

A HYDROSTATIC TRANSMISSION FOR A RAILWAY PASSENGER VEHICLE

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British Rail's fleet of suburban rail vehicles is due for replacement in the next 5-10 years. A new generation of diesel powered units is required, and these units should have a low first cost and be inexpensive to run and maintain. The purpose of this hydrostatic transmission project is to investigate an alternative to traditional designs. These consist of a fluid coupling, freewheel unit and four speed epicyclic gearbox mounted on the vehicle underframe (or in some instances a torque converter). A final drive gearbox with forward-reverse selection is mounted on the driven axle and driven by a cardan shaft. This type of transmission is specially designed for railway applications, so total sales are low with resultant high cost. The epicyclic gearbox also suffers from poor power utilisation during acceleration.

A hydrostatic transmission using standard industrial parts has been designed for a passenger carrying railway vehicle. This offers improved power utilisation as well as a reduction in axle weight.

A vehicle has been fitted with the prototype transmission and running trials have confirmed the predicted performance and demonstrated it to be a practical proposition. The design and performance of the transmission is discussed together with areas for further development, notably the motor/axle assembly.