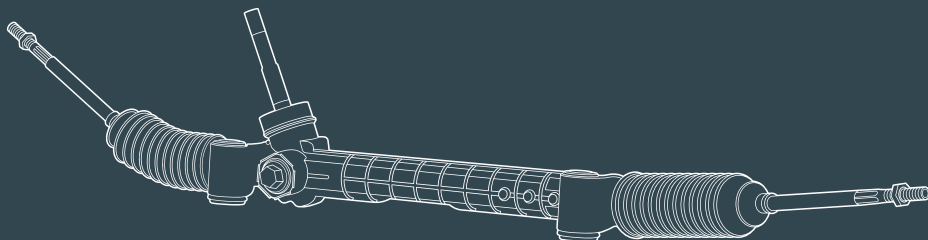


TROUBLESHOOTING GUIDELINES - STEERING RACK



INSTALLATION STEPS

Determine the cause of breakdown.	Before installing a new steering rack – please determine what has caused the old rack to break down – fitting a new rack will not improve the rest of the system, and defects that are not repaired might also damage the new rack.
Compare the old and new rack.	Check that the rack is equivalent to the one from the vehicle – same fixation measurement & connections (hydraulic as well as electric).
Flushing is necessary.	In general, it is recommended to flush the steering system, when replacing the rack. This is done to ensure that any particles that could have caused the failure of the rack are removed.
Check the power steering lines.	The hoses wear from inside out, so their condition cannot be assessed visually. If any hoses feel stiff, porous or hard, then replace all hoses. They have been installed for an equal length of time, so they are likely equally deteriorated.
For electronic racks.	Ensure that the battery is in good condition. Clear any stored error codes, before removal of the old rack.
Bleeding the system.	After the new rack has been installed, it is necessary to bleed the steering system. This includes filling the system with fresh power steering fluid (following the recommendations of the vehicle manufacturer). In specific cases, it may be necessary to use a vacuum rack, to remove all airlocks.
Programming electronic racks.	The electronic racks need to be calibrated and programmed to the car. Please follow the vehicle manufacturers guidelines.
Check the fluid level.	After finalising the installation of the rack, including bleeding the system, remember to check that the level of power steering fluid is within the minimum and maximum mark on the container or dip stick. Running with either too little or too much fluid may damage the system.
Align and adjust.	Having fitted a new steering rack, it is necessary to carry out a full wheel alignment. Not doing so, may affect the handling of the vehicle as well as the predictability.

POSSIBLE ERRORS

PSR = Power Steering Rack
 ESR = Electric Steering Rack
 MSR = Mechanical Steering Rack

Product Group	Problem	Cause	How to identify	Solution	Preventive actions
PSR	Leaking.	Starter is not in correct mounting position.	Power steering fluid is visible on the outside of the unit, and spills have been cleaned up.	Ensure the o-rings/ gaskets have been changed, if the leak is present at the hydraulic lines. If the leak is present elsewhere, the unit must be returned.	Always renew o-rings/ gaskets for the hydraulic lines, when installing a new rack or pump.
PSR, MSR & ESR	Steering does not self-centre.	The suspension system can affect the functionality of the steering system. Wheel alignment has not been carried out. The spring clamp, that torques the pinion and rack bar together could have been set too tight.	Upon exiting a corner, the car will not straighten up unassisted.	Check the condition of all joints in correlation to the steering system, is moving freely. Carry out wheel alignment. If this is found to be okay, the unit must be returned for exchange.	Always check the condition of the suspension system prior to renewing the steering system.
PSR, MSR & ESR	Steering wheel is offset.	Wheel alignment has not been carried out. The incorrect rack was ordered. The rack was assembled incorrectly.	When driving in a straight line, the steering wheel is not straight.	Carry out wheel alignment. If this does not solve the problem, compare pinion position to that of the old unit. This is best done by placing the two units side-by-side, and turning both fully left or right. Confirm that the correct rack was purchased. If the above is found to be okay, the unit must be returned for exchange.	Always check that the new and old unit corresponds, prior to installation. Always order by VIN number or OE reference on the old unit.
PSR, MSR & ESR	Car pulls to one side.	Uneven tyre wear or worn out suspension. Wheel alignment has not been carried out.	The car needs constant steering input to run in a straight line.	Check condition of tyres. Check condition of suspension system. Carry out wheel alignment.	Always keep track of condition of tyre thread and suspension system.
PSR, MSR & ESR	Play in steering system.	The ball joints and correlating connections to the steering rack may be worn. The spring clamp that torques the pinion and rack bar together could have been set too loose.	The reaction of turning the steering wheel is not immediate to the wheels turning.	Check the correlating ball joints and connections to the rack. If these are found to be okay, the unit must be returned for exchange.	Always check the condition of the ball joints and connections to the rack prior to renewal of the steering system.
PSR	Steering is unequal weighted.	The suspension system can affect the functionality of the steering system. Debris in the steering system, or collapsed hydraulic lines. On rare occasions crossflow can occur around the pinion.	Greater force has to be applied, when steering to one side than the other.	Check the condition of all joints in correlation to the steering system is moving freely. Flush the steering system thoroughly. The hydraulic lines may have degraded – most lines last around 10 years. If the above solutions comes out inconclusive, the cause is most likely cross-flow, and the unit must be returned for exchange.	Always check the condition of the suspension system prior to renewing the steering system. Always check condition of old power steering fluid for debris, and always flush the system.

POSSIBLE ERRORS

PSR = Power Steering Rack
ESR = Electric Steering Rack
MSR = Mechanical Steering Rack

Product Group	Problem	Cause	How to identify	Solution	Preventive actions
ESR	Error Codes.	Always check the condition of the suspension system prior to renewing the steering system. Always check condition of old power steering fluid for debris, and always flush the system.	It is not possible to clear the error codes related to the unit.	If the error codes was not cleared prior to the removal of the old unit, the codes have been transferred to the replacement. The unit must be returned for exchange. Check battery voltage as this will also affect the unit. Initialise/program the unit, following the vehicle manufacturers instructions.	Always clear the system of error codes prior to removal of the old unit. Remember to initialise/program the unit with the car.
ESR	Steering is unequal weighted.	The suspension system can affect functionality of the steering system, or the torque sensor could have been damaged during transport.	Greater force has to be applied, when steering to one side than the other.	Check the condition of all joints in correlation to the steering system is moving freely. If this is found to be OK, the torque sensor has come out of calibration and the unit must be returned for exchange.	Always check the condition of the suspension system prior to renewing the steering system.
ESR	Non-communication.	If the incorrect unit is installed it will not function correctly – and in many cases, communication with the unit is impossible.	It is not possible to establish a diagnostics connection with the unit.	Confirm that the installed part is correct to the vehicle, and that it matches the old unit.	Always order by VIN number or OE reference on the old unit.