

Tips & Technology

For Bosch business partners

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BOSCH

Invented for life

All modules

Non-disengaging starters

Take a close look when replacing starters

If a defective starter has been identified as the cause of a problem, this should be examined carefully before fitting a new starter.

If the defective starter failed to disengage, the damage or destruction will have been the result of another fault in the vehicle. In other words, any new starter fitted will soon be destroyed again if this underlying problem is not located and eliminated.



Most common causes of non-disengaging starters:

- Defective ignition lock
- Temporary connection of wire from terminal 50 to + (e.g. due to faulty insulation)
- Incorrect operation (e.g. if the vehicle is moved with the starter)

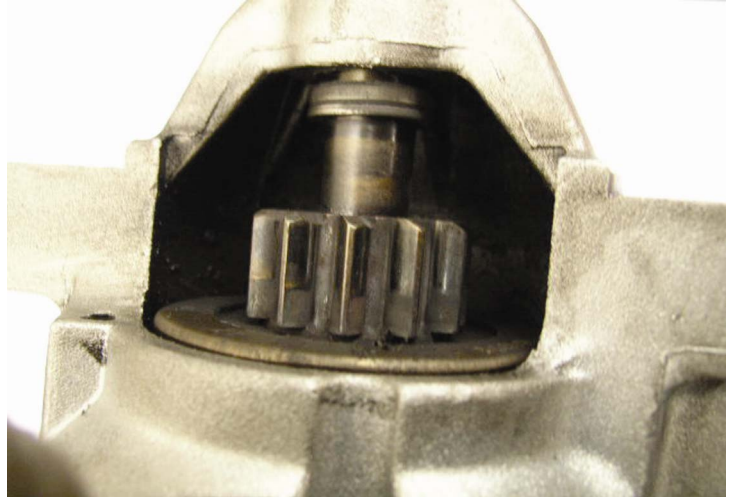
Warranty claims are not justified, as the problem of non-disengaging starters does not usually stem from material defects or manufacturing errors.

Identification of non-disengaging starters

The main indicators of a non-disengaging starter are listed below to help identify the problem.

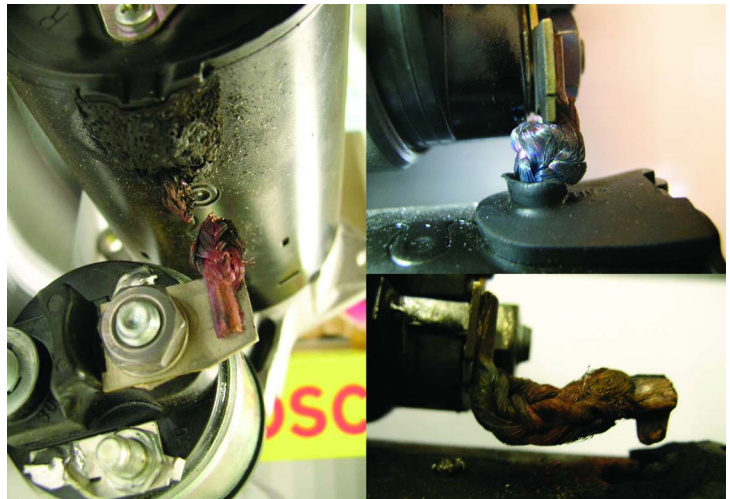
Tarnished shaft

The classic sign of a non-disengaging starter is discoloration of the shaft in temper colors. Such discoloration is a clear indication of extreme overheating.



Scorched wire

The connecting wire may be overloaded by a non-disengaging, blocked starter and become scorched as a result.



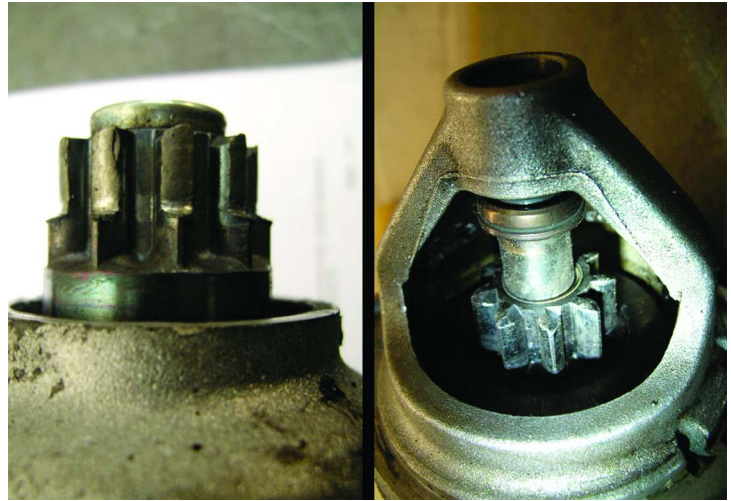
Damaged solenoid switch

Severely discolored winding insulation in the solenoid switch is evidence of an excessively long solenoid switch actuation time via terminal 50. This occurs for example as a result of a defective ignition lock or incorrect operation. Non-disengagement of the starter may be the consequence. Always check actuation of the solenoid switch (ignition lock, cable, ...).



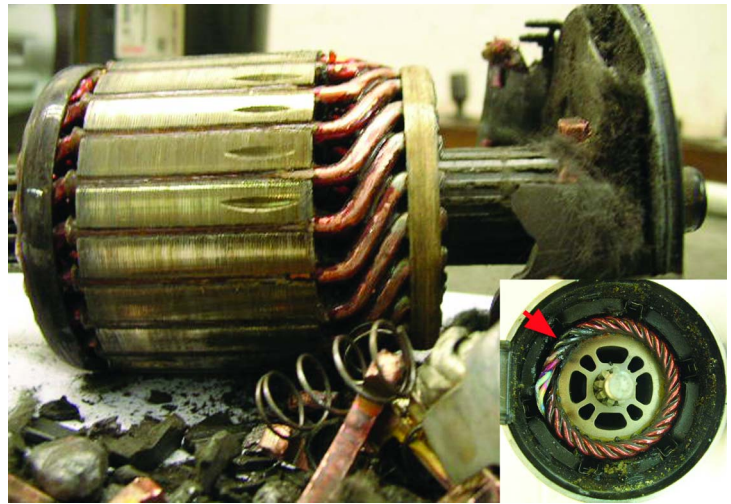
Worn pinion

As is the case with temper colors on the pinion and armature shaft, a worn pinion is an indication of incorrect operation or faulty actuation of the starter.



Ejected armature

The intense heat occurring as a result of the high speeds may cause the solder to be liquefied and the soldered connections will work loose at the commutator. The windings may be loosened or the commutator ejected on account of the centrifugal forces acting on the armature.



Overheated components

Extreme heat is generated on account of the high speed attained by the starter if it fails to disengage (transmission ratio from engine up to 1:12!). Consequently, certain components (e.g. the reduction gear, ...) may become overheated or scorched. If the components are made of metal, temper colors will again be visible.



It should be noted that some of the damage patterns illustrated above can only be seen after opening (sometimes destructively) the starter or solenoid switch housing.

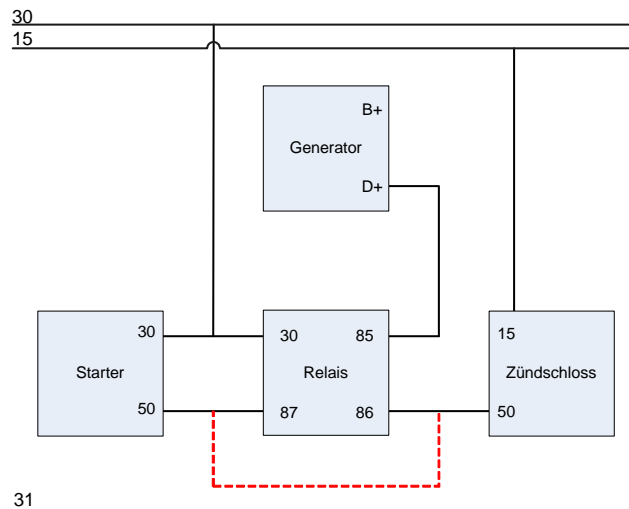
Deposit values

Non-disengaging starters are normally damaged to such an extent that they cannot be reconditioned and included in the Bosch eXchange range. So please always remember to bill the deposit value of the starter for customers with non-disengaging starters.

A piece of good advice to finish

To avoid the problem of a non-disengaging starter, it is possible to fit an NO relay in almost any vehicle. As soon as the alternator is in operation, this relay breaks the connection between terminal 50 of the ignition lock and the starter. As a result, there is no risk of starter damage from incorrect operation or faulty or excessively long actuation.

Block diagram of the circuitry:



The dashed line represents the connection replaced by the relay circuit.