Minsk Repair Manual

By
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REPAIRING NON IGNITION PARTS 25

Hail the Minsk

The Minsk is the only remaining Eastern Bloc 1950's designed two-stroke scrambler still in production on the planet and the only dirt bike in the world with the option of a user friendly touring seat. It is designed for difficult roads, slippery goat tracks, forest paths, mountain inclines and for where there aren't any roads at all. Minsks are imported into Vietnam as farm machinery, not vehicles, and form the backbone of the nation's rural economy. At different times Minsks have been seen hauling up to 15 dogs, three huge pigs, one cow, one buffalo, seven people, three other Minsks or 20 bicycles. The Minsk is a beast that will get you where you want to go. No wonder the Vietnamese call it the "CON TR©U GI " (old buffalo).

The Minsk is a practical and pragmatic bike with no flash or sharp design. It is made of steel not chrome and prefers to be greased not polished. It is a war-horse which carries its wounds and scars well and can be repaired with just a rock and a stick. The Minsk is cheap to buy and maintain, there are mechanics everywhere, it is a snap to repair by yourself and it is incredibly robust, inconspicuous and gutsy. That is why the Minsk is easily the best motorcycle to travel with in Vietnam. Just ask anyone who has toured on one.

This manual is about showing you how easy it is to repair your Minsk. If you understand only half of the advice herein then you will still be in a strong position to explore the back roads of Vietnam with confidence and ease. This manual is designed to get people out into the mountains so they can have a good time safely in this special part of the world. The more you know about the basic running of the bike the easier it will be to not get stressed if something goes wrong out on the road. Simple problems like faulty sparkplugs, loose wire connections or scum in your filter can stop the bike and leave you stranded. However, with just the slightest of know-how you can fix these yourself and be back on the road in a flash.

It is satisfying touring on a Minsk because the bike makes you think for yourself. It is very rewarding to have your Minsk die on you out on a mountain road with a nice view and then be able to fix it in under five minutes. Have problem, no worries! Expect to have some fun improvising with gaffer tape, wire, sticks, rocks and tractor parts. On one trip a cracked front mudguard was replaced by two pieces of bamboo and a towel. On another the front wheel was stopped from falling off with rubber straps made from inner tubes tied to the wheel and handle bars. One Minsk Club member even used his brake cable to strap the frame together when the main bar under the petrol tank snapped on him.

Northern Vietnam is an incredibly beautiful region, so get on your Minsk and get out there. Good luck!

Understanding the Minsk

Electricity, petrol and air combine to cause an explosion in the cylinder above the piston to create the energy to run the bike. This is the ignition system. Then the cam disk, clutch, gearbox and chain transform this chemical explosive energy into forward movement on the back wheel. This is the transmission system.

The energy from your leg when you kick-start the bike does two things. Firstly, it pushes the piston up and down which sucks petrol and air from the carburettor into the cylinder. Secondly, it causes a magnet to spin inside the generator which creates a charge. This charge then makes its way to the sparkplug where it causes an explosion which forces the piston to move up and down again. When the piston moves in such a fashion it sucks in another batch of petrol and air from the carburettor and also causes the generator to make another burst of charge because the piston and the magnet in the generator are connected. Everything is cleverly timed so that the sparkplug fires only when the piston is in the right position in the cylinder (the top) so that the full force of the explosion goes into forcing the piston back down again. So long as you keep introducing petrol into this system then the engine will run in this perpetual way.

Understanding the Electrical System

The electricity is produced in the generator when a spinning magnet creates an electric charge by moving past a series of wire coils. If you cast your mind back to physics classes at school then you might remember how this is the same system used in hydro electricity dams to produce electricity. In the dam the huge magnets are spun from the force of the dam's water rushing down over huge paddle wheels whereas with the Minsk the initial movement of the magnet is caused when you kick-start the bike. Once the bike has started, the force to spin the magnet comes from the movement of the piston.

Most of the coils (there are four of them) in the generator produce electricity for the lights and horn while the remaining two or three coils (depending on the type of generator used) produce the charge for the sparkplug. This charge then passes through the electric box under the seat (where it is made into a consistent charge), then over to the transformer under the tank (which boosts the charge into massive volts) and then onto the sparkplug.

Understanding the Generator

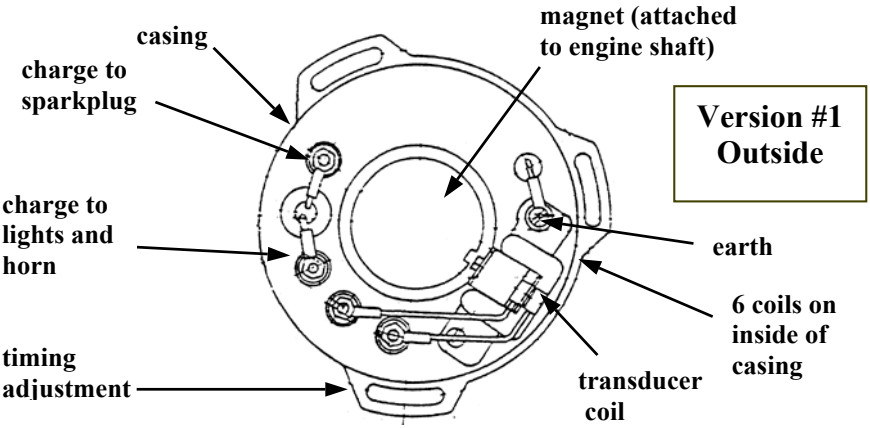
Every time the piston goes from the top of the cylinder, down to the bottom and back up to the top again, it causes one revolution of the cam disk. The cam disk is a large double disk deep in the engine under the piston which converts the up and down movement of the piston into circular momentum. This circular movement is then transferred to the generator via a shaft which runs though the

axis of the cam disk to the magnet in the generator. One revolution of the piston causes one revolution of the cam disk and one revolution of the magnet.

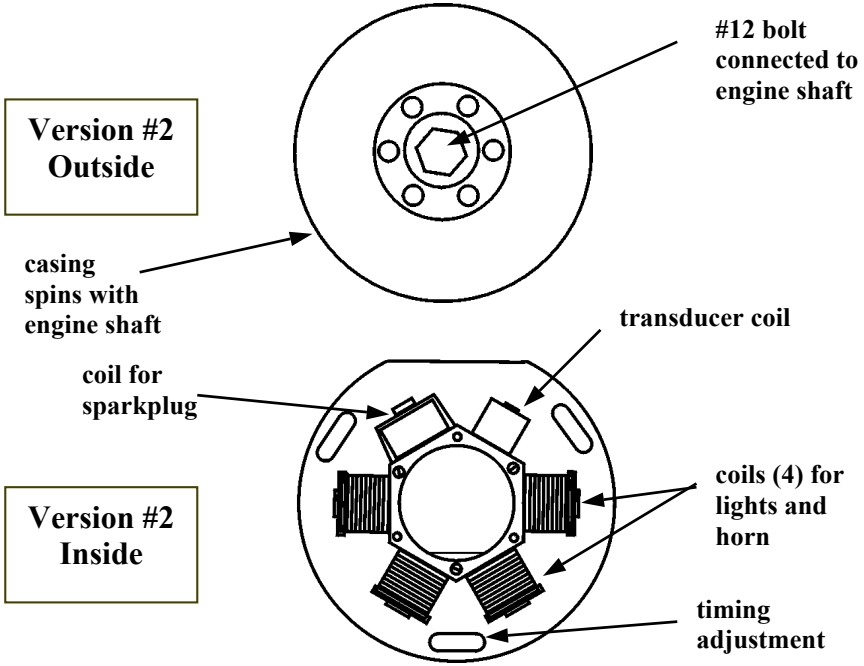
The coils in the generator are positioned to release the charge at just the moment when the piston begins to move down the cylinder again. In this way all the explosive energy is converted into a downward push to the piston. This is called the "timing of the generator". When a bike has bad timing then much of the power is wasted because the moving parts work against each other. The timing can be adjusted because the housing to which the coils are screwed to can be moved a little to either side.

There are two types of generators made for use in the Minsk. In version #1 a large solid magnet attached to the shaft inside the engine spins *inside* a set of six coils which are on the inside of a fixed circular casing. Four of these coils make electricity for the lights and horn while the remaining two make the bulk of the charge for the sparkplug. On the outside of this fixed circular casing is an additional coil called the transducer coil which boosts and lengthens the charge for the sparkplug. In version #2 a number of smaller magnets fixed to the inside of the movable circular casing connected to the shaft inside the engine spin around the *outside* of a fixed set of six smaller coils. Of these six coils, four make the charge for the lights and horn, one makes the bulk of the charge for the sparkplug while the remaining smaller one is the transducer coil.

The coils which make the electricity for the light and horn are made of thick strong wires and very, very rarely burn out. The two or three remaining coils which make the charge for the sparkplug are made of thinner wire. They are more likely to burn out and if they do then the bike will not start. Luckily they can be



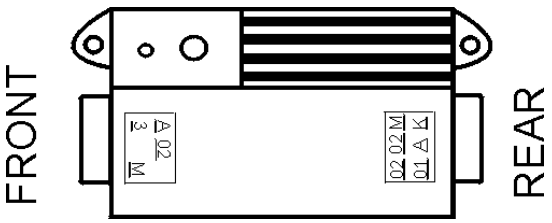
replaced with Vietnamese copies. However, the original Russian coils are much stronger than the Vietnamese replacements. The problem is that the Russian coils are only sold when you buy a complete generator – you can not buy them as a spare. Once they burn out you have to replace them with the much weaker Vietnamese coils. The Vietnamese coils will last a while but you can never be



sure. My advice is to buy a whole new generator if you have a problem like this. More dollars for less pain.

Cuong has devised a way to overcome the problem of burnt out coils. Essentially he takes out the original thin wired coils and replaces them with thick wire coils. These thick wire coils are much more robust and burn out once in a blue moon but create too much electricity. So Cuong also installs a transformer to bring the charge back down to 12 volts – the standard for the Minsk.

Understanding the Electric Box



The electric box regulates the charge coming from the generator and sends it off to the various parts of the bike. Essentially it makes sure that there is always 12 volts running around the bike regardless of whether the bike is running fast or slow. Electricity enters the box from the front and leaves it at the rear.

At the front of the electric box are five connections points coded with letters and numbers which have the following characteristics:

A – Electricity that comes from the transducer coil in the generator which boosts the charge to the sparkplug.

3 – Electricity coming from the thin-wired coil(s) in the generator which power the sparkplug.

02 – Electricity coming from the four large-wired coils in the generator which powers the lights and horn.

M – Earth.

Blank – the middle/bottom connection point has no marking but is in fact the same as the 02 connection point.

At the rear of the electric box are six connections with the following characteristics.

02 – Electricity going to the lights.

M – Earth.

K – Electricity going to the transformer and then the sparkplug.

01 – Electricity going to the horn.

A – Key and start/stop switch.

The electric box is under the seat. You have to use a fork prong or metal toothpick to remove the wires from the electric box as there are little latches on the clips.

When buying a new electric box make sure the date imprinted on it is modern and that there are six connection points at both ends of the box. Earlier versions only have five connection points at the front end of the box. If a couple of you go on a long mission down some of the nastier roads in Vietnam then it is not such a bad idea to carry a spare electric box between you.

Understanding the Air/petrol System

Petrol flows from the tank down through the petrol filter into the bottom of the carburettor. Inside the petrol filter a piece of metal gauze stops large pieces of grime or rust from passing through. In addition, the filter collects any water. As the carburettor fills up with this cleaned petrol, a float tank begins to rise in the same manner as the float in any toilet. As this float tank rises it pushes a small stopping pin into the hole through which the petrol enters the carburettor. When there is the correct amount of petrol sitting in the carburettor, this stopping pin blocks any more petrol from getting in.

When the piston moves up and down inside the cylinder it creates suction and compression. To demonstrate this, just remove the sparkplug, put your finger in the hole and kick-start the bike. First you will feel air pushed into your finger as the piston moves up in the cylinder and then your finger will be sucked down as the piston moves down in the cylinder. This suction has the effect of sucking air through the air filter, air box, carburettor and into the cylinder. When this air passes through the carburettor it moves over the top of two small brass tubes called jets whose bottoms rest submerged in the petrol at the bottom of the carburettor. The movement of this air over the top of the jets sucks petrol up

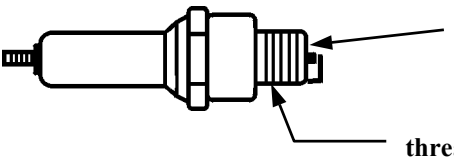
through them and causes a spray of petrol to mix with the passing air. This petrol/air combination then passes into the cylinder where it is compressed by the upward movement of the piston into a tight space at the top of the cylinder just below the sparkplug. Combine this with a spark and you get what you need to haul your Minsk up a muddy track.

The two jets have different purposes and are of different length. The shorter one called the idle jet has the job of making the air/petrol spray when the engine is idling (when you have yet to turn the throttle) and is always open. The longer one called the accelerator jet has a needle running down its centre which is closed if you do not turn the throttle. When you accelerate the bike by turning the throttle with your right hand, this needle rises inside the accelerator jet, thereby allowing more and more petrol to pass though the jet and then on into the engine.

The different lengths of the jets means that if there is not enough petrol sitting in the bottom of the carburettor, then only the longer accelerator jet will be immersed in the petrol, leaving the idle jet dry. This will cause the bike to stall when no throttle is applied (while not moving). Should the level be too high then the action of both jets will be inhibited by to much petrol and the engine will flood. The ideal level is just above the bottom of the idle jet. Not too high, not too low.

Inside the carburettor is also a gate, sort of like a sliding trap door, which moves up and down when you twist the accelerator throttle with your right hand. The more you open this gate, the more the compression from the piston's movement is able to suck in air from the air filter. The more air that passes over the jets, the more the petrol is sprayed into the air/petrol mix and the greater the power behind the explosion in the cylinder. When you open the throttle, the action of the gate and the accelerator pin work to make the bike go faster.

The mixture of air and petrol in the spray needs to be in just the right proportions to cause the most efficient and powerful explosion possible inside the cylinder. It is possible to have too much or too little air in the mix and both will cause sluggish performance. On the carburettor is a small screw which regulates how much air is mixed in with the petrol. When you turn this screw inwards it limits the amount of air in the mix and when you turn it outwards it allows more air into the mix.



BROWN – just right
WHITE – too much air
BLACK – too little air

The correctness of the petrol/air mix dictates the colour at the bottom of the sparkplug so a simple check will tell you if your carburettor is adjusted correctly. A properly adjusted carburettor will cause the ceramic insulation in the centre of the sparkplug thread to be *dry and brown* and the base of the thread to be dry and black. If the ceramic insulation however is covered in *dry black carbon* then the

petrol mix has too little air in it. Conversely, if the ceramic is *white* then there's too much air in the mix.

Understanding the Cylinder and Piston

Around the head of the piston are two metal rings just the right size to allow snug movement of the piston up and down the cylinder without any air or pressure being able to pass them. The metals used are extremely strong and are designed to expand and contract at the same rate when exposed to all the heat caused by the exploding petrol. What stops the rings from grinding against the sides of the cylinder is the cooling and lubricating effect of the oil mixed in with the petrol. This oil does not combust when the petrol explodes. Instead, it covers the sides of the cylinder and makes the movement of the piston easier and smoother. If you buy petrol with not enough oil in it then the piston will seize up after about 20 minutes of driving because of all the friction caused. Some of this oil then makes its way down under the rings to lubricate the cam disk and engine bearings while the rest gets blown out the exhaust pipe. Rather a lot of oil and smoke in fact spews from the back of the Minsk. It not the cleanest bike in the world by any account.

Four stroke engines used for example in Honda Dreams or in any car do not need oil mixed with the petrol because there is a permanent supply of cooling and lubricating oil under the piston. This oil never gets above the piston and then out the exhaust pipe so these kinds of engines are much cleaner. Four stroke engines also use a complicated system of valves at the top of the cylinder to make them much more fuel efficient than two stoke engines.

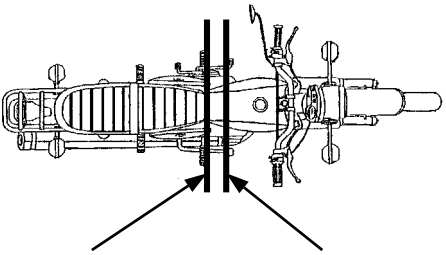
It is these valves which give rise to the two names – four stroke and two stroke. Without going into the details, the valve system only found on four strokes requires the piston to down then up and then down then up (hence the name four stokes) for every time the sparkplug fires and the petrol explodes. In a two stoke engine like the Minsk however the piston only goes down and then up for every time the sparkplug fires. For this reason two stoke engines are more powerful than four stokes because the energy of every explosion goes into pushing only one rather than two revolutions of the piston. Two stroke engines are therefor used by dirt bike racers who need power while four stroke engines are used by the public who prefer efficiency and cleanliness. Two strokes are also much more simple, have much fewer parts on the inside and therefor suffer from less problems.

The Minsk might be a little bike and it might be a dirty bike, but no one has ever said that it lacks the power to get you up and over any obstacle thrown up by the back roads of Vietnam.

Understanding the Transmission System

The up and down movement of the piston is converted into circular movement by the cam disk, which is a large double disk deep in the engine under the piston.

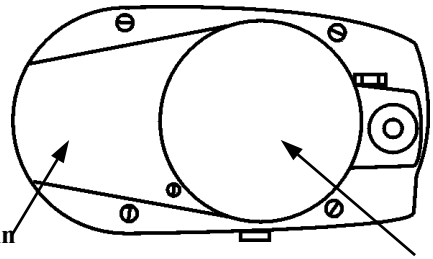
This circular movement of the cam disk is connected by a large shaft in the middle of the engine to both the generator on the right hand side (where it spins the magnet which generates the electricity) as well to a cog on the left hand side (which spins the clutch via a small chain called the clutch chain). If you look at your Minsk from above you will notice that the axis of the generator on the right hand side is lined up with the cog (under the clutch cover on the left hand side). The clutch chain then takes the power to the clutch which is lined up with the main drive sprocket on the right hand side. The drive sprocket is what turns the main chain and hence the back wheel. In between the clutch and the drive sprocket are the gears.

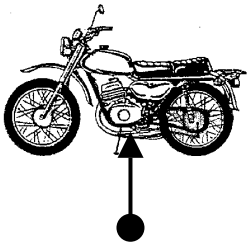


clutch and drive sprocket run along this axis

generator, engine shaft, cam disk and cog run along this axis

Clutch Cover

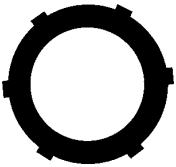




clutch chain and cog under here

clutch pads under here

The clutch is the point where the power of the engine can be disengaged from the back wheel. When engaged (clutch lever out), six or four clutch pads press against metal disks inside the clutch with enough force to transfer all the power of the engine to the back wheel. When disengaged (clutch lever squeezed in) the pads move away slightly from the metal disks and the two systems can slide past each other. The clutch pads and the metal disks still touch each other while sliding past each other when you squeeze the clutch lever in. That is why you wear down your clutch pads quickly if you hold in the clutch lever a lot. This is what's called 'riding the clutch'.



clutch plate

It follows that should the clutch be engaged *and* the bike in gear, then any attempt to manually push the bike forward will be difficult because the back wheel has to force the piston to move up and down contrary to the resistance of the compressed air in the cylinder above the piston. Only if you change into second gear and give the bike a good hard push will you have enough power to cause the piston to move up and down a few times in just the same manner as kick-starting

the bike. As this process also spins the magnet in the generator you will be able to 'bump start' bike because there will be a charge and hence a spark.

The gear box is just a series of four differently sized cogs which convert the energy created by the combustion in the cylinder to either a fast moving but weak force (fourth gear) or a slow moving but powerful force (first gear). Just like on a ten speed bike, a big cog turning a smaller cog will cause more speed but less power because one revolution of the big cog will cause more than one revolution of the smaller cog. The relative size difference between these gear cogs causes the difference to the speed and power behind the bike when you pass through the gears. An interesting feature on the Minsk is that the first gear is very large meaning that it is a slow but very powerful gear, strong enough to get you over most obstacles.

How to Get Your Minsk Running

When you have a problem with your Minsk you should start methodically from the beginning (is there petrol?) and slowly isolate the part which is faulty. This process takes time but is effective. Once you become more experienced with your Minsk then you will recognise the symptoms made by faulty parts and be able to zero in on the most likely problem quicker. This chapter describes the step by step way of isolating your problem while the next two give a summary of symptoms and problems to help make the process go faster.

If your Minsk does not start or it suddenly stops running then you either have a problem with the electrical system or with the air/petrol system. Luckily you very rarely have problems, especially if you start out with a Minsk serviced by Cuong. The trick is to check for electricity at the sparkplug first as this is an easy thing to do. If there is electricity there, then your problem must be with air/petrol system. If there is not, then your problem is with the electrical system.

Starters

Open your tank and make sure there is enough petrol. If you are running very low then turn the switch on the petrol filter to the reserve position. Then check that the petrol can flow freely through the petrol filter and petrol tube by pulling the petrol tube out of the carburettor and confirming that petrol pours out. If it does not then blow through the petrol tube and open the petrol filter and remove the gunk obstructing the petrol's flow. You will need an adjustable spanner to remove the bottom of the petrol filter. Then ensure the key and starter switch are turned on and the cap to the sparkplug has not fallen off. Finally, make sure you have not accidentally left the choke on.

Checking the Sparkplug

Remove the sparkplug with the sparkplug remover and a screwdriver. Then clean the sparkplug with sand paper and use a bit of wire to pick out any pieces of grime or rock. Plug the sparkplug back into its plastic or metal sparkplug cap, touch the threaded end of the sparkplug to the engine mount and kick-start the engine. If the sparkplug is working then you'll see and hear a spark. What you want to see is a strong blue/white spark which doesn't jump all over the place. A bad sparkplug gives a redder spark. A spark on a bad sparkplug can also jump outwards to the outer screw section of the sparkplug. The correct distance between the two nodes where the spark jumps should be about 0.7mm. Tap the top node lightly with the end of your screwdriver to get the right distance. If you make it too close then

carefully pry it open with you pair of pliers.

Solving Electrical System Problems

If there is no spark at the sparkplug then either there is no electricity in the bike or the sparkplug is dead. To determine which is the case, remove the spark-plug cap from the sparkplug wire and touch the end of the exposed wire to the engine. Kick-start the engine and look for sparks jumping from the wire to the engine. If there is sparking coming from the wire but not from the sparkplug then you know the problem is with the sparkplug. Replace it. If it still does not work then you know the problem is with the sparkplug cap. Ensure that no water or oil is in the sparkplug cap and that the clip inside the cap is strong. If the clip is weak, use a paper clip to connect the wire to the sparkplug directly or get a new sparkplug cap.

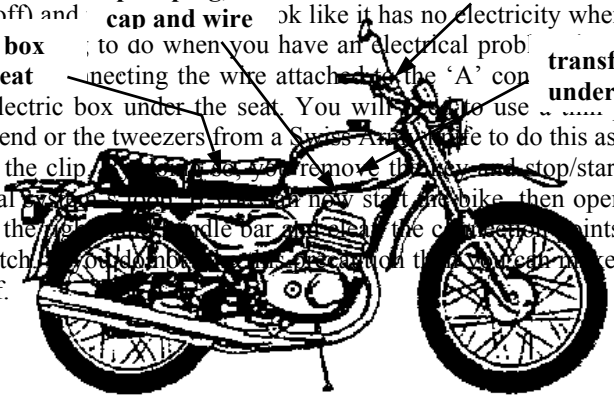
If there is no spark from the sparkplug wire to the engine n[illegible] **generator** problem is with something in the electrical system. Because the e[illegible] from the generator to the electric box to the transformer to the sparkplug to the frame and then back to the generator, the process of finding out what is wrong involves starting with the sparkplug (which you know has no electricity) and moving backwards down the wires until you get electricity. This electrical loop is broken by cut or loose wires, faulty parts or by turning the bike off with the key of start/stop switch.

Check the sparkplug, then the start/stop switch, then the sparkplug cap, then the sparkplug wire, then the transformer, then the electric box and then the generator. And don't forget the wires in between all these parts.

Sometimes the casing for the start/stop switch on the [illegible]dle of the handle bar can get wet or **sparkplug, cap and wire** his shorts the sta[illegible] (same as turning the bike off) and [illegible]ok like it has no electricity when in fact it does. **electric box under seat** to do when you have an electrical prob[illegible] this po[illegible] necting the wire attached to the 'A' con[illegible] the rear of the electric box under the seat. You will need to use a thin piece of metal like a fork end or the tweezers from a Swiss Army knife to do this as there is a small catch on the clip [illegible] you remove the [illegible] and stop/start switch from the electrical [illegible] new start the bike, then open up the switch casing on the [illegible] handle bar and clean the c[illegible] points behind switch [illegible] occasion th[illegible] can make a lot of elf.

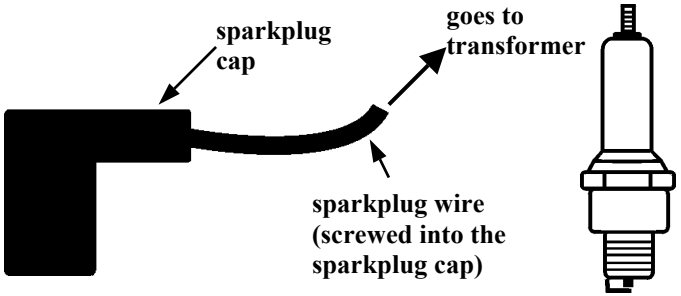
start/stop switch

transformer under tank



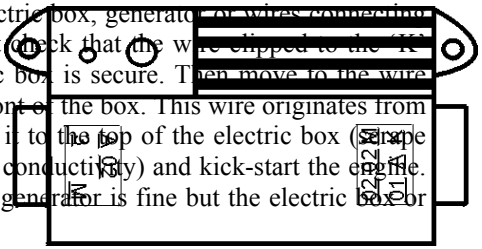
Electrical System

Otherwise, first make sure there is no problem with the sparkplug wire. Ensure that both ends of the sparkplug wire coming from the transformer to the sparkplug



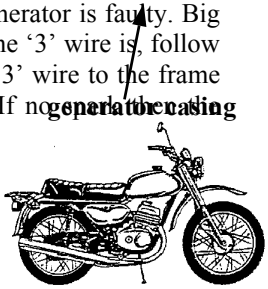
cap are screwed in nice and tight. Then ensure that this thick wire is not old and weak. Often the fine copper wires in it break up at the end near the sparkplug cap. To rectify the problem, cut five millimetres off the end of the large wire and once again earth the large wire to the engine and kick-start the bike to see if there is any spark. If no spark, then carry on to the transformer, which is the large plastic tube shaped object screwed to the frame under the petrol tank. At the rear of the transformer on the left is where the large wire going to the sparkplug is screwed in. Also at the rear of the transformer but on the right hand side is a smaller wire. This is the wire which brings the charge from the 'K' terminal on the electric box to the transformer. Pull it out from the transformer, touch it to the engine casing and kick-start the bike. There should be a very large explosive spark. If there is a spark here but not with the large sparkplug wire then you know the transformer is broken or the connection clip is dirty. Check and clean all the connection points on it first and try again. The transformer can not be repaired and must be replaced.

If there is no large sparking from the 'K' wire to the engine mount then the problem lies further upstream with the electric box, generator or wires connecting them. Move to the electrical box and first check that the wire clipped to the 'K' connection point at the rear of the electric box is secure. Then move to the wire connected to '3' connection point at the front of the box. This wire originates from the generator. Pull out the '3' wire, touch it to the top of the electric box (scrape the surface of the box first to improve the conductivity) and kick-start the engine. If there is a spark then you know that the generator is fine but the electric box or the 'K' wire is broken. To check the 'K' wire, connect the '3' wire to the 'K' wire, kick-start the bike, and check for a spark back at the engine mount under the transformer like you did before. If now you have a spark then the electric box is broken. Confirm this by using an electric box from another bike. Clean all the clips on the faulty electric box with



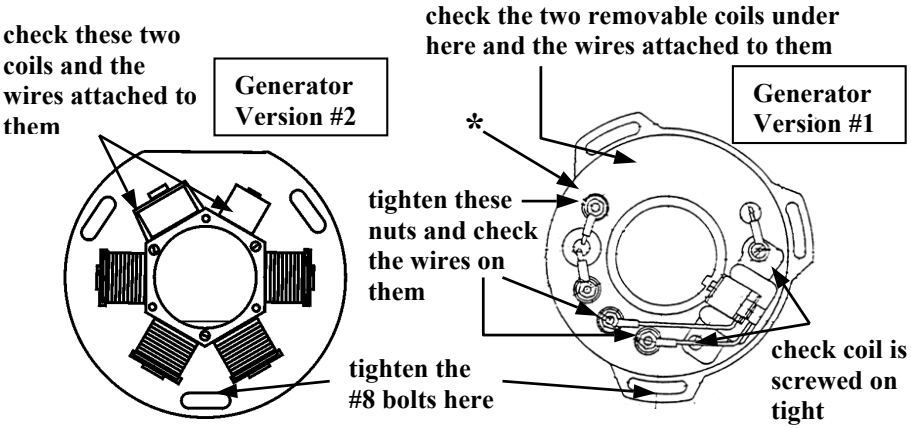
sandpaper as a last resort.

If there is no spark from the '3' wire then you have to turn your attention to the generator. Use your screwdriver to remove the generator casing first. If you have a generator version #1 then touch the '*' nut (see diagram below) and the magnet at the same time with your screwdriver and kick-start the bike. If there is a spark here then you know the '3' wire is broken. If not then the generator is faulty. Big problem! For the version #2 generator, find out what colour the '3' wire is, follow it down into the generator, connect the generator end of the '3' wire to the frame using another spare piece of wire and kick-start the bike. If no spark then the generator is faulty.



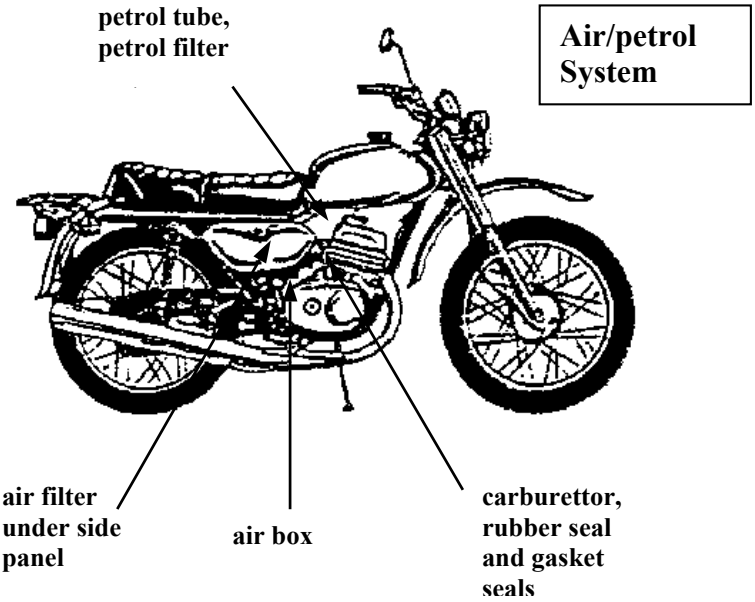
Ensure that all the wires inside either generator are sound and that all the nuts on the outside of the version #1 generator are tight. Make sure the transducer coil on the outside of the version #1 generator is tight and not touching the magnet. Ensure that the three #8 bolts which hold the generator, either version, to the bike are tight. Ensure the #12 bolt holding the outer casing of the version #2 generator is tight. Look at the coils in either generator for any burnt out wires. Check for water in the generator and water in the wire casing going to the electric box.

If you still have no charge and you have no replacement coils then you will have to head for a mechanic. Otherwise, replace the coils yourself. It is a tricky job but quite possible. Just open up the generator, remove the old coil, replace it and re-attach all the wires. Good Luck!



Checking the Air/Petrol System

If there is a good spark to the sparkplug but the engine is still not starting then the problem is with the air/petrol system. Essentially there is too much petrol, too little petrol or water is getting into the engine and fouling the sparkplug. The problems causing these involve the air filter, the carburettor, the petrol and the seals between them. Of these it is the carburettor that can cause the most grief, so you need to understand its internal mechanics first.

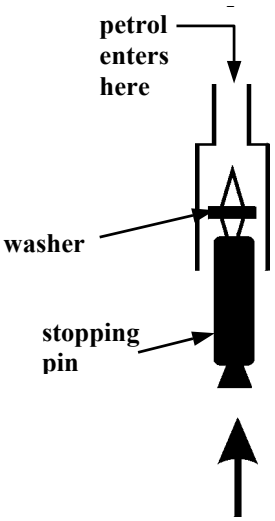


How Good is your Carburettor?

The small float tank in the carburettor and the small blocking pin connected to it regulate how much petrol lies dormant in the bottom of the carburettor. The float tank can cause problems if it can't move freely, if it is adjusted wrongly or if it is damaged. If the float tank gets stuck below its top most position – the point when the pin cuts off the petrol coming into the carburettor – then petrol will continuously flow into the carburettor and flood the engine because the stopping pin will never be pushed all the way into the petrol line. If, on the other hand, the float tank is adjusted wrongly, it will cut off the petrol prematurely, ensuring that the bike will not run on idle. Remember that the idle jet is shorter than the accelerator jet and will be high and dry is there is not enough petrol at the bottom of the carburettor. You also must ensure that the float tank has no leak to it, otherwise a little petrol will get in and mess up its buoyancy – damaged float tanks

are very hard to replace. You also want the stopping pin to be able to move up and down freely. Sometimes it can get jammed.

Of *critical* importance if you have the square carburettor is the tiny plastic washer on the stopping pin. If it is genuine then this washer will be clear, uniform and well made. This washer ensures that when the float tank moves up with the level of the petrol to its top position – i.e. when the carburettor is full of petrol – the pin performs its job correctly by stopping any more petrol getting in. Conversely, should the washer get dirty, then the stopping pin can get stuck and block any further fuel from entering the carburettor. The washer can not be replaced without buying a new carburettor. The round carburettor does not have this washer, using instead a ball bearing to stop the petrol from flowing into the carburettor.



As the float tank rises it pushes the stopping pin into the petrol tube

Another problem concerns the jets in the carburettor, which if old and worn, won't spray the petrol and air in the right way. When you turn the accelerator handle, a long pin moves up and down through a hole at the end of the accelerator jet through which the spray comes out of. This action, over time, wears the pin and the hole down, thereby allowing more petrol into the petrol/air spray. Mechanics correct this by placing a thin piece of wire through the hole in the jet to limit the amount of petrol which can get through. This works pretty well but is haphazard because if the wire breaks or becomes loose then the carburettor won't work. No problem if you are experienced and have some replacement wire but quite nasty otherwise.

The last items of importance are the gasket seals both *inside* the carburettor as well as between the carburettor and the engine and the air-box. The two seals used in the rectangular carburettor need to be sound and not cut up or worn through. The same goes for the round carburettor, but it only has one seal between the main middle section and the bottom cup. The same can be said for the two larger gasket seals on either side of the hollow square shaped component which is fitted between the carburettor and the engine. These two seals should also be sound. Always make sure the square shaped component and the carburettor are fitted snugly between the gaskets when you screw the carburettor back on.

Likewise, if the rubber seal between the carburettor and air box is improperly fitted or the seal is not sound then too much air and dirt will spoil the combustion.

If water gets into the carburettor then it will sink to the bottom of the carburettor. When enough water collects there then it will get sucked up the jets and foul the combustion in the cylinder. Sometimes it only gets sucked up the longer accelerator jet and fouls the bike when you rev it up. So keep your air-box clear of water and check your petrol filter regularly for water build up.

Finally, if your kick stand is weak causing your bike to lean over to its left at an acute angle then the mechanics of the float in the carburettor can be inhibited. The float can get jammed before it closes off the petrol which means that it will always flood.

Solving Air/Petrol System Problems

First kick-start the engine a few times with the start/stop switch off and then with it on. Then try the same process but with the choke on. Then remove the sparkplug and have a look at it. It will either be dry, wet from water or wet from too much petrol.

If the sparkplug is dry then first check that petrol can flow into the carburettor. Pull out the petrol tube coming down from the tank. Check that the rubber seal between the air-box and carburettor is fitted snugly and that the air-filter is tightly screwed on. Otherwise too much air can get into the system and make the petrol/air mix 'dry'. Then screw the sparkplug back onto the engine and kick-start the engine many times with the key off and the choke on. Then try and start it with the key on and the choke either on or off. Repeat a few times. Then put a little petrol on the sparkplug, re-screw it back onto the engine and kick-start the bike. This often does the trick.

If you still can not start the bike and the sparkplug doesn't smell of petrol then remove the carburettor and clean out the jets. There is a more detailed description of how to do this in the next section. Make sure the float tank's movement is not hindered and the petrol stopping pin is not jammed due to poor workmanship or a dirty, sticky washer. While you're at it, check that the two gasket seals between the engine and carburettor are tight and good.

If the sparkplug is too wet instead of being dry then you first need to determine if the wetness is from water or petrol. Water tends to make the sparkplug stay wetter for longer, leaves a slightly white, grey film on the end, and smells like nothing. If you think that's your problem then check to see if there is water in the air box. There is dribble hole at the bottom of the box. Make sure that it is open and the water can get out. Then empty out and clean the petrol filter as this is where water collects from the tank. Also remove any residue in the filter as it may eventually find its way into the jets in the carburettor. Then remove the carburettor and empty out the water contaminated petrol. When mixed into petrol, water sinks to the bottom, looks like melted wax and binds together in balls. It goes without say that water might be a problem after rain or washing, but also know that this problem can occur when the air is very moist and humid.

If you suspect that the sparkplug is wet because of too much petrol then open the accelerator throttle for about 30 seconds. This will open up a gate in the carburettor and air will be allowed to get in and help dry out the sparkplug. Then try starting the bike without turning the accelerator handle. Then try turning the air screw on the carburettor anti-clockwise as this will increase the proportion of air in

the petrol mix which might do the trick. If it doesn't work then return it to its original position.

Prolonged rain or a high stream crossings will dampen the paper in the air-filter and limit the amount of air passing through to the carburettor. This will cause a petrol-rich mixture to get to the sparkplug which will flood it and cause it to die when the accelerator is opened too much. So check your air filter and if it is too wet then either dry it in the sun, buy a new one or use a clean T-shirt as an impromptu filter.

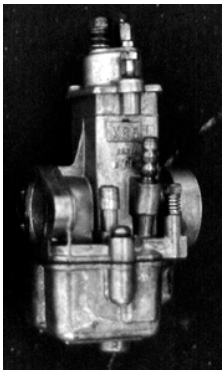
Confirm that the accelerator cable is not stiff and that the accelerator handle can rotate back to its rest position. It is possible that the gate inside the carburettor can't close completely, thereby letting too much petrol/air vapour into the cylinder when you kick-start the bike. So if there is any friction when you open the throttle then think about opening the carburettor and smoothening the movement of this gate.

Open up the carburettor and check that the washer on the stopping pin effectively closes off the petrol when the float tank moves up. Make sure the floats can move easily. Also check that the floats are not cracked and that the stopping pin is not jammed. All of these reasons allow too much petrol to flow into the carburettor. Blow through all the holes you see in the carburettor and make sure the jets are not blocked.

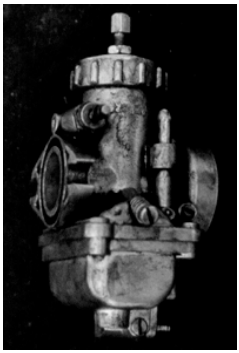
One last thing you can do is place a piece of thin wire in the hole at the bottom of the main accelerator jet in the carburettor. This will decrease the amount of petrol which can then get into the engine.

Cleaning the Carburettor

If dirt or muck gets into the carburettor then it can block the jets and inhibit the creation of the spray so essential to the bike's running.



Square Carburettor



Round Carburettor

Cleaning the carburettor is not as difficult as it sounds as most of the parts in it have non-uniform shapes which can't be put back together the wrong way. All you need is a #13 spanner, a flat screwdriver, a thin strand of electrical wire, a clean rag and a pair of pliers.

As there are two kinds of carburettors found on Minsks, I'll make a description for both. The smaller, rounder, screw-top version is much more straight-forward on the inside and cleaning it is easier as you can use your eyes to see if the jets are blocked. It is also more fuel efficient, more expensive and causes the bike to drive a little slower at top speeds. The taller, rectangular shaped one has more bits on the inside but the mechanics are essentially the same. The bulk of the following description is based on the rectangular version with small annotations made where necessary for the rounder carburettor.

First pour a little petrol onto the carburettor's exterior and wipe all the grime off. Do the same for your hands. The rubber seal connecting the rear of the carburettor to the air box can be turned inside out – or folded back onto itself. Use your screw driver to do this. Pull off the tube coming from the petrol tank. Remove the two #13 screws connecting the carburettor to the engine and then pull it off the two threads attached to the engine. The best way to remove the carburettor is to rest your chest on the seat and with one arm on either side of the bike, come at the carburettor from above. You will have to push the carburettor back into the air box to get it off the screw threads coming out of the engine. You have to push hard so persevere if you have a hard time.

Once removed, unscrew the two screws at the top of the rectangular carburettor and pull out the brass gate, pin and spring. Be careful not to let the spring and gate become unattached to each other as getting them back together correctly takes time. The process is simpler with the round carburettor as the round lid can be unscrewed by hand.

Now the carburettor is completely disconnected from the bike. Hold the body of the carburettor in the palm of your hand and unscrew the two (if it is the rectangular version) or four (if it is the round version) screws holding the bottom section of the carburettor on. The bottom of the carburettor, which is in fact the sump, will then fall into your hand and give you access to everything inside. Look for dirt residue and balls of water at the bottom of the sump under the petrol. If there is any gunk then get rid of it.

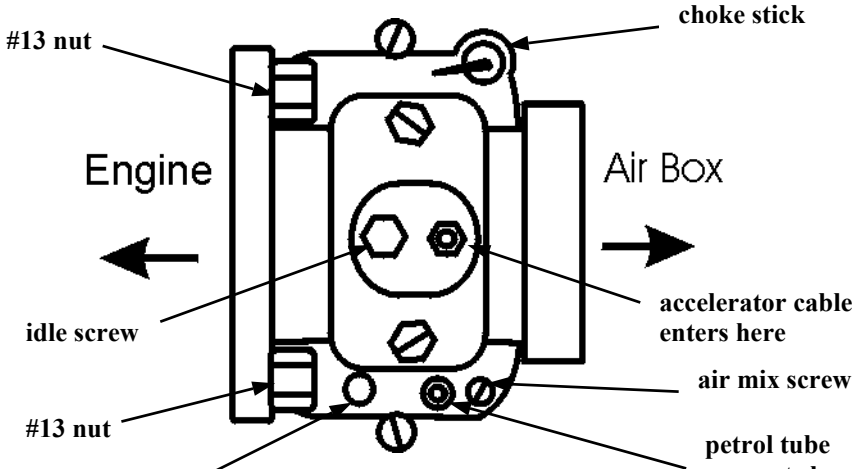
Then blow through both brass coloured jets to clear any remaining petrol in them. Also ensure that they are screwed down tightly. Then point the top end of the carburettor to a light source and look down both jets to see if the holes are clear of residue. If blocked then try to blow the gunk out or alternatively use a single thread of electrical wire to do the job. Blow hard into every hole that you see on the inside of the carburettor. Also blow into the outside hole where the petrol tube is normally fitted and ensure that this is not possible when the stopping pin attached to the float is in its top most position.

Check that the float tank can move up and down easily, that there is no liquid in either of its two tanks and that the tiny plastic washer seal on the stopping pin is

sound. Dirty petrol often gathers around this washer seal on the stopping pin causing the carburettor to overflow – therefore make sure it is clean.

Check that the overflow hole on the bottom cup of the carburettor is not blocked as then any excess petrol will not be able to get out, which will make the bike harder to start.

If you want to perform a thorough clean then remove the float tanks, the blocking pin (don't loose the tiny washer seal on the pin) and the two jets – the longer one is for normal acceleration while the smaller one is for when the engine is running on idle (the same applies for the round version however the idle jet can not be removed as it is recessed into the metal. Put all the bits into a metal tray and give them all a good clean with petrol and an air blower. Essentially you are making sure that all the little holes and tubes in the carburettor and bits are not blocked up. Don't use anything plastic like a toothbrush to clean the bits as plastic melts when exposed to petrol. When reassembling the rectangular carburettor don't forget to put the small black 'U' shaped washer under the idle jet – the shorter of the two brass coloured jets – and make sure that the stopping pin has the tiny washer seal on it. The last thing you do before screwing the carburettor back up again is to put the float tank and stopping pin back on. This is a finicky little process which takes some nimble hand-work. Again, make sure that the float can move freely up and down and make sure that when the float



Square Carburettor Top View

is in its top most position that the stopping pin actually blocks the petrol from coming in.

Before you put the carburettor back together again, douse it with petrol – don't forget the top – and make sure it is clean of any residue from dirty hands.

When you replace the top lid, the spring and the gate mechanism back to the main body of the carburettor you will have to slowly slide it back into place making sure that the long pin fits into the hole at the bottom. If it does not slide in sweetly then the pin is not in position. With the rectangular carburettor you might have to squeeze in the ⊓ shaped brass gate slightly so that it fits correctly into position. Make sure the accelerator cable or the side of the brass gate which has the semi circle cut from it (rectangular carburettor only) is *to the rear* of the carburettor when you slide the parts back on. The round carburettor is easier as there is a notch which the round solid gate must slide over.

When you screw the carburettor back onto the engine, make sure the gasket seals between it and the engine are snug, tight and sound.

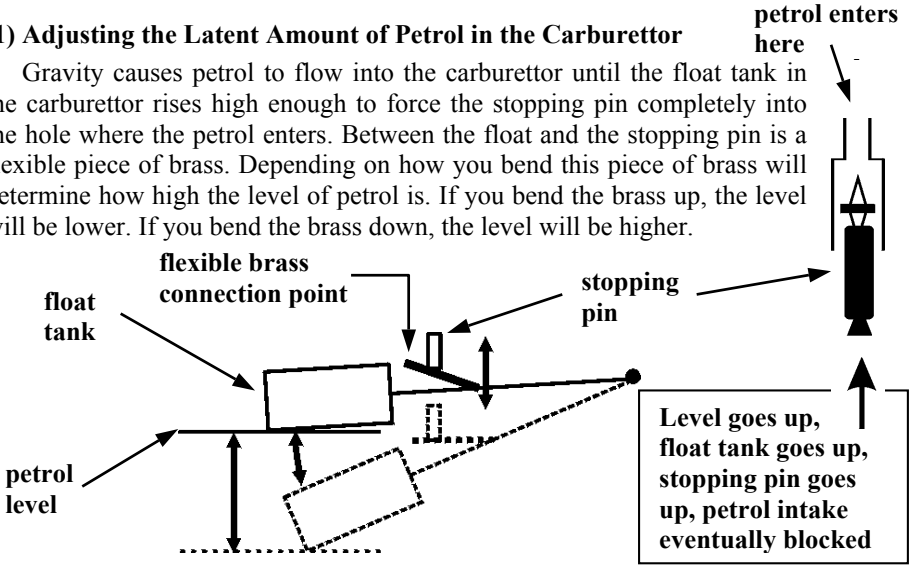
Never forget that a brand new carburettor will only set you back from US$12-20 depending on whether it is the square version or the round version so there's no point giving yourself unnecessary grief travelling around with a bad one.

Adjusting the Carburettor

There are five adjustments that you can make to the internal mechanics of the carburettor.

(1) Adjusting the Latent Amount of Petrol in the Carburettor

Gravity causes petrol to flow into the carburettor until the float tank in the carburettor rises high enough to force the stopping pin completely into the hole where the petrol enters. Between the float and the stopping pin is a flexible piece of brass. Depending on how you bend this piece of brass will determine how high the level of petrol is. If you bend the brass up, the level will be lower. If you bend the brass down, the level will be higher.



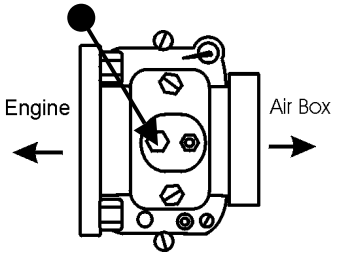
NOTE: this diagram is just a representation of how the float tank works

You want the level to be above the bottom of the accelerator jet and just above the bottom of the idle jet. To get the right level, first allow petrol to enter the carburettor at its own pace when the bike is off and standing straight up and down.

Don't pump the petrol by pushing the petrol button on the side of the rectangle carburettor. Then remove and open the carburettor and note where the level is with respect to the two jets. Bend the brass connection point either a little up or down to let more or less petrol in. Then connect the carburettor back to the engine, let it fill again and check to see if you have got it right.

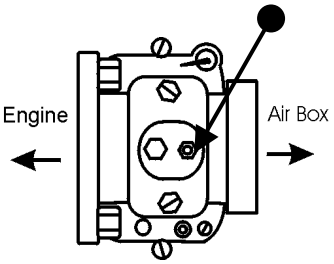
If the flexible brass connection point is adjusted so that the petrol level is too low then the bike will run fine at speed but will stall when on idle. This is because the idle jet is shorter than the accelerator jet, i.e. the accelerator jet will be immersed but the idle jet will not. Conversely, if the float is set high then too much petrol can get in and flood the spark.

(2) Adjusting the Idle Screw



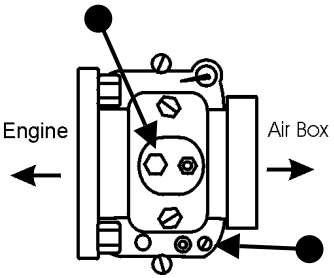
The idle screw on top of the rectangular carburettor or on the right side of the rounder one regulates how much suction gets through the system when the engine is at idle. Turning it anticlockwise lifts the gate mechanism in the carburettor in the same manner as turning the accelerator. With the round carburettor you have turn the screw *clockwise* for the same effect. In both cases the engine's pitch will rise.

(3) Adjusting the Cable Screw



You can move the accelerator's wire casing up or down by turning the screw at the top of the carburettor where the wire goes in. This will then raise or lower the gate, thereby controlling the engine's speed at idle. This adjustment is made to counter the effects of a stretched cable and to make sure that the accelerator handle can be fully twisted. Same for both carburettors.

(4) Adjusting the Air/Petrol Mix Ratio



A properly adjusted carburettor will produce a sparkplug that is brown in the middle of its thread and black around the bottom of the thread. Too much air will make it white whereas too little air will make it black.

On the rectangular carburettor the screw with a spring under it on the left hand side controls the amount of air mixed in with the petrol. On the rounder version, this screw is very small and on the right-hand side.

For both carburettors, turning this screw clockwise limits the amount of air in the petrol mix, and turning it anticlockwise increases the air in the mix. As with the idle screw, the engine's pitch is affected by turning this screw – clockwise makes the engine run lower, anticlockwise makes it run higher.

Every bike needs to have its petrol/air mix in the right proportions. This ratio can change from bike to bike as climate, engine characteristics and petrol all have an effect. Getting the right ratio requires both the air mix screw and the idle screw to be adjusted. It is a job best left to a mechanic as it takes a seasoned ear to recognise the right engine pitch when the mix is just right.

(5) Adjusting the Height of the Accelerator Pin

The long pin inside the accelerator jet can be adjusted into a higher or lower position with respect to the end of the jet by unclipping it from the top of the gate in the carburettor and moving it into a different groove. Moving it down increases the amount of air in the mix and moving it up increases the amount of petrol in the mix. This adjustment is best left to a mechanic as it need only be done should the end of the pin become worn after long use.

Summary of Ignition Problems

If your Minsk breaks down or does not start straight away, then one or some of a *finite* number of problems are at work. As the list below shows, there are only 33 possible faults which cause ignition problems. If you become familiar with this list then you can always get your Minsk going if you persevere. It is that simple.

Electrical System Problems

1. faulty sparkplug
2. wet or poorly connected sparkplug cap
3. broken wires
4. poor connections at the end of wires
5. wires with their protective plastic covering worn off
6. wet switches on the handle bars
7. loose coils inside the generator
8. broken or weak coils inside generator
9. broken or weak electric box
10. broken or weak transformer
11. incorrectly timed generator
12. loose generator casing
13. loose magnets in generator

Carburettor Problems

14. water in the petrol
15. blocked jets
16. incorrect air mix
17. faulty washer on the stopping pin
18. cracked float tank
19. stuck float tank
20. jammed stopping pin
21. faulty gasket seals between the carburettor and the engine.
22. loose nozzles on the jets
23. worn down jets
24. worn down accelerator needle inside jet
25. wrongly adjusted adjustable brass connection point
26. wrongly shaped gate

Air filter and Air Box Problems

27. dirty and/or wet air filter
28. loose air filter
29. dirty and/or wet air box
30. loose rubber seal between carburettor and air box

Petrol Filter and Tube Problems

31. clogged petrol filter
32. pinched or leaking petrol tube
33. empty tank

Recognising Ignition Problems

Experienced mechanics are able to home straight to a problem because they recognise the symptoms caused by faulty or improperly adjusted parts. The following list summarises these symptoms and will help you to repair your bike quicker. Always remember though that the best approach is to start from the beginning and then to slowly isolate the problem in a methodical fashion. Do not assume anything.

Engine Suffers Erratic Loss of Power

1. dirty sparkplug
2. ailing sparkplug
3. hot engine
4. dirty oil in petrol
5. water in petrol
6. either brake is inadvertently on causing extra strain on engine
7. flooding in the carburettor due to float or sticky stopping pin washer
8. pinched petrol tube
9. too little petrol in carburettor due to poorly adjusted float
10. wet sparkplug cap or sparkplug wire
11. faulty start/stop switch

Engine Suddenly Dies

1. no petrol in the tank
2. faulty sparkplug
3. sparkplug failure
4. one of the electrical system's wires breaks or becomes loose
5. blocked jets in the carburettor
6. clogged petrol filter or petrol tube
7. water in the start/stop switch
8. generator failure
9. electric box failure
10. transformer failure

Bike Backfires

1. dirty sparkplug
2. faulty sparkplug
3. improper timing in the generator
4. faulty coils in the generator
5. magnet too close to the transducer coil
6. water in the engine cut-off switch

Bike Starts But Weakens or Fails When Going Fast

1. wet air filter
2. water in the carburettor
3. blocked accelerator jet in carburettor
4. improper timing of the generator

Engine Stalls When Not Moving

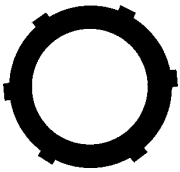
1. too little petrol in the carburettor due to poorly adjusted float tank
2. improperly adjusted idle screw on the carburettor

Bike Over Revs

1. tight accelerator cable
2. improperly shaped gate in carburettor

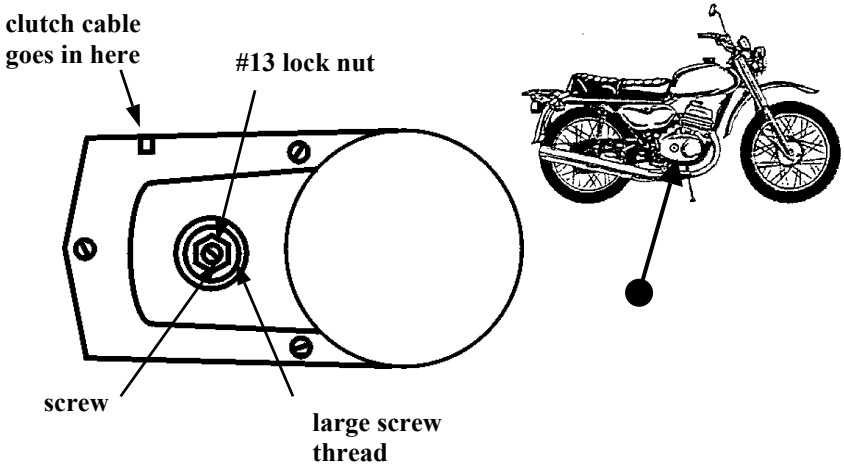
Repairing Non Ignition Parts

Adjusting the Clutch



When the clutch pads wear down, they get thinner, which causes the clutch lever to become looser and the gear changing clunkier. This is normal and you can compensate the effect by adjusting the clutch screw. This adjustment can not go on forever, and eventually as the clutch pads wear right down, they will begin to slip when you accelerate. When completely shot, you will not be able to move no matter how hard you rev the engine.

You can tighten or loosen the clutch by tightening or loosening the screw located on the generator cover. This screw pushes a rod via a little ball bearing into the clutch pad mechanism and forces the clutch pads away from each other. First loosen the #13 lock nut. Then turn the screw anti-clockwise – you will notice that the large screw thread will move inwards. Then turn the screw clockwise until the large thread moves outwards and you feel resistance. When you feel resistance then the rod is just about to begin to push the clutch pads apart. As soon as you feel this resistance then the rod is in the right 'rest' position. Now when you pull in the clutch lever, all its force will go straight into pushing the clutch pads apart via the action of the large thread around the screw. If you tighten the screw too much then the clutch pads will be pushed a little apart even when you have not pulled in



the clutch lever meaning the clutch pads will slip. If you do not tighten the screw enough then the clutch lever will be too loose and will only engage the clutch pads when fully pulled in. The gears will then be hard to change.

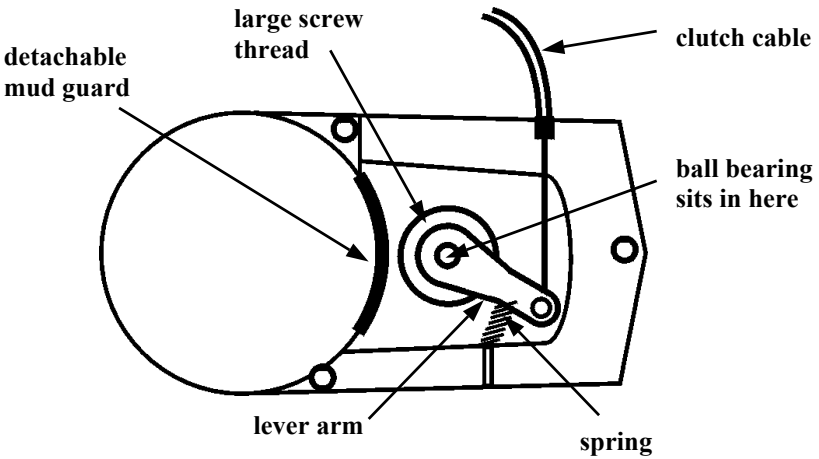
To test your work, put the bike in first gear with the engine off. Then squeeze the clutch handle and see if you can push the bike forward. If you can then things are fine but if you can't then the screw needs to be tightened more. If you have made it too tight then the engine at high revs will slip, making a RrRrRrr sound. Just play around until you get it right. When you have found the right position, tighten the #13 lock nut to keep the screw from moving out of position.

Improving the Clutch Mechanism

When the cable pulls the lever arm up, the large screw thread pushes a rod into the clutch plates. You can make this action much easier on the Minsk by cleaning, greasing and protecting the thread/lever mechanism.

To do this, remove the generator cover to reveal the drive sprocket, the generator and the clutch lever mechanism. Disconnect the clutch cable from the lever arm, unclip the spring and then unscrew the lever arm. Clean the large screw thread on the lever and the thread in the cover with petrol and then grease them all up before putting everything back together again. Do not forget to put the black detachable mudguard back into place and do not loose the ball bearing between the screw and the rod going into the clutch. If the small spring on the lever arm is stretched then replace it in order to give the lever arm better spring.

Always make sure that the three screws which hold the generator cover to the bike are tight. If they are not, then the whole process of pulling in the clutch cable to change the gears will be made much weaker as the force will go to moving the generator cover outwards rather than the lever arm upwards. You will then grind through the gears no matter how hard you pull in the clutch lever.



Repairing a Flat Inner Tube

There are so many mechanics in Vietnam that flat tyres are normally not a problem once you have paid VND50,000 for the service of getting them fixed.

However, once you are off deep in the mountains then it is very possible that there will be no one to help you. Therefor, when on a mission into the wilderness, you *must* take a pump, a puncture repair kit and a set of three tyre removing tools. Remember that you do not need to remove the wheel from the bike to get to the inner tube, so repairing a flat tyre by yourself is no great drama.

You can make life easier by replacing your old inner tubes with new ones before you head out. Also ensure that there is a protective rubber loop wrapped around the wheel rim to stop the spokes from rubbing against the inner tube. Without one of these on each wheel you will have flats all the time.

If you notice your tyre is flat or is getting flat then the first thing to check is whether the valve is faulty. In this way you save yourself from opening up the tyre when all you needed to do was test the valve. Wipe some spit on the valve and see if a bubble forms. If you are no where near a mechanic then let the air out and use the top end of a black plastic valve cap to tighten the valve device inside. The cap can be used like a screwdriver. If the valve still leaks after you pump the tyre back up again then cover the valve with the black plastic cap and hope that it is tight enough to limit the air leakage. At the first sign of a mechanic get the valve replaced. Luckily the valve is standard for all inner-tubes regardless of the bike so most guys will have one.

When you get a puncture, the first thing you will notice is a wobbling or a bumping sensation coming from the wheels. Immediately look ahead for a large rock, ditch or road sign that can be used to prop the bike up. If you do not have a centre stand then place a large enough rock under the engine near the kick stand so that the wheel with the flat tyre is above the ground. Sometimes you can use the cement kilometre stones or posts on the side of the road. If not, just lie it down on the ground. Then feel around the outside of the tyre slowly and carefully with your hands and try to spot the protruding thorn or nail. If you find it then pull it out and remember its position with respect to the valve. Ninety per cent of the time you can find the nail.

Then remove all the remaining air and loosen the tyre from the rim by hitting and pushing it. This is often difficult as hot weather can fuse the tyre to the rim. If you don't do this then removing the tyre will be all but impossible.

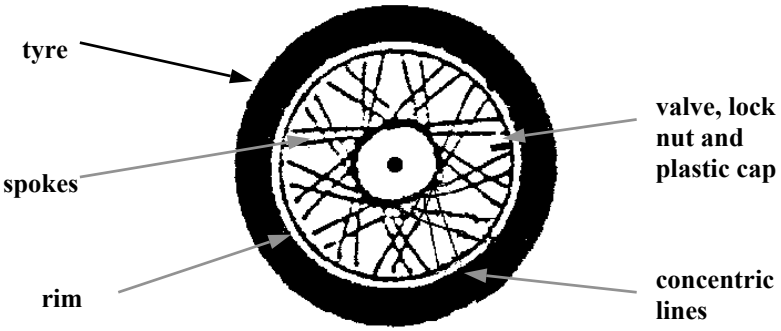
Once the tyre is loosened from both sides of the rim, use the tyre removing tools to lever the edge of the tyre on one side over the metal rim of the wheel in the same way as fixing the wheel of your bicycle when you were a kid. You must have three of these tools to do this.

Once you have done this, undo the nut around the valve and pull the inner-tube completely from out of inside the tyre. Pump it up a bit, wet it where you estimate the hole to be and look for bubbles to confirm the exact spot. Stick a piece of grass in the hole so you do not

forget its position.

Clean the area around the hole with soap and water if you have it, let it dry, then rough up the inner-tube with sandpaper before applying the glue (not too much) to both the patch and the area around the hole. It is important to keep oil and dirt away from the patch and the glue so keep your hands clean. Wait 4-5 minutes for the glue to get tacky before applying the patch to the inner-tube. Put something soft like a paperback or a plastic sandal above and below the patch and tube and give it a good beating with a spanner or large screwdriver to make sure the seal is sound.

Before putting the inner tube back into the tyre, check inside the tyre for nails, glass, bits of metal and exposed rivet spokes. Also make sure that the protective rubber loop between the inner-tube and the rim is snugly in place.



Slip the inner-tube back into the tyre and fit the valve back through the hole in the rim. Secure the valve with the lock nut and make sure it sticks out straight. Make sure that the inner tube sits snugly inside the tyre.

Now comes the tricky part. When putting the side of the tyre that you had peeled off back on to the rim, make sure that the opposite side of the tyre is touching the opposite side of the rim – i.e. the tyre is sitting snugly in its proper, normal position which it is when it is pumped up. A few hits around the circumference of the tyre or a little massaging to the edges will do the trick. If the other side of the tyre is not sitting snugly then the elasticity of the tyre is significantly tightened making the whole process of levering the tyre back on with the tyre removing tools almost impossible.

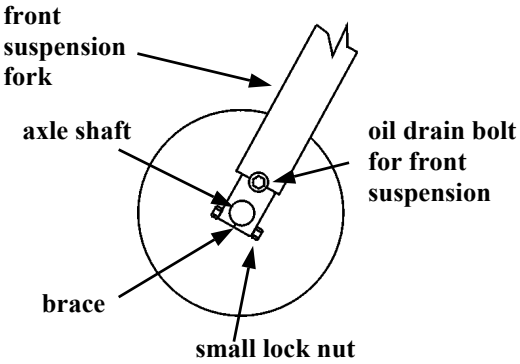
If you are having a real hard time getting the tyre back on then I guarantee that it is because the other side of tyre is not in its right position. If it is in the wrong position then all that metal wiring in the tyre will work against you instead of stretching easily which it does when the tyre is in the right position. Therefore make a special effort to hit and massage the tyre into position. Putting the tyre back on is either easy or impossible.

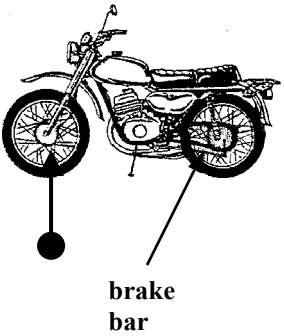
When the tyre is back on, pump it up, making sure all the circumference of the inside of the tyre is equally spaced from the rim. There are concentric lines moulded on the tyre around the inside circumference to aid this.

Removing the Front or Back Wheel

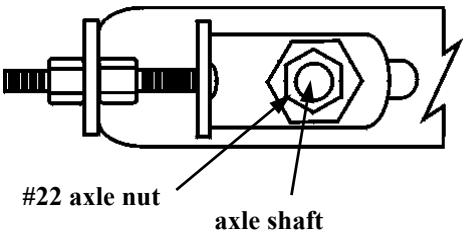
You might want to remove the entire wheel in order to install a new inner tube. First prop the bike up on a large rock as described above.

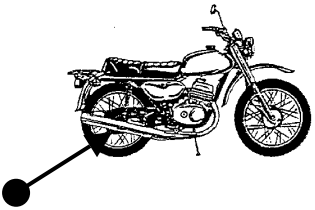
Removing the front wheel is easy. First loosen the small lock nut which tightens the brace thereby fixing the axle shaft in position – it is found under the axle shaft on the left-hand side. Then go to the other side of the wheel and remove the large #22 nut at the thread end of the axle shaft which holds the wheel on. Then use a rock/hammer and a screwdriver to bang the axle shaft out. The wheel will then fall off. Let the air out and then stand on it with both feet. This will help loosen up the tyre from the rim and will make it easier to wedge the tyre removing tools under the lip of the tyre when removing it from the rim.





The back wheel is a little more tricky. First take off the #22 axle nut from the axle shaft (sometimes on the left-hand side, sometimes on the right-hand side).

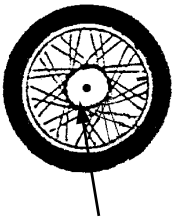




Then remove the small pin fixing the thick break bar to the brake lid (on the left-hand side) and move the brake bar out of the way. Then bang out the axle shaft with a screw driver. You might have to remove the exhaust pipe to make this action easier. When you pull the axle shaft free, you will notice a small metal tube falling to the ground on the left hand side of the wheel. The space left behind by

this metal tube will now allow you to move the wheel away from the chain housing and then away from the bike. You might need to tilt the bike at an angle to make this easier. As you move the wheel away, the lid holding the brake pads will fall off but it will still be connected to the back brake rod. This rod connects the back brakes to the back brake foot lever. Make sure that none of the black rubber plugs on the chain housing fall off. This job is a lot easier with two people.

Then replace the inner tube as described before. Putting the back wheel back on is the reverse of the above procedure. It involves a bit of back work. Fit the brake lid holding the brakes back into the wheel. Move the wheel back into position against the chain housing. Line up the six rubber plugs on the chain housing with the six holes on the wheel. This is the tricky bit. Then fit the small metal tube back into position. Slide the axle shaft back through the tube and wheel. Position the brake bar back onto the brake lid (don't forget the small pin) and screw the #22 axle nut back on.

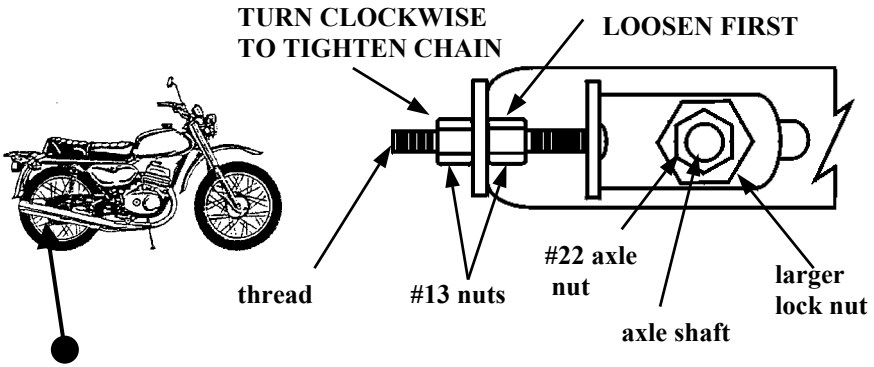


brake lid

Adjusting the Chain

It is normal over the course of time for the chain to stretch. If you forget to drip some oil onto the chain every month or so then this will happen more quickly. The teeth on the drive sprocket and the sprocket on the back wheel will also wear down over time. Spotting worn down teeth is easy. Old teeth are sharp and thin whereas new ones are thick triangles with flattened ends.

To tighten the chain you first need to loosen the back wheel by undoing the two bolts on the axle shaft. First loosen (but not remove) the #22 axle nut which is on the right-hand side but sometimes on the left-hand side of the axle. Then loosen



(but not remove) the larger lock nut on the right-hand side with your exhaust pipe removing tool. Then kick the wheel to loosen it up.

Once the wheel is free to move, you force it backwards, thereby tightening the chain, by turning the #13 nuts on the threads found on both sides of the back wheel just behind the nuts mentioned above. Of the pair of #13 nuts on either side, it is the ones furthest to the rear which you must screw clockwise to push the back wheel backwards. But first you must loosen the two #13 nuts at the front of the threads on both sides (they are locking nuts but can also be used to force the wheel forward if you turn them anti-clockwise).

Start with the rear nut on the right-hand side as this is the side the chain is on. Give this nut a few turns. The chain will begin to move up and tighten. Then copy the same amount of turns on the left-hand side rear #13 nut. When the chain is tightened correctly it will be possible to tap it with your fingers and wobble it a bit, but not a lot – it must not be tight or taught. Or to be more exact, the chain should have 2.5-3.5 centimetres of slack – that is how far it is from its maximum height to its minimum height when you push up the chain and then let it fall back down.

A word of advice – just tighten the chain a bit as it is easy to over do it. Never tighten it too much.

When happy with the chain's tightness, give the wheel a spin to ensure that it is straight. You can use your thumbs to make sure that both sides of the tyre are equidistant from the frame. Then tighten up all the #13 nuts. Finally, don't forget to loosen the back brake as tightening the chain also tightens the back brake. See the next section for details on how to do this.

Tightening the Brakes

The brakes work when two adhesive pads are forced into the inside of the wheel. Chinese brake pads are more sticky but wear down quicker than their Russian counterparts which last longer but don't stick so much. Over time the pads wear down until eventually you have metal on metal. The brakes then make a loud vibration noise when applied. Then you know that the pads have either worn out or contain too much dust. Replace or be prepared to clean them. Drilled into the brake pads are a number of holes with metal at the bottom of them. You know the brakes are finished when the pads have been worn down to the same height as the metal.

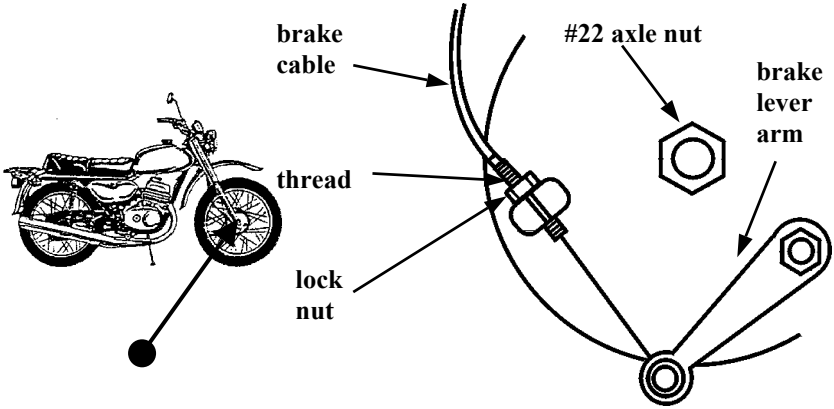
As the pads wear down you compensate their thinness by tightening the front brake cable or the back brake rod. When you can't make this adjustment any more, it is time to replace the pads.

Some bikes have weak brakes because the metal surface inside the wheel which touches the brake pads when applied is not perfectly round. In these cases only a limited surface area on the brake pads actually touches the wheel and there is less friction and braking effect.

If your front brake is weak then you can strengthen it by tightening the brake cable. You do this by turning up (anti-clockwise) the thread through which the brake cable emerges from its casing before connecting to the brake lever arm.

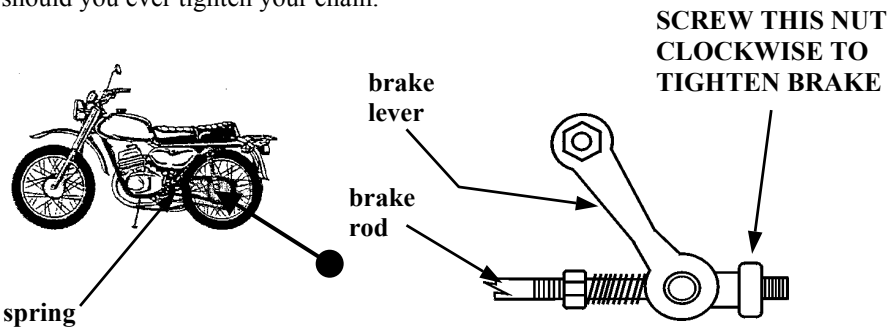
Screwing this thread anti-clockwise effectively makes the brake pads further away from the brake lever on the handle bars meaning the whole action will be tighter. You will need a pair of pliers for this, but first loosen the lock nut by turning it anti-clockwise.

When finished, test your work by lifting the front wheel and giving it a spin to make sure you have not made the brake too tight. Then tighten the lock nut.



It is possible for the front brake cable to stretch and cause a weaker braking action. Fine mud or dust can also get into the brake compartment and weaken it. The only way to fix this is to open the wheel up and clean the pads with a dry rag and sandpaper. Think about changing the front brake cable every six months or so.

To tighten the back brake rod, turn clockwise the nut touching the brake lever and brake rod just below the back wheel's axle on the left-hand side. Give the nut a few turns and then test the result. This is the same nut that needs to be adjusted should you ever tighten your chain.



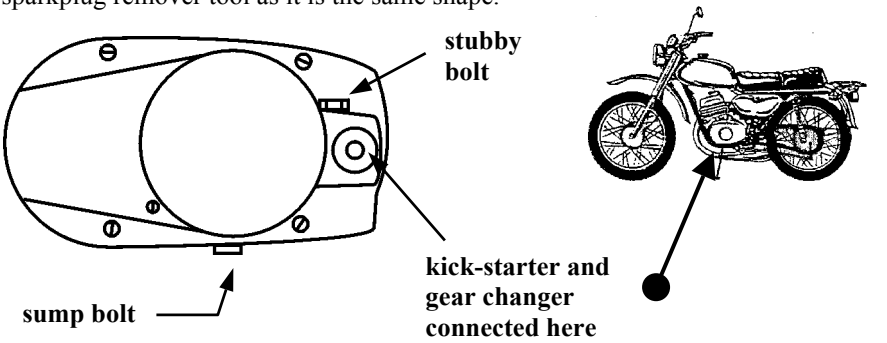
Sometimes the back brake can stick when you apply it. Check that the spring just behind the kick-starter is still attached at both ends. If your front brake sticks, then replace the brake cable with a new oiled one, open up the brake and clean all the parts and put a spring on the bottom of the cable to force the brake lever arm back to its normal rest position.

If you cross a river then expect to loose your brakes for a while. Remember to pump (squeeze on and off constantly) your brakes to dry them out.

Changing the Clutch Oil

Fresh oil in the gear box and clutch will protect the gear cogs, clutch plates and gear changing parts from unnecessary wear and will make shifting the gears easier. Most people neglect to change their oil regularly allowing grime, water and dirt to foul their Minsk's insides prematurely.

To replace the oil, first remove the stubby bolt on the top of the clutch cover above the kick-start pedal. Then empty out all the oil by undoing the #17 sump bolt underneath the engine. The oil will pour out all over the place so have a container handy. If you have a hard time removing the sump bolt then use your sparkplug remover tool as it is the same shape.



Shake the bike and lean it from side to side to make sure all the oil gets out. Then put back the sump screw and fill the housing with some petrol – 500 ml is fine. Put something over the hole where the stubby bolt was to stop all the petrol from spraying out and then start the bike to let the petrol swirl around the clutch and gears. This will wash out all the muck in there. Then remove the sump bolt and empty the dirty petrol via the sump hole. Lean the bike from side to side to get it all out. Then give it a few minutes to dry, return the sump bolt and refill the housing with a little less than a whole can (700ml) of oil. Change the oil every two months or so. If you have been driving the rain for extended periods or have crossed a few deep streams then do check that the oil is not white – this means water is mixed in – and change it if it is.

Repairing the Lights and/or Horn

All the lights and the horn are on the same circuit and get their electricity from the same four coils in the generator. Therefor, it is possible to have electricity to the sparkplug but to have lost it for the horn and lights. This means you will be able to drive the bike but you won't be able to use various combinations of the front head-lamp, the back light, the horn or the indicators.

(1) Just the Horn Dies

Remove one of the wires from the horn, touch it to the frame, start the bike and hit the horn button. If it sparks then you know the horn is broken. If not then the wires are most likely to be loose. Check that the connection points on the horn with the wires are good. Take a match and slide it through the hole on the connection clip on the horn to keep it connected to the wires. Alternatively, scrape any rust off the clips, pinch the female clips so that they are tighter and check that the plastic on the wires are not worn down, loose or cut. Otherwise remove the seat, look at the rear of the electric box and ensure that the wire connected to the "1" terminal is secure. Then go to the horn itself and ensure that the small nut in the middle of its front side is tight. The tightness of this nut determines the pitch of the horn. If still no luck, open up the switch casing on the left-hand side of the handle bars and check that the horn button is doing its job correctly by forcing the brass plate against the terminal. The best way to do this is to use a piece of metal to make the same bridge connection as does the action of pushing the horn button to see if that results in a blast from the horn. Then use sandpaper to make the connections in the switch better.

(2) Both the Back and Front Lights (But not the Horn) Flicker or Die

Take off the seat and look at the electric box. Check that the connections at both ends marked "02" are secure. Scrape any rust residue on the clips. Notice that at the rear end of the electric box there are two connection points marked with a "02". These are interchangeable so change the wire over and see if it makes a difference. Then give the bundle of wires under the tank and seat a shake to see if it makes a difference. If it does, home in on the faulty wire.

(3) Just the Front Lamp Flickers or Dies

Check the bulb for failure. Check that the clips on the bulb are rust free and are tightly connected to the plastic plug. Ensure that the other plastic connection plug just outside the back of the head-lamp casing is connected to the wires going into the head-lamp casing. Remove any water from inside the head-lamp as it can short the circuit.

(4) Just the Back Light Flickers or Dies

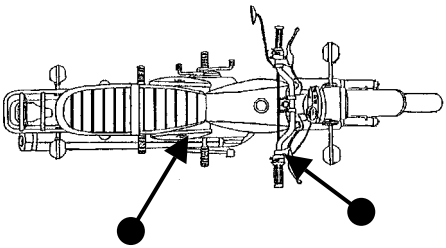
Remove the back light's red casing and check both bulbs for obvious failure. Know that the top bulb is activated when you apply either the front or back brake whereas the bottom bulb comes on whenever the front head-lamp is on. Swap the bulbs over with a bulb you know works (the indicator bulbs are the same size) to see if all you need to do is buy a new bulb. If no luck then remove any rust or residue from the brass connection points for these two bulbs with a screw driver and sandpaper.

Then take off the seat and note the three wires going into the back light casing which run along the top of the back wheel's mud guard. Two enter it via a plastic connection clip and one via a screw. Ensure that the screw is tight and the connection clip secure. You might need to use a little sand paper to make sure the screw is able to conduct electricity. Also check that these three wires are not broken, open or cut.

(5) All Lights and the Horn Flickers or Die

When some of the wires on the bike touch each other, the entire horn/light system shorts out. As this touching is often quite loose, the electric cut out will be haphazard, changing with the bumps of the road. If your lights are cutting out randomly then get the bike started, turn the light switch on and go around the bike shaking and rattling the wires and wire casings. Eventually you will stumble on the problem area where you will then be able to concentrate your efforts on finding the loose, broken or touching wires.

Two points where this commonly occurs are at the connection point on the



switch which turns on the bake brake light when activated by the brake lever – it is just behind the back brake foot lever, or on the right-hand side of the handle bars where there is a wire which turns on the back brake light when you activate the front brake lever. In either case, should the two male connection clips touch each other, then the lights and horn will short out. Make sure these clips are not touching.

It is possible but very unlikely that one of the four coils in the generator which makes the charge for the lights and horn has burnt out. Remove the wire going into the "02" clip at the front end of the electric box and touch it to a part of the frame where there is no paint. Remove the sparkplug, kick-start the bike and see if the wire sparks. If not then there is a problem with the coils in your generator. This is very rare so check first that the "02" wire is sound and that it is tightly connected to the generator. Otherwise you will have to replace your generator or rig up a battery to run just your horn – better than nothing.

Checking and Adjusting the Spokes

If your spokes are loose then you run the chance of buckling the wheel's rim. Check that all the spokes are tight by pushing and squeezing them with your hand.

Alternatively, tap them with a spanner and listen for a clear sounding noise. If they are loose then this tapping will produce a dull thudding sound much different from the harmonic ring when they are tight

Normally a visual check while spinning the wheel will tell you if the rim is warped but if you want to be more accurate about where exactly the warp is then do the following. With your fingers and palm braced against the back suspension, stick your thumb out so that it touches the rim of the back wheel and keep it in that position. Then spin the back wheel. Any buckle will become apparent by virtue of the rim either pushing into or moving away from your held-in-position thumb.

To rectify a buckle you need to selectively tighten the spokes. There are two kinds of spokes. Half of them pull the rim to the right and half of them pull the rim to the left. Find where the buckle is and rectify it by tightening the spokes which pull the rim back into the right position and by loosening the spokes which are otherwise pulling the rim into the wrong position. It is a process you just have to keep doing until it is right.

The tool you use to do this tightening is the one same one you use to remove the tyre from the rim when you have a flat. On the side of this tool is a notch which fits perfectly onto the screw at the end of every spoke. Alternatively, leave this somewhat complicated job to a mechanic.

If your bike is a new one then make sure the spokes are tightened up before heading out as they tend to come pretty fresh out of the box. Just go around the wheel and tighten each spoke – not to the full limit, just tight. Use the tyre removing tool or a #9 spanner.

If you are driving on difficult road with two people then check the spokes every couple of days.

Checking the Tyres

Feel around the sides of both tyres for any bulges or lumps. Such bulges indicate that the tyre wall is weak at that spot and runs the risk of blowing-out. Often pumping too much air into the inner-tube causes this – always be wary if you use an electric pump as they can be too strong. Also make sure there is plenty of tread on the tyre and that there are no groves cut into them by inopportune contact with the mud guards or frame.

Repairing the Head-Lamp

Replacing the bulb in the front headlamp is a snap. Just undo the screw at the bottom of the headlamp, remove the cover housing the glass, pull the wires out from the bulb and unclip the faulty bulb. The bulb has three clips coming out of it. The correct position for the bulb occurs when the three connection clips are positioned like this diagram → 
i.e. the middle clip is horizontal and at the top.

If the beam from the front light is eschew then simply remove the three tension clips between the glass and the head-lamp cover and twist the glass until the writing on it is horizontal and the right way up. There is a small arrow on the glass which must be at the top. Then put back the three tension clips, making sure they are evenly placed, and screw the head-lamp cover back on. Clean any dirt off the glass.

Replacing the Cables

Brake, accelerator and clutch cables often stretch, rust-up and get filled with grime, all of which make their use more difficult. Replacing them with new ones is well worth it and carrying spare sets is *essential*. New cables also make an *enormous* difference to the ease of applying the clutch, front brake or carburettor. Try to get the black Russian cables as they don't expand nearly as much as the Vietnamese ones in the heat.

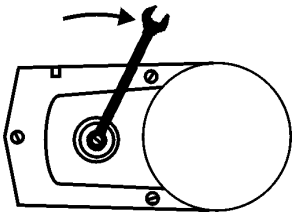
Know that a new cable should effortlessly be able to slide up and down in its casing. Test it before you buy one.

Before putting a new cable on the bike, oil it up first to smooth its action and protect it from rust. Just get a piece of paper or plastic and make a cone shaped funnel at the top of the cable. Fill the cone with a little oil and wait for it to slowly seep down inside the cable encouraged by you pulling and pushing the wire up and down continuously. Do this until oil seeps out the bottom of the cable.

When putting a new cable onto the bike, place it in position along side the old cable first in order to get it in the right position. Then copy exactly where the old cable was connected. The clutch cable is easy to replace but you will get your hands dirty when you remove the generator cover. The front brake cable can sometimes be difficult. Remember to screw the front brake tightening thread clockwise all the way first. Connect the cable to the brake lever on the front wheel and then use a screw driver to lever the cable onto the brake hand lever.

The accelerator cable is not so easy as you have to open up both the top of the carburettor and the throttle casing on the right-hand side of the handle bars. Just go slowly, commit to memory everything before you undo it and copy exactly what the old cable was doing. If you have no replacement cable then you can save yourself a long walk by turning up the idle screw on the carburettor to the max. In other words, the engine's idle will be very high and therefor sufficient to drive the bike along on the flat. You can also physically pull the cable with your hand to give yourself a burst of speed.

If your clutch cable snaps and you only have a spare front-brake cable then you can still use it despite its greater length. Just wind the lower end of the cable around the lever arm (on the inside of the generator cover) one time and you should get some tension.



If you snap your clutch cable and have no spare then you can get a way with crunching the gears without using the clutch. Just start the bike in neutral,

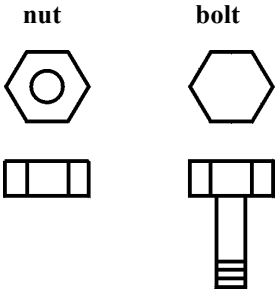
get the bike rolling and then change into second gear. If you have a #13 spanner then you can tape it to the locking nut which protrudes from the generator cover and push it down with your right foot to hold the clutch in. This is much easier if your #13 spanner has a circular end. Some Vietnamese even go so far as to weld a lever onto this lock nut so that they can open or close the clutch with their foot rather than their left hand.

Dealing with Cracked hand Levers

If you drop your Minsk then the levers can snap. Luckily the brake and clutch levers are interchangeable so if the clutch lever breaks then at least you can sacrifice the brake lever to get the bike to move, if not some what dangerously. If you crack the lever again then you are in trouble. You *will* be able to get the bike started but getting it into gear without stalling will be difficult unless you're moving. If you are all alone in the wild then as a last resort take off the number plate and remove the strip of metal bracing it to the mud guard. This piece can sometimes be used to wrap around the broken lever in such a way as to keep the cable from falling out. If you were driving an expensive Yamaha then this would not be possible. That's why Minsks are best.

If the bolts which hold the brake or clutch levers to the handle bars fall off then you can use a nail or piece of wire as an alternative until you find someone to fit a proper size bolt and nut onto them.

Nuts and Bolts



Tighten up *all* the nuts and bolts you see on the bike, especially if you have bought it new. The most important ones are the nuts on the back brake bar, the nuts connecting the engine to the frame, the nuts on the front and back wheel and the nuts holding the back suspension on.

Keep an eye on the two bolts holding the two side panels on either side of the bike, the two bolts which keep the petrol tank from shaking around, and all the little nuts and bolts which keep the back gear rack on.

Use the exhaust pipe removing tool to tighten up the exhaust pipe's connection screw to the engine. Use a hammer or rock to really make it tight. Also use this tool to tighten up the caps at the top of the two sides of the front suspension, the lock washer on the steering column and the large lock nut on the back wheel.

If you are out on the road trying to undo a bolt or nut but your spanner is one size too big then wedge your flat end screw driver into the gap to make things

easier. If you are having trouble undoing a screw then hit the handle end of the screwdriver with a hammer or rock a few times while the other end is in the head of the stiff screw. This is usually enough to jar any rust or grime from the screw's thread thereby allowing it to turn. Otherwise use some lubricating spray if you have it.

Spotting Gear Box Problems

There are basically three things that can go wrong with the gears. All involve a bit of complicated work as the gears are deep inside the engine and require more tools than what you would normally carry. So when you begin to feel one of the following problems, head immediately to a mechanic.

Sometimes the teeth on a gear cog can break off or wear down. When driving using this faulty cog you will hear a nasty grinding noise and the gears might slip suddenly into neutral. This noise will only happen when you are in that particular gear. Get it replaced quickly as eventually you might not be able to use this gear at all and the bits of metal floating around in the gear box might do further damage to other parts.

Secondly, the large coiled spring which returns the gear pedal back to its horizontal rest position after you move it up or down when changing gear can break or stretch. If this happens then you will always have to move the gear pedal with your foot back to its horizontal rest position before you can change into another gear.

Thirdly, you might have a problem with two things called pawls which make the clicking sound when you change gear. Essentially their job is to lock in the change of gear by acting in a similar manner as the deadlock on a door. If a deadlock is loose because it has no spring then you will not be able lock the door because the latch will not enter the hole in the door frame. If you get stuck in a particular gear and can't change either up or down then these pawls or the springs which keep them tight are not doing their job. A mechanic will have to clean them, file down the pawl and replace the springs. Nasty job to do alone.

Checking the Wheel Bearings

Faulty bearings in the axle of your back wheel will allow the wheel to wobble around and lead very quickly, if left unchecked, to strain on the chain, the drive sprocket and the back wheel sprocket. This will stretch or wear them down and the chain might slip off. Faulty bearings in the axle of your front wheel, on the other hand, will render steering and braking more dangerous as the front wheel will wobble when you turn or brake. So it is important to look out for weak bearings and get to a mechanic should there be a problem. They are quite hard to fix yourself as you need a special pair of pliers and a hammer.

To check the front wheel's bearings, get a friend to hold the bike upright, grab the front wheel and shake-wobble it from side to side. If it moves around the axis

and is not firm or set in line with the bike then the bearings are shot and must be replaced. Another way is to take the bike for a drive and apply the front brakes. If the front bearings are weak then the whole front wheel will wobble when the brakes are on. Change them.

To check the back wheel's bearings hold the left side of the handle bars with your left hand and the back of the seat with your right hand. Then rock the bike back and forth towards you and away from you. If the bearings are bad then you will notice how the wheel can move independently of the frame. Alternatively, lift up the back wheel and see if you can shake it a little without moving the bike.

Checking the Suspension

Both front and back suspension on the Minsk are pretty tough so even when they fail, which is rare, you can still drive a long way to the next mechanic to get them fixed. This is good as repairing them is pretty complicated and requires some special tools. Cuong can install front suspension from the Bonus motorbike which is much stronger than the Minsk version. Not a bad idea if you are cashed up.

There are three types of back suspension ranging from the stiff, black pig-carrying Chinese set to the longer, silver medium Chinese or Russian set to the weak set which comes with a new bike. It is a matter of personal preference but I would not recommend the weak original suspension as it bottoms out with two people on the back.

The back suspension springs can be made tighter or looser by turning the brace positioned at the bottom of them. There are a number of different settings depending on your preference. To twist this brace, thereby adjusting the level of tightness, you will need to use the exhaust pipe removing tool.

Keep an eye on the connecting points of the rear suspension with the frame as the rubber seals there can wear down allowing the bolts and nuts which hold the suspension to jolt around.

There are seals inside the front suspension which often break, allowing oil to leak out. Leaking oil will not inhibit the main qualities of the front suspension and it is not expensive to replace the oil and springs when you get back to base.

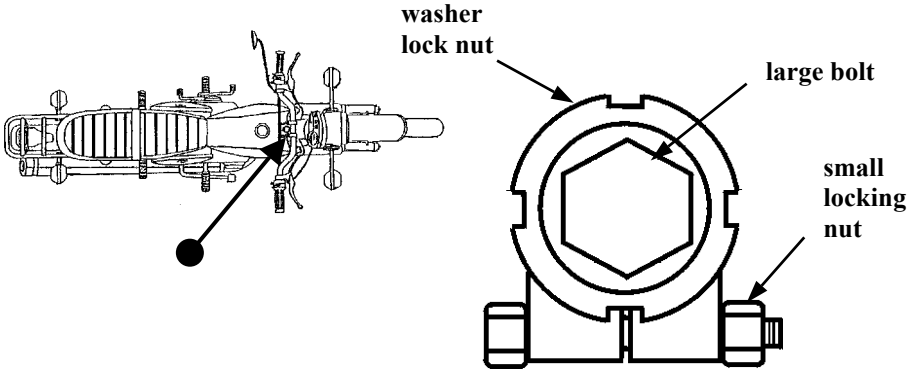
If you ever completely loose all spring to your front suspension then be extremely careful as there is a possibility that the entire bottom of the suspension along with the wheel will fall off. The bike will be nasty to drive as every bump will jar so get to a mechanic straight away. Make the ride a little safer by wrapping some rubber straps around the front wheel's axle to the handle bars to inhibit it from falling off.

Adjusting the Handle Bars

Two bolts and two nuts keep the handle bars from moving around. The two #12 bolts that you can see on top of the two braces around the middle of the handle bars allow the height of the handle bars to be changed. Just loosen them, move the handle bars higher or lower and then retighten the two bolts. The two #17 nuts under the two braces holding the handle bars to the frame must always be tight. If they become loose then the handle bars will rock back and forth in a dangerous manner. They might even fall off if both nuts fall off. Just keep them tight and you will have no problems.

Tightening the Steering Column

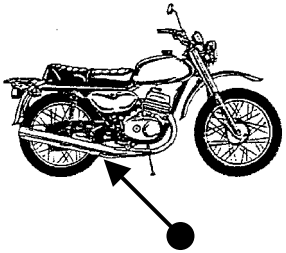
Inside the steering column are a number of ball bearings wrapped in grease which allow the handle bars and front wheel to turn with ease. If these ball bearings become damaged or the housing containing them becomes loose then the front steering will begin to wobble and the use of the front brakes will cause the front wheel to vibrate up and down in a dangerous manner.



To confirm this problem, lean the bike over on its kick-stand so that the front wheel is in the air. Then grab the front wheel and see if you can move it up an down a little, independently of the bike. If you can then you have to tighten the large bolt at the top of the steering column. But first you must loosen the small locking nut on the side of the steering column and the washer lock nut around the large bolt (use the exhaust pipe removing tool). If you tighten it too much then you will not be able to turn the handle bars. So just play around with the large bolt until you get it right.

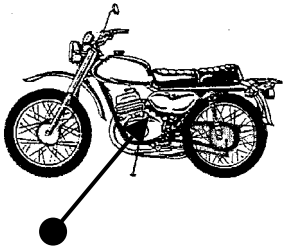
With luck this is all you will have to do to fix the problem. If, however, the ball bearings inside the steering column are the culprits then you will need to head for a mechanic as the process of repairing them is quite complicated.

Tightening the Frame Bearings



The entire back of the bike where the chain and wheel are can move independently from the engine block and main frame because of a set of tough rubber plugs at the point where the back wheel's brace frame connects to the main frame. These rubber plugs allow the whole back system – chain, wheel and suspension – to move up and down when the bike goes over bumps. These rubber plugs occasionally wear down, causing extra strain on the chain, drive sprocket and back wheel sprocket as the three parts are no longer lined up in a straight line. The only way to spot faulty rubber plugs is to shake the bike from side to side and observe the movement of the back wheel's frame in relation to the engine block. If you can see the back of the bike moving a little irregularly from the main then get a mechanic to fix the rubber plugs. Otherwise damage will be done to your chain, drive sprocket and back wheel sprocket.

Cleaning your Petrol Filter and Tank



Paint, rust, grit and muck will always get into the petrol tank. Luckily the petrol filter stops most of this from entering the carburettor. But over time the filter will fill up with this gunk and you will need to clean it out.

Simply unscrew the petrol filter which is below the petrol on/reserve/off lever and clear out the sump of any water or gunk – stuff accumulates in there frequently. You will need an adjustable spanner to do this. Also make sure that the filter has a tight fitting, plastic sealed piece of gauze in it. If not then buy a new one, it's cheap.

To clean the petrol tank, first remove it by unscrewing the two bolts on either side of it at the back. Then fill it up with a litre of non-oil petrol and give it a good rattle and shake. Then empty it out, pick out any pieces of rust or grit and then repeat the whole process with the same petrol a few times more. This should get rid of most of the muck and water.

Welding Parts Back On

There are two kinds of welding – electric and gas. Gas is suited for the frame and other heavy duty spots. Clean the area first and make sure the guy paints the weld after to stop it from rusting. If you go for some electric welding – it is stronger than gas welding in certain circumstances – then you must remember to unplug either the wire going into the sparkplug or one of the connection plugs

going into the electric box under the seat. This action will break the electrical loop which would otherwise facilitate huge surges of electricity going through some of the bike's more sensitive electrical bits and blowing them up.

Spotting Problems with the Cam Disk

Any problem with parts under the piston is a big problem as the whole engine needs to be taken apart. These parts, which include the cam disk, a number of engine bearings and the engine shaft are luckily some of the toughest bits on the bike so they are something you rarely have to deal with.

If you ever fill your bike with petrol with not enough oil mixed in then you will damage your cam disk, engine shaft, engine bearings, cylinder and piston. Assuming that the bike has not seized on you yet, some tell tale signs are a grinding noise from inside the engine and a gradual loss of power as the piston begins to rub against the sides of the cylinder. Always make sure enough oil is mixed in with the petrol and be wary if your exhaust pipe stops belching out the normal cloud burst so hated by drivers behind you. Also know that the petrol station on the dike road behind the history museum in Hanoi is responsible for no less than three destroyed bikes because the petrol bowser there incorrectly mixes in the right amount of oil.

Should any of the bearings under the piston become weak then the shaft which takes the power from the cam disk to the both the clutch and generator will begin to spin incorrectly. If this shaft can wobble off centre a little then the magnet in generator version #1 will rub against the coils and possibly destroy them, cutting out your electricity. The best way to spot this problem is to observe the spinning motion of the magnet inside the generator while the engine is running. If there is a problem with the bearings then the magnet will spin inconsistently. You will also be able to move it by applying force with your hands and there might be signs of wear and tear on the coils like grooves or fine grey dust.

The same logic applies to generator version #2. However, instead of the shaft being connected to the magnet, it is connected to the entire round outer casing. It follows therefor that should this casing spin irregularly, then you have a problem with the bearings inside the engine.

With either generator, an irregularly spinning magnet will wear against the coils and eventually destroy them.

Recognising Strange Noises

Sometimes a weak part will begin to rattle against other parts on the bike. Being able to recognise these sounds and do something about it will help you no end in your pursuit of trouble free Minsk adventure.

Near the Exhaust Pipe

If the screw at the front end of the exhaust pipe loosens up then you will notice a loud, tinny sound coming from down near your right foot and oil will also spit out onto your shoe. Tighten it up with the exhaust pipe tool.

From under the Petrol Tank

If the petrol tank comes loose then you will hear a gong type noise every time you go over a bump. Check that the two rubber plugs supporting the front of the tank to the frame are still in place. Otherwise tighten the two bolts on either side of the tank and make sure the rubber plugs around those bolts are sound.

Under the Rear Wheel Mud Guard

If the gear rack at the back of the bike breaks loose or some of its screws fall out then it is possible for the mudguard to touch the tyre and wear it down. If there is a muffled, high pitched sound coming from the rear then stop pronto and fix it.

From the Chain

A loose chain will cause a tapping sound to the rear of the bike especially when you turn down the accelerator. This happens when the chain rattles against the plastic housing at the rear of the bike. Tighten the chain immediately.

From Inside the Clutch Near Your Left Foot

Under the clutch case near the gear changer is the clutch and the clutch chain. This chain connects the engine shaft (which is attached directly to the cam disk and piston) to the clutch. The chain can stretch and wear down and touch the sides of the case. A stretched clutch chain will cause a grinding sound similar to footsteps on gravel down on the left-hand side of the bike. Get a mechanic to open up the casing and replace it. You do not want this chain to break on you.

From Under the Piston

If you hear a nasty grinding sound from inside the engine then there is a good chance that the cam disk is rubbing against the sides of the engine and is about to seize. This will happen if the petrol does not have enough oil in it.

When You Get Stuck in Water

One time south of Hanoi a normal enough pool of water turned out to be deep enough to leave a high water-mark line on the petrol tank. Muddy water got into everything – engine, exhaust, air filter and carburettor. If the same thing happens to you then do persevere, as it is only a matter of time before the water and grit in your system is removed and you can get some combustion going. Water will not kill your Minsk, it will only quiet it down a while.

Basically you are going to have to get the water out of the air box and filter, the carburettor, the exhaust pipe, the generator, the wires and the engine. The worst thing you can do is try and kick-start the bike while it is still in the water as the back pressure will suck water into the cylinder and carburettor. This will make life tough as these are the most complicated parts to clean.

So first try and pour out as much water as possible from the exhaust pipe by lifting the front wheel – get the bike as vertical as possible. Then disconnect the exhaust pipe from the engine mount and try to wipe as much mud and water as possible from inside the engine. Take out the sparkplug and give it a good clean. Use a lighter to dry your sparkplug and sandpaper should they be too wet. Clean and wet the sparkplug with a little petrol, cross your fingers and give the bike a kick-start or two. You could even put a little petrol directly into the engine to give it a bit of a kick. If the bike starts then rev the shit out of it to warm it up. Problem solved.

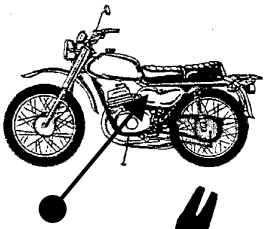
If the bike does not start then have a look at your air filter. A wet air filter will stop air from getting in so take it off and dry it. If it is wet and muddy then it is no good for anyone. When trying to start the bike without it, use a shirt to provide some measure of filtering. Make sure that the sparkplug you are using is strong. Check the generator is not wet by opening up the generator case on the bottom right-hand side of the bike and drying it. Empty the air box of water and mud. Dry all the wires going into and out of the electric box.

If the cylinder is full of mud then you're going to have to get it out. Put some cloth over the sparkplug hole and kick-start the engine again and again so as to spit out any water in the cylinder either via the sparkplug hole or the exhaust pipe hole – which is open as you have already removed it. This action will also warm the engine up helping the water to evaporate.

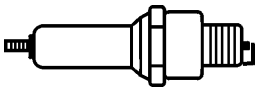
Remove the carburettor, get rid of the mud and water in it and make sure all the jets are clean.

Once you do get the engine running then give it a good blast to help clear out any bits of grime and water in the system. Remember to push/bump-start the bike a lot as this action helps clear blockages both in the carburettor and the cylinder.

Minsk Tool Kit



Always carry a full tool and repair kit. Store it in the removable side panel on the left-hand side of the Minsk. Problems do occur, so the better prepared you are, the easier time you will have should things go wrong. I highly recommend that you take with you all the equipment listed below.



1. Spare **spark plug**.
2. **Pair of pliers**.
3. **Sparkplug remover**. It can double up as a #17 and a #21 spanner. Good for the sump bolt and the #22 wheel axle nuts (it still fits for some reason!)

4. **Flat head screw driver**. Used for removing the generator case, the clutch case and the front head-lamp casing. It can also be used to remove the sparkplug, the large rubber seal between the carburettor and the air box, for banging out the axle from either of the two wheels and for taking apart the carburettor. Note that some bikes have had Phillips screws unofficially put on them so check if this is the case and carry one accordingly.

5. **Spanners** – sizes #**8** (for removing generators), #**10** (for some nuts and bolts), **12** (for removing the petrol tank, side panels and generator version #2. Also used for locking the steering column, locking the front wheel and holding on the rear of the exhaust pipe), #**13** (the most important size, used for the engine's brace nuts, the carburettor, the clutch lock nut and chain tightening screws) and #**17** (for the back suspension, the back wheel axle shaft, the handle bars and both bolts to do with changing the clutch and gear oil).

6. **Adjustable spanner**. Used to remove the petrol filter and the #22 nuts which hold both wheels on.
7. **Sand paper** for cleaning the sparkplug and brake pads.
8. **Tyre removing tools** – you need a set of three. It is worth buying the flat, more expensive type as they are stronger. Can also be used to tighten the spokes.

9. **Exhaust pipe removing tool**. Used to tighten the caps at the top of the two front suspension forks, the lock washer at the top of the steering column, the exhaust pipe to the engine, the screws half

way down the front suspension forks and the lock nut on the back wheel. It can also be used to adjust the spring on some back suspension sets.

10. **Tyre repair kit** – glue and patches. Before you head out squeeze some of the glue out of the tube as they are prone to breaking open. Then put the tube in a plastic bag just to be safe.
11. **Air pump**. Store it under the seat.
12. Either one prong of an **eating fork** or the **tweezers** commonly found on Swiss army knifes. You need these to remove the male clip at the end of the wires from the female plugs found all over the bike.
13. **Gaffer tape** (electrical tape) for wrapping around weak or newly made wiring.
14. A length of thin wire for sparkplug cleaning and a larger piece to tie down anything that might break off.
15. **Spare clutch cable**.
16. **Spare accelerator cable** – it is thinner than the clutch and brake cables.
17. **Spare brake cable**.
18. **Spare bulb** for the front head-lamp.

How to Maintain Your Minsk

1. Make sure all the bolts and nuts are tight.
2. Make sure the chain is not too loose. Oil it occasionally.
3. Watch that there is smoke always coming out from the exhaust pipe. Some shops do not give you enough oil mixed in with the petrol. 4%=1 Pepsi bottle (200ml) per 5 litres. Go for 5% when driving in the country. 5%=small La Vie bottle (500ml) per 10 litres. A full tank holds 11-12 litres.
4. Check for loose and broken spokes.
5. Make sure the rubber seal between the carburettor and the air box is fitted tightly.
6. Change the oil in the clutch regularly or after you drive through a lot of water.
7. Keep your brakes tight.
8. Clean any mud off the engine as it is a heat retainer.
9. Keep on the look out for wobbly wheels due to bad bearings.
10. Keep the sparkplug clean.
11. Make sure the sparkplug is the right colour – brown.
12. Make sure dirty oil never goes into the petrol tank.
13. Have a preference for petrol from petrol stations.
14. Keep the air filter clean, tight and dry.
15. Keep the petrol filter clean.
16. Clean any dirt off the head-lamp glass cover to make your light brighter.

How to Start Your Minsk

This section might seem a little redundant for most drivers. However, there is an easy way and a difficult way to start your Minsk so you may as well know the right way.

1. Check that the engine start/stop switch on the right hand side of the handle bars is up i.e. off.
2. Ensure there is petrol by looking in the tank or by pulling out the tube running from the tank to the carburettor.
3. If your carburettor is the taller, square version then:
   a) pull up the choke, kick-start the bike once without touching the accelerator throttle, push down the choke, push down the engine stop switch (i.e. turn the bike on), turn the accelerator throttle a quarter of a turn, and kick-start the bike, or;
   b) push down the petrol pump switch on the left-hand side of the carburettor until petrol seeps out of the carburettor through its overflow hole, kick-start the bike once or twice without touching the accelerator throttle, push down the engine stop switch (i.e. turn the bike on), turn the accelerator throttle a quarter of a turn, and kick-start the bike.
4. If your carburettor is the smaller, round model then push down the choke lever, kick-start the bike once or twice without touching the accelerator throttle, flick the choke lever up, push down the engine stop switch (i.e. turn the bike on), turn the accelerator throttle a quarter of a turn, and kick-start the bike.

If the bike doesn't start then repeat the above mentioned procedures a few times, and try to vary the number of times you kick-start the bike both before and after you turn on the engine start/stop switch.

If the bike still doesn't start then open the accelerator handle completely for around 30 seconds. This gives the sparkplug a chance to dry out. Then repeat the above procedure.

If the bike still doesn't start then push/bump-start the bike. To do this, put the bike in second gear, hold in the clutch lever, push the bike until you are running and then let the clutch out at the same time as pushing down on the handle bars (this will increase the friction under the tyres making it harder for them to slip). Doing this on a hill makes it much easier. This is the best way to start the bike as it involves far more revolutions of the engine than does a kick-start. These extra revolutions along with the power of a push behind it will have a greater chance of clearing out anything in the carburettor (if that is the problem) and getting the petrol/air mix to fire. If a friend is handy then get him or her to push your bike with theirs by sticking out their foot and pushing you via your passenger foot pedals – this process has more power than just pushing it by yourself.

If the bike still does not start then it is time to look at the bike more thoroughly by checking either the electrical system or the air/petrol system.

Useful Addresses

Minsk Club

The club knows all about the Minsk and can tell you everything you need to know about biking in Vietnam.

WebPage: www.minskclubvietnam.com
Email: minskclub@hotmail.com

Mechanics in Hanoi

1. Mr. Cuong (the most famous in the whole Hanoi region) can fix everything. He sells the best second-hand Minsks. His team is the most competent in Vietnam. In Hanoi he is at 1 *Luong Ngoc Quyen* street in the Old Quarter. Call Cuong direct on mobile phone 091351 8772.

Mink Language

MINSK PARTS	
Accelerator cable	D©y ga
Air	Kh«ng khÝ
Air filter	Läc giã
Battery	¾c quy
Bearings	Bi
Bolt	Bu l«ng
Brake	Phanh
Brake cable	D©y phanh
Brake lever	Tay phanh
Brake light	§Ìn phanh
Brake pad	M¸ phanh
Bulb	Bãng ®Ìn
Cam disk	Trôc quay, bi³n
Carburettor	ChÕ hoµ khÝ
Carburettor (washer on stop pin)	Do¨ng kim x¨ng
Chain	XÝch
Clutch	C«n
Clutch cable	D©y c«n
Clutch chain	XÝch c«n
Clutch lever	Tay c«n
Clutch pads	L¸ c«n
Cylinder	Xy lanh
Drive sprocket	Nh«ng
Electric box	Côc tk (b¸n dÉn)
Electrical wire	D©y ®iÖn
Electricity	§iÖn
Engine	M¸y
Engine block	B-ëng m¸y
Exhaust pipe	èng x¶
Foot pedal	§Ó ch©n
Frame	Khung xe
Petrol	X¨ng
Gears	Bé sè

Gear pedal	CÇn sè
Generator	bé ®iÖn
Generator coil	quËn næ
Headlight	§Ìn pha
Horn	Cßi
Indicator lights	§Ìn xi nhan
Inner tube	X¨m
Key	Khoa
Kick stand	Ch©n trèng
Kick-starter	CÇn khëi ®éng
Lock	æ khoa
Mud guard	Cao su ch¾n bïn
Number plate	BiÓn sè
Nut	ªc
Oil	Dçu
Oil (hydraulic)	DÇu gi¶m sãc
Paint	S¬n
Panniers	§Ìo hµng
Petrol with oil	X¨ng pha dÇu
Petrol cap	N¾p b×ng x¨ng
Petrol filter	Kho¸ x¨ng
Petrol tank	B×nh x¨ng
Petrol tube	èng dÇn x¨ng
Piston	Piton
Rear-view mirror	G-¬ng
Rubber strap	D©y tr»ng
Saddle bag	Tói hµnh lý
Screw	èc vÝt
Seat	tÊt c¶ xªn
Seat pa®ding	Mót yªn
Sparkplug	Buzi
Spokes	Lan hoa
Suspension	Gi¸m sãc
Suspension big size	Gi¸m sãc to
Transformer	M« bin
Tyre	lèp
Wheel rim	Vµnh
Wheel	B¸nh xe

MINSK TOOLS	
AIR PUMP	B M
EXHAUST PIPE REMOVING TOOL	CHBNG V ¨N CÆ X¶
GAFFER (ELECTRICAL) TAPE	GI²C ®IÖN
INNER-TUBE REPAIR KIT	BÉ V ¸
PLIERS	K×M
SANÐ PAPER	GIÊY GI ¸P
SCREWÐRIVER	T« VŸT
SPANNER	CL
SPANNER (ADJUSTABLE)	MÅ LÔT
SPANNER NUMBER..	CL SÉ ..
SPARKPLUG	BUZI
SPARKPLUG REMOVER	TUÝP BUZI
TYRE REMOVING REPAIR TOOLS	MIC LÉP
VOLT METRE	§ÅNG HÅ ®O ®IÖN
WIRE THICK	D©Y NHANH H N
WIRE THIN	GI©Y ®AI