

ABSTRACT
GYROSTABILISERS

A vacuum chamber assembly 10 of a gyrostabiliser houses a flywheel 11 in a housing 13 of a vacuum chamber 12 or flywheel chamber. The housing is pivotally mounted on precession bearing stubs 14 and driven by precession damper or actuator mounts 16. The flywheel 11 is on a flywheel shaft 19 located relative to the housing 13 by upper spin bearing 21 and lower spin bearing 23. A lubrication oil circuit and an air circuit are leakage tolerant, enabling oil leakage from the bearing chambers into the vacuum chamber to be purged back into the oil circuit. Seals 33, 34 between the bearing chambers 22, 24 and the vacuum chamber 12 to allow bearing chambers to be at a different pressure to the vacuum chamber and to prevent free flow of lubrication oil into the vacuum chamber. Oil is pumped from an oil reservoir 36 by a supply oil pump 37 through a filter 38 and then an oil cooler or heat exchanger 39. Oil exits the heat exchanger and the flow is then split between a conduit 50 towards the upper spin bearing chamber 22 and a conduit 51 towards the lower spin bearing chamber 24. Cooling the oil before it passes through and around the spin bearings helps to cool the spin bearings at the point of heat generation and provides cooling not possible with grease lubrication. The oil reservoir can also act as a passive cooling tank.

Fig. 1