

Starter motor

The starter motor

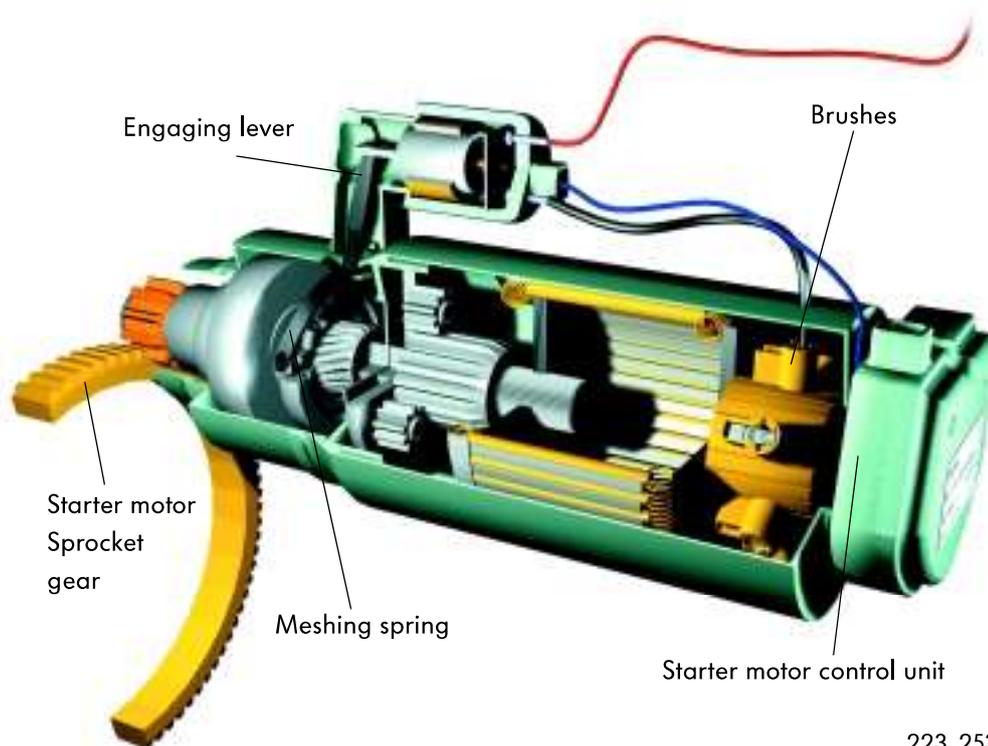
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The starter motor of the Lupo 3L has a control unit which controls the starting operation.

Basically, the starter motor equivalent is designed as a bendix-drive starting motor with planetary gear. The service life of the starter motor has been extended by the numerous starting cycles due to the STOP/START function. This was achieved by reinforcing the mechanical components of the starter motor and modifying the electrical control.

Mechanical reinforcements

- Brushes extended
- Meshing spring reinforced
- Engaging lever is carbon-fibre reinforced
- Starter sprocket gear widened.



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Electrical control

The starter motor control unit is mounted on the housing. It controls the meshing operation. Wear of the starter pinion and starter

sprocket gear is reduced by soft, time-controlled meshing of the starter pinion in the starter sprocket gear.



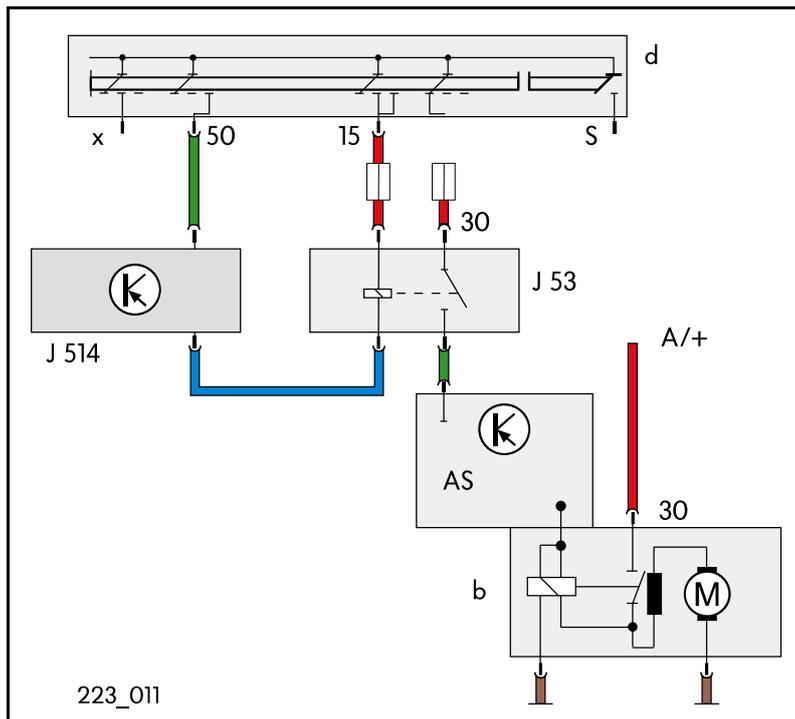
The starter motor and starter motor control unit can only be replaced together.

This is how it works:

The starting cycle is initiated by the gearbox control unit. For this purpose, the gearbox control unit activates the starter inhibitor relay. The relay switches the current to the starter motor control unit. The control unit regulates the current flow for the starter pinion meshing operation. The starting cycle is activated either by means of the STOP/START function, or in the conventional manner by turning the ignition key in the ignition switch.

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Electrical circuit



- A: Battery
- B: Starter motor
- D: Ignition switch
- J53: Starter motor relay
- J514: Electronic manual gearbox control unit
- AS: Starter motor control unit



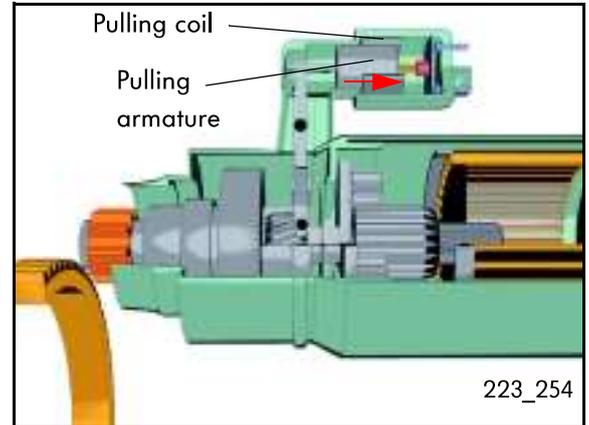
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Starter motor

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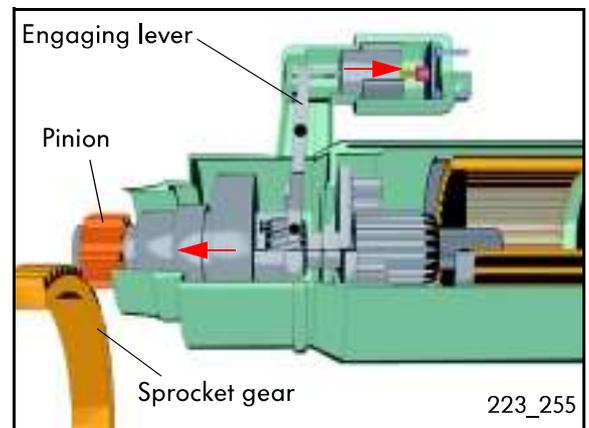
Phase 1

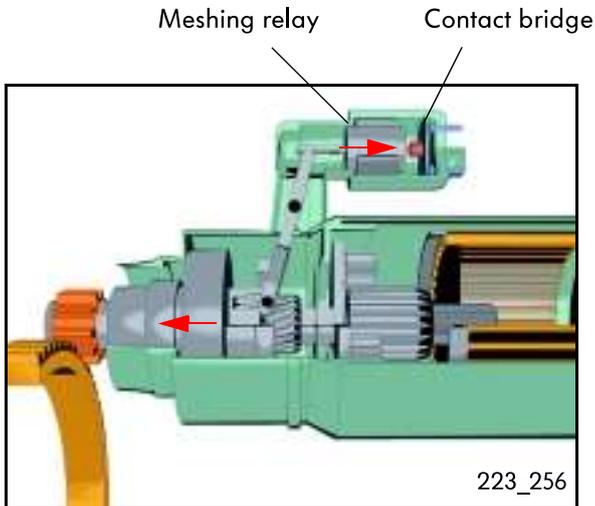
In the first phase, the current rises. A magnetic field is built up in the pulling coil and the pulling armature picks up.



Phase 2

After the idle motion of the engaging lever has been overcome, the current flow from the control unit is reduced for approx. 10 ms until the starter pinion makes contact with the starter sprocket gear. This reduces the pre-engagement speed of the starter pinion by a factor of 4 and ensures soft pre-engagement which reduces starter pinion wear.





Phase 3

In the third phase, the current rises again. The starter pinion meshes with the sprocket gear at the same time.

Phase 4

The last phase is initiated by the closing of the contact bridge in the meshing relay. As a result, the starter motor starts up and turns the engine crankshaft via the sprocket gear. The holding current is maintained until the engine has started.



Current curve

