I thought the article below which was written by well known South African Renault enthusiast , Ian Schwartz, who built and raced Renault R8 Gordinis for some years , may be of interest to other enthusiasts worldwide. I have included a short reference section to explain terms in the text which may not be familiar to readers outside South Africa.
Keep those G's rolling ! Carvel Webb

GORDINI GREMLINS or AVOIDING GRIEF WITH YOUR *G*

By Ian Schwartz

It is my firm belief that the big "G" on the tappet cover stands for "GRIEF", a warning to the unwary and the careless. Five years spent racing Renaults, both wedge and G, show me that with almost no exceptions, wedge motors are quicker on the track than G's.

How can this be? The answer is simple: - wedge motors are usually running cleanly on all four cylinders, while the heroes with G's are furiously changing spark plugs, carb settings, timing, valve adjustments and anything else adjustable, that is if the G is running at all !

Do I consider the G less reliable? No – it is we tinkerers who make it so! Every piece in a G is as strong or stronger than the corresponding parts in a wedge:- Put it together right and it will stay right.

I am no exception, but find it sad that people keep making the same easily avoidable mistakes. Some I have made with sometimes-disastrous results, some I have avoided, but the number of motors I still find with major assembly errors is unbelievable.

So here follows a list of points to watch when assembling a G, over and above accepted good practice such as correct bearing to crank, piston to wall, and pin fit, valve stem, follower, and cam clearance, crank and rod straightness, bearing housing trueness etc.

1. CONRODS
Conrods are clearanced offset so that the gudgeon pin boss does not touch the piston due to the offset boring of the block. Small marks near the big end show the clearanced side, nos. 2, 4 must face the flywheel, nos. 1,3 must face the pulley. Check visually after assembly.

2. VALVE TRAIN
The area where all the grief sneaks in - get it right and all is well. Make any mistake and you'll wish for a clean 1108 Alconi.(1)

Rocker Shafts
There are 48 different ways to assemble your shafts, of which 36 will cause some or all of your rockers to seize. The number of galled shafts I find bears witness to incorrect assembly.

- Make sure you use the oil feed (i.e. Side drilled) pedestal at the flywheel (oil feed) side of the block.
- Make sure each individual rocker centres over an oil feed hole in the shafts, if not you have your shafts in incorrectly or an unmatched set.
- Do the pedestals rest properly on the head i.e. Not on galled alloy where oil will leak out?

- Depending on 1108/1255 G and varieties, tappet adjusters are either pressure fed or gravity fed. Don't use pressure (side drilled) adjusters with gravity (undrilled) rockers, the pushrods will only last 5 minutes without adjustment – use top drilled adjusters.

Rocker geometry
With any high lift cam, and with the number of strange valves fitted in G heads. (Even G valves), geometry will be incorrect. (particularly exhausts). Rapid guide wear will follow, and ..... rocker tips will wear out, and ……. Valve stem tips will peen out and mushroom.

Drilling oil feeds and countersinking funnels into the guides is not the answer. It is a Band-Aid, which will cause other problems, particularly plug fouling to which G's with their very cold plugs are prone.

To get geometry right, the line drawn through the centre of the rocker shaft and the point of contact of the rocker on the valve at half lift must be perpendicular i.e. 90 to the valve stem. This is a painful job, but must be corrected, particularly if far out and this can be achieved by;

- Using longer, or shorter stem valves
- Building up (welding) onto rocker tips or grinding down and rehardening,
- milling down pedestals or shimming up
- or a combination of all three, since it is seldom on a G that the Inlets and Exhausts have the same problem to the same degree. If incorrect by any significant amount, your G will exhibit some or all of the problems above, and you will be forever resetting tappets, changing plugs and wondering why your guides have worn out so fast.

Pushrod followers
Fouling pushrods are probably the single main reason for evil running track G's. To raise the compression ratio to any reasonable amount for track racing at Reef altitudes (2) (have any of you ever compression-checked a 1255 and found even 10.5:1 ?), the block must be drastically cut, even using a 1296 High compression kit. Cheeky G's also make use of cut cams, which drop the followers further down the bores at zero lift.
Between the cam and the cut block and sometimes skimmed head, the angle of the pushrod increases (exhaust particularly) and fouls any, some or all of the block, the follower the gasket and the head, any of which are liable to make your G run worse than an 850 Dauphine with a bent crank! So

- Cut exhaust followers down, thin the upper rim
- Clearance the block at the follower bore
- Clearance the block where cutouts already exist
- Cut gasket cutouts further back but check to see that you are not exposing the crack between the sleeve and block, since water will pour all over your followers.
- Cut back the exhaust pushrod holes in the head.

When assembling, torque lightly and tap the pedestals forward and backward until you are sure that pushrods will not foul, then torque finally.

Do not use bronze bushes as spacers on your rocker shafts unless you are absolutely sure they are right. You are far better off with springs than bushes if you are not 100% sure the bushes are neither too big nor too small.

All of this means you must not expect your hot G to go together as soon as you have all the bits. Do dry assembly after dry assembly until you are sure everything is right. Accept the fact now!

Valve pocketing, valve springs, retainers.
All G cam grinds, standard included, have a lack of deceleration duration i.e. Their noses are too sharp. Use of big valves (heavy valves!) often with 8mm stems (even heavier), together with steel (heavy) retainers and weak valve springs (standard G, Fiat 1500 etc.) and valve bounce will begin at 3500 – 4000rpm. i.e. The follower will go into orbit as it reaches full lift, and return with a crash on the lee side of the cam. If you don't believe me go and scratch out your RA – 3's, RA - 5's, 755's, 701's etc.(3) and have a good look at the return side of the cam for circular marks from the follower. You will find them all the way down the side if the motor has been used hard at all (Is there any other way ?). You, unlike the motor, will only notice the bounce at 6000 – 7000rpm. Man has invented no finer method of bending pushrods, breaking valve stems, followers and retainers than valve bounce, so

- Use stiff valve springs, and check seat and open pressures
- Lighten or use as light as possible valves, retainer's pushrods etc. This, if done properly, will increase reliability greatly.

Valve retainer to guide clearance
Make sure that your retainers still have at least 2mm clearance at full lift, because, on your valve train's travel into orbit, something is going to have to stop it, and it wont be spring tension, particularly with an RA- 5 etc cam . Make sure your retainer hitting the guide will not be the built-in stop (a Cordon Bleu recipe for dropping a valve), but rather let the spring stack solid first.

Pocketing
Allow 2,5mm valve to piston clearance on exhaust side and 2,0mm on inlet. Check with clay, a dial indicator, through a port or with any other method. Valve bounce and cam retard can quickly chew up 2.5mm clearance on exhaust side – witness some pistons.

- Remember when pocketing that bores are offset, i.e. Valves will not centre over pistons – pocket accordingly.
- Pocket only as much as necessary sideways – do not unnecessarily weaken ring lands.

3. HEAD

- Clean out scale, either by acid (carefully) or by bead blasting. The head must transfer heat to the water, or detonation can be induced, or worse, exhaust valve guides overheat and valves seize in the guides – with dire consequences.
- Take a steam bleed off the rear of the head – I am convinced that the amount of grief occurring at No. 1 is a result of steam pockets at the back of the head. Since I started bleeding the rear of the head, overheating problems (and many others) have been eliminated. A 1mm-diameter hole in the blanking plate on the back of the head with a suitable fitting and a small pipe back to the header tank is all that is required!

- The 1255 head uses angled water holes, unlike the 1108 G. If you skim the head substantially and are using a big bore (77 – 78.5mm), the water hole lands up inside or very close to the bore – leading to an instant leak or easily blown gasket. Weld up, redrill and reskim if necessary.
- If you skim very much and use Alfa pistons etc., the pistons will try to lift the head off for you. Check piston to head clearance with clay or twin-pack silicone mold. Grind out the head to suit.

4. PISTONS AND SLEEVES

- Try to use only high quality, unslotted, cast or forged pistons, using 2mm or less compression rings. Slotted pistons eventually break up under very hard use.
- Lap in the sleeves into block, then skim the block and sleeves, remove the sleeves and mill a further 0,004"off the block. The paper sleeve seals hammer out eventually with continual high rev use as the sleeve tries to follow the piston up and down.
- Bore and hone the sleeves with a head plate torqued into place – distortion with thin sleeves and big bores can be as bad as .010" and is usually much worse than 0.002" to 0.003". Blowby on most 1480 – 1500's is awful, unless Alfa/Peugeot sleeves are used. Check sleeves with a bore gauge from the crank side with the head torqued on with a gasket.

5. OILING SYSTEM

The standard system in good order is perfectly adequate, but for high rev use the head is over-oiled, as it is designed to have enough oil for idling and traffic conditions. A restrictor can be placed in the block oil feed to the head, but its size is critical and its effect is difficult to calculate. At an oil pressure of 4 bar, 35 litres/min is delivered to the rockers – small wonder the guides are over- oiled and fouling occurs! So

- Improve the drain-back path from the exhaust valve guides.
- weld up the rocker feed holes on the shaft, swop over the shafts and redrill (– broken tungsten carbide bits galore), in corresponding places (1.25mm - 1.5mm holes).

For a pure road car in standard form – leave well enough alone.

6. POWER AND RELIABILITY

Contrary to popular opinion, a standard 1255 is not particularly fast. In its day, the best of the 1255's were good for 153 – 157 km/h on the Kyalami (4) measured top speed trap. The best of the standard valve size 1296cc Gordinis have achieved 192km/h there, and the large valve Group 5 Gordinis 204km/h. 192km/h requires 83% more power than 157km/h, and 204km/h requires a further 36%. These cars have found reliability at twice the power of a 1255 using mostly standard or Alpine parts. There is no reason why any road Gordini should not give absolute reliability. The number of so called hot G's on the road (and on the track !) that go shockingly may prompt an article on producing power from your G, but careful attention to detail will provide power and reliability in itself.

Remember the Government health warning on the tappet cover !

References

(1) The Alconi was a South African developed tuned version of the Renault R8 and R10. Many options were available for sport and track use . The basic conversion comprised a reworked head , higher lift cam, twin choke Weber carb, and a free-flow exhaust resulting in a power increase of 20bhp over stock for both 1108cc

and 1289cc engines.
(2) The "Reef" refers to the area in and around Johannesburg and originally relates to geological formation in which gold was discovered, and which led to the development of the area. This area is approximately 6000 feet above sea level which results in roughly a 17% decrease in performance compared to sea-level for normally aspirated engines .
(3) Various camshafts for Renault wedge and cross-flow engines were available from Alconi and others. They were predominantly Iskanderian profiles for sport as well as competition use. The "701" was a sport/semi-race cam with a 4000 - 7500 rpm range, while the RA-5 was a race cam working from 5500- 8500 rpm
(4) The Kyalami race track is situated close to Johannesburg and hence the comments in (2) above apply

Carvel Webb

carvelw@absamail.co.za