



SCRUTINEERING & TECHNICAL INSPECTION GUIDE



SCRUTINEERS AND TECHNICAL INSPECTORS TRAINING GUIDE

DOCUMENT UPDATE SCHEDULE

It is certified that the updates listed below have been approved by the Australian Karting Association.

Revision No.	Revision Description	Revised By	Date
1	Introduction	T. Sheedy	28/05/2012
2	Revised based on 2013 Manual	T. Sheedy	27/01/2013
3	Scrutineering, Technical Inspectors Findings & Infringement Notice Forms, and Duties of the Chief Scrutineer and Fuel Tester Added	T. Sheedy	3/02/2013

Introduction

This document has been compiled as a training tool to be used by clubs to introduce club members to the requirements of, and procedures to be adopted in Scrutineering and Technical Inspections. Since it covers much of the material covered in a Tech School, it may be used in the training of both new officials wishing to become involved in Scrutineering and Technical Inspections, and for current officials wishing to brush up on these activities.

Accreditation in the role of a Scrutineer or Technical Inspector must still be established by the current approved procedures as endorsed by the relevant State or National body.

At no time should this document ever be considered to be complete. It must be viewed as a living document, subject to revision as methods change, or as new classes or components are introduced to the sport, or old classes fade away. A typical example would be the recent adoption to Rotax classes of the technical specifications in large part of World Rules, which is yet to be incorporated into this document.

I would like to acknowledge the significant foundation work of Ken Seeber - former WA STO, and Les Allen - current National Technical Co-ordinator, in compiling this manual.

Terry Sheedy - February 2013.

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PART (A) SCRUTINEERING

1. INTRODUCTION

The purpose of scrutineering is to ensure that the kart, the driver's apparel and the driver comply with the requirements of the competition regulations of that event, and importantly, that the kart and equipment is safe to participate in competition.

However, there are other duties of a scrutineer and these are all summarized below:

1. Filling out and checking relevant documents
2. Checking out the kart, driver's apparel and the driver
3. Carry out various checks during the race day as directed by the stewards and officials on the day

This part is directed towards the general kart requirements (covered under Chapter 25 Australian Kart Formula) and does not include any engine or related components which are covered under **Part (B), Engine Inspection**

Whilst also including procedural matters, it is considered that a major part of Scrutineering is to focus on SAFETY. Whilst sprint karting is a relatively slow speed form of motorsport, accidents do occur for a variety of reasons. It is a tribute to the overall regulations that have been developed over the many years of karting that the number and severity of reported accidents is very low in relationship to the number of karters.

Safety is the responsibility of everyone involved in karting, the drivers, the officials, the mechanics and the organizers. The scrutineer is not primarily responsible for safety, but represents a part of the overall process to maintain safety. If the scrutineer works to the rules of the appropriate chapters, then he/she can be deemed to have performed their duties. If a kart loses a wheel during a race and someone is injured as a result, the responsibility for that falls upon the driver. The scrutineer, whilst having the power to refuse a kart to be raced based on its state at the time of scrutineering, cannot be held responsible for any subsequent failure. The scrutineering function just provides an additional check over the kart in addition to that of the driver's preparation.

While there is a trend towards self-scrutineering, it is advised that scrutineering by a scrutineer is performed at club days. This is because virtually every new karter starts their karting career at club days and they do need as much guidance as possible. The scrutineer can be of great assistance in these situations.

The purpose of this guide is to provide some additional information, guidance and psychology to the scrutineer that is not included in the necessarily concise Karting Manual.

2.0 ATTITUDE

On race day, the scrutineer is the first or second official the karter will deal with on the day and vice versa. The karters will be hyped up (whether they are aware of it or not) and can tend to be over reactive if challenged on any issue, be it large or small. It is very IMPORTANT to be aware of this right from the start. The same can most likely be said of yourself. You have an important job and don't want to see anything go wrong.

Therefore at all times try to be cheerful, fair, helpful and constructive. This may be difficult at times, the guy you are scrutineering may have run you off the track last meeting. Any such feelings must be ignored. You are a scrutineer, not an historian with a grudge.

Remember also that there will always be new faces in karting and these people need to be treated with some consideration. A rude or ignorant official, perhaps combined with a disappointing day of racing, can be enough to turn people away from our sport in a very short time. It is in our interest to be helpful to the newcomers. Not to compromise the job, but to be helpful.

Your attitude can make or break the pleasure of the day for the karters and yourself, the scrutineer. For 99.9% of people all the above will come naturally, but it is important to have all this in mind at all times.

3.0 FURTHER DETAILS OF EACH TASK

The following is intended to provide some further details into the tasks of the scrutineering;

3.1 Filling out and checking relevant documents.

In the main, this will consist of the Scrutineering Report form. The Scrutineering Report must be completely filled out and signed by the driver or parent/guardian. This acknowledges they take responsibility for the safety of the kart. For Open events etc where drivers most likely will have 2 engines, these must have their engine numbers recorded in the Scrutineering Report. If the driver is a Provisional, ensure that they have the correct P plate displayed. Ensure that the driver is of the necessary grade for the class he/she is entered for. There will be no issue with Comers, Clubman, TAG 100, Restricted TAG 125 and National based classes where the C & D grade of licence applies, but for all of the Open TAG 125 Classes, Formula 100 etc a B licence is required. However pay particular attention to the Midget and Rookie grades with respect to what they have entered for. Refer to Chapter 13 for further details.

For Open events where the engines are to be sealed, ensure that there is a cylindrical nut with an internal hex (as per Rule 1.30.9) for Clubman and ARC air cooled engines, and that there are two engine sealing nuts for the head on all engines. Motors running restrictors must also have two sealing nuts fitted.

3.2 Checking out the kart, driver's apparel and the driver

The extent of this will vary, mainly based on the level of competition. Why, might you ask, should this vary? In a high level of competition such as CIK or the National Sprint

championships, the karters are usually very experienced, backed with professional teams and are there to win. This means that they and their karts are almost always extremely well prepared and the classic scrutineering procedure superfluous. However, at the other end of the spectrum, the club day, there will be newcomers and karters who only race occasionally.

Without detracting from the majority, there are some that put a low priority on to kart preparation and these need to be monitored. For this reason, this part has been written around the club day level.

In most cases, the karts will be very well presented and scrutineering is very simple. However there will occasionally be a “dog” of a kart where it will be dirty, rusty and clearly not prepared. Here you need to be careful, both in your tact to the driver, but also in your inspection. If it is so dirty that you feel that you cannot inspect it, then request the competitor to go and clean it and bring it back. You’re in charge.

General things to look at (in the order of the Scrutineering Report) are as follows. Fundamental to this is that the kart must be treated as being “ready to race”. No concessions should be made to drivers who say that “they just have to do this or that” to the kart prior to going onto the track. Note: refer to the relevant clause in Chapter 12, 13, 14, 23 & 25 for details:

- **Kart Numbers.** These must be easily read with four number plates being required. If not correct in your opinion, these to be remedied.
- **King Pins.** This area covers steering and deserves some time as this is a key safety area. Main areas to look for are binding of the steering mechanism on either full lock position, lock nuts are tight and a steering shaft retaining device is in place. Some slop in the rod ends, is acceptable from a safety viewpoint as long as there is no possible way the joint can come apart. Whilst should be highlighted to the driver, the main downside will be a kart that does not handle as well, to the driver’s detriment.
- **Nuts on Stub Axles.** As these are continually being removed, the tightness of the Nyloc nut gradually diminishes. If you can turn the nut by hand then it must be treated as failed. However, most usually the nylon end of the nut can be given a sharp hit with a hammer and this will be sufficient to squeeze in the nylon enough so it becomes sufficiently tight.
- **Steering Wheel and Shaft.** General check for cracks. If the steering wheel wobbles on rotation, this would most likely be the result of an accident. As the hub is generally cast, look for cracks in this area. Any crack to be treated as a failure.
- **Floor Pan for cracks.** Main areas to look for are around the tank and the mounting points. Small cracks are common and probably do not represent a safety hazard and can sometimes be overcome with a large washer underneath. However, larger cracks which could result in the floor pan dragging on the ground must be regarded as failures.
- **Throttle Return Springs.** There must be an effective spring at the throttle pedal in conjunction with the spring on the throttle spindle. It is desirable that the pedal snaps back to a closed position on release. If there is any indication of a slow, dragging return (usually by a frayed cable) then this must be regarded as a failure.

- **Tyres and Wheel Rims.** Tyres must be appropriate to the class and be in good condition. The dimples must all be visible. Front wheel must spin freely and with a minimum of wobble. Inspect any run out at the rim flanges and for cracks. All cracks to be treated as failures. Back wheels must be tight. If not, this must be rectified before the kart can be passed. You might get the excuse that “they are loose so I can slip them in to fit them in the trailer”. Ignore this. If they don’t remember to tighten them for scrutineering, then why should they remember to tighten them for practice or racing.
- **Fuel Tank.** This to be obviously leak free in all areas, particularly the cap and hose outlets. Must be firmly located.
- **Fuel Hoses.** These again to be obviously leak-free at all connections points and must have a clip on the outside of the hose at each connection point, including overflow connections. Must be sufficiently secured so that there is no possibility of the hose, or even filter, slipping below the underside of the frame and dragging on the ground. Pulse lines do not need to be clipped.
- **Frame for Cracks.** Main areas to look for are around the engine mounts, rear axle supports, engine side pod support. If the kart is so grimy that you consider that you could not see a crack, then request the driver returns the kart after cleaning.
- **Chain & Sprocket Finger Guards.** Must be present and secure. Note all clutches must have a retaining device.
- **Muffler Springs & Safety Cable.** Mufflers must be firmly and securely mounted. The secondary securing system must connect to some secure part of the kart, other than the muffler cradle.
- **Weights securely attached.** Each weight needs to be felt by hand to test for correct clamping. Any looseness must be rectified, as a loose weight will quickly wear a larger hole in itself or the fibreglass seat. It would be undesirable to run into a lead weight when racing.
- **Side Pods.** Must be sufficiently secured and must not protrude beyond the width of rear tyres during dry conditions. If they appear to be really floppy mounted, check that they are greater than 25 mm from ground.
- **Brake Pad Retainers.** Ensure that the screws retaining the pads are lock wired or other designed pad retaining devices are in place and functioning.
- **Brake Cables, Hoses & Fittings.** Ensure that these are in good condition and show no signs of fraying or leaks. Particular areas for fraying are around the pedal and anywhere the cable is bent. The hose must be secured so there is no possibility of slipping below the underside of the frame. Feel the brake effectiveness by holding the pedal and trying to turn the back wheel. Request that the brakes be adjusted if there is an excessive amount of pedal travel. Floating discs do wear so check for excessive wear or slop in these areas.
- **Battery Mount.** Ensure that the battery mount is securely fastened to the seat or chassis, and that the battery is of an approved type and correctly restrained
- **Kill Switch.** All karts fitted with clutch must be fitted with a fully functioning kill switch. If in doubt, request the driver to start the kart and stop the engine via the kill switch.
- **Induction Silencer.** Ensure that karts are fitted with an approved induction silencer for the class, and that where required, a filter is fitted.

- **Drivers Apparel.** Suit must be in good condition with no holes. Likewise with gloves and footwear. Helmet must have no signs of accident damage or deep scratches and be less than 10 years old. Night races require a clear visor. Footwear must cover ankles.

3.3 Carry out various checks during the race day as directed by the stewards and officials on the day.

Whilst you have checked the kart during formal scrutineering before practice, there is an ongoing requirement to further check that the kart conforms to the rules during the race day. Any such secondary scrutineering would be done at the direction of the Stewards or Officials of the day and in the case of larger events, be agreed upon prior to the running of the event as part of the overall planning. This could range from checking for obvious hazards, tyre checking, engine number checking. Fuel testing would be carried out by the Technical Inspector or other designated officer.

4.0 CONCLUSION.

Scrutineering is an essential part of karting control. It can be as enjoyable or as miserable as you want it to be. It also offers a good education and insight into understanding good kart preparation and will help you as a competitor in this regard.

Remember that you have the power to reject a kart from racing as it has been presented.

Remember also that good commonsense and judgment are required.

When in doubt always refer to the rulebook and/or someone who has a lot of experience in these areas.

The goal is for everyone to get out there and have an enjoyable day racing under safe conditions. If you consider that there is a minor fault, then request the driver to rectify it promptly. If you feel that it is unsafe for the day, request the driver takes the kart away and rectifies the fault and returns it for further scrutineering.

It is recommended that, if you haven't done official scrutineering before, that you go home and practice with your own kart until you are confident with the overall sequence of checking. You don't want to be learning this under pressure from anxious karters.

After successful scrutineering, you retain the signed (by the driver and yourself) Scrutineering Report. The filled out Scrutineering Reports are to be handed to the Race Secretary on a regular basis to ensure that these can be cross referenced to the entry forms, and for use by the Technical Inspectors during the competition, and for post event inspections.

Rule 4.15(f) now requires that reports of inspections conducted by the Chief Scrutineer, Scrutineers, and Technical Inspectors must be completed and handed to the stewards at the conclusion of the meeting.

Chief Scrutineer

While the position of Chief Scrutineer has been well established, the role is one of significant importance. Under Rule 4.03, the Chief Scrutineer is an essential official, and under Rule 11.5, the position MUST appear on the Supplementary Regulations.

The Chief Scrutineer is a Judge of Fact concerning conformance to technical rules, kart or component compliance with Chapter 25, damaged kart or tyres. The decision of a Judge of Fact, once given in the context of relevant paperwork, and lodged with the stewards, cannot be appealed.

Consequently, any decision taken by the Chief Scrutineer will not be made lightly.

For example, any kart damaged during competition, or presented for inspection, which in the opinion of a scrutineer is unsafe to be allowed on the track, then the Chief Scrutineer will adjudicate the matter. Under R1.20, the kart will not be released without the approval of the Chief Scrutineer.

In 2013, A range of non-compliant infringements, if detected at the completion of any section of an event, will, under R25.23, result in an Infringement Notice Form (Page 45) being raised by the Chief Scrutineer as Judge of Fact.

25.23 Technical Infringement during an Event:

If, at the completion of an event, any of the below items, (a) to (i), are found by the Scrutineers / Technical Officers to be dislodged / non-compliant, the kart will be impounded for further inspection. Karts that fail inspection due to any of the following items, (a) to (i), will be automatically excluded from the section of the event to which the non-compliance relates. Action will be taken by the issue of a Penalty Notification Form, which will be issued without an Officials Hearing and signed by at least 1 Steward and the Chief Scrutineer (Judge of Fact).

A complaint / appeal cannot be lodged against this action.

- (a) Bumper Bars rule 25.01(g)
- (b) Side Pods rule 25.02
- (c) Nassau Panel rule 25.03
- (d) Nose Cones rule 25.06
- (e) Exhaust System rule 25.09
- (f) Chain Guard rule 25.11(i)
- (g) Engine sprocket guard rule 25.11(ii)
- (h) Noise Induction Silencer rule 25.24
- (i) Transponder rule 16.05

PART (B) TECHNICAL INSPECTION

Technical Inspection covers all aspects of scrutineering, and progresses through to detailed examination of the competitor's equipment, including engines, carburettors, mufflers etc. However, the inspection of these items requires a greater level of knowledge, and skill. Quite often, these inspections take place without the competitor or his representative present.

It is important that in handling all such items and components, that they are handled in the manner in which you would expect for your own gear to be treated.

The various procedures will be presented in an order based on the simplest inspections, progressing through to the more complex inspections.

Prior to conducting any inspection, it is always good practice to place an Impound Tag on the kart, and ask the competitor to present his kart to the impound area. Once in the impound, you can then advise the competitor what inspections you plan to carry out, so that they can then set about gathering up appropriate tools to remove the component if that is necessary. A typical Impound Tag is shown below, placed on a kart.



Should it be necessary to remove a component from the kart, then a receipt Tag will be completed, and a portion of the tag will be handed to the competitor. It is essential that they retain this portion of the tag to later claim their component when the inspection is completed, or upon the completion of a stewards hearing, in the event a component is determined by the Technical Inspector to be non-compliant. The larger portion of the Receipt Tag is attached to the component, so that it can be identified at any later stage of the inspection process. A completed Receipt Tag is shown below, together with the portion fitted to an engine impounded for technical inspection.



It is not unusual for a competitor to not be familiar with technical inspections. If they are present when their equipment is being inspected, it is always a good idea to explain to them what you are doing.

THE AIRBOX NO-GO GAUGE



This tool is used for two (2) inspections.

- A The width of the air box tubes (see photo 1a)
- B The length of the air box tubes (see photo 1b)

Photo 1a With the air box tubes exposed use the large end of the gauge and place it in the top of the tube and rotate the gauge ensuring that the gauge does not enter the tube. This completes one of the inspections.

Photo 1b Turn the No-Go gauge so as the hook end is then placed into the air box tube and is captured at the bottom of the tube this will then measure length of the air box tube. This then completes the second inspection. If there is a discrepancy in these inspections then appropriate paperwork is raised.



Photo1



Photo 1a



Photo 1b

A further inspection of the internals of the AKA 43 is then conducted by looking into the air box and inspecting the filter to ensure that it is as per the manufacturers specifications, for sprint racing the rubber adaptor is black in colour and the filter is blue , for dirt track karting and speedway the adaptor is black and the filter is yellow.

The air tubes maybe partially blocked see photo1 and these restricted components are to be easily removed for inspection.

INTERNAL CALLIPER



This tool is used as a No-Go Gauge and is set to the correct inspection size using Vernier callipers or micrometer. It may be used for carburettor venturi bore inspection. Refer to photos 2A for setting at 24.13mm for this purpose.



Photo 2A

After the kart is impounded and the air box is removed from the carburettor the venturi can then be inspected.

The calliper, after being correctly set to the Walbro venturi diameter (24.13) is placed into the venturi and turned in a complete circle ensuring that the gauge does not enter the carburettor throat. Keep the calliper in line with the venturi bore when turning, and use only the lightest possible pressure. If the gauge does not enter the carburettor throat then the carburettor passes this portion of the inspection. Refer photo 2B.

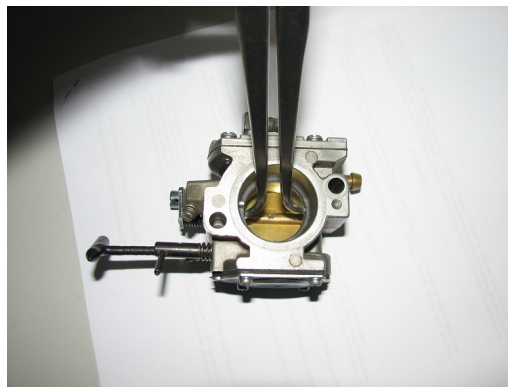


Photo 2B

When the venturi has been inspected the carburettor butterfly and shaft is then inspected to ensure that it is as per manufactured. A threaded butterfly screw must be retained. The carburettor may be back bored, but this modification must not pass the transition fuel hole. Refer photo 2C. Also check for non approved repairs, such as stainless steel sleeves in the bore.



Photo 2C

While inspecting the back bore, it can also be checked for maximum bore diameter (25.70mm). This inspection is also performed with the internal calliper. Set the calliper as shown in photo 2D, and check the bore as shown in photo 2E. The calliper should not fit into the back bore. If the calliper

enters the back bore, this is a fail, and a **Technical Inspectors Findings And Complaint Form** needs to be completed.



Photo 2D

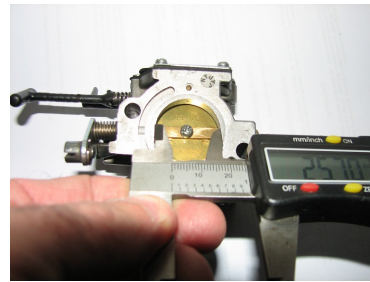


Photo 2E

As a final inspection, set the calliper to the minimum width of 37.50mm, and check the carburettor. The calliper should not fit over the carburettor. Refer to photos 2F & 2G.



Photo 2F



Photo 2G

This method is applicable to all carburetors, based on specifications in relevant technical documents.

EXHAUST RESTRICTOR PLATE NO – GO GAUGE.



This No-Go gauge is used on several exhaust restrictor plates photos 3A & 3B show how the gauge is used (note: the restrictor plate needs to be clean and free of carbon build up around the restrictor hole).



Photo 3A



Photo 3B

Remove the restrictor plate from the kart exhaust, place it in the palm of your hand and using the no-go gauge carry out the test by placing the appropriate restrictor gauge for the restrictor plate into the restrictor hole and rotate. If the gauge does not go through (photo 3A) then the plate complies. In the case of the restrictor shown in photo 3B, the restrictor clearly entered the hole, and the restrictor has failed this test. A **Technical Inspectors Findings and Complaint Form** will be completed, and the Clerk of Course, or a Steward will raise a Complaint based on that report.

NOTE:- DO NOT FORCE THE GAUGE THROUGH THE RESTRICTOR PLATE.

The gauge is used on all restrictors in all classes that they apply to.

Photo 3C shows another type of restrictor that may be encountered. It does not have the AKA identifying number, and is in fact home made. Again, a **Technical Inspectors Findings and Complaint Form** would be completed.



Photo 3C

EXHAUST & END CAP GAUGE



Photo 4

This rod or gauge in photo 4 is used as follows:

Have the kart impounded and the competitor remove the end cap from the AKA 14 muffler. You will see inside there is a raised plate with a small hole. See photo 4A.



Photo 4A



Photo 4B

Using the rod with the small end (4.5mm), place it in the hole. If it does not go through the hole, the end cap passes inspection. If the rod enters that small hole then the cap is non compliant and the appropriate paperwork is to be raised. See photo 4B.



Photo 4C

A further inspection is then conducted on the inner plate of the muffler to ensure that the plate complies with the manufacturer's specifications. (No holes drilled into plate or weld repairs etc). See photo 4C. If there are holes drilled or weld repairs evident, then the muffler is non-compliant. Raise the appropriate paperwork.

Another no go gauge that can be used to ensure that the correct end caps are being used for the AKA 14 and AKA 39 checking the length of both end caps. See photo 4D.



Photo 4D

To use this tool simply holding the appropriate tool edge against the end cap and check the length from the edge of the cap to the lip of the end cap. See photo 4E.



Photo 4E

If on any of the inspections the length is incorrect then the end caps are non-compliant and the appropriate paperwork is raised.

It is appropriate when inspecting mufflers, to ensure that they are secured to the kart, other than to the muffler cradle, securely with a multi-strand wire.

Using the AKA14 & AKA39 muffler rod, check the positions of the various plates, tubes and baffles inside the muffler body. This is usually performed with the muffler and cap intact. Note, it is still important to have the competitor remove the end cap so that it can be inspected as above, and to visually inspect for non compliant modifications. Refer to Chart 4F and 4G for the muffler inspections.

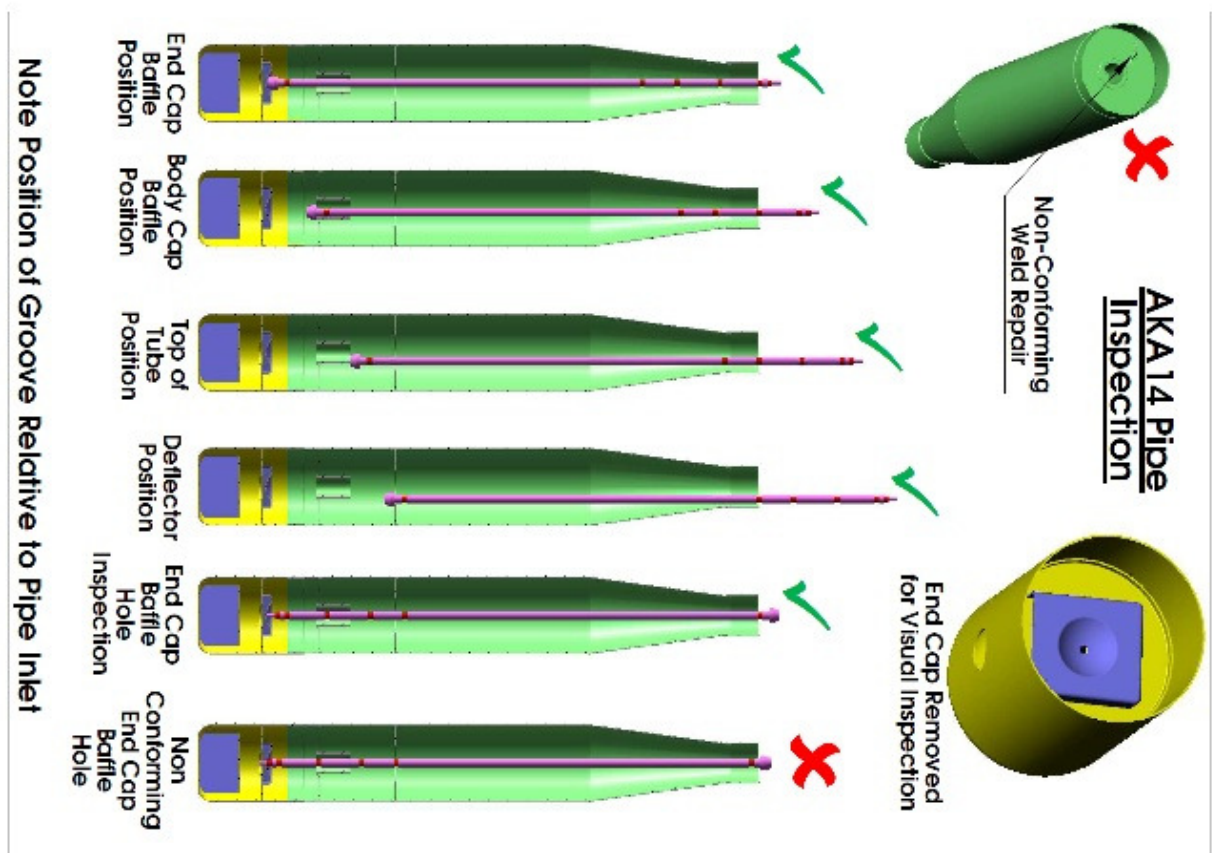


Chart 4F

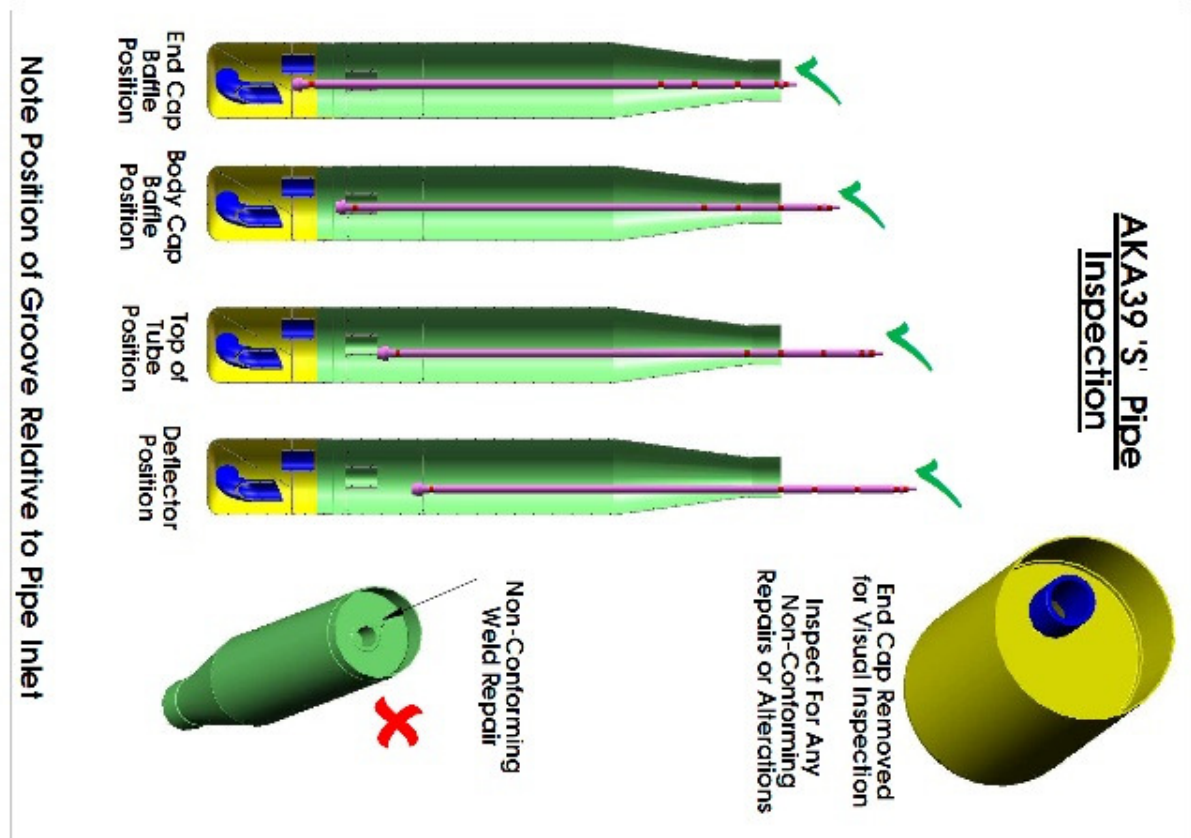


Chart 4G

REAR TRACK / SIDE POD WIDTH



Photo 5A



Photo 5B

Use a straight edge to check the rear wheel alignment relative to the side pods. Unless the track is declared wet, and wet tyres are in use, the tyres must be outside the line of the side pods. Photo 5A shows a pass, while photo 5B is a fail.

NOTE:- Once the track has been declared wet, wet **or dry** tyres may be moved inside the line of the side pods. However, at all times, wet or dry tyres, the tyres must remain outside the rear bumper bar or plastic moulding.

FUEL LINES SECURED

Run a visual inspection over all fuel line connections, including those to the overflow catch bottle. With the exception of the carburettor pulse line, all fuel lines must be secured with clamps or zip ties.

COOLANT CHECK

Glycol is not permitted in any coolant. In the case of Rotax motors, no additives or coolants are permitted at all. A simple method of checking for Glycol is to use a Glycol tester shown in Photo 7,



Photo 7

Ask the competitor to remove the radiator cap, ensuring that they are careful not to burn themselves with hot liquid. Squeeze the bulb, and insert the tube into the radiator. Slowly release the bulb so that it draws coolant into the body. The float should settle to the zero % glycol (water) mark. Once the test is completed, return the coolant to the radiator. If Glycol is detected, complete the appropriate paperwork.

Note, always rinse the glycol tester in clean water between tests, so as not to contaminate a competitor's coolant.

As of 2013, under Rotax World Rules as adopted for Australia, Non- Glycol coolant additives are now permitted .

FUEL TESTING

Fuel test kit consists of 3 main components:

Digitron DT-47 (Fig 1). Alternates are the Digitron DT-15 or FT-60.

Hydrometer (Fig 2)

Pump (Fig 3)



Figure 1



Figure 2



Figure 3

Fuel Test with Digitron DT-47

The Digitron DT-47 consists of 3 parts, being the display unit, the multi plate sample probe, and a temperature probe.

Contrary to popular belief, the Digitron does not measure Octane rating, but instead is used to measure the electrical conductivity of a fuel sample. Additives, such as oil, octane boosters, and ethanol when added to raw fuel alter the conductivity of the fuel.

Method

Assemble the two probes to the display, and power up the display unit. The display unit will run through a power up check, and will then stabilize at a reading, usually about -220. The unit will now be ready for calibration with a raw sample of fuel.

Fully submerge the assembled multi plate and temperature probes into a sample of raw fuel, and jiggle the probes to remove any air bubbles from the multi plate probe. Once the display reading has stabilized, the unit is ready for calibration. If the display reading is not equal to zero, then calibration is required.



Simultaneously hold down the TEMP & POWER buttons for approximately 2 seconds, then release. The display unit will then run through a calibration setup.

Use the DC button to reduce the display reading to zero, or the TEMP button to raise the display reading to zero, as necessary. Once a zero reading is attained, press the POWER/EXIT button once to return to sampling mode.

The temperature of the raw sample should be noted. Hold the TEMP button to read temperature of the raw fuel sample.

Fully submerge the assembled multi plate and temperature probes into the fuel tank, again jiggling the probes to remove any trapped air bubbles. Note the reading. Hold the TEMP button and note the temperature of the fuel in the tank. A complying reading is in the range of zero to + 40.

NOTE 1:- the Digitron DT-47 displays temperature in Fahrenheit. For a valid test, the sample fuel temperature and competitor's fuel temperature must be within $\pm 3^{\circ}\text{C}$ ($= 5^{\circ}\text{F}$) of each other.

NOTE 2:- As fuel temperature changes throughout the day, the Digitron DG-47 will require periodic re-calibration.

NOTE 3:- The multi plate probe must be rinsed in raw fuel prior to each inspection test of competitors' fuel.

NOTE 4:- The method has proved to be valid for all brands of non ethanol blended PULP fuel, when using a raw non ethanol blended reference PULP sample. When a competitor is using ELF BFK07, then ELF BFK07 must be used as the reference sample. Should a competitor be using an E10 PULP fuel, then the reference sample must be of the same brand of E10 PULP. There are significant variations in display readings between different brands of E10 PULP.

Fuel Test with Hydrometer

The hydrometer is used to test the specific gravity of a competitor's fuel. Some additives may alter the Specific gravity (SG) of the fuel, and there may be noticeable differences depending on the source of the fuel. However, where a control fuel has been specified, the fuel hydrometer can serve a useful purpose in detecting fuel sourced other than from the specified source.

The SG of the control sample will have been checked using the hydrometer. For PULP, it will be in the range of 0.74 to 0.76. For ELF BFK07, it is typically 0.69 to 0.70.

Use the pump shown in Figure 3 to withdraw approximately 2/3 of the sample bottle capacity from the competitor's tank. The SG of the competitor's fuel sample should be almost identical to that of the raw sample. The cylinder and hydrometer float shown in Figure 2 are used to check the SG of the fuel sample.

For further information on the testing procedure, and on how to deal with a non-complying sample, refer to Chapter 22, and in particular, R22.01 and R22.02.6.

Note - The Fuel Tester is now a Judge of Fact. Consequently, a decision of the Fuel Tester cannot be appealed.

TYRE SNIFFER

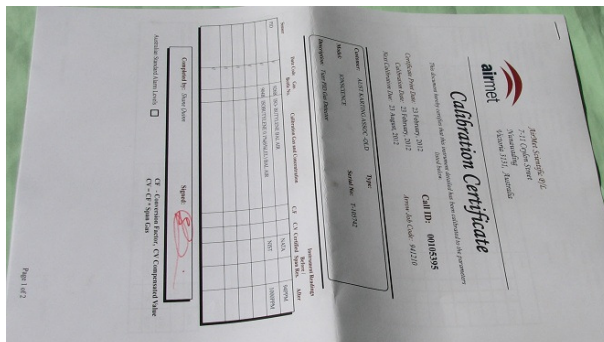


PID



Adaptor

The ION Tiger Photo Ionisation Detector (PID or Tyre Sniffer) as used for detecting tyre treatment consists of two parts. These are the Detector itself, and an adaptor used for sampling air from inside the tyre. The adaptor has a Vent Hole in the cap which is placed over the valve stem.



Calibration Certificate

A requirement of Rule 23.03.2(c) is that the PID must be calibrated every 12 months. This is necessary in order to be certain that the instrument is providing reliable readings. A failure to maintain calibration would most likely result in any complaint raised from the use of the PID being dismissed by the stewards or at a tribunal.

The ION Tiger PID comes with a manual, and a laminated double sided operator's instruction leaflet. While brief, it covers the essentials.

Unfortunately, the model as purchased by national office is not supplied with the battery charging system and rechargeable battery pack. The PID is quite severe on batteries, to the extent that their life is about 1 month only when left in the battery case.

AKAQ have purchased a 2/4 battery charger, and 6 long life rechargeable batteries for use in the ION Tiger PID. The ION Tiger PID takes 3 batteries.

As shown in the operator's leaflet, when the PID is turned on, it goes through a power up check, and then should show a zero reading on the display. It is not ready to take samples of volatile organic compounds emanating from the tyres.

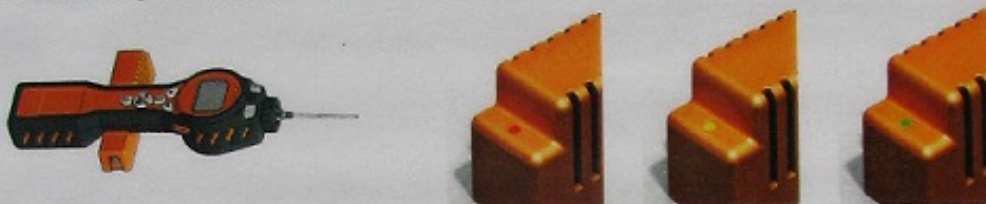
Tiger Quick Start



Please read this card through before operating the instrument for the first time. Please refer to the User Manual for full operational information.

Charging your Tiger – Ensure that the Tiger is charged for at least 7 hours before using for the first time.

1. Connect the charging cradle to the mains. A RED light will indicate that the charger is ready.
2. Place the Tiger into the cradle. An AMBER light will indicate the Tiger is being charged.
3. A GREEN light will indicate that charging is complete.



Switching ON

1. To switch the TIGER on press the On/Off / Enter key once.
2. Start up screen 1 appears showing the TIGER logo.
3. Start up screen 2 contains variable text sent from the TIGER PC configuration screen. The lower half of the screen contains the instrument serial number and firmware version.
4. The third screen shows TIGER checking that the lamp has 'struck'. When 'OK' appears, the working screen will follow. (If the lamp fails to strike, refer to the Tiger user manual).



Switching OFF

1. To switch the TIGER off press and hold the On/Off / Enter key. A three-second count down takes place before the instrument shuts down. During this count down visible RED LED's flash and audible alarm sounds. This is done to alert the user to avoid accidental switch off.

Ion Science Ltd, The Way, Fowlmere, Cambridgeshire, SG8 7UJ, UK. Tel: +44 (0) 1763 208503, Fax: +44 (0) 1763 208814
info@ionscience.com www.ionscience.com

Ion Science Americas, 35 Cross Road, Waterbury, VT, 05676, USA. Tel: 1 802 2445153, Fax: 1 802 2448942
info@ionscience-americas.com









Screen Display

The display is divided into four sections.

Fixed LCD Status icons fill the top of the screen offering instrument status at a glance. The main central viewing screen will display readings in large numbers only, 4 digits and decimal place will display 0.001 ppm to 19,999 ppm. Two soft key areas have been set aside as soft key indicators. The area between the soft key indicators displays the measurement units.



Keypad functions

-  **A** Soft keys A & B rely on graphical prompts on the display to indicate their functionality.
NOTE: Pressing both soft keys together switches the torch on and off.
-  **B**
-  **Up & Down** keys are used to adjust settings and navigate through the menu structure.
- 
-  **Enter / On/Off** key is used to accept adjustments and select functions; also to turn the TIGER on and off.
-  **Escape (Esc)** key is used to abort an adjustment or exit from a menu.



Filters

The filter should be changed after every 100 hours of use. This frequency should be increased for dusty or moisture laden environments or whenever the filter appears 'dirty' when viewed through the transparent upper surface of the Filter Clamp.



Custom Calibration Procedure

To carry out a custom calibration you need to set the calibration parameters via the Tiger PC software supplied with your instrument, please refer to the Tiger user manual under Maintenance & Calibration.

Service and Annual Calibration Options

At Ion Science we recommend that all of our gas detection instruments be returned for recalibration on an annual basis to ensure optimal performance. For your convenience recalibration has been built into both of our annual service options. Choose between our Gold and Platinum Service levels giving you piece of mind in a fixed cost solution. Contact our Service department for more information on calibration@ionscience.com or +44 (0) 1763 207228.

Ion Science Ltd, The Way, Fowlmere, Cambridgeshire, SG8 7UJ, UK. Tel: +44 (0) 1763 208503, Fax: +44 (0) 1763 208814
info@ionscience.com www.ionscience.com

Ion Science Americas, 35 Cross Road, Waterbury, VT, 05676, USA. Tel: 1 802 2445153, Fax: 1 802 2448942
info@ionscience-americas.com

Should it become necessary to change settings, or to set alarm levels on the ION Tiger PID, this is accomplished through the use of the A and B function keys described in the laminated leaflet. There are two alarm settings that can be pre-set on the ION Tiger PID. This suits us fine, since under Rules 23.03.2 (d) & (e), we have two maximum sampling levels, depending whether we are sampling from the tread of the tyre, or sampling air from within the tyre. For air samples from the tread, the maximum permissible level of VOC' is 3 parts per million (ppm), and for air samples from within the tyre, the maximum permissible level is 250 ppm.



First Screen using the A key

First Screen using the B key

To set alarms to register at these maximum values, press the B key. The screen displayed on the right above will appear. Use the UP or DOWN arrow keys to select the bell icon. Once the bell icon is highlighted, use the Enter/On-Off key to select this function. The screen below will appear.



Use the Up or DOWN arrow key to select the upper or lower alarm setting. The top alarm setting displayed must be set to the higher value, and likewise, the bottom alarm setting displayed must be the lower of the two alarm settings. Use the Enter/On-Off key to select the alarm of interest, then use the UP or DOWN arrow keys to set the required alarm value.

Use the Enter/ON-Off key to set the alarm value. Repeat as necessary for the other alarm setting. The ESC-Exit key is used to back up to allow for other setting adjustments, or to return to the sampling mode.

Once the alarm settings have been entered, they should not change. However, it is wise to check before using the ION Tiger PID that the alarm settings are correct. There are two distinct alarm sounds, so that the lower alarm cannot be confused with the higher alarm

The ION Tiger is now ready to use to take samples from the tyres.



Sampling Tread Surface



Sampling Air from Inside Tyre

To sample the tread area, pass the probe on the end of the PID slowly across the tread, holding the end of the probe about 2 to 5mm clear of the tread. When the tyre is hot, as is likely when the tyre is samples just after the completion of a heat, the reading would be expected to be up to 1.5, but must be less than 3.0. If an unusually high reading is noted (greater than 3.0), then the lower alarm will be activated. Refer to Rule 23.03.2(f) reproduced below for the procedure which must be followed.

WARNING:- The ION Tiger PID is extremely sensitive to VOC's. Exhaust fumes, even once an engine has stopped, coming from the muffler can set the alarm off. Likewise, petrol fumes drifting from the fuel tank if the cap is removed may set off the alarm.

Should the alarm be activated, remove the PID from the source of the fumes, and when it falls below the relevant setting, press the ESC-Exit key once.

The image to the right above shows a an air sample being taken from inside the tyre, via the valve. Before taking this sample, check with the competitor whether they wish to check their tyre pressure. Some competitors do this routinely, and when we take a sample, we deny them this opportunity if we do not ask first.

Fit the adaptor tube over the probe, and place the cap over the valve. **WARNING:- DO NOT** cover the vent hole, as doing so will over pressurise the PID, and will damage it. The PID will ingest sufficient air over about 5 seconds to obtain a reliable reading, even though most air is expelled through the vent hole.

Do not be alarmed by the lower alarm being set off. Typical readings for a tyre without any bead seating agent are generally in the range of 5 to 20 ppm. Our only concern is for unusually high readings, and in particular, any reading above 250 ppm. Once your sampling of the tyre is complete, allow the reading to fall below 3.0, and cancel the alarm.

There are any number of agents that may result in an unusually high reading, often in the range of 50 to 100 ppm. These include rubber grease used to seat the tyre on the rim, some detergents, and especially INOX, CRC and the like. The use of substances such as CRC should be discouraged, since their indiscriminate use on tyre tread areas may be considered as modifying agents.

There are a number of illegal tyre treatment products available to soften tyres, and provide additional grip levels. One commonly available such product id GRIP. You hardly need a PID to detect it, as even a month or two after it is applied, the tyre retains a distinctive odour. It also gets the PID quite excited.

Some tyre treatments are marketed as non-detectable. Further, they are recommended for use inside the tyre. Your nose and mine may not detect them but again the PID goes ballistic when it encounters tyres treated with them. Also, when tyre treatment is used inside the tyre, it leaves a tell tale residue in the tyre and also on the rim.



As an alternate, a tyre durometer may be used to ascertain the hardness of the tyre. When using the tyre durometer, you are looking for tyres that are noticeable different in hardness to the remainder of the sample. Since rubber hardness changes appreciably with temperature, the tyre temperatures needs to fairly uniform when making comparisons.

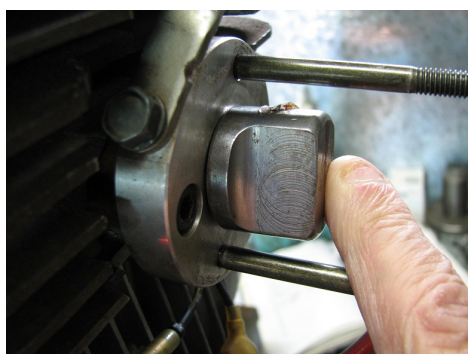
Procedure for dealing with suspect tyre/s (Rule 23.03.2(f):-

(f) If chemical treatment of tyres is detected or suspected, the tyres will have their barcode numbers recorded and the competitor must present the tyres, still fitted to the rims, at the end of the race meeting when the tyres will be impounded, bagged, sealed and tagged and sent to the State Technical Officer/Coordinator for final testing. The competitor or their representative has the right to be present for final testing with the State Technical Officer/Coordinator. If chemical treatment of tyres is established as per rule 23.03 c, d and e above, competitor will be excluded from the race meeting and their licence fully suspended for 12 months. This decision and penalty is non-appealable.

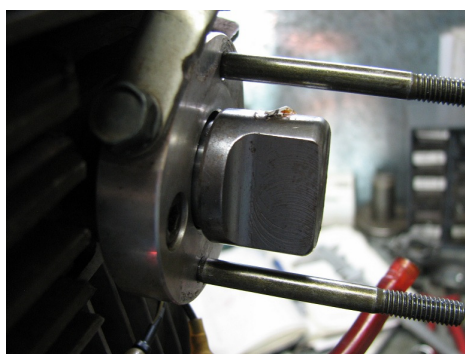
INLET TRACT LENGTH



The AKA Yamaha Inlet Track Length Gauge is used to check that the length through the inlet port and adaptor blocks conforms to the correct length. In the case of the KT100S, there is a minimum length only of 65mm. With the aluminium adaptor block in place, but the carby to block gasket removed, place the gauge into the port. If it makes contact with the piston, and the large shoulder is clear of the adaptor block, then the length is too short, and does not comply. Raise the appropriate paperwork.



Pass



Fail

In the case of the KT100J, the inlet tract length, with the end of the pin in contact with the piston, must be longer than the pin, but less than length to the second shoulder. However, in this case, the inspection is carried out including the phenolic spacer, and a gasket either side of the spacer.

An alternate method involves setting a Vernier Calliper to the inspection length, and checking for compliance.

CC TEST



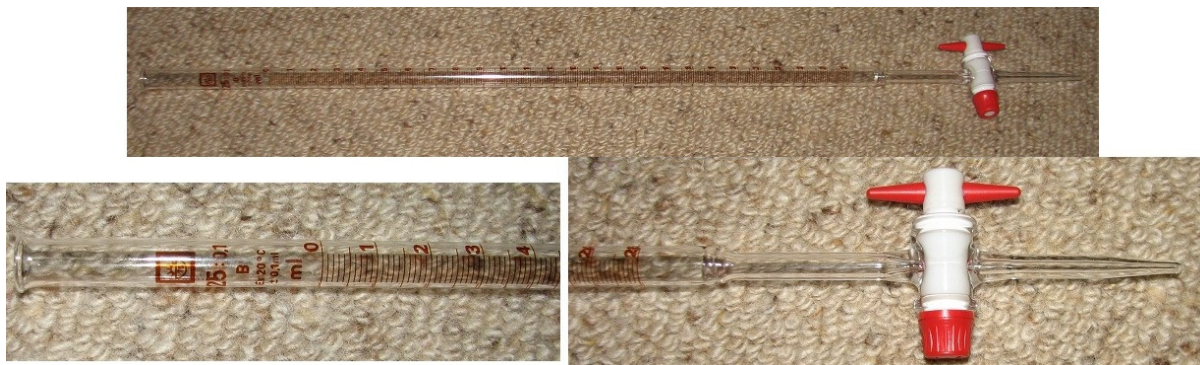
Type 1

Type 2

Type 4

There are 3 CC plugs currently in use. The Type 1 is used on all engines except for the Comer SW80 and Rotax. The Type 2 is used on all engines except for the Comer SW80, while the Type 4 is used on the Comer SW80 only.

In addition, a burette, calibrated to Class 'A' or 'B' is required. The burette can be either 25 or 50cc's, but must be graduated in 0.1cc or less. A 25cc burette is preferred.



In a competition where an engine is sealed prior to, or during the competition, the seal must remain in place until the successful conclusion of the CC test.

Set the engine up so that the head is level horizontally (Photo 8), and rotate the crankshaft in its direction of rotation until the piston is almost at TDC. It is best to set the piston so that crankshaft needs to rotated in its direction of rotation when completing the CC test. Screw the appropriate CC plug into the head, until it is fully home against the plug sealing face. Refer Photo 8A. Next, back the plug back out 2 turns. Refer photo 8B. This is necessary to ensure that air is not trapped in the combustion chamber when running the CC fluid into the head.

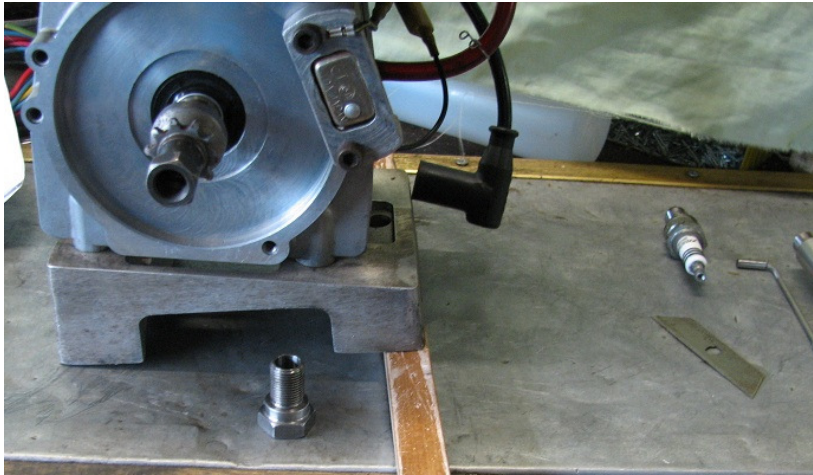


Photo 8

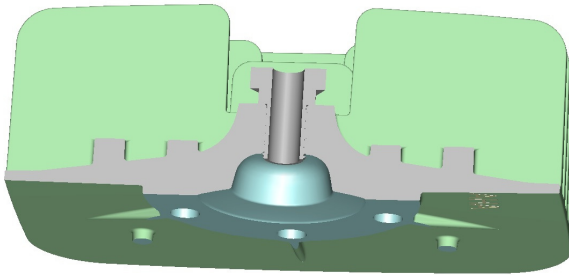


Photo 8A

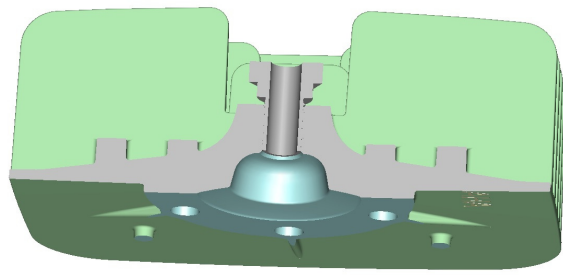


Photo 8B

The CC fluid is a 50/50 mix of diesel fuel and automotive transmission fluid. Fill the burette and run fluid through slowly to set the initial reading at 0. Allow some time for all fluid to stabilise, and ensure that it is set a zero before starting the test. I have found for most burettes, allow about 3 drops per 0.1cc. **NOTE:** Always read to the bottom of the meniscus – photo 8C.

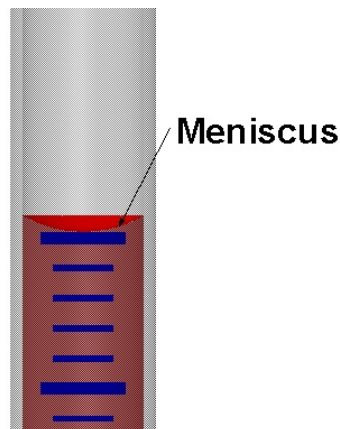


Photo 8C

Following the procedure in R26.01, having set the piston at or very near to TDC, run the required volume of fluid into the engine. I find that if the fluid is run in very quickly, that depending on the

ambient temperature, you may find that, once the burette has settled for a minute or so, you may be short of the required volume by 0.2cc or more. I tend to run the fluid at a moderate rate, and slow it down toward the end. Even then, you may end up with 0.05 to 0.1cc less than the required volume. At least any error is to the benefit of the competitor.

Once the fluid is dispensed, set the burette carefully aside and making sure that fluid is visible in the CC plug, turn the plug back in the 2 turns. Wind the engine over TDC slowly. If fluid flows across the top of the CC Plug, then you will need to have the officials contact the competitor or in the case of a minor, his guardian. You may also need the Clerk of Course or a spare Steward on standby as well.

Once the competitor is present, explain what has happened, and advise them that they have two options. The first is that if they are happy that the engine has failed the test, you are to complete a **Technical Inspectors Findings and Report Form**, which is handed to the Clerk of Course to go to the Stewards.

The second option is that if they request a second measure, the engine will be thoroughly rinsed with raw petrol, **and allowed to stand for a minimum of 10 minutes with the exhaust port open**. The rinse and dry is to be conducted by one of the Technical Inspectors, and appropriately, will be done in the presence of the competitor or his designated representative. This second test will be the final test, and a second fail WILL result in the paperwork being completed, and a visit to the stewards is a certainty.

If it is of any comfort, far more engines pass on the second test than fail. Some still do fail however.

I should make comment here that it is not usual for competitors or representatives to be present during any inspections, unless they have been requested to be present in cases such as this. However, if a competitor wishes to be present, they have a right to be there, but only while their own equipment is being inspected. No other competitors are allowed to be present.

Caution – Comer SW80 - When running a CC test on a Comer SW80, it is always advisable to first remove the starter cover. This is because the detents are likely to drop in at about TDC, and this can rapidly run the engine over TDC, expelling fluid that might not otherwise have done so.

A further caution involves the spark plug thread condition. When impounding the engine, always ask the competitor to remove the plug. If the thread is in poor condition, then you cannot be held responsible. If you cannot screw the CC plug fully home, then under Rule 26.01, the engine can be automatically failed. **NEVER** force the plug in, as this may damage the thread, or even crush the CC plug, rendering it useless.

PTG INSPECTION



The PTG inspection is used to determine compliance of an engine with the specified port durations, and also for the maximum stroke of the engine. The photo above shows the body, cap and locking nut of the PTG at the top. Below that is the PTG rod for a KT100S. All piston port engines have 5 grooves, while reed valve engines only have 4 grooves. The 5mm 'Sneaky Peek' pin is shown below the KT100S rod.

There are individual rods for Comer SW80, KT100J, ARC Spec 100, Leopard RL, Leopard X30, Fireball, and Cheetah. In addition, there are additional rods for the Rotax engines, which are no longer used since the introduction of the Australian 'World Rules'.

The inspection method is set out in Rule 26.04.

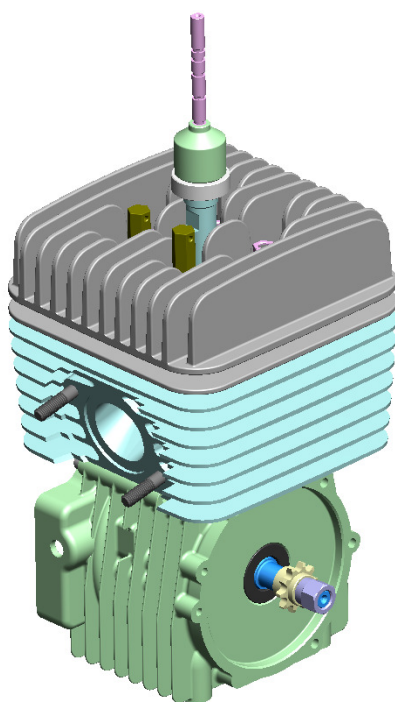


Figure 9A

Figure 9A shows the PTG body, cap, locknut and rod set up in a KT100S. Screw the body into the spark plug hole, and nip it up just firm enough to fix it for the inspection. Next, wind the piston to TDC, and adjust the cap until the lower land of the lowest groove is flush with the top surface of the PTG cap. Rock the piston back and forth while making this adjustment to ensure that at TDC, the land and cap are level. Refer to Figure 9B. It may help to use a sharp blade or similar to feel for any mis-alignment between the land and cap when making the adjustment.

Note also that while the engine is not fitted with a seal, it has two sealing nuts adjacent as required at **ALL** times under Rule 1.30.9.

A word of caution:- There is at least one case of the rod punching a hole in the piston crown when dropped in, or on winding the engine over rapidly, the rod is blown partially out of the PTG body, and dropping back onto the piston. The Tech involved was up for the engine re-build. **ALWAYS** wind the crankshaft over slowly, and it is wise to maintain a slight downward pressure from your free hand on the PTG rod.

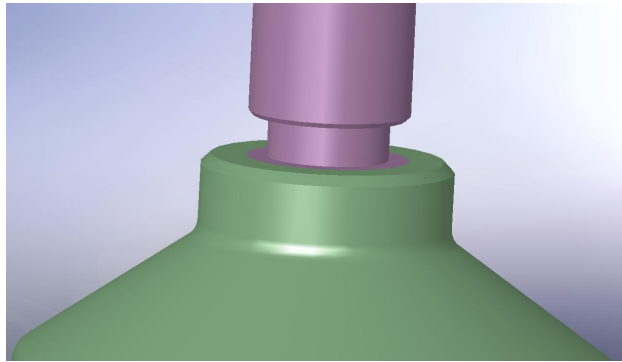


Figure 9B

Once having established the TDC setting of the PTG cap, wind the crankshaft over slowly, to check for maximum stroke. A pass is noted if the lower land of the top most groove is level with, or above the top of, the cap at BDC. If the land is below the cap, this is a fail. I will deal with the fail procedure at the conclusion of this section. Refer to Figure 9C.

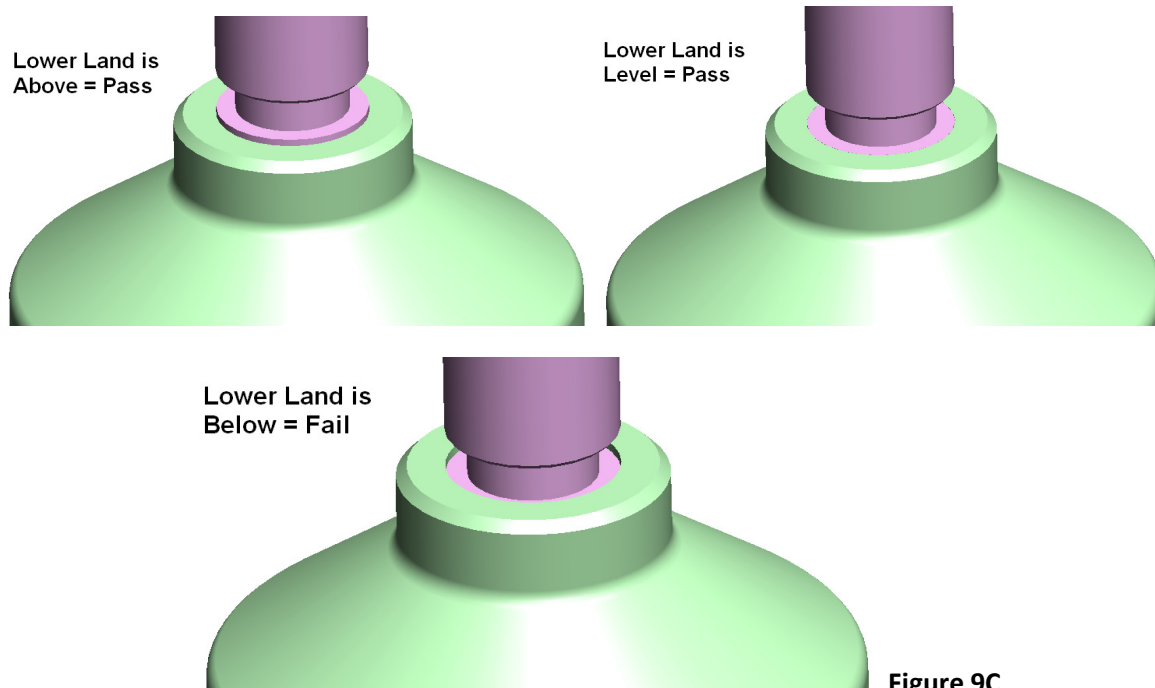


Figure 9C

Having established that the stroke complies, we move on to check the exhaust port duration for compliance.

CAUTION:- When inspecting the Comer SW80, remember that the barrel is plated aluminium, and any sudden contact against the port surface by the 5mm pin can very easily bruise the cylinder. The result could be a barrel damaged beyond repair at best, and at worst, further damage resulting in a seized motor. Also, the upper surface of the exhaust port is quite often a bit ragged, and the highest point may be located elsewhere than in the centre of the port.

Moving on to the exhaust port inspection, place the straight end of the 5mm pin into the exhaust port, close to the centre of the port, or in the case of the KT100S, into one of the exhaust port segments. Rotating the crankshaft in the direction of rotation, bring the piston slowly into contact with the 5mm pin, and maintaining light pressure on the pin, rotate the pin to establish the high point of the port. Where the exhaust port has a bridge, check both port openings to establish the

higher of the two. In this instance, the lower land of the exhaust port groove should always be level with or below the top of the PTG body cap. Where both a maximum and minimum dimension is specified, the upper land of the exhaust port groove should be level with, or above the top of the PTG body cap. Refer to Fig 9D.

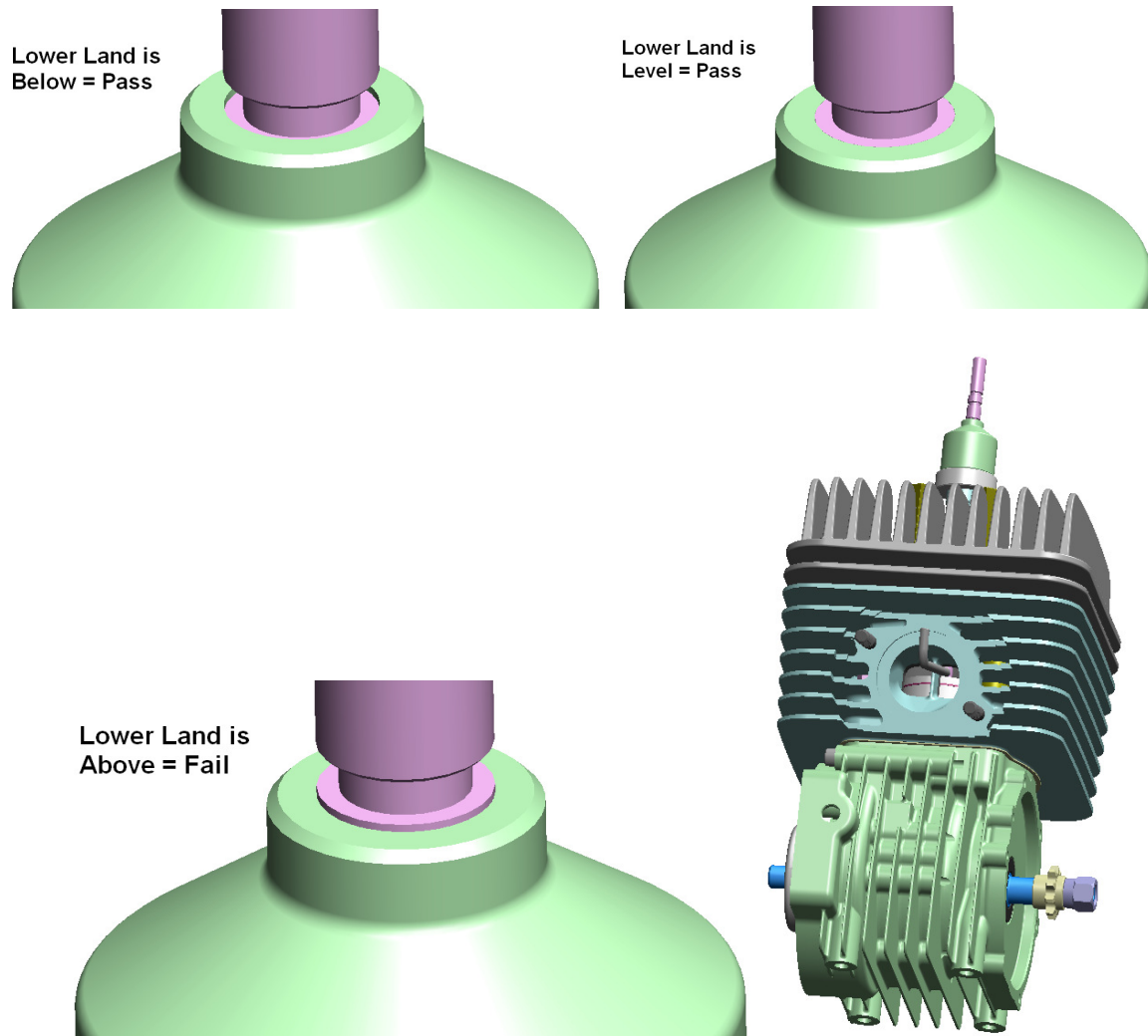


Figure 9D

Having satisfied ourselves that the Exhaust Port duration complies, we now reset the PTG Body cap to be level with the lower land of the exhaust port inspection groove. With a firm but light pressure holding the 5mm pin in place, lower the cap until it is level with the lower land of the groove. Refer to Fig 9E.



Figure 9E

We can now turn our attention to the transfer port duration inspection. This is given as a split relative to the exhaust port. That is why we reset the cap as described above.

Lower the piston to BDC, and reversing the 5mm pin, insert it through the exhaust port to locate the transfer port. In the case of engines having multiple transfer ports per side, we are inspecting against the main transfer port. Referring to the cutaway image - Fig 9F, the 5mm pin is shown in the main transfer port of a KT100S.

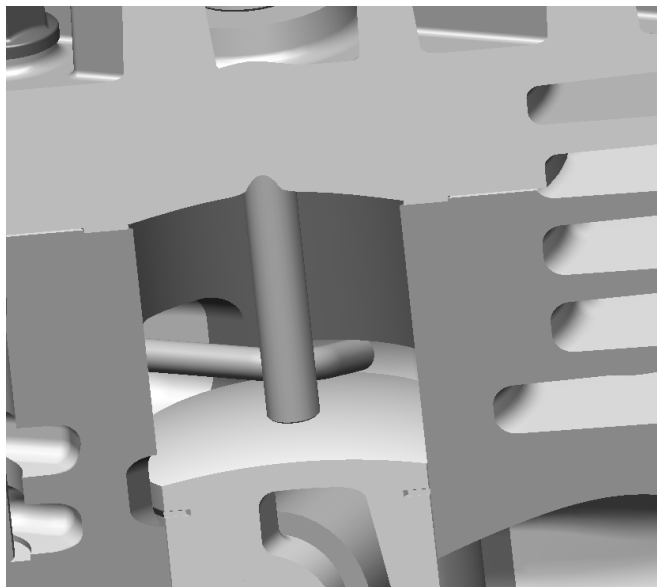


Figure 9F

Slowly rotate the crankshaft to bring the piston into light contact pressure with the 5mm pin. You may need to move the pin back or forth to find the highest point of the transfer port. In the case of the KT100J, the high point is toward the inlet side of the transfer port, while for a KT100S, it is toward the exhaust side of the transfer port.

For all engines where this inspection is performed, the split is a minimum. Pass and Fail criteria are as shown in Figure 9D.

For engines incorporating reed valve inlets, typically all TAG 125 motors, the PTG inspection is complete. However for piston port engines, such as the KT100J, KT100S, or the Comer SW80, we must perform one further inspection to ensure that the piston skirt has not been shortened excessively. Do NOT reset the PTG body cap, as it is already in position for this final inspection.

Continuing to rotate the crankshaft in the direction of rotation, move the piston to TDC or thereabouts, to expose the inlet port. Using the long end of the 5mm pin, place it approximately centrally in the inlet port, and carefully lower the piston until there is firm but light pressure against the 5mm pin. Rotate the pin to find the lowest part of the inlet port. Refer to Figure 9G.

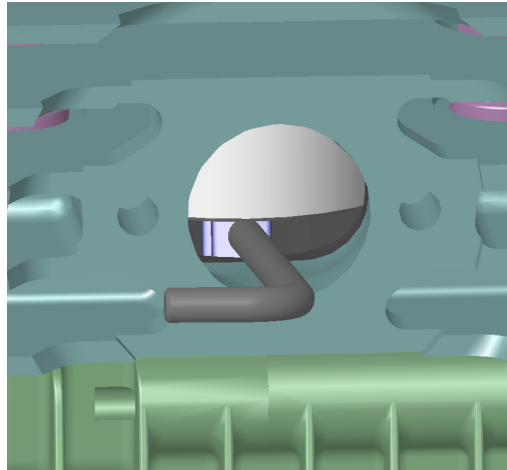


Figure 9G

At this point, the lower land of the inlet port groove should be level with, or above the top surface of the PTG body cap. Refer to Figure 9C for pass/fail criteria.

At any point where you have determined a fail criteria has been met, it is a good idea to repeat the process to make sure that you have performed the inspection correctly. Once you are sure that a non-compliance exists, it will be necessary to summon the competitor to the tech shed, and explain your finding.

NOTE:- Bear in mind that this is a field test, and in may not necessarily represent final proof of non-compliance. Under Rule 26.04 Step 6, the engine **MUST** be tagged and receipted if not already done so, and sealed for a final inspection by the State Technical Officer, using a digital or analogue dial gauge. Only if the State Technical Officer determines using this final inspection method that the engine does not comply, will a complaint subsequently be raised, for the matter to go to a tribunal.

INTERNAL INSPECTIONS

We are now in a position to conduct internal inspection of engine components. It is assumed at this point that ancillaries such as carburettors, header pipes and the like have been removed. If the engine is sealed, break the seal, and remove the head. For most engines, the requirement is that there is a squish band present, and that the combustion chamber and spark plug hole are visually central. Refer to Photo 10A.

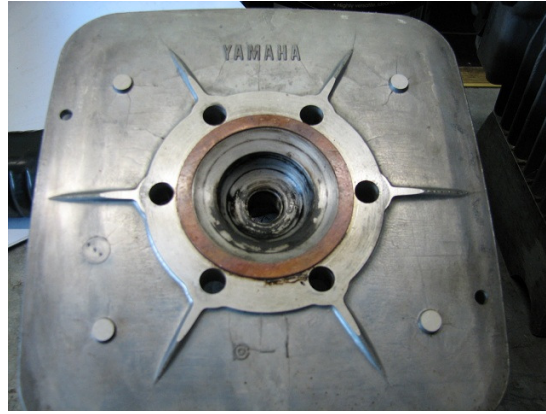


Photo 10A

In the case of the Leopard RL, X30 and Rotax, there are profile gauges for inspecting the combustion chamber profile for conformance.

Next, remove the barrel, and check for any evidence of tampering with the ports. In the case of the KT100S, one of the nuts must be cylindrical, with an internal hex drive. It should be located on the drive side, and preferably to the rear. Refer to photos 10B and 10C.

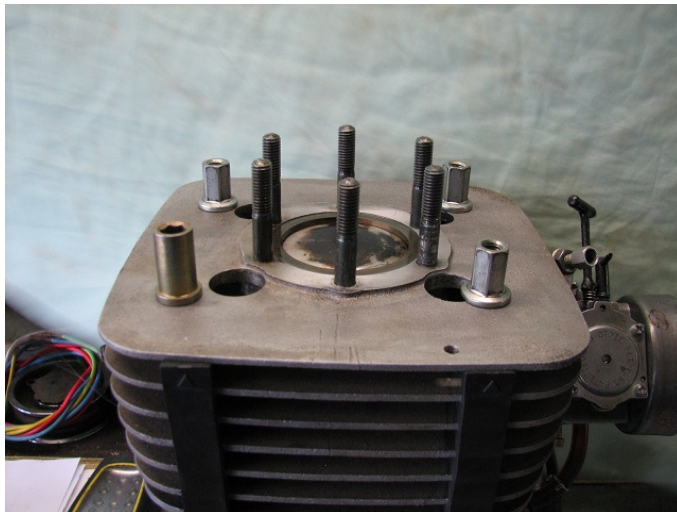


Photo 10B

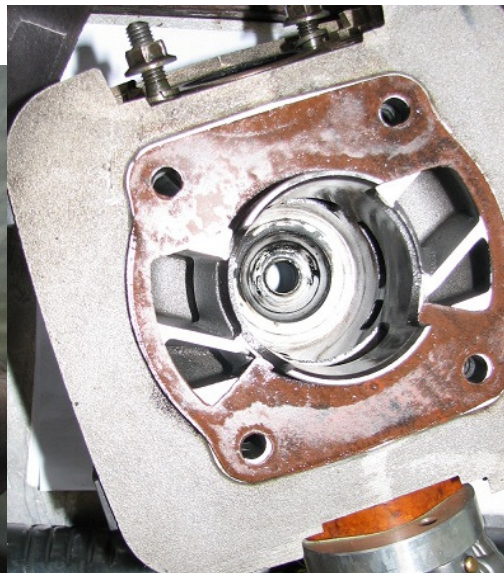


Photo 10C

The piston can be inspected for maximum size. In the case of the KT100S, it is 53.00mm maximum. Set vernier callipers to 53.00, and check the piston. The piston skirt diameter must be less than this setting. Refer to Photos 10D & 10E. For the KT100J, this dimension is 51.00mm maximum.

Place a flat strip, ruler etc across the crankcase deck, and lower the piston onto it. The piston skirt must be trimmed perpendicular to the vertical axis. Check that the piston is visually vertical when in contact with this strip.



Photo 10D



Photo 10E

The crankcase chordal width can also be inspected at this point. For the KT100S, it is 97.5mm minimum, and for the KT100J, it is 81.5mm minimum. Set the vernier calliper to the appropriate size, and inspect the port. Refer to Photo 10F and 10G. The calliper should fit into the transfer as shown.



Photo 10F

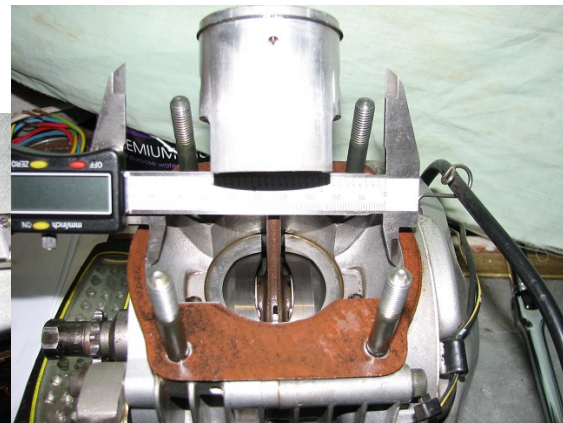


Photo 10G

When inspecting the KT100J, you can also check to ensure that the ignition rotor has not been reduced in size below 81.5mm.



Scrutineers Quick Reference

	Item	References		
1	Air Boxes - AKA43	25.24		
2	Approved Tyres	23.09		
3	Axles	25.01 (e)		
4	Barcodes	1.31	19.09 , 19.25	20.25
5	Batteries	25.27		
6	Brakes	25.07		
7	Cameras	25.31		
8	Carburetors	25.26	Various Tech Chapters	
9	Catch Tank / Overflow Bottle	22.05	25.18 (b)	25.18 (g)
10	Change of Motor	1.30		
11	Change of Tyres	1.32		
12	Clutches / Clutch Engagement	25.17	25.17 (f)	25.17 (g)
13	Engine Inspection	1.21	Ch 26	
14	Engine Seal - Loss of	1.30.10 (c)		
15	Engine Sealing	20.17		
16	Engine Sealing Nuts	1.30.09	12.01 (b) 1	
17	Exhaust Mufflers	25.22	26.06	26.02 (g)
18	Exhaust System	25.09		
19	Exhaust Probe	25.00	25.09.7	
20	Exhaust Probe - Cadets	SW 1.08		
21	Exhaust Restrictors - Cadets	27.02.2		
22	Exhaust Restrictors - Jnr Performance	32.02		
23	Exhaust Restrictors - Rost. TAC 125	37.02		
24	Exhaust Restrictors - Rookies	26.02.1		
25	Exhaust System Fastening	25.09.5		
26	Exotic Compounds - Carbon Fibre	25.20		
27	Fin Dampeners	24.9	KTS 1.05	
28	Fuel / Fuel Testing	Ch 22		
29	Glycol / Liquid Cooled Motors	25.18 (c)	Rotax 19.1	Jmax 19.1
30	Hex Cylindrical Cylinder Nut	1.30.9.2		
31	Noise Induction Silencer	25.24		
32	Noise Induction Silencer Adaptor	25.25		
33	Nose Cones	25.00		
34	Number Plates	25.13.5		
35	Phendic Spacer	KIJ 1.12	KIS 1.13	
36	Side Pods	25.02		
37	Skid Plates	25.11 (iii)		
38	Spark Plug Corner SW80	SW 1.04.7	25.21.8	
39	Spark Plug Length	25.21.7		
40	Throttle	25.10	25.20.1 (g)	25.20.2 (b)
41	Transponders	16.05	25.30	
42	Tyres / Marking	1.32.1		
43	Tyre / Treatment	23.03		
44	Weights	25.10	14.10	
45	Wheels	25.01 (e)		



Class Weights

Class	Ch	Weight			Kart Alone
Cadets	27	90 (SW80)	100 (KT100J)		
Rookies	28	105			
Junior National Light	29	120			
Junior National Heavy	29	140			88
Junior Clubman	30	140			
Formula Junior Max	31	145			100
Junior Performance	32	135 (Air Cooled)	140 (Water	145 (125	
Senior National Light	33	140			
Senior National Heavy	33	155			88
Clubman Light	34	140			
Clubman Heavy	34	160			88
Clubman Super Heavy	34	180			88
Clubman Over 40	34	160			
Yamaha TAG 100	35	160			
Sportsman	36	Refer to State Spec			
Restricted 125 Light	37	160			
Restricted 125 Heavy	37	180			100
Formula Rotax 125 Light	38	160			
Formula Rotax 125 Heavy	38	180			100
Parilla Leopard 125 Light	39	160			
Parilla Leopard 125 Heavy	39	180			100
TAG 125 Light	40	160 (Leopard RL, Fireball, Cheetah)	165 (Rotax, Leopard X30)		
TAG 125 Heavy	40	180 (Leopard RL, Fireball, Cheetah)	185 (Rotax, Leopard X30)		100
Formula 100 Light	41	150			
Formula 100 Heavy	41	170			88
Open Performance	42	Refer to Supplementary Regulations			



Basic Technical Inspections

Category	Item	Cadets	Rookies	National	Clubman	TAG 100	Jmax	Rotax	Leopard	
									RL	X30
Induction	Induction Silencer	AKA 43	AKA 43	AKA 43	AKA 43	AKA 43	WR 14.1	WR 14.1	RL 1.11	X30 1.12
	Intake Tubes	Ø23 x 95	Ø23 x 95	Ø23 x 95	Ø23 x 95	Ø23 x 95			Ø22 x 95	Ø22 x 95
	Carby	Tillotson HL326A / 166B	Walbro	Walbro	Walbro	Walbro	Dell'Orto WHSB34 QD or QS	Dell'Orto WHSB34 QD or QS	Tillotson HL334A / 334AB	Tryton
	Carby Venturi	15.87 Max	24.13 Max	24.13 Max	24.13 Max	24.13 Max			23.25 Max	26.0 Max
	Carby Throttle Bore		25.7 Max	25.7 Max	25.7 Max	25.7 Max			25.5 Max	28.0 Max
	Needle									
	Float									
	Slides									
	Jets									
	Carby Length		37.5 Min	37.5 Min	37.5 Min	37.5 Min				70.5 Min
Ignition	Plug Thread Length	1/2" Max	20mm Max	20mm Max	20mm Max	20mm Max	20mm Max	20mm Max	20mm Max	20mm Max
	Plug Cap	SW 1.09						NGK TB05EMA		
	Ignition Module	Ducati/Bosch KDT							AKA 20L	AKA 20L
Exhaust	Restrictor	13.02mm	16.00mm							
	Exhaust Length	445 Max	445 Max	Free	Free	Free			Free	Free
	Header Bore		34 - 36mm	34 - 36mm	36 - 36mm	Yamaha				
	Muffler	S60 5500	AKA 14	AKA 14	AKA 39	AKA 39	WR 20	WR 20	RL 1.13	X30 1.14
Tyres	Dry	SL1	SL1	SL1	MG AZ	SL1	Mojo D2	Mojo D2	MG FZ	MG FZ
	Wet	KT6SLW1	KT6SLW1	KT6SLW1	KT6SLW1	KT6SLW1	Mojo W2	Mojo W2	MG WZ	MG WZ
Clutch	Engagement Speed	4,800	4,800	4,800	4,800	4,800	4,000	4,000	4,800	4,800
	Condition	75x10 Bar	75x10 Bar	75x10 Bar	75x10 Bar	75x10 Bar	Flat Ground	Flat Ground	75x10 Bar	75x10 Bar
	Kill Switch Operational	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	O'Ring Seal						Yes	Yes		
Port Timing	PTG Test	Yes	Yes	Yes	Yes	Yes	WR 5.8	WR 5.8	Yes	Yes
Head Volume	CC Test	11.0	11.0	11.0	11	11.5	N/A	N/A	10	10.3
	Squish						1.2 - 1.8	1.0 - 1.5		
	Head Profile						Yes	Yes	Yes	Yes
Helmet	Date & Standard	R 14.01	R 14.01	R 14.01	R 14.01	R 14.01	R 14.01	R 14.01	R 14.01	R 14.01

AKA SCRUTINEERS COMPETENCY TRAINING AND GRADINGS

LEVEL 4 CLUB SCRUTINEER.

Be fully conversant with the all technical requirements that the kart and driver have to meet prior to practice or competing in any event under AKA rules.

Be able to conduct the inspections in a courteous and professional manner as directed by the Chief Scrutineer, assist in tyre barcoding or tyre marking, engine and chassis tagging if and when required.

Be trained in the use of no-go gauges and tools for inspections of the air box, Carburettor venturi, restrictor gauges and muffler end caps.

Accreditation only lasts for 12 calendar months from the date of initial training. Re-accreditation can be conducted at major meetings when the State Technical team is in attendance or at club training days.

LEVEL 3 ZONE SCRUTINEER.(Line Chief)

Be conversant with the current AKA Manual and addendums, be able to supervise the tyre scanning, engine tagging and chassis tagging.

Be a member of the Technical team for ongoing training in the use of all inspection tools and no – go gauges, be conversant with all field tests for technical compliance, spot non – compliance with karts or driver on the in and out grid, be conversant with rules pertaining to the eligibility of equipment used in all classes.

Assist club scrutineers in their duties and any concerns that may arise during the meeting.

Be conversant with the paperwork and basic fuel testing procedures.

Worked as a club scrutineer at club level for 3 years.

Accreditation only lasts for 12 calendar months from the date of initial training. Re-accreditation can be conducted at major meetings when the State Technical team is in attendance or at club training days.

LEVEL 2 ASSISTANT CHIEF SCRUTINEER.

Be fully conversant with current AKA rule book and addendums, fuel testing, tyre testing, muffler testing and engine inspections as prescribed in the rulebook.

Be a qualified fuel tester level 3 or better.

Know the correct paperwork procedure to follow if there is a non – compliance or conformance found in a competitors engine or equipment.

Be able to assist in the organising and leading the team of scrutineers over the course of the meeting.

LEVEL 1 CHIEF SCRUTINEER.

Worked as Chief Scrutineer at 10 Major meetings, 4 Nationals and 6 State at 7 different tracks in a 10 year period.

Be able to handle all the reporting and paperwork that goes with the position.



Australian Karting Association - SCRUTINEERING RECORD																								
To Be Completed by Competitor			PASSED TECHNICAL INSPECTION																					
TRACK <u>Too Woom BA</u>		DATE <u>20/11/2012</u>																						
Date		Time																						
Competitor Details.																								
SURNAME. SHEEDY		First Name Terry																						
Racing Class	RACING NUMBER	AKA LICENCE NUMBER																						
Clubman / Sportsman O/40	85	Q 85																						
SCRUTINEERING CHECK = To be filled out by Competitor			Fuel Details																					
Rule 25.13 Kart Numbers ✓ 25.05.4 King Pins ✓ 25.01(e) Nuts On Stub Axles ✓ 25.03 Steering Shaft ✓ 25.05 Steering Wheel For Cracks ✓ 25.04 Floor Pan For Cracks ✓ 25.10 Throttle Return Springs on Carburettor ✓ 23.01 Tyres ✓ 23.02 Tyres ✓ 23.03 Tyres ✓ 23.07 Tyres ✓ 23.09 Tyres ✓ 25.01(e) Wheels ✓ 22.04 Fuel Tank & Hoses ✓ 25.01 Chassis (Check For Cracks) ✓ 25.11 Chain and Sprocket Finger Guards ✓ 25.09(5) Muffler Springs and Safety Cable ✓ 25.02 Side Pods ✓ 25.07 Brake Pad Retainers ✓ 25.07 Brake Cables, Hoses & Fittings ✓ 25.19 Weights ✓ 25.27 Battery Bracket & Mounting ✓ 25.17(f) Clutch Retention ✓ 25.17(g) Kill Switch ✓ 25.24 Induction Silencer ✓	Rule 13.02 Licence Signed 13.10 Log Book - Check Prior Details 14.01 Helmet 14.02 Visor 14.03 Driving Suit 14.04 Gloves 14.05 Boots.	Brand of Fuel:- BP Ultimate Brand of Oil:- Castrol R30 Oil mix Ratio 16:1																						
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AKA25B/06

Scrutineering Form - Completed



No. 1327

**Technical Inspectors Findings
And Complaint Form**

Australian Karting Association (NSW) Inc.

Meeting Date 9/2/2013 Club X42 Kart Club
Class Cadets Kart No. 1234 Licence No. Q 9876
Driver's Name Young Karter
Engine Make Comer SW80

Report on Findings (in detail with item No.)

Failed cc test Rule 26.01 (1-8)
Second test conducted with Guardian present

Was component bagged and receipt issued? ☒ YES ☐ NOTechnical Inspector (name) Inspector Signature [Signature]Official's (name) Chief Scrutineer Signature [Signature]
Chief Scrutineer ☒ or State Technical Advisor ☐use official's
Name**Notification of Steward's Finding - Re Above Complaint**

To: _____ (name) A.K.A. Licence No. _____

This / These matter/s to be referred to a Disciplinary Tribunal.

YES ☐NO ☐

A complaint was made against you. The substance of this complaint being- (details if different from above)

After consideration the Stewards find the Complaint constitutes a breach of Rule/s _____

and impose the following Penalty _____

AND / OR

Have referred this matter to a Disciplinary Tribunal for further penalty.

The Stewards recommend to the Tribunal a penalty of _____
(The Tribunal is free to impose a higher or lesser penalty)**NOTE:** We draw your attention to your "Right of Appeal" as set down in the current A.K.A. Manual.

Signature (Complainant) _____ Co-Signature (Parent/Guardian if required) _____

Signature (Defendant) _____ Co-Signature (Parent/Guardian if required) _____

Names (Stewards hearing Complaint) _____

Signature/s _____ Time _____ am / pm Fee Refund Yes / NO \$ _____

N.B. This form should be completed in quadruplicate and handed to the Chief Steward or Clerk of Course.

Distribution: White-Clerk of Course Blue-Technical Inspector's File Copy Pink-Competitor's Copy Green-Steward's Copy
AKA NSW Issued 05/2005**Technical Inspectors Findings And Complaint Form**



INFRINGEMENT NOTICE

This notice is issued in respect of an alleged breach of rule/s at a race meeting which is being conducted under the International Sporting Code of the FIA, the General Standing Regulations and National Competition Rules of the A.K.A. and any further addendums and bulletins to the regulations.

IT IS ALLEGED THAT:	
Competitor / Drivers Name:	Licence No:
Event:	Class: Kart No:
Date:	Time:
Committed the following breach of Rule No:	
Description of breach:	
.....	
ISSUING OFFICIAL:	
Issued by: Official position:	
On behalf of the Stewards of the Meeting.	
PENALTY:	
<input type="checkbox"/> Fine \$.....	
Time Penalty of seconds to be added to the Competitors time for this section of the event.	
<input type="checkbox"/> Place Penalty places to be added to the Competitors original finishing position.	
<input type="checkbox"/> Points Penalty points to be added / subtracted to / from my points allocation for this section of the event.	
<input type="checkbox"/> Exclusion from A (this section of the event) B (the event) C (the race meeting)	
<input type="checkbox"/> Other.....	
I DO NOT ADMIT TO THE BREACH OF RULE/S AS DESCRIBED ABOVE.	
An AKA Form of Complaint will be raised for a Stewards hearing to be convened for me to attend, where I will have the opportunity to state my case in person, call witnesses and present evidence supporting my case. A Prosecutor may be appointed on behalf of the issuing Official. The AKA Form of Complaint will state the time for the hearing to be heard.	

STEWARDS HAVE THE AUTHORITY TO IMPOSE ADDITIONAL / HARSHER PENALTIES TO THOSE DETAILED ABOVE IF A BREACH OF RULE/S IS ESTABLISHED AT A STEWARDS HEARING.	
Signed	Signed
Competitor / Driver	Parent / Guardian
Date	Time

I DO ADMIT TO THE BREACH OF RULE/S AS DESCRIBED ABOVE.	
I, the above named Competitor / Driver have signed this section of the Infringement Notice, admitting to this breach of rules and accept the penalty as described above. I further understand and acknowledge that by signing this section of the form, my rights to Appeal this matter have been waived.	
Signed	Signed
Competitor / Driver	Parent / Guardian
Date	Time
I, a Steward of the Meeting, find the Competitor/Driver in breach of the rules by their own admission and impose the above penalty.	
Signed.....	Steward of the Meeting

Stewards copy – white
Club copy – green

Competitors copy – pink

Chief Lap Scorers copy – yellow

Infringement Notice Form

THE CHIEF SCRUTINEER:

The functions of Chief Scrutineer, Scrutineers, Technical Inspector, Fuel Tester, Tyre Tester and Barcode Operator may be combined at the discretion of the Chief Scrutineer. The Chief Scrutineer is generally responsible for ensuring compliance with Chapter 12. – Scrutineering and Technical Inspection, and may make inspections at any time throughout the duration of a race meeting. The Chief Scrutineer is empowered to prevent competitors from competing if their karts or safety apparel are found not to comply prior to any event or section of any event.

Any kart or apparel which has not passed scrutineering on the decision of the Chief Scrutineer or the Stewards, cannot take part in the event or section of the event to which the decision relates. If the Chief Scrutineer deems that a kart or driver should be excluded from an event or any section of any event on safety grounds, a competitor cannot lodge a complaint or appeal against that decision.

The Chief Scrutineer is empowered to sign a Penalty Notification under Rule 25.23.

If a kart or apparel is not submitted for inspection when requested at any time by the Chief Scrutineer, Technical Inspector, Fuel Tester, Tyre Tester, Noise Control Marshal or Clerk of Course, the kart and the driver are automatically excluded from the meeting and forfeit all placings or points already gained at that meeting.

The following are duties of a Scrutineer :

- ☐ In preparation for scrutineering, refer rule 4.15 of the current Manual. Also refer to Chpt 12 for assistance.
- ☐ Be present at the circuit to coincide with the appropriate timetable (refer to meeting Supp Regs).
- ☐ Inform the Clerk of Course or club official of your presence and 'swipe-on' as an official of the meeting.
- ☐ Attend the drivers and Officials briefings.
- ☐ Check for any rule updates / addendums.
- ☐ Collect the completed drivers Scrutineering Forms from the relevant sign-on officials.
- ☐ Use the Scrutineering Forms as a record of karts at the race meeting and retain the sheets for any further technical inspection.

FUEL TESTER:

The Fuel Tester will be Judge of Fact as to the compliance of the competitors fuel, as per rule 22.01 of the Manual.