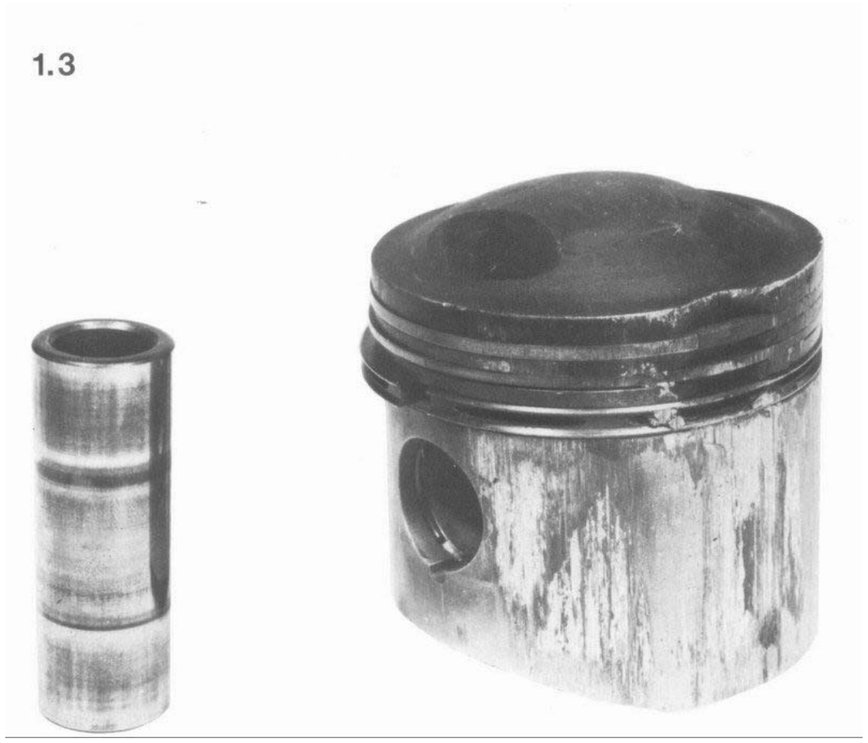

1 Piston Skirt

1-3 Seizures due to severe overheating (see also 3,"Piston crown")

Symptoms

Damage caused by overheating is characterized by seizures at the top land,or in the ring belt and upper skirt area.The machining profile and clearance specified for a piston are designed for normal operating temperatures. Excessive heating ,together with the associated increase in diameter.have caused a seizure in the upper piston area.In the case shown here,the melting of the top land and ring belt indicates faulty combustion,leading to an elevated temperature level.

Cause and Effect

Most localized overheating caused by faulty combustion,such as knocking or preignition precipitated by an an over-lean mixture,guel with octane rating which is too low,spark plugs with wrong thermal coefficient,incorrect ignition timing or faulty cooling result not only in an excessive increase in diameter but also in the melting of the piston material.Damage of this kind is not dependant on the length of time the engine has been in service.In contrast to the case of damage caused by insufficient clearance,the pistons in this case hace a well-run-in wear pattern onto which the seizure is superimposed.

Malfunctions such as oblique running of the piston ,or lack of clearance between the piston and the gudgeon pin or between the small-end bushing and the gudgeon pin ,may also cause localized hard piston/cylinder contact (see also 1.5).This may impair the movement of the rings which no longer seal well,allowing the hot combustion gases to pass through.This not only causes severe heating of the piston but also burns away the oil film on the cylinder wall.The same condition may occur by overloading during the running-in phase,if the combustion gases blow past the rings which are not yet sealing completely(see 2.1.2),The consequences are seizures in the irng belt and upper skirt area.

Remedy

Check that carburetor and ignition settings are correct.that petrol injection is working properly and ,in the case of Diesel engines,that injection timing and quantity are correct.Avoid poor-quality fuel,or in the case of incorrect refueling,compensatefor this by reducing the load on the engine.Check the fitting clearances of gudgeon pin and small-end bushing,and the angular position of the pistons,connecting rods and crankshaft .particularly after a case of engine damage(seizure),coneecting rods should be replaced;alternatively,their angular position should be measured with great care before reusing them.Checking the cooling system of the engine ,replace the thermostat ,the water pump if damaged ,and the V-belt if slipping Remove hard-water deposits from the engine block.Exercise care in cases where there are additional components covering the radiator(extra headlights)