

Lucas M50—Description

LUCAS TYPE M50

DESCRIPTION

The M50 type starter is a conventional four-brush, four-pole starter motor with a pre-engaging push-screw roller clutch drive. The solenoid is arranged to provide two-stage switching when tooth-to-tooth abutment occurs. This ensures that the starter pinion is always fully meshed before full cranking torque is developed.

OPERATION

The solenoid contains two pairs of starter switch contacts. When the solenoid is operated and the pinion moves towards the engine flywheel its teeth will either mesh immediately with the engine ring gear or will meet the ring gear in tooth-to-tooth abutment. On occasions of immediate meshing, both pairs of contacts close

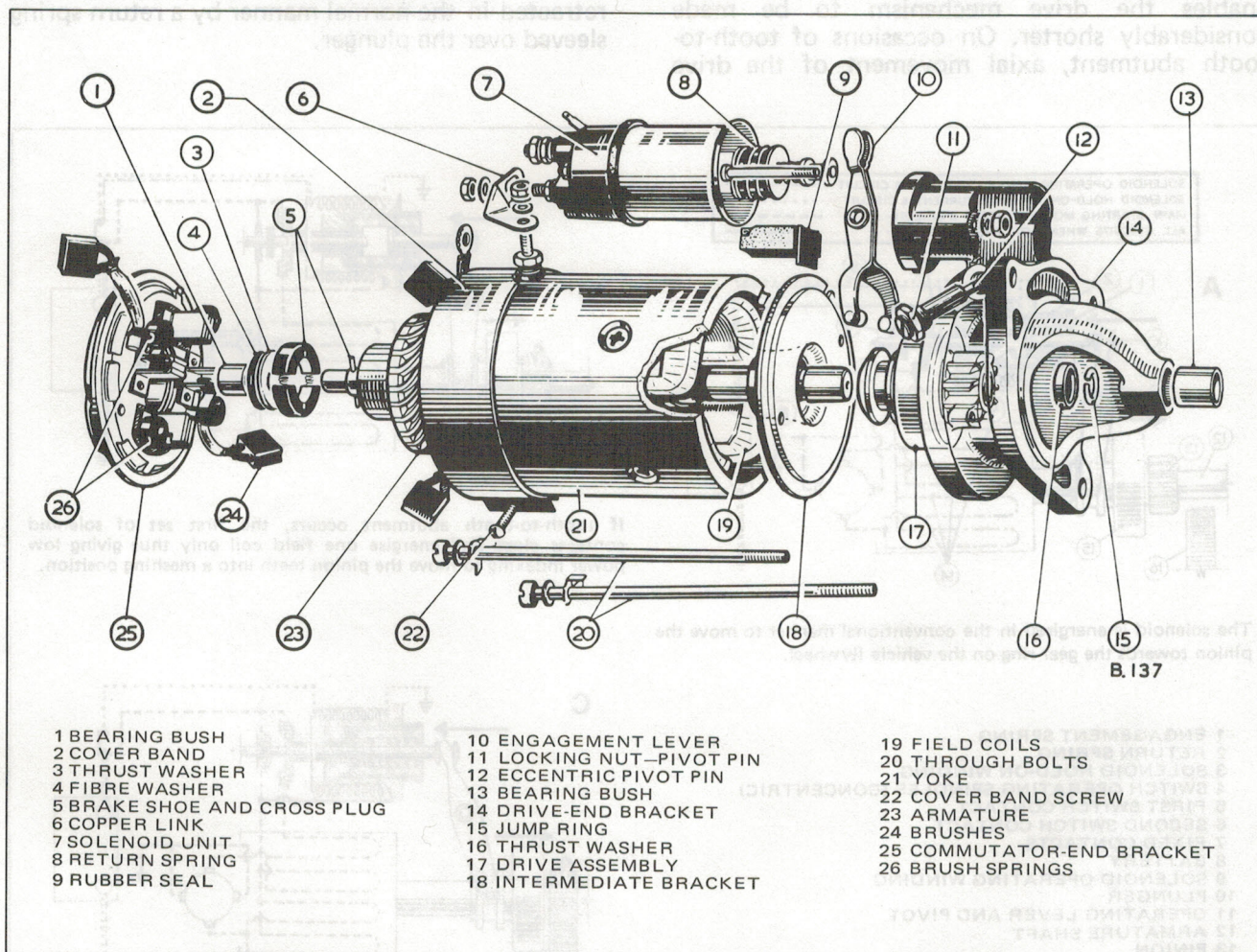


Fig. 1 Pre-engaged starter motor with solenoid—
exploded view

simultaneously when the position of full drive engagement is reached. On occasions of tooth-to-tooth abutment, only one pair of the contacts closes initially to energise one of the four field coils. This results in partial torque being exerted by the armature with consequent indexing of the pinion. As soon as the position of alignment is reached and the pinion meshes with the flywheel, the second pair of contacts closes to connect the remaining field coils in parallel with the first. Full cranking power is then exerted. Two-stage switching is illustrated in Fig. 2.

The solenoid also carries the drive engagement spring. This is located within the plunger and enables the drive mechanism to be made considerably shorter. On occasions of tooth-to-tooth abutment, axial movement of the drive

and pivoting of the engaging lever is stopped, but the solenoid can continue its travel by pressing the engaging spring with it. When the first pair of contacts closes, the pinion clears the abutment and moves into mesh under pressure from the engagement spring and with push-screw assistance from the drive sleeve helix.

In other respects, the solenoid is of conventional design, having two windings, a series pull-in and shunt hold-on windings, the former being shorted out by the second pair of contacts in the fully-engaged pinion position.

When the solenoid is switched off, the drive is retracted in the normal manner by a return spring sleeved over the plunger.

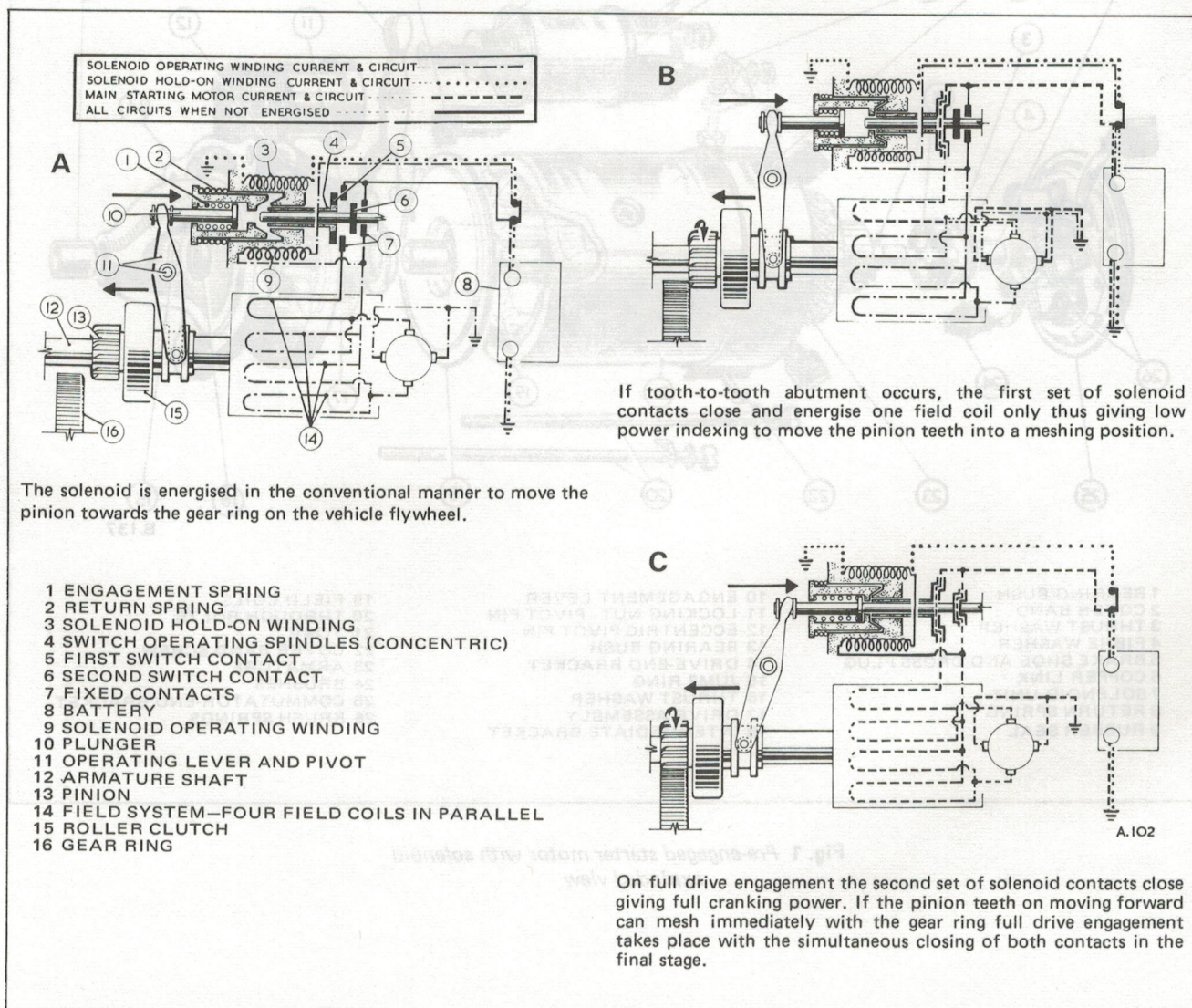


Fig. 2 Schematic explanation of two-stage switching