

Pipe Bending.txt

Roger Hulett

Joined: 31 May 2004

Posts: 78

Location: South West France

Posted: Fri Jan 06, 2006 6:35 pm Post subject: The Bends

Now that I am an "expert" at paint spraying, thanks to the information and advice from Roger Moss, Ian Parsons et al, I have now decided to become an "expert" at bending copper pipe for oil and petrol supply. My first attempt was quite good but I couldn't understand why the oil and petrol was not getting through the flat bits on the pipes !!!

OK guys, how do you bend small bore, small length copper pipe without creating flats ??

Roger Hulett

Judging by the number of views on the paint spraying query it would appear that our members are very appreciative of technical advice. On behalf of all those who have benefited from these advisees, very many thanks.

RH

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Lewis onions

Joined: 02 Jun 2004

Posts: 37

Location: Coleshill, west Midlands

Posted: Fri Jan 06, 2006 7:13 pm Post subject:

Machinemart sell a mini pipe bender for this at a price of around £9.00 if I remember correctly. I am at the pipe bending stage of my restoration at present and so far although I have not created any flats using the tool. The only problem I am finding is in creating tight enough bends for some applications.

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Stan Thomas

Joined: 01 Jun 2004

Posts: 78

Location: Stafford

Posted: Sat Jan 07, 2006 1:05 pm Post subject:

Hi Roger.

Copper "work hardens" if it is bent - so having cut the pipe to length, heat it to cherry red and immediately quench in cold water. The pipe will then be very soft (or ductile as R.M. would say!!!!).

If you need a tight bend, keep heating and quenching, although I've never found a copper petrol/oil pipe which will not form in one go. Use your thumbs and fingers, as any tool will mark the soft outer surface and set up a "kink-point" which will cause a flat.

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Stan Thomas.

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efr215

Joined: 06 Nov 2004
Posts: 80

Posted: Sat Jan 07, 2006 5:25 pm Post subject:

Copper whilst easily worked is not as ideal material in some other ways, it seems it can act as a catalyst and promote the formation of gummy deposits, not to be welcomed! Copper is also prone to fatigue failure due to vibration. Although the risk is pretty low, I have only seen two examples 40 years, it is worth noting.

One alternate choice would be flexible armoured tube available these days with stainless braid which looks neat and tidy.

Another possibility is thin wall stainless steel tube which is readily available and while a little less easy to work than copper it is also less prone to kinking. Again, cosmetically it will remain bright and clean. Nipples, etc would best be silver soldered, there are special solders and fluxes for stainless steel but "EasyFlo" has always worked for me.

With regard to making tight bends there is an alloy called "Cerrobend" made by Fry's and sold in the form of ingots. The formulation is a trade secret but is probably an alloy of tin, bismuth, lead and antimony. It melts at a very low temperature and has an almost zero shrinkage, I suspect it may even expand slightly as it solidifies. The tube to be bent is filled with the alloy which forms a sufficiently strong core to prevent collapsed walls but still allow bending. It is easily melted out when the bend is finished. It has the added advantage that it will not adhere to the inner wall of the tube making cleaning the bore a breeze. When a very tight bend is required work hardening of the copper becomes an issue. If this is the case make an initial bend at a larger radius, melt out the Cerrobend, re-anneal the copper, refill and finish the bend.

As stated in an earlier post small tube benders are cheaply available and very useful but to be effective the formers need to be an exact match for the O.D. of the tube if deformation is to be avoided for as long as possible. They also restrict the radii that may be made. A special bender is easily and cheaply made if you have access to a drilling machine and a lathe when any desired bending radius can be chosen.

Another interesting source for all sorts of neat copper fittings, bends, "Tees", "Y's" all sorts and sizes, (solder type), including 180 degree return bends, is the refrigeration industry. Be warned though they have their own thread system for compression fittings and as is to be expected it is incompatible with BSP.

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Roger Hulett

Joined: 31 May 2004
Posts: 78

Location: South West France

Posted: Sat Jan 07, 2006 7:27 pm Post subject:

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What is the correct measurement (od) for oil and petrol pipes ???
What I have now is a mixture of rubber,clear plastic,braided and flattened
copper pipes. Since I am replacing the lot I might as well go for the correct
sizes.

Roger Hulett

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efr215

Joined: 06 Nov 2004

Posts: 80

Posted: Sun Jan 08, 2006 2:30 pm Post subject:

I have a rather grubby copy of a Kenyon's 1956 Fuel Lines List of component
parts. The most popular sizes seems to have been 1/4" & 3/16" bore.

Even the most greedy Scott has got to do better than 30mpg flat out, (petrol
that is although not necessarily oil!), it has to, hasn't it?

My addled brain reckons that is >200cc's/min, a volume that 1/4" pipe will
handle easily. There are a lot of things that will conspire to slow that number
down though, the head of fuel, bends, corners, fittings, vibration, just about
everything in fact but that's life 'aint it?!!!!.

If you can supply an email address I will try to send you a scanned copy if
it'll help.