TEE-ONE TOPICS

Issue 94 – January, 2012

APOLOGIES

Some readers will be aware that I am not (at the time of writing) dead! A little over a year ago our principal source of income used for luxuries such as eating, accommodation, health etc was seriously threatened. The solution was to cease most other activities, address our problems and overcome them. The end result was most favorable, the only embarrassment being the realization that we should have foreseen and corrected the problem long ago! There were a few casualties, my own car quickly lost its concours status. The lawns moved into crop form and had to be registered with the Wheat Board and the swimming pool is now leased to the Oberammergau organizers for the next passion play, as a prop for the water-walking if you follow my drift!

But the watching brief on the surviving cars we are committed to, continues and lots of photos were taken which I hope to share with you in due course.

Let's get on!

CHECKING ONE OF YOUR LIFEBUOYS

As my few readers may guess I tend to snap away with my camera whenever I am working on one of our cars and afterwards turn up pictures that quite confound me. I know what the first picture is and you should. Towards the end of the eighty's the coolant level device moved from being integral with the coolant bottle to one that was inserted and screwed down to contain the normal pressure generated by a hot engine.

The object hanging over the mudguard is a reed switch from the coolant bottle of an '89 Turbo R. The black float at the bottom closes the switch when it drops to this position. When the bottle is filled the float rises and the switch opens and the warning light on the dash is extinguished. With the screwed-in switch there is a very simple method of checking its operation, illustrated. With the ignition on and someone to observe the warning light you can move the float up and down and check the result.

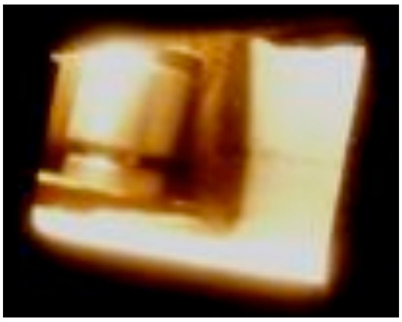
The need to ensure that there is no shortage of coolant is probably more important than making sure your wheels are bolted on. A wheel off may result in a bit of repairable damage to the body but a loss of coolant if not detected quickly will destroy the engine!

ACCESSABILITY

I have now recovered from the shock of driving a Turbo R Bentley and discovering that one end of the steering rack was swinging in the breeze. The assembly is held onto the sub-frame seen to the left of the exhaust downpipe with the aid of four special bolts. These pass downward through the mounting bracket seen immediately above the steering rack above and into the body of the rack. The threads were damaged in the casting but recoverable with new helicoils.

On the 'dangling' side one bolt was lost and the other was jammed in the support bracket. To repair the damage threads, the whole rack had to be removed and amazingly the two bolts of the other side were literally finger tight. Apparently the rack had been removed for whatever reason at some time but in replacing it, tightening the bolts proved well nigh impossible.

This is the tool one needs to remove or install the racks since the four bolts pass through mounting plates on the subframe from top to bottom. To get at the bolt heads requires the services of ET but even then he could not tighten them. The 'question mark' shape of the socket extension in the picture allows access to the bolt heads from below. The tool can be fairly easily made up from a very long straight socket extension, bent with the aid of a good heat source. There are two shapes to cope with different bolt locations. The dimensions should you need them can be supplied if you ask.



Lest you think I am exaggerating, at left is the best view I could get with my somewhat primitive camera facilities, of one of the rack mounting bolts being 'accessed' by the special spanner. The view is through an aperture in the car subframe.

And below is a worm's eye-view of the dangling rack. The blotchy bulb is the mounting extension on the assembly and the hole to its right is one of two, through which the mounting bolts depend.

And talking of bolts here are the items used on the 1989 plus cars to hold the racks on. So I guess the Factory were not unaware of the problem of racks coming lose on their cars. The bolt and washer is a machinist's delight I imagine, as they are inseparable. The underside of the bolt head is convex to match the concave recess in the washer. This presumably is to give the maximum frictional contact area to stop the thing unscrewing!

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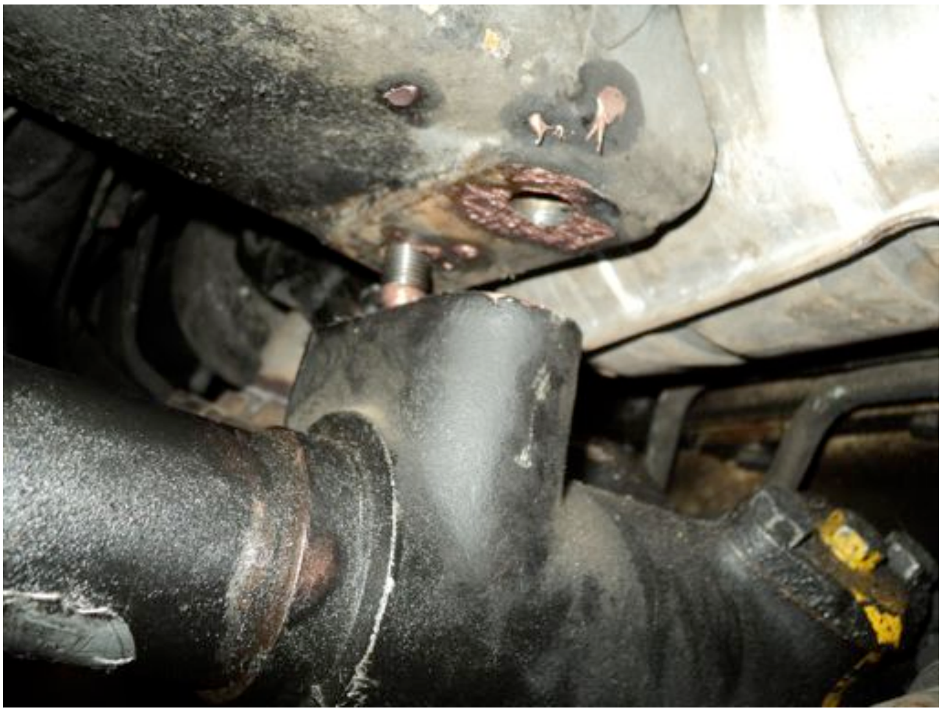

Here is another view of the dangling rack.

At the time of writing, stocks of new racks were exhausted. There are probably enough wrecks with racks to repair where necessary. In that context be aware that in the late eighties the design was improved with a more robust pinion. It is probably a good move to restore one of these rather than the earlier version.

Here is the later universal joint connecting the steering column to the rack requiring a 45° change in direction. The designers may have foreseen the possibility of shedding the steering rack in providing a scalloped spigot splined shaft into the rack to house the clamping block. In this case the bolt and the scallop prevented the complete detachment of the steering rack.

We take these universally jointed steering shafts for granted these days. Have a close look at the immediate post-war cars with their long steering columns from the box to the steering wheel. A really good biff at the bottom end could well see the driver kebabbed, so to speak.

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MADAM – ROLLS-ROYCES DON'T BREAK AXLES!

For some fifty years the Factory did not disabuse cartoonists, commentators and columnists from spreading stories such as the 'Lady in Spain'. For those readers who came in late the story set in Phantom days in the thirties describes a lady in Spain whose car snapped an axle. Folk lore would have it that she was quite resigned to the event and was pleased to witness Factory men responding to her cry for help, sent no doubt by telegraph. They in turn replaced the errant item and she completed her journey. Some time later she realized that she had not received an account for the repair and telegraphed again querying the account. The reply was as above; that she must be mistaken since RR's don't break axles!!!

Breaking axles in the immediate post-war market was not uncommon. The development of steel was still progressing but the war generated a lot of scrap, which was fed back into the furnaces to get production for the new world order in place. In our post-war models the early 'S' series cars started life with slightly smaller section axles where it mattered and there were a few breakages. Fortunately with all our cars, when an axle breaks, the only

effect you have is to lose all drive, not personally, just the car!!! Lesser chariots at the time when they snapped their axle and the wheel hub and part of the axle wound its way out of the axle housing thereby cancelling any braking and undoubtedly spoiling some perfectly good upholstery! If your car was fitted with complete rear wheel spats, these would at least stop too much migration of the wheel.

The introduction of the SY cars in 1966 was an enormous step for the Factory, the chassis' including disc brakes and independent rear suspension. The latter was good news for the axle department since the designer was able to build a unit on which to bolt the rear wheel that included the brake rotor the wheel hub and bearings and a flange to drive the whole assembly.

The bits of importance are pictured here, the axle now a shadow (no pun) of its former self and resting against it the flange to connect to the driving bits so the car will move.

As usual there has to be an Achilles Heel somewhere in the setup and it is the means of anchoring the drive flange, which by now you will have recognized as the bit the drive shafts from the differential bolt onto at the wheel end. The flange and the end of the axle shaft are tapered and to stop one rotating in the other they are locked by a Woodruff Key illustrated at left. These little wedges are incredibly strong instanced here by taking the torsion of a three hundred horsepower engine doing burnouts in front of the local police station!

The accompanying pictures show an increasingly common problem in post 55 cars through age and general wear; that is the woodruff key shearing. The driver in this case was simply moving the car into his garage and there was a loud bang. The car did the usual impression of 'failing to move' and the cause is shown in the photographs. Fortunately there are a few wrecks around the traps and a used replacement was soon found.

If the god of most things mechanical is kind to you, one of the bearings that the axle shaft runs in will start to eat itself and the accompanying whine and grind will force you to hoist the old girl's rear and remove the whole assembly for bearing renewal and very importantly examination of the Woodruff Key which will as likely show signs of fretting where it has flexed in the keyway in the shaft.

Key renewal and tightening the axle nut to the correct torque should produce a fitting that will outlast you and maybe the car!

For overhauling the axle unit refer to Tee One Topics Issue 63 Page 896.

Removing the yoke from the axle after 30 years of use is the only real task for the repairer. One of my mentors kindly sent me a tool made up, as a gift, (most of my friends send chocolates) which enables you to make the disconnection in an average workshop. The tool, pictured at right requires four high tensile studs and nuts, an appropriately drilled very thick steel plate and an arbor to push on the stub of the axle. Having evenly tightened up the nuts to cringing level and secured the whole assembly in a large vice with the lower end sitting on a substantial base, give the plate a bash to remember and if the gods are with you the yoke will be freed. Note that the retaining nut is screwed up to the end of the thread leaving a gap underneath it for the yoke to move. This also spreads the load of the press (or thump if your like) across the end of the shaft and the surface of the very large nut avoiding as far as possible distorting the 'starting' threads on the shaft. If things get difficult, warm the yoke up to about 'Owww plus a bit' level and bash again. If that doesn't work throw the lot in the deep freeze then repeat the 'Owww' process. If that doesn't work – use your initiative!

LIGHT HEARTED REMARKS

It must be over 40 years ago when in the depths of penury I spent my last dollar buying a partly dismantled Silver Dawn to satisfying a craving to investigate the inner secrets of construction of the legendry Rolls-Royce. Fortunately I had managed to acquire an original workshop manual and parts manual and even a service bulletin set. Unwittingly I had set the ethos for Wiki Leaks to emerge nearly half a century later. That I had this information, was viewed by a few 'practitioners' in the maintenance of these cars as dangerous to their livelihood. Then I met the late Bruce Ross, one of these same people who however was kindness itself, extremely experienced and more than prepared to help this floundering fool! Successive Service Managers of the various agents for the Marque have all been a great help without exception and the old Company itself was always there to help. Today a few renegade repairers do talk to me and offer advice and there are some very knowledgable owners who are also prepared to share their knowledge.

Then there is the Forum. Run by a Club member, one of a family that seem to be part of the fabric of our enthusiasm. The Forum is not 'owned' by the Club nor is it run on Club web equipment. This ensures that any participants that want to play havoc with the setup or content can be speedily dealt with. The content is monitored by yet another Club member. His task is to try and avoid extraneous chat evolving into a parallel version of Facebook as well as fending off the inevitable hackerites!

Lastly, there are the contributors who literally come from the four corners of the planet including the nations accommodating other very large Rolls-Royce owner communities and a number of people whose livelihood apparently relies on keeping our cars on the road.

In total with these resources and I include our Technical Library, we must have one of the best support groups for the Marque on the planet.

TELESCOPIC AERIALS

A small detail but often overlooked. These things have to survive weather and passing vandals and it does not take much to stop them extending to their full length. Try some WD40 and steel wool, fully extend then clean the frum off.

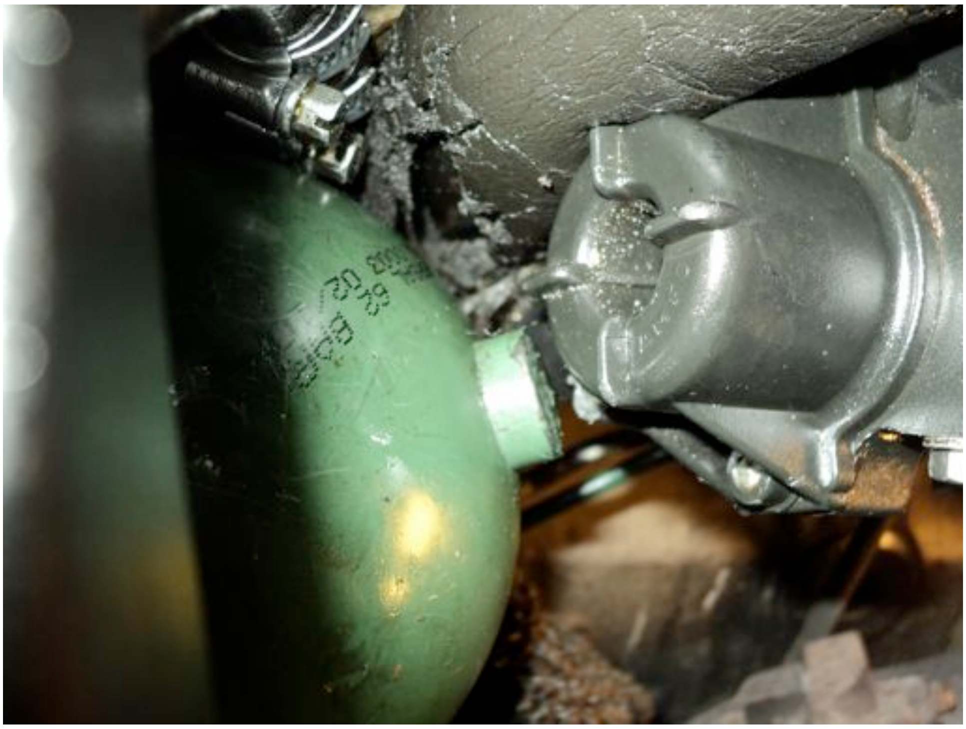
SERVICING THE MORE INACCESSABLE ACCUMULATORS.

I am very much old enough to recall the wonderful roomy compartments, pre and immediate postwar cars enjoyed for their engines. Eventually people started to get over the vicissitudes of war and rationing of fuel, found an income and demanded 'better 'cars. The thrill of speed and power were the required ingrediants. Engines expanded, roads repaired and the industry took off. A little later, particularly on the West Coast of the United States inhabitants realized they liked to breath relatively clean air thus starting the dreaded anti-pollution movement. The net result of these factors has produced cars today that defy sectional repairs. Several makes actually require the removal of the engine to change the spark plugs!

Co-incidentally, Richard Treacy had occasion to replace some accumulators in his Turbo Bentley and at the same time one of these cars arrived in my garage needing the same treatment. So having done the job Richard wrote the following. At the same time I picked his brains, did the job but as always took photos. The following article therefore is Richard's which is already in the Technical Library but as not all my readers access that place I include it here with my photos!

Difficulties with the Low Pressure Return Hoses

Difficulties often arise particularly on SZ Vehicles with their accumulators located at the rear of the B-Bank Crankcase. This applies to all Turbocharged vehicles and to all vehicles from Chassis 30,000 onwards.



To the uninitiated this is the juxtaposition of the two accumulators besides the 'B; bank, Note the 'plastic ' housing of the regulator behind which is the second accumulator

On removing an accumulator assembly from the vehicle, two common difficulties arise using the normal procedure.

1) The hose may be very difficult to slide from the return adaptor on the accumulator valve body. The adaptor is of a composite material and may be damaged or broken through excessive force when removing the hose. In this case, it is wise to cut the hose free from the accumulator assembly and to remove the remaining piece of hose on a bench.

2) Once removed, and after a few such operations over time, the hose end becomes damaged or weakened, therefore difficult to seal upon refitting

The original hose is of the exact length required, and fitting the hose to the accumulator is difficult in the confined space. Furthermore, if the hose has been shortened by cutting it free from the accumulator assembly, it will not be possible to refit the accumulator without replacing or extending the hose. The original hose is only about 30cm long, and clamps to a tube beneath the firewall. Replacing the hose without removing the engine is very difficult.

Another view, the return hoses can be seen clearly. The thick hose to the left is one of the power steering lines.

Action for Each Accumulator Assembly – fit a hose extension

1) Obtain a 40cm length of reinforced hose suitable for use with HSMO - LHM – Mineral Oil Hydraulic Fluid. A compatible hose is a reinforced Automatic Transmission Cooler hose. The internal hose diameter is 3/8". Also source a two-way inline hose connector.

Suitable hose is 3/8" H514 automatic transmission cooler hose. This is a high-temperature hydraulic mineral oil hose rated at 60 bar and exceeds the requirements in every respect. H514 hose is available at Autopro, Supercheap or ENZED, as are suitable connectors. Autopro part number 06007-06 is the ideal connector. Quality generic hose clips are suitable. Obtain at least four hose clips for each accumulator.

2) Shorten the existing hose on the vehicle until the weakened or used section is removed.

3) Insert a two-way 3/8" brass hose connector, and connect the new hose length. Clamp with a pair of Jubilee or similar hose clips.

When Richard pointed out that replacement of the return hoses would require removal of the engine he was not exaggerating. This is a view of the mess of mechanicals one of the hoses (seen in the middle tucked to one side) has to negotiate to get back to the reservoir.

4) Place two more hose clips over the lower end of the hose. One is for immediate use and the other a spare in case any hose clip fails at any time.

5) With the hose hanging down beneath the chassis, it may readily and safely be fitted over the accumulator return adaptor and clamped with one of the remaining hose clips. Secure the remaining hose clip against moving or rattling.

Here is the forward regulator hanging on its extended return hose

6) Rotate the accumulator assembly and raise it to its final position, ensuring that the hose extension forms a smooth loop with no kinks. Typically, the loop will rest neatly between the two accumulator pressure tubes once secured. Secure the accumulator loosely on its mounting bracket.

A complete view of the regulator. Note the somewhat fragile hose connection on the left.

7) Reconnect the accumulator pressure tubes (using new rubber sealing sleeves on

early cars). Tighten the tubes, then tighten the accumulator assembly to its mounting bracket.

When removing the accumulator assembly for service at a later time, the assembly may safely be lowered beneath the chassis for the convenient removal of the hose from the accumulator. Should it at any time be necessary to cut the accumulator free from the hose, then there will likely still be adequate spare hose length after the hose has been so shortened.

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THE FORGOTTEN DIZZY

When I was a lad (here we go!) the distributor seemed to be the Achilles Heel of the average car. Filing points and setting their clearance was almost second nature to most owners regardless of the make of their steed! Components also were way below the quality that we expect today particularly the material of points and the reliability of condensers and coils. Indeed the Mk VI Bentley and early Silver Dawn were blessed with not one but two coils and two condensers, the second as a spare.

Nowadays the distributor and its supporting bits are so reliable we seldom open them particularly if they have been fitted with electronic ignition. There is simply nothing to maintain? **Wrong!!!** All our distributors have an advance mechanism.

The points ingeniously manage to break the ignition circuit thereby activating the coil to send a high voltage charge to a spark plug to fire the mixture compressed in the engine!

The timing of that spark is crucial to the performance of the engine moreover, the faster the engine revs the earlier the spark has to fire to give the fuel time to explode! Pre-war this

advancing the timing of the spark was done by a control on the steering column but some ingenious bloke (I am sure it wasn't a woman 🎖) found a way of advancing the spark automatically.

Here is the naked distributor. At 9.00 o'clock are the points, the cam is on the shaft in the centre. The condenser which stops the points incinerating themselves with all that sparking, is located a little after midnight if you follow my clock reference!

This was done by separating the cam which opens and shuts the points from the main distributor shaft, connecting it by pegs to the latter via some centrifugal weights normally kept in their place by small springs. So the faster the distributor shaft spins the further out the weights will move pulling the pegs and turning the cam with its rotor on top around in advance of the driving shaft below. Ingenious???

Well if you are still with me, it is important that the sleeve of the cam can rotate freely on the drive shaft on which it sits. And here is the rub. It requires lubrication.

To lubricate this little setup involves opening the distributor, pulling the distributor rotor off and dropping some light oil down the middle of the exposed shaft! Do that at least every time the engine oil is changed and you should keep the ignition system very happy!

Here, that mess of bits has been removed to see the area of interest to us! Here you can just see the top of the drive shaft surrounded by the 'cam' shaft that has to swivel on it.

You can also see the springs that control the amount of 'advance' the weights can swivel the 'cam' shaft.

The picture at left is minus a large round headed screw that goes down the centre of the shaft to stop the 'cam' shaft being pulled out of the distributor. The picture above shows the centre of the cam filled with a plug of felt. This is to absorb the oil that you put down the shaft and keep muck out.

🎖 *Lest any of my lady readers take offence at my remark it should be noted that their sex is credited with the invention of the windscreen wiper!! Add to that are the diverse items of Xerox photocopying and mobile cement mixers!*

GETTING DE-TANKED

I had to use this heading out of deference to the local would-be water saver's industry in the Nation's Capital. Considering many of the local residents are currently applying for their gondola licences, I don't believe business will be that brisk for the industry. Their motto by the way, importuning residents is 'Get Tanked'.

About 1976 I think, the Shadow fuel tank moved from under the boot floor into the boot itself jammed between the wheel arches and the back of the rear squab. This was a nice idea even though we lost quite a bit of boot space. However in the event of a rear end whammy it is comforting to know that 108 litres of highly flammable fuel is not going to rain down on you while you are frantically trying to get out of the car.

Removing fuel tanks is about the last task restorers want to tackle and the tank fitted to Spirits and Spurs is an ideal deterrant. They are held in place with two metal straps and wedges of packing material to prevent squeaks. Removing them involves disconnecting the filler tube and the inlet and exit pipes of the re-circulating fuel system and breather and fuel gauge sender. Undo the straps and wrestle the beast out of the boot.

Here's the result of your labours. The rholes in the floor are for the supply and return pipes from the front end.

The reason the boot carpet is still in place is that it was fastened to the floor with an antique CD magazine which we were too lazy to detach.

The pipe seen wandering across the picture is part of the rear suspension system, one of the towers of which can be seen on the left hand side.

Here is the business side of the tank seldom seen by mortal eyes. Gone are the nicely styled copper pipes and unions with separate bolt on filters. But in fairness the above setup for the supply exit is perfectly satisfactory. The filter slips into the tank nicely sealed with a gasket and the pair are then held in place with the locking ring seen here which is a push-in and turn fitting.

While almost all readers might be curious about this tank removal, I collected these photos because from time to time we have enquiries about cleaning the in-tank filter. Although the manual is a little

vague about this procedure, the advice I have been given by my highly experienced professional is be prepared to be unsuccessful in getting a good seal for the filter assembly if you do the job with the tank in situe! From what I could see the hazard is having the filter and its aperture exactly central to the hole in the boot floor when the tank was installed.

SACRE BLEU!

There we were motoring through the Eastern Highlands of our State enjoying the unseasonal green of the pastures when on rounding an unremarkable corner the driver casually touched the brake pedal of this nice well preserved Spirit and we both decided that we were in the middle of an earthquake.

Rapid down changing of gears illustrated how long it takes to stop a two tonne car without using the brakes but eventually we rolled to a dead stop. Looking at each other didn't help, neither did expletive laden questions about what was that! A quick spot check that we hadn't lost a wheel or dropped a suspension arm (the story of the lady in Spain seemed rather unremarkable now) so we cautiously wended our way back to our garage. All went well as long as the brakes were not used.

Well, enough of the histrionics, we took the wheels off and were greeted by the above. One of the rear brake rotors had split in fact split, so far as can be seen, it had almost fractured the whole hub. The rotor was not worn beyond limits and there was no sign of external damage! Just one of those things I suppose!

Considering what we subject these bits to with our driving and modern traffic it is amazing that they last at all. Fortunately we don't have the problem of rust. Many years ago an English import managed to separate the rotor brake area from the hub because the connecting web had corroded completely. What is more common though is replacing brake pads without checking the thickness of the rotor. The Factory stamp the minimum acceptable thickness on the rim of all their stock and it is really foolhardy to exceed these dimensions!

POSTSCRIPT

Steering racks among other bits are really quite heavy. If you on your own and trying to align bolts with hold, tie the assembly in place with cable ties. They come in a variety of lengths and strength, are easily removed and adjustable.