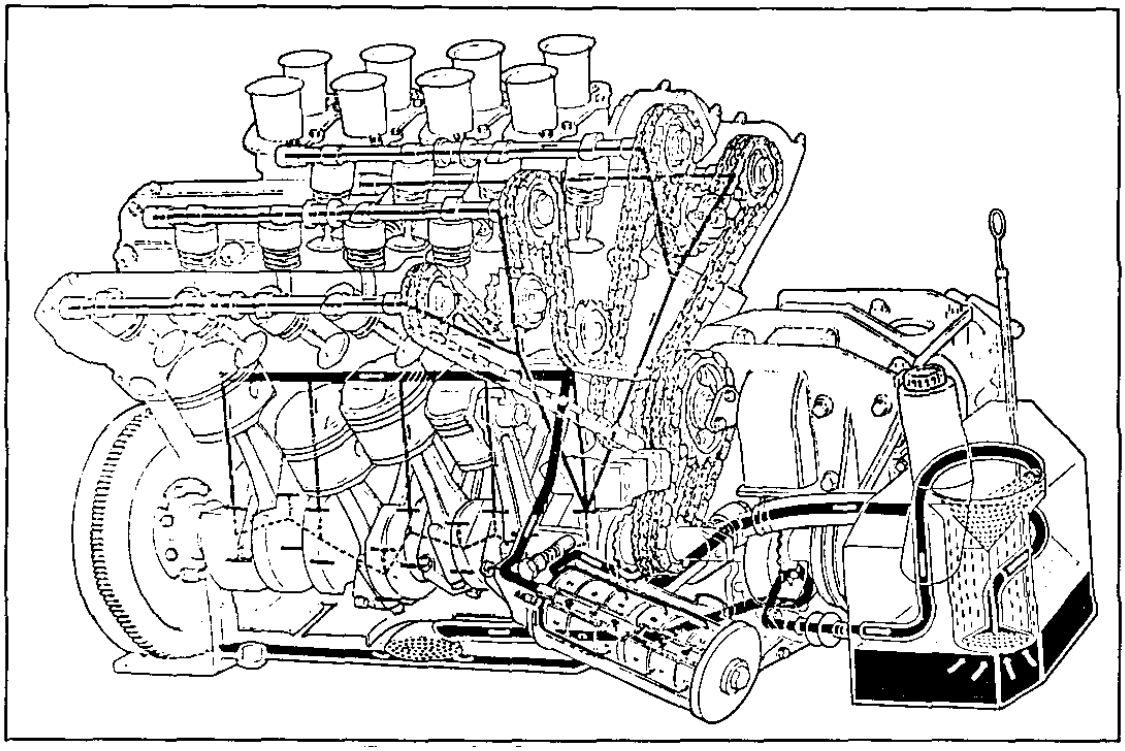
Ghibli Dry Sump Lubrication

By Chuck Sturnburg FALL 1991

Pressure lubrication for all of the Ghibli engine main parts is by two concentric gear pumps on the front of the crankshaft. The pressure pump pulls oil from the separate tank in front of the engine and, after a complete passage through the filter, sends the oil to the parts to be lubricated. The scavenge pump recovers oil from the engine sump and sends it back to the tank. This pump has a greater capacity than the pressure pump so that no significant quantity of oil ever accumulates in the sump. The solid and dashed black lines in the following diagram show the oil system. (This diagram shows the heat exchanger which was mounted until early 1970. Later cars had a normal spin-on filter in the same position.)



Engine Oil Circulation Diagram

When an oil change is performed on a Ghibli dry sump engine, both the sump (pan) and the oil tank are drained along with the heat exchanger that holds the filter cartridge. There are about sixteen quarts of oil in the system.

After installing a new filter element and replacing the drain plugs in the tank and the sump, the oil tank should be filled with 20W-50 oil up to the top line on the dip stick. Replace the dip stick and the oil cap before starting the engine or else oil will be discharged from these openings.

Start and run the engine briefly to get oil throughout the system. Stop the engine.

and add several more quarts of oil to bring the tank level up to the top mark on the dip stick. Make sure that the oil tank cap and the dip stick are firmly in place before running the engine or driving the car. Failure to have the dip stick in place while the car is driven will cause enough oil to be blown out of the dip stick tube to cover the engine compartment and get onto the exhaust manifolds, causing a trail of blue smoke after about 15 miles of driving.

When the oil level is to be checked, have the car on level ground and let the engine idle for a few minutes. Stop the engine and check the oil level with the dip stick. Add oil with the engine stopped.

With so much oil in the system, it's easy to assume that being down a couple of quarts is no big deal. Wrong! The scavenge pump picks up a lot of air with the oil in the sump, and the resultant froth is pumped into the tank. Yeah, it dribbles through the screen funnel which helps separate the air from the oil, but some air probably slips through. Quite some time is required for this air to bubble out of the oil in the tank. If the oil level in the tank is too low, the pressure pump will try to lubricate the engine using oil with this entrapped air. Since the air compresses, the result will be low oil pressure, and the possibility of engine damage. This is especially so when the oil is cold. All of that oil in the tank is to provide time for the entrapped air to escape, not as a gigantic reserve.