

How to install a Pete Roper type windage plate in the V11 sump

Posted on the v11lemans.com forum by Greg Field on 26 September 2006.

Forum comments by Pete Roper are added at the end of the document.

Here are some words and pix on what's involved:

Preliminaries:

Drain the oil. I did it the night before so more of the oil would drip off the parts I would be playing with. If you will be changing oil and filter, remove the filter, too. I had just changed oil two weeks prior, so I'm reusing the oil and filter. Inspect the windage plate, and if necessary, debur it.

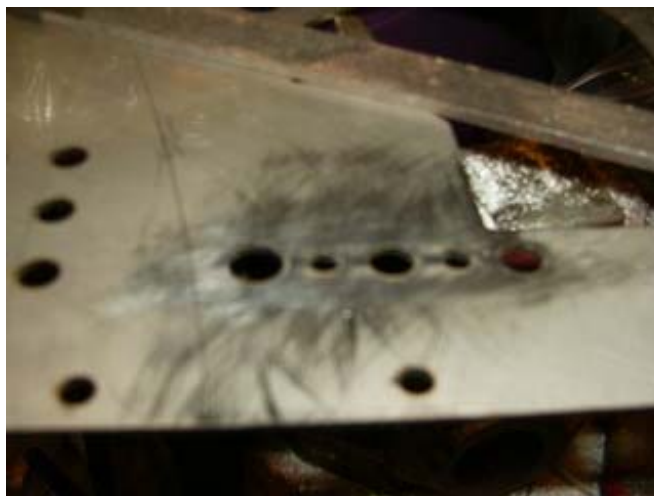
Pic 01:

Here's the plate. It's a very nice piece that's even inscribed with the name of Pete's company, so that when some archaeologist unearths your V11 ten thousand years from now, they'll read the inscription and surmise that the Aussies ruled the entire world in the year 2006.



Pic 02:

There were no real burrs on the one Pete sent me, but whatever cutting process used left a minor raised ring around the circumferences of some of the holes. The only holes on which this could possibly matter are the ones for the oil journals. I used a flat file to gnaw them down. This shows it about halfway through the gnawing. Clean the plate thoroughly afterward.



Pic 03:

Using a 19mm wrench, loosen and remove the three oil lines that enter the sump.

Remove the screw that fastens the side stand support to the upper sump, as shown in the fuzzy photo above. Loosen also the big bolt that holds the side stand mount to the crankcase. I have a crash bar, so I had to loosen the big silver nut shown, which fastens on the crash bar.



Pic 04:

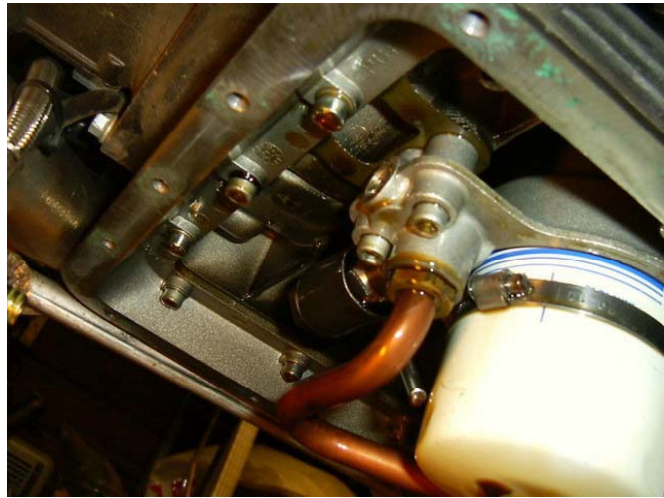
Remove the lower sump by removing the screws that fasten it. If you lack an air ratchet, or (like me) can't stand the racket made by air tools early in the morning, let me introduce you to my little friend, the perfect tool for this job: Mr. Torq-It. He's great for taking out and replacing all those sump screws.



Pic 05:

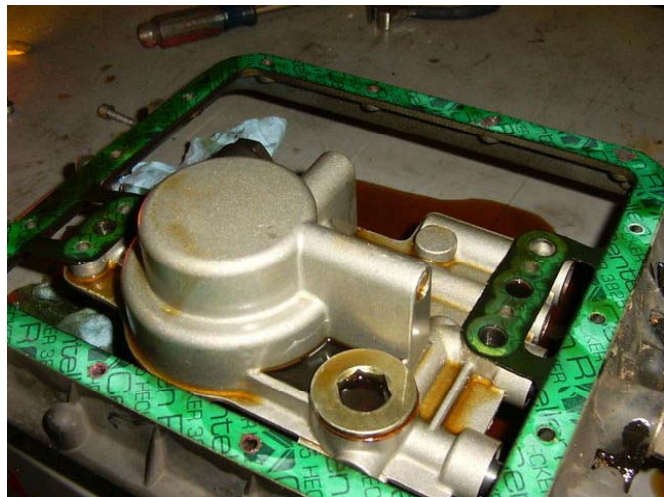
Loosen the upper sump by removing the screws around its inner perimeter. Some of them are shown below, as is another of my little friends: Mr. Hose clamp. This one is a best friend with Billy Bob's oil filter, but there's another Mr. Hose clamp out there that wants to be your oil filter's friend, too.

Loosen the four screws that hold fastens all the plumbing for the oil system (two are shown in the pic). Support the oil filter and the rest of the guts as you are removing the last screw, so it doesn't tear free of its threads under weight of the upper sump.



Pic 06:

Set the upper sump carefully on a bench, supporting it if necessary to keep it from tilting and spilling the oil out of you filter, as shown in the pic.



Pic 07:

If the old gasket is torn, replace it, and then top it with the windage plate and add another gasket on top, as shown in the pic.

Those lobes of the gasket that extend toward the centre are the most important part of the gasket and need to be in perfect shape because they seal the pressurized oil journals. Make sure they are in top shape. A leak from one of the journals will be internal, so you won't see it. A small leak won't be catastrophic, but a big leak will be.

I do not use gasket goo for these gaskets. If you insist on using gasket goo around these journals, use it very sparingly (so you do not plug a journal) or use an anaerobic sealer so it will not harden in the journal if it gets in there.

As the photo shows, the windage plate is a good fit and fills well all the space toward the back of the sump (right side of photo), so it should keep more oil near the pickup during drag-race starts.



Pic 08:

Time to install the upper sump and windage plate.

It is vital that the gaskets that surround the oil journals stay in place during installation. One good way to ensure this is to slide one bolt into place at both front and rear journal blocks before lifting the assembly into place, as shown above. Lift it into place and start threading the two screws until they can support the assembly. Then, insert the other two screws and thread them in partway. It is best not to fasten them until you have started threading in all the perimeter screws. Go ahead and thread in these perimeter screws loosely, then tighten the oil-journal screws, and lastly tighten the perimeter screws.

If the lower sump gasket is torn, replace it, and then lift the lower sump into place and tighten its perimeter screws.



Pic 09:

Hook up the three oil lines and tighten them. The two at the front are often routed so tightly that they rub together and onto the alternator cover. As you can see above, mine were abrading each other and the alternator cover. Take this opportunity to separate them before you tighten the fittings, so they do not wear through.



Pic 10:

By adding the windage plate, you've lowered the upper sump by about 2.5mm, between the thickness of the plate and extra gasket. Because of this, you may need to relieve the lower perimeter of the hole in the side stand mount. In my case, I had to remove about 0.5mm and did it with a Dremel and burr, as shown in the fuzzy photo above. Tighten both the screw into the sump and the bolt above it that fastens the side stand mount to the engine block.



Pic 11:

The thin, silver "Roper Line" betwixt engine block and upper sump is the only external cue that that plate's in there. Check your work once-over, add engine oil, and go for a ride.

I added oil to halfway between full and add, as checked by the Guzzi method, meaning with the bike level and dipstick screwed all the way in (this is about where it had been when I experienced oil starvation under acceleration before) and then rode it yesterday on a long ride two-up. Tonight I'll try some full-on launches while watching the oil-pressure gauge to see if the windage plate does its job.

Whatever the result, afterwards, I'm gonna add oil to the full mark as checked by the safer method of just inserting the dipstick to the top of the threads.

Thanks again, Pete!



Forum comments by Pete Roper:

The plate won't prevent the oil from surging backwards completely. The rectangular hole has to be there as the oil pressure relief valve sits proud of the top of the spacer where the plate fits. Also there has to be some space for the oil to return to the sump while the engine is running. Although most of the oil seems to end up in the front left hand corner, (Why I'm not sure, centrifugal/cyclonic forces would seem the obvious answer.) I felt that it was going to be necessary to have other *holes* as well in different parts of the plate, hence the larger than strictly necessary OPRV hole and the fact that the right hand edge of the hole through which the 'Filter Mount and Thermostat Munt' sticks is straight rather than being contoured to fit more closely around the fitting.

Remember, the oil starvation only seems to be a problem under really fierce acceleration in the lower gears. The plate doesn't have to completely prevent the rearward slop of the oil, it only has to slow it down and inhibit it enough to ensure that the pick-up isn't exposed.

As I mentioned in an earlier thread the IDEAL solution would be to dry-sump the motor but that would require a scavenge pump and a whole lot more weight and complexity. With the plate I'm not looking for a *perfect* or *Ideal* solution. What I'm hoping I've achieved is a simple solution to the pick-up exposure problem to prevent bearing damage.

As I also stated earlier IMHO the CORRECT level for the oil should be just below the plate, which corresponds to the bottom of the block. When the plate is installed it is worth marking the dipstick at that point. While by doing this you will be adding a bit more oil and therefore will slightly increase the crankcase pressurisation the plate will help prevent oil expulsion by reducing windage so it is unlikely that the breather system would be over-taxed by the extra oil volume. Since many people have already started running their 'Broad Sump' Engines over-full to combat the loss of pressure problems I can't see this over-pressure causing any sealing problems.

Pete