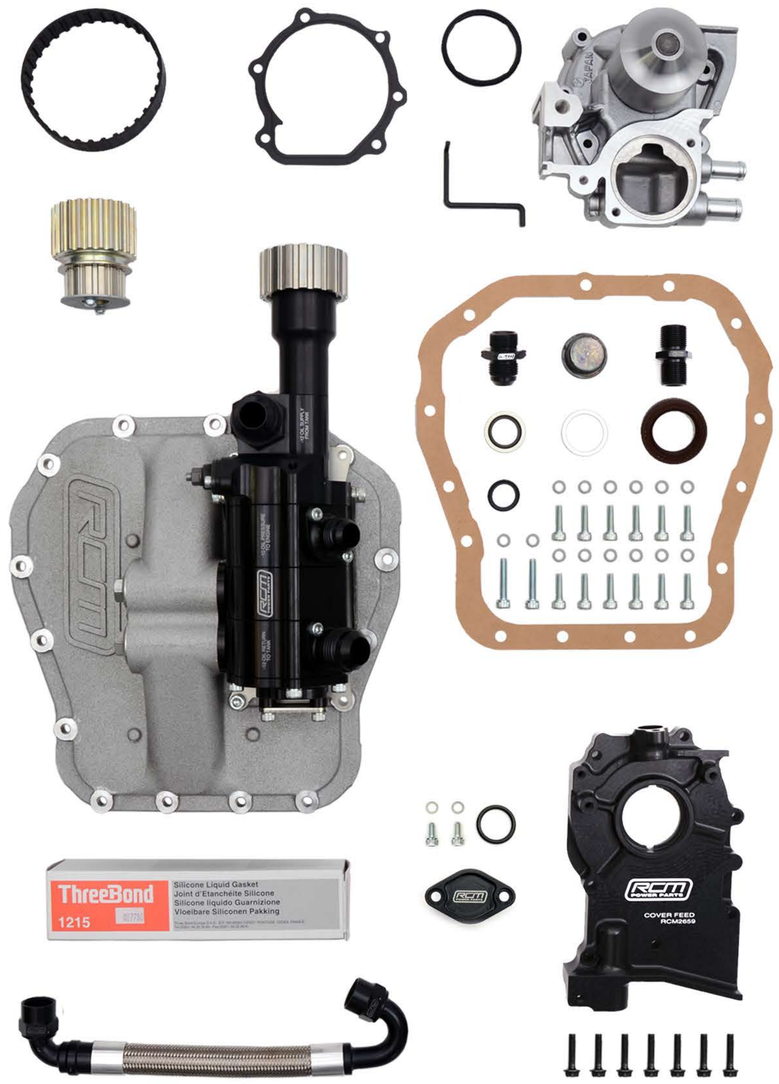
RCM DRY SUMP SYSTEM

We recommend reading our fitting instructions in full prior to beginning installation

1x RCM oil pan fitted with scavenge filters & windage tray.
1x 3 Stage oil pump.
1x Dash 10 Oil feed pipe & fittings
1x RCM combined toothed cambelt idler & oil pump drive pulley (replaces OEM toothed idler).
1x Drive belt.
1x RCM Oil pump replacement cover.
1x RCM Oil pump replacement cover male / male feed adaptor
1x M22 Dowety seal
1x Front crank oil seal
1x Oil pump cover "O" ring
7x RCM Oil pump replacement cover bolts
1x Tube of 1215 Sealer (sump & pump cover)
1x Oil pan gasket.
1x Male / male oil cooler modine delete adaptor
1x Cylinder block water gallery blank
1x Cylinder block water gallery blank gasket
1x Water pump
1x Water pump gasket
1x Water pump casting seal
1x Thermostat seal
2x M6 x 30mm cap head screws.
6x M6 x 12mm cap head screws.
12x M6 x 20mm cap head screws.
20x M6 lock washer
1x Timing belt cover modification template.
1 x Oil filler neck blanking plate & cap head screws



Installation:

The operation of the RCM dry sump system relies on it being correctly plumbed in with the components supplied in the kit, in conjunction with a suitable good quality tank.

Key Kit Components:

- Oil Supply line from Tank - De-aerated oil from the base of the tank is drawn along the oil feed line to the inlet of the high pressure stage of the pump. This is marked on the pump as "-12 Oil supply from tank". The line should be a minimum of -12 JIC (3/4") but for long lines -16 (1") may need to be considered.
- Oil Pressure line to Engine - (Cover Feed)- Oil from the high pressure stage of the pump is fed to the oil pump replacement cover, directed through the block via an internal oil gallery to the oil filter, then into the engine at system pressure. -10 JIC (5/8") is used. This is marked on the pump as "-10 Oil Pressure to Engine".
- Oil Return line to Tank - Oil and air scavenged from the oil pan is fed along this pipe at low pressure to the oil cooler and then back to the top of the oil tank. A -12 JIC (3/4") line is used. This is marked on the pump as "-12 Oil return to tank".
- Oil cooler - An oil cooler of suitable size for the application must be used in the return line.
- Oil Tank - This acts as the reservoir for the oil and is also used to separate air from the oil once returned from the engine.
- Breather lines - The engine breathes into the top of the dry sump tank, allowing any oil to be separated. X2 -8 (1/2") lines from each head joined together and a single -8 (1/2") line from the block breather. The dry sump tank then vents to atmosphere.

Oil Tank notes:

The oil tank is a key component of the dry sump system, but does much more than just store the oil. The oil returned to the tank will be highly aerated especially when oil temps, RPM and cornering forces are high. The oil tank therefore is used to separate the air from the oil and let it escape via the oil tank's own breather. Dry sump oil tanks use a fast swirling action combined with a baffle plate. The swirling motion uses centrifugal forces to separate the bulk of the air, and the baffle plate then helps smaller bubbles propagate out of the thin layer of oil running over it.

ALL DRY SUMP TANKS REQUIRE A VOLUME OF AIR TO FUNCTION PROPERLY!

This means that you can easily overfill your oil tank. The correct level for most dry sump oil tanks is just below the top baffle plate when the oil is hot and the engine is running. In some cases oil levels will need to be slightly higher when static in order for it to be correct when used in track or racing conditions. Typically when using the RCM Dry Sump System with the RCM tank supplied, around 8 litres of oil would be required.

Prime engine with pump only:

- The oil system can be primed without turning the engine. To do this ensure the drive belt has NOT been fitted.
- Ensure system is correctly plumbed in, and oil is present in the oil tank at the correct level.
- Using an air ratchet or battery drill with a 12mm socket you can carefully drive the dry sump pump clockwise. DO NOT USE IMPACT GUNS.
- After around 15 seconds you should see oil being recycled through the system. Oil returning to the tank is visible through the dry sump tank oil filler cap when removed.
- Re Check the oil level once the above procedure has been completed.

Fit drive belt:

- You can fit the drive belt by sliding it on without the flange in place.
- Once the belt is fitted, place the flange on the drive pulley and secure with two M5x35 cap head bolts, fitted with mild threadlock.

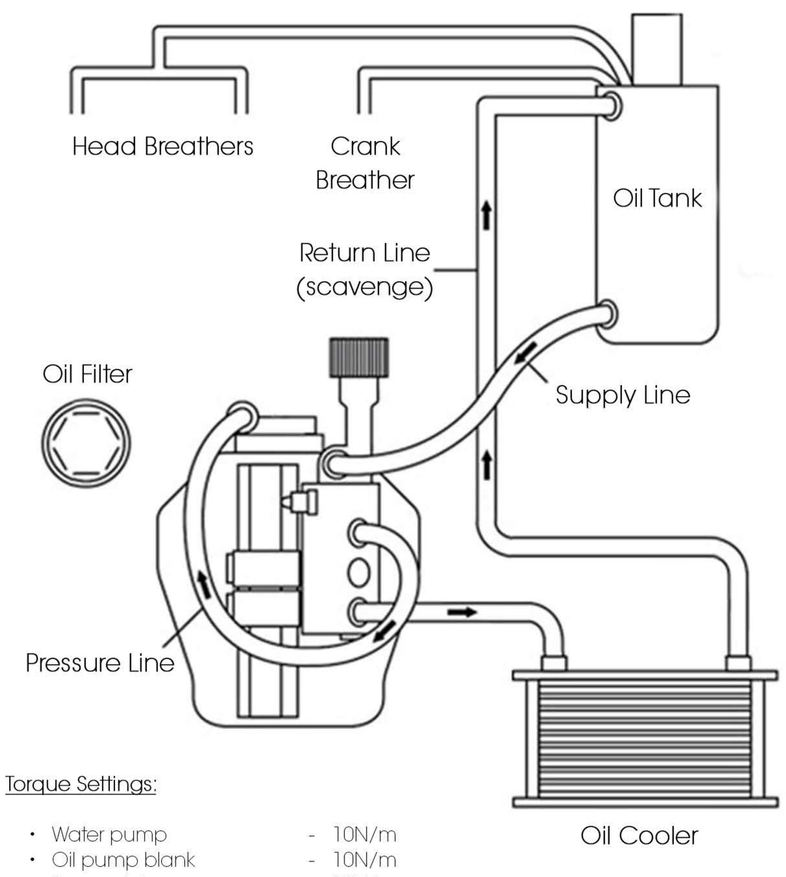
Final checks:

- Dry crank the engine, check the drive belt runs true and that oil pressure is present.
- If oil pressure is present, start the engine and let fast idle; ensure oil pressure is at least 3 bar at low speed; if not stop engine immediately.
- Use the following guidelines as a starting point for optimal oil pressure.
  - 1200rpm - low idle 4 – 7 bar cold 2 – 3 bar hot
  - 2500rpm - fast idle 5 – 8 bar cold 4 – 5 bar hot
  - 6000rpm - N/A cold 5 – 6 bar hot
  - 7500rpm - N/A cold 5.5 – 6 bar hot
- Setting the oil pressure for your particular engine is an essential part of the overall installation. You can adjust the threaded preload screw on the side of the oil pump (with locknut). As a starting point we would recommend having 3.5mm of exposed thread sticking out past the lock nut on the adjustment screw.

Ideal oil pressure recommendations:

- Your final oil pressure should be determined using the oil you intend to use. The nature of the dry sump system means less oil pressure (compared to a normal wet sump systems) is required to ensure good oil supply throughout the engine. Wet sump systems suffering from low oil pressure due to surge, they do so because the oil is full of air bubbles. This foamy oil is not good for bearing life, as such, constant oil pressure on a dry sump system is ensuring good quality oil to the engine at all times.
- With your chosen oil, you should be able to get the oil temperature up to around 90°C and check the pressure at 7000rpm. We recommend a minimum of 5 bar and a maximum of 7 bar. Most applications should target 6 bar at 7000rpm with hot oil.
- Recommended Oil Type – We recommend Motul 15W/50 V300 or Castrol Edge 10W/60.

Pipework Installation:



Torque Settings:

Water pump	-	10N/m
Oil pump blank	-	10N/m
Sump plate	-	10N/m
Oil pump to sump plate	-	10N/m
Oil filter adapter	-	40N/m
Male/male cover adaptor	-	40N/m
Toothed drive pulley	-	35N/m
Drive pulley guide plate	-	8N/m

FAQ

- Where can I put the oil tank?

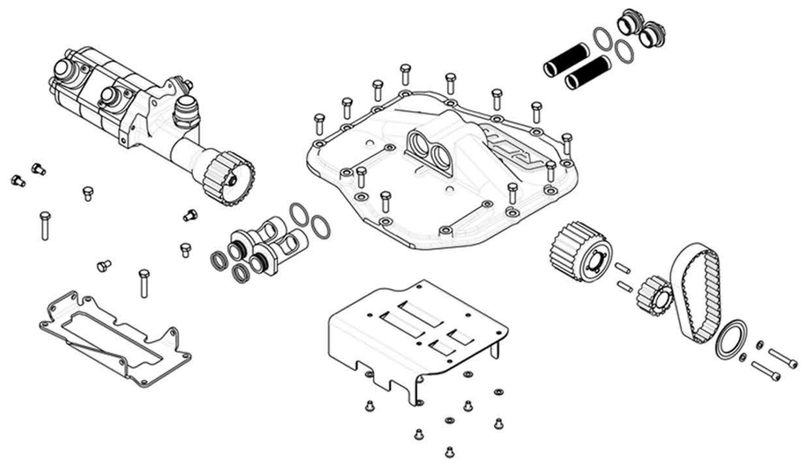
  The oil tank can be located anywhere within the car. The oil tank we provide in our under bonnet installation kit option (RCM2670) is designed to fit in the engine bay of RHD vehicles. However, with the correct hose sizing, our in car split oil tank (RCM2041) can be used pretty much anywhere in the car. We have proven examples of engine bay, passenger foot-well and boot mounted systems.

- How often should the belt be replaced?

  There is relatively little load on the belt, but we would recommend replacement once a year, or sooner based on periodic inspection of the belt.

- Are there any other parts that wear or require periodic maintenance or replacement?

  The pickup filters in the sump pan should be cleaned periodically.
  Pump drive pulleys inspected for wear and replaced as necessary.
  Pump drive belt inspected for wear and replaced as necessary.
  Oil pump nose bearing can become dry and require replacement if used in front-mounted turbo installations where surrounding heat is very high.



All I ask of my performance parts is that they get me to the finish, and in first place.....