Removing Cylinder Liners

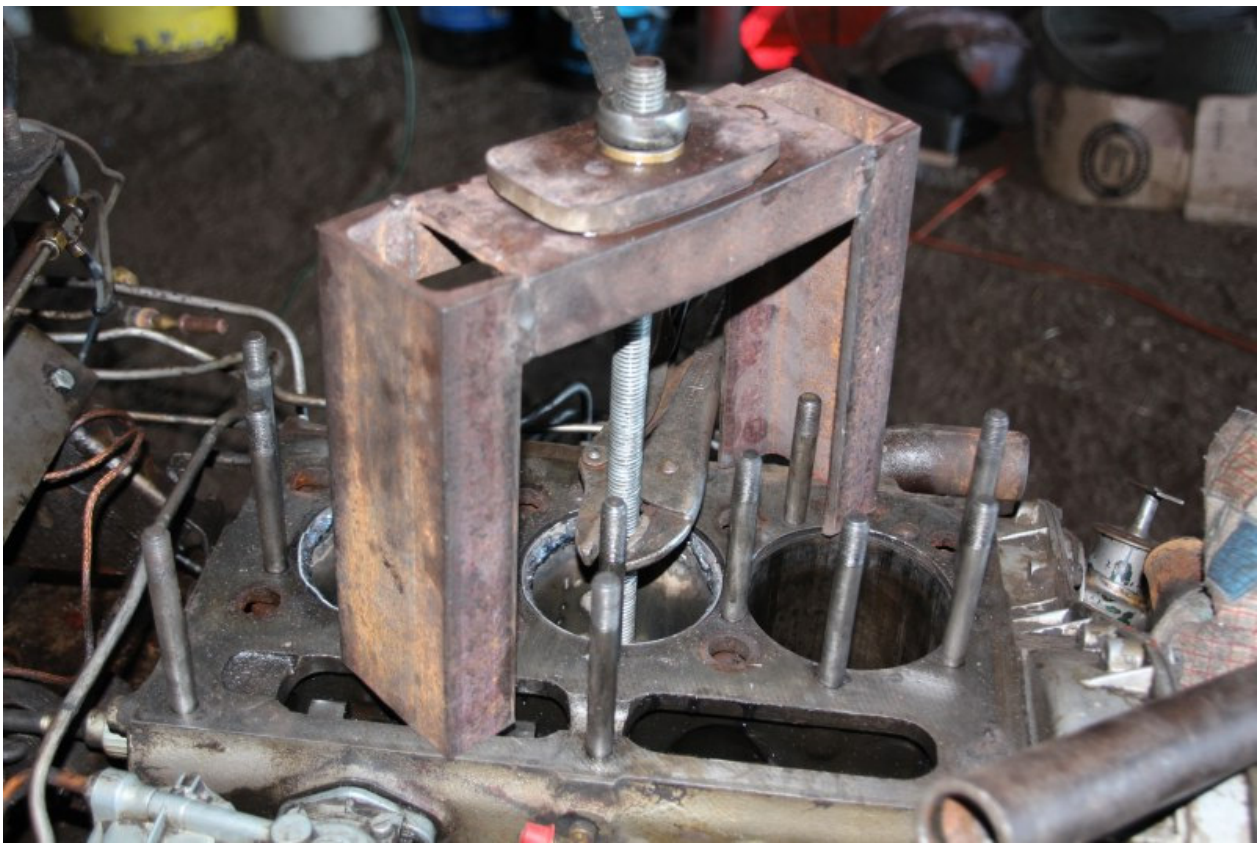
Mark McMillan

Mark McMillan, Master Mechanic and owner of Meadow Springs Guest Ranch （Meadow Springs.com） prepared this photographic record and describing of the removal of the cylinder liners while rebuilding the Perkins diesel engine on my Massey Ferguson 135.

Welding a bead around the inside of the liner can shrink the liner to make it easier to pull. Extreme caution must be used however as the liner are very thin and you must not burn through.

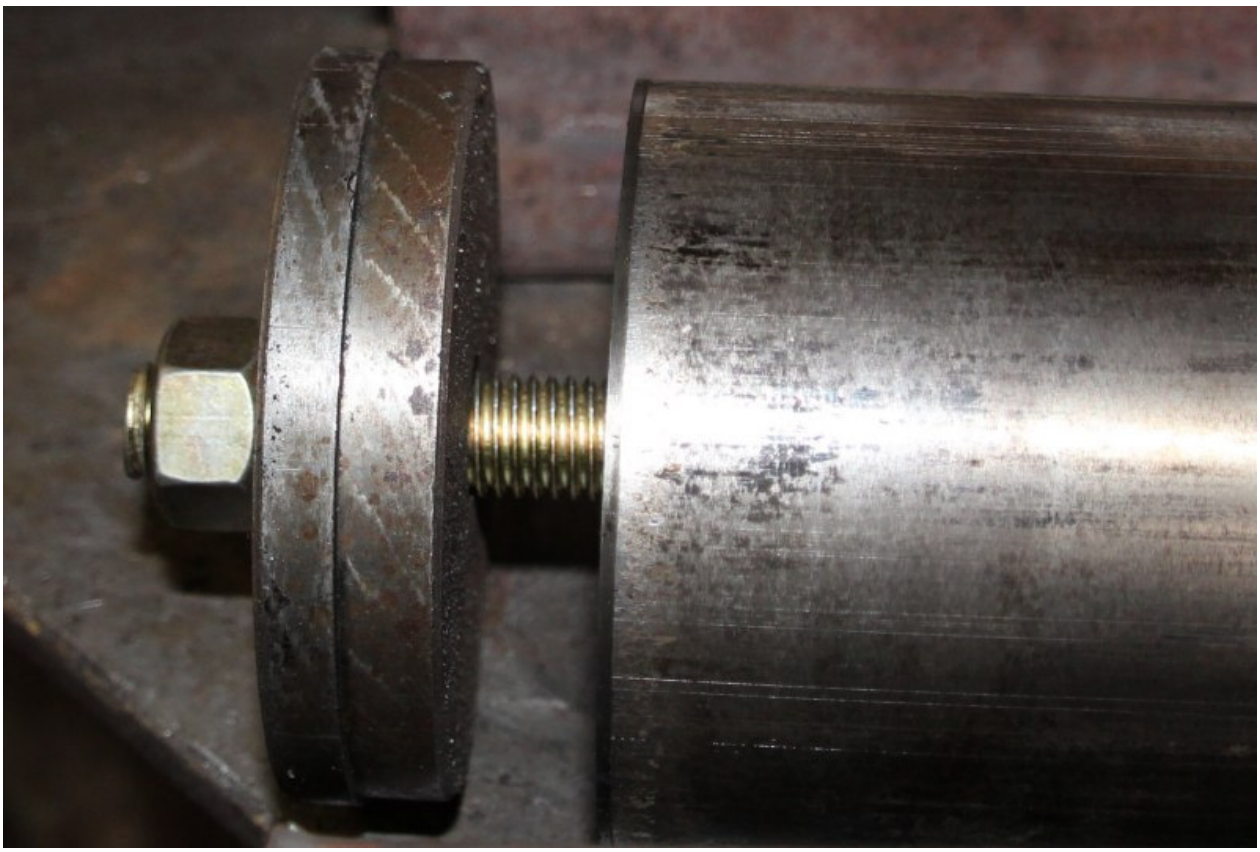
Disclaimer: This pictorial describes the removal of cylinder liners on one tractor only and no claim is made as to the suitability of the use of this equipment or these techniques in any other situations.

Pulling Frame



Even after the welding the liners can be very hard to pull. A minimum of 5/8 reddi rod should be used with a well built pulling frame. It must be positioned on the block carefully so the pulling point is centered and so that it won't slip off. It may be necessary, after putting pressure on the puller, to tap the bottom of the puller with a hammer and long punch from underneath (careful - don't hit the crank shaft in doing this inframe).

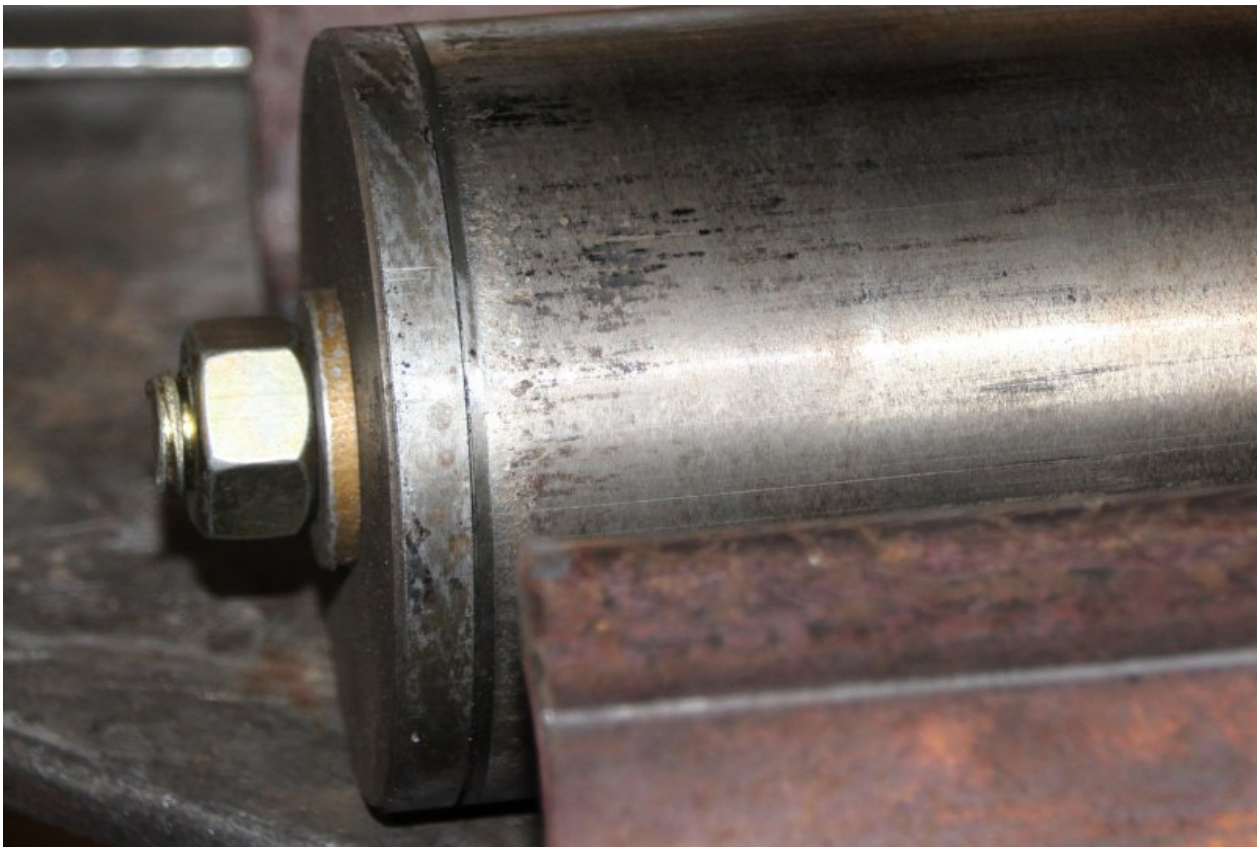
Puller—Bottom Plate



The puller must use an exact sized bottom plate. It must be stepped so that the top of the plate fits inside the liner with no play. The lower section must be slightly smaller then the OD of the liner. The step must be machined precisely to give an even pull.

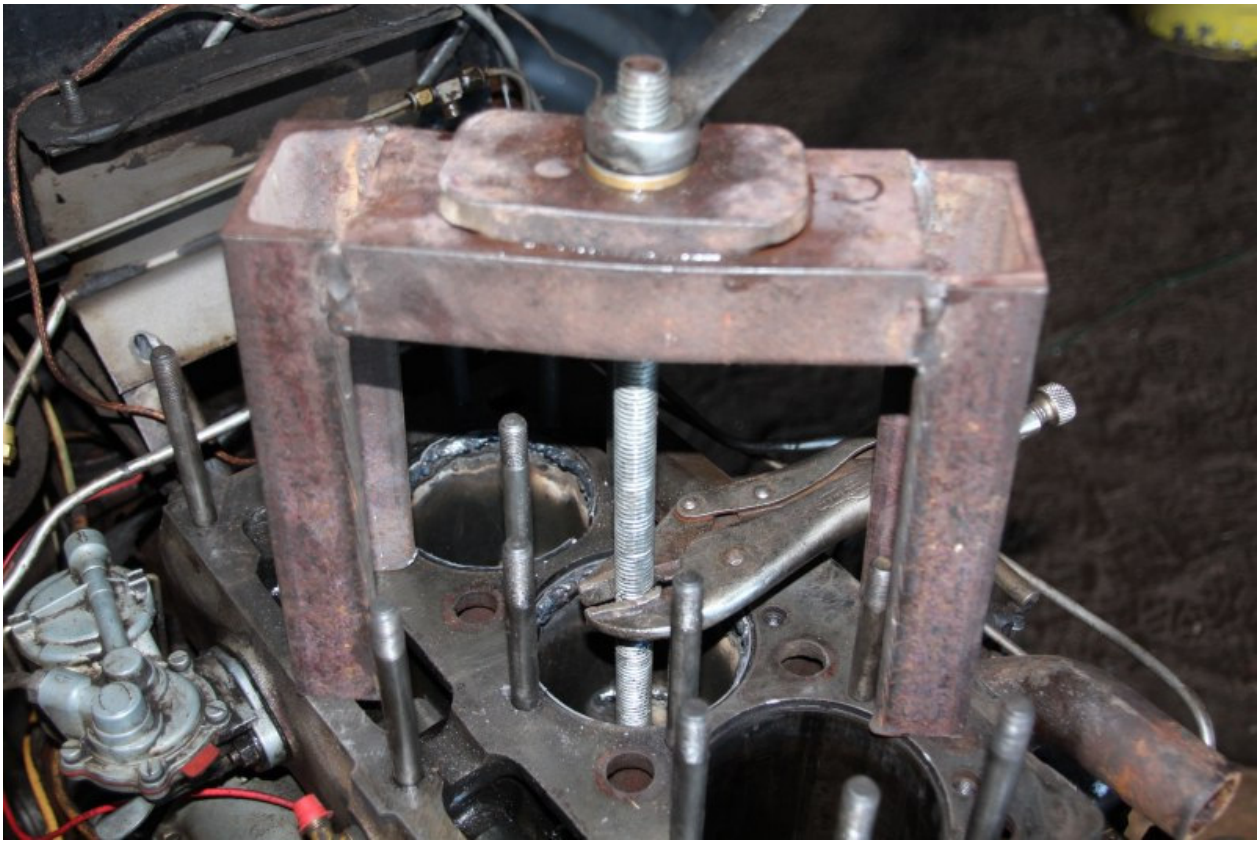
Puller—Bottom Plate

Fitted in Liner



The bottom plate must be fitted squarely into the liner bottom before pressure is applied.

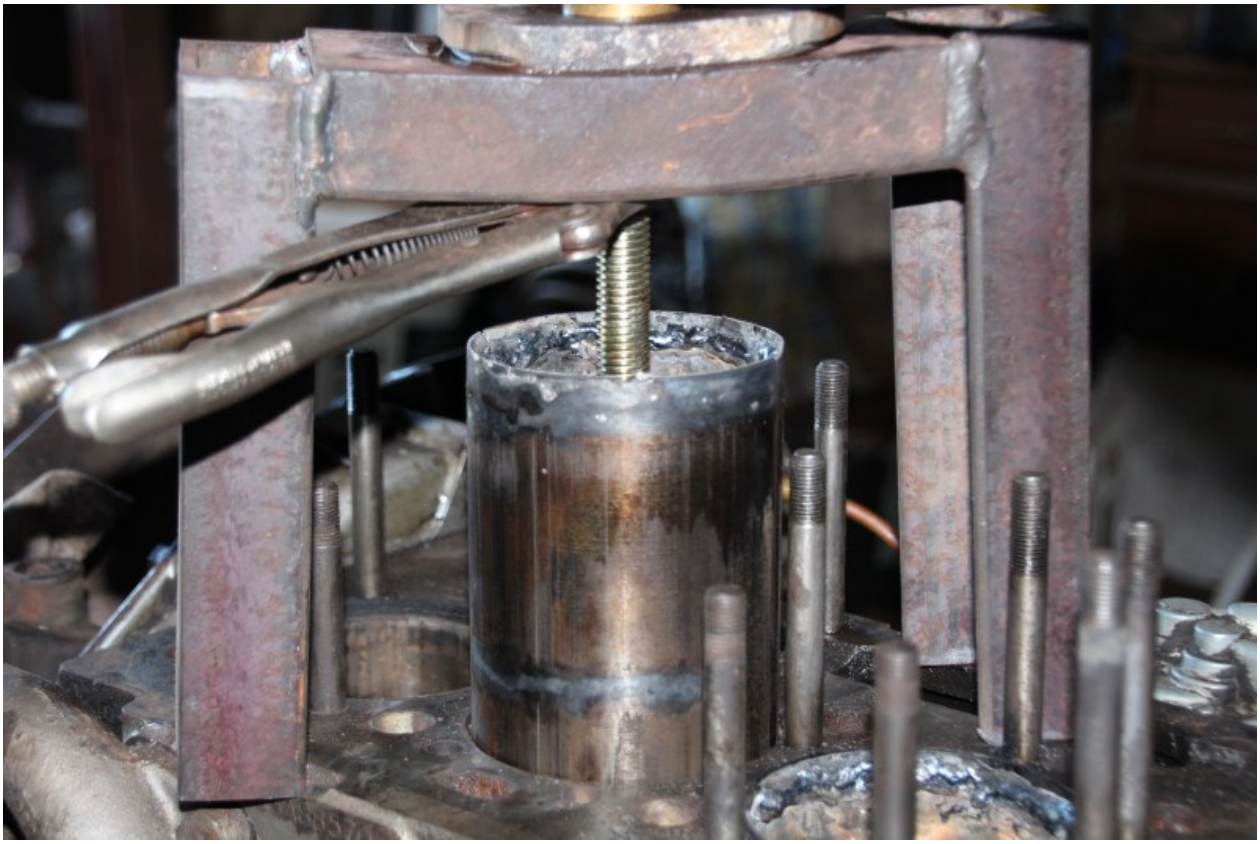
Pulling Liner



Vice grips should be placed on the reddi rod to stop it from turning. It could spin and not pull or it could spin and screw down into the crank shaft (if doing the rebuild in frame).

Pulling Liner

Nearly Out



Here the liner is about half way out - watch for the vice grips and or liner top to contact the puller frame.

Pulling Liner

Last Step

When the liner contacts the puller frame it should be broken off (they break very easily with a tap of a hammer) so that you can continue pulling. A tall pulling frame could be used but the taller it is the stronger it has to be and the longer the reddi rod. I found that a shorter puller and two pulling stages works best.

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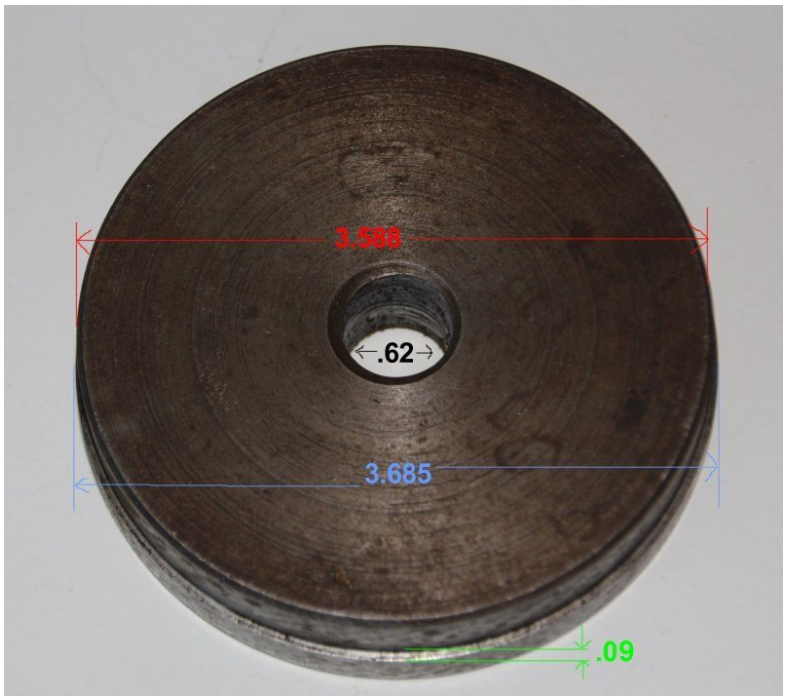
Bottom Puller Specifications



The following measurements are what we used but should be confirmed - the best was to make a puller bottom, or have it made at a machine shop, is by using the actual of the new liners for measurements. The most important measurement is the outside OD - it must be as close as possible to the block bore size - it should be a tight fit.

The service manual says:
liners are .0425 thick
block bore = between 3.6875 and 3.6885

our puller say is:
outside OD = 3.685
inside OD = 3.588