GEOMETER deals with the problem of retaining lubricants under speed and load

Felts and oil seals

RETAINING lubricant in bearings and casings of engines and machines is a problem that can be solved in various ways depending on such factors as type of lubricant, speed and loading of bearings, heat to which lubricant and assemblies are normally subjected. With the advent of wear, the problem eventually recurs for users in a large number of cases-or earlier if recommendations are neglected or disregarded, or working conditions become severe.

Avoidance of trouble often depends on adhering to a suggested type of lubricant or indicated quantity if it is oil. Another type, or a larger quantity, may lead to escape and further trouble-such as if instead of high melting point grease, the ordinary variety is used to pack bearings of magnetos and dynamos, or a car rear axle is filled with the wrong oil, or over-filled-when the escape will be on to the brakes.

Heavier loadings on bearings, or faster speeds with increased heat, may also occasion escape of lubricant where none has occurred before. Thus, in the case of car hubs, a long fast journey on a hot day is much more likely than local ambling to and fro to reveal shortcomings in sealing which may be evidenced by traces of oil and grease radiating from hubs to wheel rims.

Important considerations for a soft seal are resilience and flexibility to grip the shaft or component where relative movement occurs, and imperviousness to the lubricant retained. If the seal is hard, a small crescent-shaped gap appears with slight wear or wobble, and is sufficient to allow considerable leakage over a period-a fault that may occur with some synthetic seals.

Ordinary rubber is unsuitable for sealing oil and grease because of their softening action on it. Leather may be effectively employed but not in the simplest installations because of a tendency to split if stretched, and a lack of continued resilience to compress unless aided by a spring device. Felt, however, as a ring or strip, possesses the necessary qualities for many simple installations.

In a plummer block for line shafting, as at A, a felt may be used each side to retain the medium grease employed-the seals fitting in tapersided grooves machined in base and cap. In assembly, the seals can be complete rings pushed on the shaft, then the base and cap can be clamped about them and the bearing. In repair, when it is inconvenient to remove more than the base and cap, strip felt, cut long enough to compress and with the joint brought to the top, can be used.

In the end of a casing, as at ***B,*** a felt seal may be in a recess and kept from contact with the bearing by a steel washer, itself dished for clearance against the revolving centre. In assembly, the felt goes first, followed by the washer and bearing. To avoid disturbing a fitted bearing, however, a worn seal can be picked out with a pointed tool, the new one worked in from the bore and seated by entering the taper shaft.

In a motor-cycle wheel hub, as at C, the felt seal may be in a recess in the locking ring holding the bearing. Then an end cap keeps the seal in place, and can be prised off when renewal or dismantling may be necessary.

In the timing-case-sump joint of Morris and other engines, a special graphited asbestos seal bears on the boss of the crankshaft pulley, as at ***D.*** The material is rather hard, and care is required in fitting; if the halves are long, a gap may exist at the joint faces; if the halves are short, gaps can be left in the seal.

A modern type of knife-edged or lipped seal with wide applications as in hubs may be of leather or synthetic material with an encircling coil spring to compress it, the whole in a metal housing easy to fit-which must always be with the lip towards the bearing, as at ***E***.