

The air temperature may be quite high for an instant, but because the mass of air in the supercharger at a vacuum of 24 inches is small, the heat doesn't damage supercharger parts. However, it can melt the grease in the bearings. (This doesn't occur with the centrifugal supercharger because the throttle is after the blower.)

Depending on its size and throttle opening, up to half the airflow can pass through the bypass valve rather than through the blower. Although it might seem that on each cycle it would send progressively hotter air into the supercharger, this doesn't occur, because the heat of compression is lost when the air expands in the manifold. Regardless of the heat reduction on expansion in the manifold, the process is not completely reversible. Therefore, some work is actually lost. The bypass valve for a twin-screw supercharger is the same as for a Roots; see

Rear bearing grease and seal issue.

Lubrication

Some twin-screws enjoy the option of being pressure-fed with lubricant from the engine or carrying their own oil in an onboard reservoir. The simplest approach is to use the onboard reservoir and top it up periodically as required. Because the oil is slowly depleted in operation, this may not prove the most reliable path for the neglectful maintenance person. Topping up the oil should be considered a 2000-mile necessity.

Pressure-feeding the gears with engine oil provides a substantial benefit for forgetful operators. The somewhat more complex requirements of oil feed and drain lines should not influence the installer/designer, who should do what he feels best suits the circumstances and objectives of the vehicle and its user.

The pressure-feed requirements can easily be met with standard engine oil pressure, as the only requirement is maintaining a given level in the gear case. Standard engine oil, either mineral or synthetic, is entirely satisfactory. An oil-flow metering orifice of approximately 0.025–0.030 inch diameter, supplied with the Autorotor, must be installed at the entry to the supercharger gear case. It permits an oil sump to be maintained in the supercharger's gear case at all times but prevents engine oil pressure from filling up the gear case and pressing past the seals.

One of the access holes in the case is used for the oil feed. One of the two lower holes is used for the oil return to the crankcase. One of the two higher holes is vented to the throttle inlet, the same as a crankcase breather, or to the valve cover. The breather can also run from the pulley extension bearing (if there is one) to the engine's breather. The fourth hole is plugged. The threads in the gear cover are British Standard Pipe; plugs are available from fastener supply companies like Wilson or Goodridge, which can be found in the suppliers list at the end of the book.

Fig. 7-7: The Autorotor enjoys the option of being pressure-fed with engine oil. An oil-flow metering orifice must be installed at the entry to the supercharger gear case. The gears and bearings are lubricated by splash as the outer edge of the larger gear passes through the sump. Excess oil flows out the drain line and returns to the engine.

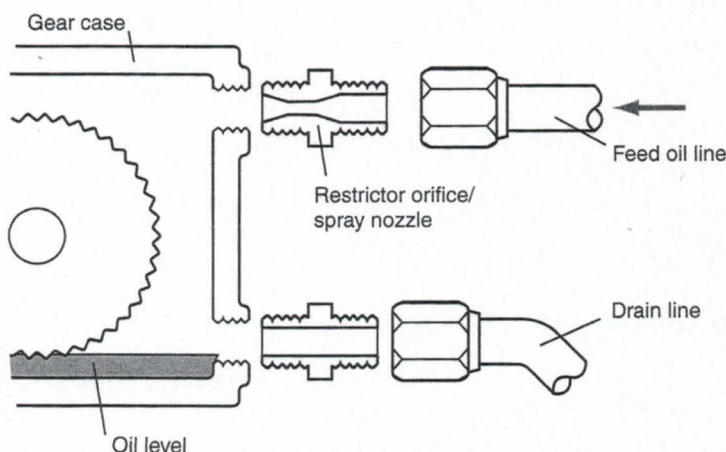


Fig. 7-6: The Autorotor enjoys the option of being pressure-fed with engine oil. An oil-flow metering orifice must be installed at the entry to the supercharger gear case. The gears and bearings are lubricated by splash as the outer edge of the larger gear passes through the sump. Excess oil flows out the drain line and returns to the engine.

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