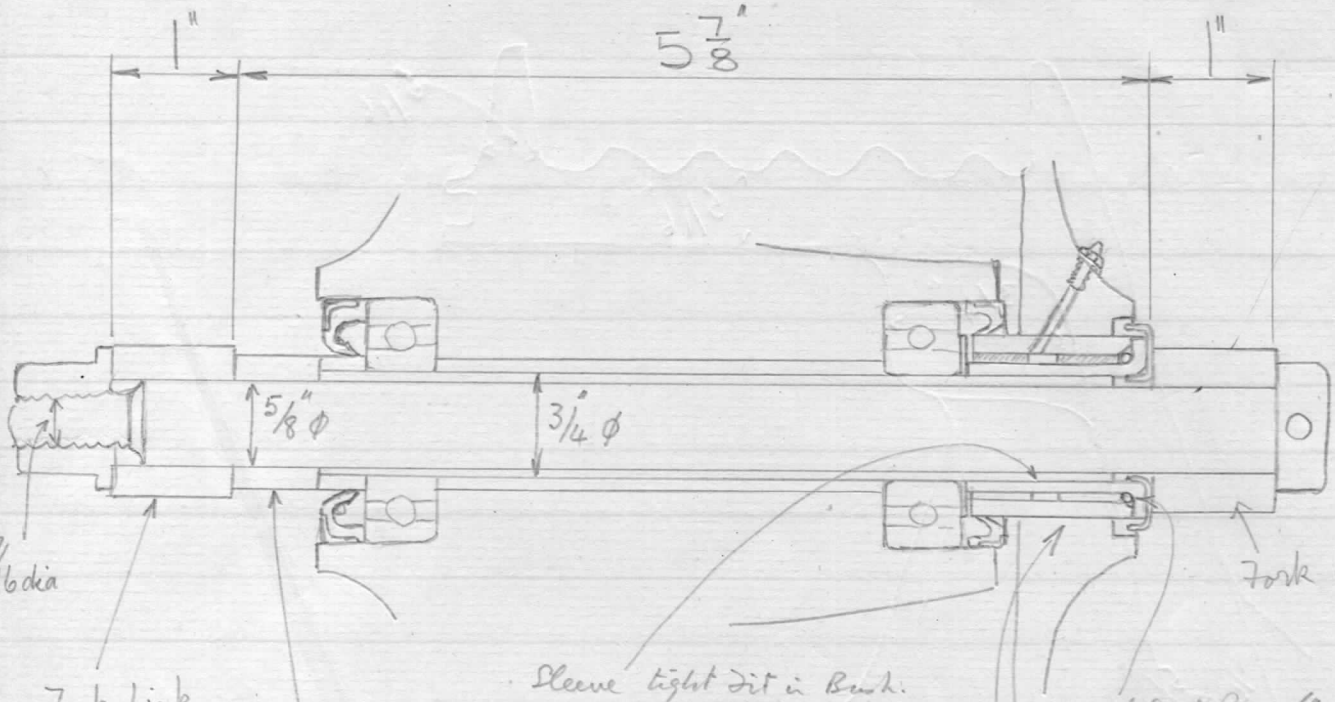
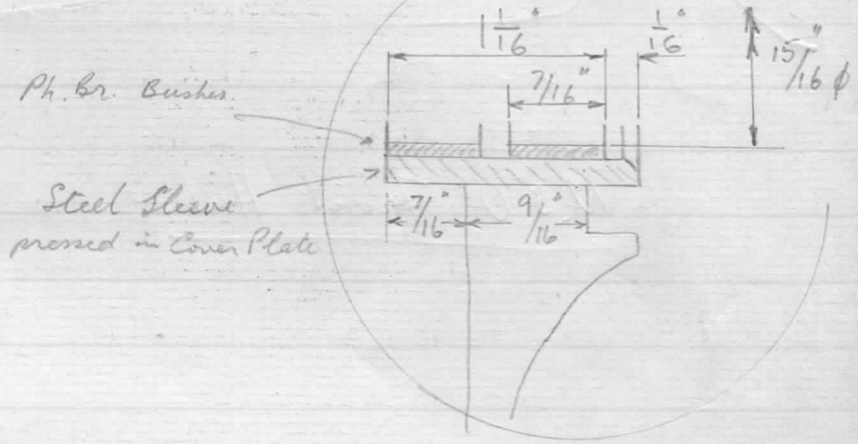
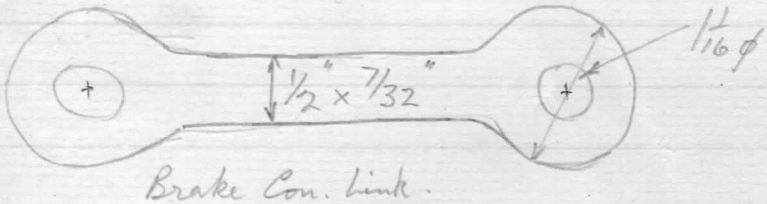
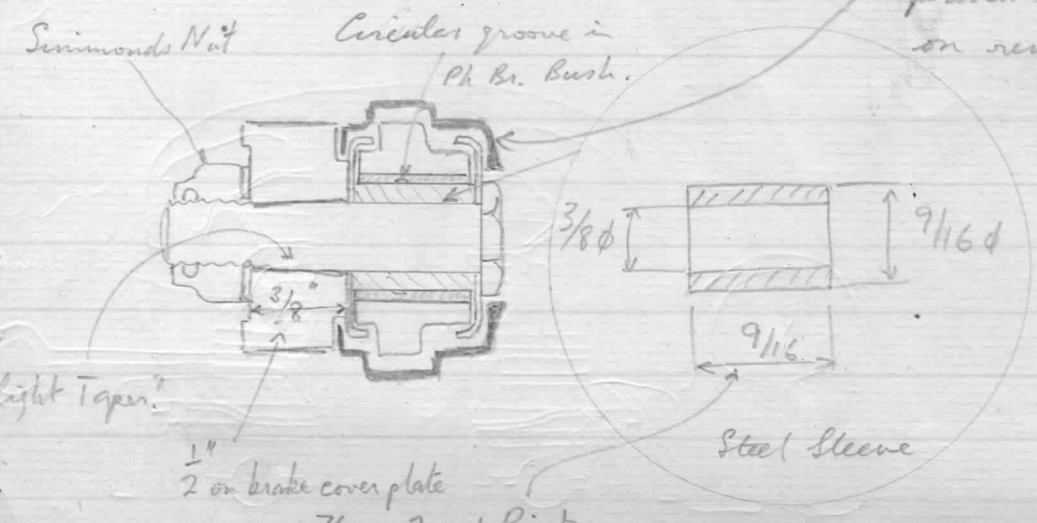
N.S.U. Leading Link Front Fork. 16/7/56

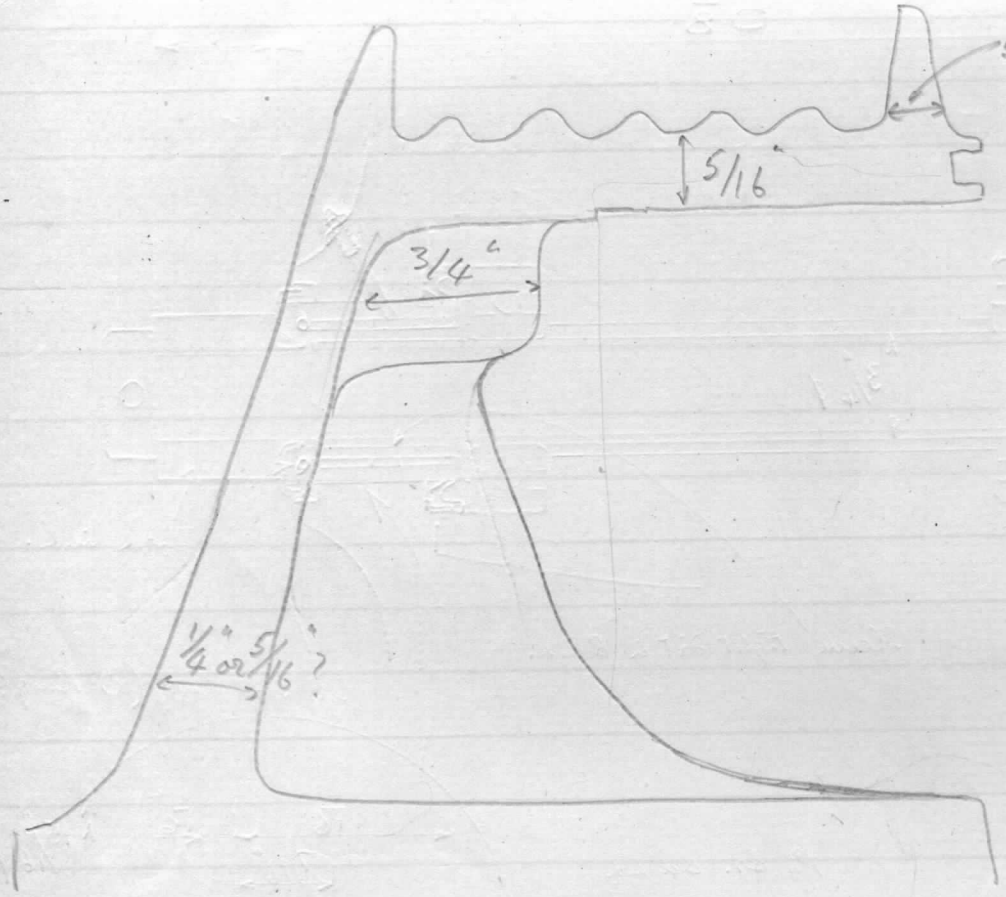


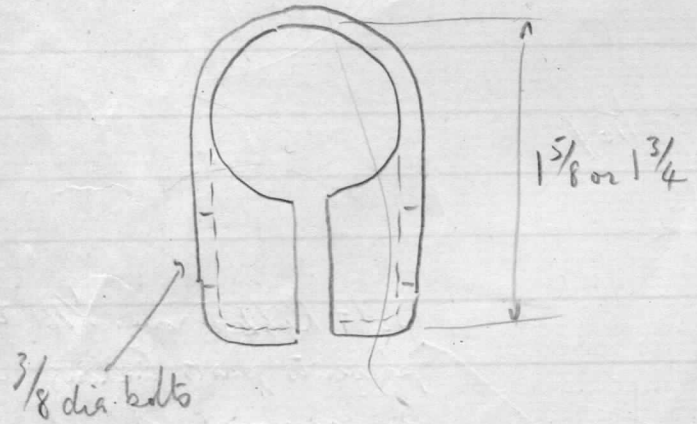



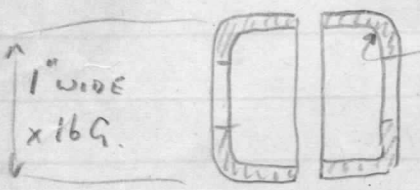

Soft Rubber cover 1/16" thick prevents parts falling out on removal of wheel.

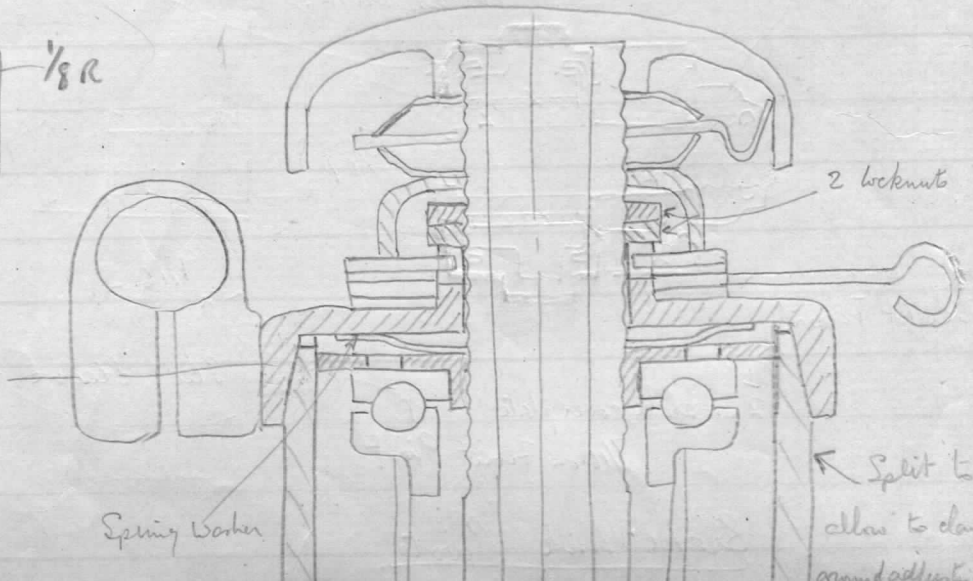




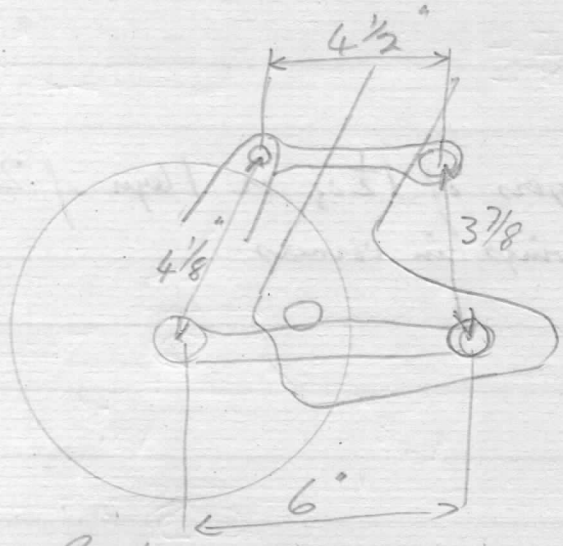

N.S.U. Front Hub.



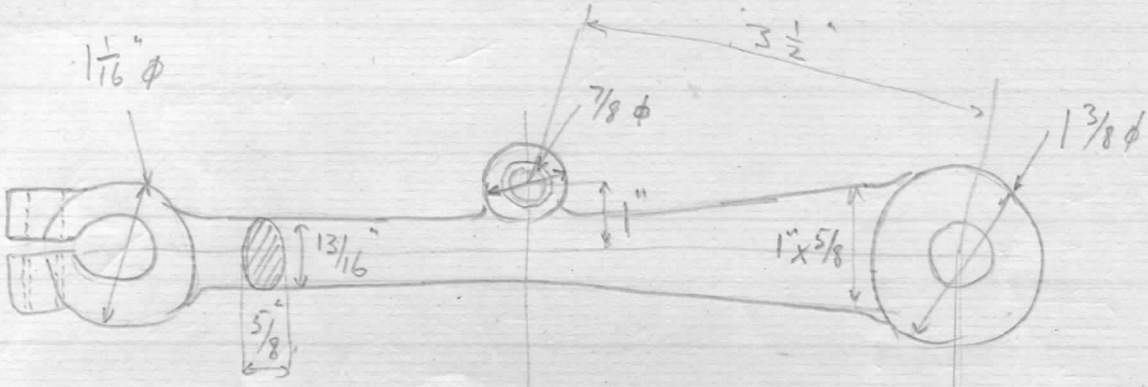



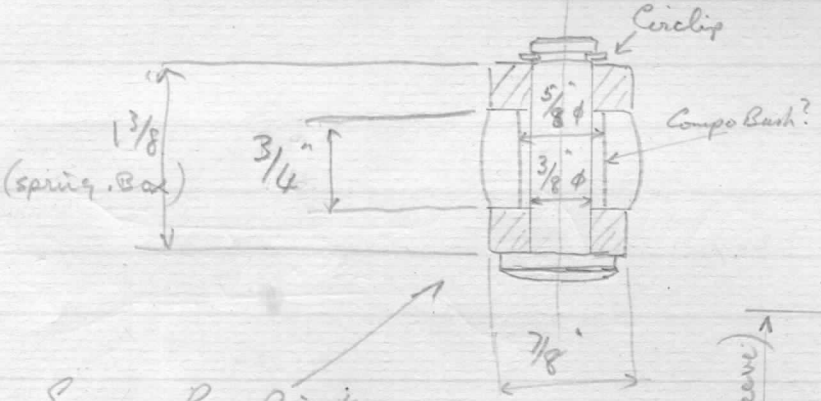



N.S.O. Leading Link Front Fork 16/7/56

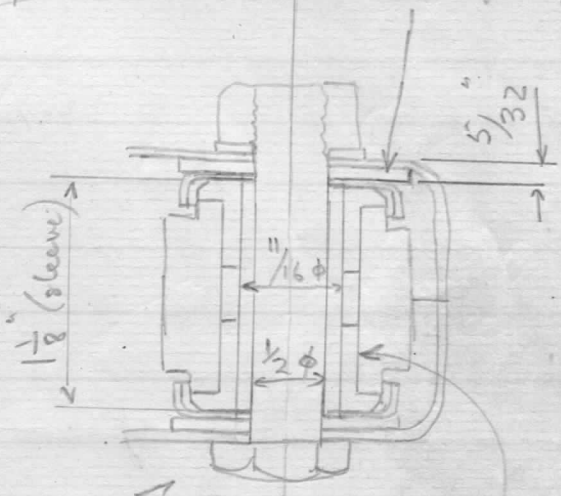



Brake Linkage

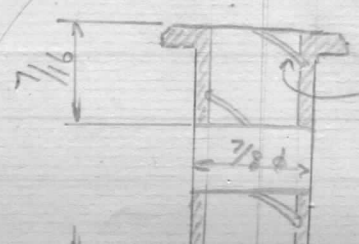


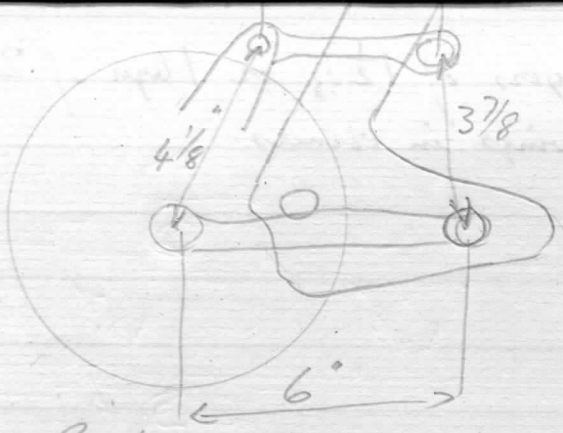




Spring Box Pivot

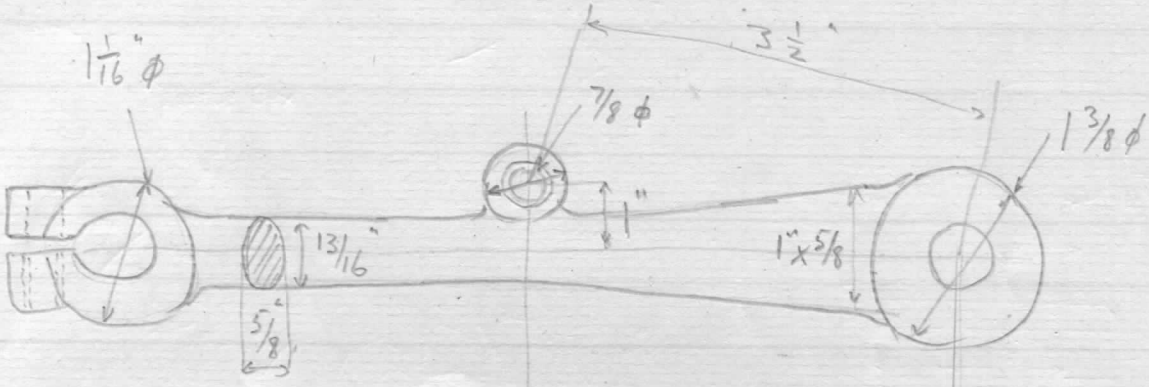


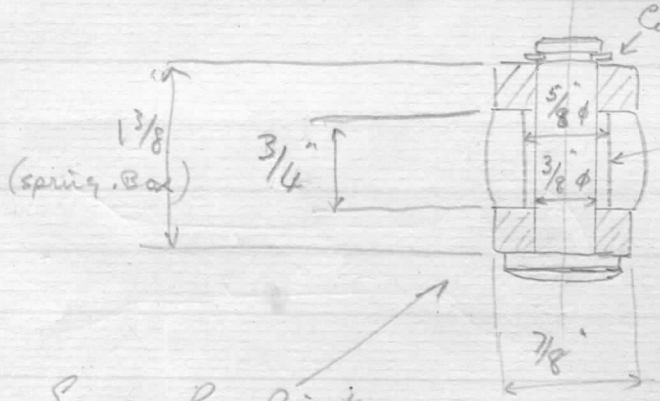

Link Pivot



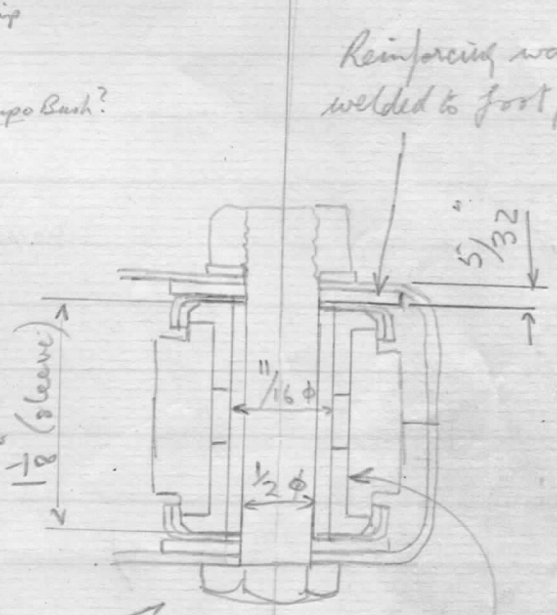



Brake Linkage

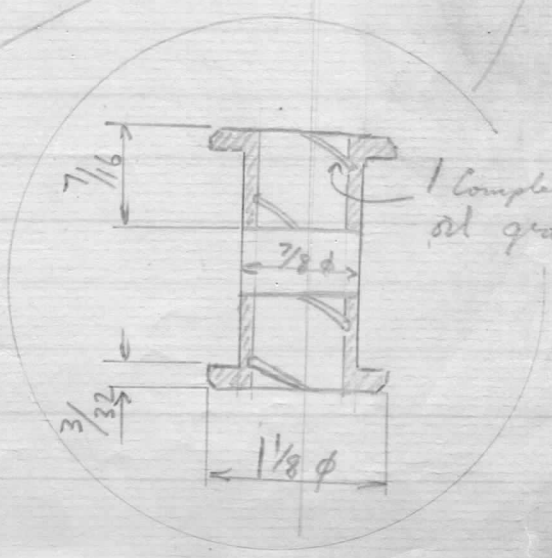



Spring Box Pivot

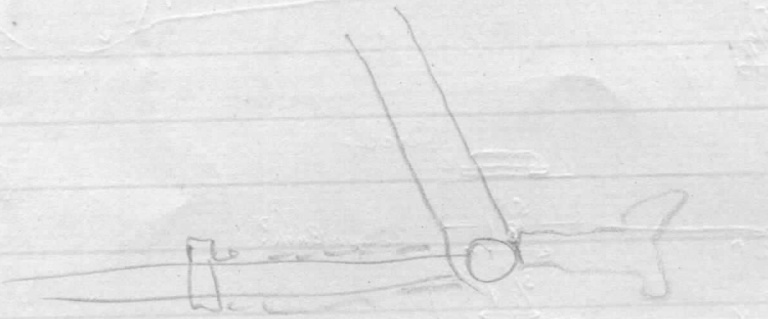



Link Pivot



# GLASS FIBRE NOTES

Chopped Strand Mat 2 layers of 1½ oz or 1 layr of 2 oz
Use Rovings in corners.



## TIMING SPROCKET W. 36853 (7943 M) 12/2/57

Dimensions of flats altered by J.B.L. Westwood as follows:-

.557" .296"
.555" A/FLATS. .295" from ℄ to one flat.

---

## 7" dia Brake Shoes and Linings. 19/2/57

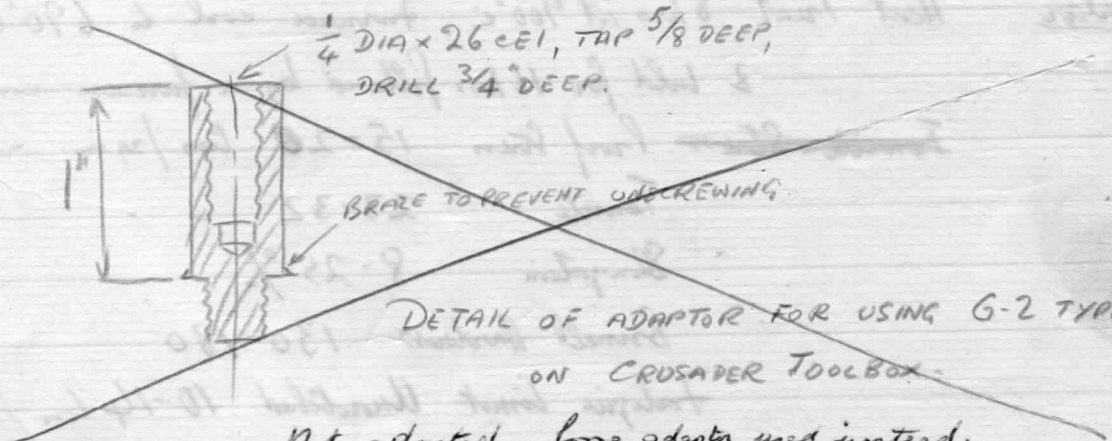
Existing Brake Shoe, 1" wide,

Shoe without lining.
- 6.710" dia on ℄ at right angles to pivot ℄ with .531" gap between cam faces.
- 6.657" dia " " " " .427" " " " "
- 6.650" dia " " " " .417" " " "

6.970" dia over linings with .427" gap between cam faces.
Thickness of lining .154"

Calculated diameter outside brake shoes to give .007" clearance at end of linings in a 7.000" dia drum = 6.958" dia.

---




DETAIL OF ADAPTOR FOR USING G-2 TYPE COVER SCREWS ON CRUSADER TOOLBOX.

Not adopted, loose adaptor used instead.

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22-3-57

Front Fork Main Tube for Meteor Minor & Meteor, G-2, J-3. (Leading Link Fork)
As 42829 but 22" overall length.

3rd July 1957

Lavenders have the following number of castings to deliver:

| | | | |
|---|---|---|---|
| Pr Crankcase (N/Side) | 38848 | P.5079 | 877 |
| Primary Chaincase | 42444 | P.5086 | 404 |
| | | | 473 Covers supplied to crankcases. |

Lavenders to supply 473 more crankcases before making modification for returning oil from chain into top of oil tank.

---

Visit to Cast Iron Research, Alvechurch. 3rd July 1957

Properties of Cast Iron

High Duty Flake Cast Iron
Tensile Stress 16-20 tons/sq in
Brinell Hardness 230-270
Fatigue Limit Unnotched 7-10 tons/sq in
Notched 6-9 " "

Ferritic Nodular
Heat Treat 8 hrs at 900°C, furnace cool to 690°C & hold for 16 hrs followed by a furnace cool.
~~Tensile Stress~~ Proof Stress 15-20 tons/sq in
Tensile 23-32 " "
Elongation 8-25%
Brinell Hardness 130-180
Fatigue Limit Unnotched 10-14 tons/sq in
Notched 7-9 " "

Pearlitic Nodular Graphite — No heat treatment.

| | | |
|---|---|---|
| Proof Stress | 20-25 | tons/sq in |
| Tensile | 40-48 | — |
| Elongation | Up to 3% | |
| Brinell hardness | 240-300 | |
| Fatigue Limit | Unnotched | 16-20 tons/sq in |
| | Notched | 9-11 — |

Normalised Pearlitic

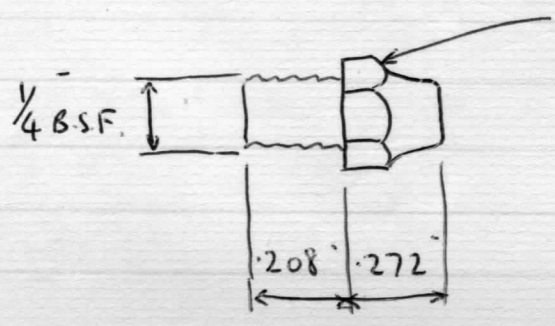
| | | |
|---|---|---|
| Heat Treat | 1hr at 900°c, air cool. | |
| Proof Stress | 26-32 | tons/sq in |
| Tensile | 45-55 | — — |
| Elongation | 5% | |
| Brinell hardness | 24-300 | |
| Fatigue Limit | Unnotched | 17-21 tons/sq in |
| | Notched | 10-12 — — |

Pearlitic, hardened & tempered for 2hrs at 600°C

| | | |
|---|---|---|
| Proof Stress | 41-47 | tons/sq in |
| Tensile | 55-65 | —— |
| Elongation | Up to 5% | |
| Brinell hardness | 270-320 | |
| Fatigue Limit | Unnotched | 19-23 tons/sq in |
| | Notched | 11-14 — |

---

Tecalemit Grease Nipple N.C. 6057 for Leading Link Front Fork 28-9-57



| | |
|---|---|
| Wheelbase. | |
| Front Wheel Rim | W.M.2-19 |
| Front Tyre | 3·25"-19" Universal |
| Front Brake Dia | 6" dia |
| " " Width. | 1" |
| Front Fork movement | |
| Rear Wheel Rim | W.M.2-19 |
| Rear Tyre | 3·50"-19" Universal |
| Rear Brake Dia | 6" dia |
| " " Width | 1" |
| Rear Springing movement. | |
| Oil capacity | |
| Petrol capacity | |
| Gear Ratios:- 1st | |
| 2nd | |
| 3rd | |
| 4th | 5·01:1 |
| Engine Sprocket | 25T |
| Clutch " | 56T |
| Final Drive " | 17T |
| Rear Wheel " | 38T |
| Timing. Ex Opens | |
| Ex Closes | |
| In Opens | |
| In Closes. | |
| Ignition Timing. | |
| Valve Lift | 5/16" |
| Valve head dia (Inlet) | 1 5/16" |
| " " (Exhaust) | 1 1/4" |
| Cylinder Bore | 64 m/m |
| Stroke. | 77 m/m |
| Compression Ratio | 6·5 |
| B.H.P. | 25 at 5,500 |
| Max Speed. | |

| | |
|---|---|
| Crankpin Dia. | 1 3/4" |
| Big End Width. | 7/8" |
| Main Bearing Dia (T/side) | 45 m/m |
| " " (D/side) | |
| Front Fork Rake. | |
| " " Trail. | |

# Leading Link Front Forks MK II

24-9-57

## Comparative figures for strengths of Main Tubes.

YIELD

Modulus of Bending of Tube = $\frac{\pi}{32} \frac{D^4 - d^4}{D}$

[ Tensile stress = 40 tons/sq in before welding, 25 tons after welding ]

Woodman Telescopic Fork Main Tube 1 3/8 o/dia x 129. (1.167" Bore)

$$\frac{1.375^4 - 1.167^4}{1.375} \times 40 = 50.02$$

Leading Link Main Tube MK I 2 1/4 o/dia x 16g (2.122" Bore)

$$\frac{2.250^4 - 2.122^4}{2.250} \times 25 = 59.465$$

2 1/8" o/dia x 16g (1.997" Bore)

$$\frac{2.125^4 - 1.997^4}{2.125} \times 25 = 52.825$$

2 1/8" o/dia x 15g (1.981" Bore)

$$\frac{2.125^4 - 1.981^4}{2.125} \times 25 = 58.775$$

---

Steering Stem Lock Stop 43033 (9382u) to be added to C-6 Frame for Leading Link Fork with Steering Lock

---

Std Crusader Fork

From centre of wheel spindle to centre of fork crown clip bolt 1/4 29/32"

Spring 1" at top not working, 3/4" at bottom not working

BOTTOM

TOP

## Comparative figures for strengths of Main Tubes.

YIELD

Modulus of Bending of Tube = $\frac{\pi}{32} \frac{D^4 - d^4}{D}$

[Tensile stress = 40 tons/sq in before welding, 25 tons after welding]

**Woodsman Telescopic Fork Main Tube** 1 3/8 o/dia x 12g. (1.167" Bore)

$$\frac{1.375^4 - 1.167^4}{1.375} \times 40 = 50.02$$

**Leading Link Main Tube MK I** 2 1/4 o/dia x 16g (2.122" Bore)

$$\frac{2.250^4 - 2.122^4}{2.250} \times 25 = 59.465$$

**2 1/8" o/dia x 16g (1.997" Bore)**

$$\frac{2.125^4 - 1.997^4}{2.125} \times 25 = 52.825$$

**2 1/8" o/dia x 15g (1.981" Bore)**

$$\frac{2.125^4 - 1.981^4}{2.125} \times 25 = 58.775$$

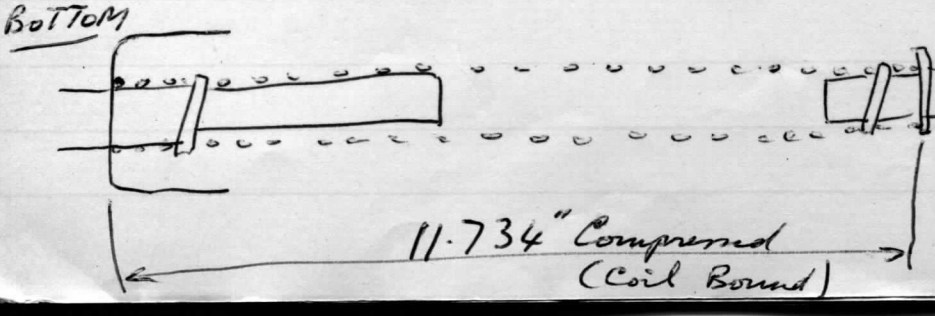
---

Steering Stem Lock Stop 43033 (9382u) to be added to C-6 Frame for Leading Link Fork with Steering Lock

**Std Crusader Fork**

7" from centre of wheel spindle to centre of fork crown clip bolt 1/4 29/32"

Spring
1" at top not working
3/4" at bottom not working
52 thicknesses of spring in between (working)



Crusader Air Flow

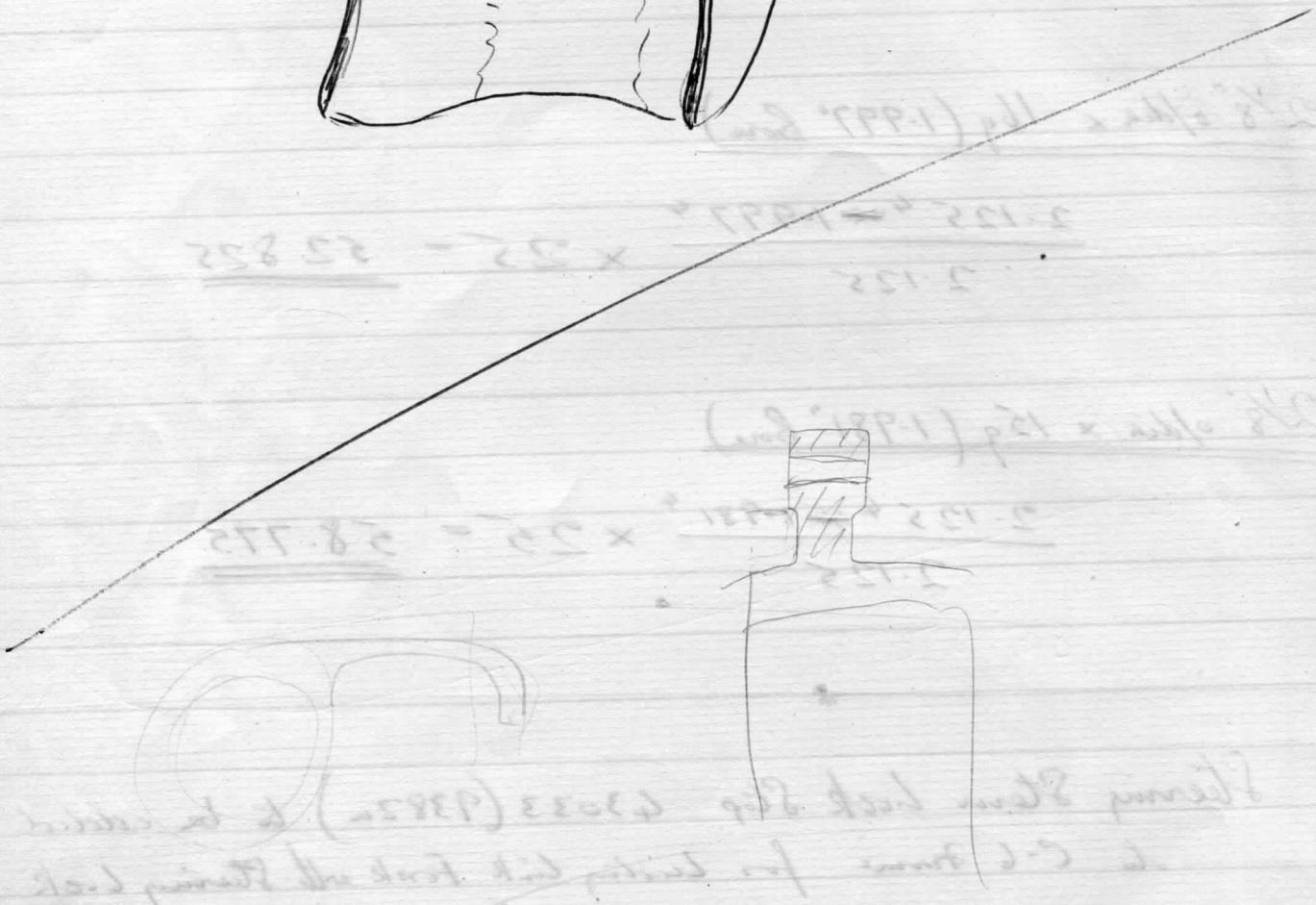
Length of Rubber Beading

E section around

Screen & Legshields

= 10' 6"

Between points "X" = 6' 2"



# Gear Ratios

10-1-58

## Rear Tyre 350×19 Sports on WM 2-19 Rim

### Hounds Model with Clipper Engine

| | |
|---|---|
| Engine | 15T |
| Clutch | 42T |
| C/Shaft | 15T |
| Rear | 38T |

= 7.09:1

### Hounds Model with Crusader Engine

| | |
|---|---|
| Engine | 23T |
| Clutch | 49T |
| C/Shaft | 17T |
| Rear | 57T |

7.14:1

| | |
|---|---|
| Engine | 23T |
| Clutch | 49T |
| C/Shaft | 17T |
| Rear | 58T |

7.27:1

| | |
|---|---|
| Engine | 19T |
| Clutch | 49T |
| C/Shaft | 17T |
| Rear | 49T |

7.43:1

Airflow Headlamp Attachment  Feb 24th 1958

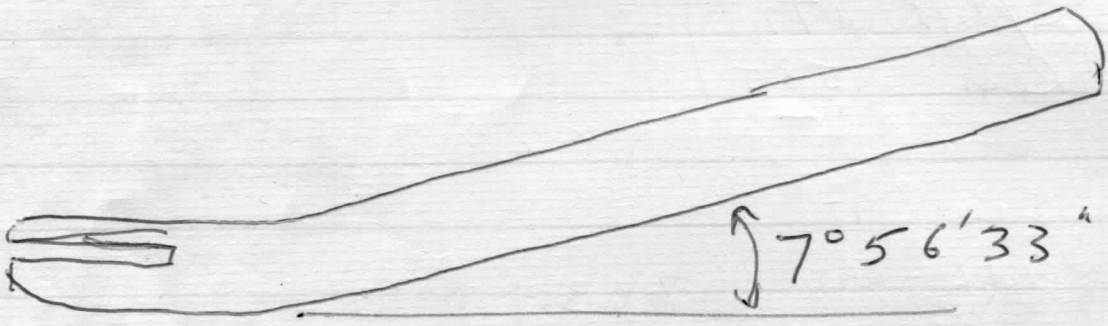
| | Per Thousand |
|---|---|
| Headlamp Fixing Screw 23825, 1-049d each | 87/5d |
| " " Shakeproof Washer 29058, 2/11 per thousand less 10% + 33⅓% | 3/6d |
| " " Plain Washer 5916, 2/11 per gross | 20/3d |
| " " Nut 25498, ·534d each | 44/6d |
| Total | 155/8d |

Simmonds

| | | Per Thousand |
|---|---|---|
| Spire ~~Nut~~ Flat Nut | SNR 0416/17/8 | 24/- |
| N°8 x 5/8 Sheet Metal Screw | STO 2081/10/0 | 19/3d |
| | | 43/3d |
| N°8 J x 7/8 Sheet Metal Screw Mark II Black Finish | STO 1983 | 25/5½d |

3-3-58

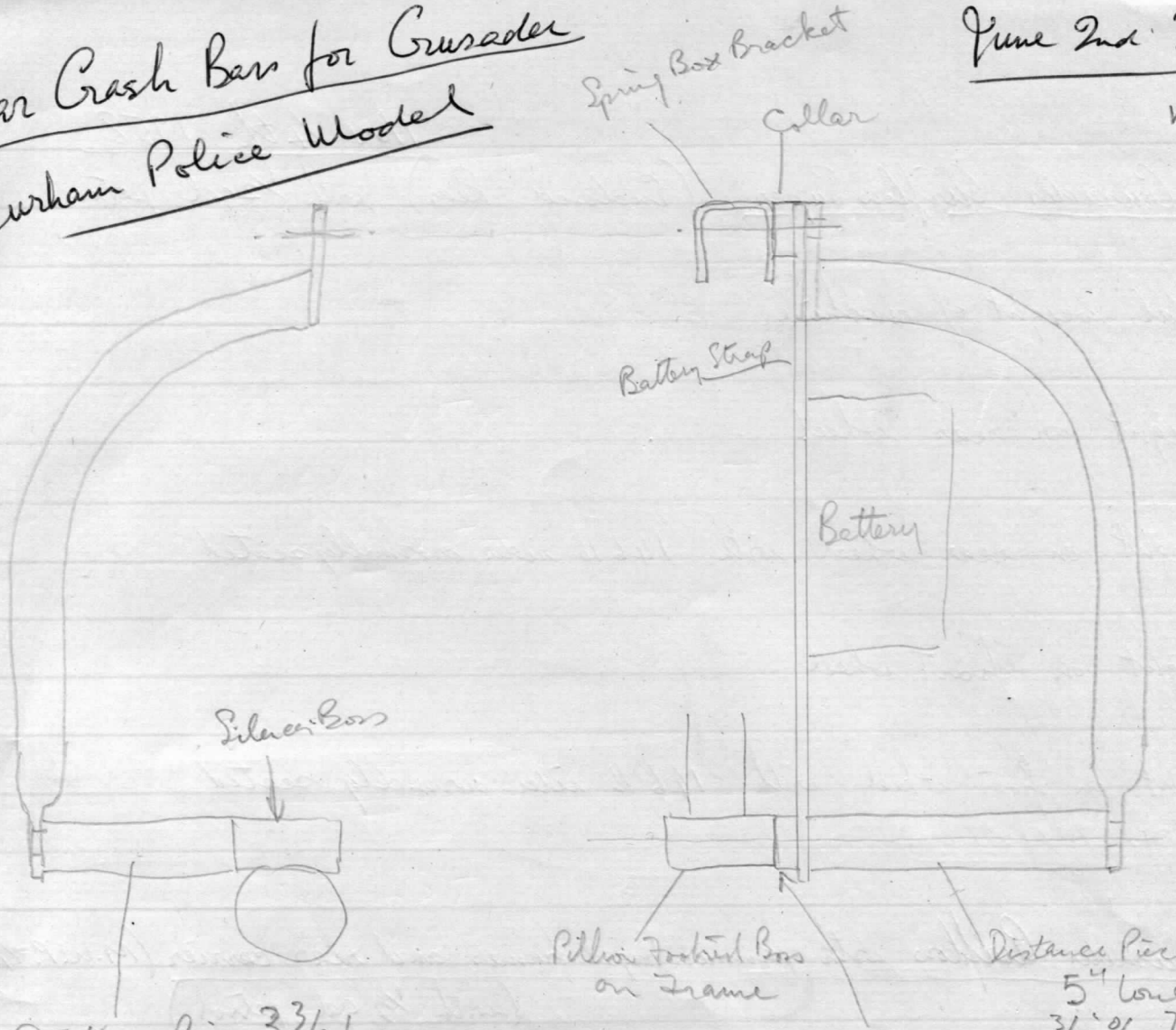
Chainstay Tube W44160 (9.65m)

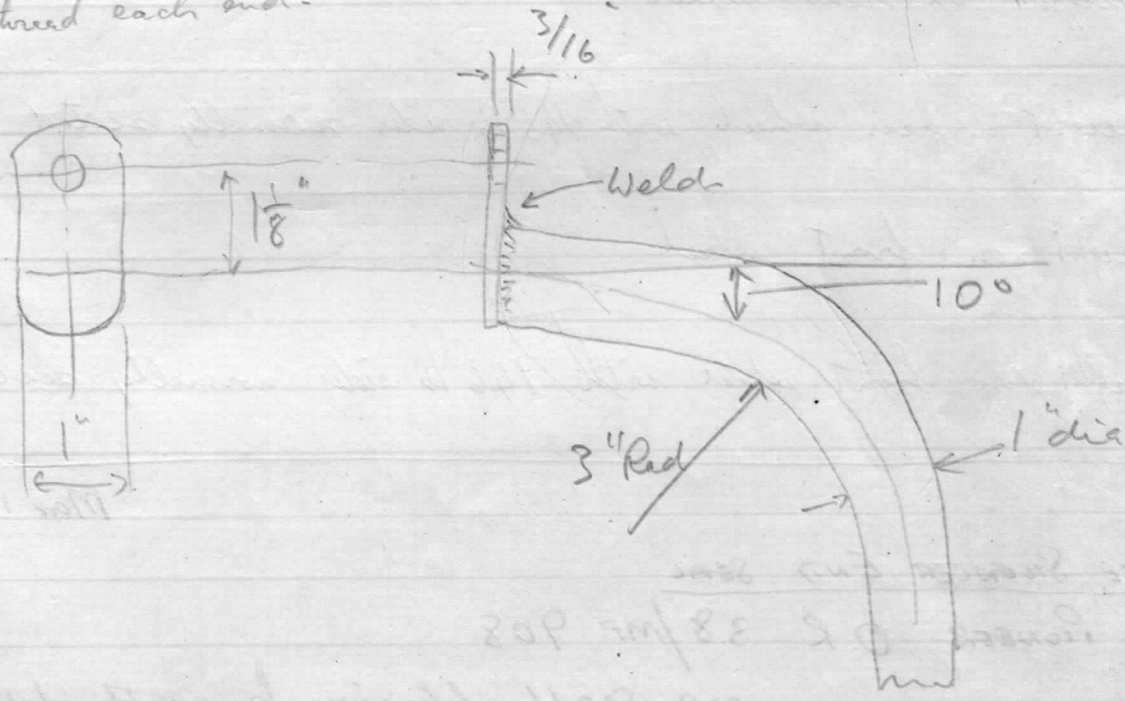


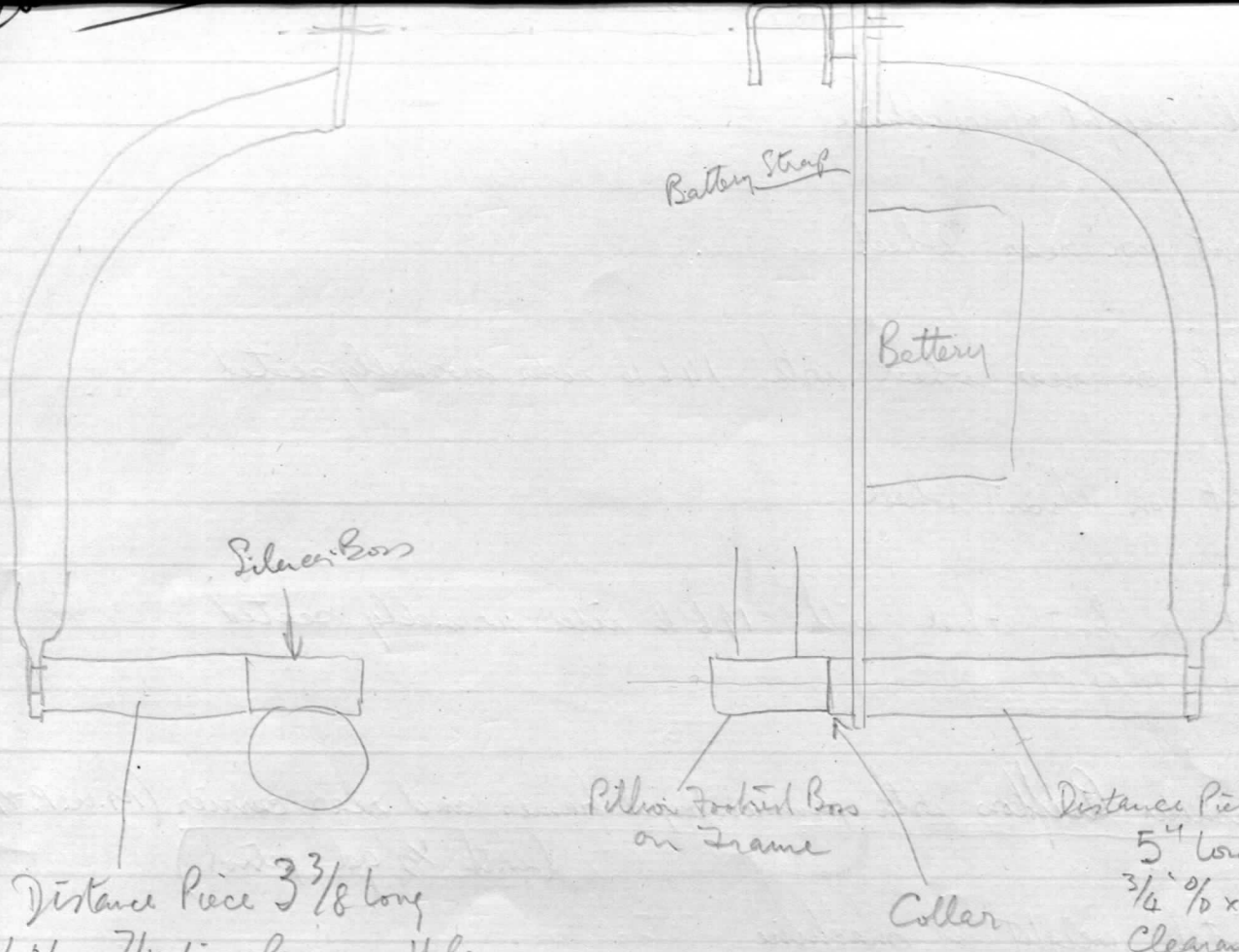

Address for Cross Weld Inserts: Cross Manufacturing Co
Coombe Down
Bath.

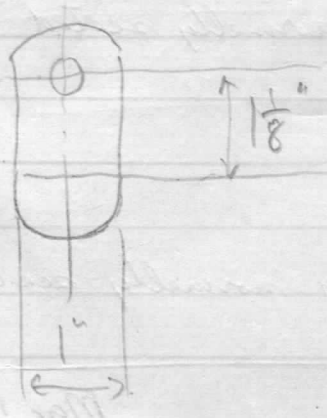
# Rear Crash Bars for Crusader
## Durham Police Model

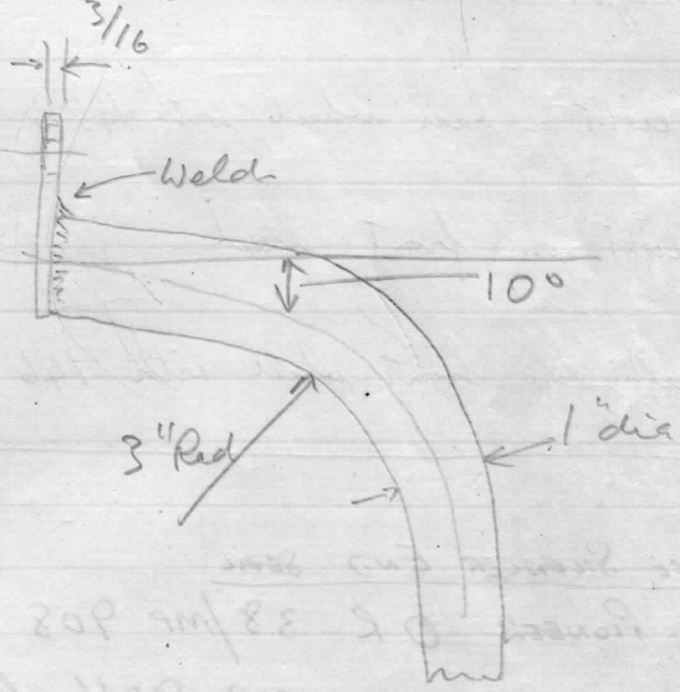
June 2nd '58

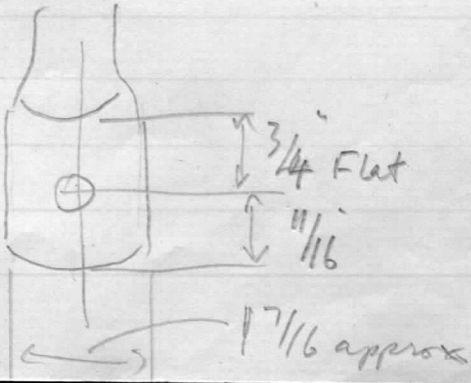


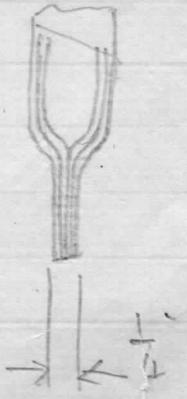





Battery Strap
Battery
Silencer Boss
Pillion Footrest Boss on Frame
Collar
Distance Piece 5" long 3/4" O/D x 7/16 dia Clearance Hole Stud 7/16 dia x 7 5/8" 1/2" long thread each end
Distance Piece 3 3/8 long 3/4" O/D x 7/16 dia clearance Hole Stud 7/16" dia x 7 5/8" 1/2" long thread each end.


1 1/8"
1"


3/16"
Weld
10°
3" Rad
1" dia


3/4" Flat
11/16"
1 7/16 approx


1/4"

Nov 4th 1958

Crusader Airflow Super (Enclosed Rear) with ½gal petrol

Total weight of machine 356 lbs

Weight on rear wheel 202 lbs

Weight on rear wheel with 146 lb rider normally seated 300 lbs

Weight on front wheel 154 lbs

Weight on front wheel with 146 lb rider normally seated 186 lbs

Crusader Airflow with pannier bags & frames and rear carrier (M.W.P. 4)
(with ½ gal petrol)

Total weight of machine 356 lbs

Weight on rear wheel 198 lbs

Weight on rear wheel with 146 lb rider normally seated 300 lbs

Weight on front wheel 152 lbs

Weight on front wheel with 146 lb rider normally seated. 178 lbs

---

Mar 13th 1959

PRINCE SILENCER END SEAL

PIONEER OR 38/MP 908

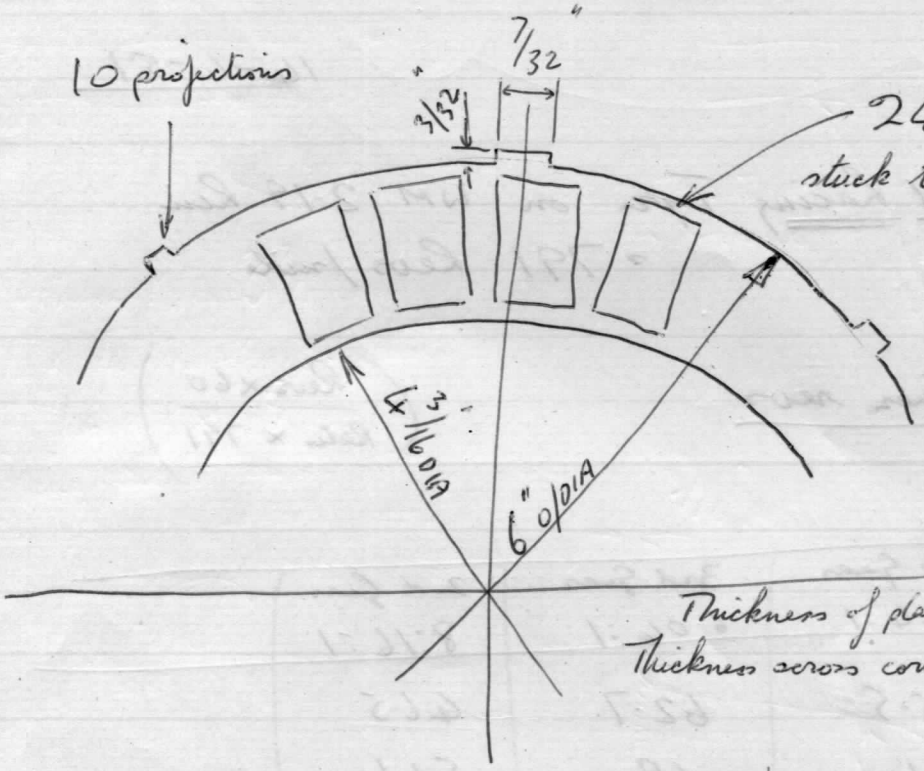
MP 9016 later mix for quantity of 100

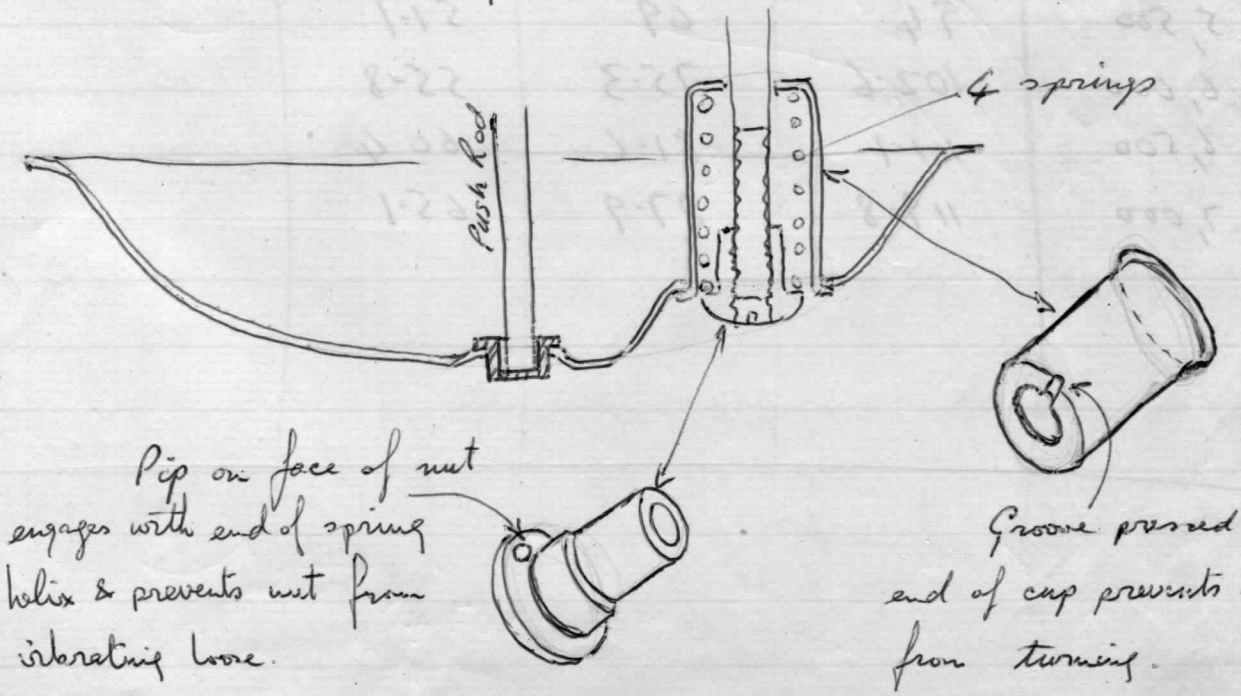
CRUSADER  Balanced with Aluminium crankpin plug assembled.

$21\frac{1}{3}$ ozs brass balance weight
$3\frac{1}{16}$" o/d, $1\frac{3}{4}$" bore, $\frac{7}{8}$" wide
chamfer each end of bore $\frac{3}{32}$" x 45°
split with $\frac{1}{16}$" wide saw.
circlip groove for $\frac{3}{16}$" dia piano wire circlip

---

TRIUMPH CLUTCH T.110  30-1-59

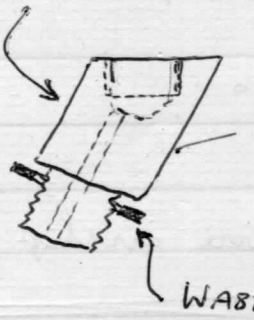


Constellation. 26-3-59

## Petrol Tap Adaptor

Enots Nº F45 1/4" B.S.P. x 1/4" B.S.P.




(MR GROOM)

---

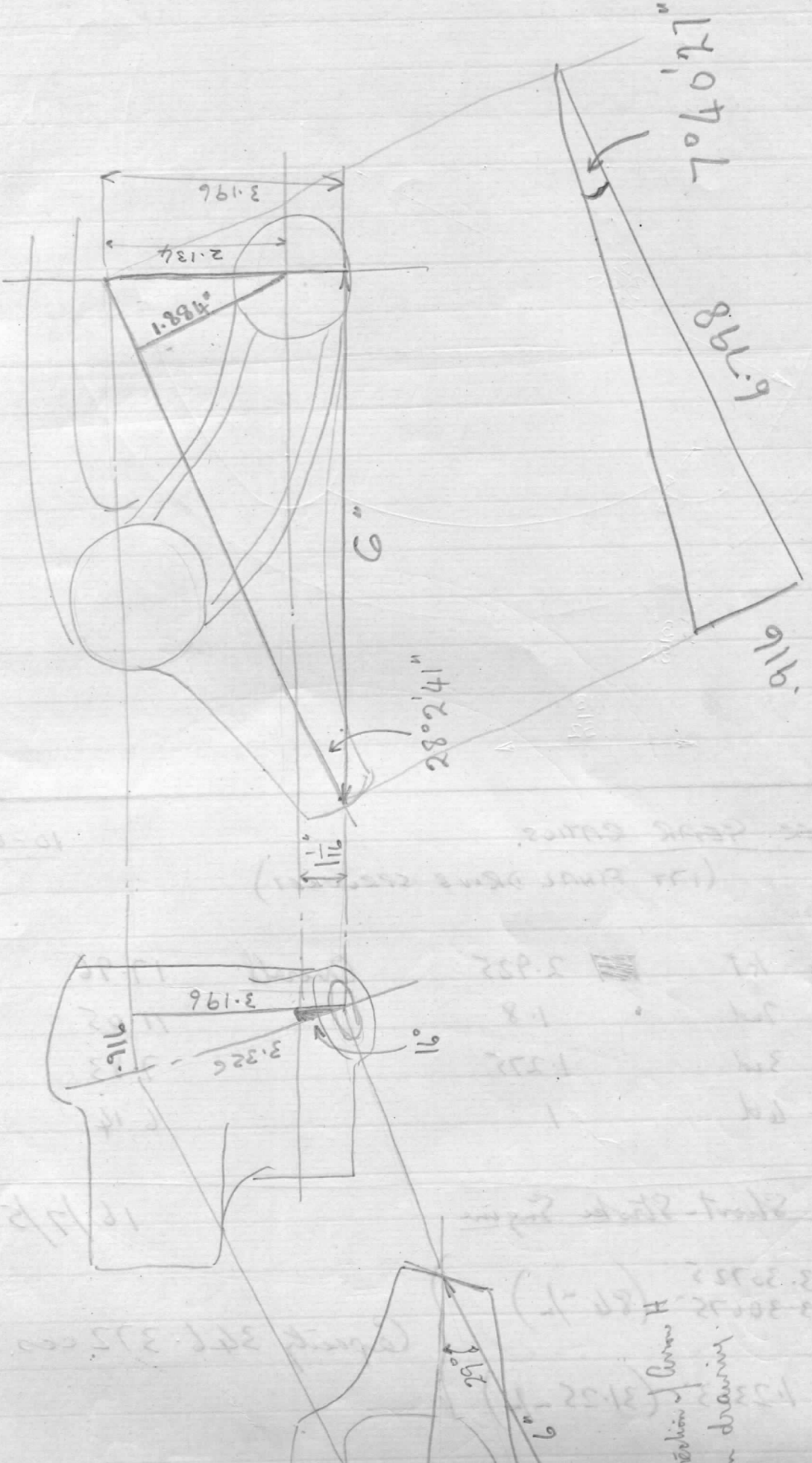
## CONSTELLATION 14-4-59

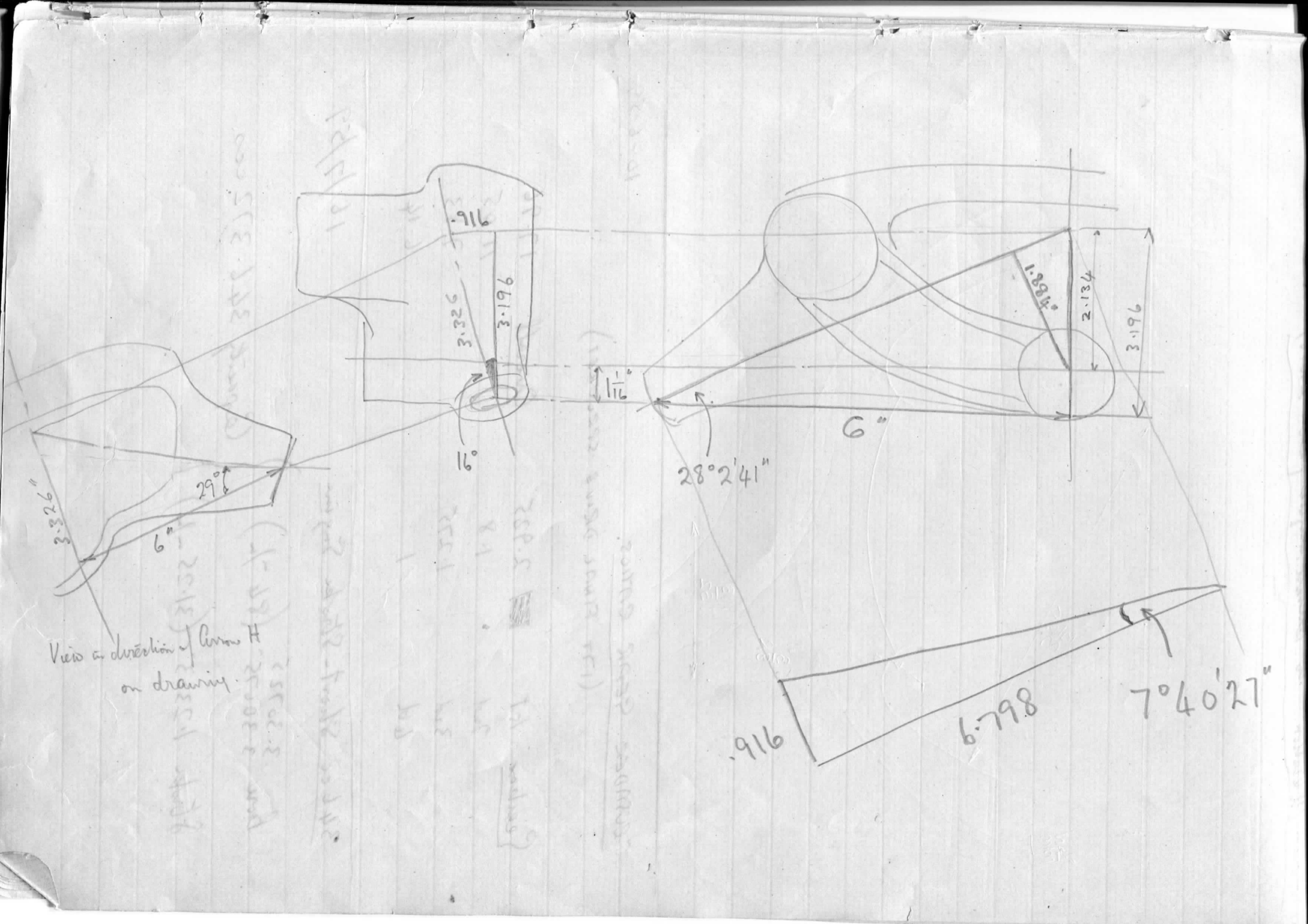
350×19 Road Racing Tyre on WM 2-19 Rim
= 791 Revs/mile.

M.P.H. at given revs $\left(\frac{\text{Revs} \times 60}{\text{Ratio} \times 791}\right)$

| Engine Revs/min | Top Gear 4·44:1 | 3rd Gear 6·04:1 | 2nd Gear 8·16:1 |
|---|---|---|---|
| 5,000 | 85·5 | 62·7 | 46·5 |
| 5,500 | 94 | 69 | 51·1 |
| 6,000 | 102·6 | 75·3 | 55·8 |
| 6,500 | 111·1 | 81·6 | 60·4 |
| 7,000 | 119·8 | 87·9 | 65·1 |

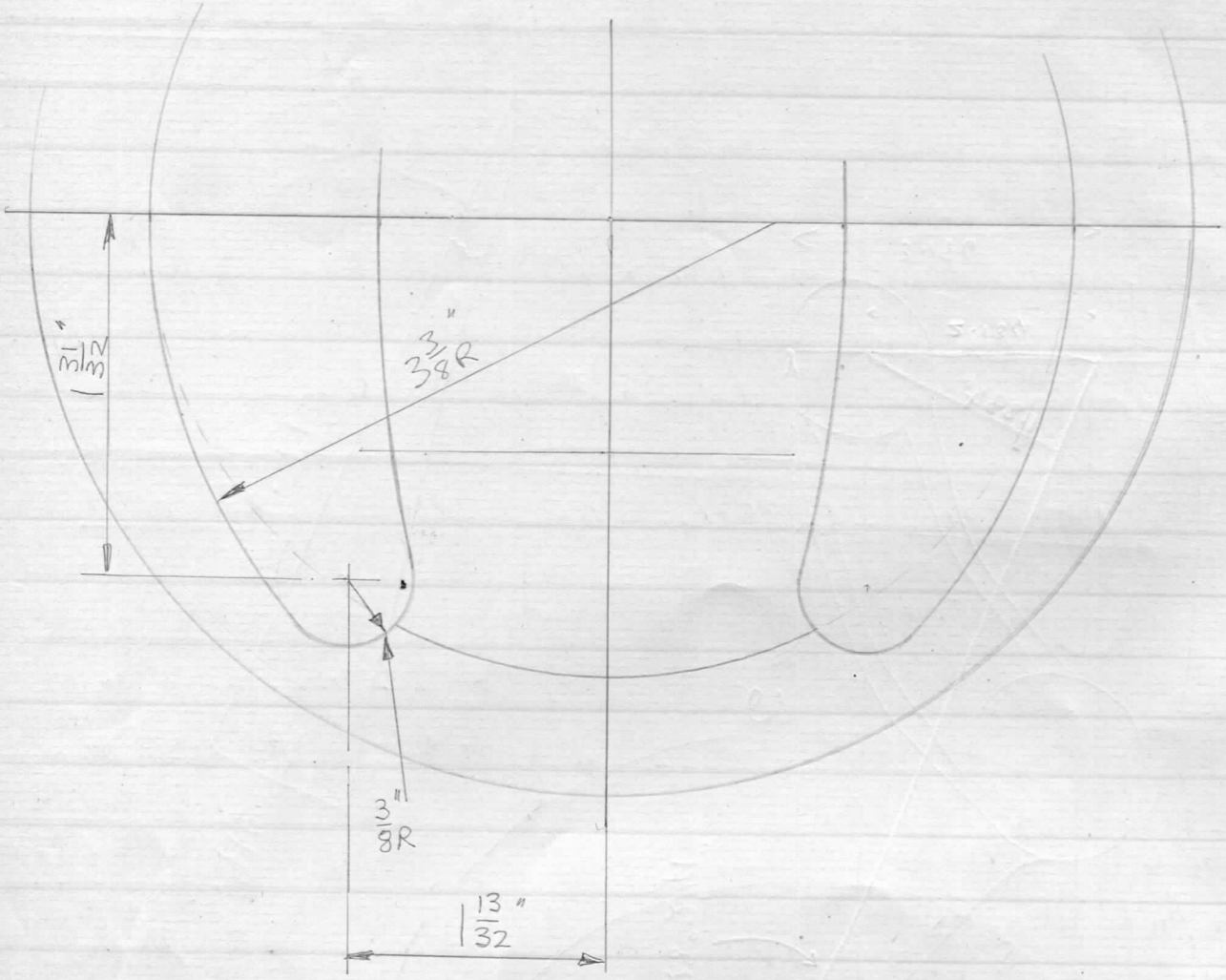
# Telescopic Front Fork Head W.45504(1739A) 8th May 1959




.916
3.326
3.196
1 1/16"
16°
28°2'41"
6"
1.894"
2.134
3.196
3.326"
29°
6"
View in direction of Arrow H
on drawing
.916
6.798
7°40'27"

## CRUSADER CRANKSHAFT W.44771 (9829m) 30-5-59

Proposed Alteration to balance weights (each wheel)

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## CRUSADER GEAR RATIOS 10-6-59

(17T FINAL DRIVE SPROCKET)

| Gearbox | | | Overall | |
|---|---|---|---|---|
| | KT | 2.925 | | 17.96 |
| | 2nd | 1.8 | | 11.05 |
| | 3rd | 1.275 | | 7.83 |
| | 4th | 1 | | 6.14 |

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## 346 cc Short-Stroke Engine 16/7/59

Bore 3.30725" (84 m/m)
3.30675"

~~Stroke~~ 1.2303" (31.25 m/m)

Capacity 346.372 ccs.

Thorpe