

TITAN ZG 80 PCI



Instructions

5 years guarantee for TITAN model aircraft engines

More than 20 years experience with TITAN engines plus our quality control allows us to extend the period of guarantee from one to five years. This guarantee covers the engine and the ignition only.

The following conditions must be met to obtain the guarantee:

Guarantee is for the first owner only and is not transferable to any other person.

In the event of any claim, the engine must be returned to us with the original invoice. The serial number on the crankcase must be undamaged, and must not have been removed and reapplied. The serial number is registered by us with the buyers name and the date of purchase.

The only fuel to be used is the petrol oil mixture as specified in the instruction manual. Use of Methanol invalidates the guarantee.

The guarantee includes the Microprocessor Ignition unit, the maximum voltage of 6,7 volts must not be exceeded. Mechanical damage to the cables is not covered by guarantee.

The guarantee is that we replace any defective parts free of all labour and material costs and pay only the return postage and packing. This guarantee covers only the engine and can in no way be construed to cover anything else.

This guarantee does not cover crash and related damage in any form whatsoever.

Congratulations on your purchase of this fantastic Titan ZG80PCI.

You now possess an utterly reliable engine with real power in the form of high torque at relatively low RPM. The Titan ZG 80PCI, fitted with the Microprocessor Ignition, will start just as easily as with the Easy Start System.

Please read this handling manual carefully. Do not be put off with the amount written, this is not the normal type of instruction manual but more a collection of mistakes that others have made and hopefully will assist you in avoiding such difficulties. I am sure you will agree, it is cheaper to learn from other peoples mistakes.

With the ZG80PCI there nothing that can be described as complicated or prone to give trouble. We thoroughly check each engine before it leaves our factory, each engine is stripped down and professionally reassembled. The certainty of only perfect engines leaving our factory is worth the 25 to 30 minutes it takes. Experience has clearly shown us, there are endless possibilities for user mistakes, due to a lack of know how, especially with the installation of the engine. The reliability of an engine stands and falls with how you install and handle it. It is up to you, read everything set down here thoroughly, follow these instruction exactly and you will get the very best out of your engine and be able to really enjoy our fascinating hobby. I have to tell you, there are modellers who ring us about self-made problems, the answers to their problems are nearly always to be found right here in these instructions. But of course from time to time a problem occurs, even when one has done everything by the book, and we are always available, well nearly, to answer any call for assistance.

The Titan ZG80PCI is a very powerful engine. Take every care and think carefully about the safety of others as well as yourself. For example check twice that the throttle lever is at tickover before attempting to start the engine. If you do not have anyone to help, you must anchor your model securely or flick the propeller over from behind the engine, using the other hand to hold the model, this way you are in no danger from the prop. A screwdriver stuck in the ground in front of each wheel is not only useless, it is dangerous!

Do not taxi your model back to the parking place. Switch off the engine and push the model, this may offend your ideas of professionalism but it is definitely safer. If suddenly while taxiing with power on and something gives out with your radio, when the large prop has eaten its way through a friends model and not some part of his anatomy you can count yourself very lucky.

Engine installation

A firewall cut from 9 mm thick Birchply is sufficient, the fixing screws must be M6 Allen Screws with crown nuts behind the firewall. The screws must have spring washers fitted under the heads.

For cooling you do not need any especially large air inlets. But you must ensure that the air that has been forced into the cowl goes through the cooling fins and part flows over the carburettor. Remember that air flowing through the cowl takes the line of least resistance, this is to say it will not flow through the fins unless you take positive steps to make it do so. Use Balsa sheet to duct the cooling air through the fins, Balsa is ideal as this can rub against the motor without giving rise to metal to metal interference and is not affected by vibration. Remember that air, that passes the cooling fins at a greater distance than 2 mm, does nothing towards cooling the motor. Put another way: A motor sitting in a large cowl with a large intake area is badly cooled, unless you do something to force the air to go between the cooling fins.

Ignition installation in the model

The most important rule covering battery ignition systems first:

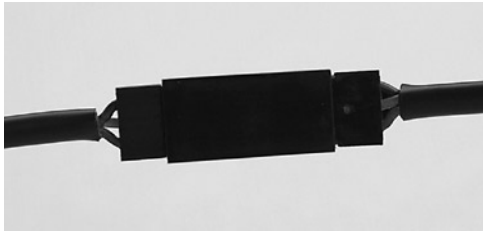
Never ever switch the system on without the spark plug cap being on the spark plug!

Keep all parts of the battery ignition as far as possible from the receiver, minimum distance being 25 cm.

The microprocessor Ignition is protected with a tough metal case and the electronics inside are encapsulated to protect against vibration. In spite of this it is not a good idea to simply mount the ignition box onto the firewall with a couple of cable ties.

Please fit the cables very carefully into your model, especially the high tension cable, as this will not contain the 21,000 volts if it is damaged due to scuffing against the cowl inner surface. If the screening flex is damaged due to scuffing when threaded through a GRP cowl opening, it will not be long before the inner insulation is damaged also. Then the HT will short out to the screening flex and this may cause massive radio interference and will of course lead to an ignition cutout.

Mechanical damage caused to the HT cable is not covered by the guarantee!



Take care with plugging together the JR-plugs and sockets by noting that the colours should line up on opposite sides. It is possible with a little extra effort to push these together with reverse polarity. No damage will be done but the ignition will of course be dead. I tape these plugs and sockets with insulation tape for additional safety.

Ignition-Switch

Use only knife edge contact switches such as the Graupner receiver cable with charger socket order no. 3046. Toggle switches with roller contacts are not suitable as these are intended for 240 V. Used on 6 V, oxidation can occur, this increases the contact resistance and will lead to ignition failure.

Ignition-Battery

The battery should be either a 4 cell NiCd or NiMH type with 1200 mAh capacity at least. More capacity will certainly do no harm. We recommend a 4 cell NiMH battery of about 2000 mAh capacity. The power consumption is dependant on the rpm. At 2,000 rpm the ignition unit draws 300 mA, at 8,000 rpm it is 1100 mA. Under normal conditions, you will not fly at full throttle the whole time, so a 2000 mAh battery, that is carefully managed, will suffice for two hours with safety.

Using a 5,5 V linear voltage controller, like the "Digi-Switch" available from Modellbau Deutsch, you can also use twin cell Lipos.

Spark plug

The very robust Champion RCJ-7Y resistor plug is fitted. In the event of a plug change it is important to use only this type. The contact gap is 25 thou or 0,6 - 0,7 mm

Propeller

We have set out here the RPM taken with a variety of propellers using a well run in ZG80PCI. The silencers were the standard silencers supplied. The intake was fitted with the 60 mm long intake ram tube #7480. These figures can be rather more or less with your engine and are only provided as a fairly rough guide.

Menz-S 2-blade

Size	RPM
22x12"	6600
22x14"	6350
24x10"	6200
24x12"	5900
26x8"	6400
26x10"	5650

Super Silence-CF-2-blade

Size	RPM
23x12"	7100
24x12"	6850

Menz-S 3-blade

Size	RPM
20x12"	6600
20x14"	6300
21x12"	6250

Super Silence-CF-3-blade

Size	RPM
21x12"	7000
22x12"	6550
23x12"	5800

For best performance, especially with an aerobatic model, I prefer the 24x12" two blade Super Silence CF-prop, there is simply nothing better for this engine! For quietness, but with a little less power, I use the 22 x 12" three blade Super Silence CF-prop. I know, such super props are not exactly cheap, and many are looking for cheaper alternatives. They can choose from the Menz-S 24x10" 2-blade and the 21 x 12" three blade propellers, but will notice the lower performance.

Prop the engine to keep the RPM between 5800 and 7000, you may think this is rather low but the ZG80PCI will run with plenty of power and there is no danger of overheating. Due to the lower RPM the sound is very pleasant and definitely not too loud. But in the air the revs will definitely increase somewhat.

You must balance each and every propeller. Some companies claim their propellers are balanced, do not take any chances, always check the propeller first before fitting.

WARNING: Should you decide to use a thermoplastic propeller such as Nylon, you must remember these can shed a blade, this can happen any time even if they are glass or carbon fibre filled. Due to the large diameter and the power of the ZG80PCI these plastic propellers are loaded to the limit of their tensile strength. Also there are other weakening factors to be considered such as material fatigue, manufacturing faults and drying out.

Propeller fixing

Experience has shown that, without doubt, the safest method is to fix the propeller onto the ZG 80PCI with a single large bolt and a wide flange on the prop hub. As long as the bolt is tightened down enough, the prop will not come loose. Should the propeller come loose by normal starting, then the prop bolt was not tightened down sufficiently, or the propeller has shrunk under pressure from the tightening down. But again, nothing dangerous will happen, you will not be able to overlook the loose bolt!

It is a real danger for persons and property to fix the propeller to the ZG 80PCI with a multiple screw hub system. The problem is, that you will not notice if the screws are not tightened down sufficiently to provide enough friction between the propeller and the hub to prevent any movement at all between the two. The continuous firing stroke impulses from the engine can very quickly lead to metal fatigue in these fixing screws, should they not be tight enough. This fatigue will cause the screws to shear, allowing the propeller to fly off. This is not something I have dreamt up, I have seen it happen!

For the single prop bolt it is not possible to come loose while the engine is running, as every firing stroke impulse only serves to tighten the bolt more. But should the ZG 80PCI be adapted for glow fuel and the timing be incorrect, it is then possible for the engine to start pinking (knocking) and, like the well known four stroke problem, this can lead to a prop being thrown.

Please do not fit a steel pin through the propeller and hub, the reason being the dowel holds the prop in place although the bolt may be loose. You may not notice this looseness, then suddenly the prop is split in two by the dowel. You can count yourself lucky with a near miss when this happens.

Should there not be enough resistance to movement between a smooth aluminium spinner back plate and the prop hub, the answer is to put a disc of 320 grit wet or dry paper between the hub and the back plate, the grit side against the back plate.

When you have understood what I am saying about propeller fixing bolts, and see that the friction between propeller and hub is the only means to give a safe fixing, you do not then have to envy your club friends, when they must bore a chain of holes around the hub of each new propeller, only to try to compensate for a too small and smooth prop hub surface.

Changing the propeller hub

We have 3 different lengths of propeller hubs. To remove and refit the two socket head screws, securing the propeller hub only requires a propeller to be firmly fixed to the hub to act as a lever.



Tank and Fuel-Tubing

For the Titan ZG80PCI we recommend to use our 1,000 cc tank #0051 for a reasonable flight time. For ease of starting, install the tank above the level of the carburettor, this will then allow the fuel line to fill easily. No need for concern, the non return valve in the carburettor prevents the fuel running out. For ease of starting it is better that the fuel line is full, hence the recommendation for the high tank position. The length of the fuel line itself is uncritical, it can be up to 1 Meter. Avoid a roller coaster type of fuel line run as air will be trapped in the top parts of the bends.

Make two air vents made with fuel tubing, fitted to two single sided nipples in the tanks topside, central at the rear end. These two air vent lines must be led forward over the tank and then down into the fuselage floor at the cooling air outlet of the engine cowling. One of these vent lines (does not matter which) is used to fill the tank. These two lines are always shut off, with two 3,5 mm self tapping screws 15 mm long with heads removed, while the model is flying or otherwise parked. Because the threads are so coarse, enough air can enter the tank, but even during violent stunting no fuel will be lost. The saving in fuel is considerable! This system is simple and 100% reliable, also during filling the tank, you will not spill fuel over your model. The double sided tank nipple from the clunk filter is best placed in the middle of the tank cap.

Never fill your tank via a Tee piece inserted into the fuel line between the tank and the carburettor or by removing the fuel line from the carburettor. These you may think are obvious mistakes, but ones that we have not seldom come across from even experienced modellers. Always fill the tank with one of the two independent vent lines.

It is best to leave a little fuel in the tank at all times, even when the model is in your home or workshop. This remaining fuel will prevent the carburettor diaphragms from drying out and becoming hard. Partially emptying the tank only when really necessary i.e. when tank is full. To drain excess fuel off, invert the model. As long as the self tapping screws are inserted, pressure cannot build up in the tank. Make these two vent lines airtight, then liquid fuel will be forced into the carburettor, causing a strong smell of petrol that cannot be ignored very easily.

Petrol foams easily when subject to vibration, as happens when the motor is running, this foaming will cause the carburettor pump to draw air as well as fuel, this air will build up in the fuel line and carburettor, causing the motor to run erratically and then stop. This air in the fuel problem is easily prevented by fitting our special clunk filter to the pick up in the tank. **This filter has a thick cotton felt sleeve that soaks up the fuel and prevents air being drawn into the fuel line and carburettor.** This filter has the additional advantage that the tank can be run absolutely dry. Do not operate your Titan without this filter being fitted for the very fine particles of dirt that are always present in petrol will be sucked into the carburettor, these fine particles will clog the very small passages as well as the gauze filter in the carburettor.

Do not remove the wire gauze filter from the carburettor for any reason, once removed it will not go back into place without deforming. Do not fit the transparent bodied filters that are sold for motorbikes and similar uses as these filters allow air to build up in the body of the filter, this air will soon be drawn into the carburettor. Do not use the small filters that are sold for model use, the mesh is too coarse and will let through the dirt that is always present in petrol.

Do not use transparent PVC fuel tubing. This clear fuel tubing often fits neatly onto the nipples and seals nicely for a short while, but after a fairly short period, this clear tubing becomes hard and expands a little in the process, due to the action of the petrol. This tubing then moves due to engine vibration, allowing air to enter the fuel line. It is well nigh impossible to seal this PVC tube satisfactorily. Never use Silicone tubing for the fuel lines. Silicone will swell and disintegrate.

Our specially made, thick-wall Neoprene fuel tubing is fairly soft and can be sealed perfectly at the nipples with 0.5 mm copper or brass wire, by being wound twice around the tubing and twisted together. The first contact with petrol causes this tubing to swell just a little, the fuel tube is restricted by the wire and is thereby squeezed onto the nipples securely. Do not be tempted to use nylon tie straps or small Jubilee clips to seal the fuel lines, these straps and clips do not exert pressure right around the tubing, they only serve to pull the tubing into an oval shape on a round nipple. The black fuel tube is very tough and due to having a very thick wall, it is not easily kinked.

A very good alternative tube is the transparent yellow **Tygon® F-4040** tubing. It is very much lighter and does not expand in contact with petrol, also you can see air bubbles in the fuel. You must use more care in laying this Tygon tube in the model to ensure that there are no sharp bends. This tube is not especially heat resistant, therefore it follows it must not make contact with any hot engine parts.

Fuel

Use only lead free Normal grade or Super petrol, mixed with any of the standard two stroke oils. A much better lubrication is to use **BEL RAY H1R** synthetic oil with a ratio of 1:40 and 1:50. For the first five litres with a new motor 1:40 and thereafter 1:50. The advantage with this BEL RAY racing oil from the racing bike world is a up to 10-times better lubrication, more power, plus a top quality anti-corrosion element.

TAKE GREAT CARE WHEN HANDLING PETROL:

USE ONLY THE SPECIAL AIRTIGHT RESERVE CANISTERS

NO SMOKING!

Carburettor linkage

The carburettor is fitted with a spiral return spring on the butterfly valve shaft. This spring is light enough to leave in place, as modern servos can easily cope with such loads, this spring also serves to take up any amount of play in the throttle linkage. Removing the spring will result in irreparable damage to the carburettor! What happens is, with the spring removed, the butterfly valve is free to move and will hammer the walls of the venturi, thereby enlarging the venturi, the butterfly valve will not seal properly and this will prevent a stable tickover.

The throttle lever on the carburettor can be taken off by removal of the small screw and the lever can be turned through 180 degrees if necessary. The screw must be secured again with Loctite®.

WARNING! Never attempt to remove the screw holding the butterfly valve! This screw, you will notice, is spread on the threaded end to prevent screw loosening. If you remove the screw the threaded hole will be enlarged, you then have no alternative to purchasing a new carburettor. There is no way you are going to fix the screw safely into the damaged shaft; if the screw should ever become detached, it will be sucked straight into the engine, the engine will be completely ruined.

To prime the engine, the choke butterfly valve must be completely shut and must not catch on the intake ram tube. This means that the intake ram tube must be exactly centred onto the carburettor. Shut the choke butterfly valve, mount the intake ram tube and tighten the two fixing screws. If you now cannot open the choke butterfly valve, you know that you have to readjust and try again.

The choke valve can also be operated with a servo if required. Do not remove the spring and ball bearing selector for locking the choke spindle. A normal servo can overcome the resistance without a lot of effort. With mini servos set the servo throw on the transmitter to max value, i.e. 150% and use a small servo arm.

We have discovered that it is an advantage to paint the inside surface of the intake manifold with two component car paint. This leads to less fuel droplets forming or more probable, these droplets do not adhere so strongly.

If you use the intake ram tube and the engine sucks the air from inside the fuselage, something to be carefully avoided is loose objects such as small washers or nuts being sucked into the engine from the fuselage. You should make up an air filter, which can easily be done by cutting a square piece 10x10 centimetres from the filter mat that is supplied for kitchen air filters, and then gluing it to a Balsa frame. This filter element should be 20 mm away from the intake bell mouth. A (plastic) tea sieve placed over the intake bell mouth and glued directly onto the firewall works just as well and is easier to make.

Warmed air from the exhaust system must not be sucked in by the carburettor!

Carburettor settings

The high and low speed needle valves have the letters **H=high speed, L=low speed** marked on the carburettor body adjacent to the respective needles.

Standard needle valve settings	H	L
Without intake ram tube	1 1/4	1
With intake ram tube	1	3/4

The **return stop screw** on the throttle lever is useful for the test stand, but when the throttle is operated by a servo this screw should be removed, so the motor can be shut off by pulling the trim lever back against the stop. Set the throttle trim lever on the transmitter fully forwards, at this position the motor should tickover reliably, pull the throttle trim back against the stop and the engine should stop.

For a reliable tickover you must adjust the slow speed needle in steps of 10 degrees and wait for the reaction for about 20 seconds before further adjustment. You can improve the acceleration by fitting an intake ram tube, a ram tube also will considerably reduce the fuel consumption. It is better to fit a slow reacting servo on the throttle. And when you are running the ZG80PCI on the test stand, do not let the spring slam the throttle to the closed position, just move the throttle lever at the same speed as the servo would.

You can only tell from the engine performance in flight whether the carburettor is correctly adjusted, additionally you should check the colour of the spark plug. To check the spark plug colour it is essential that the engine be shut off at full throttle after running for few minutes on full throttle. It is no use to check for colour after the engine has been running at tickover. The ideal colour is an even soft brown. When the plug is black and oily it is of course too rich, when whitish or with an appearance of being glazed over then the mixture is too weak.

WARNING: As opposed to glow plug motors the Titan ZG80PCI will run on a very lean mixture but will not reach full power but will become so hot after several minutes that the motor will seize. With a new motor this can easily mean you will need a set of new cylinders and pistons!

When the carburettor is satisfactorily adjusted, it will stay so. The carburettor will not alter in its settings when left alone. It will not get clogged up when you have the clunk filter in the tank. The metering chamber will automatically alter the mixture to compensate for changes in air pressure.

Starting the engine

Due to the Microprocessor battery ignition starting the engine is very easy, but there is one very important point to always keep in mind:

**Never prime the engine by sucking in with a switched off ignition!
The battery ignition, unlike the magneto ignition, will not start the engine with a wet plug!**

For starting follow these rules exactly:

1. Fill the tank (very helpful).
2. Close the choke.
3. Set the throttle at a slightly higher setting than normal tickover.
4. Have someone hold the model.
5. **Switch on the ignition.**
6. Immediately hit the prop **without any prior sucking in.**
7. The engine will start as soon as enough fuel air mix is ingested due to the closed choke, and will turn a couple of times and stop as the choke is not opened. This is nothing for concern, the engine has shown you there is enough fuel ingested. It remains to open the choke and with a couple of flicks the engine will fire, burn off the excess fuel and run.
8. Let the engine warm up for about 15 seconds before advancing the throttle.

It is to no purpose to violently flick the propeller, just lightly flick the prop over the TDC, you will notice it only takes the small finger at the propeller tip to do this. An elegant method is to flick the propeller over from behind the engine, using the other hand to hold the model, this way you are in no danger from the prop. You will find it pays to have the transmitter in range from your flicking hand.

As a safety feature the ignition will automatically shut down when one minute has elapsed without the propeller being turned. This safety switching can be a slight problem if you get distracted when starting and you do not turn the propeller at least once inside one minute and forget to switch off and on to reactivate the ignition. With the ignition shut down you will easily suck the engine full of fuel before you notice what is wrong and it will then be probably too late and you will have to remove the spark plug and shake out the petrol.

Nevertheless **always switch off the battery ignition immediately after finishing a flight** as during the minute it only requires someone to carelessly flick the propeller once... Further with the engine stopped and the automatic shut down active, the ignition still draws a small current that will unnecessarily flatten the battery when forgotten.

Running in the engine

This is the critical time in a engine's life. Do not use the glow-engines method of a really rich set needle valve on a test stand on half power, rather set the needles on the Titan ZG 80PCI to a normal position and **fly** the new engine with very short periods of full throttle and long periods of tickover. You will of course ensure that the mixture setting is not on the lean side. Avoid letting the engine run at half or three quarter throttle for long periods. After the first tank full you can increase gradually the full throttle periods. After four tank fulls you can fly full throttle for as long as you wish.

Experience has shown the power steadily increases over the first fifty flights and even after this time, the power will increase from season to season, due to the build-up of carbon deposits on the piston crown and on the combustion chamber walls. This carbon build-up increases the compression ratio. Because the engine is designed for an extraordinary long life span, even when mineral based two stroke oils are used, the designers had chosen a relatively low compression ratio to allow for a considerable amount of carbon build-up. So "don't worry" about carbon build-up and as long as it is not in the piston ring groove, do not remove it, instead "be happy" about the extra power!

It is far better to break in the engine in a model with the engine cowling fitted. Due to the unequal temperature distribution around the cylinders, because of the unequal cooling airflow, the cylinders always tends to slightly distort. A new piston ring, with his special surface treatment, can easily adjust to this condition. During the first hour of running in, the piston rings will continually get polished and thereby it's surface becomes harder. An engine, that has been run in on the test stand, must run for a considerable longer length of time, until it has settled down to the new and almost always completely different temperature distribution under the models engine cowling.

Very important:

Although the microprocessor ignition unit is perfectly screened, please make a range test with full throttle before the first flight. Use a small propeller to simulate the rpm when the model is in the air. The range difference with the engine shut off and running at full throttle should be minimal.

If you have a PCM-radio, use the fail-safe and programme it so that in the event of interference the engine will be throttled to a reliable tickover. If you can programme the time lapse, then make this half a second.

By the way, it is technically impossible to shut off the fail-safe with a PCM-radio, it is an integral component of the PCM-system, that cannot be removed. Should the fail-safe be activated by interference or a loss of range, you have several pre-programmable options. This means you can programme the radio as to what will happen, for example the length of time elapse, usually from 0,25 up to 1 second, during which the servos will stay

in the last correctly received position before they move to your programmed „fail-safe position“. With fail-safe on or off, you get full control again in the moment the receiver gets a good signal. With the fail-safe „shut off“ the servos stay at the last correctly received positions and will stay there until either the model crashes or the receiver once more has a satisfactory signal from your Tx. With fail-safe in and the engine throttled by the fail-safe, the signal will often get better and you have a reasonable chance. Also you usually have some prior warning when something is not quite right.

Imagine when your model is taking off, someone switches on his Tx on your frequency. Your model is heading in the direction of bystanders at full power. You would be greatly relieved if your PCM-radio immediately switches the engine to idle. Or?

If you use a metal pushrod for your throttle, you must insulate this metal pushrod from the engine with a nylon ball joint.

I can advise you strongly, to fly only with a double battery pack. Experience has taught me that this is something never to fly without. The double battery pack I use is with two separate plugs, two separate switches and the batteries separated with diodes. You can use a servo socket for the second switch harness.

Install the receiver, battery and servos as far away as possible from the engine and particularly from the microprocessor ignition unit; in certain cases the interference comes not through the aerial, but through the wiring from the batteries or the servos. A double superhet will not help!!! Most cases of interference are not caused by the ignition, but through metal to metal generated noise or from a servo pot wiper that has suddenly become faulty.

In many radio instructions it states, that one should lay the aerial in a straight line. This is only OK when the Rx aerial is parallel to the Tx aerial and not pointing directly to the Tx as is mainly the case in take off and landing. When the Rx aerial points directly at the Tx this causes the reception to drop to its lowest value. The answer is simple: lay the aerial straight in the fuselage but bend up the last 25 cm to form a right angle and fix the aerial in this position securely. You can of course have this 25 centimetre vertical element straight out of the Rx case and the rest laid flat along the fuselage. If your fuselage is very short, then you can have this vertical element along the fins king post. A vertical piano wire aerial on a model owes its better performance to being bent over with the airstream.

Maintenance

The Titan ZG 80PCI requires almost no servicing. If your engine is difficult to start after the hibernation, suck fresh petrol into the carb to loosen the thick oil left after the petrol has evaporated, and let this stand for a few days and you will find the engine will run again without any adjustment of the needle valves.

Never use compressed air to clean the carburettor. Never remove the fine stainless steel gauze filter in the carburettor for any reason. When you have followed our advice and fitted a cotton felt clunk filter, there will never be any dirt in the carburettor, but there may well be fine cotton fibres over the small gauze filter (this is the sole reason for this filter). You can remove these fibres carefully with a toothpick, or tweezers.

If you wish to check the screws on the engine for tightness, please use the following table showing torque settings. Especially critical are the four cylinder retaining screws. These must never be really „pulled down“, otherwise the cylinder gasket, which is fairly thick, will squash at the corners of the cylinder flange, causing the flange corners to bend down and resulting in distortion of the cylinder. Cylinders so over tightened will be difficult to turn through BDC when hot and will not be able to run at a low tickover and will have considerably less power. This easily can happen with owners who having just purchased a brand new engine and having nothing better to do than to really pull down all the screws, the cylinder will then be useless scrap metal. If you do not have a feel for tightening down screws or do not possess a torque wrench, then it is better and cheaper, you leave them well alone.

	Thread	Tightening torque
Cylinder bolt	M5	7 Nm (5 lbsft)
Crankcase bolt	M5	7 Nm (5 lbsft)
Propeller hub bolt	M6	10 Nm (7 lbsft)
Rotor nut	M10x1	30 Nm (22 lbsft)

Thank you for taking the trouble to read carefully what I have written here. Have fun with your ZG 80PCI!

Gerhard Reinsch and Toni Clark.

April 2006

