Knud Jørgensen

NIMBUS Maintenance

2. English Edition 2018

FOREWORD to the English edition 2018

The first edition of *´NIMBUS – vedligeholdelse'* (NIMBUS - Maintenance) was published in spring 1990 and at that time titled: *´NIMBUS - og kunsten at vedligeholde den´.* (NIMBUS: The Art of Maintenance*).*

A second Danish edition was published in 2008, and many have asked for an English edition, hence the publication of this edition in 2012. This new size edition was published 2018

There were 4,500 Nimbus-C motorcycles registered in Denmark in spring 2015. If we take account of the 1,000 in use abroad, almost half of the total production of 12,715 motorcycles survive to this day. All require maintenance and repair, and from time to time renovation and restoration. This book is about the first three of these subjects, and together with *´Nimbus -Technical Development'*, it may also be useful in restoration. The content of this book is by large limited to those operations which a skilled owner can do or can have done. Many repairs nowadays have to be left to a professional workshop, as mistakes can become very expensive and irreplaceable original parts may be damaged.

Many thanks to Ben Geutskens and to Charles Duffill for their work on the English edition. Errors or shortcomings remain the author's responsibility.

Højbjerg, October 2018

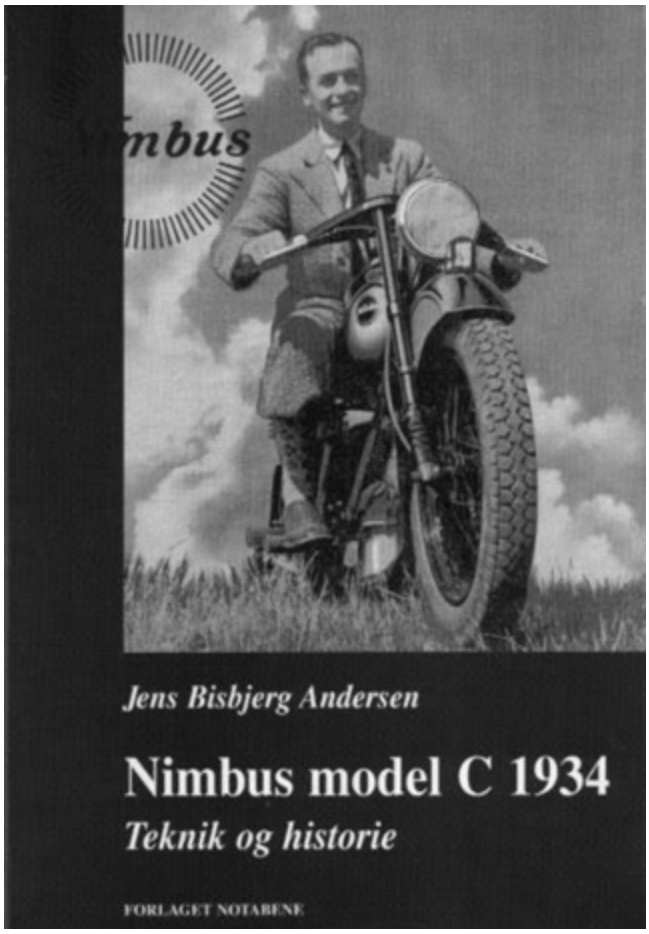
Knud Jørgensen


Nimbus

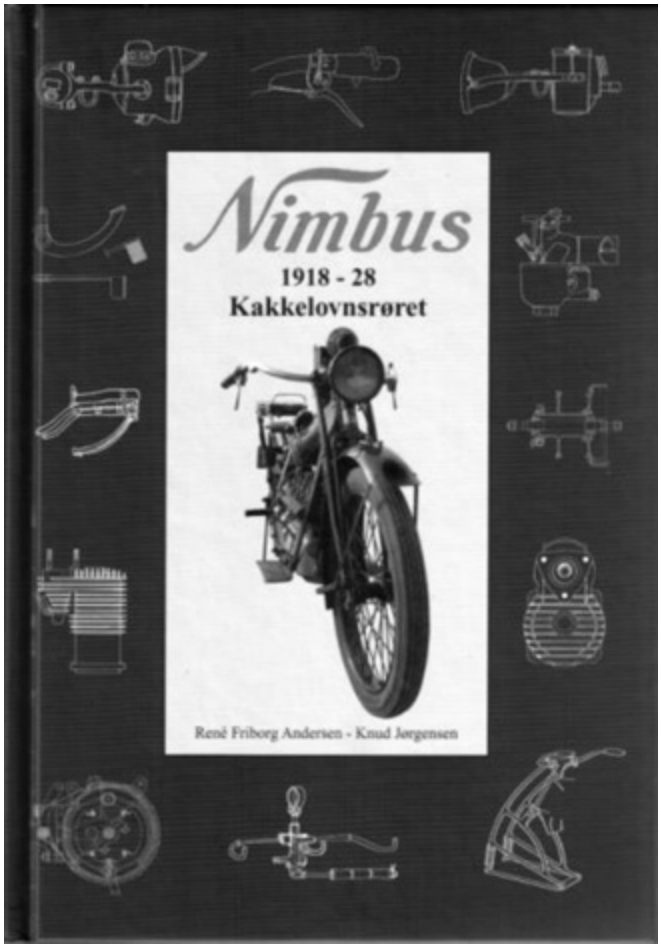
Introduction

This book is intended as a guide to the maintenance and repair of Nimbus type C motorcycles built between 1935 and 1959. The first Nimbus-C series, built during 1934 and 1935 and with serial numbers 1301-1551, differ somewhat from later models. See *Andersen, J. B. (1996): ´Nimbus model C 1934´.* An English translation of this book is available on www.geutskens.eu

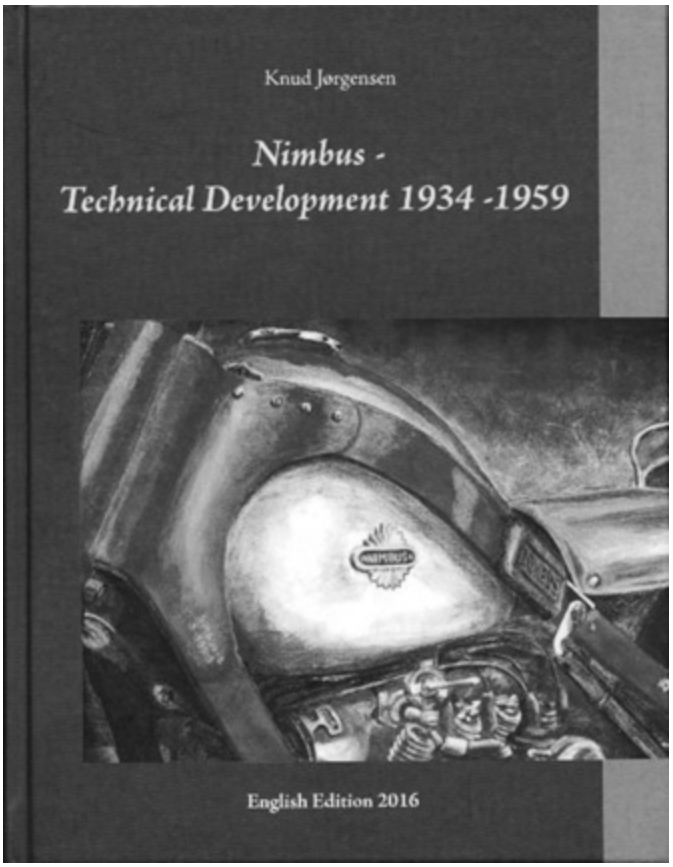
The 1934 rear wheel to which this book refers was in fact fitted up to 1937, and the 1934-2 carburettor model was used up to 1938.



The earlier Nimbus type A/B 1918-1928, widely but unofficially known as the ´Kakkelovnsrør´ or 'Stovepipe', is described in *Andersen og Jørgensen (2007). ´Nimbus 1918-28 "Kakkelovnsrøret"*



The many changes to Nimbus-C between 1934 and 1959 are described in *Jørgensen, K. (2016): ´Nimbus – Technical Development 1934 - 1959´*, This book explains the 'early' versus the 'later' design, the 'low' telescopic fork as opposed to the 'high' version, etc.



In the description of the various dismantling, repair and reassembly procedures, spare part numbers are given in brackets. The spare parts catalogue issued by A/S Fisker & Nielsen in 1951 and corrected in 1958: (´*Værkstedshåndbog – originale reservedele´)* has been reprinted many times by Denmark's Nimbus Touring Club (DNT) and others.

Every illustrated part in the catalogue is numbered. This part number will be found in the list on the opposite page. An underscored illustration number indicates that the numbers of any earlier versions of the part are also listed. The serial numbers applicable to different versions are given in the column to the left of the part numbers.

Reference is also made to *Weidinger, S. (2007): Nimbus – Ord-bog – Dictionary - Wörterbuch.*

Contents

- Voltage regulator
- Ignition coil and distributor
- Combination switch

- -Ammeter and charge warning light
- Horn and horn button
- Brake light switch
- Lighting equipment
- Headlight
- Tail light
- Sidecar lights
- Wiring
- Fuses
- Instrument lighting

Gearbox

- Maintenance
- Repair

Drive shaft

Carburettor

- Maintenance
- Dismantling and cleaning
- Adjustment
    - carburettor 1934-1
    - carburettor 1934-2
    - carburettor 1938
    - carburettor 1950
    - carburettor 1951
    - carburettor 1951-2
    - carburettor 1953

Wheels

- Hubs
- Spokes
- Nipples
- Rims
- Checking wheel truth

- Wheel-building and ‘trueing’
- Emergency repair
- Tyre pressures
- Front wheel
- Fitting front wheel
- Dismantling
- Assembling
- Speedometer gearbox
- Rear wheel
- Removing
- Dismantling
- Initial assembly and adjustment
- Final drive pinion
- Crown wheel and pinion adjustment

Brakes

- 150mm brakes
- 180mm brakes
- Maintenance and repair.
- Adjusting the brakes
- front brake
- rear brake
- sidecar brake

Frame

- Frame straightening
- Frame modifications
- Steering lock
- Knee pads
- Footrests
- Tool box
- Centre stand

Petrol tank

- Removing
- Fitting
- Repairing

Telescopic forks

- Removing the complete fork assembly
- Fitting the forks
- Preparation, assembly and fitting
- Dismantling the forks
- Assembling the forks - Fork repair

Handlebar

Saddle and pillion seat

- -Coil-sprung saddle
- Rubber suspended saddle
- -Coil-sprung pillion seat
- -Rubber-suspended pillion seat

Gear change mechanism

- Removing and fitting
- Dismantling and assembling
- Repairing

- Adjusting

Speedometer

- Removing and fitting
- Dismantling
- Maintenance and repair

Valve enclosure

Sidecars

- Sidecar types
- Maintenance and repair
- Adjusting the brake

Adjustments

- Rear wheel bearings
- Brakes
- Crown wheel and pinion (final drive gears)
- Carburettor
- Valve clearances
- Contact breaker
- Ignition timing
- Valve timing

- Camshaft and dynamo bevel gears
- Helical cut bevel gears
- Tyre pressures
- Torque settings
- Lubrication
- Paint Colours

Specifications for Nimbus-C

Number of cylinders:	4 in line
Bore:	60mm (available oversize's: 60.6mm, 61.2mm or 61.8mm)
Stroke:	66mm
Cubic capacity:	746 cm^3(761 cm^3, 776 cm^3or 792 cm^3). Figures in brackets are for 1^{st}, 2^{nd} and 3^{rd} oversize.
Compression ratio:	5.7:1 (domed pistons) or 5.4:1 (flat-top pistons)
Power output:	22 bhp / 16.2 kw @ 4500 rpm. (5.7:1 compression) 18 bhp / 13.2 kw @ 4500 rpm. (5.4:1 compression)
Max. speed:	Solo: 120 km/h.; with sidecar: 95 km/h.
Cruising speed:	Solo: 90 km/h.; with sidecar: 75 km/h.
Gear ratios:	1^{st}: 2.43:1, 2^{nd}: 1.53:1 (or 1.57:1), 3^{rd}: 1.00:1 (or 1.04:1)
Final drive ratio:	Sidecar gearing: 4.92:1 (59/12) Solo vehicle: 4.07: 1 (57/14) or 4.00 (56/14)
Brakes:	150mm or 180 mm drums, front and rear
Wheel base:	1301 – 7500: 1410mm 7501 – 14015: 1435mm
Rake:	65 °

Trail:	*Frames1301 – 7500*	*Frames 7501 – 14015*
Overall lenght:	60mm	65mm
Overall width:	2160mm	2200mm
Overall height:	780mm	720mm
	1050mm	1100mm

Seat height: 710mm

Dry weight:	185kg (with passenger seat)
Petrol tank:	12,5 1itre, of which approximately 1 litre reserve
Tyres:	3.50” x 19” (possible front wheel »Sport« 3,25” x 19”)
Wheel base:	1301-7500: 1410mm; 7501-14 015: 1435mm
Front fork offset:	1301-7500: 60mm; 7501-14 015: 65mm
Valve clearance: Contact breaker	Inlet: 0.3 mm, exhaust: 0.7 mm (cold engine)
gap setting:	0.7mm
Plug gap setting:	0.7mm
Ignition sequence:	1 - 3 - 4 - 2
Ignition timing:	1650 rpm: 37° before top dead centre (TDC)
Valve timing:	*Inlet valve* opens: 7° before TDC closes: 39° after bottom dead centre (BDC) *Exhaust valve* opens: 42° before BDC closes: 4° after TDC
Battery:	6 V/ 12 Ah

Dynamo: 8V/70W

Lighting: Low beam / high beam: 35/35 W Parking light: 4 W (possible 5 W) Tail light and licence plate light: 5 W Brake light: 15W Instrument light: 1,2W Ignition/charge warning light (Bosch): 4W Ignition/charge warning light (lighting switch): 2W

Workshop practice

- Give a task all the time it needs.
- Arrange good lighting.
- Have pencil and paper within reach.
- Have plenty of clean rags available.
- Use service tools where necessary and quality tools in all other cases.

Fasteners and locking methods:

Thread types

All threads on the Nimbus-C are right hand, with the exception of that on the speedometer drive worm (7572 or 8361), which is a left-hand thread. With few exceptions, threads are standard metric or metric fine.

Fasteners

Bolts, screws, washers and nuts for Nimbus-C are standard engineering hardware items. Their precise sizes can generally be read from the spare parts list. For example: Plan 9C in the spare parts list calls for: *7651 Screw 6 – 0,75 x 13mm,* that is, an M6 screw with an under- head length of 13mm and a thread pitch of 0.75mm (metric fine).

Bolts

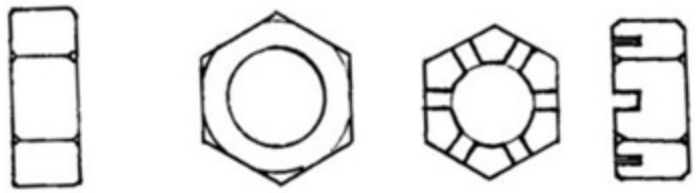
On the Nimbus-C all bolts are hexagon head, and the following sizes are used:
* 6mm (10mm across flats)
* 8mm (originally 14mm across flats, replacements 13mm)
* 10mm (17mm across flats)
* 12mm (19mm across flats)

Screws

All screws are slot head type.

Studs
All studs are 6mm, 8mm or 12mm, either plain or shouldered

Nuts
All nuts are hexagonal, either plain, castellated (locked by split pin) or domed (as on wheel spindles). (Dynamo bevel gear retaining nuts are an exception, being round castellated pattern requiring a special spanner).



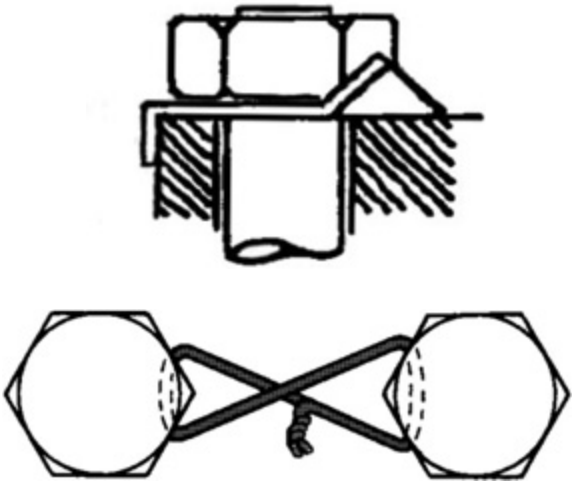
Washers

Fibre washers are used in some places to prevent damage to surfaces. Flat washers of galvanised or stainless steel are used for the same purpose. *Spring washers* are locking washers (see below).

Locking methods

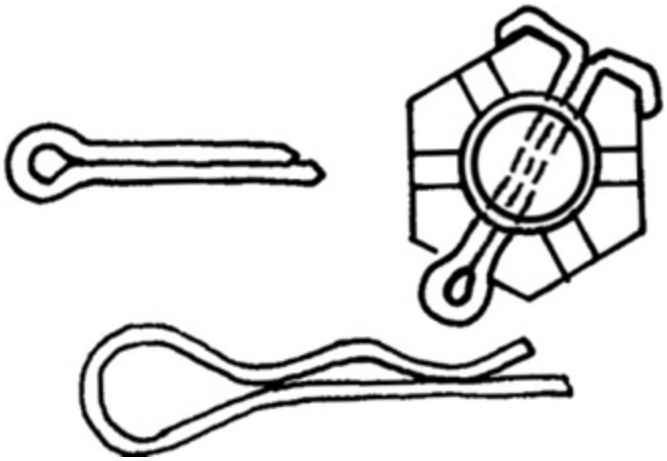
* *Spring washers* are used when connecting parts. Spring washers must be in direct contact with the screw head or nut. A flat washer should be placed under a spring washer if the fastening to a light- alloy metal surface,

* *Locking washers / locking tabs* prevent fasteners from loosening, typically by means of a section of the washer or tab being folded against a flat of a bolt head or nut, while the washer or tab is itself secured against turning.



* *Locking wire* can be used if the bolt head or nut is drilled.

* *Split pins* are used to lock castellated nuts to drilled bolts.

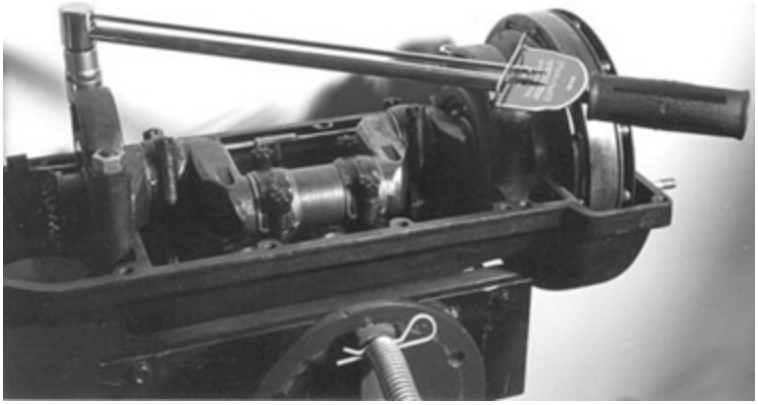


* *Special purpose adhesives* such as 'Loctite' are now available and are very effective when applied to thoroughly cleaned and dry fasteners. There are various grades of these 'anaerobic expansive' products. Some are suitable for locking bearings into place.

Torque settings

In some cases, applying the correct torque setting to a fastener is essential. (Page 210) The head of the bolt may bear a code indicating the grade of material and therefore

the maximum allowable torque. Recommended torque settings assume clean, dry, undamaged threads. Torque figures are usually specified in foot-pounds (ft/lbs) or Newton-metres (Nm).



Hand Tools

Hammers

* Engineer's ball-peen hammer
* Soft-faced hammer (rubber, plastic, or fibre faced)

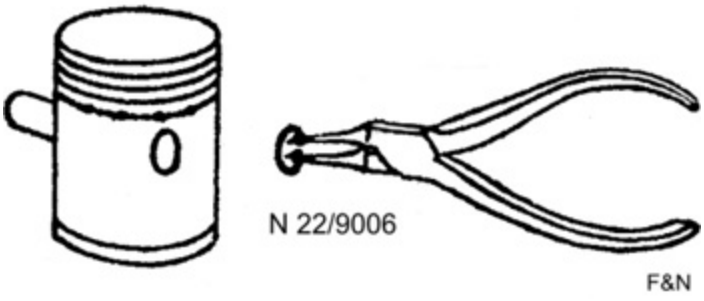
Spanners

* Adjustable spanners
* Ring spanners
* Open-end spanners
* Combination spanners (one ring end and one open end of the same size)

* Sockets - used with square-drive ratchet handles
* Box spanner / tubular spanner
* Torque wrench

Pliers

* Combination pliers
* Circlip pliers
* Multigrip pliers



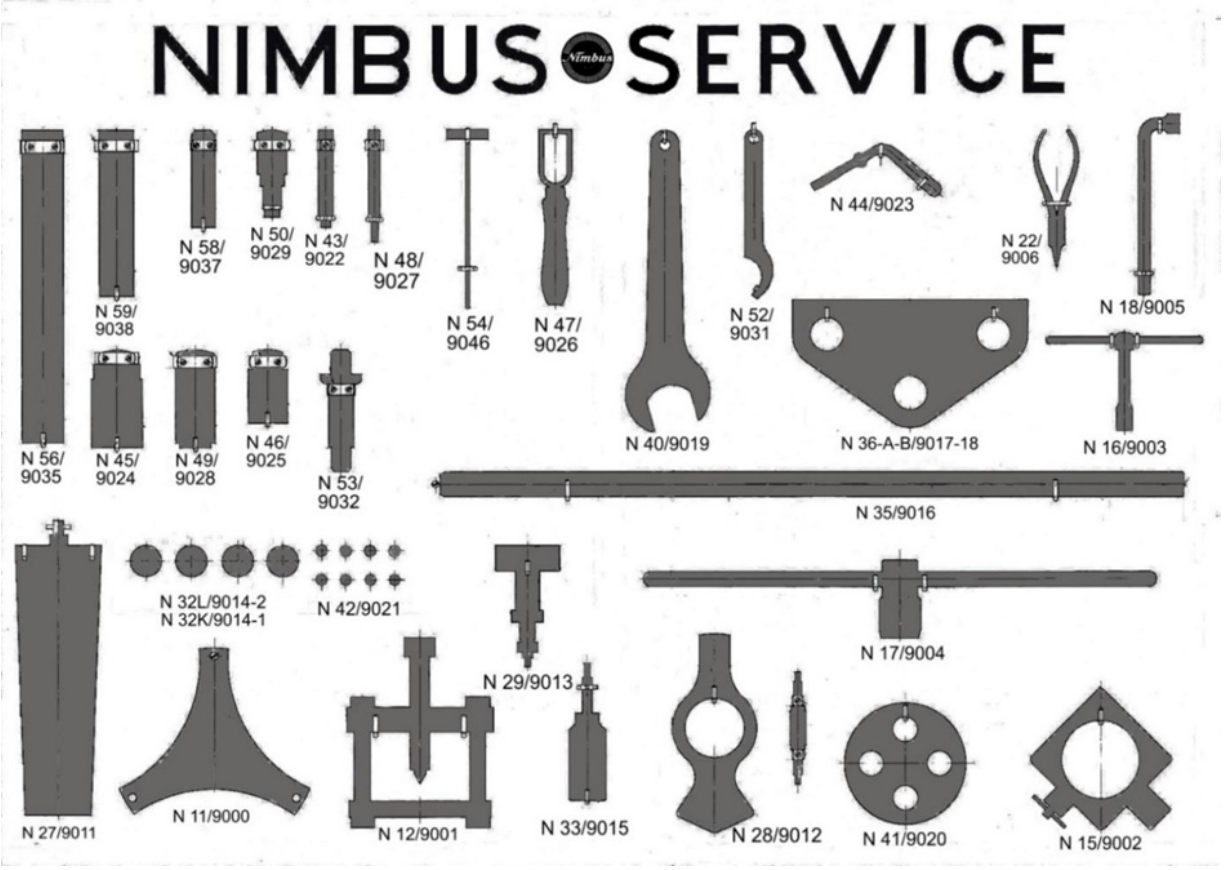
Screwdrivers

Make sure you have a selection of flat-blade screwdrivers to fit the varied sizes of slot-head screws found on the Nimbus. The blade of each screwdriver should be ground so that the flat sides are slightly hollowed and parallel at the tip, reducing the risk of damaging the screw head. Right-angled screw drivers can be useful where access is difficult (for example when removing the Nimbus dynamo’s brush holder screws).

Special-purpose tools

For the Nimbus-C motorcycle the factory developed a set of 'Service Tools' for certain specific repair operations. General-purpose tools can be used, but with care and less conveniently for some, but not all of these operations. In such cases, repairs have to be carried out in a specialised workshop. Factory service tools marked * appear in the DNT Drawing Archive.

Where service tools are mentioned or illustrated in this book, tool numbers and the Archive drawing numbers are given.



Drawing	Tool	Tool description

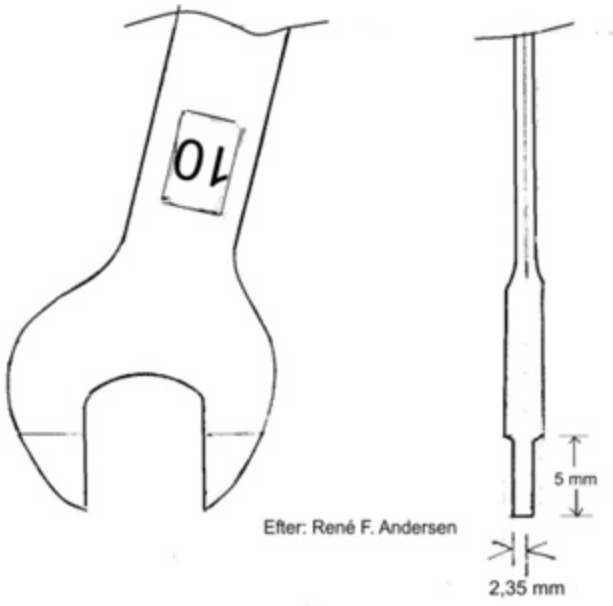
8999	N10	Puller for dynamo gear wheel
8999	N14	Puller for dynamo gear wheel
9000*	N11	Puller for flywheel
9000-2*		Puller for flywheel
9001*	N12	Puller for crankshaft bevel gear wheel and main bearing
9002*	N15	Holding bracket for dynamo
9003*	N16	T-bar socket for upper dynamo bevel gear retaining nut
9004*	N17	T-bar socket 27mm for flywheel and fork stem top nut
9005*	N18	Offset 14mm spanner for cylinder head fasteners
9006	N22	Circlip fitting tool
9007		Reamer, connecting rod small end bush
9007		Puller for camshaft bevel gear wheel
9008	N25	Valve facing set, complete in box
9009	N26	Engine stand
9010		Workshop stand
9011*	N27	Drive shaft tool
9011-2		Puller for drive shaft hub
9012*	N28	Adjustment gauge for final drive pinion
9013*	N29	Puller for wheel bearing outer race
9014*	N32	Distance piece, rear hub assembly

9015*	N33	Fork bush extractor for bush
9016*	N35	Test mandrel for fork tubes
9017*	N36A	Test gauge for fork tubes
9018*	N36B	Test gauge for fork tubes
9019*	N40	Spanner 46mm steering head bearing nut
9020*	N41	Alignment tool for clutch plate
9020-2*		Alignment tool for clutch plate
9021*	N42	Retainer for connecting rod bolt
9022*	N43	Drift for gudgeon pin
9023*	N44	Clutch compression tool
9024*	N45	Drift for main bearing
9025*	N46	Drift for bevel gear wheel
9026*	N47	Valve spring compressor
9027*	N48	Drift for valve guide

9028*	N49	Drift for small end bush and bevel gear bush
9029*	N50	Drift for small end bush
9030*		Frame alignment gauge
9031*	N52	'C' spanner for speedometer worm gear
9032*	N53	Drift for front wheel bearing and telescopic fork bushes
G-9033*	N29	Extractor for front wheel bearing
9034*		Rear frame alignment tool
9035*	N56	Drift for fork stem bearing cone
9036		Drilling template for cylinder head (Valve enclosure)
9037*	N58	Drift for removing sidecar axle
9038*	N59	Drift for fitting sidecar axle
9040*		Tool board with profiles
9041*		Tool holders for tool board
9042*		Tool board
9043*		Installation tool for dynamo upper bevel gear 7115
9044*		Installation tool for dynamo upper bevel gear 7147
9046*	N54	Hand reamer 16mm for connecting rod small end bush
9047*		Drilling template for saddle suspension brackets
9048		T- bar socket 14mm

9049	T-bar socket 19mm

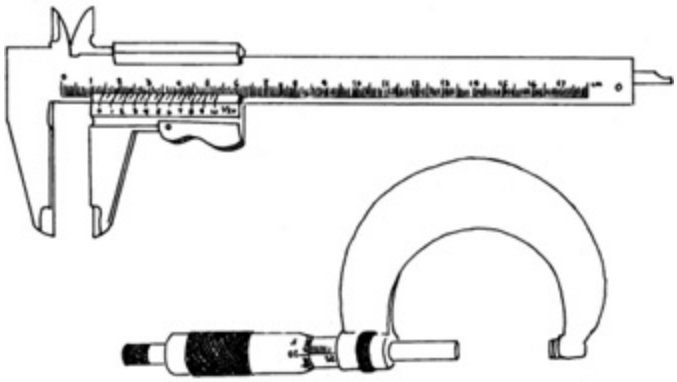
Improvised tools



If factory service tools are not available, consult the Drawing Archive. In many cases it may be possible to make a substitute, as exact dimensions are given. Right: In absence of tool number 9003/N16 T-bar socket.

Measuring equipment

In order to be able to take dimensions in case of engine overhaul, a vernier, dial, or digital calliper and a micrometer will be needed. Dial gauges are particularly useful for measuring specified tolerances (as in trueing wheels) or backlash (when fitting gears).



Drawing Archive

The Nimbus-C factory engineering drawings available in the Drawing Archive were produced 40 to 70 years ago to the standards of that time, and are certainly very useful today. Some more recent drawings lack precise spare part dimensions and do not comply with the requirements for technical drawings. Some spare parts do not have original factory part numbers but have been assigned an identifying number. That is the case with helical . timing gears for example.

In 2006 the Danish Nimbus Touring Club (DNT) produced two compact discs with original Nimbus construction drawings and drawings of prototypes and new developments.

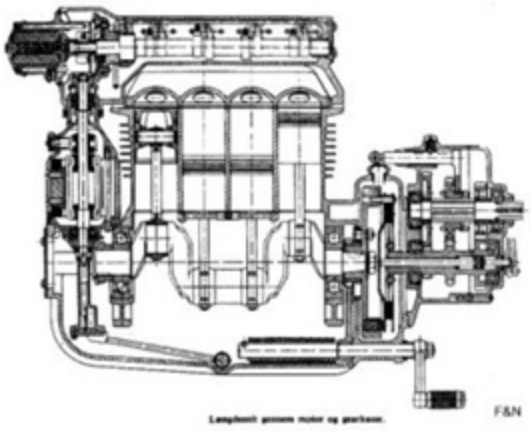
The opening text on the CD reads:

Drawings from A/S Fisker and Nielsen's drawing archive were registered and photocopied by Danmarks Nimbus Touring in 1982 and as many missing drawings as possible have been re-created by measuring spare parts. All drawings were scanned by Danmarks Nimbus Touring between 2002 and 2005.

*The Nimbus-C drawings are organized according to A/S Fisker and Nielsen's Parts Catalogue published in 1951 and updated in February 1958. Drawings for the Nimbus A/B are organised according to component categories. Drawing numbers with a preceding **G** are combined drawings which illustrate multiple parts. The meaning of a preceding **E** is unclear, but might indicate a repeat order. Trailing characters to a drawing number indicate the following:*

***S** (Smede) - the drawing is of forged parts*
***P** (Plade) - the drawing is of sheet metal parts*
***A** (Arbejde) - a working or production drawing*

K *(Kalkule) - a drawing including calculations or other documentation.*



Nimbus-C archive drawings

Whereas there is a limited collection of drawings for the Nimbus- A/B, an almost complete set of drawings for the Nimbus-C survives. The drawings are on CD and arranged in folders corresponding to the organisation of the Nimbus-C Parts Catalogue. Each folder contains all drawings

Each file contains a sub file with drawing in PDF-format (to be opened with Adobe Reader) and a file with drawings in TIF-format. Besides, all files open up automatically in JPG-format. Most of the scanned drawings are very large and besides that, very dirty. That means that a certain computer capacity is required for opening and printing the drawings, where required, especially those which are in TIF-format.

Archive searching

Use the computer search function, specifying the drawing number (part number).