Title (en)

OIL COOLED, MULTIPART PISTON FOR RECIPROCATING PISTON INTERNAL COMBUSTION ENGINES

Publication

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Application

EP 86100309 A 19860111

Priority

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Abstract (en)

[origin: EP0189767A2] 1. Oil-cooled plunger piston which is composed of a one-piece lower piston part (1) and an upper piston part (2) made in one piece from steel material, which comprises a piston base (3) and an outer wall (4) with piston rings (6) inserted into annular grooves (6), and is pivoted to a connecting rod (33) connected to the crankshaft of a reciprocating piston internal combustion engine by means of a piston pin (26) which is anchored by its ends in bearing bosses (63, 64) provided on a piston pin carrier seat (15) in the lower piston part (1), in a bearing bore (27) transversely penetrating it, the upper piston part (2) being supported on the end surface (13) of an annular carrier collar (14) formed on the top of the piston pin carrier seat (15) with a bearing surface (12) on the end face of a single support collar (7, 17), spaced from the piston base (3) and separated from the outer wall (4) by an outer piston cooling chamber (45), and, by means of a circular cylindrical centering surface (11), centred with respect to the lower piston part (1) by a centering surface (16) provided on it, and connected to the latter by means of several tightening screws (26), with in addition a projection (36, 38) arranged on the top side of the piston pin carrier seat (15) and like it penetrated by a central cooling oil passage (39) coaxial to the longitudinal axis of the piston, which projection projects into the area of the upper piston part (2) and with its upper edge (40) defines the cooling oil filling level of an inner cooling chamber (41) which, as a dome-like hollow chamber, is bounded in its lower region by the curved inner surface (42) of the carrier collar (14), the upper side (37) of the piston pin carrier seat (15) and the outer surface (43) of the projection (36, 38), and in its upper region by a curved inner surface (50, 51) in the upper piston part (2) and an adjacent continuation arch in the inner surface (52) of the piston base (3), and in addition is connected by means of inclined transfer bores (44) in the upper piston part (2) to the outer cooling chamber (45) which extends both in the upper piston part (2) and also in the lower piston part (1) round the carrier collar (14), characterised in that - the upper piston part (2) is made of spheroidal graphite iron or steel material and the lower piston part (1) of grey cast iron or spheroidal graphite iron, - the plunger piston is formed for a shakercooling, with a cooling oil supply from the connecting rod (33) through the cooling oil passage (39) into the inner cooling chamber (41), transmission of the cooling oil through the transfer bores (44) into the outer cooling chamber (45) and from there via outlet apertures (49) back into the motor chamber, - the piston pin carrier seat (15) on the lower piston part (1) is constructed also dome-shaped approximately like a hollow spherical sectional dome, and with a small clearance surrounds the connecting rod head (34) (1) which has a substantially round outer contour (62) inside the lower piston part (1), - the annular carrier collar (14) arranged at the top of the dome-like piston pin carrier seat (15) supports the upper part of the piston (2) in its neutral bending zone resting on the end face (13) of the collar with its annular bearing surface (12, 18), - the central projection (36) and the annular carrier collar (14), which are both formed on the upper side of the dome-like piston pin carrier seat (15), each have a height which corresponds approximately to the diameter of the piston pin (26), - those peripheral areas of the lower edge (68) of the lower piston part (1) which lie in the region axially below apertures (65, 66) of the outer wall (21) which allow mounting of the piston pin (26) are made with sharp edges as oil stripping edges (69), whilst the other peripheral areas of the lower edge (68) of the lower piston part (1) lying in the region of the pressure and counter-pressure side of the plunger piston are bevelled or rounded as oil supplying surfaces (70).

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