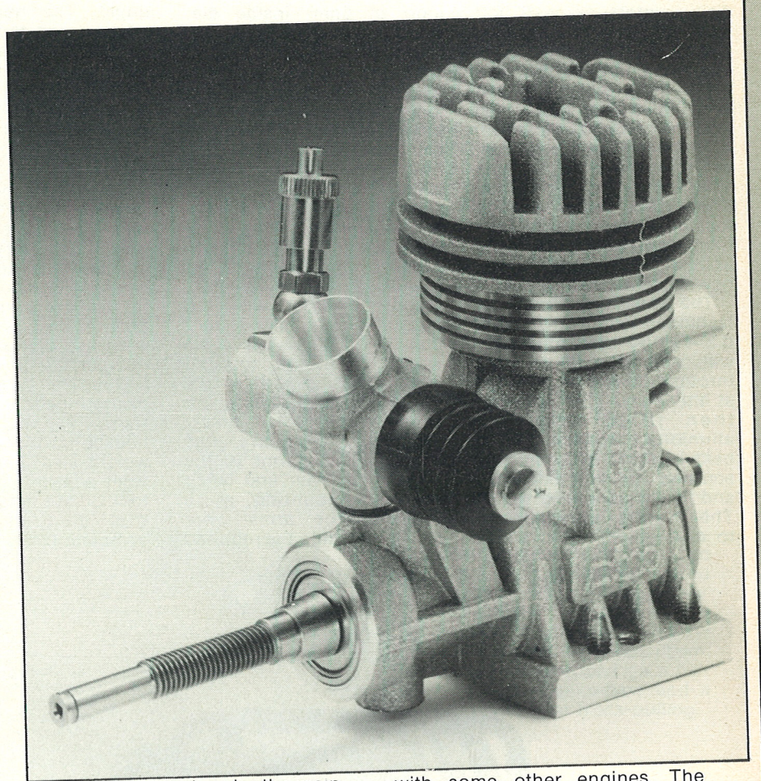
Engine Test No. 17 | **by Mike Billinton**

Picco P21 Delta

Packing a Whallop!



CONTINUING THE competitive march forward, the 1984 'MkIII' base-mount Open class car engine tested here incorporates design changes directed as much towards greater reliability as to power increase itself, and this reflects interestingly on the racing priorities as seen by this factory.

The flexure-free performance afforded by the new wide stance base mounting plus the inherently more reliable steel connecting-rod should both result in longer life at high power outputs. General consistency of handling and vibration-free running at all rpm's during this particular test were noteworthy. Increasing the exhaust timing plus some other small changes (which *continually* flow from the *Picco* factory), have now enabled this most recent 1984 unit to respond much more strongly to tuned pipe fitment.

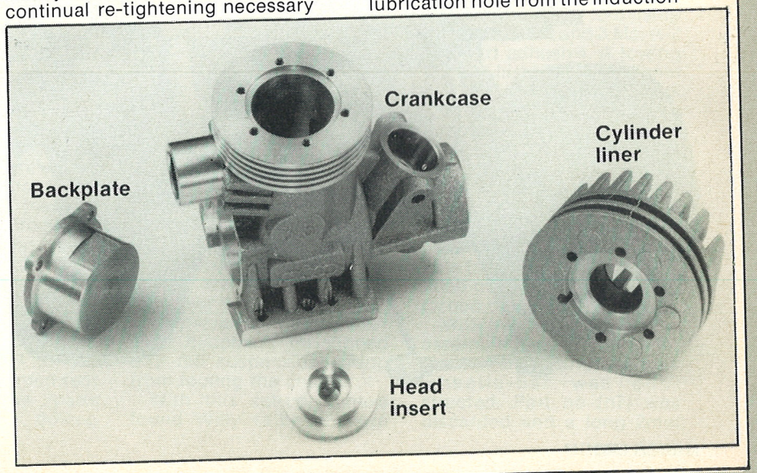
This rather unusually concentrated series of 'Model Cars' Engine Tests (just one engine size and type) has certainly enabled a clearer view that the release of an expected 50 per cent power uplift by use of tuned pipe and 50 per cent nitromethane fuels is a difficult goal to attain, and one at which not all engines have succeeded — at least not in this series of tests. It does seem that correct matching of pipe and motor parameters is not an easy matter, but once realised the result is clearly audible and obvious on the dynamometer, as was the case with this new *Picco* 21.

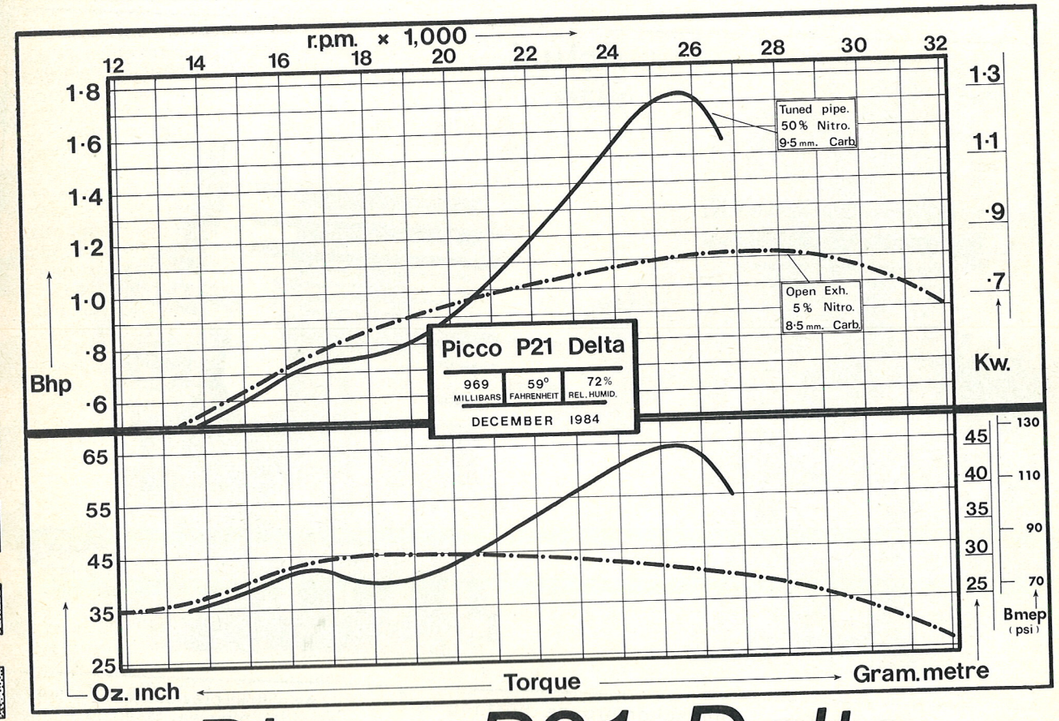
Points of mechanical interest:

Crankcase — at 4.7oz (with bearings), *Picco's* distinctive rough-cast aluminium alloy one-piece unit now incorporates a base mount with four pillars either side. Even more sensible, a mounting point is also fitted under the main front bearing position, giving the *Picco* the widest mounting base currently available. Use of the one front screw and just two rear ones provides a massively wide and secure triangulated area to hold steady any likely power release (and also makes engine easier to photo!). The Allen grubscrew carburettor mounting bosses held the large 8.6mm slide carburettor rock steady at all rpm points without the continual re-tightening necessary with some other engines. The crankcase still retains the previous two boost and two larger side transfer ports.

Liner. This brass chromed component now has exhaust timing increased to 170° — giving 21° lead over transfer. The 126° boost and 128° transfer timings are reversions to those of the 1981 engine.

Crankshaft. In hardened steel, and still using *Picco's* angled lubrication hole from the induction

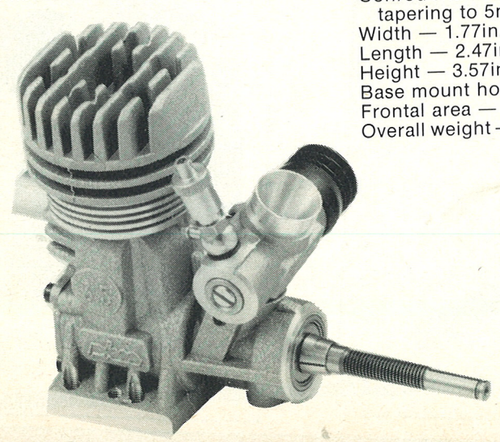




Picco P21 Delta

Dimensions and weights

Capacity — .210cu.in. (3.44cc)
Bore — .6515in. (16.5mm)
Stroke — .631in. (16.0mm)
Stroke/bore ratio — .968/1
Timing periods
— Exhaust — 170°
— Transfer — 128°
— Boost — 126°
Front induction
— Opens 27° ABDC
— Closes 53° ATDC
Total 206°
Exhaust port height — .236in. (6mm)
Combustion chamber vol. — .32cc
Compression ratios
— Effective — 7.6/1
— Geometric — 11.7/1
Cylinder head squish — .012in.
Squish band angle — 0°
Squish band width — .120in.
Crankshaft dia. — .472in. (12mm)
Crankpin dia. — .1967in. (5mm nominal)
Crank bore — .335in. (8.5mm)
Crank nose thread — .245in. × 28 TPI
(¼ UNF)
Gudgeon pin dia. — .1586in. (4mm nominal)
Connecting rod centres — 30mm
Conrod shank dimensions — 6mm tapering to 5mm × 2mm thick
Width — 1.77in.
Length — 2.47in.
Height — 3.57in.
Base mount holes — 3mm
Frontal area — 5.32sq.in.
Overall weight — 12.00oz (.34 Kilo)



Performance:

Max. BHP — 1.74 at 25,740rpm (Picco pipe/50% nitro/9.5mm carb)
— 1.12 at 27,000rpm (Open Exhaust/5% nitro/9mm carb)
Max Torque — 64oz in. at 25,740rpm (Picco pipe/50% nitro)
— 45 oz in. at 18,400rpm (Open exhaust/5% nitro)
RPM Standard Propellers:
8 × 6 Zinger — 16,330 (Open Ex/5% nitro)
7 × 6 Taipan — 18,620 (Open Ex/5% Nitro)
7 × 4 Taipan — 24,100 (Open Ex/5% Nitro)
7 × 4 Taipan — 26,090 (Picco pipe at 210mm/50% Nitro)

Performance equivalents:

BHP/cu.in — 8.28
BHP/cc — .506
Oz in./cu.in. — 304.7
Oz in./cc — 28.6
Gm metre/cc — 13.4
BHP/lb — 2.32
BHP/kilo — 5.11
BHP/sq.in. frontal area — .327

Manufacturer:

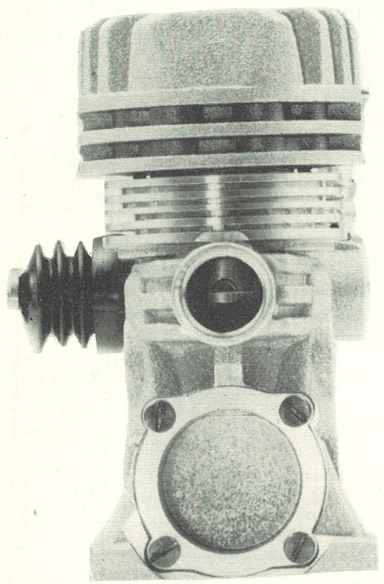
Picco Gualtiero, Monza, Italy.

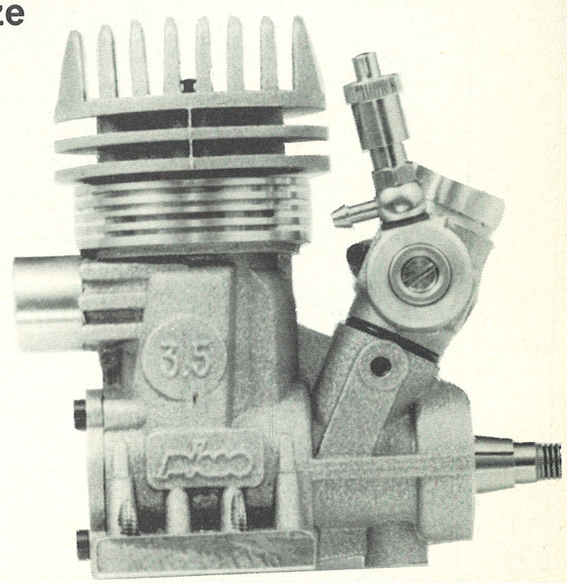
UK Distributor:

PB Racing Products Ltd., Downley Road, Havant, Hants.

Engine Test No. 17

Actual size





bore to outer face of crankpin. The induction timing now opens and closes some 6° earlier than before.

Head insert. On this engine the squish band is set at .012in. though other changes have led to a reduction of effective compression ratio to 7.6/1, and this led to quite long plug life during the high nitro runs.

Connecting rod. With information from the manufacturer on material selection still being hard to obtain, an *estimate* of the new steel rod structure is nickel/chrome/moly steel — subsequently, selectively hardened at big and little ends by masking the main body with copper plating — thus leaving the thin but highly stressed rod shank in unhardened but tougher condition. A phosphor-bronze bushing is nevertheless still used at the big-end, with one vertical lube hole above the crankpin. Rod weight is an ethereal 4 grams.

Power Test 1

Open exhaust/5% nitro and 15% Castor/8.6mm carb/Rossi R8 plug. By comparison with the 1981 test; motor torque figures were somewhat higher, up to 23,000rpm, though the final resultant bhp at 27,000rpm was of similar order at 1.12.

Test 2

Picco quiet tuned pipe (210mm plug to first max. dia.) 50% nitro/10% castor and 8% ML70 synthetic oil. Rossi R8 plug./Carburettor now 9.5mm slide.

As with all previous rear-exhaust tests the pipe was taken back in a straight line from the rear-exhaust outlet (by use of suitable tubings and sleevings) and the resulting length was similar to that obtainable if using the oddly shaped and slightly constricted right-angled manifold supplied with the engine.

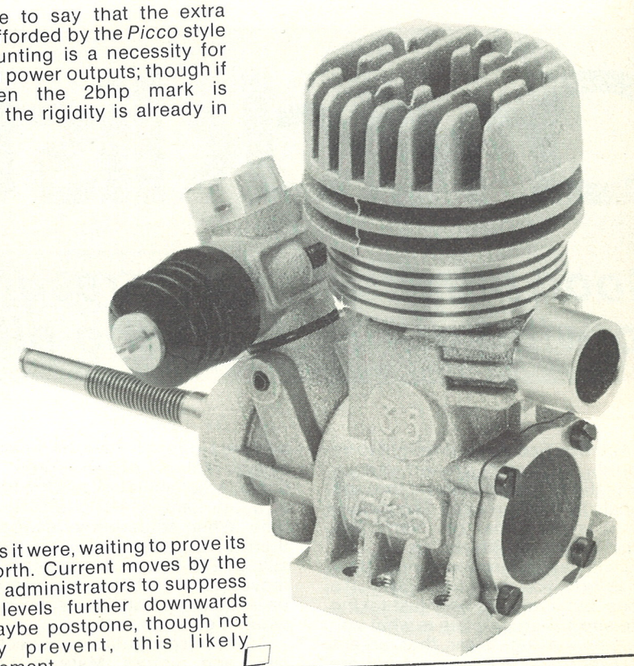
At this length, the correct 'resonance' occurred at almost 26,000rpm, i.e. not far short of Open Exhaust peak point. Maximum torque recorded was 64oz in. . . . (currently only the very strongest engines are reaching above the 60oz in. mark using this 'standard' equipment).

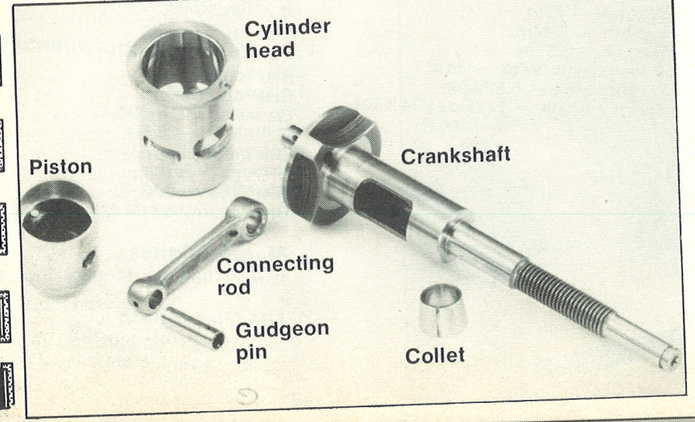
The result was a high 1.74bhp — and as usual this is a corrected figure after having accounted for atmospheric conditions, which on this occasion included a quite low pressure of 969 millibars, together with high humidity around 78% — both of which place restraints on IC engine performance.

Summary

Apart from the power figure itself, the most positive aspect of the *Picco* performance was the rock-steady running at all rpm's; with no points where damaging vibrations occasionally intrude. This fact alone made the test session a much less 'jangling' period than normal.

At this point in the development of the 'Open' Car engine it may be premature to say that the extra rigidity afforded by the *Picco* style base-mounting is a necessity for very high power outputs; though if and when the 2bhp mark is reached, the rigidity is already in place as it were, waiting to prove its real worth. Current moves by the sport's administrators to suppress noise levels further downwards will maybe postpone, though not finally prevent, this likely achievement.





Under view