Starting a 2 stroke after it's been sitting!

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lot of people out there. I want to make it less risky for people who have this dream to be able to follow a structured path to build their technical skills to get them to a point that they can venture out into this world where you can learn to work with dirt bikes on the side or for a full time living! If this sounds like you please look through the other guides on phoenixmotos.com, follow me on facebook, instagram and youtube!

Good Luck and have fun with your 2 stroke journey – it is truly amazing!

Conclusion

Hopefully you will have got your bike started and you've managed to go for a ride!

More importantly I hope that you have learned some tips, tricks and real information about how the 2 stroke engine actually works.

More than likely you'll use this guide again in the future and I'd really encourage you to do so and share it with your friends.

If you didn't manage to get your bike started then I hope that you manage to find a guide to help you on phoenixmotos.com

What I'm hoping is that going through this has opened your eyes and interested you enough that you want to keep on going down the road of learning more, experimenting and successfully working on dirt bikes.

My goal in these guides is not just to teach you "how to start your 2 stroke after it's been sitting" but to give you a more in depth understanding of what is going on inside your engine and why some of the steps that people often don't do are really important.

My life was turned around when I started working with dirt bikes for a living. I know how much I enjoy it and I also know how I spent years wondering if I could ever be lucky enough to do what I love for my job. It was a risk I took and I never looked back. I know this isn't everyones dream but I also know that it is for a

About The Author

My love of bikes started from a very young age. Some of my first memories go back to being 3-4 yrs old and involve a TV program called Kick Start. At the time we lived in a town in the North East of England. I remember watching the program with my friend, we'd watch the show and play for hrs pretending and dreaming that we were on one of the fabulous trials bikes that we watched on the show.

The show was a “Game show” presented by Peter Purves who also presented the famous Blue Peter. There were trials obstacles that world class riders would have to negotiate against the clock with time penalties given for a foot down, the winner being the rider to complete the course in the shortest time.

Kick start made motorcycles my obsession. I understand that the world has changed and the way we consume TV and video is vastly different but I always wonder why Kick Start was never followed by similar shows and why we never got any better TV coverage of things like motocross which seemed to be relatively non existent in UK.

At the age of 4 I was incredibly lucky to move to a village with fields and countryside – the perfect place to grow up. Better than that the perfect place for a kid with a motorbike to grow up. That’s right I pestered my parents so much that when I was 7 they finally gave in and made my dream come true. I was the happiest kid in the world.

If you are at this point then you need to try to dry out your bottom end. For this, follow the steps below:-

- Remove your plug
- Remove your reed valve
- Remove your exhaust (this may be full too and may need to be emptied and dried out)
- Turn your bike upside down YES UPSIDE DOWN
- Use your Kickstarter to turn your engine over and over and over again
- Now watching either through the exhaust port OR inlet port – use the Kickstarter to move your piston to the top (bottom now the bike is upside down) end of the cylinder
- If you have an airline blower – blow into the bottom end through the inlet port
- Leave the bike like this for a 30 mins or so to dry out
- Turn the bike the right way up
- Put everything back together and try to start the bike again

- If neither of the above bear fruit, then most likely you have an air leak in your bottom end. You see the compression test we have used so far tests the compression of the top end BUT there is also compression required in the bottom end. If this is not present then the act of kicking the bike over **may not draw fuel from the carb** as the piston travels up the cylinder Or force the fuel up the transfer ports into the top end as the piston travels back down. If these 2 processes don't take place then when the piston travels back up then there is no fuel and air mix present to be compressed and therefore there will be no big bang when the spark plug fires. You need to do a leak down test to confirm this you'll need to check out my other guides

- If it is then this is good BUT maybe it's too wet.. Or flooded
  - Dry the plug with a lighter. With the plug removed, open the throttle and kick the bike over 5-10 times. Replace the plug and try to start the bike again.
  - if this still doesn't work – either
    - Your fuel is not fresh
    - Your carb is over Fuelling – have you got the idle set too high? Were the jets (pilot and main) the correct sizes? Is the carb slide returning to the bottom when you open and close your throttle
    - Your bottom end may be flooded with fuel (usually old fuel!)

Now I just needed to learn to ride it.

It was harder than it looked on kick start for sure! Well issue number 1 was that this was a 70's Suzuki TS90 – a trail bike (not a trials bike) but more of an adults sized trail bike which I definitely couldn't touch the floor on and it had gears. It wasn't so easy but eventually I got the hang of it and soon I was allowed to go and get the bike out of the barn, get it going and pretty much ride it where ever I wanted. This didn't really turn me into one of the trials riders from Kick Start but it did scratch my itch.

What I do remember well though was that sometimes the bike would have a problem, sometimes we got it going and sometimes we had to take it to a mechanic for them to sort out which obviously cost my dad money. I recall the frustration of just wanting to ride my bike. I also have memories of me and my mates thinking we could just sort the bike out, trying and probably making more of a problem. The result was the bike had to go back to the shop anyway. All a big learning curve and I suppose better that we tried and learned something.

Fast forward to today and over the years I've owned countless bikes both personally and professionally as a bike dealer. Over the past few years I have been working professionally on bikes. I started in 2016 with the thought that I'd setup a suspension tuning business but ended up importing bikes from America as a side hustle and selling them here in the UK. In 2020 just at the time of Covid I turned my dream of a side hustle into my full time job by setting up Phoenix Motos!

If you can't get it going, I'm not advocating a bump start here for a number of reasons, there is something else wrong with the bike. There are some things to check before you try again but lets run through the stages again:-

- You are using fresh fuel
- Clean air filter or no air filter and airbox and air boot cleaned
- Clean and adjusted carb
- Fresh or cleaned spark plug which sparks
- Working kill switch
- Engine has sufficient compression

After trying to start the bike with no joy the first thing to check is the spark plug – remove it and look at the electrode. Is it wet?

- If it isn't then this is bad – there is a reason why fuel from your carb is not reaching your cylinder. The most likely reason is that there is still something wrong in your carb:
    - Is there fuel in the float bowl? Remove the drain plug, if fuel runs out when removed then this is most likely not the issue. If the carb is dry then double check if fuel runs out of the fuel pipe going into the carb if it does then please go back to dismantling the carb to see if your float needle is sticking.
    - If you have a reed valve it is possible that your reeds aren't closing – you will need to remove the valve and inspect it BUT to do this you will most likely need replacement gaskets and probably replacement reeds

Starting Your Bike

Now you're ready to start the bike!

Fuel on

Leave for a few seconds

Tilt the bike over until fuel drains out of 1 of the overflow pipes – this makes sure the float valve opened and the bowl is full

Choke on (or use the tickler for old bikes)

Stand over the bike

2-3 slow pushes through of the Kickstarter

And kick the bike over until it runs!

For big bore 2 strokes when you are ready to kick then follow these steps

Slowly push the Kickstarter until you feel the compression – this means you are just Before Top Dead Centre BTDC

Now very very slowly and carefully keep pushing until you push past compression just fractionally – you are now on the down stroke.

Get your kicking leg ready and kick down as hard as you can (I always use a riding boot for kicking a big bore due to the stiffness of the sole)

When you kick you need it to kick past the next compression stroke so sometimes you get a few strokes where it won't kick the whole way through but keep following the guidance and you should find the sweet spot.

I've dreamed of working with motorbikes since I was a kid. I'd assumed that to get a job working with motorbikes I needed to be a top notch mechanic which at the time I wasn't. Other than going to college and studying which never floated my boat I couldn't see a way into this dream world that I desired.

I'd setup a hobby business with a mate, a mechanic who was "teaching" me about repairing the bikes we were buying. It was going really well and I thought I'd learnt everything I needed to know until Covid when we decided to go our separate ways. Since then I have been buying, working on and selling bikes on my own .

Most of the bikes are 2 stroke motocross or enduro bikes which I buy as none runners for less money than I sell them for as runners. To enable me to do this I have developed a system that gets me a really high percentage of the bikes to run. This system has without doubt made me a lot of money and is something that I take for granted but I know that so many people really don't know where to start. Granted lots of others do and for those people this is not the right guide.

For those of you who ride 2 strokes and sometimes get these issues especially after leaving the bike sitting for a few weeks, months and even years this guide will take you to being confident that within an hour or so it should go unless of course there is something more seriously wrong with it. If that is the case then there are other guides for you on phoenixmotos.com.

Why am I sharing this knowledge? Well firstly back in 2016 I went on a training course and I was really impressed with the strategy of the course, the way the framework of the company made it easy for me to work on suspension with the knowledge that I could get help and support with tools, spares and guidance when I needed it. It's something I have thought about a lot and

Compression Test

From a couple of long sections about spark and carburetor to a very short one!

On a big bike 250cc and over you can generally feel if there is enough compression but I find it hard on smaller ones. That being said it's worth doing a compression test just for peace of mind.

Simple test – remove the spark plug and install the compression tester.

Sit on the bike and give it a few good kicks until the compression dial stops going up.

You really want a reading of 115psi or above. Anything below and you are probably wasting your time and the bike needs a top end rebuild – check out the top end rebuild guide at phoenixmotos.com.

Sometimes at the lower end e.g. 115psi you may be able to get the bike to run then after it has the compression will go up. It could be that a piston ring was stuck into the ring groove of the piston and it will pop back out after the motor has run.

There is more to a healthy engine that simply a compression test but that's a whole world of information which I've got covered in the 2 stroke top end rebuild OR the 2 stroke engine rebuild courses at phoenixmotos.com

6. If you still can't find the fault you can send ignitions for testing or refurb, in my experience, often the easiest way is to swap out the ignition system for a replacement – contact me through phoenixmotos.com with your make and model of bike and I can get you a quote for a replacement HPI ignition.

If you get to the end of this testing script and still no spark then you need to be looking at some of the other guides available at phoenixmotos.com

something I wanted to replicate but in what I think is a better way. That's what I'm attempting to do here. I have no doubt it will work, I'll maybe need to tweak a few things along the way but all in all I want to help riders and aspiring hobby mechanics to amplify their knowledge and take their skills to the next level.

Why is this guide free? well for a big percentage of the time this guide will help you solve your problem but sometimes it won't and also at some point you will want to do some extra work to your bike and for that I'm hoping that you'd be prepared to buy a more in depth course to help you through the next stage. Obviously if you don't then that's fine and I've achieved a goal of helping you to move on in your quest for getting your 2 stroke running and riding again!

Disclaimer

I know a disclaimer sounds very formal doesn't it but I need to make it clear that really unless an engine in an unknown condition is fully stripped down and reconditioned that there are potential issues that can arise from starting it up meaning that in some cases it could cause damage to the engine.

It's all a risk, however we need to know and understand the risks before we can make a calculated judgement as to whether the risk is worth taking or not. I aim to guide you through so that you can make that calculated judgement before kicking the bike over.

So what I'm trying to let you know is that before we get into the detail I need you to understand that getting the bike started does not mean everything in the engine is in good condition. A lot of people like to get the engine running before doing a rebuild or top end even if that is their overall goal anyway.

There may have been problems with the bike before it was left and sometimes when it is left other issues can occur like rings rusting to the cylinder, bearings developing rust, crank seals drying out and if the crank seals have gone bad then the bike could rev up uncontrollably and seize.

If you follow this guide and there was an unknown issue that causes damage to the engine, I cannot be held responsible.

The system you will learn is the exact same system I have used over the years and in that time I have literally only had 1 or 2 major issues arise out of more than 1000 bikes. Normally what happens is that the engine simply won't run.

If no spark

Lets go through the basics and hopefully you can get your spark back! Retry to get it sparking as you work through the list below

1. Get a friend to help – because the spark plug is in an awkward place sometimes it can be difficult to watch the spark plug properly while pushing on the Kickstarter
2. Make sure the spark plug is properly grounded to the engine – using a multi meter you can set it to a tone setting. Put 1 probe on the spark plug and the other on the engine – you should get a tone. if not you need to reposition and or use the jump lead method.
3. Try to disconnect the kill switch – if this resolves the problem try to reconnect, if the problem still persists swap the kill switch for a new one.
4. Remember the multi meter? Use the same continuity setting on the multimeter. remove the stator cover, put the probe on the stator back plate and the metallic connection on the coil. You will most likely need to remove the fuel tank for this. If there is no tone then this is a major problem
5. At this stage you need to be tracing your wiring to find breakages, anything disconnected etc. Moving on from there is swapping the coil and then testing the resistance as per service manual on various components

Spark Test

We're assuming that the bike was running before it was left sitting so I am not going into altering the timing.

We are going to test for a spark and also as important if not more so is to make sure that it stops sparking when you press the kill switch.

1. Remove the spark plug and check it's condition
2. Replace with a new plug OR at least clean the old plug with a wire brush
3. Plug the spark plug back into the Spark plug wire (HT Lead) and rest the metallic part of the spark plug on the cylinder head in a way that you can see the electrode when you push the kick starter over – if you can't do this. Use a jump lead, attach 1 end to the spark plug and the other to somewhere on the engine and then position the spark plug somewhere that you can see the electrode.
4. Push the kick starter over firmly with your hand and watch the electrode – you should see a spark. If not follow instructions below.
5. Now press and hold the kill switch, when you push down on the kick starter you should not see a spark – If you still see a spark, replace the kill switch

If something more serious does go wrong then there are other guides at phoenixmotos.com like "rebuilding the top end on a 2 stroke" or "2 stroke full engine rebuild" which can guide you through more in depth procedures.

Tools Needed

Compression tester

Spark plug spanner

10. Reinstall the carb onto the bike, remember the heat gun or hair dryer for the stubborn air boot – use the same method to install if you need to. Install the air intake side of the carb first and the output side.

11. Check your needle jet is clean, clean with carb cleaner and a rag and use this opportunity to check and alter if needed the clip position at phoenixmotos.com
12. Reinstall the carb slide, needle and top
13. Make sure your carb is installed at the correct angle before tightening the jubilee clips

6. Use the carb cleaning wires to ensure the pilot and main jets are clear

7. If using an ultrasonic cleaner – this can be used at any stage. You ideally

   want some carburetor ultrasonic cleaning solution as this helps. I like to get the worst of the dirt off before using the ultrasonic cleaner so that it doesn't wreck the fluid.

The cleaner can help clear the holes in the jets and also in the removal of the float pin so try to make use of it where you can.

8. Once everything is cleaned, reassemble the carb.

Now is a good time to check your float height, ideally get the manufacturer spec BUT if you cannot find that a good rule of thumb is that the float should sit parallel to the carb body when help upside down. If not, you need to bend the tab which sits on the float needle until you are at the correct height.

9. Once you have the float bowl reinstalled I like to check to see if the carb is overflowing as it's easier to correct with the carb off the bike – hook it up to fuel whilst holding it level and wait. If it is overflowing check float height and or change the float needle.

Carb jet screwdriver

6mm spanner

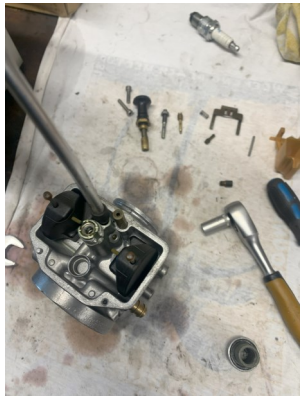
Carb jet cleaning wires

Carb & choke cleaner

Multi Meter

Auxiliary Fuel Tank

Ultrasonic Cleaner - nice to have!



Essential too bundles available from phoenixmotos.com

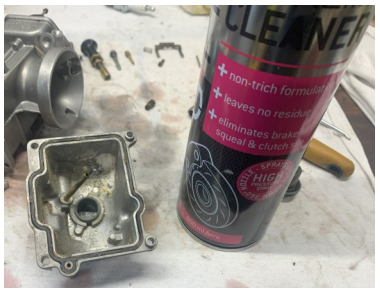
Use the fine punch and a very light screwdriver to carefully tap the pin out

4. Remove:-

- Air Screw
- Choke
- Main Jet
- Pilot Jet – be very careful to select a suitable screwdriver so as not to damage the jet

you can check your jet sizes and specs at phoenixmotos.com

5. Use carb and choke cleaner, an old screwdriver and nylon brush to soak the jets and clean anything you can get to. Use an air line blower if you have one to blow through all holes if you are using compressed air.



2 stroke basics

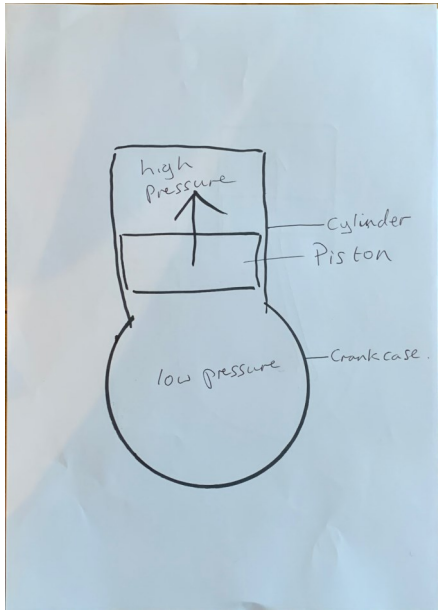
To give you the best possible chance of getting your 2 stroke engine running I think it's important to run through the basics of the 2 stroke cycle and then we can move on to the exact steps to follow to get your motor running.

First of all I'm sure you understand what goes into the engine to make it run when the spark plug sparks. So a few things to note here:-

The petrol and air have to be mixed at the right ratio

In a 2 stroke, oil is mixed with the fuel/air to produce lubrication to the moving parts (not the gearbox this has it's own oil)

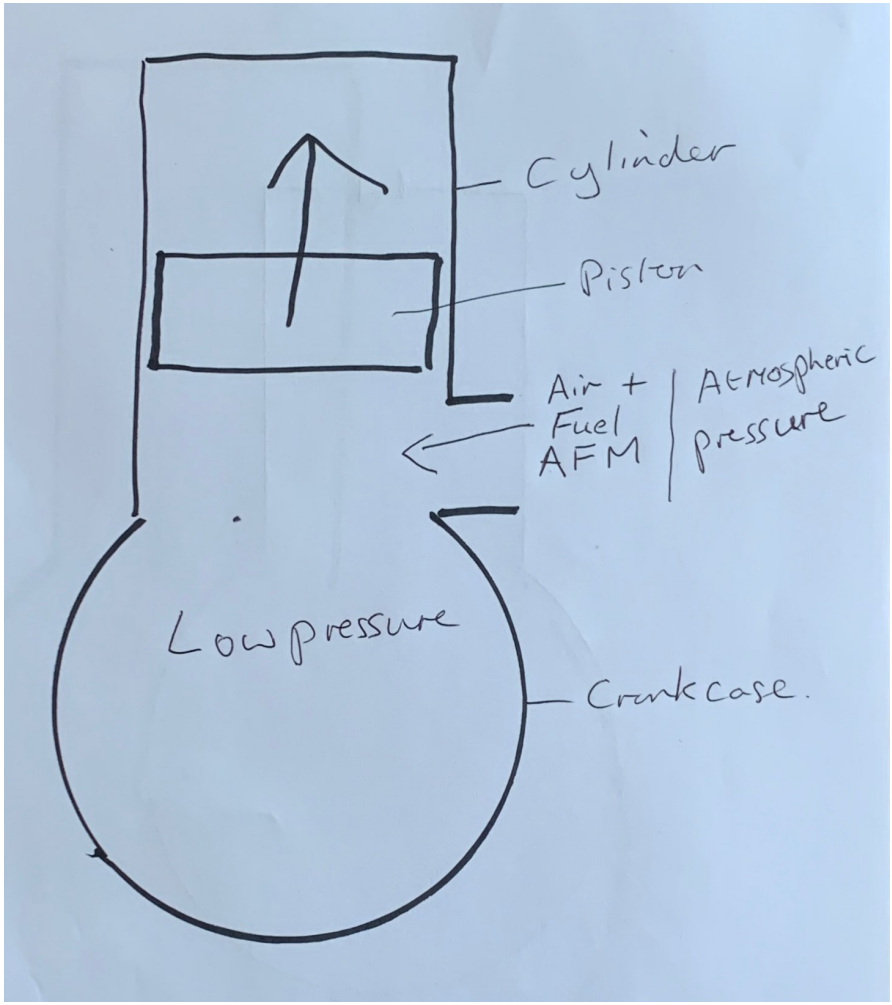
Fuel goes off and becomes less combustible



So we now know that we need a fresh fuel air and oil mix of the right proportions to make the magic happen. The 2 stroke process starts with the engine turning over.

The Piston moves up inside the cylinder which creates a vacuum in the bottom of the crankcase, where the crank lives.

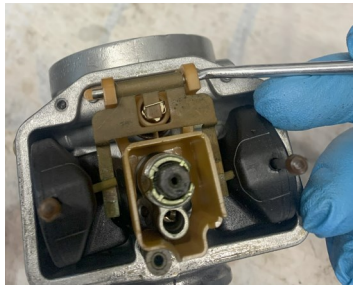
The mixture of fuel and air is drawn from the carburetor into the bottom of the crankcase.



2. Turn the carb up-side down (may need to rest it on something) and remove the float bowl.

If the bowl is stuck, lightly heating with the hot air gun / hair dryer and tapping lightly all around with a non-damaging object (plastic) - patience here as it's better to take the time and do this slowly rather than damage something. Keep lightly heating and lightly tapping and it will eventually come free

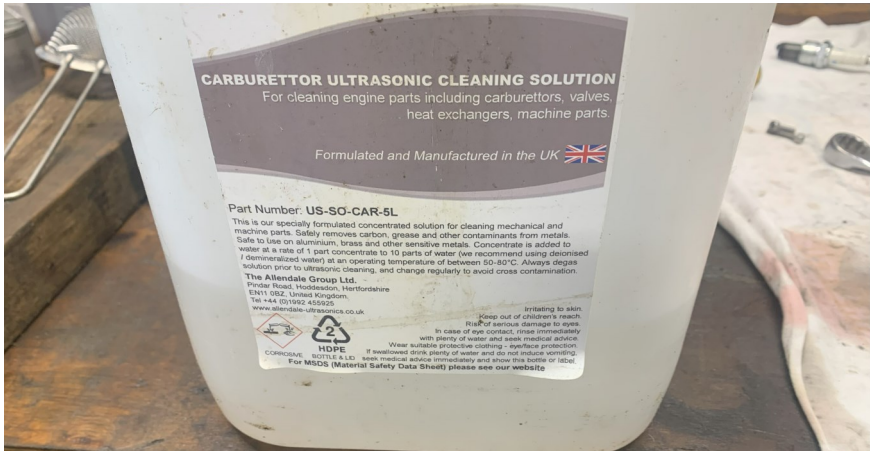
3. Remove the floats and float needle



The pin will either slide out easily or can often be stuck. Again patience is needed.

Soak overnight in WD40 / penetrating oil

Rest the underside post on something like a socket



The procedure we are going to follow here is not complicated, it is simply a process of dismantling the carb and cleaning it.

1. Remove the carb from the bike

   Loosen the jubilee clips on the air boot (back of carb) and inlet manifold (front of carb)

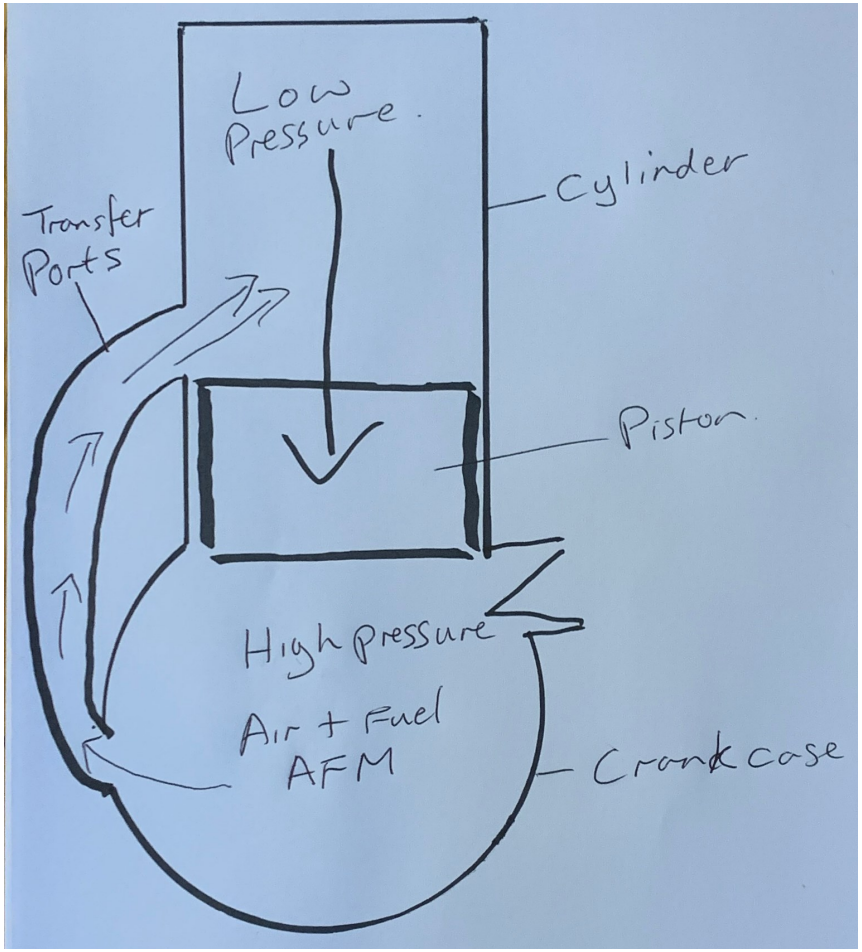
   Rotate the carb so that you can remove the top of the carb (where the throttle cable goes in)

   Remove the carb

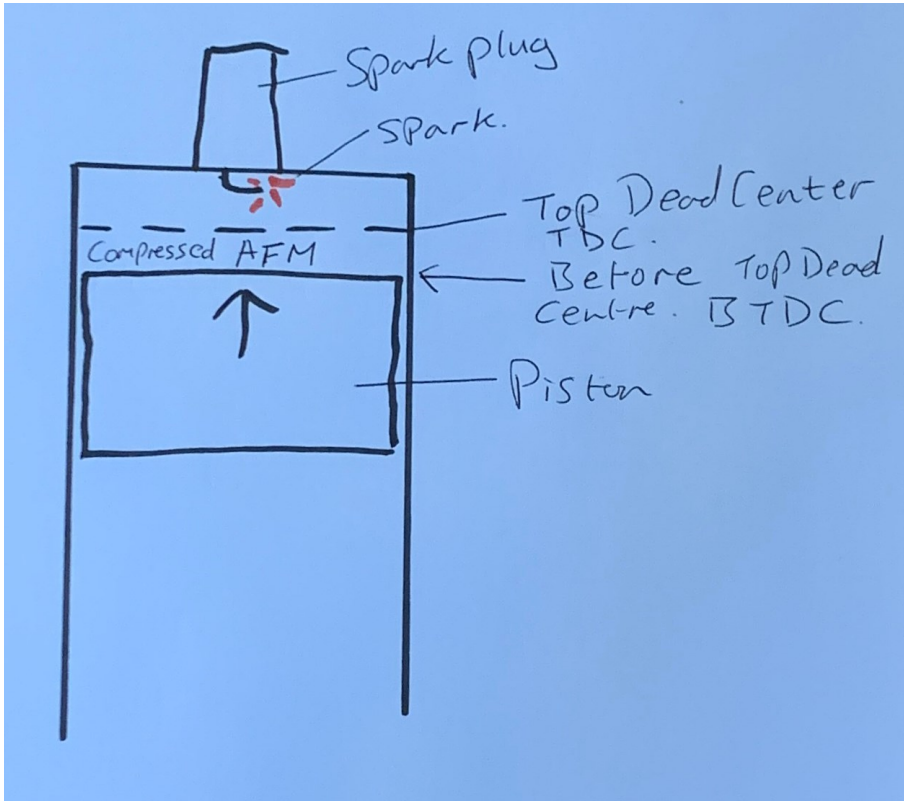
*** Keep an eye on the inlet manifold for any tears or cracks in the rubber as an air leak here can be very bad.

*** If the rubber on the air boot is hard and you struggle to remove/reinstall the carb, carefully heat it up with a heat gun or hair dryer. The rubber will become soft and you should easily be able to remove / reattach the carb.

As the piston passes the Top of it's stroke it starts it's was back down the cylinder creating high pressure in the bottom of the crankcase which forces the fuel air and oil mixture up the transfer ports (usually on the side of the cylinder) and into the top of the cylinder.



Next the piston reaches the bottom of it's stroke and as it makes it's way back up it begins to compress the mixture in the top of the cylinder until very near the top just Before Top Dead Centre BTDC, the spark happens, the mixture explodes and forces the piston back down.



Now we have a perpetual cycle which will continue until something is interrupted usually 1 of the following:-

The spark does not happen e.g. when we press the kill switch

We run out of fuel / interrupt the fuel supply

The physical motion is interrupted e.g. we are running too high a gear and stall so to stop it we need to do 1 of the above. Normally we will press the kill switch or switch off the ignition but if that doesn't

I spend quite a bit of time on this step as getting the carb cleaned properly and working correctly is going to have a huge impact.

You will need tools here to help with the job – some are mandatory and some nice to have:-

- Decent Phillips screwdriver
- Carb/Choke cleaner
- WD40 / other penetrating oil
- Carb cleaning wires
- Pilot jet screwdriver
- 6mm socket / spanner (depending on the carb)
- Fine punch
- Hot air gun / hair dryer – nice to have
- Air line blower – Nice to have
- Ultrasonic Cleaner

Inside the carb there are a few different jets, etc.:-

Cold start circuit: when the engine is cold to get it to run you generally need extra fuel to enable the engine to start than you do for a warm engine. In an old carb the common method was to hold the floats down so they don't stop the flow of fuel which floods fuel into the throat of the carb. In a more modern carb there is generally a choke which is effectively a valve which opens up an extra source of fuel.

Pilot jet: This is smaller jet which is responsible for the delivery of fuel into the engine at closed throttle and partially just above closed throttle. So tick over and just above tick over.

Main Jet: This is a larger jet to the pilot jet and is involved in fuel delivery from 1/8 open throttle to full throttle

Slide: this is the block which moves up and down in the throttle body as the throttle is opened and closed. It's function is to allow more or less air through the carb body and entering the engine. The more the throttle is open then more air gets through.

Needle jet: This is attached to the slide and moves up and down with it. It is a tapered needle so is thin at the bottom and thicker at the top. When closed the needle fits right into the main jet and pretty much blocks all fuel from being drawn up through the main jet whereas when the slide is at the top the needle will not be sat in the main jet at all and will allow full unrestricted fuel to flow through the main jet. The Needle Jet and main jet combination are responsible for fuel delivery from just above throttle closed to just less than throttle fully open

It's highly important for the Carb, airways & jets to be clean – as clean as is possible! It's also very likely that when the bike was put away it was left with the carb being full of fuel and 2 stroke oil which will dry up and will be likely to block the pilot jet etc..

All of the above actions can prevent the perpetual motion of the 2 stroke engine so to stop it we need to do 1 of the above. Normally we will press the kill switch or switch off the ignition but if that doesn't work we can look at 1 of the other options. We can interrupt the fuel supply but it can be risky if there is an air leak the engine can continue to run with no fresh fuel which creates a lean condition and potential seizure. This leaves the last option of holding the brake, knocking it into gear and stalling it. These options are worth remembering just in case.

Now we understand the 2 stroke cycle.

The closer everything is to being perfect, the easier the engine will start and the better the engine will run. Anything that is not right in the cycle will make the engine harder to start and not run perfectly.

Does it turn over!

Here is the first test that we always do. Does it turn over? if it doesn't you've got a far bigger job on your hands and chances are that you want to be looking at 1 of the other guides at phoenixmotos.com like "rebuilding the top end on a 2 stroke" or "2 stroke full engine rebuild".

My focus is dirt bikes which we would try to turn over using the kick start in general, I know newer models have an electric starter and some other 2 strokes will use a pull start etc. The question "does it turn over?" in this guide refers to the actual engine turning over rather than is the pull start or electric start working. If your starting method does not work you could do with ascertaining whether you can fix that method at this stage – for electric starts make sure you have a known good charged up battery and for Kick and pull starts make sure that the starter mechanism is engaging.

On a bike another way to ascertain if the engine turns over is by putting it in gear and pushing it back or forward. Remove the spark plug and select one of the higher gears as this will make it easier to turn the engine over without the rear wheel locking up and sliding.

The aim of this guide is not really to assess all of the different starting mechanisms and provide fixes for these so if your starting mechanism is the problem then maybe you should review some of the other guides available at phoenixmotos.com.

The float and needle work like a toilet ballcock, they allow the float bowl to fill up with fuel until it reaches the desired level. At the desired level, the float needle valve blocks the tube stopping the flow of fuel and only allowing more fuel into the bowl when the level drops.

It is quite common for this system to leak and to continue to allow fuel to enter the float bowl which results in fuel from pouring out of the overflows and also to begin flooding the crankcase – If this happens then you will need to reset the float height and you will most likely need to replace the float needle. For the purposes of simply starting the bike I will switch the fuel off just as it starts overflowing as there will be plenty of fuel in the carb to allow the bike to run for a while.

In the case of an overflowing carb that you can't stop, it is worth purchasing a carb rebuild kit which should contain replacement float needle, jets and gaskets which can help solve the overflow problem. Check phoenixmotos.com for available rebuild kits.

Once you have made sure that you have fresh fuel mixed with a quality 2 stroke oil to the correct ratio – unless of course your 2 stroke uses an auto lube system where you just top up a 2 stroke tank. You now need to make sure that fuel flows from your fuel tank / auxiliary tank depending on which option you are using and unblock if required. It's quite common for petrol taps to block and need unblocking before you'll be able to try to get your bike to run.

The next step is the carburetor (Carb) which is an incredibly important step and I would say the cause of >90% of 2 strokes failing to start that I see.

Here is an overview of how the carb works.

There is a fuel inlet tube which the fuel tank connects to with a pipe.

This fuel inlet tube allows fuel to enter the float bowl via the float needle valve which is attached to the floats

Lets say your engine doesn't turn over, there can be many reasons why the engine is locked up. There could be a slight bit of rust built up on a piston ring which could prevent the piston moving up and down, the other end of the scale could be the crankcase could have been sat in water for years causing the big end and main bearings could be rusted solid.

Sometimes an engine will free up very easily if it's simply a rusty ring and can run fine. Whether you decide to try to start the motor or not it's worth trying to unseize the engine. If you decide to follow one of the other guides on phoenixmotos.com to rebuild your motor then to get it apart in the first place it will be far easier if the engine is unseized.

A simple procedure to follow is:-

1. Remove the spark plug
2. Spray WD40 or an alternative lubricant liberally into the into the spark plug hole in the head – ideally use the WD40 can straw to try to get the WD40 to coat the circumference of the bore
3. Leave the WD40 for a couple of hrs to work it's magic – in bad cases I have done this over a matter of days but where that has been the case I have definitely not attempted to start the engine but gone on to do a rebuild of some kind

Whilst the WD40 is working it's magic now is a good time to remove the exhaust so that you can look up the exhaust port using a torch to see whereabouts in the cylinder the piston is. If you can see that at this stage then you will be able to work out which part of the cylinder to assess for any damage before deciding whether to try to start the engine or not. A really nice option is a cheap borescope

1. which if the picture quality is good enough would mean that you wouldn't need to remove the exhaust to see the state of the bore.
2. Now you have left the WD40 to work it's magic, sit on the bike, put it in a high gear and rock the bike backwards and forwards until the engine stops you. With a bit of luck and perseverance the engine should start to turn over. Often this can happen quite quickly with little effort.

I am not advising that you try to start the engine after you have unsiezed it without further investigation into the causes and the state of the engine.

Assuming the engine wasn't seized and we have established that the engine does turn over we can move on to the next stage.

Mixing ratio: ideally follow the manufacturers recommended mixing ratio if you can - this can be found in your manual. If you don't have that then a safe ratio that I use and have great results with is 32:1 so that's 32 parts petrol to 1 part oil or 155ml of oil to 5 litres of petrol. This ratio works great across a wide variety of bikes and I always see decent amounts of oil residue in the engines when I am doing a rebuild which is good. Remember all the lubrication for the bottom end comes from the oil that is mixed within the fuel so this is really important for the life of your engine.

2 Stroke oil: a hotly debated topic, which brand is best, Castor based or fully synthetic etc etc.. And what is available varies in different countries. I personally stick with a top brand of synthetic 2 stroke oil, if that brand offers different grades of oil use the best. I am currently using Motorex but have previously used other brands with good success. What I have noticed with some other oils is that sometimes they will separate from the petrol and sink to the bottom in the fuel tank and in the bowl of the carburetor. I noticed this particularly with a Castor based oil I was testing. A lot of people swear by Castor oil for racing but in that application all of the fuel will be fresh every time and everything will be emptied out. For general applications where the bike will sit with fuel in it for a while you really don't want the oil to separate. If you want to switch to Motorex you can get this from Phoenixmotos.com and I know you won't be disappointed.

When I'm trying to get an unknown bike started, or one that I've had sitting for a while I never try to start it with the fuel in the tank. What I do involves an extra piece of equipment, an auxiliary fuel tank. Using this will save you a bit of time initially and if you are going to be doing lots of this then it is well worth it BUT otherwise my advice would be to drain the fuel out of the bikes fuel tank and fill with some fresh.

My recommendation if you don't have a go to fuel, mixing ratio or oil type is as follows

Now we have petrol with high concentrations of Ethanol in it for example in the UK E10 petrol contains 10% Ethanol. This is done to reduce our reliance on fossil fuels for internal combustion engines. Ethanol however can cause rubber seals etc to perish and crack. This can affect fuel pipes, your inlet manifold and crank seals which could cause major problems. I would only recommend using an E5 fuel (or better). If you do a little research you will find some fuels labelled E5 actually contain 0% Ethanol or at least there are some available at the time of writing this. An extra advantage of using the E5 fuel is that it is a higher octane which is better for your 2 stroke engine and most likely closer to the octane that the manufacturer used when developing the jetting spec for the engine.

Oil Change

That's right an oil change, it's worth it. When your motor runs OR turns over it is turning over your gearbox, clutch etc so you really want these to be sat in nice fresh oil.

Draining the oil from the gearbox will also be an indication of the state of the gearbox, some good questions you want to think about as you drain the oil are:-

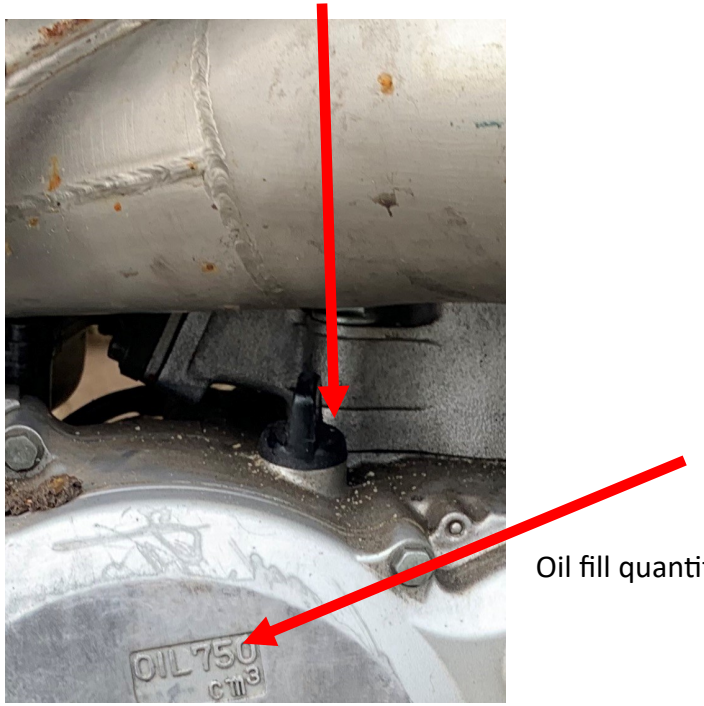
- is there metal in the oil? If there is it's bad and you would probably want to follow the full 2 stroke engine rebuild guide from phoenixmotos.com
- Is there water in the oil? Again this is bad for a number of reasons:-
    - Gearbox bearings probably need replacing and there is probably rust on the gears that needs to be cleaned off - this depends on how long the water has been in there. You possibly know this if you know the history of recent oil changes. If you don't know the history and the water problem is bad then you would most likely want to follow the full 2 stroke engine rebuild guide from phoenixmotos.com
    - In a water cooled engine the chances are that the water pump seals and bearing have failed and would need replacing. You possibly need to replace the water pump shaft also but this would need to be assessed for wear. Some bikes like mid 80's hondas, ktms and husqvarnas used magnesium clutch covers incorporating water pump housings which did not react nicely when water was used instead of coolant and rotted through.

You'll need to take a view on the state of the existing oil but hopefully the oil you drain out is not too bad and you are literally just going to replace it with fresh. Let the old oil drain out for some time before refilling.

I use Automatic Transmission Fluid in my 2 stroke gearboxes but there is much debate on oils and if you are not sure then really the one to use is the oil type and quantity stated in the owners manual. in 9 out of 10 cases the quantity of oil is stated on the clutch cover near the oil filler cap. In other cases there us an oil level plug part of the way up the clutch cover, usually a 10mm bolt head with copper washer behind it, just remove the bolt and slowly fill the gearbox with oil until it starts dribbling out of the bolt hole.

oil change procedure:-

1. Locate gearbox oil fill plug and remove



Oil fill quantity

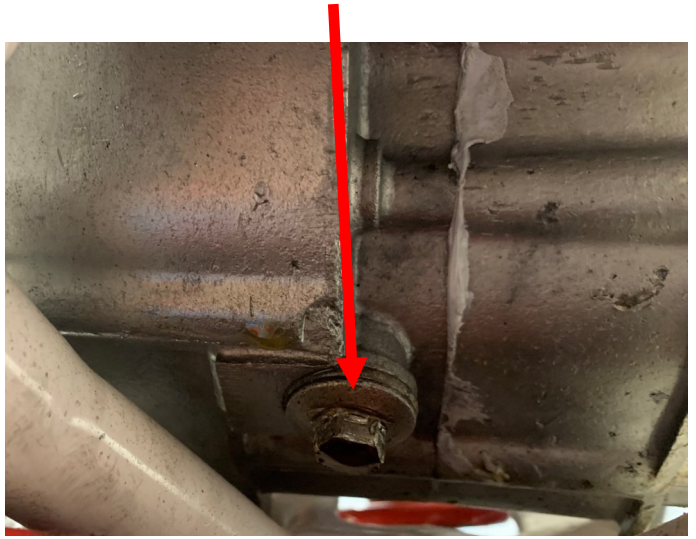
Fuel & Air system Inc Carb

You don't want to try to start the bike with a dirty air filter, air-box or air boot.

If you've not got a clean oiled air filter in the bike, remove the old one. When you have removed the carburetor later on, you want to clean the inside of the air box and air boot. be careful not to get debris OR water (if using water) in the inlet manifold (attached to the engine). I prefer to use Carb cleaner and a rag for cleaning and I stuff a clean rag into the inlet manifold to pre-vent debris going into there.

2. Place container for waste oil underneath the drain plug

3. Locate the gearbox oil drain plug



4. Undo the drain plug and leave the oil to drain out (for cold oil as this will be, I leave it draining for a couple of hrs)

5.Select the correct grade and volume of oil (see advice on p24)

6. Replace the copper washer on the drain bolt - as you tighten the bolt, the copper crushes and makes an oil tight seal between the bolt and the crankcase

7. Re install the copper washer and drain bolt – do not over tighten

8. Fill with new oil and re install the oil fill plug