ASK21 User Maintenance.
Version 1.00
Robin Birch

Introduction.

This document describes several tasks that owner operators can be expected to carry out on ASK 21 gliders. It may be that they should be taken through this document and perhaps the first execution of these tasks by a suitably qualified person (Inspector or previously trained person).

Also described in this document is a list of general “Gotchas” for K21s that can be easily checked for or avoided.

The tasks described are:

- Inflation of nose, main and tail tyres;
- Replacement of nose, main and tail tyres;
- Checking and replenishment of hydraulic fluid.

There are separate sections on brakes and inner tubes as they are worth a discussion in their own right.

All other tasks require some form of duplicate sign off (control tapes, safety critical tasks and so on) and can be trained on the job by the supervising inspector/person who is providing the sign off.

Paperwork

In order to ensure that the aircraft paperwork is at least as heavy as the aircraft and provide a record of all work carried out, a BGA 205 rectification form should be completed for each job undertaken. This can be initialled by the person carrying it out but should be signed off by a suitable person, ideally an Inspector. The log book should also have a suitable entry describing the work and referencing the appropriate forms. If you are at all unsure of what to do then grab an inspector and ask them.

Health and Safety.

- Several of these tasks require the jacking up of heavy airframes. This should not be done without suitable equipment, an example is discussed in these notes.

- Jacking of heavy items must not be done on a surface that is any of: Sloping; Uneven; Soft; or does not completely support the weight and lifting area of the jack.

- Tools must be the correct ones for the job. Screwdrivers should have the correct tip for the application (Do not confuse: Philips; Pozidrive; JIS; Torx; and so on).

- Spanners and sockets MUST be the correct size for the job.

- All other tools must be serviceable.

- When cleaning the residue from joint tapes and spilled hydraulic fluid, protective gloves should be worn and hand creams used as a barrier material before the start of the job and skin preservative once all residues from the task have been removed.

Necessary Tools.

- Tubular valve extender. Of the sort that can go through a narrow round opening around the valve stem.
- Portable source of compressed air with a gauge. A hand pump, small portable compressor, or car driven emergency pump are all suitable so long as a reasonably accurate measurement of pressure (to 0.1 Bar) can be achieved and capable of delivering up to 4 Bar as a minimum.
- Two 17mm hex sockets modified, if not already capable, by turning down the socket end to fit in the ends of the undercarriage legs. This last part is necessary to guarantee engagement on the main wheel axle nuts.
- A selection of metric spanners and sockets: 13mm open ended, 11mm spanner or socket; 10 mm socket.
- Two ratchet braces to fit the 17mm modified sockets.
- 5 mm Allen keys/hex keys.
- If a split tail wheel is being worked on 4mm Allen or hex keys.
- ¼” or 3/8”, as appropriate, ratchet brace and extender for any other sockets other than the two for the main wheel axle nuts.
- Sharp side cutters.
- Low range torque wrench (9 – 10Nm).
- Valve extractor tool.
- Bead breaker.
- Jacking fuselage dolly.

What to look for when a tyre is soft.

A quick inspection is always a good place to start. Things to look for:

- Is the tyre on the rim and/or is the inner tube sticking out between the rim and the tyre? If so then suspect that the tyre and tube are damaged beyond repair. The rim also may be damaged. At this stage it is probably time to refer the problem upwards and find an Inspector as there may well be other damage.
- Is everything intact but the valve stem has been pulled into the tyre? This is probably a consequence of landing on a semi flat tyre – progress straight to removing the wheel and replacing the inner tube and possibly the tyre.
- Damaged tyre – cuts, items stuck in the surface, heavily worn – progress to removing the wheel and replacing the tyre, probably along with the inner tube.
- Mud forced into the side of the joint between the rim and the tyre, The tyre may be alright but the tube is almost certainly damaged – progress

to removing the wheel and replacing the inner tube once all the mud and debris have been cleaned out.
- Nothing obvious – pump the tyre up.
- If the main wheel has gone flat whilst the glider is standing still then pump it up in order to move the glider to a place where it can be investigated further – it is a lot simpler to deal with a glider when the wheels work.

Tyre Inflation (Wheel On Aircraft).

The valve will have to be located. Rotate the wheel, either by hand or by moving the glider (This assumes that the wheel – especially the main wheel – Is not flat as rotating the main wheel when flat by moving the glider on the wheel will damage the tyre and inner tube beyond repair) If the main wheel is flat then it is probably worth moving straight to tyre/inner tube replacement.

Ideally the valve will have a dust cap fitted. This may not be so on the nose and tail wheels as it is often impossible to fit one, either due to the small clearance around the valve stem or the clearance between the valve and the wheel box where a cap may prevent rotation of the wheel. Wherever it is possible to fit a dust cap, it must be fitted. The cap is part of the leak prevention system and also prevents debris and contamination from getting into the valve system.

You can use any available system that can provide air to at least 4 bar. You will need a valve extender, this should be one with a smooth tubular form that is just larger in diameter to the valve stem, otherwise you may not be able to attach it to the nose or tail wheel valves.

Once the valve is located, remove any dust cap and put it in a safe place.

Attach the valve extender, making sure that it is firmly screwed on. If, at this stage, there is sound of air escaping suspect that the valve or the extender has a fault.

Attach the compressed air source and add air until the required pressure is reached.

- Nose Wheel – 2.0 bar;
- Main Wheel – 2.7 bar;
- Tail Wheel – 2.5 bar.

Remove the compressed air and the extender. Replace the dust cap. Job done.

Tyre Inflation (Off the aircraft).

This applies to when the wheel has been removed and the tyre and/or tube replaced. You are inflating the tyre on a bench or beside the glider prior to refitting it.

There is one special word here – do it carefully! Before doing this make sure that all bolts have been tightened and everything has been reassembled as it should be.

Do no over pressure the tyre. It is far too easy for something to break, especially the bolts that hold split rims together, so only apply the pressure that is required – see previous tables.

Nose Wheel

The nose wheel is a split rim Tost wheel with sealed ball bearings. It uses a 4.00-4 tyre with an appropriate tube. It is inflated to 2.0 Bar.

It is held in place by a bolt with a 17 mm AF (across flats) head. The nut also is 17 mm AF.

To remove, dismantle, reassemble and refit it

First, get a box/tray to put all the bits on whilst working on the wheel. Then, using the two 17 mm sockets and ratchet braces, undo the bolt. If it can be easily pulled out then do so, other wise drive it out using a long screwdriver of suitable diameter. Then pull the wheel out of the wheel box.

If there is a valve cap (Unlikely) remove it and put it safe.

Before dismantling the wheel remove the valve core using the valve extractor. Never split a wheel with there being a chance that pressure is within the inner tube. Wheels can explode when the last bolt is removed if there is any significant pressure left in t,he inner tube.

The wheel rims are held together by 3 M6 cap head bolts. These will have hex socket heads and nuts on the other ends. The nuts are 10 mm AF and so a hex/Allen key and a 10mm socket should be used to loosen them. Slightly turn each one in turn, do not completely loosen a bolt in one go, until they are all loose, then remove all of the nuts and then the bolts.

The wheel should now fall into two halves, releasing the tyre and tube, also a spacer should fall out of the wheel – keep this safe.

If the tyre is stuck on the wheel then use the bead breaker, NOT a flat bladed screw driver, to break the grip of the tyre on the wheel. If you don’t have a bead breaker then compressing the tyre in a vice or by standing on it, will hopefully unstick the tyre.

Pull the tube out of the tyre. Visually examine it for a reason for deflation but please don’t waste too much time on this as it is easier in the long run to discard the tube. Look around the inside of the tyre and remove any debris that is running around loose. Remove this with a vacuum cleaner. If there is anything sticking through the tyre then discard the tyre, also discard it if the walls are split or the treads are nearly worn out.

The inner tube needs to be covered in talc. A reasonable shake of talc that is smeared all over the tube is sufficient, then put the tube in the tyre. Place the wheel half with the valve hole in the tyre with the valve stem in place. Place the axle in the bearing and then slide the spacer over it. Put a bolt into the other half of the wheel to help alignment and push it into place, making sure that the cutout for the valve stem is in the correct position over the valve stem. Press the tyre down till you can see the joint between the two halves and check that the tube isn't caught in place. Then do the bolts up to 10 Nm torque.

This image shows the tyre with the tube, valve stem and axle in place.

At this stage the other half of the wheel can be fitted with one or more bolts in place for alignment.

Here you can see the cut out for the valve stem and a bolt in place to help alignment.

Once the two halves of the wheel are bolted together the tyre can be partly inflated to about 1 Bar just to check that everything is ok. The wheel can then be fitted into position and the bolt put through the mountings and the hole in the middle of the wheel. Then do up the nut tightly.

Once the wheel is in place then inflate the tube to its operating pressure of 2 Bar and you are done.

Tail Wheel

The first thing to say about changing an inner tube or tyre on a tail wheel is, if you can avoid it, don't – it is a horrible job. It is better to have a stock of several wheels ready to go and then get someone who knows what they're doing to change the tyres and tubes on the dead ones as a batch.

The issue is that most tail wheels, as delivered on K21s, are solid rims. This means that changing the tyre/tube is like changing the same on a bicycle rim but on a far smaller and less flexible component. As a result it is a physically demanding task and very easy to end up destroying a perfectly good new inner tube through in appropriate use of sharp implements.

If you are lucky and have split rims on your tail wheel then proceed as with the nose wheel. The tools used will be dependant on the type used, there are several.

If, however, you have a solid wheel then the most important items are:

- A good bench vice to grip the wheel whilst removing and fitting the tyre;
- Strong but small tyre levers with suitably rounded ends that will not pierce the inner tube;
- Sometimes “G” clamps are useful to compress the tyre in various places around the circumference as you “tease” the tyre on to the rim;
- Possibly some lubricant such as soap to help the tyre over the rim.

If anybody wants to give me a major Christmas present of a small 210*65 or 200*50 equivalent of the big tyre machines in Kwik Fit or similar then please crack on as this is my least favourite tyre related job on gliders.

Main Wheel

After the doom and gloom of the previous section, this is an easier section but not without its darker corners.

Where to start: Well, there are two different main wheel types, and they are not the same. The earliest one is the Cleveland type, the latter is a Tost type. At first glance it is difficult to tell them apart and, without some experience, you cannot be certain as to which one you have.

The first thing to do is decide whether you are taking the wings off. The upside of derigging is that you have much easier access to the wheel, the down side is removing the front canopy , assuming that you are turning the fuselage upside down, and the risk to the rear one. Personally I go for not derigging as the potential cost of damaging a canopy vastly outweighs the problems of lifting the rigged fuselage.

Lifting The Fuselage

There are two methods that work.

The first is to find a two seat clam shell trailer and lift the fuselage up on the ramp and dolly to a height that you can remove the

wheel from – make sure that the wings are tresseled and that the ramp cannot collapse (jack leaking oil being the primary cause).

The second is to lift the tail of the fuselage to a point where you can remove the wheel. There are risks to this and the first thing to be done is to place a car tyre under the nose so that the nose wheel is through the hole in the middle. This will spread the load as far found the nose structure as possible and not concentrate it into the axle mounts for the nose wheel.
The next thing is to identify how you are going to lift the fuselage and support it. The safest way is to use an jacking dolly. A suitable one is the IMI workshop dolly.

This is positioned just behind the main wheel and the wheel brakes locked in position. The fuselage is jacked up and enough height can be achieved to remove the wheel.

Note: You are lifting a heavy object that you are working underneath. Make sure that it cannot move and the things that you are using to lift it can with stand the load indefinitely.

Removing the wheel

This is the same operation regardless of the type of wheel. You will need two 13mm spanners, two 17mm sockets, probably turned or ground down to get into the recesses at the end of the undercarriage legs, an 11mm socket/spanner and some wire cutters.

Cut the locking wire on the two caliper retaining bolts. With the 11mm socket or spanner remove the two bolts and their washers. Keep these

safe. The back plate (one pad) will fall away and the front plate which is attached to the hydraulic hose can be pulled away from the plate that it is attached to. This will release the other pad which is on a plate sitting on the two pins that the caliper slides on. Put all of the removable parts in a plastic bag and put safe.

With the two 13mm spanners remove the short bolt that holds the torque plate in place.

The hole with the rusty rim is the location of the bolt that retains the torque plate (the bit with the nuts). The nut is on the outside and the head is on the inside of the tab. This is what you will see with the bolt removed.

Next, with the two 17mm sockets undo the nut at the end of the undercarriage leg. You will need a socket for the nut (in one leg) and another for the head of the bolt (in the other leg). Drive the bolt out with a screw driver. Put these items safe.

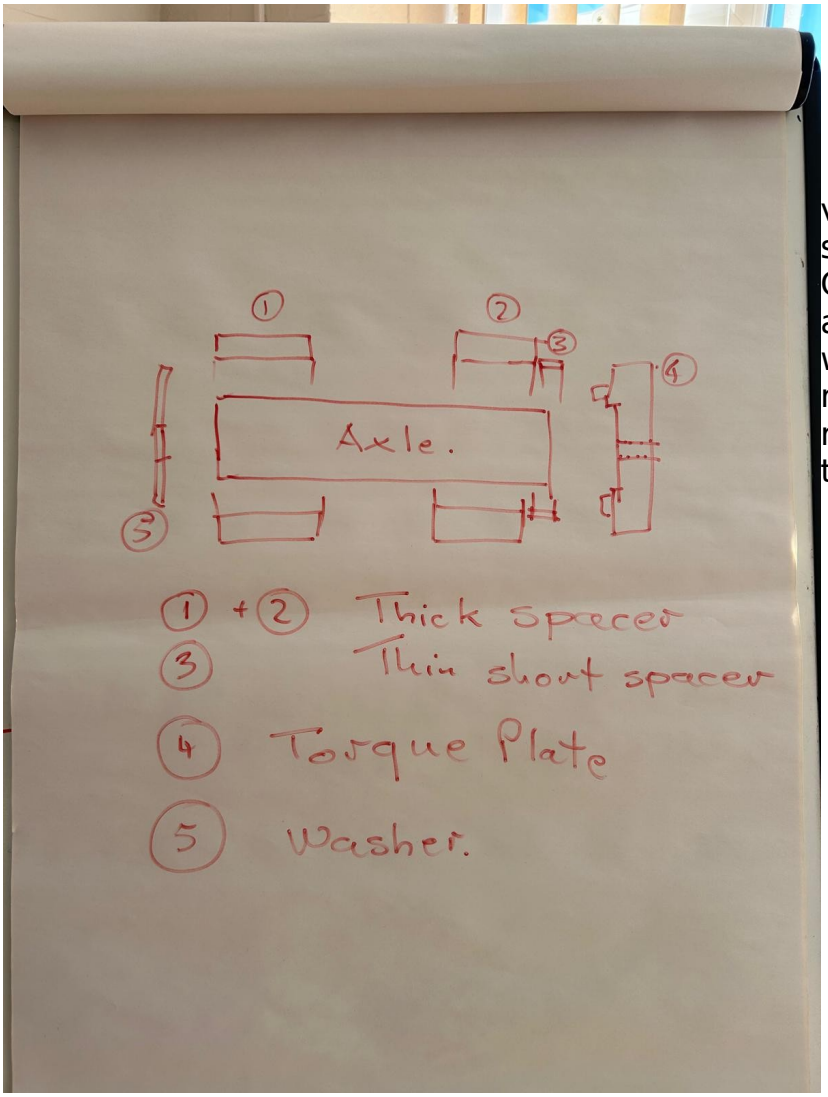
The wheel can now be lowered out of the undercarriage legs. The torque plate and any spacers, probably a large washer, will fall to the ground, put these safe, and we can now work out what we have got.

Cleveland Wheel.

This is the older type of wheel and has a different bearing and spacer system to the newer Tost style of wheel.

This is a Cleveland style wheel. Note the large diameter spacer between the wheel and the big washer at the leg. You cannot see the bearing as it is behind a metal and felt dust seal. Note the bolt heads around the recess. These hold the wheel together.

So we have a Cleveland wheel. Now to dismantle it. Slide the spacers off the axle, there are 3, not including the large washer, one on the valve side and 2 on the brake disc side. There are none inside the wheel.



This sketch shows the various plates and spacers that go with a Cleveland wheel. The axle goes through the wheel and the inner races of the two taper roller bearings slide on to it.

Once you have the various spacers and the axle off the wheel, slide the spacers on to the axle in the order shown above and put them safe. Next we dismantle the wheel.

First, we remove the valve from the valve stem and then use 11mm sockets to undo the bolts that hold the two halves together. Keep the nuts and bolts safe. Pull one half out of the tyre and then pull the other, Put the tyre and tube to one side. Look at the outside of the wheel in the area of the hole that the axle goes through. You should see in each wheel a circlip that can be removed by putting a flat bladed screwdriver between the clip and the wheel and gently levering inwards (there should

be one end of the clip that has a suitable gap). You can then remove the clip. Under the clip there will be a steel washer a felt washer and then another steel washer, remove these and put them safe. Inside of these will be the inner race of one of the wheel bearings. Remove this and put it on some clean cloth or paper. You can now see the inner race.

Check that the outer race is not loose. If it is, remove it, clean it with IPA (Iso Propyl Alcohol, or clutch and brake cleaner) and put it on some clean cloth or paper. Carry out the same cleaning process in the recess that the bearing has been removed from. Put a smear of bearing lock around the inside of the bearing recess and carefully insert the inner race with the thick edge first so that the inner race can be inserted in a while. Wipe a thin layer of grease over the inner surface of the race.

If the outer race is not loose then just clean the bearing surface with IPA or clutch and brake cleaner and then wipe a thin layer of grease over the inner surface of the race.

Take the inner race, which will have the cage and rollers with it, and clean them with IPA or clutch and brake cleaner. Thoroughly grease them, (not to a solid lump!!) and put them into the wheel on top of the outer race.

Take one of the steel washers and place over the bearing. Take the felt washer, wipe off any surplus grease and debris, and coat both sides and the inner surface with grease, place it over the steel washer and then place the second steel washer over the felt one. Reinsert the circlip and repeat the process on the other half of the wheel.

The tyre and tube can be dealt with in essentially the same way as the nose wheel with a couple of exceptions. Because the 5.00-5 tyre is a common aircraft tyre, it will be balanced and have a red dot on the side. This signifies the lightest point on the tyre so when the inner tube is positioned, the valve needs to be at the point where the red dot is. Also, the valve stem will have several nuts and washers on it. This is for wheels where the valve is screwed into place to prevent it moving. This wheel is not of this type and so they are removed before the tube is fitted.

Assembly is similar to the nose wheel but without the spacer in the middle of the wheel. Be very careful not to nip the tube in-between the two halves. Insert the bolts and do them up Inflate the tyre to 3 Bar and the wheel is complete (The tyre pressure will fall to around 2.7 once the tyre is run in).

Take the axle and slide it through the wheel. Put the spacers in the order laid out in the sketch above and put it in the undercarriage with the torque plate in place. Do not put the washer in. Push the bolt through from the brake side but stop just short of the leg so that you can slide the washer in. This may take a bit of a firm push as you are now tensioning the bearings – push the bolt finally through and put the nut plus any associated washers on the bolt and tighten it all up.

Everything after here is identical with both types of wheel so I'll put it after the Tost description.

The link takes you to the Cleveland maintenance manual. It covers their entire range but has some useful information in it.

https://www.clevelandwheelandbrake.com/wp-content/uploads/AWBCMM0001-31-1.pdf

Tost Wheel

The Tost wheel is considerably simpler than the Cleveland one, primarily because of the type of bearings used.

The Tost wheel has two spacers, one either side of the wheel. Make sure that you have the correct one on either side, Again place them with the axle and take a photograph to ensure that you know which is which.

The axle is a much smaller diameter than the Cleveland one.

Firstly deflate the tyre and then remove the valve.

The bolts that hold the wheel together are undone using a 5mm hex/Allen drive. Undo them and keep them safe.

Split the wheel, you may have to compress the tyre to release it from the wheel. Remove the tyre and tube. Inside the wheel is a spacer, similar to the one in the nose wheel. The axle goes through this. The spacer's job is to set the distance between the two inner bearing races so that the bearings are not crushed when the bolt holding the wheel in is done up.

Rotate the bearings, they should be smooth with no grittyness or notchy feelings as they are rotated, If there is any felt then the bearings will need to be replaced and a suitably trained/qualified person should be approached.

Prepare the new tyre and tube in the same was as the Cleveland one and reassemble the wheel with the valve aligned with the red dot. Remember to put the spacer in place before joining the wheels and use several bolts and the axle to aid alignment as in the nose wheel. Insert the remaining bolts and screw them up. Torquing them to 10 Nm to finish the job.

Inflate the tyre to 3 Bar and the wheel is complete (The tyre pressure will fall to around 2.7 once the tyre is run in).

Put the axle through the wheel, making sure that it goes through the spacer and the spacer is not loose. Then place the spacers on the axle and reassemble with the torque plate and any packing washer, insert the bolt and do it up in the same way as the Cleveland wheel.

The following is the maintenance and installation manual for the Tost wheel and makes interesting reading.

https://www.tost.de/wp-content/uploads/2019/09/Installation-and-Operating-Manual-Penta-Iss.-1-1.pdf

Finishing the Job

Line up the hole on the leg and the one on the torque plate. Insert the short bolt from the wheel side of the hole, put the nut in place and then do the bolt up with the two 13mm spanners.

Put the brake plate on to the caliper and push the pins on the caliper into the sleeves on the torque plate making sure that the caliper is freely floating. Place the back plate against the caliper and insert the two bolts, tightening them to finger tight and then torquing to 10 Nm. Finish by wire locking.

It is unlikely that the brakes will initially work properly. This is because the amount of fluid moved by the master cylinder is probably not enough to close all the gaps between the caliper piston, the pads and the disc. You will need to work the airbrakes several times, possibly up to 10, before the system works.

If, after this, the brakes are still soft, then ask an inspector to bleed the brakes for you.

Inner Tubes

This is a separate section as it is a subject in its own right.

Firstly, there are two main types of inner tube, natural rubber and butyl rubber. Natural rubber are the more expensive and, these days, not that easy to find. Butyl rubber have largely replaced the natural rubber and are the default ones that most suppliers provide. The upsides of Butyl is lower cost and ease of purchase, the down side is that they are hard to repair – it is very difficult to get repair patches to stay stuck whereas they stick to natural rubber easily.

It is generally simpler to replace an inner tube if you have dismaled the wheel for whatever reason. This is because it is difficult, unless blindingly obvious, to determine the state of wear of the inner tube, so it is very easy to carefully reassemble a wheel, pump it up, only to have it go pop or start a slow leak after the next landing.

Reasons for inner tubes to go bad, apart from the obvious of running over a nail.

- Under inflation – not checking the pressures at the start of the day. The tube will start to fret against the inside of the tyre, no matter how much talc you have used, and eventually wear a leaky spot;
- Debris – if you have put a new tube into an old tyre and not thoroughly cleaned out the debris that eventually builds up then this will eventually generate damage where it is pushing against the tube;

- Incorrect valve stem. A 90 deg one in a 45 deg rim or vica versa. This outs a strain into the joint between the valve and the stem and it will fail fairly quickly, make sure that you know what type of tail wheel you have;
- Too long a valve stem. This causes wear between the end of the valve stem and the wheel box. It can damage the wheel box and wear away the end of the stem. In very bad cases it will wear the stem away enough to allow the end of the valve to be pushed in by the wheel box, letting the air out. There are many different inner tubes out there, especially for tail wheels, most of them are designed for trolleys, wheel barrows, scooters and the like. Although it is more expensive, you'll save in the long term, get your tubes from someone who buys them for the wheels that you have. E.g., Navboys, who are well versed in finding correct inner tubes for, say, Tost wheels.

Brakes

K21 brakes are all hydraulic disc brakes. They are all essentially the same whether they are Cleveland or Tost.

The brake fluid is Shell No. 41. DO NOT USE DOT3/4 as you will destroy the hoses and seals.

The oil should be a nice pinky purple colour. If it is getting dark or mucky then it is time to change it.

Firstly make sure that the hydraulic fluid is topped up. There are two different types of reservoir in use:

The standard one is a model aeroplane clunk tank. This has a pipe going to the master cylinder and a vent pipe that is taken down the undercarriage leg out of the fuselage. It is held in place with a piece of sponge that locates it against the inside of the fuselage on the Port side of the aircraft, underneath the rear seat. The rear seat should have a round window through which the tank and the level of fluid can be seen. Note: The early gliders did not have the window so if this is the case on your aircraft make a hole where the tank can be seen and rivet a piece of clear plastic in place as a window. If you are uncertain where and what this should be like then have a look at a more recent aircraft.

These model aeroplane fuel tanks are not particularly robust. They are flexible, which makes them leak, and over time they get brittle and break. Also the fluid that is used, if allowed to evaporate ,goes sticky, which can block the vent which prevents the brakes from working as the master cylinder can't suck against the vacuum that is created in the bottle.

All of this suggests a regular check is made on your reservoir and the fluid. To do this, remove the rear seat and have a good look.

The second version of the reservoir is a repurposed automotive brake, clutch or steering hydraulic tank. This is a sealed unit and has one outlet which goes to the master cylinder. The oil is isolated from the air by a rubber bellows in the top of the cylinder under the screw on cap. This can be retrofitted to a K21 with the model fuel tank version using TN39 and ordering the parts from Schleicher.

This is a much more robust version of the reservoir, much less prone to leaking and doesn't suffer from blocked vents. It is also better for aerobatics due to the system being completely sealed.

Secondly, check the pad thickness. If the pads are wearing thin, and especially if the disc is reaching the end of its wear limits, it is possible for the piston in the caliper to move far enough for the seal to come out of the cylinder, neatly dumping the contents of the hydraulic reservoir over the wheel and the ground. The pads should be changed just before the rivets start wearing. Some versions of pads have wear cutouts in their ends some do not, anyway they are difficult to see. As a rough guide, replace the pads once they have got to 2.5mm.

Also check that the caliper is freely floating in the plate that it is mounted on, other wise the pads will wear unevenly.

A last comment is to make sure that the two bolts that join the caliper together are correctly wheel locked. The wire is visible and intact and it goes the correct way round, preventing the bolts from undoing, not encouraging it.

Other Gotchas

As well as the various issues and pitfalls identified above, the following have cropped up over the years and been corrected.

Front Hook Release Cable

The front hook on a K21 is operated by a cable that goes round a pulley. This pulls the arm on the hook forwards which operates the hook and pulls on a cable that is connected to the CofG hook and operates that. When correctly installed the cable is crossed over as in the image below.

It is quite easy to install the pulley with the cable not crossing over. This has two side effects. The first is that the T handles have to be pulled a lot further to operate the hooks and the resultant spare cable flops around the front pilot's feet. The second is that, due to the path that the cable takes, the gap between them increases towards the nose (to the left in the image). This means that the cable can wear against the strap that goes from the top of the pulley to the bottom causing damage to itself and also to the strap. The fix is to undo the pulley from the operating arm and reposition it as in the image.

Over Zealous Locking Of The Safety Wire On the Front Canopy

The front canopy jettison is by the lever with a red handle that is moved from right to left over the instrument panel. To prevent this from happening inadvertently there is a thin piece of copper wire that is in a U shape which is poked through the lever and then two holes in the coming. This is supposed to be very thin and only twisted together with one turn.

We have seen steel locking wire, thick copper wire, multiple locking turns probably done with locking pliers, missing wire and pretty much every other combination that you can think of.

In this instance just cut the wire, remove it and throw it in the metal bin. Then replace with a single thin piece of wire with one, finger tight, turn to lock.

Worn Rear Release Cable.

The Rear (CofG) Release cable passes through a dust cover over the rear hook.

The cable can be seen passing through the cover (the light grey plate). If the cover is misadjusted then the cable wears on the cover, damaging the cover and causing the cable fraying seen in TNS 1-2026 08 (Image 2). If seen immediately replace the cable and adjust the cable path/cover position.