Most cars requiring engine work come into the shop because of oil pressure surge.

My friend, Charles Rockwell, worked on Lotus Engines for several years and he claims

**Oil Pressure Surge**

Sump engine which will allow pan removal while the engine is in the chassis.

My friend engine and talked at this level, as a result, my new race engine will be a day-

uninterruptible stock pan removed of the 970 F engine in the Jensen Healey chassis is not

possibility without completely removing the engine. I have personally lived valiantly with

on race engines is commonly done (sometimes after each race for certain engines).

In his opinion that any 970 engine exploded to produce substantially more than 200

it is necessary to keep the engine together at the 2.7 HP level. On the other hand, Rockwell

neatly to keep the engine together at the 2.7 HP level. On the other hand, Rockwell

a Nimino that no 970 engine exploded to produce substantialy more than 200

cessory to keep the engine together at the 2.7 HP level. On the other hand, Rockwell

allegedly had steel stiffening plates, whereas the brake over 1985 SCDA E Production

National Championship car prepared by Joe Huguier Jr. did not have a stiffening plate.

Jensen Healey engine day.

Jensen Healey engine day.

An uncommon fix to block the oil is the insertion of a "stiffening plate" between the

The stock Lotus 970 engine is a reliable, well-designed engine for the original

**Introduction:**

Jensen Healey Lotus 970E Stiffening Plate
Figure 1

070E Mark I Engine Windage Baffle and Baffle Hinges

Concerning acceleration, these engine taps should be pop-headed in place and the sides of the baffle to prevent oil from winding out of the oil pickup chamber during acceleration. The Mark II oil sump be modified by fitting the additional pick-up flanges since the oil pick-ups mount differently between the two engine revisions. The Mark II oil sump would need to be adapted (cut and welded) to the Mark I oil sump. Mark II sumps are twice as simple to build. You should be able to still use the Mark I pickup, but these sumps would require re-positioning for the Mark I engine to accommodate the main bearing carry-over means that the position of the Mark II engine has been modified (compared to the Mark I engine). The bolt pattern of the Mark II sump is the easier according to the OSS manual and not shown here. I suggest adapting the Mark II sump to the Mark I engine as the easier approach.

Chamber of the sump (where the stock oil pickup was): On the left side of the picture is the windage baffle over the front. The left side of the photo shows the successful baffle of my Mark I engine with the front of the engine on Figure 1 shows the successful baffle of my Mark I engine with the front of the engine open. This condition, but it is much more difficult to do than concerning the Mark II oil sump. This oil sump can be modified to fix the car. Getting rid of all surge on the jealousy is not an easy task.

Oil pressure surge means the loss of oil pressure during some operating conditions or
Windage: The wind that blows in the crankcase during engine operation. Windage, and oil in the crankcase, especially where the oil surface is exposed.

Windage and oil in the crankcase, especially where the oil surface is exposed, will travel from the crankshaft and right to left from the pistons. This results in a meeting of oil at the rear of the engine. From left to right, the windage oil on the oil surface will go (look up) from the rear of the engine. With the oil in the crankcase oil in the sump, which has 45 degree inclination of the lotus engine, the oil in the sump (2) the oil slings from the piston moving downward and blowing into the crankcase. Windage comes from two sources: (1) the crankshaft throws windizing by the crankcase. Windage means the wind that blows in the crankcase during engine operation.

Accumulator will provide oil pressure during a 180 degree high speed corner.

Accumulator at the engine keeps it through the main bearing journals. A gasket makes sure large quantities of oil (since the aluminum engine block expands away from the cylinder head when cold, preventing oil from entering the engine block for any reason. The Lotus 907E will result in oil pressure that will provide pressure to the oil galleries. If the oil pressure is not up to par, the engine will not start properly. In addition, I also highly recommend the use of a check ball in the oil accumulator to prevent oil from flowing out.

Answer:

The image shows a section of an engine with visible components and details. The text explains the function of windage and oil in the crankcase, highlighting their movement and the importance of the accumulator to maintain oil pressure during high-speed corners. The recommendation includes the use of a check ball in the oil accumulator to prevent oil from flowing out.
Figure 3: Fabricated Mark | Rear chamber oil pickup

Level while the engine was running was unobservable in de-bugging the wet sump oil compartment near the oil gallery. The ability to view the oil container through two pipe-threaded hose barbs into the sump and using high pressure for a slight gauge to see from the oil level was during engine operation. This was used for a sight gauge to see from the oil level was during engine operation. This was

Also note at the bottom left of the Figure 2 is a U-shaped piece of clear tubing: this was

pumped into the engine oil gallery.

Note that without horizontal baffles, the higher the level oil in the sump, the more oil

in the front pan chamber to the rear, necessitating the fabrication of a new oil pickup tube.

the oil surface in the rear (oil pickup tube) sump chamber is protected from windage by these sheet metal baffles. Note that the oil pickup was moved from its stock location in

plus a write plate mounted to the oil pickup tube: between these two baffles, most of

the baffling shown in Figure 1) an additional center shaped baffled attached to the pan.

Figure 2 shows the complete baffling of the Mark I wet sump and shows (in addition to

windage except where the oil pickup needs to fill) did not affect the aluminum mesh

Most Lotus race engine builders recommend welding of an aluminum mesh in the front
Some people suggest using a restrictor in the cylinder head oil gallery to
operate the oil pump. This oil will slowly seal by the oil seals which
character of the oil grate or oil pump. A crack or hole in the cylinder head

down the primary side of the oil grate. You can try again to see if this

batches. After you modify your pump with

check the oil grate. Then the oil level will be at the add level, go
down one more quart and try that too (where the oil level will be at the

small dry sump. If you fill your pump with oil and remove the

level of the oil grate before the same way and it is easy to see why the stock oil

stock to the dipstick tube and fill the pan to the level on the dipstick desealed (and

On the depth of the sump. With the sump removed from the engine (and cleaned up)

return to 0.40" of force. You can see where the

stated in the dipstick: At first level on the dipstick, the oil level is about half way

The sheen: Metal baffles for this engine were constructed from 0.40" 6062 (Al

baffles were all attached with TOL32

Remember correctly) aluminum sheet metal. The baffles were all attached with 10X32

Also work well to prevent seepage through the fastener threads.

Also work well to prevent seepage through the fastener threads.

The pickup tube from windage. The pickup tube is positioned at the bottom of the

The pickup tube from windage. The pickup tube is positioned at the bottom of the

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The pickup tube is positioned at the bottom of the

The pickup tube is positioned at the bottom of the
5/16" drill (for 2, 3 and 4 bearings) and a 1/4" drill will be required for bearings 1 and 4.

When the block is in the bearing shell, did this with a 1/4" hand drill, both a standard length and a 2 1/2" drill, (if 1/2" drill is used) for the block. The hole should be the same size in the block. The press fit of the bearings in the block is the same size in the bearing shell. You will notice that the oil in the bearing is equal to the oil in the main bearing at 2/3 of the oil groove. Where your oil pressure gauge is located, ream main oil hole (the 0.255 diameter hole, from the oil groove) is equal to the main bearing at 2/3 of the oil groove. If this is true, then your bearings are in good shape.

I am not sure what the oil pressure system is. What I found was that the oil restriction in the system was being reamed by the oil groove system. The cross-sectional area of the oil groove was greater than if the oil were not restricted. This will cause the oil pressure to be higher. If you have a system like this, it is possible to have a restriction for the oil groove.

Pressure should be 70 PSI if your engine is new. If your engine is older, then the pressure should be 100 PSI. If the engine is more worn, then the pressure should be 150 PSI. The oil pressure should be checked at 1500 RPM. The oil pressure should be 3000-4000 psi.

When the oil pressure is too low, the oil pressure will not reach the bearings. The oil pressure will not reach the bearings because the oil pressure is not reaching the bearings. The oil pressure is not reaching the bearings because the oil pressure is not reaching the bearings. The oil pressure is not reaching the bearings because the oil pressure is not reaching the bearings.

Oil Flow:

As low as possible without restricting oil flow up to the pickups. The height should be 1/4 the diameter of the pickup tube (to get it up to the pickup). The diameter of the pickup tube (to get it up to the pickup) is the height of the pickup tube. Also note that if you place your own pickup tube, the height of the pickup tube is the height of the pickup tube.

With proper horizontal windage baffles, the oil pressure will not be affected by the windage by 2 quarts is.

According to the formula, the oil pressure will not be affected by the windage by 2 quarts is.

If the oil pressure is too low, the oil pressure will not reach the bearings. The oil pressure will not reach the bearings because the oil pressure is not reaching the bearings. The oil pressure is not reaching the bearings because the oil pressure is not reaching the bearings. The oil pressure is not reaching the bearings because the oil pressure is not reaching the bearings.

It is only possible to have all the oil pressure via the windage baffles to prevent oil.
Some people recommend drilling the crankshaft for good oil flow to the rod bearings. However, Red Ramsource's recommendation recommends NOT cross-drilling the crankshaft. The reason for this is that unless the crankshaft galleries can restrict oil to the rod bearings journals at high RPM, the centrifugal force on the smaller oil hole diameters goes up with the ratio of the square of the bore and oil hole diameters. The hole is not a lot larger, but the cross-section with the bearing shells in place, the hole is not a lot larger, but the cross-section shows before and after with the bearing shells in place. Figure 5 shows the same view.

A stop-collar should be used on the drill so excessive drilling depth is avoided. Now according to calculations, the crankshaft oil galleries are more than large enough to supply oil to the rod bearings... as is. Note that normal oil flow to the rod bearings goes supply oil to the rod bearings... as is. Note that normal oil flow to the rod bearings goes... thus further reducing main-bearing oil pressure... resulting in main-bearing failure.

The cranks are actually pump the oil out of the main bearings into the rod bearings... drilling the Lotus 97T crankshaft.

Underneath the bearing journals, the bearings are lubricated by the oil jet from the galleries. Figure 4 shows the bearing gallery diameter makes the bearing shell oil hole diameter. Figure 4 shows the bearing journal diameter makes the bearing shell oil hole diameter. Figure 4 shows the bearing journal diameter makes the bearing shell oil hole diameter. Figure 4 shows the bearing journal diameter makes the bearing shell oil hole diameter. Figure 4 shows the bearing journal diameter makes the bearing shell oil hole diameter. Figure 4 shows the bearing journal diameter makes the bearing shell oil hole diameter.
Reciprocating Forces:

Figure 5: Main Bearing Oil Gallery Holes; modified larger on lift, stock on right.
Short side of block  
~2.0 mils of downward displacement  
Long side of block  
~1.0 mils of downward displacement

The main bearing center was supported from a concrete surface with 4 washers and twist from center to either end.

This result indicates that force on the center main bearing area, that the block will...

Short side of block  
~0.5 mils of upward displacement  
Long side of block  
~3.0 mils of downward displacement

For the block, I placed washers and shims under the corner main bearing stud(s) (#1) at the main bearing adapter. Placing the block at the center main bearing position, I then applied 100 pounds of downward force right and left of #1 #1 right and left studs) then placed a dial indicator at the edge of the piece should provide insight to see if a block slitter will do anything useful.

In order to assess block slittiness, I set about 2 to measure the flexure with 100 pounds of balancing with the new components.

A smaller pin hole, any changes to reciprocating mass require crankshaft end clearance, with the weight less than the stock case, plus, this resulting small-block Chrysler since I ordered a custom set of pistons from JE, I also opted for 907E case positions are good up to about 6,000 RPM. If you get a face quality connecting rod, note the 907E length is the same as.

If you want to take advantage of this potential, the inductors must be modified to do 10,000 RPM. But properly matched and ported intake tract can operate usefully up to about 6,000 RPM. A compression ratio of 2:0:1 will enable from an airworth yard's a bottom 907E which when reduced to the listed "standard" hemis or 907E position which will result in about a 0.006 actual being used as a spacer, For high RPM operation, regular pistons are a must. The best piston available is 907E case positions are good up to about 6,000 RPM. If you need you can also operate above 8,000 RPM, you should get a set of hemispherical ring end bolts (e.g. Comp or Crower). They are both higher lift, short-stroke, so if you intend your engine to operate above 8,000 RPM you should not go with the engine data or a seasoned rod bolt (the one that is uncommonly recorded 8.400 RPM during a misfire test). On my second engine, my recording took place on the dyno. 8000 RPM. The 907E case positions are really too large (weigh too much) for high RPM operation.
Stirring Plate Design:

Do a great deal to help reduce the twist of the 907E block.

Whereas you can see obvious figures in not improved much, the large plate area will
possibility have, and unless are provided for the crankshaft. Allowing the remaining parts
have their freedom of twist. My plate design features more material where the
beam crank through chambers, resulting in a plate that only has material where the
block face stiffness... providing that is and the gain are properly mounted. Note that
the block face stiffness in the earlier measurements.

The stirring plate does not appear to contribute much to linear block flexure.

\[ \text{Short side of block} \]
\[ \text{~1.0 mils of downward displacement} \]
\[ \text{Long side of block} \]

and main bearing centers.

3\% stirring plate was measured at the same main bearing stud locations as the block.

Note that the cast pan contributes about the same flexure stiffness as the main bearing
stirring plates in this design. The cast pan was measured with support at the mounting areas nearest the main
apparently the extra material for the oil pick-up. Stirring that side of the main bearing
...
free, so subsequent machine working and heat-treating cycles will not result in its changing.

You can see the machine tool shops on both sides of the plate. The material is stress-free and precision-milled. The material is machined to tolerances. It is fabricated by casting the precision pieces as needed for machining shop tooling fixtures. It is fabricated for casting die.
The plate is slightly larger than the block/main bearing cap/timer face size. The outer holes

wanted in my case.

with a crescent wrench. Some people I have talked to said stud removal was easy. If

some cases I had to find two tabs on the side and unscrew them

fairly easily. In some cases, a propeller shaft was necessary to remove the stud. In

another precaution I think I may have cheated. In my case, the block/main bearing cap/timer

would go down the stud/stud/block interface so the permanent

inferior classed to aluminum/brass interface) at the stud/stud/block interface so the permanent

studs (which will ease the removal of the stud) also stayed. I've been told that the stud/

will increase the torque of the stud by conditioning the stud in the main bearing studs. Always do the cylinder block in the sum with the block in

exiting main bearing studs. Don't let the cylinder block come out a bit longer than the stock main

bearing studs. The cylinder head studs are slightly longer than the original engine

keaded custom main bearing studs from Alum bodies Racing Products (ARP) that

All studs and bolts that go through the plate must be 0.5" longer than the original engine

w Askew... Therefore a good choice of material for a stiffening plate for an aluminum

wrench up. Instead of a thin piece of material for a stiffening plate for an aluminum

wrench up, domestic or exotic could/would also dislodge the engine block as a

stiffening plate. A steel stiffening plate would be about two to three times as stiff as an

stiffening plate (which would dislodge the main bearing). A thin piece of material for a stiffening plate for an aluminum

stiffening plate. Therefore, it is not a good idea to use a stiffening plate for an aluminum

if you are reusing a half-milled plate. Subsequent annealing cannot undo all the

mechanical stress due to the construction method. Roll-milled plate being forged. By the
There is one 0.032" diameter oilhole for each pickup and one for the oil vent tube.

You are a pioneer in the use of this stiffening plate.

Pressure gage (and level, if possible) when first running your engine. Along with me, I never located these places. I recommend keeping a sharp eye on your oil and the fluid discovery was done on a chassis dyno. So this stiffening plate gets.

The fluid to determine this is a story too long to relate here. I have 4 quarts total of oil.

High RPM oil would play at the wrong side of the engine. How I actually was essentially the same pressure as the stiffening plate... this would be oil drain holes.

The next row of holes inward are for oil drain-back. There are three chamfered holes at.

Several reasons: Stock torque specs should be used.

The next row of holes inward are for attaching the bump casting to the plate. The bump casting should help correct for that.

Stock torque specs should be used for the heads. Note if your block and main bearing carriers are slightly out of alignment, the gears.

Stock torque specs should be used in either screws ... or a full set of longer studs. Stock torque specs should be used in either.

"Just-so" if you do this option, you will need even longer long shank 1.25 threaded cap.

They should slide in the gap without wobbling but within the limits of the retaining rod and usable to the correct length studs. As I doubt a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt, a metal length of threaded rod and unable to do the correct length studs, as I doubt,
of cylinder block. For brief periods near BDC with resultant surface fretting and subsequent excessive of 75,000 pounds. Sometimes the main bearing carrier will separate from the block. Get each of these main bearing carrier studs should have a driving force in the same direction. $\#2$ and $\#3$ crank main bearing carrier to the cylinder block. The $\#3$ main bearing carrier studs must be driven into the cylinder block. Driv the $\#2$, $\#3$, and $\#4$ crank main bearing carrier carrier perpendicular to the main bearing carrier flats and main bearing carrier perpendicular to each other. 

Note that the tension on the main bearing carrier is not correct, however, the amount of the "stretcher" should be large enough and consideration with the oil flow rate. $\#1$ and $\#3$ main bearing carrier pin a stripping force on the fastener (a stud or bolt). Install the fastener attaching the fastener pin a stripping force on the fastener (a stud or bolt). Insert the fastener pin the main bearing carrier stud and then torque the fasteners to the specified torque. 

Another one: The casting walls are not really thick enough to push or pull the block until you put out a main bearing stud. You probably should stamp the block and find the main bearing carrier pin a stripping force on the fastener (a stud or bolt). Insert the fastener pin the main bearing carrier stud and then torque the fasteners to the specified torque. 

Then torque the main bearing nuts and then torque the fasteners at the perimeter of the cylinder block to the cylinder block and engine. Then apply the main bearing carrier pin a stripping force on the fastener (a stud or bolt). Insert the fastener pin the main bearing carrier stud and then torque the fasteners to the specified torque. 

Another one: The casting walls are not really thick enough to push or pull the block until you put out a main bearing stud. You probably should stamp the block and find the main bearing carrier pin a stripping force on the fastener (a stud or bolt). Insert the fastener pin the main bearing carrier stud and then torque the fasteners to the specified torque. 

**Assembly:**

**Sealing purposes:**

tube in the cylinder block. Locate the $5\theta$ does not set up hard and is intended for gap.
to the aluminum block capably and not the stud, itself.

The machined bore of the cylinder head engages manual torque specs relative to the amount of torque. I recommend using the stock torque specs or the Jensen SVF 30 angile oil, whichever. Having read the stock manual, the stud will probably pull out of the aluminum block at the front of the cylinder head during the process. I have included copy material from the ARF catalog that you should follow in

**Note:** The cylinder head engages manual torque specs on the aluminum block. Use a good quality oil (like the oil in the front of the cylinder head) to ensure proper seating. I have a high application pressure like this, but for areas where I get no oil pressure, I usually use high temperature, high pressure clips.

You will notice that the cylinder head is never really "fis in run, piece is beyond my ken..."
Happy 907E Bottom end stiffening!

Don Wollenen, Automoitve Hobdyist

Successful So like me you use this stiffener plate at your own risk.

edge becomes the "bleeding edge." The "bleeding edge" is where you are almost
the bleeding edge of engine technology. Note that there is a point where the "bleeding
of all drain-down holes (or I would not use it on my engine). In one sense you are "at
only concern I have is all drain-down, but I believe that there are an adquate number
Note that this stiffener plate design has not actually been tested on an engine yet. The

| mm OIL Sump Nuts/Studs or Cap Screws | 7 to 8 |
| mm Camber Nuts/Studs or Cap Screws | 7 to 16 |
| mm Main Bearing Nuts/Studs | 55 |

Foot-Pounds

7, 6, 1, 1; 1, 9, 4 to 2, 2; 1 |

From the Jensen Healey Shop Manual, the torque specifications are as follows:
PLATE ASSY.
W/OPTIONAL DOWELS

NOT SUPPLIED W/PLATES & STUDS