

POWER *Curve*

Mike Billinton
reviews the Picco P5

Sleek dynamic Picco P5 looks the part — and goes every bit as well as it looks!

Gualtiero Picco's 1990 update of his 5-port 1/8 Open Class top-running car engine appears, externally, little changed (apart from the new cosmetic black semi-matt finish) when compared with the model tested in late 1986.

Internally though, matters have been quietly on the move — which is only to be expected from this dynamic Italian engine designer.

A number of apparently quite small changes have together led to a quite marked performance increase, which is sufficient to bring this new Picco 3.5cc engine to a power point slightly above the almost fabled levels reached by the early versions of the 1985 Nova-Rossi Black and Red-head engines, and just below the 1.8hp of the 1984 oil-cooled Rossi 21.

Design features have now stabilised around an accepted configuration of a one-piece crankcase, front inducted crankshaft, rear exhaust, ABC piston/liner combination with Schneurle porting, having a transfer area increased by the addition of two extra ports (5-port instead of 3-port), heat sink cylinder heads and rugged simple carburetors employing main and secondary needles and slide throttle barrels.

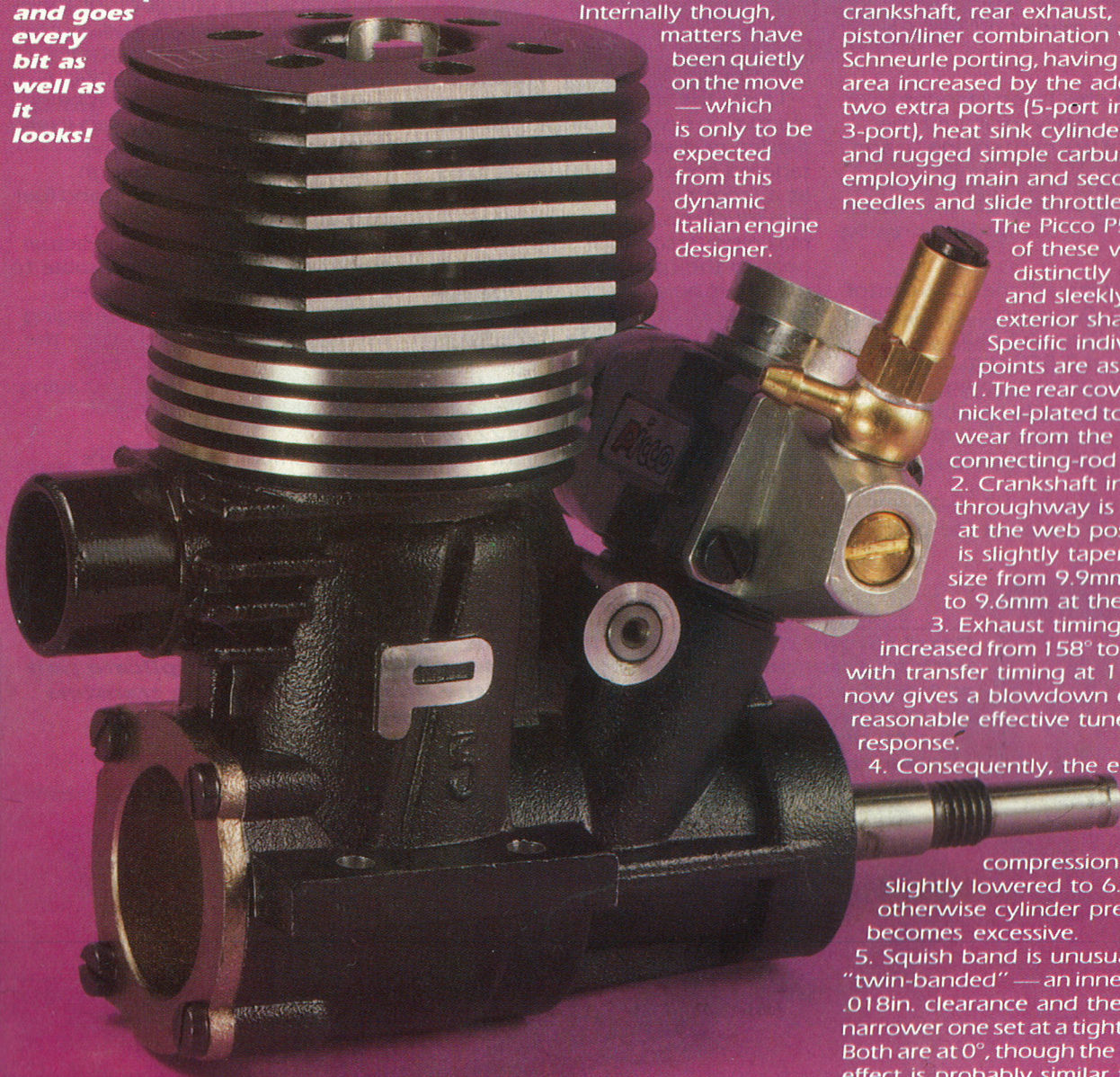
The Picco P5 has all of these within a distinctly individual and sleekly rugged exterior shape.

Specific individual points are as follows:

1. The rear cover is nickel-plated to prevent wear from the connecting-rod big-end.
2. Crankshaft induction throughway is flared out at the web position and is slightly tapered in bore size from 9.9mm at web to 9.6mm at the far end.
3. Exhaust timing is slightly increased from 158° to 163° — with transfer timing at 117°. This now gives a blowdown of 23° for reasonable effective tuned pipe response.
4. Consequently, the effective

compression ratio is slightly lowered to 6.6/1, otherwise cylinder pressure becomes excessive.

5. Squish band is unusual in being "twin-banded" — an inner band at .018in. clearance and the outer narrower one set at a tighter .014in. Both are at 0°, though the resultant effect is probably similar to an



angled squish band.
6. Carburettor locking screw is the highly effective "two-part" pinch bolt style, though even this benefits from the application of some Loctite on the locking screw where high rpm is envisaged.

7. A light alloy plated throttle barrel is used and runs within the combined aluminium and moulded high impact plastic throttle body — all of which serves to reduce wear at this critical area and thus maintain good constant fuel settings.

8. A finely produced and aerodynamically profiled connecting-rod is used with phosphar bronze bushings at either end.

The general finish and accuracy of construction appear even better than some of the earlier Picco engines and cosmetically speaking the Picco P5 now has added eye-catching marketing appeal.

Power Tests

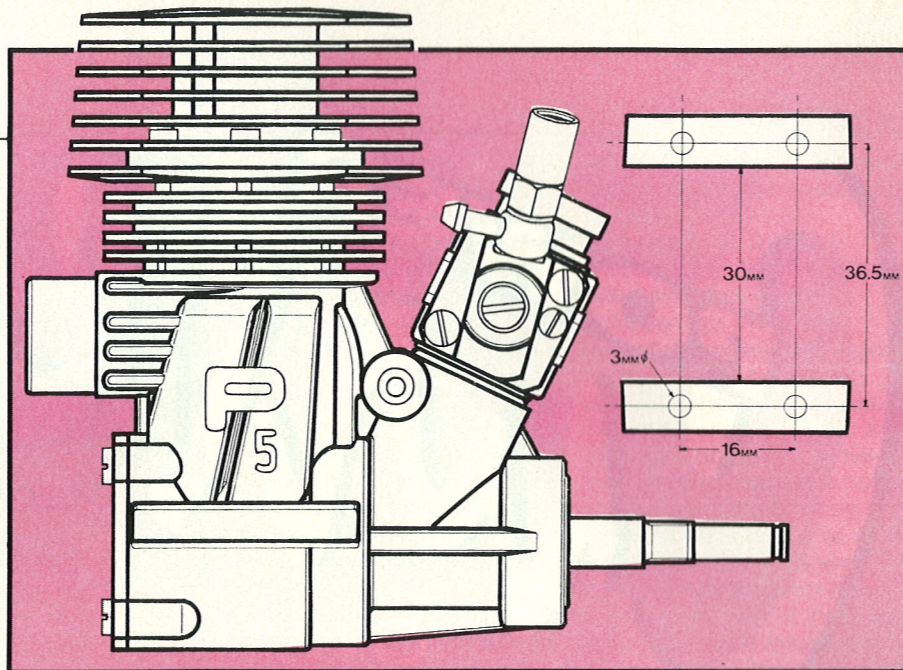
Initial rpm checks on standard propellers quickly indicated the potential of this new engine — and after a normal short running-in period torque tests were commenced.

Test 1. Open Exhaust

Fuel 5% Nitromethane/10% Castor oil/5% ML70 Synthetic oil/Balance Methanol. Plug OPS 300.

Starting at 9,500 rpm, the Picco P5 wound up (at stunning noise levels) all the way to nearly 30,000 rpm as all modern efficient racing 2-strokes of this capacity demonstrate.

HP maximum of 1.2 at 26,005 rpm virtually equalled the best



Nova-Rossi figure reached in this writer's tests and showed that Picco's continual experimentations have borne fruit in the P5.

Test 2. OPS Quiet tuned pipe (EFRA style)

Fuel/Plug as Test 1.

Using the more normal measuring system from plug to first maximum diameter (or end of first tapered cone), the pipe was fixed at a length of 195mm which, from previous tests, should have given a maximum resonance somewhere near to the rpm point where maximum hp with the open exhaust was found. In fact it appeared slightly short, because the engine surged on to a very strong 1.49 hp at a higher rpm of 28,757. For those wanting a lower rpm/maximum resonance point (say near to 22,000 rpm) then a lengthening of the pipe to around 220mm would be the thing to do, apart from being numerically easier to remember.

Test 3. Pipe and plug as Test 2

Fuel now: 50% Nitro./10%

ML70/5% Castor/35% Methanol

Mixing problems with large percentages of Nitromethane above 40% led, as is usually necessary, to a reduction of the non-mixing Castor oil and a commensurate increase of the totally mixable Synthetic oil.

In this test the engine was being pressed as hard as it is ever likely to be, and plug life became relatively short-lived though enough for torque reading and fuel consumption figures to be undertaken as normal. For actual track use it would be advisable to increase combustion chamber volume by some 25% if envisaging use of high Nitro. In practice the engine, as standard, appears accurately set up for fuels having 5-25% Nitro content.

For comparability reasons though, the 50% level was used here and resulted in a considerable performance improvement, though not perhaps as much as would follow correct combustion chamber changes to accommodate the

higher gas volumes involved when 'high-Nitro' starts delivering.

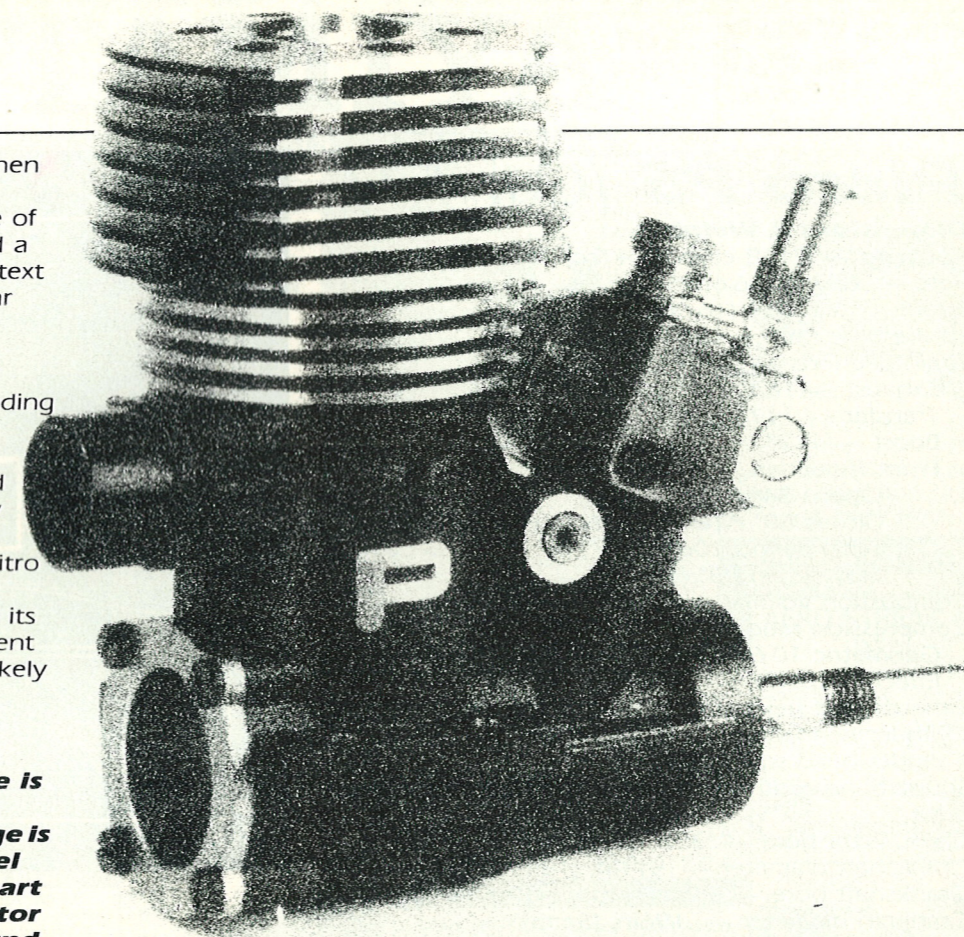
Nevertheless the final figure of 1.77 hp at 28,260 rpm proved a very competitive one in the context of prevailing 1/8 Open Class car engine performance.

Summary

Subsequent to this quite demanding set of power figures the engine (on strip-down) showed little sign of wear and so seems likely to prove a very reliable performer when used with the less demanding low-Nitro fuels.

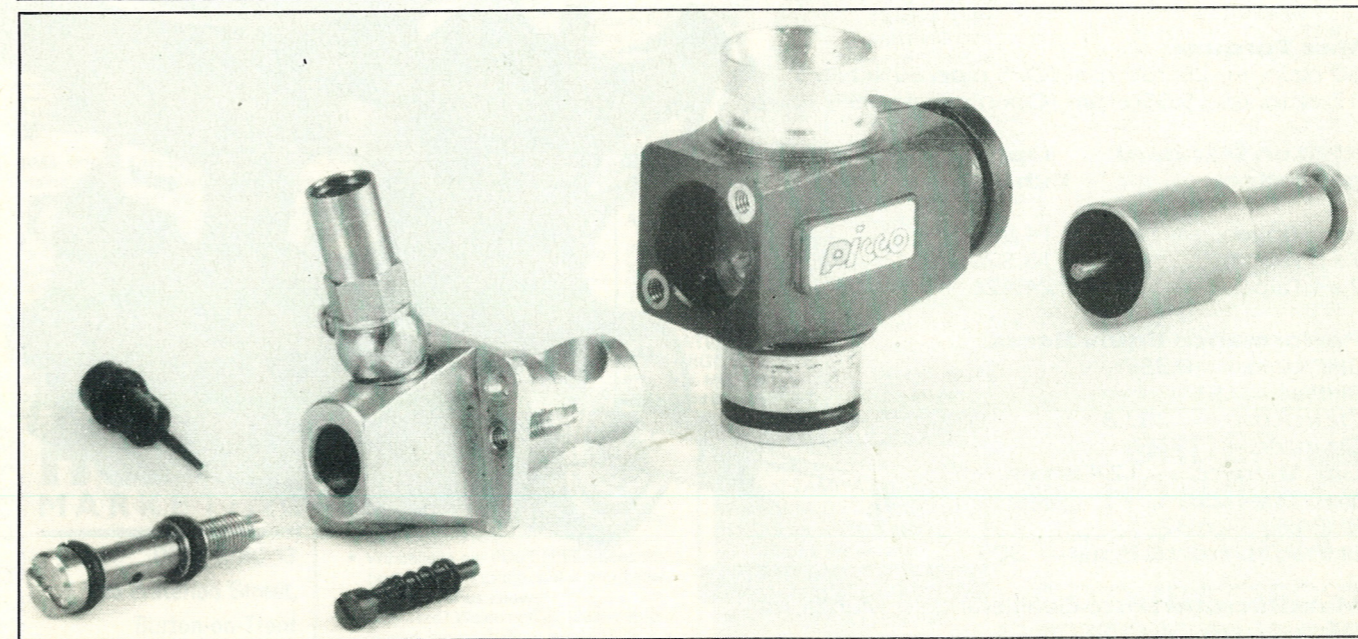
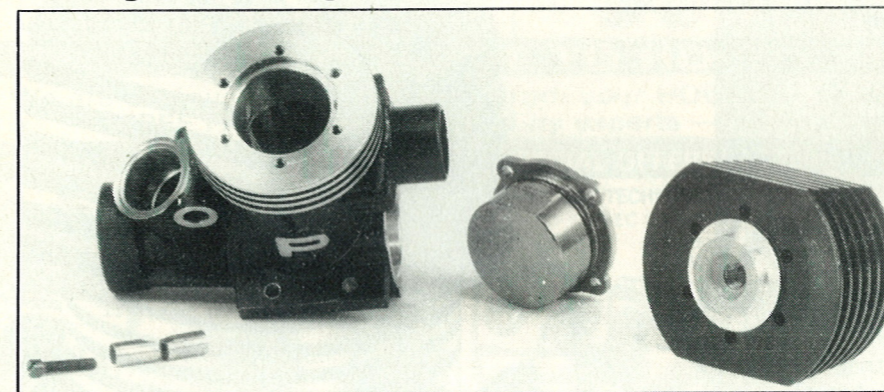
In that form, or when given its head, the Picco P5 proved a potent performer on test and is surely likely to figure prominently in competition results.

○ Nickel-plated backplate is 'O' ringed for sealing. Bifurcated transfer passage is just visible. Two-part steel locking sleeve and two-part locking stud for carburettor securing is in the foreground.

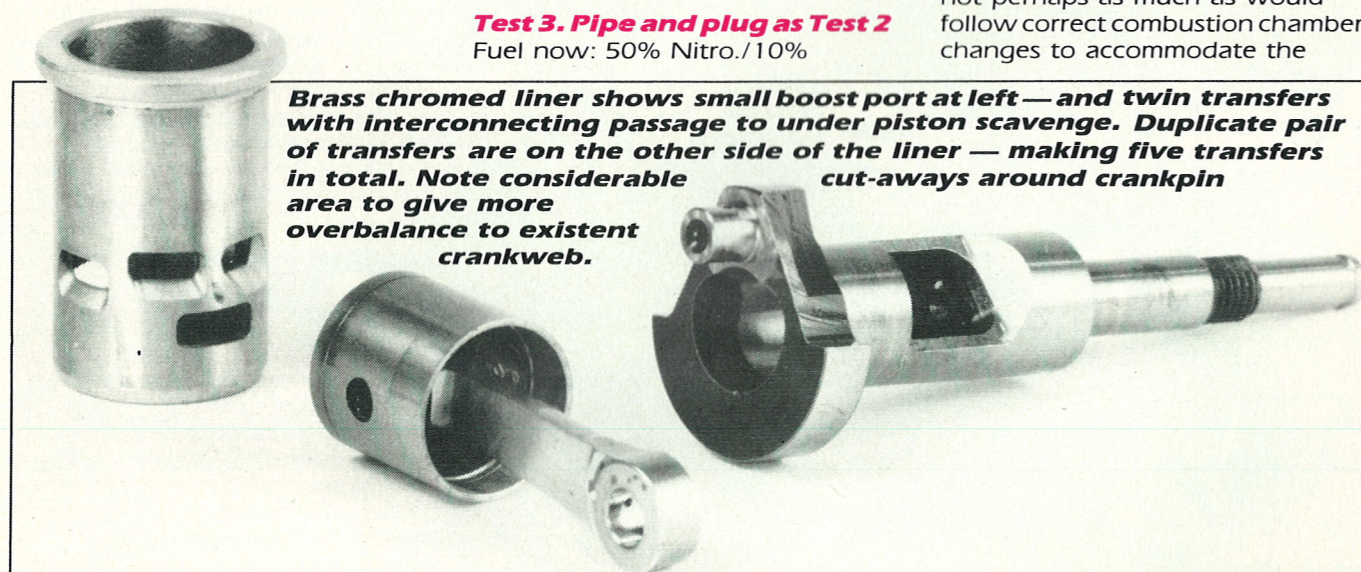


○ Exhaust manifold is cast-in with crankcase. Heat-sink head has air-throughway for plug cooling.

○ Secondary 'mid-range' jet is at extreme left — main needle control above, whilst at the bottom is the throttle position adjuster. Carb is typical Picco individuality and is well-engineered and robust.



Brass chromed liner shows small boost port at left — and twin transfers with interconnecting passage to under piston scavenge. Duplicate pair of transfers are on the other side of the liner — making five transfers in total. Note considerable area to give more overbalance to existent crankweb.



Picco P5 (Car F1)

Dimensions & Weights

Capacity — .2118 cu.in. (3.47cc)
 Bore — .657in. (16.6mm)
 Stroke — .6324in. (16.06mm)
 Stroke/Bore ratio — .968/1
 Timing Periods —
 Exhaust — 163°
 Transfer — 117°
 Boost — 112°
 Front Induction —
 Opens 34° ABDC
 Closes 60° ATDC
 Total period 206°
 Blowdown 23°
 Combustion volume — .36cc
 Compression ratios —
 Geometric 10.64/1
 Effective 6.67/1
 Exhaust port height — .226in. (5.76mm)
 Cylinder head squish — .014/.018in.
 Cylinder head squish angle — 0°
 Squish band width — .052 and .129 in. (1.34mm and 3.3mm)
 Carburettor bore — .35in. (9.1mm)
 Crankshaft diameter — .511in. (13mm)
 Crankshaft bore — 9.9mm reducing to 9.6mm
 Crankpin diameter — .196in. (5mm)
 Crankshaft nose thread — ¼ UNF
 Gudgeon pin diameter — .157in. (4mm)
 Connecting rod centres — 30mm
 Engine height — 3.5in. (89mm)
 Width — 1.73in. (43.9mm)
 Length — 2.5in. (63.5mm)
 Width between bearers — 1.186in. (30.1mm)
 Mounting hole dimensions —
 16 x 36 x 3mm holes
 Frontal area — 5.8 sq.in.
 Weight — 9.85 oz (280g)

Performance

Max BHP:

1.77 @ 28,260 rpm (OPS pipe/50% Nitro)
 1.20 @ 26,055 rpm (Open exhaust/5% Nitro)

Max Torque:

60 oz.in. @ 28,260 rpm (OPS pipe/50% Nitro)
 47 oz.in. @ 19,550 rpm (Open exhaust/5% Nitro)

RPM on Standard propellers:

	Open Exhaust	OPS EFRA pipe @ 195mm
8 x 6 Zinger	14,934	—
7 x 6 Taipan	18,520	17,631
7 x 4 Taipan	24,426	25,187

Performance Equivalents:

BHP/cu.in. — 8.357
 BHP/cc — .51
 Oz.in./cu.in. — 283.3
 Oz.in./cc. — 17.29
 Gm. Metre/cc. — 12.4
 BHP/lb. — 2.87
 BHP/kilo — 6.32
 BHP/sq.in. Frontal Area — .305

Manufacturer: Picco Gualtierangelo, Monza, Italy.
Distributor: Weston UK

