Issue 005

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.

Spare part numbers and illustrations

Table with part numbers and configurations as shown in Illustrated spare parts lists of WD 16H and WDBig4.

<u>WD16H</u>

Part no.	Description	Configuration
9340	Oil Feed Delivery Pipe	
9341	Oil Return Pipe	0
3315	Oil Tank Air Release Pipe	0
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	<i>0</i>
3757	Magneto Chain Cover Pipe	
2101	Crankcase Breather	3
2261	Petrol Feed Pipe complete with Union Nuts and Nipples	E.

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

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

Oil and petrol lines© RvdBrink,www.wdnorton.nl6-3-2024Issue 005Unfortunately no pictures of the intermediate version petrol lines with 2 rubber hoses and double
banjo available but those can be copied from the shown rubber line with lengths to fit.Issue 005

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	Threads per inch	Diameter outer	Diameter inner
nomenclature		inch / mm	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	Rubber lines from each	Copper pipe between
taps with T fitting to	tap to a double banjo	taps and rubber line
carburetter upto	on carb from W18001	from left tap to single
W18001 and S1701	and S1701 upwards	banjo on carb (DME
	(DME circular B41)	circular B413)

Nuts and solder nipples can be purchased from a.o. Flexolite, part of Vintage & Classic spares, <u>https://www.flexolite.co.uk/categories/flexolite-metal-pipe-and-fittings-solder-nuts-and-nipples</u>.

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Home manufacture info

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	А	А	А	В	
ØА	0.154 / 3,9	0.205 / 5,2	0.240 / 6,1	0.232 / 5,9	0.232 / 5,9	\sim
ØВ	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]

Nipples (solder):

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.



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Nipples (to rubber hose, petrol and oil lines):

Pipe outer diameter	Ø 5/16"	
Nut type	1/4 x 19	3/8 x 19
ØА	0.240 / 6,1	0.248 / 6,3
ØВ	0.319 / 8,1	
С	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

Union nuts

Dimension	variations		
Thread	1/8 x 28	1/4 x 19	3/8 x 19
BSPP			
AF	0.449 / 11,4	0.598 / 15,2	19
ØА	0.256 / 6,5	0.382/9,7 (0.327/8,3)*	0.504 / 12,8 (0.382 /9,7)**
Н	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.



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Oil pipe unions

Dimension	variations	
Thread BSPP	1/8 x 28	1/4 x 19
AF	0.449 / 11,4	0.598 / 15,2
ØА	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 flaired 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.