

# Sinner Mango User Manual

## 1. Introduction

Congratulations on becoming the owner of a Sinner Mango velomobile. The Sinner Mango velomobile offers a new way of transporting yourself and your belongings, in comfort and speed, free from the effects of the weather. The Mango is designed to require the minimum of maintenance while transporting the rider many thousands of kilometres.

This manual gives instructions for usage and maintenance for the Sinner Mango velomobile. It applies to all models of the Mango produced by Sinner (Mangos with serial numbers from 116) and also contains many details which are relevant to earlier Mangos, with production serial numbers before 116.

The information given includes tips on adjusting the Mango to your size as well as how to get and out of the Mango. There is also information to help with regular maintenance of your Mango to keep it running as well as when it was new. We hope you enjoy many thousands of kilometres of riding.

## 2. User tips

A number of things are different about the Mango than a normal bicycle. While it is tempting with any new bike to immediately try to break your own existing speed records, we recommend a period of relatively relaxed riding while you get used to your new vehicle. In particular it is a good idea to ride carefully (slowly) in corners and around obstacles. Give yourself a little time to get used to the handling of the Mango and keep in mind the points below.

### Riding in a Mango

- The interaction between steering and brakes is different from a normal bike
- A three wheeler has a very different way of taking corners from a two wheeler. Excessive speed in corners can result in tipping and crashing. The Mango has the front wheels set so far apart as possible, and corners very well, but to corner safely at speed requires practice.
- Due to the aerodynamics you can easily reach a high speed with the Mango. Please take care to allow a longer stopping distance, and don't ride excessively quickly too close to other cyclists.
- The Mango has good ground clearance for a velomobile, but it is still more limited compared with a two wheel bicycle. Take care over traffic calming measures and similar obstructions. If you use narrow tyres this is a greater problem than if you fit wider tyres.
- Due to the aerodynamics and the high speeds that can be reached riding downhill, the Mango relies more on its brakes than a normal bike to stop or slow down while descending. The Mango offers a choice of three types of brakes. The 70 mm Sturmey Archer drum brakes in particular have a limited performance and can reach a very high temperature during descents. If you smell "burning" from your brakes, slow down.
- It is better not to ride long distances with the brakes half applied to limit your speed and instead to brake more sharply before corners.
- If you suffer from overheating brakes, it may be better to ride without the wheel discs in place at least while you descend. This reduces aerodynamics a little, so reduces the amount of work that the brakes have to do, and also allows more air to reach the brakes and cool them down.
- Before each ride, check that your tyres are free of damage and pumped to the correct pressure shown on the tyre side-wall. A sudden flat tyre can make the Mango difficult to control.
- Also check the operation of the brakes before each ride.
- If you have a derailleur gear system you will have to pedal as you change gear. It is not possible to change gear at a standstill, and trying to do so can force the chain off the chainrings or cassette. Try to ease off the pressure on the pedals a little while you do this and you will achieve easier and less noisy shifts.
- If you have a hub gearing system you will also have to ease off a little while you change. However, with such gears you can also change gear at a standstill.
- If you roll the Mango backwards this can cause the chain to come off, especially with a derailleur gearing system if the gear shifter has been moved since riding.

## Traffic

- Mangos are an unusual sight on the streets. Please take care to give a good impression as you ride.
- While the Mango is relatively large, usually made in an easy to see colour, and carries reflective materials and lights, in some instances it can be difficult to see, for example behind a parked car. Take care, even if you have priority.

## Usage

- The Mango is built so light as possible. The bodywork is strong enough to take the forces which it experiences as you ride, but it is not strong enough to withstand abuse. Do not sit on the Mango or rest heavy objects especially on the front of the Mango.
- Due to its lightness, a parked Mango can be lifted by heavy winds.
- Velomobiles are rarely stolen as they are conspicuous and difficult to sell. However, it is a good idea to lock your Mango if you have to leave it. We recommend locking the Mango through the rear wheel and securing to a bicycle rack or other street furniture which is not easily moved. It is not possible to remove the rear wheel without tools. You can also lock through the front wheels and suspension and steering components.
- We recommend a regular service for your Mango, either at Sinner's Ligfietsgarage in Groningen or at one of our dealers. Our recommended interval for servicing is once per year or every 10000 km, whichever comes sooner. Good maintenance leads to greater riding pleasure.

## 3. Setting up the Mango

Before riding it is important to adjust the seat and pedal positions. Normally this is part of the procedure when you take delivery of your Mango, but if you live a long distance from Groningen or have bought your Mango second hand you may have to do this yourself. It is important for your comfort, safety, and the efficiency of your cycling that you have the correct position. An incorrect position can give lower power output from your body and lead to injury.

### The Seat position

The position of the seat on Mangos before approximately serial number 150 was adjusted by Sinner and could not be changed by the customer. This can be recognized by the seat resting on blue colour foam.

From number 150 onwards, Sinner switched to a new seat which is lighter in weight and mounted in a firmer manner. This does allow changing of the position by using just a few tools and as required it can be retrofitted to older Mangos.

With the new system there are two different lengths of seat available: a "normal" and a "long" seat. The "long" seat is for people over approximately 1.8 metres (5'10"). The maximum height for a Mango rider is approximately 2.05 m (6'8") and the minimum is approximately 1.6 m (5'3").



The position of the front of the seat is adjusted forwards and backwards by loosening the two bolts which attach the seat support to the frame and sliding the seat support forwards or backwards. You will need a 5 mm Allen Key for this job. The height of the front of the seat is adjusted by removing the bolts on the side of the seat support and moving the seat up and down. Plastic washers are used so that the seat can be lifted and lowered. These bolts are normally tightened so that when lifted the seat will stay up allowing access to the baggage space behind. In some cases, these bolts come loose too easily, which can be rectified by using locktite on the threads.

The height of the rear of the seat, and the angle of the seat are adjusted by removing and replacing the three bolts through the rear seat support. These squeeze the seat support against the frame, and must be done up very tightly so that they do not move when you sit down. For this job you need a 5 mm Allen Key and a 10 mm spanner.

The position of the seat is always a compromise between being able to adequately see the road ahead and wanting to be lower in the Mango to keep the centre of gravity low.

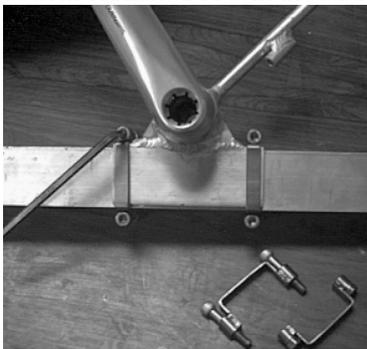
It is important that the seat is supported only on the two points shown. It should not also come into contact with the frame tube or with the idler wheel underneath the seat. There should be a little resistance as you push the seat down on top of the rear support, and the seat should hang under tension, a little like a hammock.

Most people use foam blocks attached with Velcro either side of their shoulders. This leads to a more stable position in the Mango. You may need to remove a little of the fibreglass body around the entrance hole if your shoulders are uncomfortable.

### **The Pedal / Bottom Bracket position**

The pedals can also be moved forwards and backwards within the Mango. An approximation of the correct position can be found quickly by sitting in the Mango and resting your heel on a pedal at the furthest distance from you. From this you can judge whether the pedals are too close or too far away. Pedals at an incorrect distance can lead to fatigue and injury so it is important that this is adjusted correctly.

To access these, you need to turn the Mango on its side (rest it on a blanket or grass to avoid damage to the shell) and reach through the foot holes. First mark the frame with an indelible pen so that you know where the starting position was and then you can adjust the position by loosening four bolts on the two clamps which hold the bottom bracket. You will need a 5 mm Allen Key for this job.



*Adjusting pedal / bottom bracket position*

As standard, the Mango is delivered with SPD pedals. You must wear special cycling shoes compatible with the SPD system and fitted with the correct cleats. Other “clipless” pedal systems can be used but we do not recommend riding without your feet firmly attached to the pedals. There is a change of injury should your feet drop off the pedals and contact the ground.

If your shoes come into contact with the bodywork you may need to adjust the position of the cleats on your shoes. This is more frequently a problem for taller riders who’s feet are further forward in the Mango.

If you move the pedal position you may also have to make the chain longer or shorter.

### **Foot holes**

The foot holes serve several purposes. They allow space for your heels to rotate without coming into contact with the bottom of the shell, they are used if you need to reverse for a short distance (push backwards with your feet) and they allow air to enter the Mango as you ride along.

If the foot holes are too short then your feet can catch on the bodywork and cause damage. If this is so, we recommend cutting the foot holes into a large size. Apply self adhesive tape and draw equal sized round shaped holes at both sides. We use the same tool as is used in hospital to remove plastercasts, many hobbysaws can be used. It is important that the holes have rounded corners. Sharp corners concentrate forces and can cause damage to the bodywork.

## 4. Riding the Mango

### Getting in and out

Take care with how you get in and out of the Mango. We recommend following these instructions:

- Put the Mango on its parking brake.
- Put the steering column under the bonnet. It should remain in the upright position.
- Put one foot on the very strong black “bridge” which spans the gap between the front wheels, and not on the bottom of the bike which is only thinly constructed.
- Support your weight with your hands on the side of the Mango.
- Sit on the back of the Mango just ahead of the roll protection.
- Lower yourself onto the seat. Don't slide down the seat as you will likely cause the cushion to move.
- Take hold of the steering column.
- Getting out the Mango is the opposite of getting in.



### The Steering Column

The steering column can be held in any position that you find comfortable. You steer by turning it. A small piece of foam rubber (which you can replace if it gets worn) is positioned under the bonnet behind which you can slide the steering column so that it stays in place as you climb in and out.

### Brakes

There is a single brake lever on the steering column. This pulls on two separate brake cables for the front brakes. The parking brake consists of a small piece of metal which can be turned into position when the brake is pulled on.

If you have hydraulic disk brakes then there is one cylinder on the steering column which operates both brakes. You will also have a separate lever which operates a completely independent mechanical brake calliper which serves both as parking brake and as emergency brake in the event that the hydraulic system fails.

### Gears

Mangos can be fitted with either twist grip gear changes or bar end shifter. By convention, the right hand shifter is the most commonly used, operating either the rear derailleur or the hub gearing at the back of your Mango while the left shifter will operate the front derailleur. If you have a third shifter for a Dual Drive then we recommend that this is left as much as possible in the middle position ( 2 ) which is most efficient. Only use the other gears in the Dual Drive if you really need those gears.

### Horn, bell and indicators

If you have an electric horn and indicators in your Mango then these controls are also fitted on the steering column. A bell is always fitted as standard, and operated by pulling on a cord which is attached to the steering column.

## Dashboard

Many more controls can be found on the Mango dashboard. The dashboard shown is that standard for Sinner Mangos from approximately June 2009. Dashboards from earlier Mangos did not necessarily include the same features.

As standard the computer is mounted on the dashboard and you will have three other switches:

- Master switch to turn everything on and off at once, analogous to “ignition” switch in a car. It is not necessary to remove the battery to turn everything off.
- First headlight switch
- Interior light switch.

Optional extra features on the dashboard are:

- Second headlight
- Indicator lights and emergency “all four flashing” switch
- Fog light
- USB on/off and powered USB ports for accessories.

The headlight switches also switch on the rear light.

In the Mango Sport, the dashboard is omitted and a single master switch provided which turns on day-lights. A removeable headlight can be mounted next to the mirror and can be powered by a socket provided for this purpose. This socket is also switched by the master switch.

The Mango electrical system works on 6 volts. This is provided by a battery of 5 NiMH cells in a battery pack. A suitable battery pack and charger is provided with the Mango.

Various different batteries have been provided within the lifetime of the Mango. Most have come with batteries with a capacity of around 4.2 mAh. In theory, and under ideal conditions, this is enough to run one Busch & Müller IQ Speed headlight for approximately 7 hours in the 50 lux mode and 26 hours in the 10 lux mode, and all other electrical parts other than the horn use less electricity than this. However, in practice batteries are rarely fully charged and rarely can all the energy be extracted from them. Also, cold conditions and fast discharge rates further reduce the energy available from a battery.

With age, the capacity of the battery will reduce. Rechargeable battery packs of all types have a limited lifetime both in years of service and number of charges. If you need a replacement, other 6 V battery packs can be used.

It is not normally required to regularly empty your battery and a very bad idea to leave the power on to your Mango until everything goes out. This will take the voltage to a lower point per cell than is beneficial to the battery. Due to a fear about “memory effect” if they recharge their battery without emptying it first, some owners have damaged their batteries prematurely by running them completely flat.

Some Mangos have been delivered with hub dynamos and a regulator which charges the battery from the dynamo. If you have this then you will rarely have to use the charger. However, in this case it is a good idea to discharge the battery every 2 months. For this reason, Mangos delivered with a dynamo are provided with a more advanced battery charger which can safely discharge the battery before recharging.

In earlier versions of the Mango a replaceable fuse was used to ensure safety from fires caused by short circuits. Later versions have a self resetting electrical fuse within the dashboard which does not need replacing in the event of a short circuit.

## Computer

The bike computer supplied as standard with the Mango is the Cateye Enduro 8. Other computers can be fitted.



Different tyres require different wheel size settings in the computer. Here are some examples:

Vredestein Perfect Moiree 35-406	147 cm
Vredestein Perfect Moiree 47-406	155 cm
Schwalbe Kojak 35-406	150 cm
Schwalbe Durano 28-406	145 cm

See the computer manual for details of how to change the tyre size.

## Foam Cover

The Mango includes a cover made from heat formed foam. It is useful in bad conditions as it keeps you warm as well as dry (except for your face) as you ride. In good weather this can be stored under the bonnet above your legs so that it does not use any of the luggage space. For some people there is inadequate space for knees or toes, so the cover can be rolled (lengthwise, in the same direction as the existing curve) and stored in the back of the Mango. If this is done, the cover should not be left rolled for too long a period as it will take on the tighter curved form.

Unless there is high wind, it is possible to stretch out your arm to indicate a change of direction if you don't use all the Velcro attachments.

When you park you can use the small extra cover to close the gap between the foam cover and the roll protection in order that rain doesn't make the seat wet.

## Mirror

A single mirror is provided on either the left or right side depending on the custom of the country to which the Mango is to be sent. A second mirror is available as an option.

## Luggage space

The main luggage space in the Mango is behind the seat and above the transmission. This area is reached by lifting the seat forwards. To the height of the seam, there is about 70 l of space in the narrower body of the Mango Classic and Mango Sport and about 130 l in the Mango+. This this you can add the considerable space either side of the seat, which can be easily accessed while you ride, and the space behind the seat and above the seam.

Because of the shape of the luggage space it is easier to pack many small bags than a few large ones. Take care that the seat is not supported by your luggage, and that the luggage does not push the rear wheel cover inwards onto the wheel itself.

It is a good idea to store heavier items nearer the centre of the bike as heavy items in the very back can affect cornering. Also, take care that small items cannot find their way under the seat and into the chain.

The Radical Design velomobile bag is a convenient bag for use beside the seat in the Mango.

## Legality and perceptions

The Mango rides very differently from a two-wheeler which most cyclists have previous experience, and we recommend taking time to slowly learn how it handles before trying to ride quickly. Other road users may be surprised by your speed if they perceive you as a cyclist, or in some cases by your slowness if they think you have an engine.

In all countries that we are aware of, the Mango is legally a bicycle and can be ridden wherever a bicycle can be ridden. In the Netherlands its width of 75.5 cm results in the Mango being legally useable on roads (except motorways and similar roads which exclude slower vehicles) as well as on the cycle path. Local regulations in other countries may be different.

## Safety

Most Mangos are in bright colours, and all Mangos are delivered with much use of reflective material. However, whatever is done it is impossible to guarantee that you will be visible in all circumstances. Take extra care around road junctions, drive-way entrances, and anywhere where your visibility may be limited – for example near high grass.

It is possible to lose control of the Mango if you have a flat tyre. If you suspect that a tyre is deflating, carefully slow down and check the tyre.

If your brakes are hot due to heavy braking when descending a hill, please stop and allow them to cool and check their operation before continuing.

Regularly check that your lights work, and charge your battery if you will need the lights.

In strong sunlight you can't always rely on the indicators being seen.

If you wish to wear a helmet you will need one with a short tail. "Aero" helmets will get in the way.

Some people like to use a flag to increase their visibility. If you wish to mount one, then it is best to drill a small hole in the top of the roll protection behind your head to take the stick. To do this, first attach a piece of self-adhesive tape to provide a surface in which to drill and reduce the chance of slipping and causing a scratch.

## Storage

It is best, of course, if you have a secure garage or shed in which to store your Mango. However, the outside of the body of the Mango is extremely weather resistant and it is also OK to keep your Mango outdoors. Some people have built small "car ports" or use a motorbike cover.

It is a good idea not to leave food in the Mango which could attract animals, and to make sure it is closed to prevent cats from finding their way inside.

## Transport of your Mango.

Of course the nicest way of transporting your Mango is by riding it. However, this is not always practical. The Ligfietsgarage can provide packing crates such as we use for sending the Mango to customers all around the world.

It is of course also possible to transport the Mango within a large enough van. If you do this, secure the Mango with its parking brake, and cover any parts which could be damaged with blankets. Also tie down the Mango to make sure it cannot move even in the event of an emergency stop.



It is also possible to transport your Mango on the top of a car. In this case you rely on the Mangos tyres to protect the top of the car from being damaged by the Mango. You can then tie the Mango down to rails on top of the car. In particular, tie the front wheels sideways, and use a strap over the cockpit opening, with foam rubber or an old blanket to protect the body of the Mango.

It may look a bit cumbersome, but the Mango is more aerodynamic than a normal bike, so will cause less drag on the top of a car than a bike rack carrying normal bicycles.

However, do take care as you drive. The combination will be more affected by side-winds, and a height restrictions could ruin your whole day.

## Riding Efficiently

Due to its aerodynamic shape, the Mango is fast. For about the same effort you should find you are at least 20% faster than on a traditional racing bike. If you stop pedalling you will keep your speed for longer than you might expect. Acceleration and deceleration cost a lot of energy.

An efficient rider will pedal less hard from a standstill and build up speed over a few seconds. This way you save your effort for when you need it, but still achieve around the same cruising speed. Taking a "racing line" through corners reduces the need to brake and saves energy (but don't cut corners that you can't see around). Slowing down gradually to a stop instead of pedalling right up to stop lights also saves a lot of effort, and perhaps the traffic light will change to green before you arrive at it.

Try to ride with a relatively high pedal frequency. Due to having a seat to push against you can push the pedals very hard. However, to minimise wear and tear on the knees and muscles of the rider it is best to pedal more lightly at a higher speed. Use lower gears and try to keep your cadence around 80-90 revolutions per minute. SPD pedals help.

## Identification

The frame number of your Mango is located on the frame under the seat. A typical recent frame number is "1009260". This indicates that the Mango was built in 2010 in September (month 09 and has serial number 260)

## Clothing

The foam cover makes a huge difference to warmth on cold days and in the Mango it is normally not necessary to wear many clothes, even on cold days. Many riders wear just a shirt and shorts even if there is ice and snow outside. However, your head is exposed so we recommend a scarf and warm hat in cold weather. Unlike on most bicycles, gloves are rarely needed. If you ride in cold weather we recommend carrying warm clothing even if you don't wear it as if you have to stop you may need it.

In warm weather you will mostly not want to use the foam cover. Airflow is then greater, and as the Mango provides shade from the sun for at least part of your body it is not necessarily hot to cycle even on very sunny days.

We recommend that you wear glasses at all times as the chance of eye injury is greater as you cycle at higher speeds.

## 5. Maintenance

Regular good maintenance of your wheels, steering, brakes and drivechain are important. Inexpert repair can be dangerous.

### Tyres

Keep the pressure in your tyres at the figure on the side of your chosen tyre. Low pressures cause higher rolling resistance, and require more effort on the pedals. They also cause some uncertainty in cornering and in extreme cases can cause the tyre to come off while cornering, which can cause a crash. It is worthwhile to occasionally inspect tyres to check for embedded glass and stones which could cause punctures.

Due to their smaller radius, bike tyres require much higher pressures than car tyres. 6 bar (90 psi) is unknown for car tyres, but not especially high for a bicycle tyre. A bicycle tyre at six bar will feel solid. It won't be possible to deform it significantly with your fingers.

The Mango can in principle be fitted with any tyres with the ETRTO 406 size. In practice the outside side needs to be within reasonable limits. Anything up to 50 mm wide should work on the rear wheel, and on the front wheels of the Mango+. The Mango Sport and Mango Classic have smaller front wheel arches and their front wheel width is limited to around 40 mm.

We recommend the use of good quality tyres from manufacturers such as Vredestein, Schwalbe and Continental. However, if you need a tyre in an emergency the 406 size is also that used by BMX bikes and many children's bicycles, so tyres are readily available in this size worldwide.

After changing a tyre, please take care that you understand the characteristics of the new tyre. Harder rubber compounds typically have far less grip in the wet.

### Punctures

The wheels on the Mango are all attached on one side only. This makes it very easy to take off one side of a tyre and replace the inner tube without having to remove the wheel.

We suggest tipping the Mango on its side in order to do this. It is best to find an area of grass in order to avoid scratching the side of the Mango on concrete. If you have no choice but to do the work on concrete, you can also use the foam cover to protect the Mango.

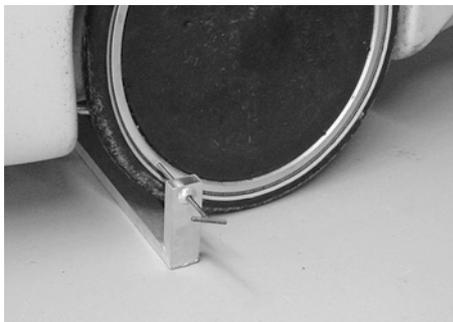
To avoid punctures, always keep the tyres at or near their maximum recommended pressure. In wet weather it is more likely that stones will penetrate the tyre and cause punctures. For this reason many people swap between summer tyres and winter tyres, using a faster but more easily punctured tyre in the summer and a slower riding but more difficult to puncture tyre in the winter. The Schwalbe Marathon Plus is currently one of the most puncture resistant tyres available.

### Tyre damage

Tyres wear with use. On any three wheeler, including the Mango, they wear to a flat profile. If stored for a long period they can crack, and if exposed to the sun this can also cause damage. Fast and aggressive cornering wears tyres more quickly.

It is important to check your tyres regularly.

If your tyres start to wear more quickly and you believe that your speed is less than it used to be, then it is possible that the tracking of your front wheels is not accurately set. This can change due to minor collisions, or due to riding through potholes.



In principle the wheels must be exactly parallel with each other. In practice this can rarely be achieved and so it is best that they are slightly “toed in”, or closer together at the front of the bike, rather than the other way around.

You can bring your bike for testing at the Ligfietsgarage in Groningen. However, if this is not convenient follow these instructions:

- Find a flat area of ground
- Remove wheel covers
- Set the steering absolutely straight
- Measure the distance between the wheels so far forward as possible and so far to the rear as possible.
- If the difference is more than 3 mm then you should adjust the balljoint behind the wheel (relative to direction of travel) on the side which looks to be less correct by one turn and check the tracking again.

Note: If your wheels are no longer true then you will not be able to adjust the tracking so easily.

### Spoke replacement and tensioning

Regularly check your wheels for broken spokes. Front wheels in particular have to counter very high sideways forces on the Mango during fast cornering.

All wheels on the Mango have 36 spokes. The rear wheel spokes are 187 mm in length. The front wheel spoke lengths vary depending on the type of brake:

70 mm Drum brake	178 mm
90 mm Drum brake	174 mm
Disk brake	184 mm
Disk brake with SON dynamo	

Before replacing spokes it is necessary to remove the wheel. As you replace a spoke, set the tension similarly to those alongside it. It is not always necessary to completely retension the wheel.

Loose spokes will fail due to metal fatigue, but it’s also important not to over tension spokes as this will break either the rim or the hub.

Building wheels takes a bit of experience. It is possible to buy new wheels, or have old ones rebuilt, at the Ligfietsgarage in Groningen.

## Removing front wheel

Front wheels with drum brakes can be removed very easily using just a 5 mm Allen key:

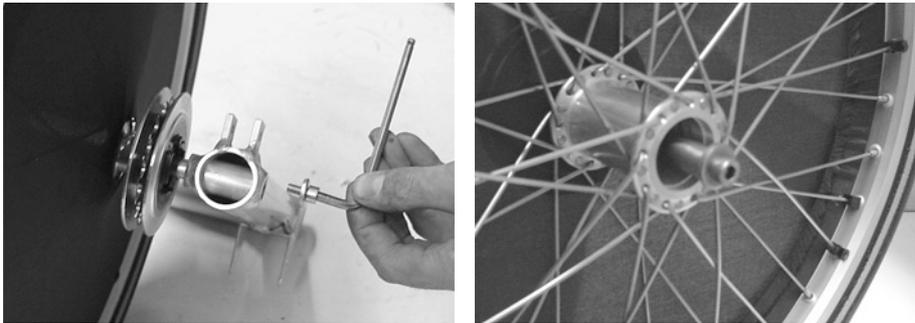
- Let off the parking brake
- Remove wheel disk and plastic cap.
- Support the Mango with a block of wood underneath the metal part just before the wheel.
- Unscrew the bolt in the centre of the wheel.
- Pull wheel.
- When you re-attach, make sure the bolt is tight.



## Removing rear wheel

You need two 6 mm Allen keys to remove the rear wheel.

- Take the rear chain off the rear chainrings and leave it lying in the bottom of the Mango.
- Remove the bolt on the side of the fork, and keep it for re-assembly. You may need to hold a second Allen key in the bolt on the other side of the wheel while you do this, and you may need someone else to hold that for you (inside the wheel arch underneath the Mango).
- Push the axle out from inside the Mango. You can use the end of the Allen key to start this. Eventually it is possible to pull it from inside the wheel arch.
- The wheel can now be removed from the wheel arch.



*NB: In the photo, the rear fork is removed from the Mango. In practice, this is not necessary.*

If you have difficulty with removing the bolt, use anti-seize oil.

## Removing Freewheel.

To remove the freewheel you will need a special tool. In some cases it is also possible using a hammer and screwdriver.

First remove the rear wheel as above. Then for older Mangos you will need to take apart the hub in order to take off the freewheel. Later Mangos have a reverse thread freewheel which can be unscrewed without taking the hub apart.

Hold the wheel with the freewheel side below. Tap with a hammer on the removal gaps to remove freewheel.



## Drivechain maintenance

It is important for the life of your drivechain that the chain be oiled every 500 km. Use just a little oil and remove excess. We supply a bottle of high quality Morgan Blue oil with every Mango.

By doing this the wear on the drivechain is minimised, and some riders have managed over 45000 km with minimal wear on chain and chainwheels. This not only reduces costs, but it reduces the time taken to repair your Mango, meaning there is more time to enjoy riding it.

While you do this, also add a drop of oil to the top of each of the front suspension mounts. This prevents these from ceasing up over time. Do not over-oil the suspension mounts because doing so causes the suspension to lose damping.

## Derailleur maintenance

During the wearing in period with any new bike it is normal that the derailleur cable will “stretch” a little causing shifts to become less firm. An adjustment is provided at both ends of the derailleur cable. If you unscrew the adjustment by the right hand shifter by a small amount then you should find that your shifting becomes good once again. This can be done as you ride.

## Brakes

Brake cables also can “stretch” a little. The same technique, of unscrewing a little at the handlebar, can bring your brakes back to full performance. It is also important that the brake cables themselves remain in good condition. You may want to visit a bike shop to have this job done for you.

After checking the brakes, you can test whether both are equal by putting on the parking brake, lifting the back of the Mango and checking if pushing left and right is equally easy.

Due to damp inside the brakes, a little corrosion can occur. Test for this by inspecting the brakes with the wheels removed. You can apply a little light oil to the brake pivots.

Take care that no oil or grease comes into contact with the brake surfaces, as this will result in very much less braking power. It does not “burn off” quickly.



## Maintenance of the body

The body is as standard made with a gelcoat covering which is permanent and has excellent resistance to the weather, UV light and most chemicals. Brake cleaner (iso-propyl alcohol) and acetone can both be used on the bodywork of the Mango.

Waxes and polishes can be used to maintain a high finish on the body. Most, if not all, products sold for use on cars should also be good on the Mango. If you are in any doubt, try it first on the underside of the Mango where any damage will not be obvious.

If you have major scratching or crash damage, this can be fixed by a car re-spray company. After such treatment a Mango can look just like new, though the paint finish will not be quite so resistant to damage as the original surface. Minor damage can be patched up at home with use of a kit for repairing damage to cars, but it is difficult to achieve an invisible repair.

## 6. Address

For questions, maintenance, appointments for services, please contact the manufacturer at:

Sinner Ligfietsen / Ligfietsgarage Groningen  
Stavangerweg 15  
9723JC GRONINGEN  
The Netherlands  
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Also check the websites for more information:

<http://www.sinnerligfietsen.nl>  
<http://www.lfgg.nl>