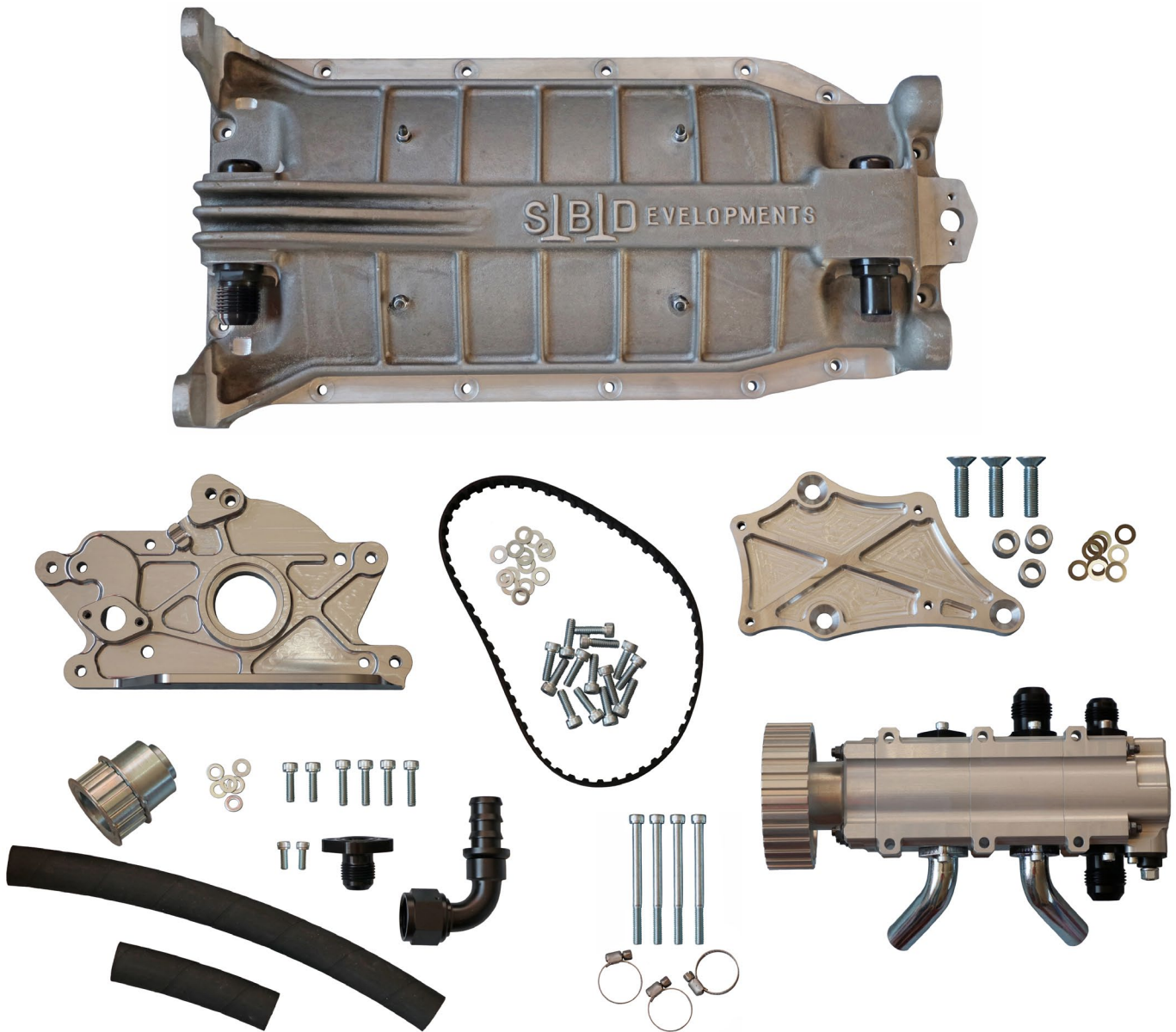


March 2021

## 2.0L XE Dry Sump System Instructions OS-DSK-VX2-US1

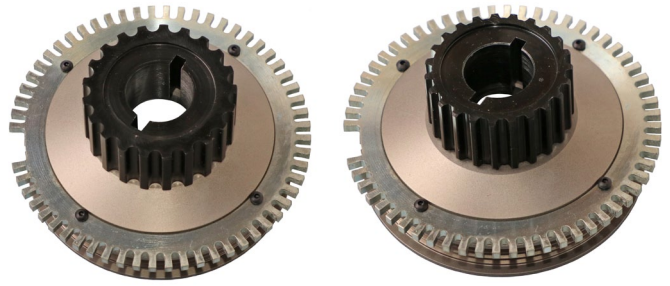


Your kit contains:

- Three stage pump with pulley
- CNC billet mounting bracket with shim kit for pump adjustment
- CNC billet front cover
- Sump pan with filters & built-in windage plate
- Hoses from sump to pump
- Drive belt & crank mounted drive pulley
- Fitting kit including all bolts & washers

We recommend the use of one our crank/cambelt pulleys.

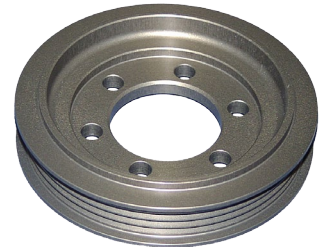
Shown on our instructions is our Crank/Cambelt Drive Pulley Trigger Wheel Kit. It is available for both the pre93 (CRK-PLY-1-SBD-01K-TW) & post93 (CRK-PLY-2-SBD-01K-TW) 2.0L XE engines.



Our Crank/Cambelt Drive Pulley Kit without the trigger wheel is available for both the pre93 (CRK-PLY-1-SBD-01K) & post93 (CRK-PLY-2-SBD-01K) 2.0L XE engines.



Our multivee pulley PLY-MV1, which will fit straight on. A 58 tooth timing wheel is also available TW-58-EX1



If your engine is not running an alternator then you do not need a pulley

You can not use this type of SINGLE MULTIVEE pulley.



If you have a DOUBLE SINGLE VEE pulley you will have to machine the front (power steering) vee off which will give you enough clearance for the dry sump pump pulley. This option is more likely to throw the belt.

**WE DO NOT RECOMMEND THIS OPTION**



It is recommended that the bottom of the dry sump tank is level with the bottom of the sump. This is because when a car is stored for any period of time, the oil will automatically drain to the lowest level. It will slowly pass through any gear system over time and the level in the engine and the oil tank will equalize. So if the oil tank is higher than the engine, effectively all the oil will drain into the engine and there will be no oil available to give oil pressure until the scavenge pumps have returned the oil from the engine to the tank. This could obviously create damage if this condition occurs.

Taps or valves should never be used because they can be forgotten and left turned off, they can also create a restriction in the oil flow from the tank.

## DO NOT USE SEALANT UNLESS SHOWN

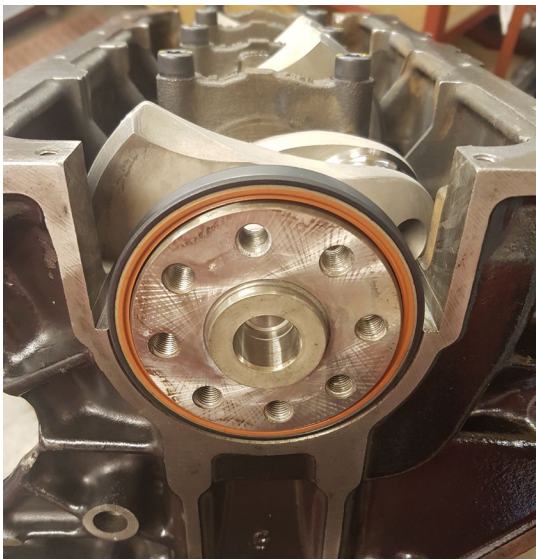
It is strongly recommended that the crankshaft is removed, fully inspected and measured with new bearing fitted before fitting your dry sump system, that way you ensure the bottom end of the engine is in good health. After everything is checked and measured, when refitting the crank seal, please follow instructions below and refer to relevant torque sheets.

### Rear crank seal

When fitting the sump, as far as the rear main cap is concerned, if the rear cap has not been removed, the same thing applies and use a smear of sealant across the joint between the main cap and the block to ensure a perfect seal.

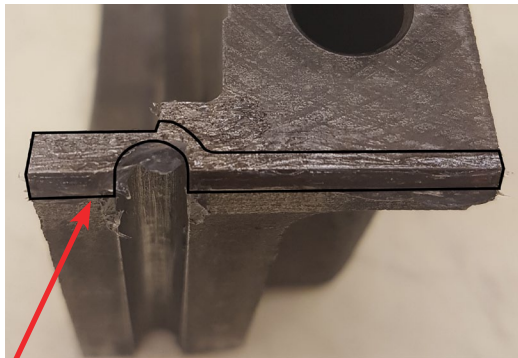
**If the rear main cap has been removed, please see the following instructions for re-fitting. There is only one way to seal the main cap correctly.**

All faces must be fully cleaned and dried and have no residual silicon.

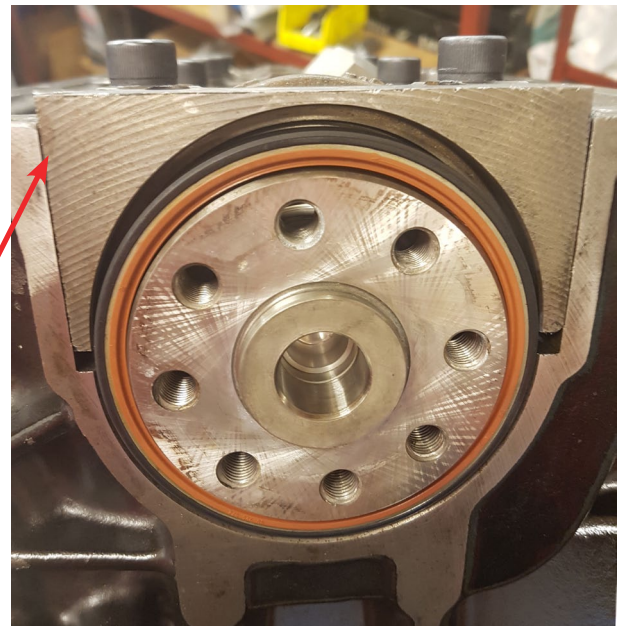


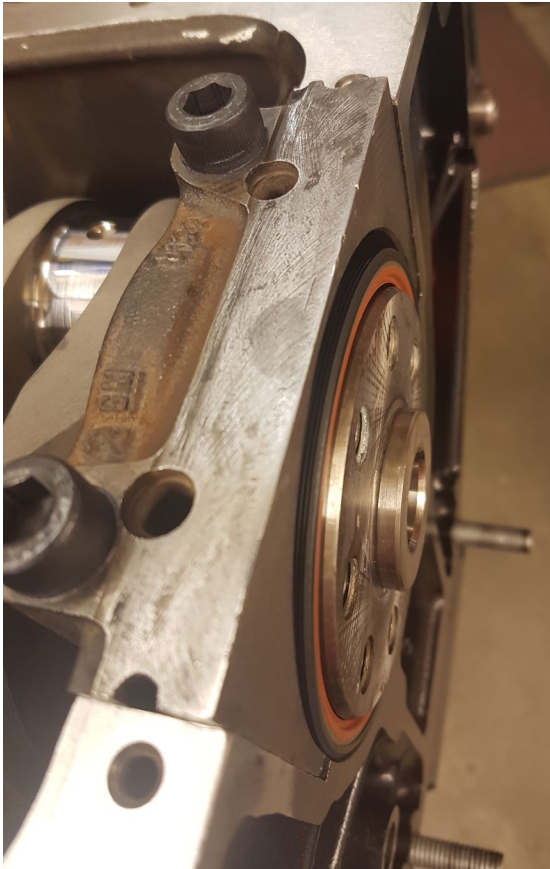
Because you have removed the main cap, it is easiest to fit the rear crank seal before re-fitting of the rear main cap.

**Note:** If you are only replacing the rear crank seal and have had no leaks previously, there is no need to remove the rear main cap, simply remove the crank seal and re-install from the rear of the crank.

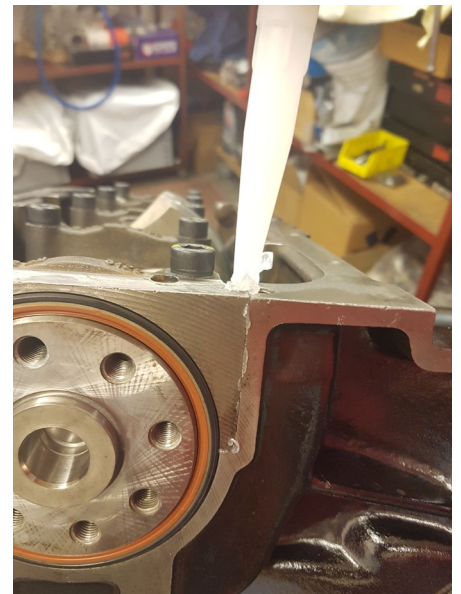
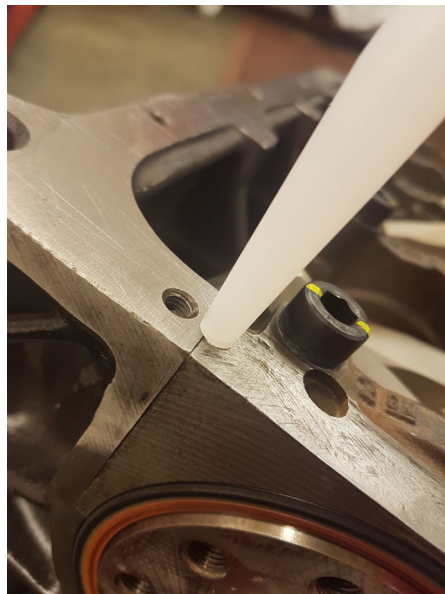
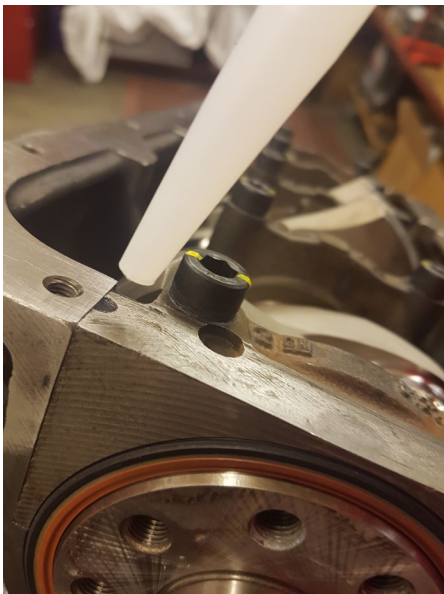
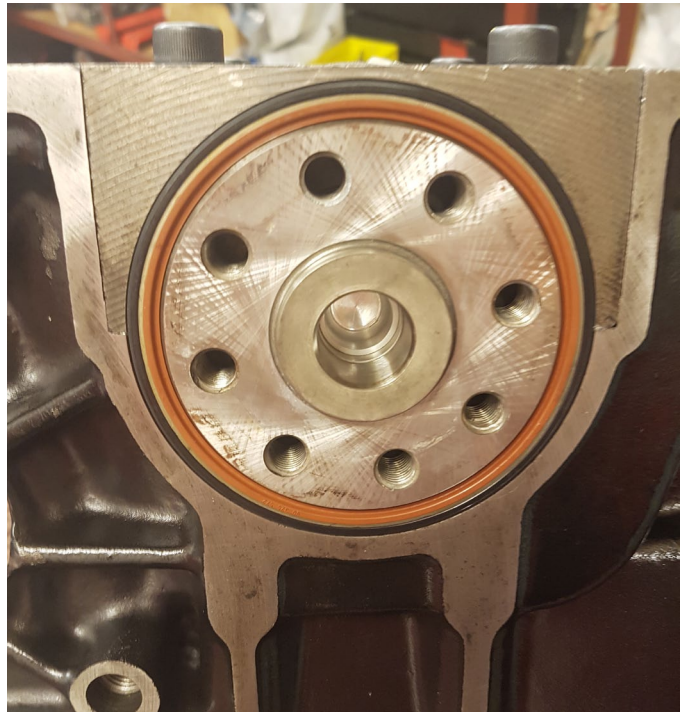


The very base of the main cap where it touches the main part of the block would have a very small bead of silicon applied as shown within the area highlighted in the picture above.





The main cap is then torqued down, please refer to separate torque setting sheet.



You will then use a silicon gun and inject the silicon into the half round groove which is machined into the edge of the main cap.

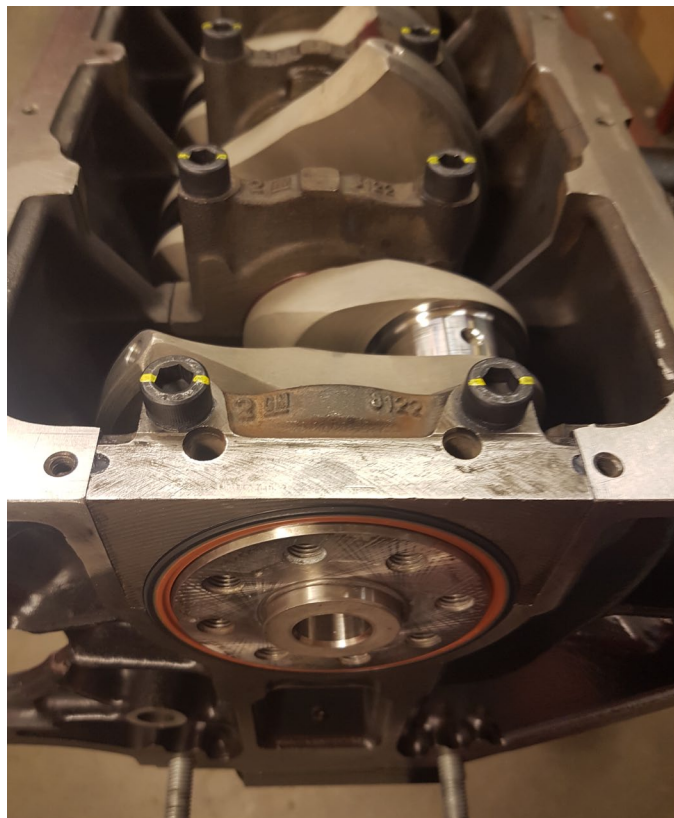
Trim the nozzle, so that it fully covers the groove, allowing pressured sealant into the groove.

You inject the silicon with as much pressure as possible until a thin layer of silicon oozes out the front and the back of the main cap all the way from top to bottom (no attempt should be made to pre-apply silicon to this groove).

With the amount of pressure required you would usually expect to get a large quantity of excess silicon oozing back out towards the nozzle.

Once the sealant has oozed out all the way then wipe off the excess.

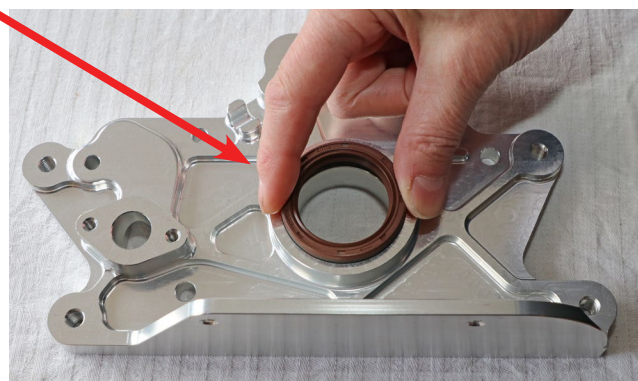
**Note:** If it does not appear all the way up the groove, then you will have to remove the main cap and start again.

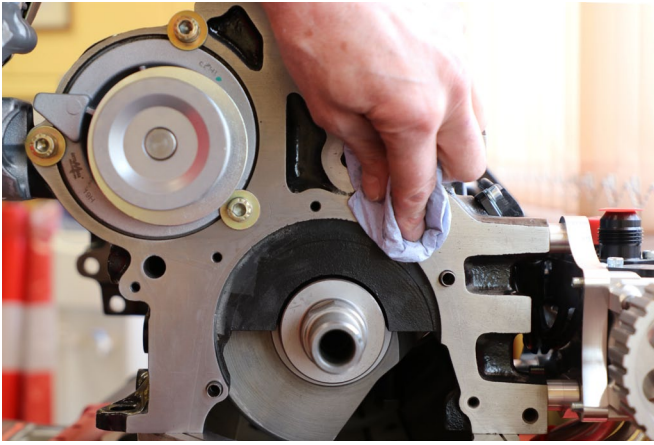


### **Front crank seal**

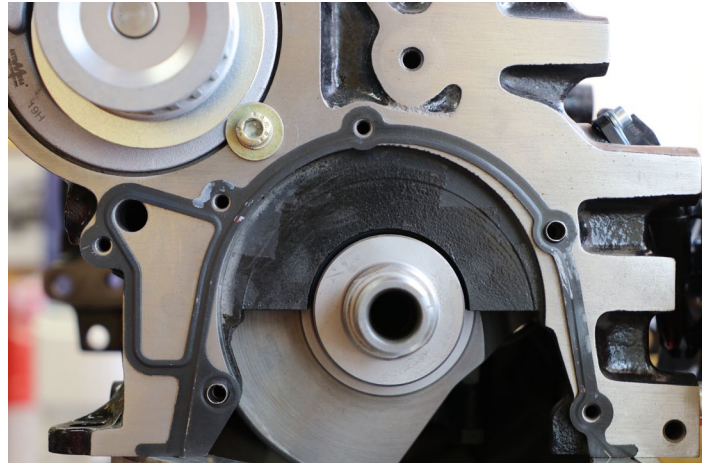
We always fit the front gaskets which are metal and have been for many years, free from any sealant, obviously the two faces must be clean and in perfect condition. When fitting the sump, apply a smear of sealant across the small void between the oil pump and block, created by the thickness of the gasket.

Make sure there is a new seal in the front cover.

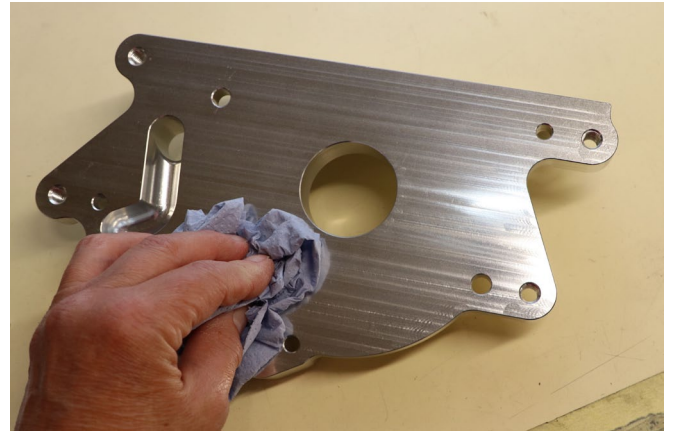




Ensure all faces are clean and fit gasket GSK4



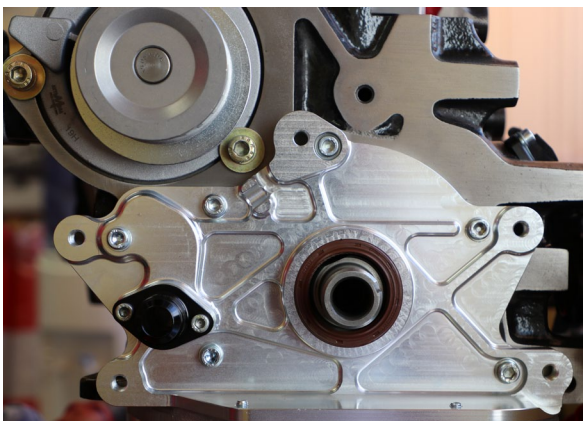
Ensure all faces are clean.



Bolt the bottom of the front cover to the dry sump pan.

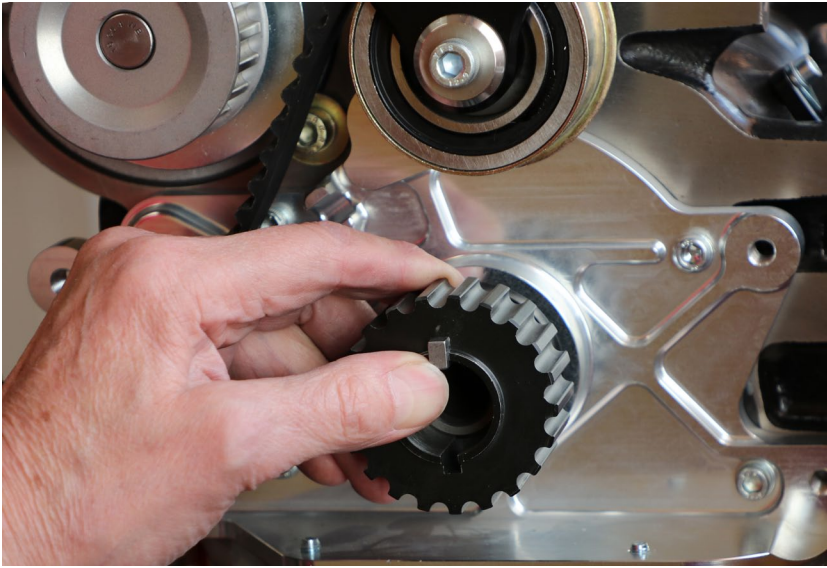
This kit includes all the bolts, two of which will be longer for the deeper sump bolt holes into the front cover.

*Torque setting - 4lbf (6NM) torque using Loctite 243*



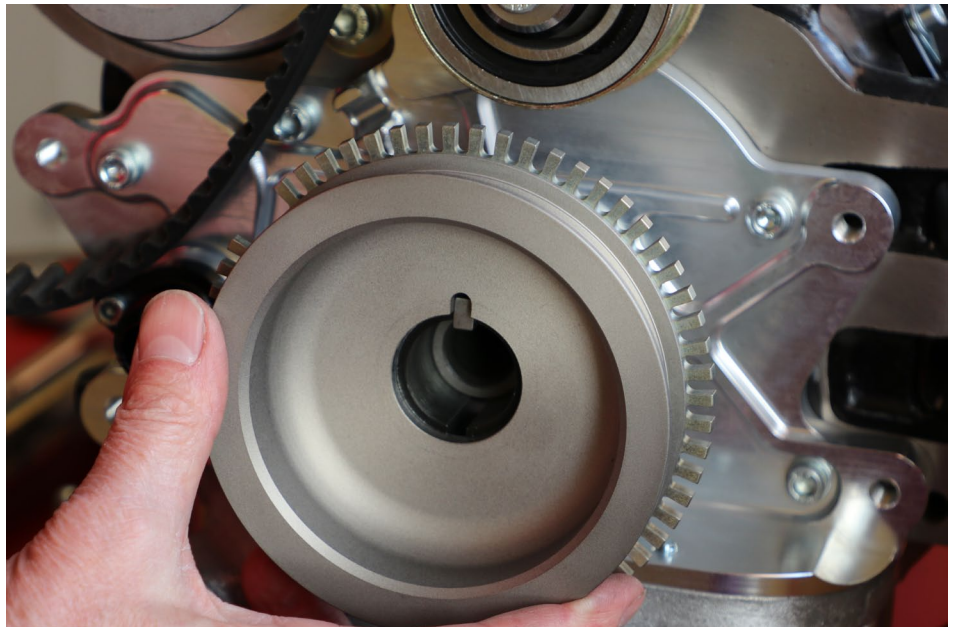
Fit the crank spacer, lubricate with engine oil, rotating to ensure the whole circumference is covered.





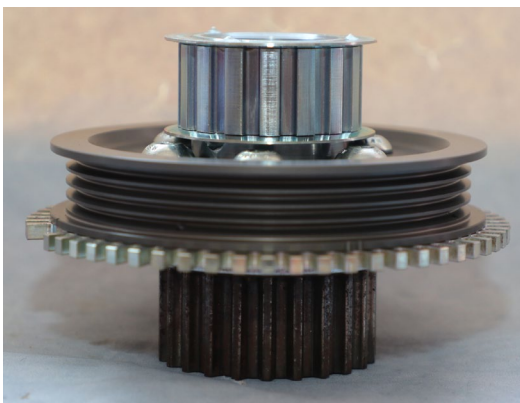
The pulley shown being fitted is the pre'93 set up.

The standard cambelt drive pulley has a key that is part of the original item and quite weak and can fail, particularly if the crank bolt is insufficiently torqued. Our new versions that are available for the pre & post '93 engines have the option for 2 keys, it is supplied with both, the key shown in the photograph being inserted from the front is the type that replaces the original version. The second key that is supplied (not shown) is normally used on some steel crankshafts where an additional keyway has been machined into the crank. This purely optional and can be discarded.



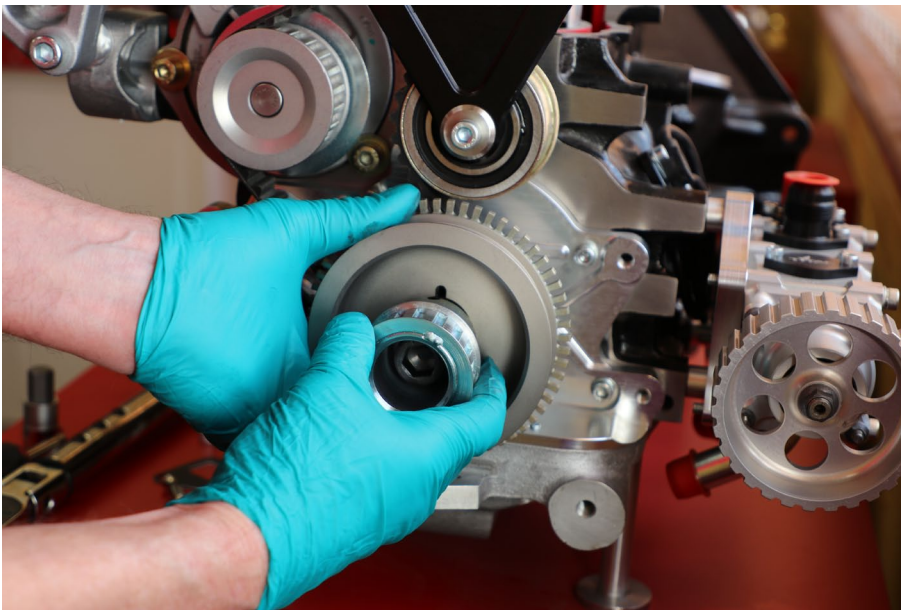
If using the pulley shown bright, use button head bolts to hold pulley on because cap head bolts are too long. Shown with the optional trigger wheel.

Torque setting for cap head bolts: 15lbft (20NM) 243 Loctite

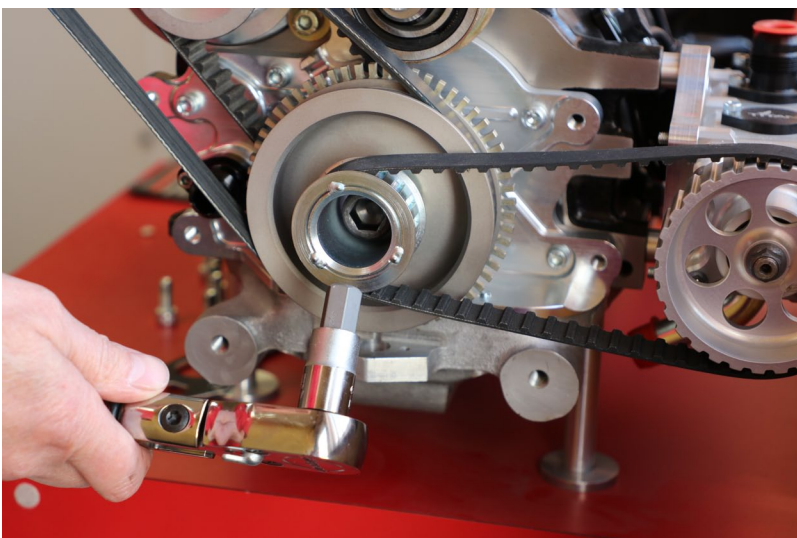




Use ARP Assembly Lube or graphite grease under the head of the bolt and use engine oil on thread.

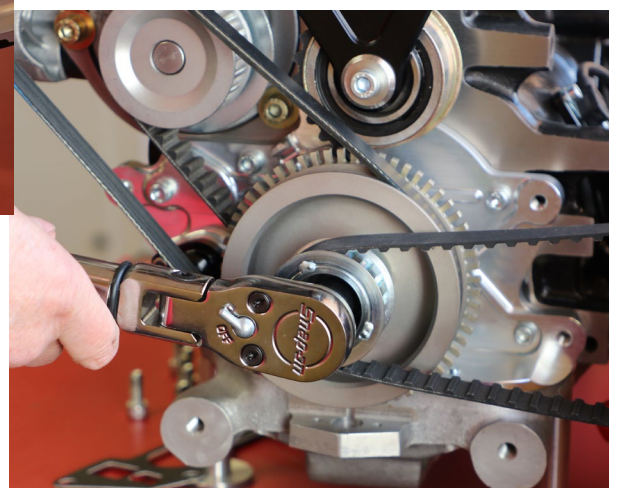


Fit the dry sump drive pulley using the our heavy duty cap head centre crank bolt, SBD part number BLT-CRK-1-HD.

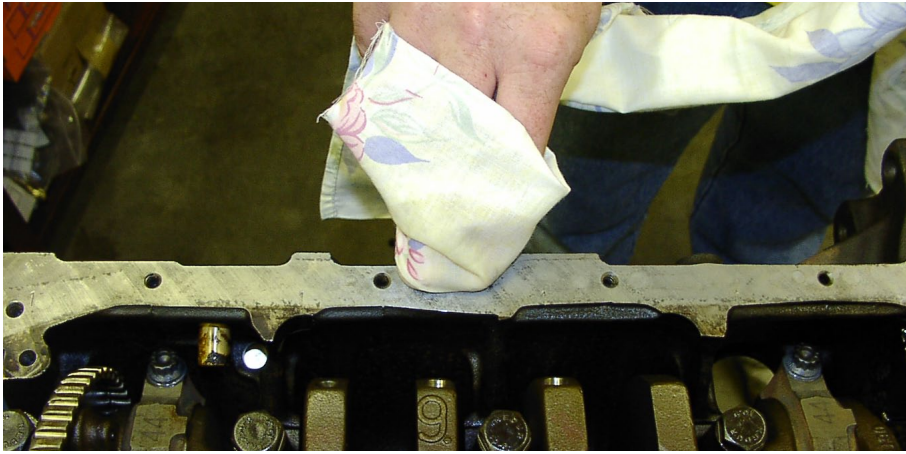


Use a 14mm Allen Key Socket  
(SBD Part No. BLT-CRK-1-HD-TOOL)

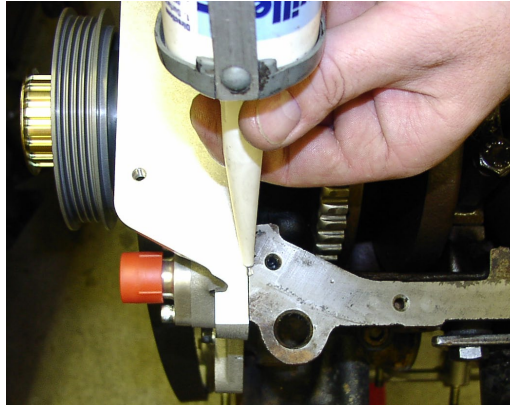
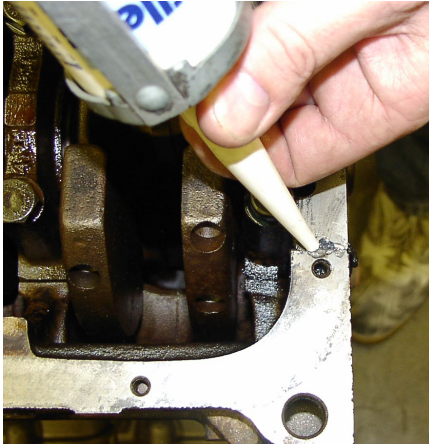
Torque setting:  
Stage 1 –184lb/ft  
Stage 2 –40/50 degrees







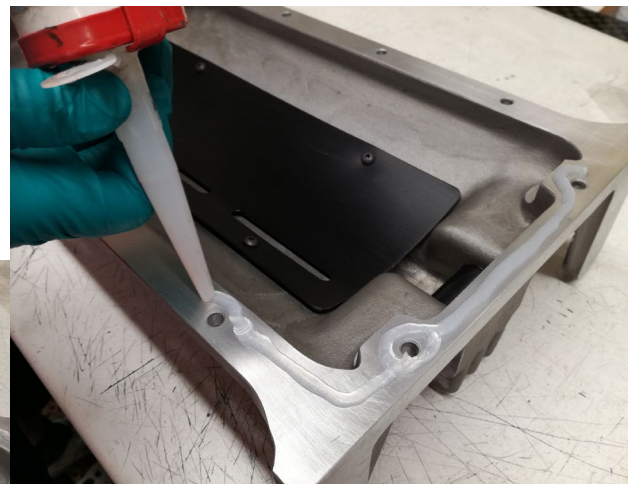
Ensure all faces are clean.



A bead of silicone should be run across the gaps from the block to the front cover and the back bearing journal.

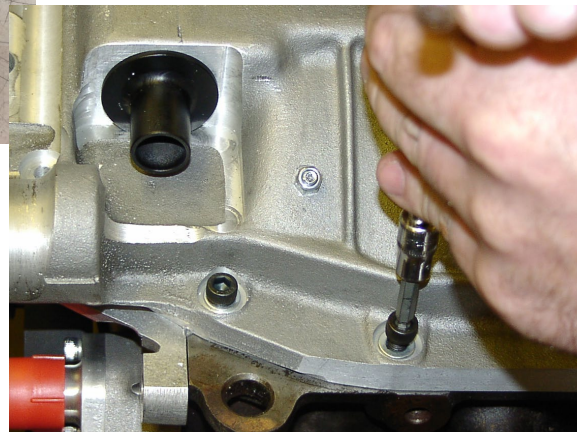
Silicone should be put around the sump pan, then installed to the underside of the block.

Note: Once the silicone has been applied the sump should be assembled as quickly as possible.

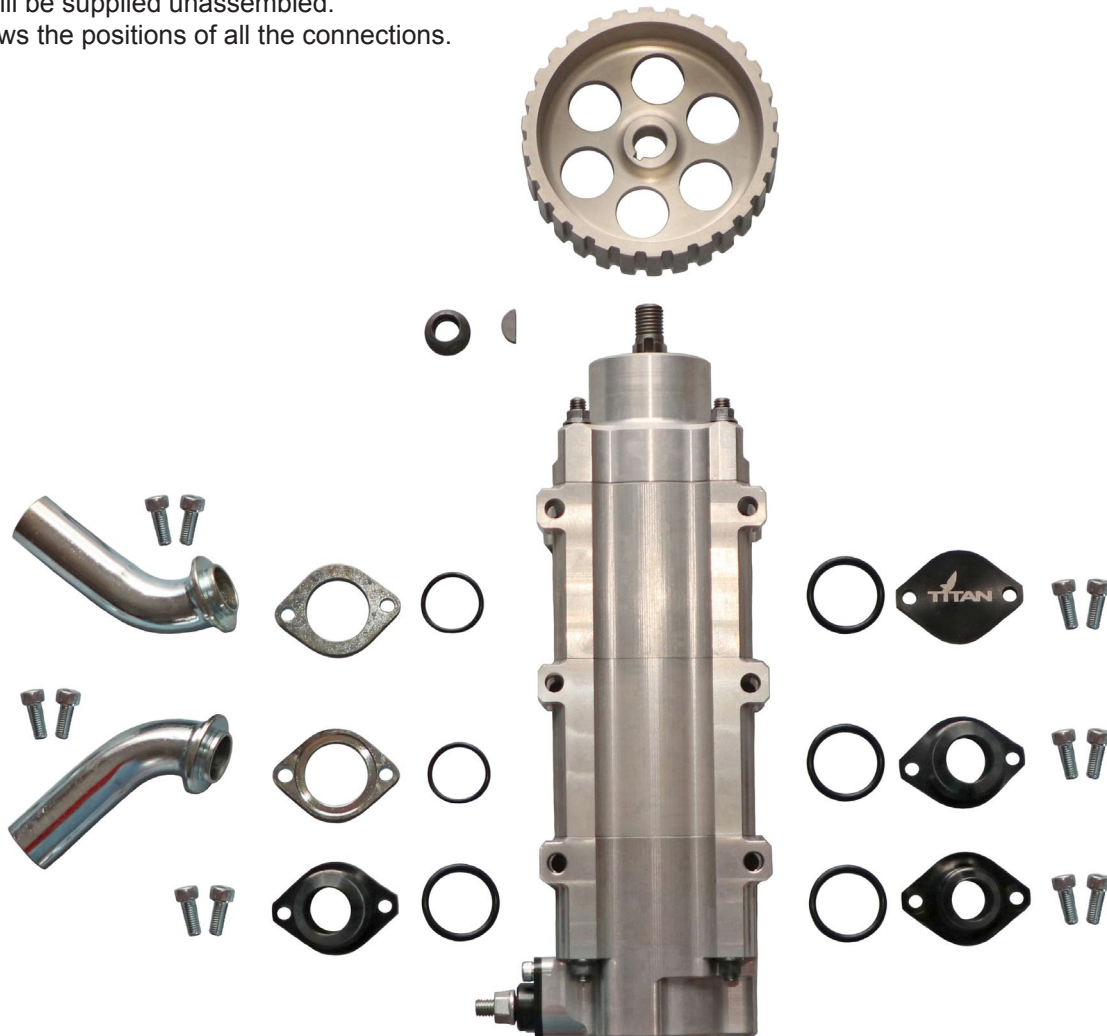


Bolt the dry sump pan to the block.

Torque setting - 243 Loctite 10lb/ft (14NM)

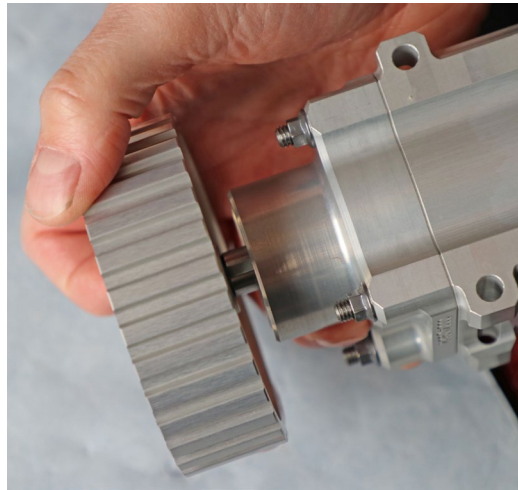
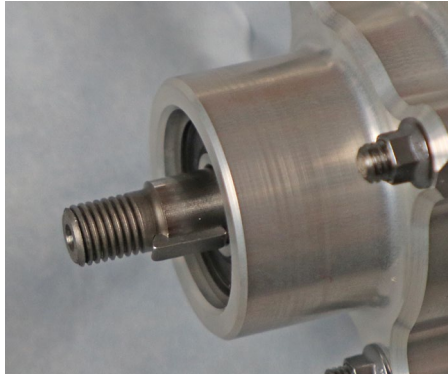
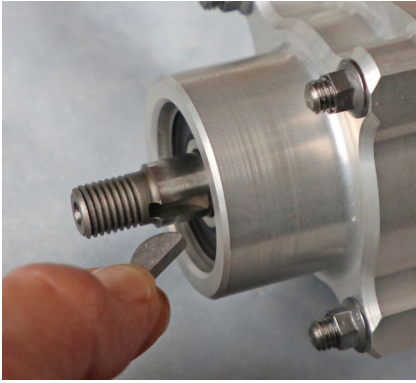


The dry sump pump will be supplied unassembled.  
The picture below shows the positions of all the connections.

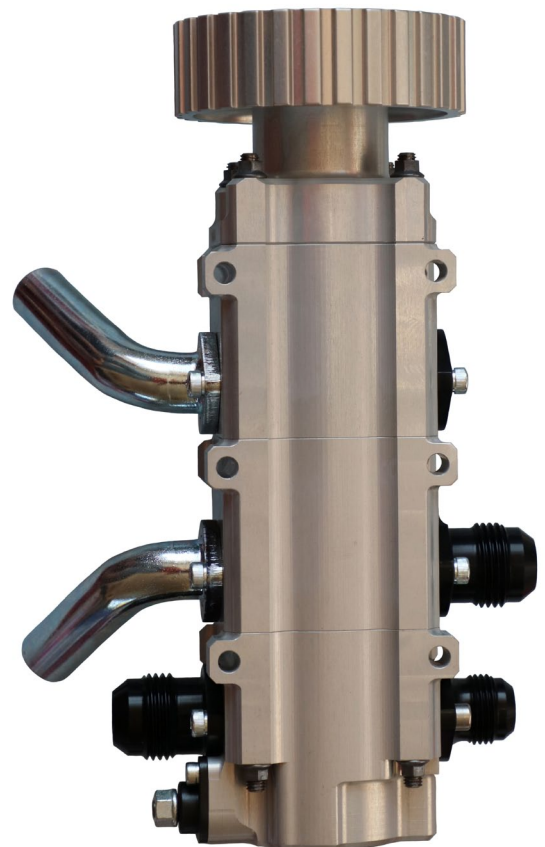


The couplings on the pump are adjustable to make fitting hoses easier.  
Loosen the bolts holding the couplings in place and the coupling will twist in  
to the required position.

The pulley has a keyway in it, fit the key in the slot so it lays parallel.  
The pulley is fitted whilst keeping the key laying parallel in the slot.

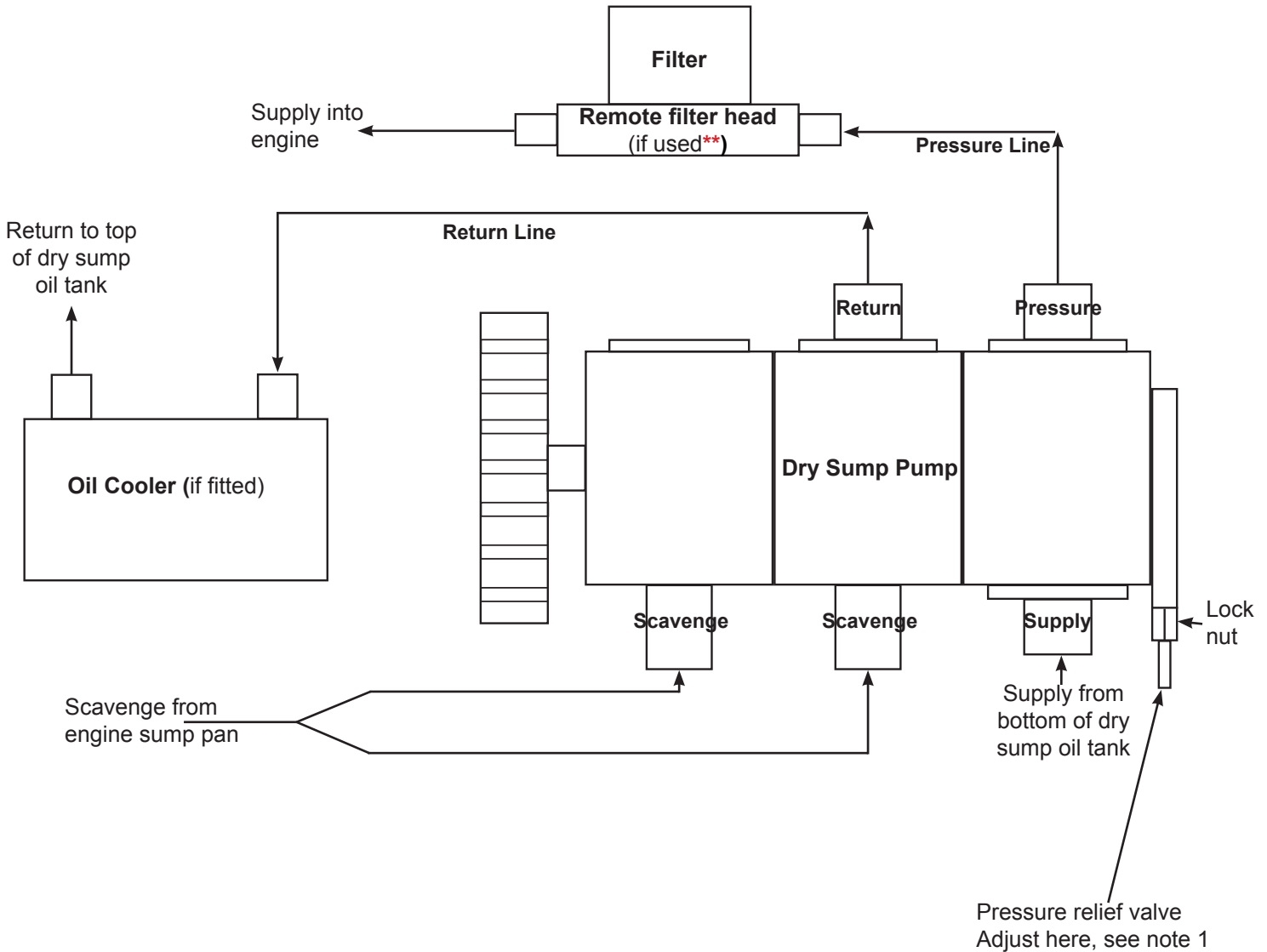


Tighten the nut and torque to 20lbft.



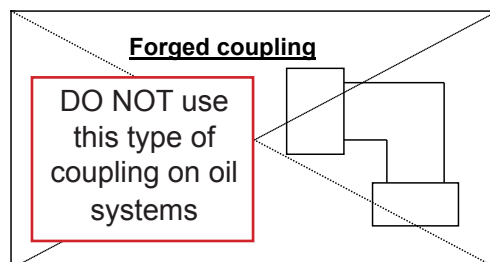
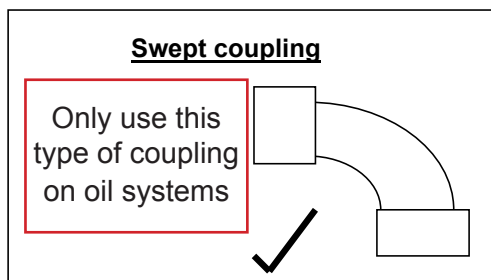
## 2.0L XE Dry Sump System Connections

**\*\*Remote filter head can be Right to Left or Left to Right, but you MUST use the correct filter housing, you CANNOT just swap the pipes around.**



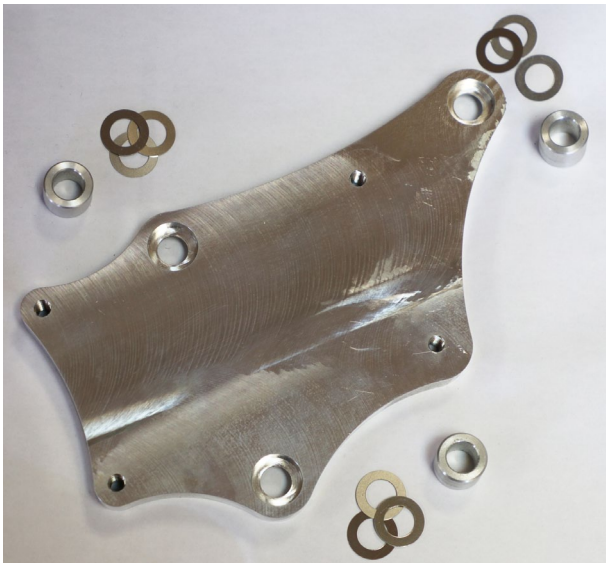
### NOTES

1. Oil pressure should be set to 65 psi when engine is hot and RPM is at 2000
2. Use straight couplings where possible or if swept couplings are needed, only use swept ones NOT forged ones.
3. Supply to pump from oil tank & return to oil tank should be JIC-12
4. Pressure to engine JIC -10
5. Scavenge pipes are push on 3/4" I/D

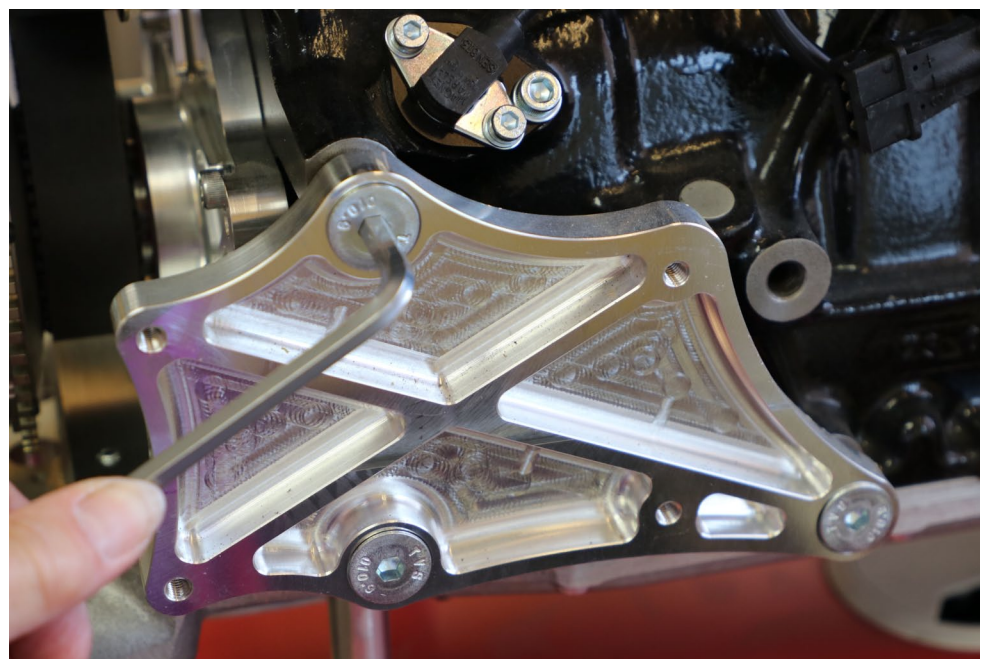
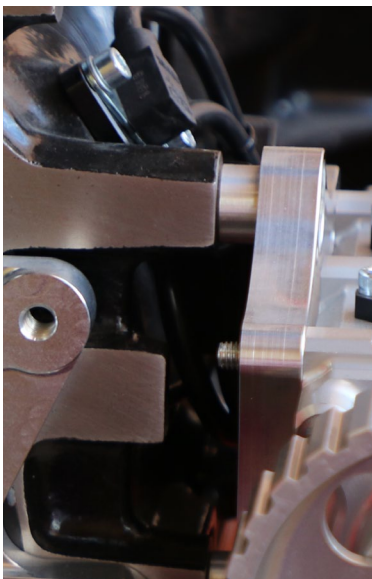


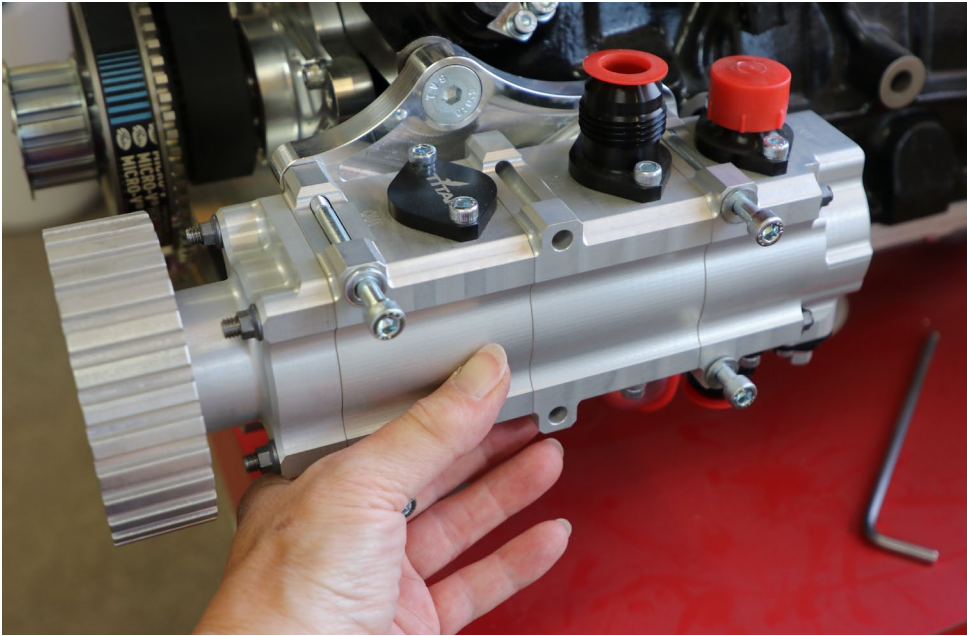
Trial fit the dry sump pump to ensure the belt has the correct tension. We suggest the tension is sufficient that when the pump is in place and the belt is fitted that it can be slid of the front of the pump without excess force and slid but on again in the same way.

The belt tension does not need to be tight as the drive design does not require high tension, also being an aluminium block engine, the engine will grow slightly when hot and the belt should never become excessive tight when the engine is hot.



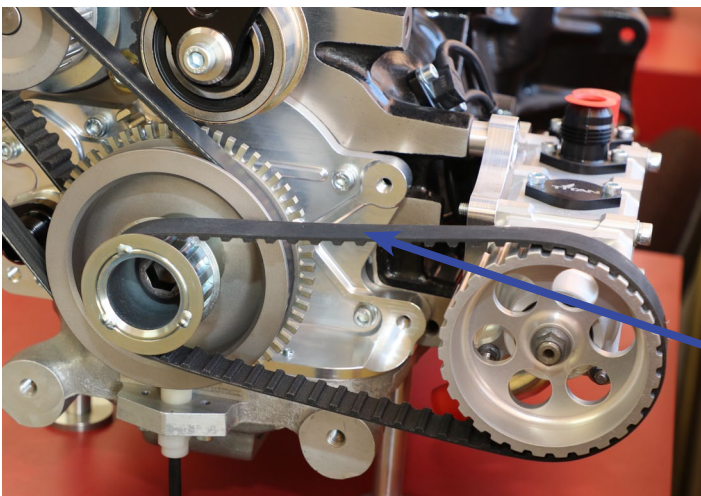
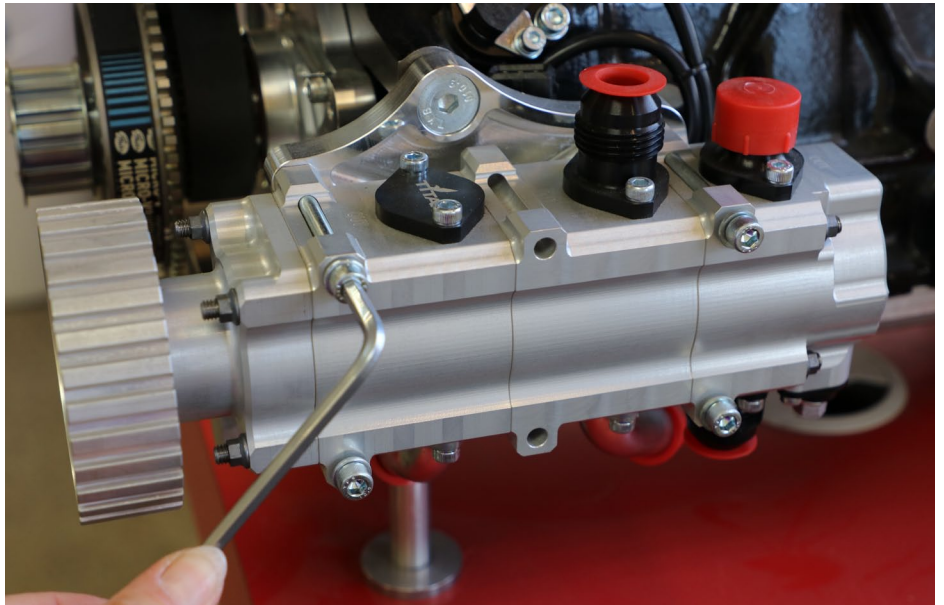
The pump mounting plate can be adjusted with the use of washers behind the black spacers which fit into the recesses on the back of the mounting plate





Once you have obtained the correct position for the pump, fit the pump and bracket using Loctite 243 for the final assembly.

Bolt on the dry sump pump using the bracket, spacers and bolts provided.



The belt doesn't have to be put under any tension, there should be about 5mm play up and down.

## Fitting the hoses



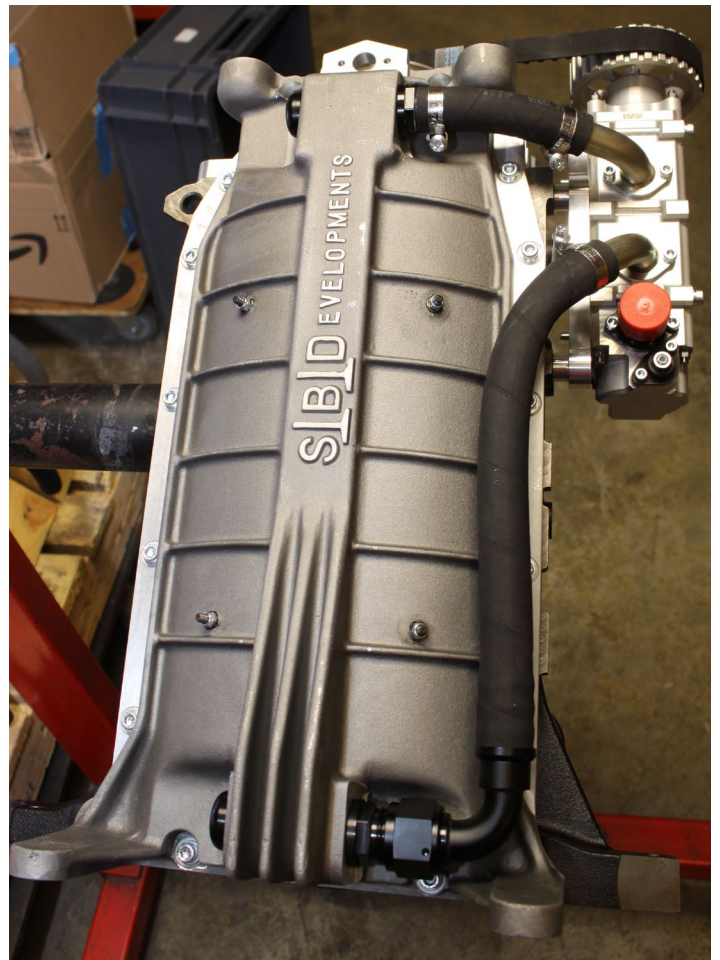
The couplings on the pump are adjustable to make fitting hoses easier. Loosen the bolts holding the couplings in place and the coupling will twist in to the required position. It is not necessary to remove them completely, the pictures shown above are for information only.



The pipes are pre-cut to the required lengths.

Fit the hoses in and use the jubilee clips to secure the hoses in position. They do not need to be excessively tighten as the pipes are under vacuum and after a short period of use they will normally seal themselves tighter on to the fittings.

If you are replacing the scavenge hoses make sure there is enough overlap and also use new jubilee clips.



It is recommended that the bottom of the dry sump tank is level with the bottom of the sump. This is because when a car is stored for any period of time, the oil will automatically drain to the lowest level. It will slowly pass through any gear system over time and the level in the engine and the oil tank will equalize. So if the oil tank is higher than the engine, effectively all the oil will drain into the engine and there will be no oil available to give oil pressure until the scavenge pumps have returned the oil from the engine to the tank. This could obviously create damage if this condition occurs.

Taps or valves should never be used because they can be forgotten and left turned off, they can also create a restriction in the oil flow from the tank.

## **Important Notes**

We recommend that the oil cooler, if required for your installation, is fitted into the -12 return line to your oil tank (size and type depend on installation and use).

SBD dry sump systems (car based engine) have never run any breathers.

Please see separate information sheet 'Dry Sump System Level Information re SBD Dry Sump Tanks' for details about filling your system with oil and the recommended oil levels.

## **GM Vauxhall/OPEL XE Engine Oil Recommendation**

The information within this data sheet is built from our experience, this is intended as a guide but the customer must be aware that there may be scenarios where an alternative is more suitable, we cannot foresee all eventualities and applications.

See separate sheet for new engines which require "running in", this sheet is intended for engines which are ready to be run on fully synthetic oil.

### **4 Cylinder GM Vauxhall/OPEL XE Competition Engines**

#### **OIL-EN-SO-5W40-XR-5L**

This oil is able to offer protection your engine even at high oil temperatures. The engine block on a XE is made of cast iron so has virtually no expansion with heat, but as oil temperate rises the viscosity of the oil will reduce. We have carried out extensively testing on the dyno and on our own race and test cars, SORT have carried out formula changes to the oil during the testing period on the dyno and this is now our recommended engine oil manufacturer.

#### **Advised oil temperature range**

*(Always monitor Oil temperature it is dangerous not to)*

Min 60C

Max 125C

Optimal Oil temp 80C to 100C

#### **Advised oil pressure range**

Set PRV to achieve 65-85psi when oil is at running temperature and engine revs are between 3500rpm and Max revs.

Idle pressure is a result of Oil viscosity and temperature, expect between 25-35psi and NOT adjustable with PRV.

Remember that as the oil temperature rises the oil pressure will drop. In order to get an indication of the condition of the bearings in your engine, always monitor and compare oil pressures at the same temperature. If you notice a drop in oil pressure compared to what was seen previously, then the engine needs inspection. DO NOT adjust the pressure relief valve setting; you are only hiding a problem and the engine will fail!

#### **Please note:**

It is very costly and time consuming to test various oil manufacturers products, we have seen good results with SORT products and as such would always advise the use of the oil as listed in this information sheet, please do not ask our opinion on other oils which we have not tested or used.

***Please be aware that Technical Support involving our Technicians is chargeable***

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