

Cylinder Head.txt

John E. Smith

Joined: 11 Jun 2004
Posts: 9

Posted: Tue Jun 15, 2004 5:10 pm Post subject: Re. my 1949 cylinder head

Re. my 1949 cylinder head

I posted the question as to how best remove the "stuck" cylinder head on my "Flying Squirrel" on 16-4-04 and was overwhelmed with helpful hints from many people.

For the record, the head is now off, after almost 2 months of trying WD40, parafin, diesel oil, plus gas, heating and chilling-all to no effect.

I then welded the old head nuts onto the studs and leaned on them with a long ring spanner. This attack resulted in 7 studs giving up and unscrewing with no further problems. The remaining 9 studs all broke off flush with the head face. (I presume this may have been at the heat-affected zone following my welding efforts). In between times I would periodically try very carefully tapping the head to check for movement. For this I used a wooden drift up the bore. Nothing doing.

Figuring the old copper/asbestos gasket could well be stuck solid, I then attacked it with a hacksaw blade (having first ground the "set" off the teeth and grinding a sharp hook shape). This was very successful, and I managed to remove almost all the centre out of the gasket. So it was by this time obvious the only trouble was with the remaining studs.

Now things start to get serious!

I carefully drilled the end of each stud using a centre drill in my bench drill, followed by a ¼" drill, then 11/32" drill. The aim being to drill to about ¼" above the head joint face level so I had something to get hold of when removing the piece of stud.

This was not a great success. Although I was using new, high speed drills, it was hard going. The studs appear to be in pretty good steel.

I got to about 25mm deep when it became clear the drill was starting to drift off and I was about to damage the head. So I gave up, admitted defeat and took the lump to a local precision engineering company.

They followed my line of attack, but did it with end-milling cutters in a vertical mill with everything clamped tight. BINGO!!! They left about 3mm of stud proud of the joint face, but STILL the head stuck fast!

A few deft blows up the bores to the combustion chamber dome finally had the bloody thing apart!

They then drilled out the studs and we had a beer!

It is clear the studs were holding in the head because their ends were in the water jacket thus allowing them to "grow". There had obviously been some leakage up the studs to explain the fantastic grip between them and the aluminium cylinder head.

Needless to say, assembly will be using lots of "copperslip"!!!!!!

I wouldn't wish this on anyone! But the as Ela Heck, one of the respondents to my plea said, "It's a character building problem". I second that! Thanks Ela, and all the other members who offered their assistance. It is much appreciated.

John E. Smith

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Roger Hulett

Joined: 31 May 2004
Posts: 78

Location: South West France

Posted: Tue Jun 15, 2004 9:56 pm Post subject:

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I am pleased that you finally got the head off. I had the same problem but with less satisfactory results, I damaged the head a little bit and had to have it ground down a fraction, this means I will have a slightly higher compression ratio than normal. It will be interesting to see what happens when I finally fire the thing up !!!!!
Roger Hulett

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Roger Moss

Joined: 31 May 2004

Posts: 242

Location: Leicester UK

Posted: Mon Jul 05, 2004 10:59 am Post subject: Well Done John

Hi John

I had the same problem years ago.

Possibly it was this experience that distorted my character!

Just a note to say that if anyone is in dire trouble and does not have access to a local machine shop I have all the machinery to get the studs out

I am not looking to make a career out of this job but will always try to go the extra mile to help a fellow owner in difficulties.

Kind Regards

Roger Moss

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Douglas Kephart

Joined: 06 Jun 2004

Posts: 11

Location: Pennsylvania, USA

Posted: Tue Jul 06, 2004 3:54 am Post subject:

[quote]I presume this may have been at the heat- affected zone following my welding efforts.[/quote]

John,

No, it just broke at the weakest point. Below the studs were firmly gripped by the head. Above it was reinforced by the nut. So the weakest point was between, and it broke through the core of the thread. Unlikely the original studs had any special heat treatment, or enough carbon or alloying elements to effect any. So heating them up and cooling them probably had little effect on strength.

I also noted quite a lot of white powder packed in between the studs and head on my Brum, though no clear evidence of leaking. Some of those were gripped fast.

So you had access to a welder but did not try resistance heating the stud to break the grip (heating the top/nut is not enough), pity. Brutal as it sound I think you would have found it simpler and safer than hacksaw blades and drilling out. Perhaps next time you go to remove the cylinder head! :D

Douglas Kephart

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