

Engine 278

General information for engines with cast-iron cylinder barrels and with Silitec cylinder barrels (aluminum-silicum cylinder barrels), conversion as from March 2015 or as from engine 2789xx 30 266191 for cast-iron cylinder barrels

The following figures and notes are helpful in assessing the cylinder barrels to allow a professional decision to be made about the condition and further use of the crankcase.

i A mechanical pressure test and a manual compression test must be conducted for an objective assessment of the cylinder condition or the cylinder barrel.

A crankcase with cast iron cylinder barrels

i A magnet can be used to perform a quick check on which type of cylinder barrel is involved, because cast-iron cylinder barrels are magnetic.

i If an increased pressure loss was found with the cylinder leakage tester, inspect engine by listening at cylinder head gasket, air intake area, exhaust system, oil filler opening and prechamber or spark plug bore of the cylinder or adjacent cylinders and thereby locate the area in which the pressure escapes. The smoke detector can be used to localize the cause of the problem.

i A score mark that can be felt with your fingernail is not permitted as a sole criterion for exchange.

i A significant degree of scoring in the cylinder barrel with material accumulation can justify an engine replacement. A score mark in the cylinder barrel with significant material accumulation should be documented with representative pictures.



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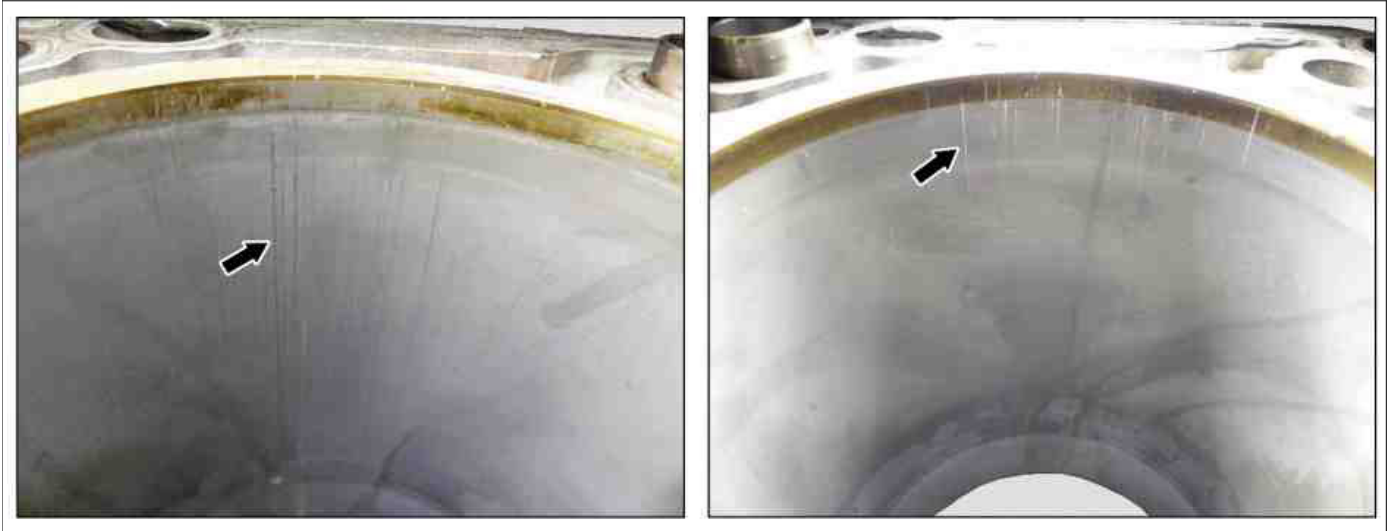
The following notes are for checking cylinder barrels with Silitec cylinder barrels

Ideal condition

Matt gray surface, no honing pattern, dry cylinder barrel, no glossy sections or reflecting smooth spots.

It is also possible that irregularities can occur which should be individually assessed.






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
Individual score marks up fields of score marks

Caused by initial dirt or soiling during operation, e.g. through back pulsation of particles from the catalytic converter or the exhaust system.

 Reuse crankcase.

Ring shaped imprints

Visible in the upper and lower piston ring reversal area are not a cause for concern.

 Reuse crankcase.



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Little hammer-like structures

Combustion-related or geometric factors that could lead to the ends of piston rings being pressed onto the barrel.

i Reuse crankcase.

Brown coloration of cylinder barrel

Brown coloration (oil varnish) over large areas of the cylinder barrel indicates that the engine has been driven at a high temperature level. This is normal and not a cause for complaint.

i Reuse crankcase.



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Glazing, smooth spots

Individual blank points, e.g. in middle of cylinder or in area of cylinder head bolts. Full circle impression at the upper and lower piston ring reversing points.

i Reuse crankcase.



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Optical steaks, friction marks

Starting from first, second or third piston ring, tapering off after approx. 30 mm. Imperceptible friction marks caused by soot particles and the oil film being washed off by fuel, e.g. during frequent cold starts during short-distance driving. These traces of friction marks which occur principally in area of cylinder head bolts and pressure side are not a problem provided they are smoothed.

i Reuse crankcase.



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Noticeable change in valve cooling bore

The cooling bore in the crankcase shows a different coloration to the cylinder barrel.

i Reuse crankcase.



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Corrugated wear of the cylinder barrel

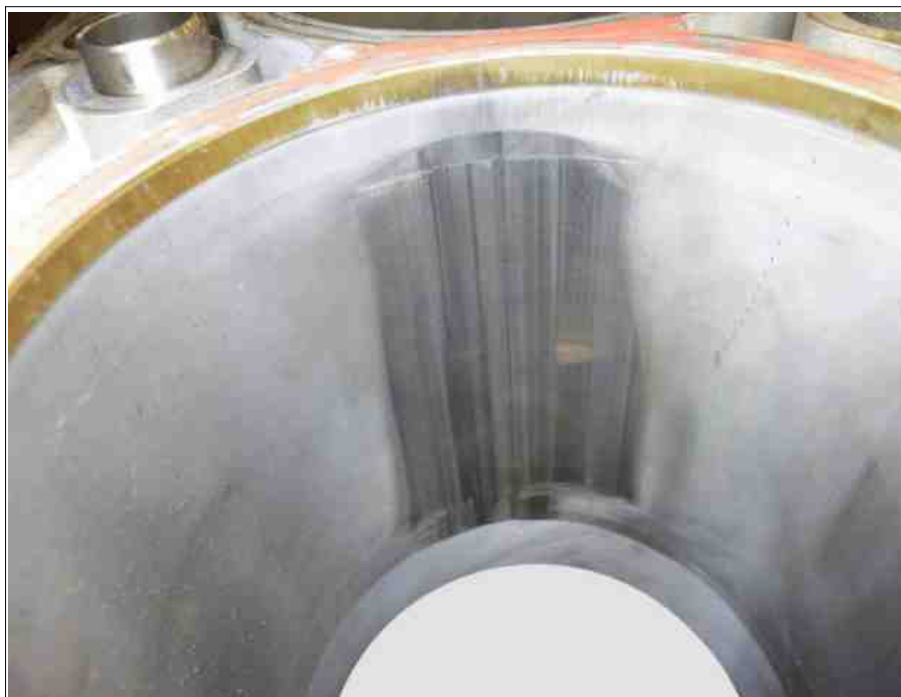
A washboard type surface structure of the cylinder barrel, partially or full perimeter.

i Do not use crankcase again.

Rough streaks, friction scoring

Starting from first, second or third piston ring, tapering off only in bottom part of cylinder. Friction marks as described under "Optical streaks, friction marks" which have advanced to friction scoring.

i Do not use crankcase again.



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P01.00-3658-78

Piston seizure, ring seizure

Most of cylinder wall perceptibly roughened over the entire length. Material deposits and perceptible scoring marks on cylinder wall and at piston skirt.

Cylinder barrel unusable.

i Do not use crankcase again.

Defect in cylinder barrel

Defect in barrel of any one cylinder.
Cylinder barrel unusable.

i Do not use crankcase again.



P01.00-3653-76

The following notes are for checking cylinder barrels with cast-iron cylinder barrel

Ideal condition

Cross-grinding marks from honing clearly visible on cylinder wall.

i Reuse crankcase.



P01.00-3654-76



P01.00-3659-78

Glazing, smooth spots

Individual blank points, e.g. in the middle of the cylinder barrel or around the cylinder head bolts.

i Reuse crankcase.



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Continuous individual traces of scratch

Caused by soiling, for example, by the back-pulsation of soot particles from the exhaust system, oil carbon marks. They are imperceptible to the touch.

i Reuse crankcase.

Brown coloration of cylinder barrel

A brown coloration over large areas of the cylinder barrel is oil varnish and indicates that the engine has been driven at a high temperature level. Oil varnish above piston ring zone is normal and is not a reason for complaint.

i Reuse crankcase.



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Visible stripes, friction marks

Starting from reverse area of the upper piston ring tapering downwards. Friction marks that are imperceptible to the touch, caused by oil film being washed off by fuel, the piston rings are not damaged.

i Reuse crankcase.




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Ring shaped imprints


Visible imprints on cylinder barrel in the upper and lower reverse area of piston rings are not a cause for complaint.

 Reuse crankcase.

Rough streaks, friction scoring

Starting from first and second piston ring, tapering to an end only in bottom part of cylinder. Progressive signs of friction lead to friction score marks.

Where these signs of friction are perceptible, the cylinder barrel is unusable. The piston rings may be damaged.

 Do not use crankcase again.



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


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Piston seizure

Most of cylinder wall perceptibly roughened over the entire length.

Material deposits and perceptible scoring marks on cylinder wall and at piston skirt.

 Do not use crankcase again.