

DUNLOP LTD, SRS DIVISION.
(BORTONWOOD OILSEALS)
TAWD VALE 3485

10-3-69

MR D C MONRO

ORDER N° 08936, 32 Seal @ 1/11d each (MIN ORDER)
STOCK N° 2379

1.000 O/D x 7/8 DIA SHAFT x 3/16 WIDE

800 cc

7-5-69

Received from H&C

12 Apex Oil Control Rings, complete with rails

Ref N° AX0734L3B

to give a tangential load of 8.7 lbs (V @ 250 p.s.i.)

Material - Carbon Steel.

Our Order N° 09198 H&C Code N° OE.456

Packing Note N° DEVT. 14746

MEASUREMENT OF RH Barrel

8-5-69

Badly worn after 3000 miles.

Piston fitted with HC22 top rings & DO Scrapper Rings.

Oil consumption - heavy - 300 miles to a pint.

Thrust Axis

90° to Thrust

| | | |
|-----------|--------|--------|
| 1/2" down | 2.9007 | 2.9035 |
| 1 1/2 " | 2.8993 | 2.9023 |
| 2 1/2 " | 2.8992 | 2.9023 |
| 3 1/2 " | 2.8994 | 2.903 |
| 4 1/2 " | 2.8984 | 2.896 |
| 5 1/2 " | 2.895 | 2.8953 |

Drawing dimension 2.8940/2.8935

Received - from Girling.

12-5-69

1 Pair springs:

P/N 9054/280 100 lbs/in Green/Green
Fitted load (at 8.0 in) 68 lb.

1 Pair springs:

P/N 9054/277 110 lbs/in Red/Red
Fitted load (at 8.0 in) 35 lb.

(Std Springs 64539963 132 lbs/in Red/Orange)
Fitted load (at 8.0 in) 62 lb)

Sidecar Specification -

15-5-69

Norton Sidecar fork crown & handlebar lug reduces trail
by approx $1\frac{3}{4}$ "

Sidecar fork spring 50 lbs/in but .7" shorter than
solo spring.

Try Girling Res Springs SA 253/5 145 lbs/in

also - SA 193/57 150 ~~at~~ "

SA 193/57 will be over stressed

20-5-69

Received from Pioneer Oil Seals.

6 samples N° 11P/10006225/MP 802

Our Order N° 08895

18-6-69

Comparison of various lengths on Norton Commando
Forks and Norton/Enfield 1969 Forks.

Commando Damping Tube $9\frac{1}{8}$ " 1969 & 1970
Enfield - - - $10\frac{29}{32}$ 1969

Commando Main Tube 23.161/23.151
Enfield - - - 24.942/24.932

Commando Dampers Rod $19\frac{13}{16}$ " 1969
" " " $21\frac{5}{16}$ " 1970
Enfield - - - $19\frac{13}{16}$ "

30-6-69

Received from George Angus & Co Ltd
6 samples Rotary Shaft Seal M1.062100. $3\frac{3}{16}$ SE 70

15-7-69

MR. P.A. LELLIOTT.
Duckhams Oils ← Send samples.
Summit House.
Glebe Way
West Wickham
Kent.

Drain 1 tank 1/2 way, then take sample before completing draining

Summary of 800 Test

3rd July 1969

My drawing of a piston for the 800 cc model was based on that used on the 750 cc which was originally a split-skirt type with the slots deleted later.

Hepworth & Grandage re-designed the 800 piston following their normal methods for a solid skirt piston i.e. less clearance on top lands and no barreling.

First pistons were fitted with Apex oil control rings giving a wall pressure of 350 lbs/4" (similar to 750)

L.H. piston seized after 867 miles (at about 80 m.p.h.) Thought to be due to mixture too weak.

New barrel and piston fitted & carburettors changed to richer settings

L.H. piston seized after 1,725 miles at approx 95 m.p.h. Signs of oil control expander ring fouling bottom of groove. Pistons returned to H & P - grooves made deeper and top lands reduced on diameter

New barrel and piston fitted, seized after 542 miles. Discovered signs of ring scuffing pointed to too drastic oil scraping. Difficult to measure oil consumption because of repeated seizures but estimated at 1,500 miles to the pint.

Fitted solid scraper rings, knowing that these would give heavy oil consumption but to prove whether engine could be made to run without seizing or if barrel distortion was the trouble

Engine ran satisfactorily for ~~3,723~~⁵⁰⁰⁰ miles using about 1 pint of oil per 300 miles (200 miles/pint at high speeds)

Speed tested at MIRA at 115 m.p.h. (engine not prepared for test)

Oil leaking from porous cyl head, changed to heads with larger inlet valve and 32 mm carbs fitted.

Changed back to Apex oil control rings giving lower wall pressure, i.e. 250 lbs/4"

Covered further 3,063 miles without trouble. Oil consumption 800 miles per pint.

type with the slots deleted later.

Hepworth & Grandage re-designed the 800 piston following their normal methods for a solid skirt piston i.e. less clearance on top lands and no barreling.

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Changed back to Apex oil control rings giving lower wall pressure, i.e. 250 lbs/sq"

Covered further 3,063 miles without trouble. Oil consumption 800 miles per pint.

Requires high speed test at MIRA, oil consumption test and check on sprocket size for top gear.

Summary of 800 Test

3rd July 1969

My drawing of a piston for the 800 cc model was based on that used on the 750 cc which was originally a split-skirt type with the slots deleted later.

Hepworth & Pendergast re-designed the 800 piston following their normal methods for a solid skirt piston i.e. less clearance on top lands and no barreling.

First pistons were fitted with Apex oil control rings giving a wall pressure of 350 lbs/4" (similar to 750)

L.H. piston seized after 867 miles (at about 80 m.p.h.) Thought to be due to mixture too weak.

New barrel and piston fitted & carburettors changed to richer settings

L.H. piston seized after 1,725 miles at approx. 95 m.p.h. Signs of oil control expander ring fouling bottom of groove. Pistons returned to H & P - grooves made deeper and top lands reduced on diameter

New barrel and piston fitted, seized after 542 miles. Decided signs of ring scuffing pointed to too drastic oil scraping. Difficult to measure oil consumption because of repeated seizures but estimated at 1,500 miles to the pint.

Fitted solid scraper rings, knowing that these would give heavy oil consumption but to prove whether engine could be made to run without seizing or if barrel distortion was the trouble

Engine ran satisfactorily for ~~3,723~~^{5,000} miles using about 1 pint of oil per 300 miles (200 miles/pint at high speeds)

Speed tested at MIRA at 115 m.p.h. (engine not prepared for test)

Oil leaking from porous cyl head; changed to heads with larger inlet valve and 32 mm carbs fitted.

Changed back to Apex oil control rings giving lower wall pressure, i.e. 250 lbs/4"

Covered further 3,063 miles without trouble. Oil consumption 800 miles per pint.

Hepworth & Spence re-designed the 800 piston following their normal methods for a solid skirt piston i.e. less clearance on top lands and no barreling.

First pistons were fitted with Apex oil control rings giving a wall pressure of 350 lbs/10" (similar to 750)

L.H. piston seized after 867 miles (at about 80 m.p.h.) Thought to be due to mixture too weak.

New barrel and piston fitted & carburettors changed to richer settings

L.H. piston seized after 1,725 miles at approx 95 m.p.h. Signs of oil control expander ring fouling bottom of groove. Pistons returned to H & S - grooves made deeper and top lands reduced on diameter

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Intercepto 800

MIRA

21-7-69

Slight West Wind - 73°F. 29.8 Bars

20T Gearbox Sprocket

Rider R. Stevens

Talboys Silencers

E to W - 111.00 mph

W to E - 119.10 mph

W to E 119.54 mph

E to W 112.94 mph

W to E 119.80 mph

E to W 114.79 mph

E to W 115.59 mph

W to E 122.00 mph

} 118.8 average.

= 7210 R.P.M.

Morning

21T Gearbox Sprocket

Rider R Stevens

Talboys Silencers

E to W 112.04 *

W to E 120.29

W to E 120.80 *

E to W 111.84

E to W 114.80

W to E 123.40

} 116.42 average.

} 119.1 average.

= 6970 R.P.M.

21T Gearbox Sprocket

Rider R Stevens

Large Experimental Silencers

E to W 111.85

W to E 122.1

E to W 112.39

W to E 121.59

} 117.25 average.

As above but - Rider C Ludgate

E to W 112.85

W to E 120.39

} 116.62 average

W to E 122.29

Afternoon

Slight West Wind 73°F 29.8 Bars

20T Gearbox Sprocket

Rider R. Stevens

Talboys Silencers

E to W - 111.00 mph

W to E - 119.10 mph

W to E 119.54 mph

E to W 112.94 mph

W to E 119.80 mph

E to W 114.79 mph

E to W 115.59 mph

W to E 122.00 mph

} 118.8 average.

= 7210 R.P.M.

Morning

21T Gearbox Sprocket

Rider R Stevens

Talboys Silencers

E to W 112.04 *

W to E 120.29

W to E 120.80 *

E to W 111.84

E to W 114.80

W to E 123.40

} 116.42 average.

} 119.11 average.

= 6970 R.P.M.

21T Gearbox Sprocket

Rider R Stevens

Large Experimental Silencers

E to W 111.85

W to E 122.1

E to W 112.39

W to E 121.59

} 117.25 average.

As above but - Rider C Ludgate

E to W 112.85

W to E 120.39

} 116.62 average

~~E to W 112.85~~

Conditions at end of test - West Wind 10 m.p.h.
85°F 29.8 Baro.

Afternoon

750 KHR Std Silencers Air Cleaner

20T Gearbox Sprocket

Rider C. Ludgate.

Afternoon

| | | |
|--------|--------|-------------------|
| E to W | 102.54 | } 107.94 average. |
| W to E | 113.34 | |
| E to W | 102.29 | |

Measurements of 800 cc Cylinder Barrels 25-7-69

Drawing Dimension 2.8940/2.8935 dia bore

LEFT HAND

| | <u>THRUST</u> | | <u>90° to THRUST</u> | |
|---------------|---------------|------|----------------------|-------|
| 1/2" FROM TOP | 2.9028 | +8.8 | 2.9047 | +10.7 |
| 1 1/2 - - - | 2.9000 | +6 | 2.9016 | +7.6 |
| 2 1/2 - - - | 2.9002 | +6.2 | 2.9014 | +7.4 |
| 3 1/2 - - - | 2.9005 | +6.5 | 2.9030 | +7 |
| 4 1/2 - - - | 2.895 | +1 | 2.8975 | +3.5 |
| 5 1/2 - - - | | | 2.8970 | +3 |

RIGHT HAND

| | <u>THRUST</u> | | <u>90° to THRUST</u> | |
|---------------|---------------|------|----------------------|------|
| 1/2" FROM TOP | 2.9015 | +7.5 | 2.905 | +11 |
| 1 1/2 - - - | 2.8990 | +5 | 2.9016 | +7.6 |
| 2 1/2 - - - | 2.8995 | +5.5 | 2.9010 | +7 |
| 3 1/2 - - - | 2.8953 | +1.3 | 2.9017 | +7.7 |
| 4 1/2 - - - | 2.8970 | +3 | 2.8971 | +3.1 |
| 5 1/2 - - - | | | 2.8971 | +3.1 |

Top 2 rings .030" gap in std bore.

13-8-69

Received from H&C :-

19 top piston rings for 788cc model

MTP 21927 Bored out to 3.000/2.992 mm radial thickness.
(D/26)

2.8935 mm \times $\begin{matrix} .0635 \\ -.0625 \end{matrix}$

19-8-69

Richard met David Measures at Sutterton last Sunday.
David's friend is Harry Moore, van driver at Polypenco.
Harry is friendly with their Technical Dept.

Technical Dept.

Polypenco.

Gate House.

Welwyn Garden City.

Herts

800 Cyl Barrels - measured 21-8-69

by ~~test~~ gauge.

| <u>L.H.</u> | <u>R.H.</u> | |
|-----------------|-------------|----------|
| ① Top 2.8952 | ② 2.8958 | ③ 2.8950 |
| Mid 2.8957 | 2.8943 | 2.8950 |
| Bottom } 2.8954 | 2.8950 | 2.8947 |
| Wear line } | | |
| Bottom 2.8950 | 2.8954 | 2.8950 |

Barrels ① & ② fitted for Richards holiday run to the continent.

27-8-69

ANGUS OIL SEAL N° M I 062100 1/4 SE 70

500 ORDERED FOR CONTACT BREAKER SEAL

800 cc

3-9-69

Barrels measured after continental trip.

N° 1 LEFT HAND

| | <u>THRUST</u> | <u>90° TO THRUST</u> |
|--------------|---------------|----------------------|
| 1/2 FROM TOP | 2.8967 | 2.8963 |
| 1 1/2 " | 2.8967 | 2.8963 |
| 2 1/2 " | 2.8972 | 2.8963 |
| 3 1/2 " | 2.8977 | 2.8975 |
| 4 1/2 " | 2.8982 | 2.8994 |

N° 2 RIGHT HAND

| | <u>THRUST</u> | <u>90° TO THRUST</u> |
|--------------|---------------|----------------------|
| 1/2 FROM TOP | 2.8954 | 2.8954 |
| 1 1/2 " | 2.8954 | 2.8953 |
| 2 1/2 " | 2.8956 | 2.8953 |
| 3 1/2 " | 2.8959 | 2.8961 |
| 4 1/2 " | 2.8966 | 2.8966 |

Visit by Dennis Smallwood.

3-9-69

Suggests ^{standard} run pistons in new barrels and inspect after 50 miles

Check top land diameters.

Then, if necessary, reduce high spots at top of skirt by stoning off .0005" and reduce top land diameters.

GEAR RATIOS

17-10-69

| | | |
|-----------------------------------|--------------|-------------------------------|
| NORTON COMMANDO :- | G/BOX | 1 / 1.22 / 1.70 / 2.56 |
| TRIUMPH BONNEVILLE :- | G/BOX | 1 / 1.19 / 1.69 / 2.42 |
| <u>INTERCEPTOR (20T G/BOX) :-</u> | <u>G/BOX</u> | <u>1 / 1.36 / 1.84 / 2.78</u> |
| INTERCEPTOR (21T G/BOX) | G/BOX | 1 / 1.36 / 1.84 / 2.78 |
| INTERCEPTOR (19T G/BOX) | G/BOX | 1 / 1.36 / 1.84 / 2.78 |
| INTERCEPTOR (18T G/BOX) | G/BOX | 1 / 1.36 / 1.84 / 2.78 |

| | | |
|-------------------------|-------|--------------------------------------|
| INTERCEPTOR (20T G/BOX) | G/BOX | 1 / 1.24 / 1.60 / 1.96 (N° 27 RATIO) |
| INTERCEPTOR (19T G/BOX) | G/BOX | 1 / 1.24 / 1.60 / 1.96 (N° 27 RATIO) |
| INTERCEPTOR (18T G/BOX) | G/BOX | 1 / 1.24 / 1.60 / 1.96 (N° 27 RATIO) |

| | | |
|---------------------------|-------|------------------------------------|
| * INTERCEPTOR (21T G/BOX) | G/BOX | 1 / 1.23 / 1.67 / 2.50 (SEE BELOW) |
| * INTERCEPTOR (20T G/BOX) | G/BOX | 1 / 1.23 / 1.67 / 2.50 (SEE BELOW) |
| * INTERCEPTOR (19T G/BOX) | G/BOX | 1 / 1.23 / 1.67 / 2.50 (SEE BELOW) |
| * INTERCEPTOR (18T G/BOX) | G/BOX | 1 / 1.23 / 1.67 / 2.50 (SEE BELOW) |

| | | |
|-------------------|-------------|-----------------------|
| * GEARBOX PINIONS | { MAINSHAFT | 24T / 20T / 17T / 15T |
| | { LAYSHAFT | 16T / 20T / 23T / 25T |

OVERALL 4.84 / 5.9 / 8.25 / 12.4

3.50 X 19 AVON G.P.

OVERALL 4.84 / 5.76 / 8.17 / 11.81

4.00 X 18 K 70

OVERALL 4.44 / 6.05 / 8.19 / 12.40

(STD 1969)

4.00 X 18 K 70

OVERALL 4.22 / 5.74 / 7.68 / 11.75

OVERALL 4.68 / 6.36 / 8.60 / 13.00

OVERALL 4.93 / 6.71 / 9.07 / 13.72

OVERALL 4.44 / 5.50 / 7.10 / 8.70

29T ENGINE SPROCKET

OVERALL 4.68 / 5.80 / 7.47 / 9.16

56T CLUTCH

OVERALL 4.93 / 6.12 / 7.89 / 9.67

46T REAR

OVERALL 4.22 / 5.20 / 7.06 / 10.57

OVERALL 4.44 / 5.46 / 7.42 / 11.10

OVERALL 4.68 / 5.76 / 7.82 / 11.71

OVERALL 4.93 / 6.07 / 8.23 / 12.34