The chain oiler CLS EVO Plus increases your chain's mileage, depending on its quality, correct adjustment of alignment and tension, your style of driving and proper operation by 2 to 4 times the amount.

2.3 CLS Heat heated grips system function

The fundamental difference between the CLS Heat and common heated grips systems is that it constantly adjusts the output heat automatically in relation to the ambient temperature.

The system activates 20 seconds after engine start and instantly measures the ambient temperature. If it happens to be below 15°C, the grips will automatically be preheated, depending on the measured temperature: the lower it is, the more power goes to the preheating process. Afterwards, the system switches to its regular mode of operation. Every 15 seconds the ambient temperature is measured and compared to the previous value. The system then adjusts the heat output in relation to the determined difference, factoring in every single change in °C. This allows for a finely tuned heat output without big spikes, commonly known from regular level systems.

The system warms your hands even before they get cold, with a subtle output heat that is barely noticeable as such. Thus your hands won't get damp in the first place.

2.4 CLS Connect function

The CLS Connect connection module is the perfect option for connecting your accessories, such as navigation, radio and intercom systems, auxiliary headlights, etc. The system is fully compatible with CAN Bus technology.

The CLS Connect activates upon engine start, and with it all the connected load. Upon engine shutoff it deactivates itself and the connected load (after a preset delay). The data bus is not impaired.

The very low energy consumption of the CLS EVO Plus, during full or partial operation, is covered by the motorcycle's battery. The electronic control unit monitors the battery voltage. Starting the engine causes the voltage to be slightly uneven. The control unit reacts to this fluctuation and activates automatically. Shutting the engine off deactivates the system and its functions. The system's power consumption amounts to about 280µA and thus is lower than the battery's self-discharge.

The use of CLS systems has proved itself in practice, which thousands of satisfied customers can confirm.

3 Packaging, scope of delivery

The CLS EVO Plus comes fully packaged in a 25 x 26 x 9 cm big cardboard box. The weight, including the provided oil, amounts to about 1,7 – 1,8 kg. Store the product in dry conditions.

Be careful when opening the package. It can prevent damage to the components. Do not use a long knife for unpacking.

Risk of property damage and environmental hazard!
The oil bottle may be damaged. Do not drop the bottle! Avoid rough impacts during transport!

1 pendulum/oil line
2 ventilation hose

Important!!!
The oil tank must be placed with both outlets above the oil level, as they are not completely leak-proof in the long run!

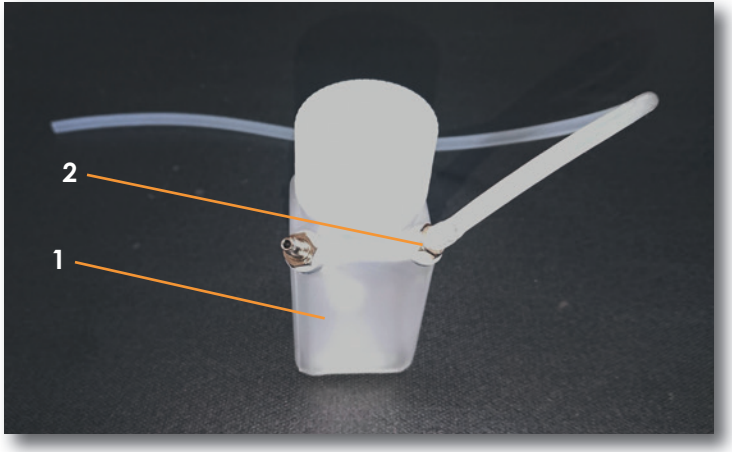


Image 2 60 ml oil tank

Image 3 Scope of delivery CLS EVO Plus (full system)

The scope of delivery contains:
1 electronic control unit CLS EVO Plus
1 Control Display
1 Control Display mount

Components for the CLS EVO chain oiler:
1 dosing pump with retainers and retaining plate
1 oil tank 60 ml with aluminum mount
1 bottle 0,5 l chain oil
5 rubber guide pieces
1 tube of instant adhesive
4 cable clips **(only for vehicle interior!!!)**
1 replacement fuse 15A
2 hose connectors
12 cable ties
1 PU hose DN 3 mm, ca. 1.5 m lengh with nozzle
1 PU hose ca. 1 m lengh
1 velcro strap ca. 22 cm
1 retaining piece with 2 mounting brackets and 4 screws
1 replacement nozzle
4 pieces of Dual Lock velcro
1 black braided sleeve
1 single-use syringe

Components for the CLS Heat:
1 pair of heated grips (22 mm diameter, 12 cm or 13,2 cm width or imperial heated grips)
1 temperature sensor (attached to control unit)
1 connection cables from heated grips to control unit

4 Installation

4.1 Introductory notes

Thoroughly read the full installation manual prior installation and follow the guidelines step by step!
The oil tank does not need to be placed above the electronic control unit or the pump, the ending of the ventilation hose however needs to be above the oil level, especially when the motorcycle is resting on the side stand. First of all, decide where to place the oil tank, the control unit and the pump. Prefered places are the rear compartment or underneath the rear side panels.
The CLS homepage www.cls-evo.de contains an extensive image gallery with installation pictures for a wide array of motorcycle models.

Prior to installation and commissioning it is highly recommended to remove any residue chain grease from the sprocket, the chain guard, around the drive pinion and the chain itself. Otherwise, the chain oil will clear any of it and the formed debris will soil the vehicle's rear end, rim and parking space.

4.2 Tools and supplies

For the installation you will need the following:
- hand drill (if you want to run the oil line through the interior lining)
- 6 mm drill
- Phillips screwdriver
- ruler or caliper
- knife
- cable ties and insulating tape
- some clean pieces of cloth
- brake cleaner
- multi-purpose grinder (Dremel®) or sandpaper of medium grain (for roughening anodized surfaces before applying glue)
- side cutter
- two-component adhesive (for bonding the heated grips)

Health hazard by instant adhesive!
Body parts will get bonded within seconds! Work with caution!
Keep glue out of reach of children!

4.3 Installation of the control unit

The following sections will show you how to install the control unit into your vehicle. The installation is universal; it does not matter which version of the CLS EVO Plus control unit you got.
The control unit can be installed in any position. Just make sure to keep it and its wiring away from the ignition coil, since it may possibly cause malfunctions of the control unit.

Image 4 Control unit installed

4.4 Establishing power supply

To power the system it must be connected directly to the vehicle's 12 V battery, not the cable harness (the only exceptions being a few KTM models like the 990 Adventure, which has a connector for accessories inside the headlight fairing). The system needs to be able to read the battery's rippled voltage curve upon engine start to active and the direct voltage (engine off) to deactivate.

4.4.1 The control unit's LEDs

The blue LED should light up a few seconds after engine start, and start flashing. This indicates that the system itself is active.
The green LED lights up, as soon as the CLS EVO Plus chain oiler's pump starts feeding oil.
The red LED will glow while the CLS Heat heated grips system heats the grips.
The yellow LED should be glowing continuously, whether any load is connected or not.
Should the blue LED happen to stop flashing after a few seconds while the engine is running, it means that the supplemental black-red wire needs to be connected, too.

Image 5 The control unit's LEDs

4.4.2 Connecting the supplemental wire

Attention!
On a series of vehicles the supplemental black-red wire needs to be connected to a + 12 V „switched plus“ line (for example main headlamp, tail light, horn, ...).

Some of the vehicles in question are Honda's VFR 800, Varadero and VTR models from 2002 on, some of KTM's old LC 4 models, like the 990 SM from 2012 on, a few Kawasaki models like the Z 750, ER-6, the Versys 650 and 1000, also the Husqvarna Nuda 900, Suzuki V-Strom 1000 models from 2014 on, the V-Strom 650 from 2018 on, and a few more. This list makes no claim to be complete..

The reason for this is the alternator regulator built into these motorcycles. This regulator only supplies the battery with (rippled) charging voltage when the battery's voltage drops below a certain value. During the time the alternator does not charge the battery, the system would not be active.
Using the supplemental wire, the system already activates upon engine ignition.

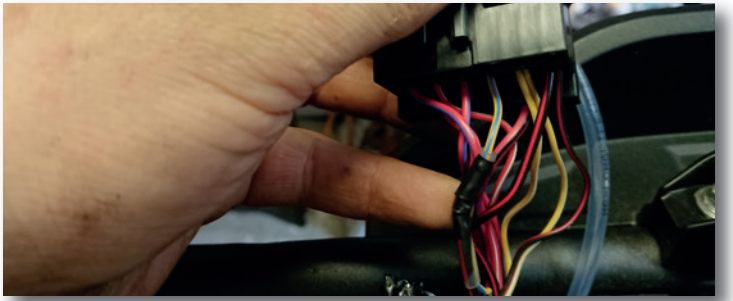


Image 6 Supplemental wire soldered to the main headlight's fuse + 12 V „switched plus“ line.

4.4.3 On Li Ion- and Gel-batteries

Using these batteries may also make it necessary to connect the supplemental wire. Due to the very low internal resistance of these types of batteries, the system may not be able to read the unevenness of the voltage. A reliable operation is not possible. To solve this problem, connect the supplemental black-red wire to a „switched plus“ line.

Proceed as follows:

1. Disconnect the ground cable (–) from the battery and move it aside.
2. Connect the red wire (+) of the control unit to the battery's positive pole.
3. Connect the black wire (–) of the control unit together with the ground cable of the motorcycle to the battery's negative pole.
4. If needed, connect the supplemental black-red wire to a „switched plus“ line, for example to the positive wire of the tail light or the fuse box (wire of the headlight fuse).

Important!
The supplemental wire must not be connected to LED tail lights, as it possibly may not deactivate!

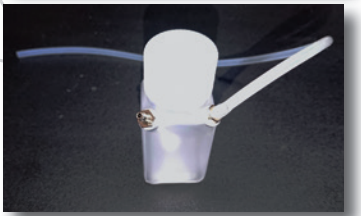
4.5 Installation of the oil tank

1. When positioning the oil tank, make sure it is safe from being damaged by sharp edges and squashing. The outlets must be on the top of the tank. We recommend the CLS aluminum tank mount for installation.
2. Fasten the tank with the aluminum mount, or the also enclosed velcro strap. To fill the oil tank, it must be placed with the lid upright on top. Keep that in mind when estimating the length of the oil line from the tank to the pump.

Image 7 Tank inside the aluminum mount, positioned horizontally

The oil tank **MUST** be placed with both outlets above the oil level, as they are not 100 % leak-proof in the long run.
The system will only function correctly using the original CLS oil.

correct



correct

The outlet with the silicone hose is for ventilation and must not be squashed or kinked.

Image 8 Oil tank inside the CLS aluminum mount (included in scope of delivery)

3. Position the end of the ventilation hose with the help of the cable clip and a hose connector **above** the oil level. It must remain **above** the oil level even in incline position. Optionally, you can complete this task after finishing the installation and filling the oil tank.

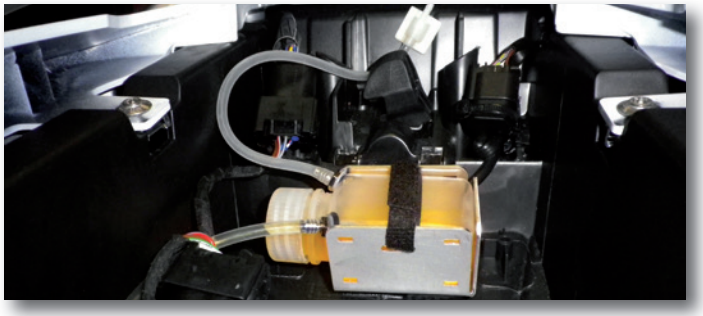


Image 9 Ventilation hose with cable clip and hose connector above the oil level

4.6 Installation of the pump

1. Install the pump with the enclosed retainers, by either gluing them in place with instant adhesive (clean and degrease bonding surface beforehand) or using cable ties.
   The pump is connected to the control unit by a wire with 2 flat plugs. The connection has no polarity, and thus no particular order.
2. Cut the oil line to the desired length and connect it from the oil tank's outlet to the pump's inlet. Pay attention to cleanliness during installation. Do not connect the oil line coming from the sprocket to the pump's outlet yet. It is recommended to vent the oil line in 2 steps: first, the segment up to the pump's outlet, then the rest of it. Further instructions can be found at „Venting the system“ on page 27.

Image 10 Rubber retainers of the pump glued to the retainer plate, retainer plate fastened with cable ties to the motorcycle.

4.7 Installation of the display

The CLS Control Display is used for operating the CLS EVO Plus. You can control the chain oiler and the heated grips with it..

1. Attach the display mount to the handlebar.
   This is done by tightening the strap with pliers while holding the mount in place with your free hand. Grab the strap with a pair of pliers, as shown in the image below, and pull it using a wave motion unit the mount can not be shifted anymore. This way the strap can be tightened one or two notches further. The important thing to do here is to squeeze the strap with your index finger and thumb.

Image 11 Installing the Control mount on the handlebar

2. Carefully cut the excess strap without accidentally opening the latch on the back side. Leave about 2 – 3 mm of the strap coming from the latch. This way it is safely covered and won't be accidentally opened. If you cut too short and the latch opens, you will be in need of a new mount..

Image 12 Shortened strap

3. Lay the display's cable to the control unit and fasten it with cable ties to preexisting cables or the frame.
4. Connect the display's cable with the control unit's. Plug the two connectors together and lock the connection with the union nut.

Image 13 Installed CLS Control Display

Image 14 Plug connectors of display and control unit

Generally very important notice!
Never use a high-pressure cleaner on the display.
The high pressure will allow the water to enter the display's interior and cause a malfunction.
This will not be covered by the warranty!

4.8 Installation of the oil line

4.8.1 Preparing the installation

Attention! Read the whole chapter thoroughly, choose a method of installation and then install the oil line, follwing the instructions step by step!

Health hazard by instant adhesive!
Body parts will get bonded within seconds! Work with caution!
Keep glue out of reach of children!

Processing note for instant adhesive:

- Spread the adhesive evenly and thin across the bonding surface.
- Apply pressure to the adhering object for several seconds without delay, until it is fixed in place.
- Do not strain the bonding surface for at least 10 min after that.
- Anodized sufaces (swing arm) need to be partially grinded down to the raw aluminum, ca. 1cm² wide, to rid it of the layer of eloxid. This is best done with a multi-purpose grinder (Dremel®) with a grinding attachment
  (Dremel®) mit Schleifvorsatz.

For fastening the retainers, guide pieces and laying the oil line from the sprocket to the pump, proceed as follows:

Fire hazard and health hazard by solvents!
Eliminate all sources of ignition! Provide enough ventilation!

- Clean and degrease the desired bonding surfaces on the swing arm with a clean cloth and some brake cleaner.
- On anodized surfaces, you will need to grind away about 1cm² of the layer of eloxid for bonding.
- Please inquire if your swing arm is anodized or not.

4.8.2 Installation of the oil line on the swing arm

Proper installation of the oil line on the swing arm is the most demanding part. If done correctly, the chain oiler will be virtually invisible.

Depending on the design of your swing arm, there are several ways to install the oil line.

The following section will present you different ways of installation on different swing arms.

In general, the black nozzle's cut surface needs to have a planar fit to the sprocket. The right position for the nozzle at the sprocket is just before the contact point of the sprocket and the chain. Positioning it further from this point will result in the oil being flinged from the sprocket, since the chain did not have contact with the sprocket yet. At the front sprocket (drive), the centrifugal force is about 3.5 times higher. Therefore, only install the nozzle at the rear sprocket (wheel).

There, the oil is being pulled onto the sprocket as a thin line and pushed into the chain by centrifugal force. Keep in mind that the nozzle's pressure against the sprocket only needs to be minimal. If the applied pressure is too high, the nozzle might tense up and slip out of position when the vehicle is being pushed backwards.

The chain must never touch the nozzle. Push the chain up against the sprocket and make sure it does not touch the nozzle. If it does, reposition the nozzle. Set the distance between the nozzle and the contact point of the sprocket and chain about the same as the distance between two teeth on the sprocket, else the oil may be flinged off before reaching the chain. Also, make sure no moving parts, such as the sprocket adapter (especially on Triumph and KTM models with a single-sided swing arm) or bolts make contact with the oil line.

Image 15 Nozzle at the sprocket

Installation of the oil line is always executed from bottom to top.
Put the oil line in the retainer piece. Turn the oil line so the steel support wire is pushed against the retainer piece's edge, depending on whichever direction you want to bend the nozzle to. This way, the support wire will stay stable in its position.

Lightly screw the mounting brackets to the retainer piece but keep the oil line moveable.

Image 16 Oil line inside the retainer piece

Important!
When positioning the nozzle at the sprocket, keep the overhanging oil line with the nozzle about 4 fingers wide from the retainer piece.

Installation on a regular swing arm

The excess steel support wire sticking out from behind the retainer piece can be shortened. Cut the covering hose alongside the support wire to the desired lengh and remove the excess material.

Image 17 Cutting the covering hose parallel to the support wire to the desired lengh

Image 18 Shortening the covering hose

Image 19 Shortening the steel support wire with a pair of pliers

When installing the retainer piece on the inner side of the swing arm, leave about 3 – 4 cm of the support wire and covering hose behind the retainer piece. This relatively long piece of the oil line is needed to bend it towards the sprocket.

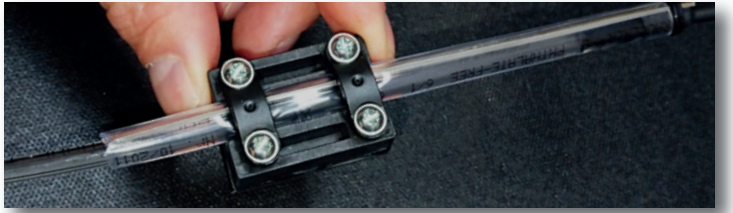


Image 20 Installation on the inner side of the swing arm, or on single-sided swing arms. Place the oil line inside the retainer piece so the protruding piece of covering hose with the support wire is about 2 fingers wide.

Thread the enclosed rubber guide pieces onto the oil line and position them 8 – 10 cm apart from eachother.

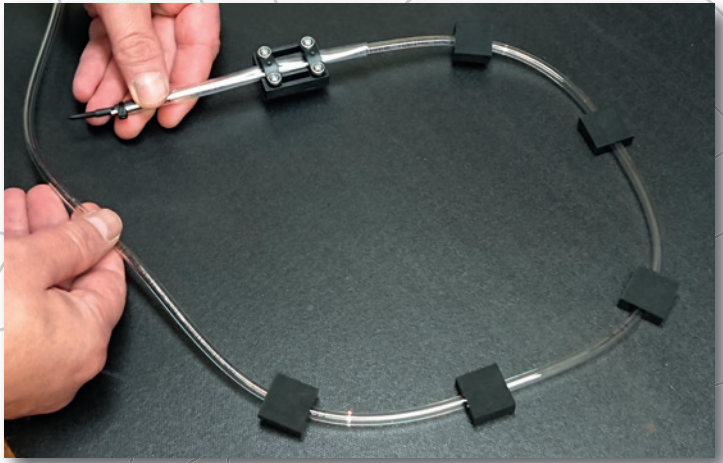


Image 21 Threaded guide pieces

Approximately position the retainer piece with the clamped oil line on the swing arm and bend the oil line roughly into position. The exact positioning of the nozzle at the sprocket will be done after venting the oil line.
Glue the retainer piece with the clamped oil line to the swing arm.

Image 22 Nozzle at the inner side of a single-sided swing arm

Image 23 Nozzle at the outer side of a single-sided swing arm

Image 24 Retainer piece installed on a regular swing arm, nozzle at the inner side

Image 25 Retainer piece installed on a regular swing arm, nozzle at the outer side

Approximately route the oil line along the swing arm, around the pivot and towards the pump. This will facilitate the installation.
The rubber guide pieces are then glued to the swing arm one after the other.
Please make sure the bonding surface is completely clean and, if your swing arm is anodized, partially grinded.

Image 26 Oil line on the inner side of the swing arm

Image 27 Laying the oil line along the inner side to the underside of the swing arm

Place the first of the threaded rubber guide pieces in position and glue it to the swing arm. Repeat the procedure with every subsequent rubber guide piece.

Image 28 Oil line at the underside of the swing arm, guided around the pivot point

4.8.3 Installation on a regular swing arm

On a regular swing arm, the oil line must be taken out of the retainer piece when removing the rear wheel. Else the oil line may be unintentionally bent, and the nozzle may be lost unnoticed. Please do not bend the oil line while it is inside the retainer piece, as the steel support wire will lose its tension over time.

On all installation options you will need to make sure the screws inside the retainer piece are accessible for tire removal.

Installation option 1:
Retainer piece on the underside of the swing arm, nozzle at the outer flank of the sprocket.

Image 29 Retainer piece on the underside of the swing arm, nozzle at the outer flank of the sprocket

The nozzle's cut surface must have a planar fit to the sprocket. Here, at the outer flank of the sprocket. The perfect position for the nozzle is just before the contact point of the sprocket and the chain.
The nozzle will only be visible when kneeling beside the motorcycle and looking at the swing arm.

Installation option 2:
Retainer piece on the inner side of the swing arm, nozzle at the outer flank of the sprocket.
This variant requires enough space between the swing arm and the sprocket for the oil line/nozzle.

Here, the retainer piece has been glued to the inner side of the swing arm and the nozzle placed at the outer flank of the sprocket on a Honda Africa Twin.

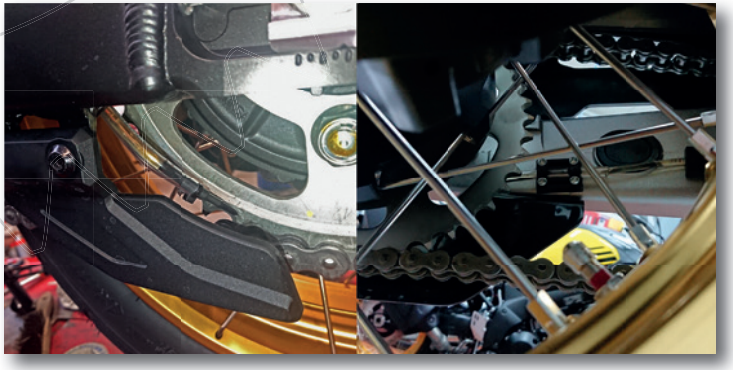


Image 30 Retainer piece on the inner side of the swing arm

Installation option 3:
Retainer piece on the inner side of the swing arm, nozzle at the inner flank of the sprocket.

On the KTM 1290 Adventure the oil line can not properly be placed along the underside of the swing arm because of the chain guard.

The solution is gluing the retainer piece on the inner side of the swing arm. The oil line is bent around the sprocket and the nozzle positioned at the inner flank of it.

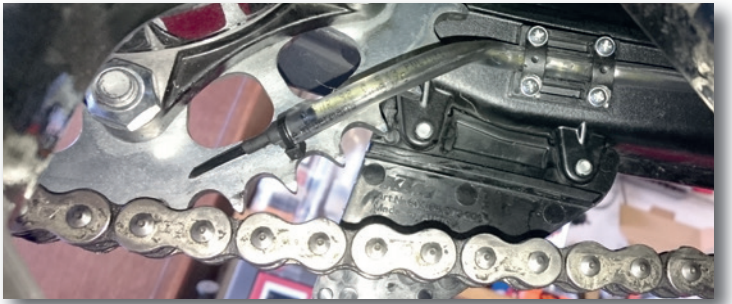


Image 31 Oil line bent around the sprocket, nozzle at the inner flank.

On some Enduro motorcycles – like this Triumph Tiger 800 – it is also recommended to place the nozzle at the sprocket's inner flank. Firstly, for protection of the nozzle during offroad travels, secondly because of the obstructing chain guard at the swing arms underside.

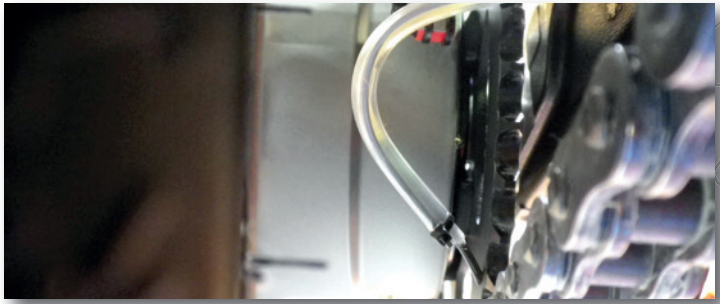


Image 32 Oil line bent around the sprocket, nozzle at the inner flank.

4.8.4 Installation on a single-sided swing arm

At first glance, the installation on a single-sided swing arm seems to be quite difficult. In reality, the installation can be done very elegantly. On single-sided swing arms the nozzle is generally placed at the sprocket's inner flank. Should having enough space happen to be a problem – like on KTM 1290 Super Duke models - simply place the nozzle at the sprocket's outer flank.

Image 33 Nozzle at the inner side of a single-sided swing arm

Image 34 Nozzle at the outer side of a single-sided swing arm

4.8.5 Checking the nozzle position

When placing the nozzle, make sure the chain, chain wheel mount, etc. can not come in contact with it. Fully press the chain onto the sprocket and check if it touches the nozzle.

Image 35 Proper nozzle positioning: the chain does not touch the nozzle.

Image 36 Improper nozzle positioning: the chain touches the nozzle.

Image 37 Proper nozzle positioning: nozzle is close to the contact point of the sprocket and the chain.

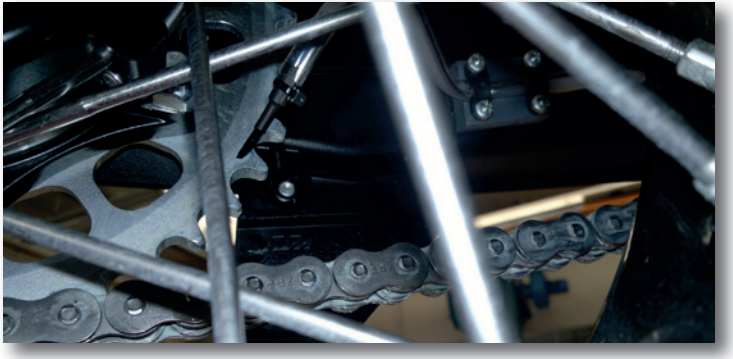


Image 38 Improper nozzle positioning: nozzle is too far from the contact point of the sprocket and the chain.

Image 39 Proper nozzle positioning: nozzle is at the sprocket's heel.

Image 40 Improper nozzle positioning: nozzle is above the sprocket's heel (if present); it should be directly at the heel.

4.9 Routing the oil line at the swing arm

When routing the oil line up to the control unit and pump, care must be taken to ensure that the it does not come in contact with the chain or the tire, and is installed virtually invisible. For this purpose, the oil line is – if at all possible – routed along the inner and underside of the swing arm and around the pivot point, to the top. The space between the swing arm and the engine oftentimes contains venting hoses, sensor wires or break lines, which will be used to hide the oil line going to the top. The motorcycle's frame and wiring will help hiding the rest of the oil line up to the oiler's pump. To prevent the oil line from being overstreched or torn off by the motorcycle's suspension movements, leave a short loop (5 – 8 cm) for compensation.

Make sure the oil line does not come in contact with the chain or the tire and can not be squashed by suspension movement.

Image 41 Oil line on the inner side of the swing arm

Here, the oil line is routet from the underside of the swing arm, underneath the pivot point and - covered by the engine's venting hoses – to the top.

In most cases, the oil line is routed from along one inner side of the swing arm (chain) to the other, to the underside and around the pivot point.

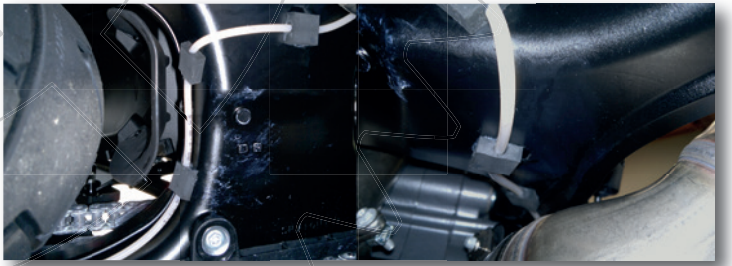


Image 42 Routing the oil line along the inner side of the swing arm, to the underside

Image 43 Oil line at the pivot point, covered by a braided sleeve as camouflage

Should it not be possible to route the oil line hidden from sight, it can be covered with braided sleeving as camouflage, as shown here on a Ducati Monster 1100 EVO.

Image 44 Oil line, covered by braided sleeving between the rubber guide pieces on a Ducati Monster 1100 EVO

On this Husqvarna Nuda 900 the oil line is visibly routed around the pivot point, and disguised by braided sleeving, making it impossible to distinguish it from the already existing wiring.

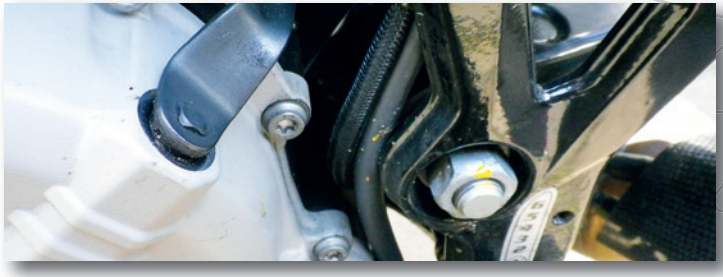


Image 45 Oil line on a Husqvarna Nuda 900 in field of view, thus covered by braided sleeving

The oil line has a lifespan of about 7 years.
A replacement is recommended after that.
The lifespan may be shortened by exposure to strong UV radiation or aggressive cleaners.

5 Venting the system

The system does not vent automatically.
It needs to be completely filled with oil before activation.

Vent the system after installation, before connecting the lower oil line to the pump's outlet. This is best done in two steps: first, the segment from the oil tank to the pump's outlet, then the rest of the line. The reason for this being the bubble formation when drawing the oil through the pump. If you draw the oil directly from the pump into the oil line, it may start foaming due to the negative pressure.

Fill the oil tank up about 95 %. Connect the syringe to the pump's outlet. Vent the pump by drawing the oil into the syringe. This way, venting the rest of the line won't be a problem. While venting the pump, it may prove helpful pushing the syringe against the direction of the flow, thus compressing the springs inside the pump to loosen any air bubbles contained in them.

Also, place the pump with the outlet facing upwards during the process, making it easier for the air to escape.

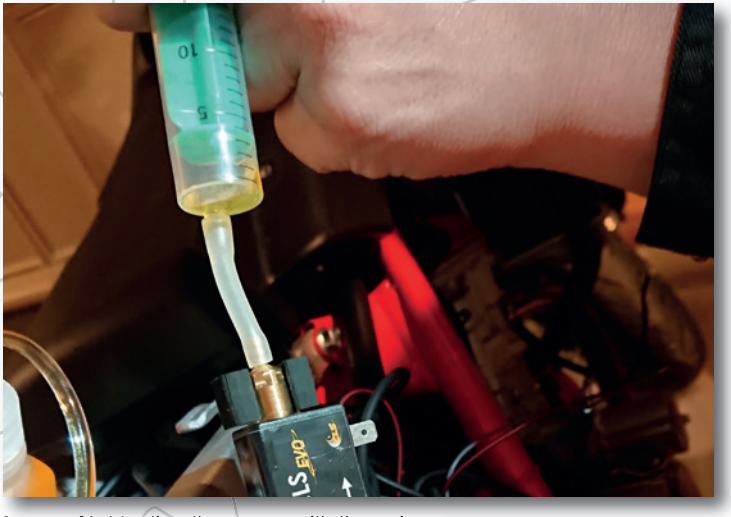


Image 46 Venting the pump with the syringe

Image 47 Syringe attached to the nozzle to vent the oil line

When venting, draw about 15 – 20 ml of oil into the syringe, while pushing it against the direction of the flow 5 – 10 times. This will loosen any air bubbles stuck inside the pump. Repeat this process until no bubbles can be seen coming out of the pump, then detach the syringe from the pump. Now, connect the lower oil line to the pump's outlet.

Next, unscrew the end of the oil line from the retainer piece, lightly pull it towards you and attach the syringe to the nozzle. Once again, drawing the oil into the syringe will vent the oil line. As soon as the oil line is completely filled with oil up to the nozzle and no air bubbles can be seen, carefully detach the syringe from the nozzle. Make sure not to accidentally pull the nozzle out of the oil line. A few very tiny air bubbles inside the oil line can be ignored, as long as they aren't as big as the inner diameter of the oil line.

Put the oil line and nozzle back in its position and make sure the nozzle's contact pressure is not too excessive and it won't move, touch the chain or any other moving parts when pushing the motorcycle backwards. This is very important!

When screwing the retainer piece together, make sure everything has a tight fit.

Important note!
Never use a high-pressure cleaner to clean the motorcycle. The high pressure will loosen the adhevise bond between the retainers and the vehicle, causing them to simply fall off over time.

6 System handling

Your chain oiler is operated via the CLS Control Display. The display digitally shows you the currently set level and reminds you, if applicable, that the system is turned off, thus set to 0, or set to the high perfomance levels H_, H= or H≡ , by flashing a few times every 5 minutes.

6.1 Possible settings on the touch display

The default setting of your system depends on the chain dimensions of your motorcycle and can be gathered from the adjacent table.

When offroading or driving in the rain, set the display to level H_, H= or H≡.

These settings will make the system deliver oil every 72 sec., 44 sec. or 26 sec. respectively. Make sure to set the system back to its default setting about 5 minutes after offroading or driving in the rain.

Display settings	
Level 1	for 520 chains, 1 drop of oil / 8:48 min
Level 2	1 drop of oil / 7:53 min
Level 3	for 525 chains, 1 drop of oil / 7:00 min
Level 4	1 drop of oil / 6:30 min
Level 5	for 530 chains, 1 drop of oil / 6:00 min
Level 6	1 drop of oil / 5:30 min
Level 7	1 drop of oil / 4:45 min
Level 8	1 drop of oil / 4:00 min
Level H_	1 drop of oil / 72 sec.; for offroad / slightly wet road
Level H=	1 drop of oil / 44 sec.; for offroad / rain
Level H≡	1 drop of oil / 26 sec.; for heavy terrain / heavy rain

The system can potentially be set a level lower than depicted. You may try and decide on your own.

6.2 The CLS Control Display

Operation manual for the CLS Control touch display
The display shows a panel of two 7-segment displays for the set levels, one button for shifting up and down respectively and two small LED's to the left and right of the display panels. The left symbol is a chain link, the right a heated grip.

Image 48 Installed CLS Control touch display

Quick shifting in the rain
After activating the display, holding the corresponding button for 2 seconds will let the system jump to level H☰ or level 0, depending on whether you pressed the up or down button. The default setting can easily be set from level 0. This allows for a quick shift to the rain mode and back.

Operating the CLS Control with 2 CLS systems (CLS Heat and CLS chain oiler)

Choosing which system to operate
Left of the display panel, an LED with a symbol of a chain link below it can be seen, right of the display panel, an LED with a symbol of a heated grip. Depending on which system you want to operate, proceed as follows:

Operating the chain oiler:
- Press the left button (down) with the symbol for the chain oiler.
- The left LED will light up green and the display will show the currently set level.
- Now you can change the set level by pressing the up or down buttons.
- The system will save the changed level and show it by flashing the display a few times. After a few seconds, the display should turn off.

Operating the heated grips:
- Press the right button (up) with the symbol for the heated grips.
- The right LED will light up green and the display will show the currently set level.
- Now you can change the set level by pressing the up or down buttons.
- The system will save the changed level and show it by flashing the display a few times. After a few seconds, the display should turn off.

Operating the CLS Control with one CLS system (CLS Heat or CLS chain oiler)

If you only have one CLS system and your control unit has only one channel unlocked, you can activate the display by pressing any of the two buttons.

The display will save the currently set level, even if the motorcycle is turned off or the battery detached.

6.3 System calibration

Calibrate the system corresponding to your motorcycle's chain dimension via the CLS Control Display. The chain dimension can mostly be found on the outer plate of the chain (the indication „50" corresponds to a 530 chain).

The default setting is intended for use on country roads and during dry conditions. In case of change of weather or road condition, readjust to the appropriate level.

High speeds:
+1 or +2 on speeds above 160 km/h

Rain:
Constant heavy rain, level H≡
Rain and wet road, level H=
Wet road, level H_
On levels H≡, H= or H_ the CLS Control Display will flash every 5 minutes.

After a ride in heavy rain, the chain may still end up washed out, despite the increased amount of oil. Thus, it is crucial leaving the system on level H≡ for another 5 minutes after the road starts drying.
The CLS Control Display will remind you to lower the currently set level by flashing every 5 minutes.

Offroad:
The CLS EVO Plus has three settings for offroading.
Level H≡ for lots of water and dirt.
Level H= for dirty terrain such as mud, sand and lots of water.
Level H_ for dusty and easy terrain.

7 CLS Heat

7.1 Preparation

If you do not have the chain oiler installed on your vehicle, look for a suitable place for the control unit and Control Display. The control unit is independent of position, waterproof and completely vibration-resistant You can position it virtually anywhere. Just make sure to keep it and its wiring away from the ignition coil, since it may possibly cause malfunctions of the control unit.

7.2 Tools and supplies

For the installation you will need the following:

- clean pieces of cloth
- break cleaner
- combination pliers
- small wire cutter
- long, thin screwdriver
- very sharp knife
- round file
- Dremel® or sandpaper of medium grain
- tools to remove bar weights, fairings, etc

7.3 Installation

7.3.1 Removing the original grips

You can cut the grips open along the bar using a sharp knife.

If you do not want to destroy the grips, proceed as follows:

- Use a long, thin screwdriver and break cleaner.
- If present, remove the bar weights and push the screwdriver in between the handlebar and the grip.
- Spray some break cleaner inside the gap and rotate the screwdriver around the handlebar.
- Now you should be able to simply pull the grip off the handlebar. The throttle grip must additionally be pulled over the sleeve's ridges.

Image 49 Throttle sleeve without the grip

Image 50 Grinded throttle sleeve

The heatet grips have different inner diameters: the grip with the smaller inner diameter is for the handlebar on the clutch side, the one with the bigger inner diameter is for the throttle sleeve.

Remove any residue glue from the handlebar and throttle sleeve and roughen the surface. Clean and degrease the bonding surface. Make sure the cleaner has no greasing properties.

7.3.2 Installing the heated grips

- Remove the ridges on the throttle sleeve, using a very sharp knife (scalpel, tinker knife), a Dremel® tool and sandpaper. Leave about 1/10 mm of some of the ridges to improve the grip on the sleeve for the new grips.

Image 51 Throttle sleeve partially grinded

- Make sure the heated grip's fit is firm, but not too tight. Else the heating wires inside might be damaged.
- Roughen the inside of the heated grips with a round file to lightly increase the surface and improve the adhesion.
- Carefully put the grips on the handlebar before adhesion for testing purposes.
- Push the rightside grip halfway onto the throttle sleeve **without adhesive**, and check if the sleeve can still freely switch from full throttle to the idle position.
- The rightside grip must have a firm fit to the sleeve, without jamming it. The throttle sleeve must be able to rotate unobstructed and snap back to idle position.
  This is very important and must be ensured.

Spray some oil (WD40 or similar) between the handlebar and the throttle sleeve, to prevent accidentally gluing the sleeve to the handlebar. But keep the bonding surface oil-free. Clean all bonding surfaces with a non-greasing cleaner (e.g. Petec Multicleaner) and give it some time to evaporate. To improve the adhesion, roughen the inside of the heated grips with a round file, as shown in the picture..

Image 52 Applying the adhesive

- Evenly apply adhesive to the inside of the grip (elastic two-component adhesive). It serves as lubricant during the installation and will prevent the grip from sliding after drying.
- Push the grip to the desired position and make sure that the throttle grip has enough room to operate. The grip's cable must not be kinked, especially with fully open throttle.
- On the left side: pull the clutch and make sure, the grip's cable does not obstruct the clutch lever.
- Any excess adhesive being pushed out of the bonding area must be removed. Else the bar weights might not be able to be reinstalled.
- Connect the grips' plugs to the control unit's wires. One pair for each connection.

The wires can be installed hidden, by routing them along preexisting cables and lines. Also, make sure the wires do not obstruct steering or get kinked or torn.

- Now, place the temperature sensor at the left grip's wire and fasten it with cable ties. Make sure not to kink or squash the sensor cable, as it may result in wrong measurement of the temperature. Especially in the area of the steering head, the sensor cable may be accidentally kinked, squashed or torn.

The sensor absolutely must be placed near the position of the hand to be able to read realistic temperatures.
If your vehicle has handguards, you will also need to place the sensor behind them.
Do not put the sensor underneath the seat, the fuel tank or behind the headlight mask, as the temperature regulation will not work properly this way. The sensor must always be reading the temperature of the area, where your hand is exposed to the airstream!

Image 53 Ducati Monster S4R: leftside heated grip with temperature sensor

Image 54 Wires at the steering head

All wires must be installed without obstructing steering.

7.3.3 Installation of the Control Display

- If you already have the full chain oiler system installed, you can skip this segment.
- Look for a suitable position for the CLS Control Display.
  The CLS Control Display is specifically designed for motorcycles with tubular handlebars.
- Attach the display mount to the handlebar. This is done by tightening the strap with pliers while holding the mount in place with your free hand.
- Grab the strap with a pair of pliers, as shown in the image below, and pull it using a wave motion unit the mount can not be shifted anymore. This way the strap can be tightened one or two notches further. The important thing to do here is to squeeze the strap with your index finger and thumb.

Image 55 Installing the Control mount on the handlebar

- Carefully cut the excess strap without accidentally opening the latch on the back side. Leave about 2 – 3 mm of the strap coming from the latch. This way it is safely covered and won't be accidentally opened. If you cut too short and the latch opens, you will be in need of a new mount.

Image 56 Installed CLS Control Display

7.3.4 Installation of the control unit

- Install the control unit inside the vehicle. Fasten it using cable ties or a piece of Dual Lock velcro.

Image 57 CLS EVO Plus control unit

- Route the power supply wires of the control unit to the battery and fasten them with cable ties. Make sure they are safe from being damaged, or squashed (e.g. by the seat or fairings).
- Connect the two wires to the respective battery poles.
- On a series of vehicles the supplemental black-red wire needs to be connected to a „switched plus“ line, because the usual activation through the rippled charging voltage will not work. Some of the vehicles in question are Suzuki V Strom 1000 ab 2014, Moto Guzzi alle neuen Modelle, Kawasaki Versys 650, ER-6, Honda VFR 800 ab 2002, VTR 1000, Varadero, Husqvarna Nuda 900 and a few more.
- Ckeck if the system actives upon engine start (mind the 20 seconds delay) and deactivates upon engine shutoff. Watch the control unit's LED. The blue LED will start flashing as soon as the system is ready, the red LED will light up as soon as the grips are being heated. Should the control unit shut off automatically while the engine is running, you will need to install the supplemental wire (see 4.4.2 on page 14).

Explosion hazard!
Mind the polarity!
Red wire (with fuse holder) goes to the battery's +pole, black wire to the –pole.
The connector's colour does not indicate its polarity.

Short-circuit hazard!
When installing the wires, the ignition and the engine must be turned off. Make sure the bolts in the battery's poles are screwed tightly. When handling batteries, there always is short-circuit hazard. Do not ever short-circuit the battery's poles!

Warning!
Make sure to keep any wiring away from the ignition coil, since it may possibly cause malfunctions of the control unit.

7.4 Handling

The CLS Heat is a temperature regulated heated grips system.

It automatically regulates the heat output of the grips with every change of the ambient temperature.

The control unit monitors the battery voltage. Starting the engine causes the voltage to be slightly uneven (alternating voltage). The control unit reacts to this fluctuation and automatically activates/deactivates with the engine. The system waits 20 seconds after engine start before activating its functions, not to strain the battery too much.

The temperature sensor then instantly measures the ambient temperature. If it happens to be below 15 °C, the grips will automatically be preheated with a higher heat output, which allows them to warm up faster. This preheating process takes max. 40 seconds. The system then remeasures the ambient temperature and, if needed, adjusts the heat output proportionally. Subjective heat sensitivity is different for every human. Also, this sensitivity is influenced by different factors, such as hunger or illness (having a cold).

For this reason, the CLS Heat has the CLS Control Display. The display allows for adjustment of the heat output to ones individual desire. Visit our homepage for a detailed step-by-step Installation video containing visual instructions and explanations.

The default setting for most men is level 4 – 5, for most women level 5 – 7.

Important notes:

- Please bear in mind, that using heated grips will nullify the effectiveness of waterproof fabrics, such as GORE-TEX®-membranes. These membranes will only work if the temperature inside the glove is higher than the ambient temperature. Warm grips and rain will invert the functionality and allow for water to enter the glove. Therefore, use rain overgloves, if necessary.
- When charging the battery inside the motorcycle, turn the heated grips off, as the charging voltage of some battery chargers may activate the system. Simply set the display to level 0 or remove the system's fuse (2).
- We recommend disconnecting the system from the battery or removing its fuse should the motorcycle rest for more than 2 months.
- Warranty = 60 months (no warranty for technical modifications, such as shortening electrical wires).

7.5 Technical data

Operating voltage	10 – 15 V DC
Connected load	max. 70 W
Heat output per grip	29 W @ 12 V DC | 41 W @ 14,5 V DC
Fuse	15 A (blade-type fuse, Type: FKS, colour: blue)
Power control	ON – OFF (PWM)
Reverse polarity protection	The control unit has an internal reverse polarity protection at the 12 V input.

8 CLS Connect

This feature allows for quick and easy connection of your electronic loads, such as navigation, radio and intercom systems, auxiliary headlights, etc.

Connecting a load

- Attach the enclosed 12 V adapters to the desired load. The wire with a red marking is positive, the black one negative.
- Join the connectors of the CLS Connect and the load. You can use the enclosed WAGO quick-connectors for any 12 V load. These quick-connectors can hold hard wire, strands or tinned wire. The wire needs to be stripped for about 10 mm. For loads with less than 12 V, please interpose an appropriate adapter.
  On some navigation systems the needed adapter is enlosed in the socket connection. In this case the corresponding socket needs to be attached to the CLS Connect.

When connecting electric motors to the CLS Connect, a diode is necessary, to prevent damage to the CLS EVO Plus control unit. In this case, please contact us before installation.

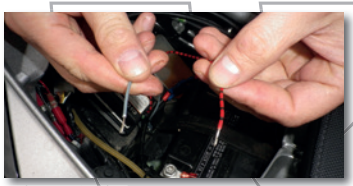
Mind the correct polarity!
Make sure to keep any wiring away from the ignition coil/ spark plugs, since it may possibly cause malfunctions of the control unit.

- The connected device will now turn on and off with the engine.
- The CLS Connect has a programmable follow-up time as one of its features, that allows connected loads to continuously be supplied with power, even after the engine has been shut off. This could be interesting for connected navigation systems, for example. The default follow-up time is 10 seconds. This follow-up time can be reprogrammed. If you wish to deactivate the supply for the connected load, you can either disconnect it from the control unit, or deactivate the whole Connect function via the programming.

Maximum output:
The system has a maximum continuous current of 10 A (120 W).

Programming the follow-up time:

- Strip the red-black and grey wire.
- First, connect the grey wire to ground (–pole of the battery or a bolt on the frame). Then, activate the CLS Connect by staring the engine, or directly connecting the red-black wire to the battery's +pole without starting the engine.
- Now, the blue, red and yellow LED will light up.


stripped wire


grey wire grounded


red-black wire on +pole


both wires on battery poles


blue, red and yellow LED glowing after engine start


yellow LED glowing during programming of the follow-up time.


WAGO connectors attached to the connection cable of the Connect. Now, a load can be connected to the WAGO connectors.

- The LEDs will go out for a second, when entering programming mode. If you disconnect the grey wire from the ground during this time, the Connect function will be completely deactivated.
- Keeping the grey wire connected to the ground will start reprogramming of the follow-up time.
- The Connect is built to multiply the time you leave it active during reprogramming by 10, thus setting follow-up time. During reprogramming, the yellow LED will glow.
- For example, if you leave the grey wire connected to ground for 6 seconds, as described above, the CLS Connect will keep supplying the connected loads for 60 seconds after the engine has been shut off.
- Successful reprogramming of the follow-up time will be indicated by short flashes of the yellow LED.
- Reprogramming the follow-up time can be redone anytime. The set values will be saved, even after disconnecting the system from the battery.
- Connecting multiple loads to the CLS Connect is easily possible, as long as 10 A are not exceeded.

Short-circuit hazard!
Insulate both wires after reprogramming the follow-up time to prevent malfunctions during operation. If you need to use the red-black wire for operation (see 4.4.2 on page 14), reconnect it to + 12 V „switched plus“.

9 Maintenance and care

The CLS systems are maintenance-free. Check the oil level from time to time. One fill should last for about 10.000 km, depending on the chain dimension and the frequency of rain and offroad rides.

10 Troubleshooting

10.1 CLS EVO Plus chain oiler

Symptom	Possible cause	Solution
No oil flow/ chain is dry	• Oil tank is empty • Nozzle not at the sprocket • Oil line kinked • Control unit not correctly connected to the battery • Display not connected to the control unit • Li Ion or Gel battery installed and supplemental wire not in use	• Refill oil and vent oil line • Position nozzle at the sprocket • Rerout the oil line • Connect the control unit to the battery • Connect the display to the control unit • Connect supplemental wire
Control unit's blue LED does not glow	• Engine is off • Wrong polarity • Fuse has blown due to damaged positive cable • Battery has been reinstalled, but one or both wires not reconnected → supplemental wire needs to be connected	• Start engine • Connect wires with correct polarity • Repair damaged area and change fuse • Connect wires → Connect supplemental wire
System drips oil after engine shut off	• Oil line damaged • Supplemental wire connected to steady plus • Battery charger connected	• Repair oil line • Connect supplemental wire to „switched plus", disconnect from steady plus • Remove fuse during charging
Nozzle is gone	• Oil line has not been taken out of retainer piece to remove rear wheel. → Do not bend the nozzle while inside the retainer piece. Steel wire will lose tension over time. • If nozzle has too much tension, it will slide downwards into the chain, when pushing the motorcycle backwards, and be pulled out or damaged with parts of the oil line by the sprocket.	• Replace nozzle properly (witch heat-shrink tubing on oil line and nozzle), loosen clamping in the future when removing rear wheel.

10.2 CLS Heat heated grips system

Symptom	Possible cause	Solution
Heat output too low	• System set too low/deactivated via the display • Temperature sensor not in general area of the hand	• Activate system/raise set level • Place sensor near hand
Heat output always on full power	• Temperature sensor wire kinked	• Repair wire
System glitches during function, switches to starting sequence while driving	• No clear signal from the battery to the control unit (Li Ion or Gel battery, or equivalent alternator)	• Connect supplemental wire to „switched plus“

MOTORRAD
"highly recommended"

MOTO ROUTE MAGAZIN
DER TOP TIPP ★★★★★
"We have tested the system, an ingenious invention!"

REISE ride on! MOTORRAD
EMPFEHLUNG
Features/ Manufacture ★★★★★
Price-performance ratio ★★★★

motoTraveller
Conclusion: „The CLS Heat convinces by it's solid manufacturing, ease of installation and most of all, a very pleasant regulation of heat output."

MOTORRAD NEWS
TIPP
200 µ easy handling, good installation manual, compensates temperature-induced differences in viscosity.

TOPTIPP
MOTO ROUTE MAGAZIN
Winner of the comparative test CLS 200 µ vs. Scottoiler

PS Tipp
Verdict for the CLS 200 µ: very good

CLS products convince through ...

... innovative technology and highest quality.
Well thought through and developed from practical experience, our products are more reliable and smart than anything you had previously known.

Convince yourself

Use our experience and profit from our first-class service.
The CLS Experts are happy to assist you anytime.

CLS-Chain Lube Systems
Heiko Höbelt e.K.
Unterer Maasweg 3
D-96484 Meeder | Germany

Tel.: +49 (0) 95 66-80 84 34
Fax: +49 (0) 95 66-80 84 35

info@cls-evo.de
www.cls-evo.de

Company stamp

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The CLS Team wishes you a safe journey!