SBD/Titan Duratec Dry Sump System Instructions
OS-DSDK-DURATEC-1-IN-A & OS-DSDK-DURATEC-2-IN-A

Instructions are the same for both full trough & twin trough systems despite pictures being shown using a twin trough sump pan.

OS-DSDK-DURATEC-1-IN-A
Twin trough, suitable for Escorts & cars with crossmembers.

OS-DSDK-DURATEC-2-IN-A
Full trough, suitable for Westfields, Caterhams & cars without crossmembers

Duratec Dry Sump Bolts

Included in Kit:
Sump
Cap Head M8 x 25 x 13 off

Front Cover bolts
Cap Head M6 x 25 x 4 off

Pump Mounting Plate
CSK bolts M8 x 35 x 4 off

Pump mounting
Cap head M6 x 75 x 4 off

Not included:
ARP Crank bolts
Please read these instructions carefully before you attempt to fit the dry sump system, particularly the section on keyed and non-keyed crankshafts

NOTE
When using an SBD part number: BLT-MK-STUD-DUR-2.0L, ARP main stud kit.
It may be necessary to trim the end of the studs to clear the oil scraper plate used in this drysump system, please carry out a dry build to check whether this affects you.
Our recommended machining for the studs is as follows;
1. Shorten each stud by 2mm from the Allen key fitting end
2. Then machine a 65° chamfer to the edge, finishing at the Allen key detail

When using SBD part number: BLT-CRK-DURA-ARP, heavy duty crank bolt.
This ARP Heavy Duty crank bolt for Duratec based engines can be used as an upgrade for a standard engine and pulley arrangement, or for an engine using an external drive Drysump system;
Please note the following:
1. Discard the supplied washer when being used with an SBD Drysump crank pulley as this equates to the thickness of the washer.
2. The washer must be used on a standard (wetsump) pulley setup, otherwise the bolt will bottom out before the correct preload is achieved.
Torque setting:
ARP Lube under head of bolt and washer
Final - 145lbft (ARP Ultra Lube)
Take care to check bolt engagement if you have a combination of parts different from those listed above.

Remove the standard oil pump.

Replace the front cover.
Put Loctite 5910 Silicone Sealant all round where the sump pan connects to the engine block.

Ensure all faces are clean.
Bolt the dry sump pan to the block using M8 x 25mm cap head bolts.
Torque setting - 18lbft (20NM) torque and use Loctite 243

Bolt the bottom of the front cover to the dry sump pan using cap head M6 x 25mm bolts.
Torque setting - 4lbft (6NM) torque using Loctite 243
Keyed & non-keyed Crankshafts

It is recommended for strength and reliability that you have your crankshaft machined to accept a 3mm key. This helps to improve the strength and alignment of all the bottom end components. We can machine your crankshaft for you or if buying a steel crankshaft from us, it will already be keyed. You can also purchase the new sprocket CRK-PLY-DURA-K that includes the original cam chain drive and oil pump drive gears, this has the key machined into it.

Also by using our trigger wheel, part number PLY-MV5TW-36-1, this is for the 2.0L/2.3L version, the 2.5L and some 2.3L versions use a larger diameter trigger wheel, please refer to our website for further information. This pulley/trigger wheel unit has the key machined into it and is made in one piece overcomes the problem where the standard trigger wheel can sometimes fall off. It also has the added advantage of a reduced diameter vee belt drive which prevents overspeed of the alternator and mechanical water pump.

If you intend on using your engine with a non-keyed crankshaft, you will need to purchase the alignment tool kit from either Ford or a motor factor and follow their instructions to ensure re-alignment. If you are running standard camshafts, you will still require the alignment tool to ensure that the cams are aligned correctly using the tool in the back of the camshafts.

Attach the dry sump pulley and bolt in to position using an ARP crank bolt and ARP lube under the head of the bolt and on threads (if replacement bolt is ever used discard the washer).

Torque setting - 145lbf ft torque

Attach the trigger wheel, shown is our PLY-MV5TW-36-1 and the crank sensor.
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 off 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.
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.
Trial fit the hoses and cut to the required length. Quite often they are supplied at the correct length but if you have issues with chassis components, you may need to trim or alter the hoses to suit.

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.
The oil in plate allows the oil to be fed from the oil pump into the engine. You will need to add a remote filter head to suit your installation, this will depend on your final plumbing and desired positioning.

Oil pressure can be taken from the remote filter head or an in-line adaptor can be added between the remote filter head and the oil in-plate.

Contact SBD Motorsport for more advice.
There is also an option for an oil in-plate and oil filter combined but this is normally only suitable for engines that do not have side engine mountings. There is a picture at the back of the instructions that shows an example.

To fit the oil in-plate, you will need to fit the 2 o-rings to the recesses in the back of the oil plate using a little engine oil or light grease, this will hold them in position during assembly.

Put the o-ring on the coupling using a little engine oil or light grease.

Insert the -10 coupling into oil in-plate. You should then plumb your oil system using -12 oil hose to and from your oil tank.

The tank itself must have a minimum capacity of 5 litres (the whole oil system may contain considerably more than 5 litres).

Fit the oil-in plate to the engine using M8 x 25 cap head bolts using Loctite 243, torque setting - 15lbft (20NM) torque.
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.
Oil Recommendation for Ford Duratec Competition engines

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.

2.0L/2.3L/2.4L/2.5L 4 Cylinder Duratec Competition Engines

**OIL-EN-SO-5W40-XR-5L**
This oil is able to offer protection and retain good viscosity even at high oil temperatures, this is critical as the Duratec has an Aluminium engine block and as such main bearing clearances will grow dramatically with temperature. 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**

SBD Motorsport Ltd
Unit 15, Red Lion Business Park, Red Lion Road, Surbiton, Surrey. KT6 7QD
Tel: 020 8391 0121
Website: www.sbdmotorsport.co.uk

---
1. Oil pressure should be set to 65 psi when engine is hot and RPM is at 2000.

2. Oil supply should be JIC-12.

3. Use straight couplings where possible or if swept couplings are needed, only use swept ones. DO NOT use forged ones.

4. Pressure to engine should be JIC-10.

5. Scavenge pipes are push on 3/4" ID.

**Notes**
- Remote filter head can be right to left or left to right. Must use the correct filter housing. You CANNOT just swap the pipes around.

**2.0L Duratec SBD Dry Sump System Connections**

- Scavenge from engine sump pump
- Supply from bottom of dry sump oil tank
- Pressure relief valve
- Lock nut
- Scavenge from oil tank & return to oil tank should be JIC-12
- Pressure to engine JIC-10
- Supply to pump from oil tank & return to oil tank should be JIC-12
- Pressure relief valve
- Adjust here, see note 1

**Pressure Line**

**Remote Filter Head**

**Oil Cooler (if fitted)**