

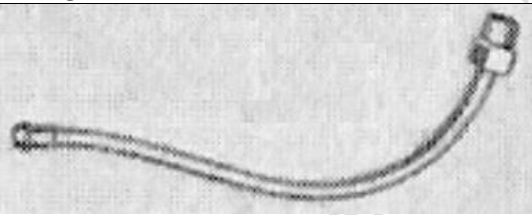
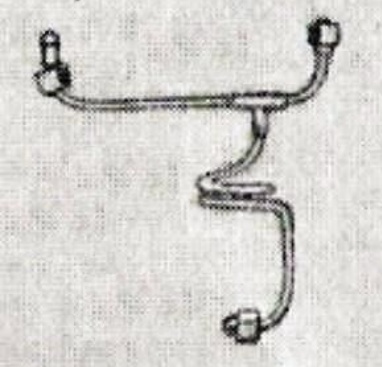
Norton oil and petrol (fuel) pipes/lines

This document is intended to give the restorer the correct information to find or make oil and petrol lines for both WD Nortons between 1935 and 1946 and useful for civilian machines with identical part numbers. *All dimensions are reference values unless tolerance is given.*

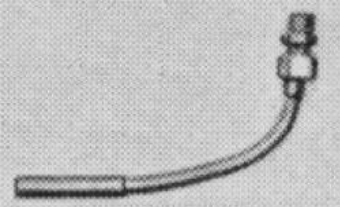
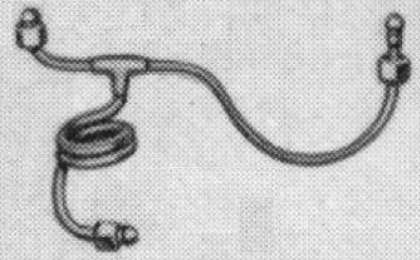
Spare part numbers and illustrations

Table with part numbers and configurations as shown in Illustrated spare parts lists of WD 16H, WD Big4 and a wide range of prewar civilian models.

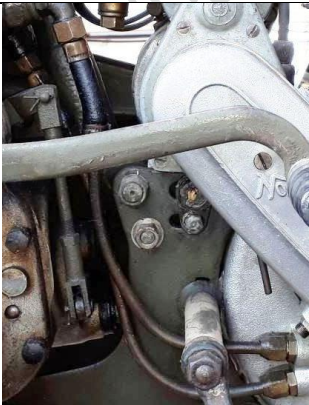
WD16H

Part no.	Description	Configuration
9340	Oil Feed Delivery Pipe	
9341	Oil Return Pipe	
3315	Oil Tank Air Release Pipe	
3757	Magneto Chain Cover Pipe	
3759	Tappet Guide Oil Pipe	
9531	Crankcase Breather	
3289	Petrol Feed Pipe complete with Union Nuts and Nipples	

WDBig 4

Part no.	Description	Configuration
2264	Oil Tank Delivery Pipe with Union Nuts and Nipples	
2265	Oil Tank Return Pipe with Union Nuts and Nipples	
3315	Oil Tank Air Release Pipe	
3757	Magneto Chain Cover Pipe	
2101	Crankcase Breather	
2261	Petrol Feed Pipe complete with Union Nuts and Nipples	

Later spare parts lists have no illustrations therefore some pictures of original parts.

Oil lines with rubber intersections, bubble swage ends and conical nuts	Final set petrol lines with connection between petrol taps and rubber line to carburetter.
	

Unfortunately no pictures are available of an original version of the intermediate version petrol lines with 2 rubber hoses and double banjo.

Line manufacture

Lines can be easily made by restorers, actual shape and lengths to be viewed on contemporary pictures and to be determined on the actual motorcycle.

Annealing the copper pipe before manufacture greatly helps to bend the pipes in the required shape.

General:

Initially, all copper pipes were provided with soldered end nipples.

Later oil pipes with rubber intersection had swaged full copper bubble flare at the engine side in combination with tapered nut for improved support through the tapered section.

BSPP, British Standard Pipe Parallel (commonly but incorrectly named "Gas" thread which is not exact as there are more thread forms referenced as "Gas" which are not always BSPP).



Thread sizes (theoretical) used on various locations:

BSPP nomenclature	Threads per inch	Diameter outer inch / mm	Diameter inner inch / mm
1/8	28	0.383 / 9,7	0.337 / 8,6
1/4	19	0.518 / 13,2	0.451 / 11,5
3/8	19	0.656 / 16,7	0.589 / 15,0

Oil line configurations	Pipe outer dia. inches	Nut upper BSPP	Nut lower BSPP
Oil Feed Delivery Pipe	3/8 or 5/16 *	3/8	1/4
Oil Return Pipe	5/16	1/4	1/4
Oil Tank Air Release Pipe	5/16	1/4	1/4
Crankcase Breather	5/16	1/4	--
Tappet Guide Oil Pipe	3/16	1/8	--
Magneto Chain Cover Pipe	3/16	1/8	--

Note * 5/16th after introduction of rubber intersection ca. Feb 1941 (DME circular B41).

Petrol Feed Pipe	Pipe diameter inches	Nuts BSPP
All versions, see below	1/4	1/4

1937 to Feb 1941	Feb. 1941 to Feb. 1943	Feb. 1943 to end
copper pipe between taps with T fitting to carburettor upto W18001 and S1701	Rubber lines from each tap to a double banjo on carb from W18001 and S1701 upwards (DME circular B41)	Copper pipe between taps and rubber line from left tap to single banjo on carb (DME circular B413)

Nuts and solder nipples can be purchased from a.o. following sources,

<https://www.flexolite.co.uk/categories/flexolite-metal-pipe-and-fittings-solder-nuts-and-nipples>.

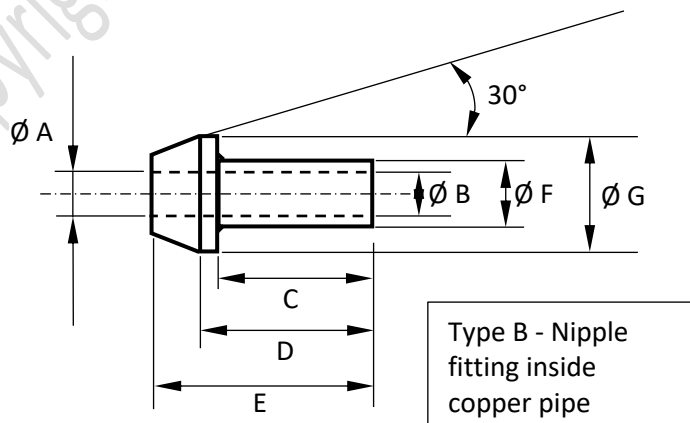
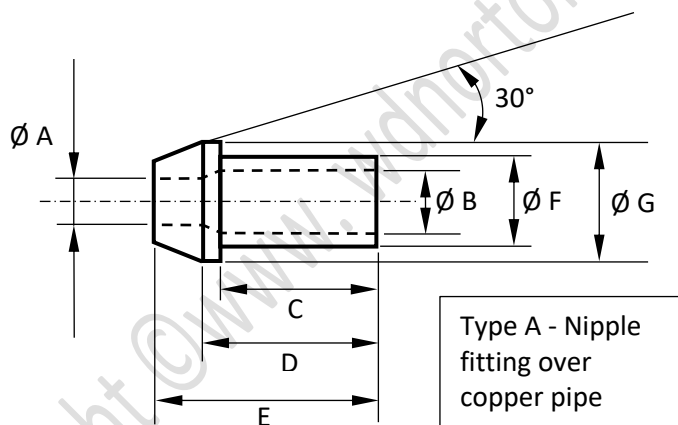
<https://www.ba-bolts.co.uk/brasscones.html>

Home manufacture info

Nipples (solder):

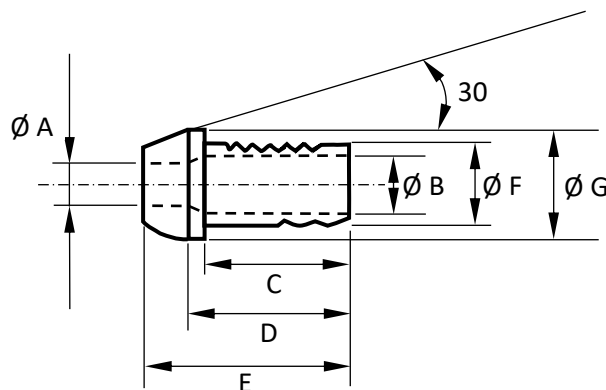
Dimension	Pipe variations				
pipe outer diameter	Ø 3/16"	Ø 1/4"	Ø 5/16"	Ø 3/8"	
Location on pipe	Upper	Upper / lower	Upper / lower	Upper	Lower
Nut type	1/8 x 28	1/4 x 19	1/4 x 19	3/8 x 19	1/4 x 19
Nipple type	A	A	A	A	B
Ø A	0.154 / 3,9	0.205 / 5,2	0.240 / 6,1	0.232 / 5,9	0.232 / 5,9
Ø B	0.197 / 5,0	0.252 / 6,4	0.318 / 8,1	0.382 / 9,7	0.232 / 5,9
C	0.307 / 7,8	0.394 / 10,0	0.394 / 10,0	0.500 / 12,7	0.472 / 12
D	0.394 / 10	0.453 / 11,5	0.453 / 11,5	0.579 / 14,7	0.551 / 14
E	0.480 / 12,2	0.622 / 15,8	0.622 / 15,8	0.748 / 19,0	0.669 / 17
F	0.246 / 6,25	0.378 / 9,6	0.378 / 9,6	0.500 / 12,7	0.315 / 8,0
G	0.335 / 8,5	0.449 / 11,4	0.449 / 11,4	0.583 / 14,8	0.449 / 11,4

Drawings not to scale, dimensions as measured on actual parts but not absolute and given in inch/mm, tolerance +/-0.008 / 0,2 mm except for BSPP dimensions, nipples to fit union nuts, slight rounding of cone will help to obtain a leak free connection.



Nipples (to rubber hose used for petrol and oil lines):

Rubber hose configurations	Application	
	Oil return and petrol lines	Oil feed
Nut type	1/4 x 19	3/8 x 19
Ø A	0.240 / 6,1	0.248 / 6,3
Ø B	0.319 / 8,1	
C	0.661 / 16,8	0.701 / 17,8
D	0.760 / 19,3	0.827 / 21,0
E	0.957 / 24,3	1.094 / 27,8
F	0.378 / 9,6	
G	0.449 / 11,4	0.571 / 14,5



Alternative shapes

Rubber hoses

Petrol and oil rubber hose 5/8" (16 mm) outer diameter and 5/16" (8 mm) inner diameter, inner diameter fixed but outer may vary depending on availability.

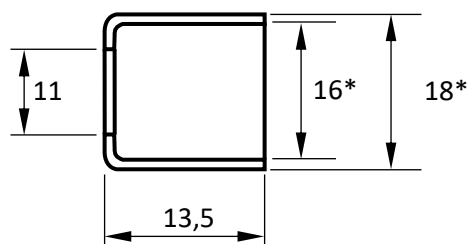
Length approx 58 – 60 mm. NBR rubber to be used.

position	Length incl ferrules inch/mm
Right hand petrol tap to double banjo	8,25 / 210
Left hand petrol tap to double banjo	6,5 / 165
Left hand to single banjo	6,5 / 165
Oil feed and return line	2,4 / 60

Rubber hose ferrules

Ferrules were press fittings made of brass, snug fitting over hose and crimped as shown in picture.

Note * Depending on available rubber outer diameter, ref above.

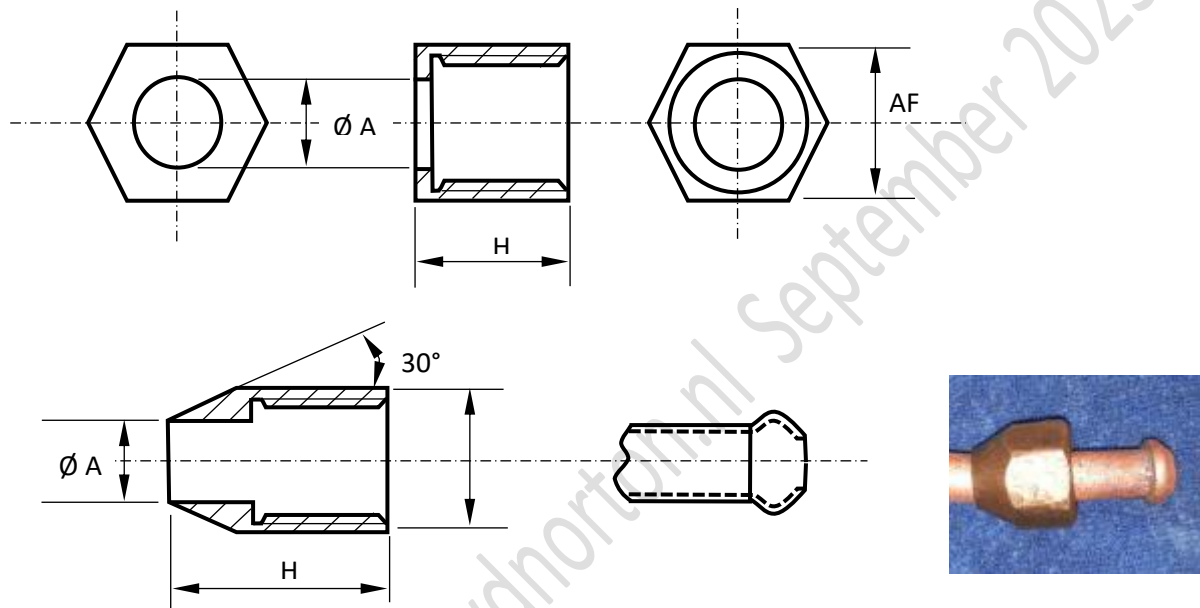


Union nuts

Dimension	variations		
Thread BSPP	1/8 x 28	1/4 x 19	3/8 x 19
AF	0.449 / 11,4	0.598 / 15,2	19
Ø A	0.256 / 6,5	0.382 / 9,7 (0.327 / 8,3)*	0.504 / 12,8 (0.382 / 9,7)**
H	0.331 / 8,4	0.457 / 11,6 (0.646 / 16,4)*	0.516 / 13,1

Notes: * dimensions on tapered nut.

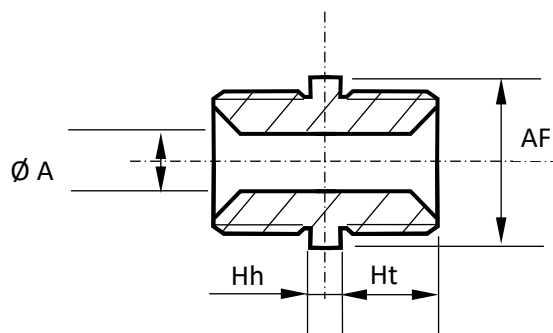
** dimension for nut in conjunction with rubber hose nipple.



Oil pipe unions

Dimension	variations	
Thread BSPP	1/8 x 28	1/4 x 19
AF	0.449 / 11,4	0.598 / 15,2
Ø A	0.256 / 6,5	0.382 / 9,7
Hh	0.150 / 3,8	0.201 / 5,1
Ht	0.244 / 6,2	0.374 / 9,5

Unions with one sided internal chamfer observed on 1937 engine.

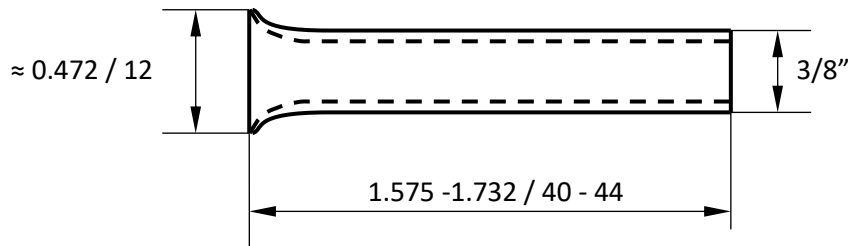


Oil tank air release and engine breather pipe ends

Both oil tank air release pipe and engine breather pipe are provided with a flared end on a piece of 3/8" pipe soldered to the 5/16" basic pipe.

This practice was continued until 1940 at least but it is not known if later production machines had this same configuration.

A 1944/45 machine in fairly original configuration was provided with 5/16th pipes without this flared end.



Pipe surface appearance.

Until at least 1940, all pipes petrol, oil and overflow versions, were dull chrome plated (chrome on civilian machines), later pipes were pure copper without any surface treatment.

This change may have coincided with the introduction of the rubber intersection pipes as this was a major change in configuration and no bubble flared dull chrome pipes have been found. The last configuration petrol pipe between the taps is found in dull chrome plated and unplated versions.