GFA AN 61
(ISSUE 5)

AIRWORTHINESS ADVICE NOTICE

TYPE AFFECTED:
Astir CS
Astir CS 77
Astir CS Jeans
Club Astir II
Standard Astir II
G 102 Club Astir III
G 102 Club Astir IIIb
G102 Standard Astir III

SUBJECT: Miscellaneous airworthiness information.

BACKGROUND: This AN records airworthiness information which is useful to know.

APPROVED MODIFICATIONS:

1. *Tailwheel installation.* The standard tailskid has little shock absorbing capability, which means that ground contact (takeoff, landing, ground handling, etc) can transfer shock through the lower fuselage, fin, rudder, tailplane and elevators and add to the possibility of local delamination of hinges, ribs, etc. (See item 9 in Maintenance Notes.)

One way of softening impact under the rear fuselage is to fit a pneumatic 210 x 65 tailwheel assembly according to GFA MOD 81-2 a kit for which may be available from the Grob distributor. Copies of this modification are available from the GFA Secretariat on request.

This wheel will reduce ground loop risk, and experience indicates that inertia loads during even mild ground loops can cause extensive damage to the rear fuselage/ lower fin area.

NOTE! Be sure to amend the cockpit minimum pilot weight placard as necessary for the change in balance created by the heavier wheel.

2. Grob Service Bulletin TM 306-32 describes the optional installation of Wedekind safety sleeves on the L'Hotellier couplings. Copies of this technical note are available from the GFA Secretariat on request.

SIGNED: Jonathan Shand.
SENIOR TECHNICAL OFFICER AIRWORTHINESS

For and on behalf of:
THE GLIDING FEDERATION OF AUSTRALIA

MAINTENANCE NOTES: 1. *Divebrake/aileron system interference.* With the divebrakes fully out and the ailerons deflected full right the bolt connecting the left hand side dive brake rod end to the forked aluminium casting fouls the aileron push rod end bolt. This is caused by installing the bolt with the head up. The bolt must be installed with the head down.

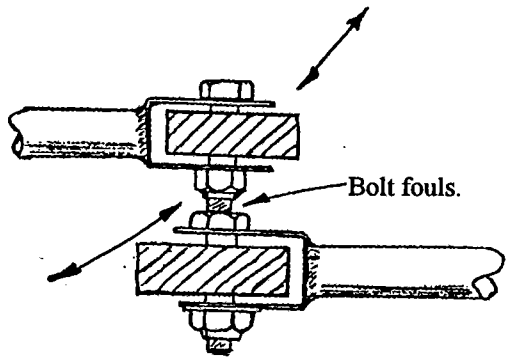

FIGURE 1 BOLT INTERFERENCE

2. *Loose control column grip.* A pilot suffered PIO just after takeoff on aerotow. The grip was pulled upwards and came off the control column. This caused momentary loss of control and a minor impact with the ground.

Check at both daily and annual inspections.

3. *Hinge roll pin removal.* The most common method of removing the ailerons and elevators is by use of a hammer and pin punch. This type of impact can be quite damaging to the hinge and its attachment to the main structure. The following sketches have been offered by one of our inspectors as an alternative tool for roll pin removal, which does the job quite well and may prevent delamination of hinge attachments. (See GFA AD 213.)

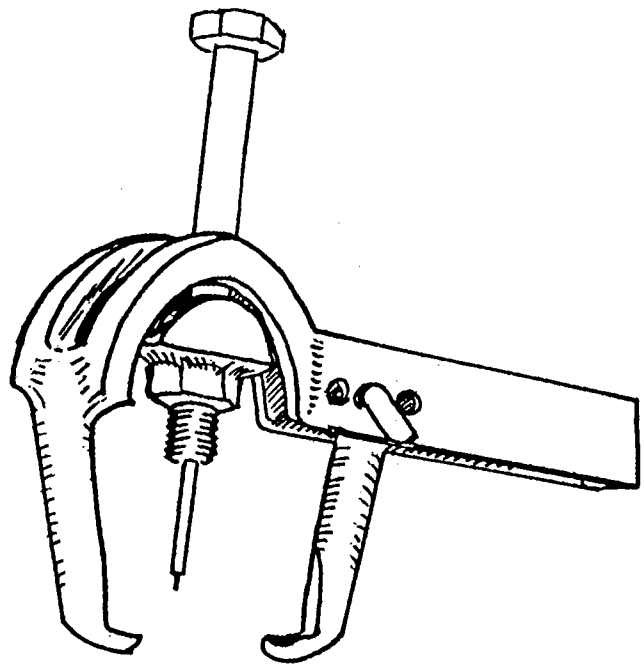

FIGURE 2 HINGE PIN REMOVER

The main problem is that the holes in the pins are individually drilled and are at all sorts of angles, hence the curved arch of the tool and the bolt in the trunnion so that the individual roll pin angle can be duplicated by the tool.

A secondary problem is that not all the hinge pins are the same length so that the tool-must cater for differing spans of hinge. The feet of the tool must slip and hold under the different sized ends of the pins. One foot of the tool (the foot in the handle) has to be loose so that it can be inserted below the end of the hinge pin first and then the main body of the tool presented to it, the foot then being secured to the body by a pin (a bent nail in the prototype). It is fiddly as the aileron/elevator also has to be held at the correct angle so that the roll pin being removed does not pierce the control surface shell. Once the roll pin is moving it slides out very easily under the positive action of the bolt thread turning.

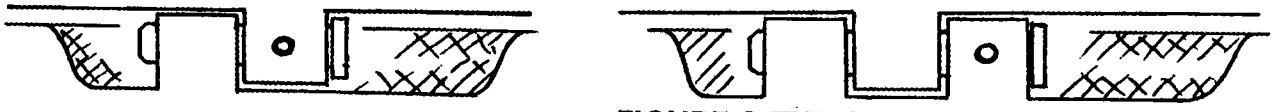

FIGURE 3 TYPICAL HINGE LAYOUTS

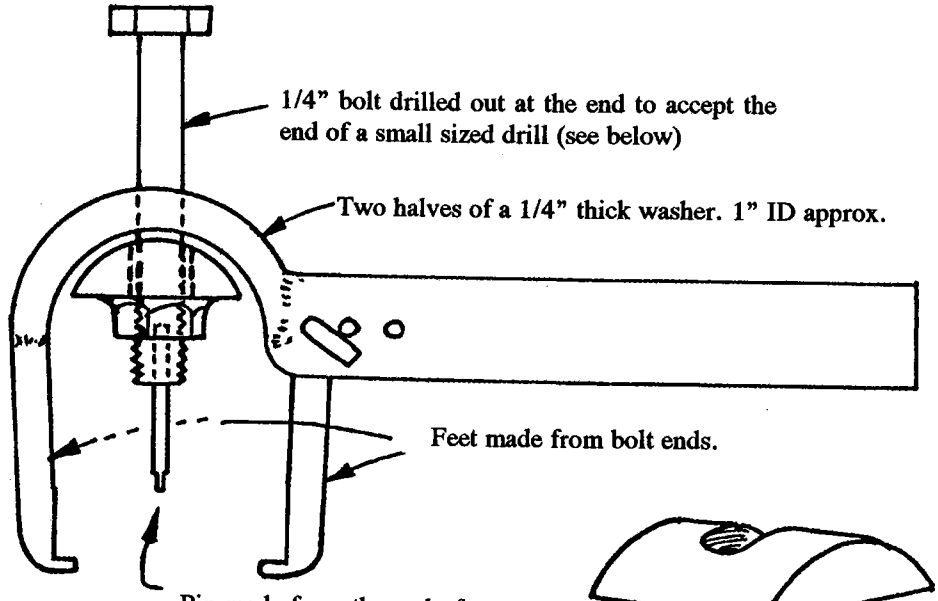

FIGURE 4 REMOVER TOOL DETAIL

The tool has to span differing hinge lengths of 30 mm, 35 mm and 42 mm. The holes in the main body assembly are drilled to suit these spans.

The feet are chiselled out at the 'instep' to suit the diameters of the hinge pin ends otherwise they will slip off when the bolt is being wound down and damage the aircraft finish. For Roll Pin insertion use another bolt in the tool with a flat ground end.

4. *Installation of tailplane/fin locating pin (CS, CS 77).* One of the contributing factors in the problem of these pins cracking in service may well be the way they are installed.

The following sketch shows by exaggeration how some pins have been found to fit, which will result in overstressing the flange when the nut is done up. Also, sharp corners on the washers will "bite" into the radius at the root of the flange, also causing stress concentration.

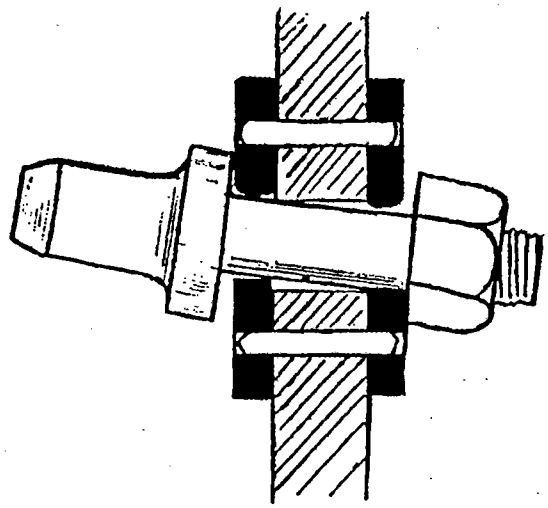

FIGURE 5 TAILPLANE PIN INCORRECTLY INSTALLED

5. *Possible jamming of the elevator.* This will apply to all Astirs subject to elevator horn replacement to AD 253.

One case found of small foreign-object (possibly a left-over from the horn modification) protruding from one of the lower surface drain holes. The object caught on the fixed tailplane skin, this restricted elevator movement.

In this case the object was a teardrop shaped piece of gel coat.

To prevent this happening, the fixed tailplane skin can be trimmed back such that the two drain holes never pass over the edge of the skin.

6. *Aileron Jamming.* One report of an aileron system locking when the hand brake cable passed between the aileron stops on the control column. The locking action was only overcome by pilot effort which finally dislodged the FRP saddle tying the cable to the fuselage shell.

This defect did not show up during the pre-flight control check and happened during release from aerotow.

7. *Interference between tailplane and fin.* One case has been reported of fin/tailplane interference prevented the front locking ball from engaging properly. This defect showed up as tailplane freeplay and may have resulted in disconnection of the tailplane in flight.

Top surface of the fin was relieved (see "A") to provide clearance between bottom surface of stabiliser and top of fin allowing ball to move further into the correct position. However, (see "B") a wrap of glass and resin was overly thick and prevented the stabiliser from moving fully back. The excess was removed allowing the stabiliser to move back and the ball to engage the seat in the correct position.

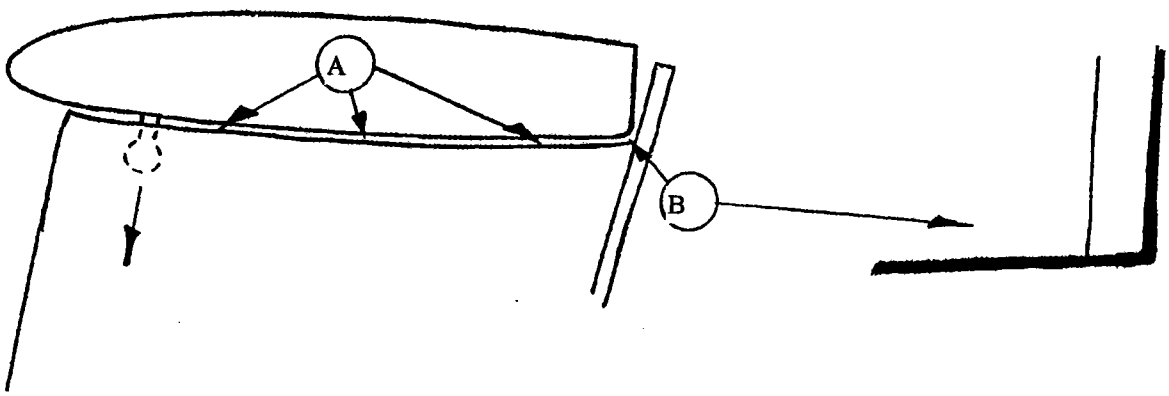

FIGURE 6 TAILPLANE FIN INTERFERENCE

8. *Welding of cast undercarriage frames.* Cracked front undercarriage cast frames can be repaired and reinforced by-welding.

GFA Modification No. 81-3 details the welding process Copies of this modification may be obtained from the GFA Secretariat.

9. *Fin structural damage.* Several cases of fin damage have been found following ground loops or flight incidents where the fin has applied substantial torsion to the rear fuselage boom, causing internal crushing of the horizontal rib, evidenced by gel coat cracking at the base of the fin near the fin leading edge

This type of damage may not be obvious to the eye and applying load to the fin may not show excessive distortion or structural "softness", however by listening closely at the cracked area while the fin is loaded will result in hearing broken epoxy and glass rubbing together.

By 1984 there were 4 reported incidences of fin delamination. Should delamination be found it must be reported to the CTOA.

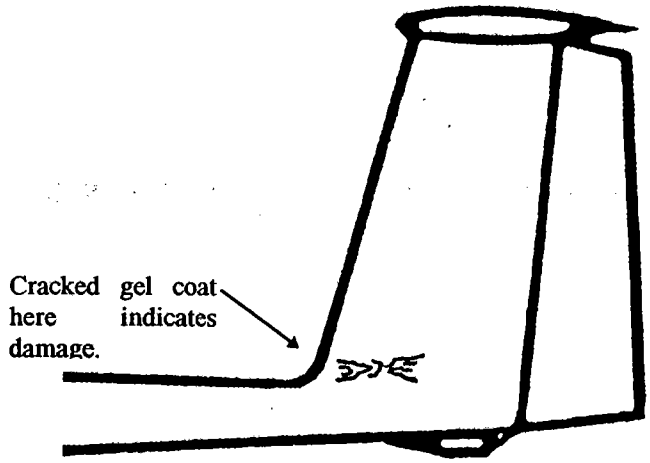

FIGURE 7 FIN DELAMINATION INDICATIONS.

10. *Rudder out of balance.* A number of operators have commented on a small amount of rudder 'Buzz", or oscillations at mainly high speeds (over 100 kts) in some cases lower speeds.

One possible cause of this oscillation may be incorrect mass balance of the rudder.

It is strongly recommended that the rudder balance be checked in accordance with the Maintenance Manual and the results entered into the log book.

There is a strong possibility that the rudder 'Buzz" is related to the delamination discussed in Item 9.

11. *Incorrect assembly of dive brake coupling.* If the right hand dive brake pushrod is installed upside down the L'Hotellier coupling can bind up with the dive brakes locked as illustrated. This is usually severest at 1/2 brake travel.

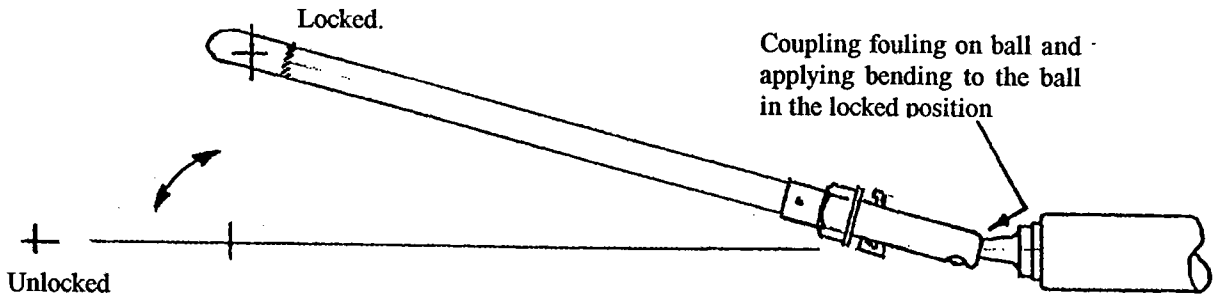

FIGURE 8 DIVEBRAKE PUSHROD INSTALLED INCORRECTLY

12. *Shoulder harness attachment.* Occasionally during Daily and Annual Inspections the shoulder harness straps have been found installed incorrectly, the shoulder straps were found looped over the small diameter wire strap, instead of wrapped around the front wing connection tube.

The wire strap is there to locate the shoulder strap sideways and has no other purpose.

The illustration shows the correct should strap location and the correct method of finishing off the end of the shoulder strap through the adjuster.

Note: Autoflug require the strap end to be folded back through the adjuster as in Sketch (b).

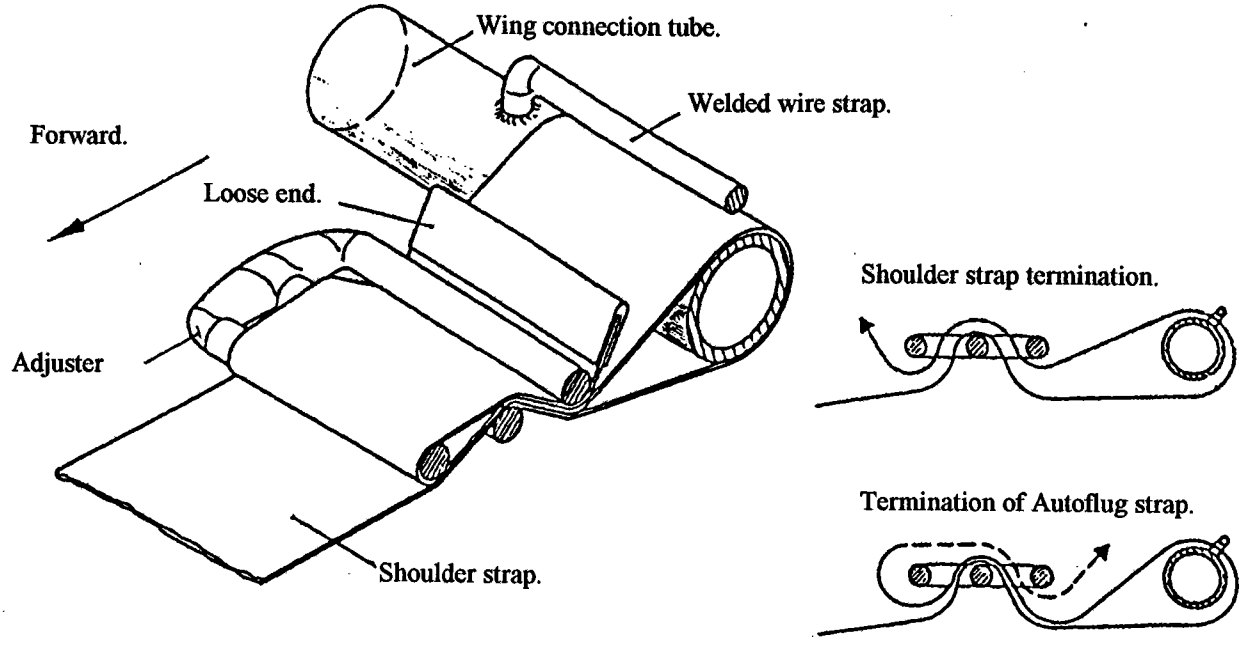

FIGURE 9 HARNESS INSTALLATION

13. *Rudder jamming.* A case was reported where two small stones in the rear fuselage, rolled rearward during a winch launch and jammed under the rudder.

Upon inspection it was found that the foreign material entered through an inspection hole in the fuselage.

When the rudder is in the full left position on these aircraft, the cutaway on the rudder where the pushrod connects, exposes a large hole allowing for the entry of foreign material.

14. *Twin Astir Trim Lever Failure.* The Twin Astir trim lever is cast aluminium with a plastic covering. The lever is similar to the one fitted in the single Astir sailplanes.

In one case a pin hole in the plastic allowed sweat to contact the aluminium which caused a corrosion spot which then propagated as a crack and the lever failed.

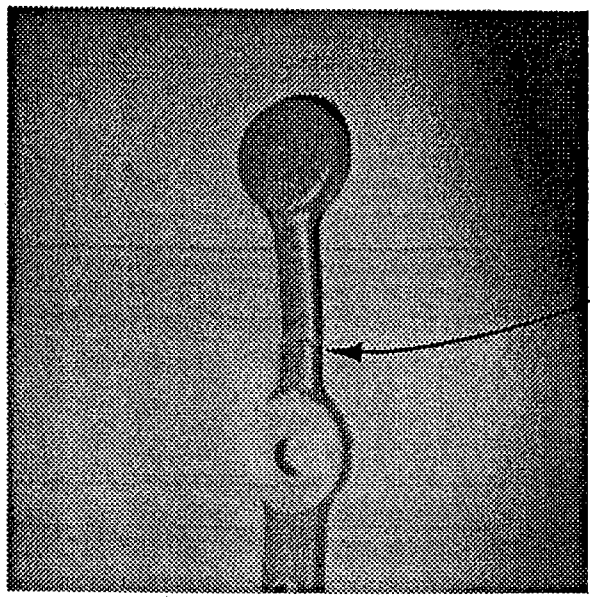

FIGURE 10 FAILED TRIM LEVER

15. *Restriction of aileron control.* This defect occurred on a Twin Astir however all Grob sailplanes may be affected.

During an Annual Inspection the metal seals on a number of control system bearings were prised out, apparently for the purposes of lubrication. These bearings are lubricated for life and require no routine lubrication. If a bearing seems to require lubrication it is faulty and should be replaced.

In the particular case someone tried to reinstall the seals and the end of the seal popped up and jammed the aileron circuit.

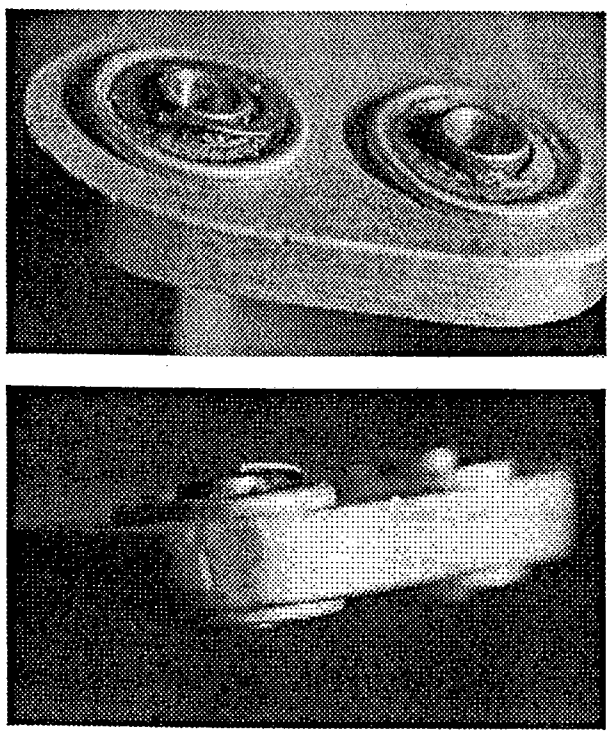

FIGURE 11 THE DISPLACED BEARING SEAL

16. *Cracking of Dive Brake Arms.* Two cases have been reported of cracking of the dive brake arms. These should be checked at each annual inspection especially where the arm contacts the stop. (see GFA AD 411.)

17. *Loose elevator pushrod ends.* A number of cases have been reported of loose elevator pushrod ends. The original design only used one tubular rivet to secure this part and so to remove slop a design involving the installation of two monel pop rivets has been developed by G. Sunderland.

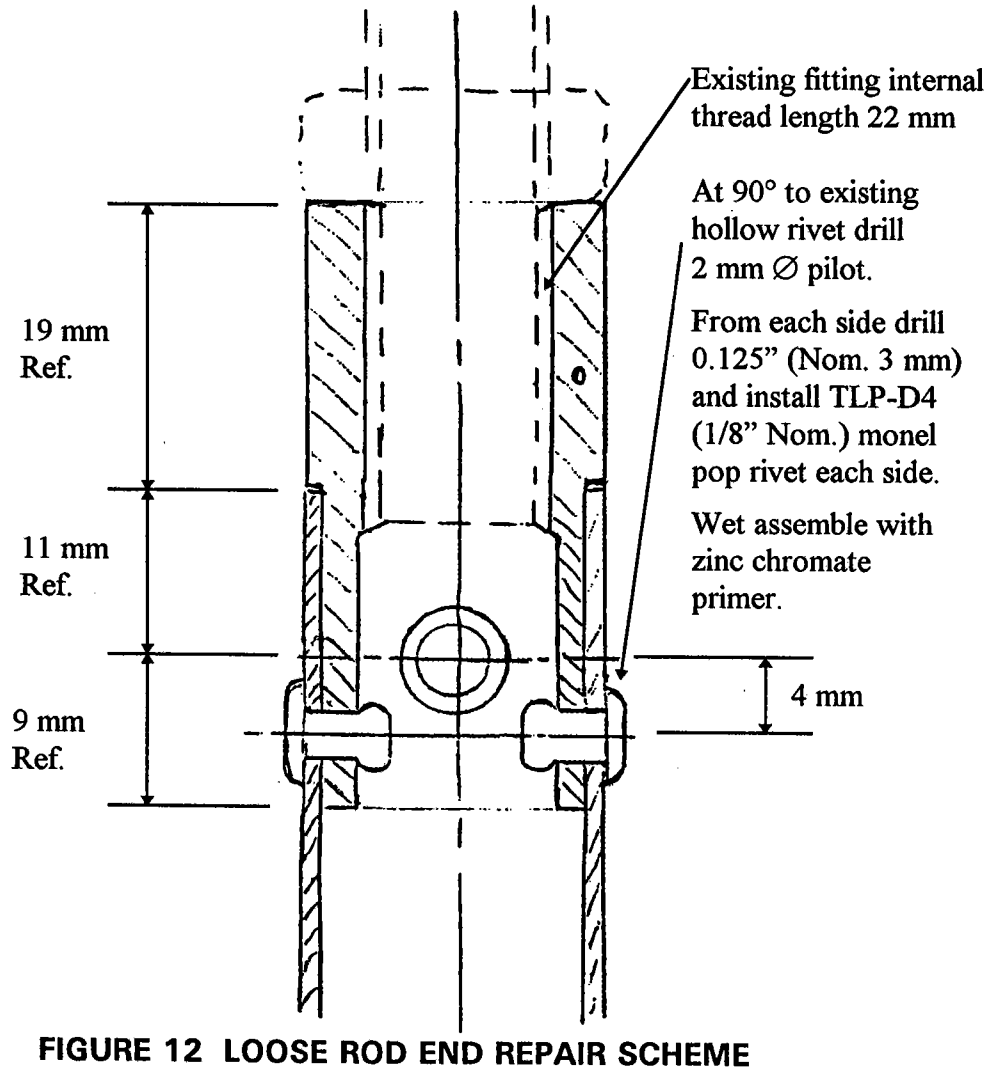

FIGURE 12 LOOSE ROD END REPAIR SCHEME

Note: This repair scheme was developed for an Astir CS and if any difficulties are encountered with other types then the CTOA should be contacted so that any necessary variations which may be required are recorded in this AN.