



**2000 OHC Drysump (cont.)**

Belt 187L x 050	S19BS
Belt 210L x 075	S19B
Belt 225L x 075	S19BL
Pump Rotor (specify Pace or Titan)	S19R
Pump Shaft (specify Pace or Titan)	S19S
Pump Seal Kit (specify Pace or Titan)	S19K
Pressure Relief Assembly (specify Pace or Titan)	S19PR
Flange Fitting AN-8 (specify Pace or Titan)	AFAN8
Flange Fitting AN-10 (specify Pace or Titan)	AFAN10
Flange Fitting AN-12 (specify Pace or Titan)	AFAN12
Flange Fitting 1/2 BSP (specify Pace or Titan)	AFBS8
Flange Fitting 5/8 BSP (specify Pace or Titan)	AFBS10
Flange Fitting 5/8 push-on (specify Pace or Titan)	AFST10
Flange Fitting 3/4 push-on (specify Pace or Titan)	AFST12

**Dry Sump Tech Info**

Dry sump systems may seem overly complex at first, but they are really quite simple in operation. Basically the idea is to be able to evacuate more oil from the engine than can be delivered. This keeps the crankcase or sump "dry" and reduces the amount of oil being whipped up (windage) giving more power and cutting down on crankcase pressures. Generally this is achieved with a double pump which has a larger scavenge section than pressure section. Most racing pumps will have an adjustable pressure relief valve which will allow accurate setting of the oil pressure to compensate for temperature and wear. Some pumps such as those used on the 2000 OHC engines have two scavenge sections to increase the scavenge volume. These pumps must be used with a sump which has two oil pick-ups, and conversely a sump with two pick-ups must be used with a twin scavenge oil pump.

Dry sump pumps for engines based on the Ford push-rod blocks such as Formula Ford, Twin-Cam, BDA, MAE etc. are generally either mounted on the side of the engine and driven by skew gear off the camshaft, or are front mounted and driven directly off the nose of the camshaft. Side mount pumps are very compact and require no additional clearance in front of the engine (they must be used on Twin-Cam and BDA engines). However, the skew gears are costly in terms of power absorbed to drive the pump. Front mounted pumps are popular on engines which lay over on their sides such as an MAE and they allow the use of very large scavenge sections because they are driven by roller chain from the nose of the camshaft.

2000 OHC Engines use dry sump pumps driven by a reinforced toothed belt and mount along side the engine in various locations. All of these systems use a three stage pump with two scavenge stages and a twin pick-up pan. Not all of these pumps use the same pulley sizes, but all use the same pulley ratio of 1/2 crankshaft speed in order to drive a tachometer gearbox if necessary. Naturally a twin scavenge belt driven pump has the potential of becoming quite a bulky assembly, but recent developments have resulted in much more compact and efficient designs.

In operation, oil drawn from the engine sump is then sent to a holding tank usually by way of an oil cooler. Since the oil is a frothy mix of oil and foam, the oil tank should be designed to de-aerate this oil and maintain a solid head of oil ready to supply the engine. There

should also be a breathing space provided in the tank and provision to vent this space to a catch can. The pressure stage of the pump will then draw de-aerated oil from the bottom of the oil tank and supply this oil under pressure to an oil filter. From here the oil will be delivered to the engine's main oil galley. Another option would be to fit the oil cooler after the oil filter on the return, the theory being the de-aerated oil will cool more efficiently.

The most efficient oil pumps are of the Gerotor type as opposed to the simple gear pump. Gerotor pumps move more oil for their size, and more importantly they aerate the oil less than the gears on a gear pump. To maintain this efficiency the internal running clearances in the pump must not be too great or else there will be a dramatic pressure drop. In normal conditions a pump will wear very little if any

at all, but should an engine experience some sort of internal failure a lot of gritty oil can pass through the pump very quickly and serious damage can result. Fortunately, oil pump components, rotors, and overhaul kits are available from us which will allow you to service or even reclaim a substandard oil pump.

We have basically two types of dry sump pans available. These pans are either fabricated from sheet steel or cast aluminum. The sheet steel pans have the advantage of being less expensive and more durable, but many later cars are using the sump as a structural chassis member and thus a special cast aluminum pan with bosses

to accept chassis mounting may be required. These light alloy pans usually have a removable windage tray which makes them easier to clean. Any good sump should have an internal screen to trap any debris which would otherwise be sucked into the pump. All of our sump pans have externally removable filter screens which can be easily cleaned and replaced.

When starting a dry sump engine for the first time after engine installation it is essential to ensure that there is unrestricted oil flow through all oil lines. This means no kinked or crushed hoses. With the oil tank filled oil should issue freely from the hose end which provides oil to the pressure-in side of the pressure pump stage. If the tank is located far from the engine as on some older cars with front mounted oil tanks it often helps to raise the front of the car a couple of feet when cranking the engine over to establish initial oil pressure.

