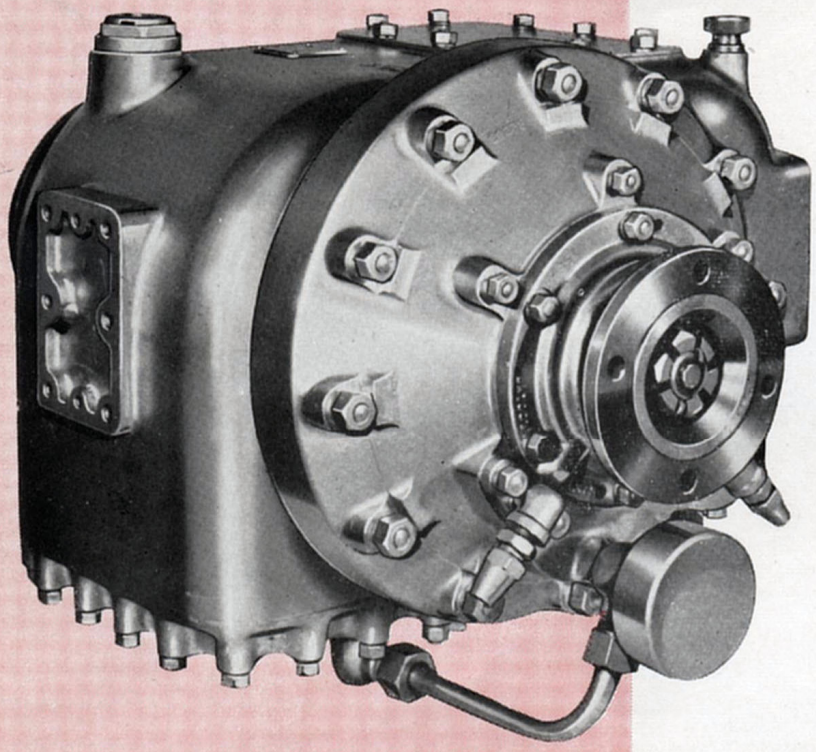
AIR-OPERATED

RAILCAR GEARBOXES



5-SPEED GEARBOX
TYPE R.11B

TYPE R.11 FOUR-SPEED & FIVE-SPEED UNITS

This gearbox in its various forms has been designed for use in railcars and shunting locomotives. It is a change speed gearbox and is normally used in conjunction with a separate reversing unit.

Use of this type of epicyclic gearbox with a fluid flywheel greatly simplifies driving and adds to passenger comfort. Harsh and difficult gear changing is eliminated, giving long life to the engine and transmission, and increased safety.

For Railcar application it is usual to employ an electrical switch for operating Electro-Pneumatic valves mounted close to the gearbox. By this means of remote control it is possible to operate two or more gearboxes simultaneously from one point.

For single unit operation an air distributor valve can be used if the transmission layout permits, and this is the form of control normally adopted for Shunting Locomotives.

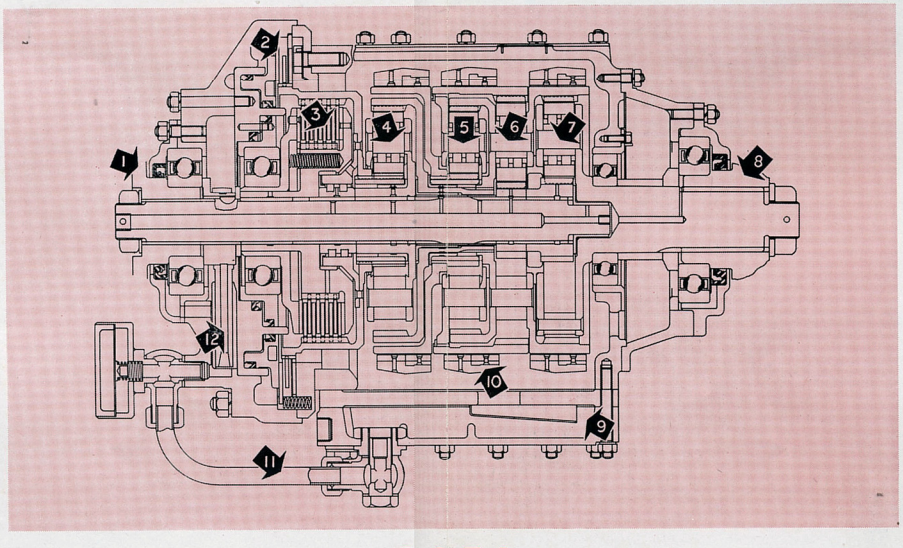
The operation and other interesting features of these gearboxes are dealt with in detail in the following paragraphs, and many of the points shown help to explain the popularity of our epicyclic gearboxes for rail transmissions, and their great reliability under arduous conditions.

SELF-CHANGING GEARS LTD.

LAYOUT OF FIVE-SPEED GEARBOX

WITH OVERDRIVE FIFTH

1 Input Coupling
2 Overdrive Brake
3 Fourth Speed Clutch
4 Overdrive Planet Train
5 Third Speed Planet Train
6 Second Speed Planet Train
7 First Speed Planet Train
8 Output Coupling
9 Sump
10 Band Brake
11 Oil Delivery Pipe
12 Plunger Oil Pump



OPERATION

Constant mesh epicyclic gearing is used throughout the gearbox ; there is therefore no sliding of mating gears during engagement. The gear ratios are obtained by 'compounding' the epicyclic gear trains ; and the appropriate indirect gear is engaged by applying a band brake to the reaction member for that gear.

The band brakes are operated by air pressure acting on a piston, which applies the brake through toggle mechanism. The brakes have balanced application so that no reaction loads are carried by the shaft bearings. Wear on the brake linings is taken up by an automatic adjusting device.

When the top gear clutch is applied, relative gear movement is prevented and the running gear rotates as a single unit. Top gear is therefore the condition of least wear within the box.

EASE OF CONTROL

The only control required when the gearbox is fitted to railcars is an electrical switch. This operates electro-pneumatic valves mounted near the gearbox which allow air to enter the appropriate brake cylinder. By this means a number of gearboxes can be operated simultaneously, in multi-power-car units.

A single gearbox can be operated by a simple air valve with piping connected directly to the gearbox cylinders, and this is the normal arrangement for locomotives.

LUBRICATION

Pressure lubrication of all rotating members is ensured by a plunger pump of ample capacity, which delivers oil from the gearbox sump.

MAINTENANCE

The only maintenance normally required is that of topping up and draining the oil. Brake adjustment is purely automatic. The air seals for the brake operating pistons have a long life, but access to them is quite simple if replacement is necessary.

MANUFACTURE

Careful design has ensured low relative rotational speeds of the gears with a correspondingly low degree of wear and gear noise. Wherever possible all gear teeth are ground and the gears tested for cracks after grinding by the latest magnetic testing method.

All the gearbox components are rigorously inspected to close limits before being passed for assembly.

INSTALLATION

Type R.11 gearboxes are giving reliable service in countries as far apart as Sweden and Australia where their simple operation and smooth positive gear changes make them suitable for use by all classes of driver under widely differing operating conditions.

They are adaptable to many types of rail vehicle and assistance with your own particular transmission problems will gladly be given.

DATA

These gearboxes are for use with separate reversing unit.

R.11 4-SPEED

No. of speeds 4
Gear ratios - 4.07, 2.42, 1.6 and 1:1
Torque Capacity - 500/550 lb./ft.* (69/76 mkg)
Mounting - Independent or Unit construction
Weight - - 341 lbs. (155 kg)

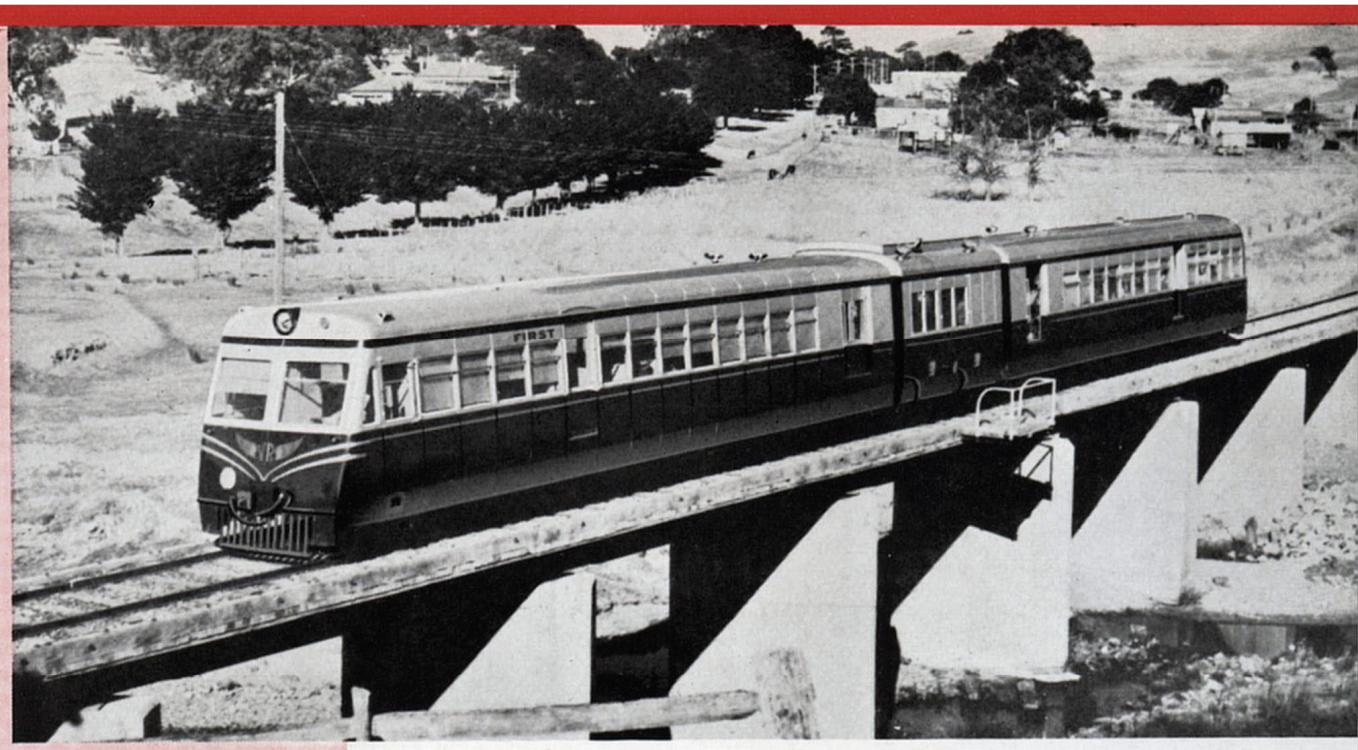
R.11B. 5-SPEED OVERDRIVE

No. of speeds 5 (overdrive 5th)
Gear ratios - 4.07, 2.42, 1.6, 1:1 and 1:1.303
Torque Capacity - 500/550 lb/ft.* (69/76 mkg)
Mounting - Independent or Unit construction
Weight - - 400 lbs. (182 kg)

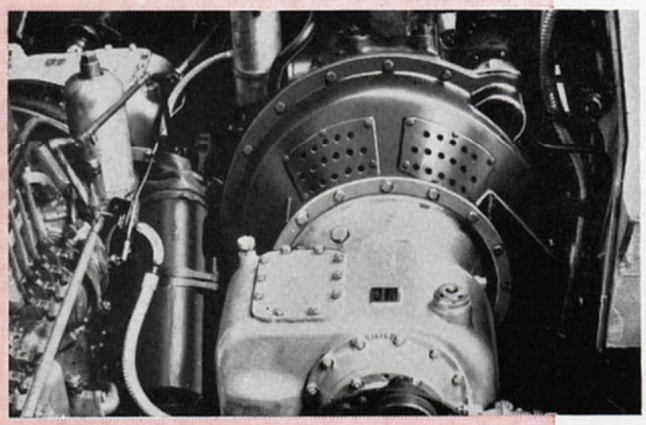
*According to nature of application

R.11D. 5-SPEED UNDERDRIVE

No. of speeds 5 (special ratio bottom gear)
Gear ratios - 5.79, 4.07, 2.42, 1.6 and 1:1
Torque Capacity - 500/550 lb./ft.* (69/76 mkg)
Mounting - Independent or Unit construction
Weight - - 593 lbs. (266 kg)



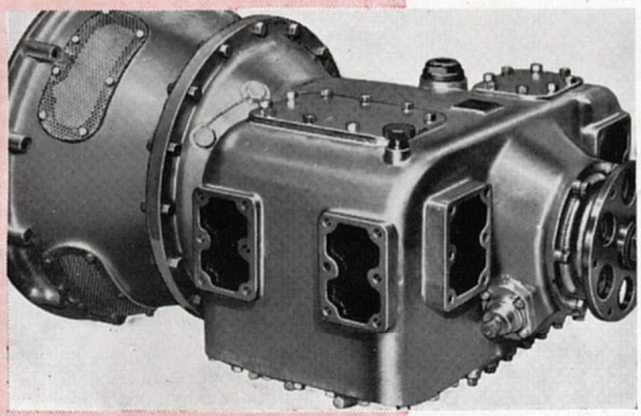
Victoria Government Railways, Australia use railcars fitted with R.11 4-speed gearboxes. The cars have a central power bogie which isolates the engine from the passenger compartments. Two gearboxes operated by a single set of electro-pneumatic valves are mounted in this bogie.



Flexible piping connects two gearboxes to electro-pneumatic valves (not shown) operated by a single control switch. Both gearboxes operate together.

SPECIAL FEATURES

- EPICYCLIC RUNNING GEAR ELIMINATES MISSED GEARS
- EXTREME EASE OF CONTROL
- TWO OR MORE GEARBOXES CAN BE OPERATED TOGETHER
- INDEPENDENT OR UNIT CONSTRUCTION



Type R.11D gearbox with special low gear. The air cylinder controlling this gear is mounted in a side extension to the gearcase.

TELEGRAMS
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COVENTRY

SELF-CHANGING GEARS LTD

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