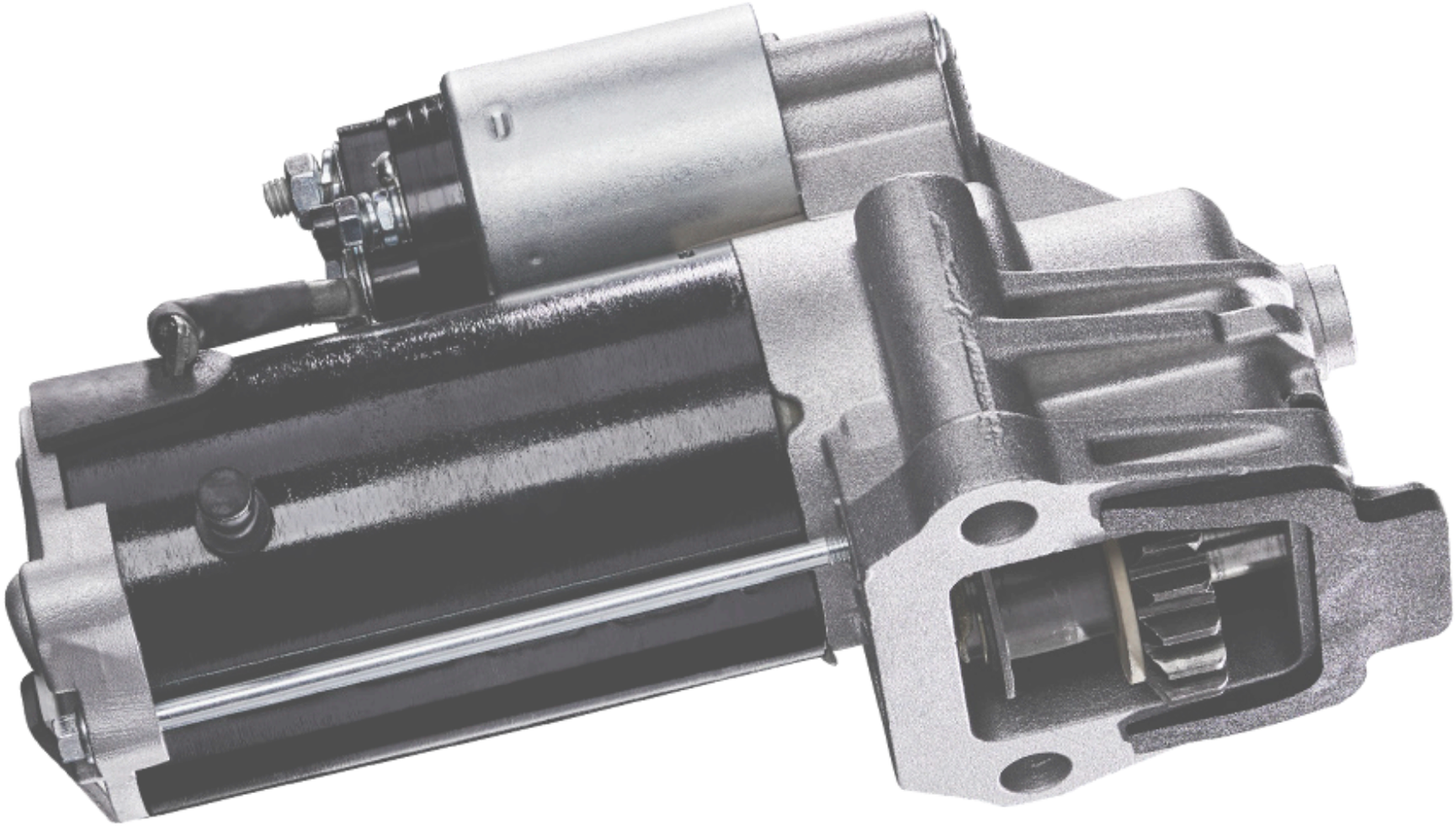
Troubleshooting guidelines: Starters



Troubleshooting guidelines: Starters
- INSTALLATION STEPS

1	Determine the cause of the breakdown	Before installing a new starter - please determine what caused the old starter to break down: Was it caused by usually wear or due to a fault in the surrounding environment.
2	Fault in the surrounding environment	Fitting a new starter will not improve the rest of the system, if the actual problem is to be located in the surrounding like cables, filters, relays and pipes. Defects not repaired, might risk to damage also the new starter (for further info, see troubleshooting guidelines).
3	Compare the old and new starter	Always check OE references from the old starter through wholesaler or www.elstock.dk for correct identification of the new starter. Here you will also be able find details about dimensions, teeth and rotation.
4	Physically comparison	Before installation, do a physical comparison of the new starter and the uninstalled starter in terms of mounting hole locations, wire connector locations and bracket/teeth.
5	Installation	Make sure that all threaded fasteners are properly torqued, and that the starter is fasten in the right position (by the use of a positioning bushing or pin). Reconnect the circuit wiring and battery positive cable to the starter/starter solenoid, and do a final inspection of all wires for damage as well as no interference between wire harness and other components. Reconnect battery negative cable and start the engine.
6	Special attention	Please notice that on some item numbers, a label or sticker will be attached to the unit, informing that there is a need for special attention at installation of the unit.

Troubleshooting guidelines: Starters
- POSSIBLE ERRORS

Problem	Cause	How to identify	Why the problem occurs	Solution	Preventive actions
Noise from the starter/ pinion.	Starter is not in correct mounting position.	During start-up the starter is very noisy.	Lack of a positioning bushing between starter and engine/gear block.	Always use a positioning bushing for correct mounting of the starter.	Check new starter for installed new positioning bushing (preferred solution). Alternatively move bushing from old starter to new starter.
Starter is burnt due to too long work during the start-up.	Damaged ignition switch or solenoid coils relay.	Pinion or shaft is blue coloured due to overheating.	Defect ignitions switch.	Exchange the ignition switch.	If it is possible to check, inspect if previous installed starter smelled burnt or had blue teeth or shaft ?
Starter is flooded with diesel oil.	Worn brushes and commutator due to oil from leaking filters.	Check the filters close to the starter for leaks.	The leaking filters have not been replaced correctly.	Locate the leak, and replace filter.	Check the surroundings of the starter for oil on filters etc.

Troubleshooting guidelines: Starters
- POSSIBLE ERRORS

Problem	Cause	How to identify	Why the problem occurs	Solution	Preventive actions
Starter is flooded with oil.	Worn brushes and commutator due to oil from a leaking steering pump or related pipes or hoses.	Oil from the steering pump or connected pipes or hoses.	The leaking pump or pipes/hoses/clamps have not been replaced.	Locate the leak, and replace pump/ pipe/ clamps or hose.	Check the surroundings of the starter for oil on pumps etc.
Starter gives only a click or works slowly.	Voltage drop on terminal"50" wire (Ignition contact).	Every 5-10 time the starter is in use it clicks.	Due to rust or bad wire connection, connected to terminal "50".	Exchange either the plug/cable ending or wire used for connection to terminal "50" on the starter.	Measure the "50" wire with consumption on (activated solonoid only).
Starter is corroded.	Flooded with water or leakage in the cooling system.	Starter gradually begins to act weaker and have a poorer performance.	Liquid leakage from cooling system, or not enough protection of the engine room against water from outside.	Locate and repair the leak in cooling system, or cause of water entrance by installation of better protection.	Check the engine for reasons for the water entrance before installation of a new starter, in case the previous starter was corroded.
New starter will not engage with ring gear.	Bad teeth on ring gear.	Check ring gear before mounting, 4 cyl. engine stops always on same 2 positions, 6 cyl. 3 positions, 8 cyl. 4 positions.	Beginning voltage drop on terminal "50" (from ignition switch).	Replace plug and clean cable end for black surface and solder new plug.	Clean and spray installation.