Action code: WHEN CONVENIENT

L16/24 Mk 2 Update Package

SL13-583/KEL
April 2014

Concerns
Owners and operators of MAN Diesel & Turbo four-stroke diesel engines.
Type: L16/24

Summary
Replacement of SL12-560/SIC regarding Mk 2 update for L16/24

Dear Sirs and Madams

In 2012 MAN Diesel & Turbo issued Service Letter SL12-560/SIC regarding a Mk 2 update for the L16/24 engine. The product has been a success.
However, engine operators have observed certain issues after the update. Very often, these issues are not related to the Mk 2 package or the engine, but rather to the external treatment systems.

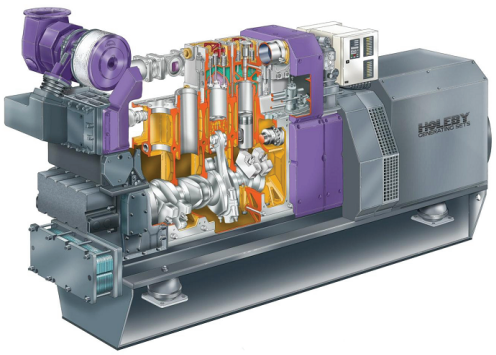
Based on the success of the Mk 2 update, MAN Diesel & Turbo, Holeby, has decided to continue to offer Mk 2 units as an attractive kit, ideal for use at the time of a major overhaul of a Mk 1 L16/24 engine.

Yours faithfully

Mikael C. Jensen
Vice President
Engineering

Kjeld Lorentzen
Superintendent
Design Warrenty

Enclosures:
Working Card 505-01.20 (13)
Working Card 507-01.20 (15)
Working Card 508-01.00 (15)
Plate 50501-19H
Plate 50502-11H
Plate 50515-11H
Plate 50601-27
Plate 50705-25H
Plate 50801-13H
Plate 51402-12H
Plate 52000-13



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Amtsgericht Augsburg

www.mandieselturbo.com

The Mk 2 update kit

Based on our service experience since the introduction of the Mk 2 update with SL12-560/SIC, the complete update kit of a Mk 2 cylinder unit now includes:

- Reconditioned complete cylinder unit
- Camshaft section (valve)
- Connecting rod bearing
- Gasket set
- Fuel nozzle (Woodward or L'Orange)
- New pages for instruction manual
- Tool for adjustment of roller guide bracket
- Tool for easy and safe adjustment of valve clearance.

Price

The price for the above-mentioned Mk 2 package is EUR 5,400 Incoterms 2010 ex works Frederikshavn.

Recommendations

The following points should be observed and consequently, we strongly recommend:

- Installation of 25 µm fuel safety filter according to SL13-577/KEL
- Lube oil treatment according to SL13-582/KEL
- Installation of the Mk 2 update kits by an MAN Diesel & Turbo authorised workshop.

We reserve the right to reject any claim for the Mk 2 parts, if the above-mentioned recommendations are not followed.

Overhaul of engine

In order to have a fully overhauled engine – a basis for having a well performing engine – we highly recommend to check and/or overhaul the following engine parts at the same time as the Mk 2 update:

- Fuel equipment
- Turbocharger
- Charge air cooler
- Thermostatic valves (water)
- Engine room ventilation/pressure
- Check of conical elements.

Return of replaced units

Replaced cylinder units must be returned to MDT/Frederikshavn for reconditioning within 60 days after receiving the Mk 2 units. If the replaced units are not received at our workshop within 60 days, we reserve the right to invoice the owner EUR 7,000 per cylinder unit. The replaced units must be protected against corrosion and mechanical damage during the stay on board and during transportation by the buyer. If the returned parts are damaged at arrival to the workshop, MAN Diesel & Turbo reserves the right to invoice the buyer an additional EUR 3,000 per cylinder unit.

How to order

To order the complete Mk 2 update kit as well as the strongly recommended 25 µm fuel safety filter and installation and commissioning assistance, please contact:

Primeserv-technic-Hol@mandieselturbo.com

Please mark the inquiry: SL13-583/KEL

This Service Letter is valid until 31 December 2015.

Safety precautions

- ☐ Engine stopped
- ☐ Shut-off starting air
- ☐ Shut off cooling water
- ☐ Shut off fuel oil
- ☐ Shut-off cooling oil
- ☐ Stop lub. oil circulation
- ☐ Press Blocking - Reset

Short Description

Dismantling and mounting of valve guide, for inlet and exhaust valve.

Starting Position

Valve spindle has been removed	505-01.05

Related Procedure

Mounting of valve spindles	505-01.05

Qualified Manpower

Duration in h	:	3/4
Number	:	1

Data

Data for pressure and tolerance	(Page 500.35)
Data for tightening torque	(Page 500.40)
Declaration of weight	(Page 500.45)

Special tools

Plate No.	Item No.	Note
52005	120	

Hand Tools

Hammer / lead hammer
Nitrogen (N2) or similar

Replacement and wearing parts

Plate No.	Item No.	Quantity
50501	076	4/cyl.
50501	088	4/cyl.

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General

If the clearance exceeds the shown max. limit, *(see page 500.35)*, the valve guide must be replaced.

Dismounting of valve guide

1) Knock the valve guide out from the bottom of the cylinder head, by means of a mandrel, which has a shoulder turning that fits into the valve guide, see fig 1.
2) Clean the bore of the cylinder head carefully.
3) Inspect for marks that can prevent mounting of new valve guide.

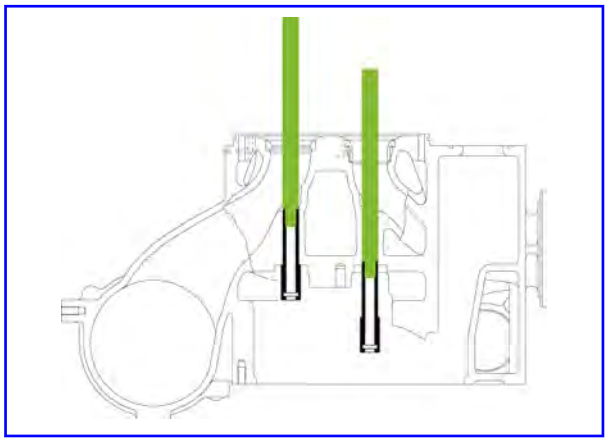

Figure 1: Dismounting of valve guide

Mounting of valve guide

1) Before mounting - cool down the new valve guide to approx. -195°C with nitrogen or similar.
2) Insert the valve guide into the bore.
3) Slightly pres-in the valve guide until the shoulder bear against the cylinder head, see fig 2.

Note: Carefully control that valve guide shoulders have full contact to the cylinder cover.

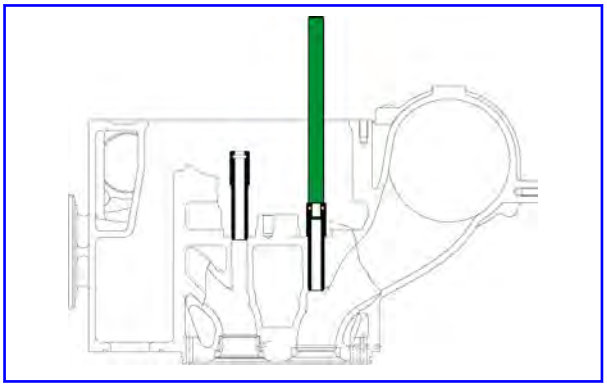

Figure 2: Mounting of valve guide

4) Insert a new O-ring in the valve guide, before mounting of the valve spindle.
   Correct mounting can easily be done by the use of two valve spindles as mounting tool, one spindle to be used as support and the other spindle to be used for pushing the O-ring downwards, see fig 3.
   Screw-drivers or other sharp tools should never be used for this purpose.
5) For mounting of valve spindle, please see working card 505-01.05.

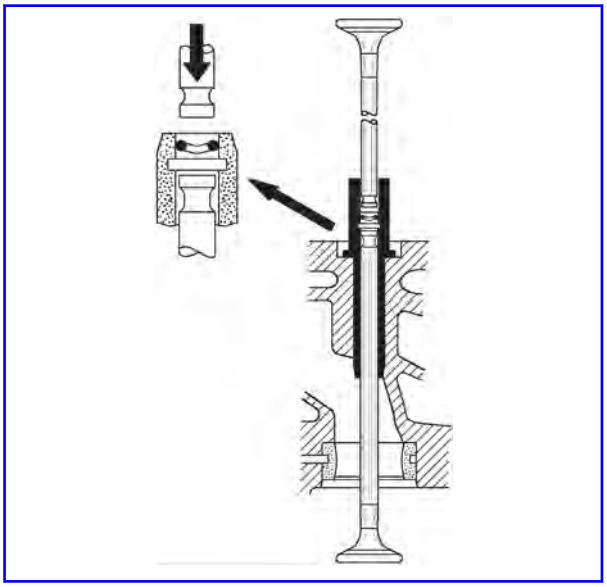

Figure 3: Inserting a new O-ring in the valve guide

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Safety precautions

- [x] Engine stopped
- [x] Shut-off starting air
- [ ] Shut off cooling water
- [x] Shut off fuel oil
- [ ] Shut-off cooling oil
- [x] Stop lub. oil circulation
- [x] Press Blocking - Reset

Short Description

Nominal adjustment of camshaft. (Adjustment of camshaft in relation to crankshaft).

Starting Position

Camshaft assembled as per timing order, mounted in frame and roller gear house. If intermediated gearwheel must be changed, the generator must be dismounted.

Related Procedure

Qualified Manpower

Duration in h	:	-
Number	:	-

Data

Data for pressure and tolerance	(Page 500.35)
Data for tightening torque	(Page 500.40)
Declaration of weight	(Page 500.45)

Special tools

Plate No.	Item No.	Note
52007	040	Woodward
52007	052	L'Orange

Hand Tools

Replacement and wearing parts

Plate No.	Item No.	Quantity

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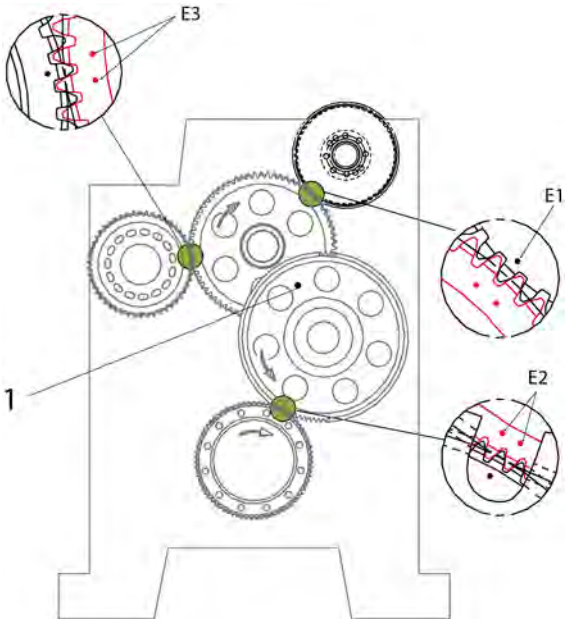
Assembly of gear wheels for valve camshaft and injection valve camshaft, without mounted flywheel

Following description is for mounting the gear-wheels in the control drive when alternator, flywheel and cover on coupling side are dismantled from the engine.

Mounting of intermediate gearwheels

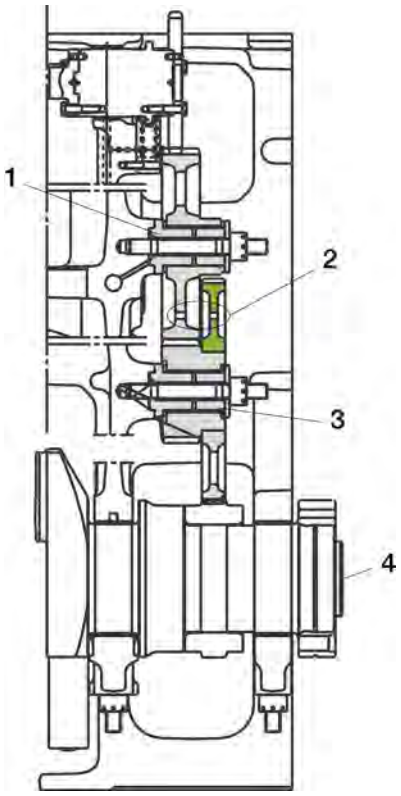
1) Turn the crankshaft to top dead centre for the last cylinder (the cylinder nearest to the coupling side).
2) Mount the upper intermediate gearwheel.



1 Small holes

Figure 1: Marks on gearwheels

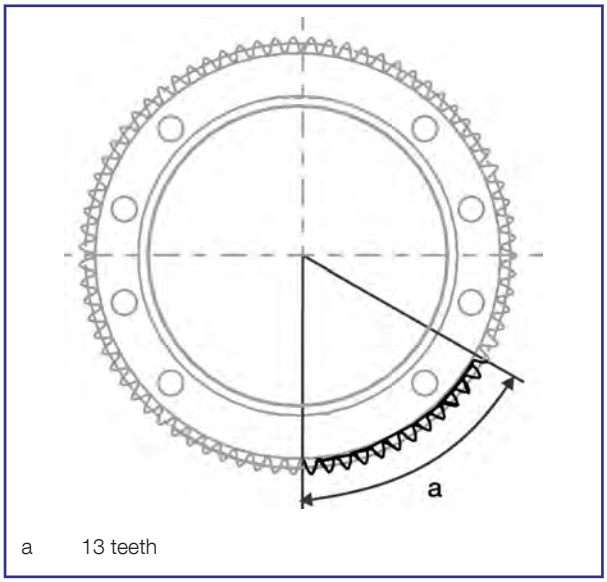
3) Mount the lower intermediate gearwheel so the marks on the lower intermediate gearwheel are corresponding with the mark on the crankshaft gearwheel, see fig 1(E2). At the same time turn the upper intermediate gearwheel so that the small holes in the circumference of the two intermediate gearwheels are corresponding, see fig 2.



1	Upper intermediate spur wheel	2	Small holes
3	Lower intermediate spur wheel	4	Crankshaft

Figure 2: Position of small holes in the circumference of the two intermediated gearwheels

Note: The punch mark on the crankshaft gearwheel is placed on the 13 teeth counting counter clock-wise from the joint of the gearwheel, see fig 3.



a 13 teeth

Figure 3: 13 teeth counter-clockwise from the joint of the gear-wheel

4) Tighten up the intermediate gearwheels. Tightening torque, please see page 500.40.

Mounting of gearwheel for valve camshaft

1) Before mounting of the gearwheel, the marks on the crankshaft and the lower intermediate gearwheel must correspond, see fig 1 (E2). Futher, the small holes on both intermediate gearwheels must correspond.
2) Turn the valve camshaft, until the mark on the gearwheel for valve camshaft corresponds with the 2 marks on upper intermediate gearwheel, see fig 1 (E1).
3) Tighten up the gearwheel. Tightening torque, please see page 500.40.

Mounting the gearwheel for injection camshaft

1) Before mounting the gearwheel, must marks for crankshaft and lower intermediate gearwheel correspond, see fig 1(E2). Secondly must the small holes for both intermediate gearwheels be corresponding.
2) Turn the injection valve camshaft, until the mark on the gearwheel for valve camshaft correspond with the 2 marks on upper intermediate gearwheel, see fig 1 (E1).

Note: Adjustment of injection valve camshaft is now needed, please see separately chapter “Adjustment of Fuel Injection Camshaft / Injection Timing”.

Measure of fuel pump lead

1) Dismantle covers for fuel camshaft and fuel pump.
2) Check the mobility of the regulating device.
3) Position the support of the measuring tool on the two bolts of the camshaft covering. Slip on the distance sleeves and fasten to the cylinder crankcase by means of hexagon nuts.

Note: During attaching, pay attention to the correct fitting position of the contact point.

4) Insert the dial gauge into the support.
5) Turn the engine until the cam base circle is reached (approx 40° BTDC).
6) Set the dial gauge to "Zero".
7) Turn the engine until the TDC mark (ignition DC) for the actual cylinder is reached.
   Read the dial gauge and note down the gauge value in sheet.
8) Determine the values for the other cylinders in the same way.
   Calculate the average value of all measurements.
9) Compare the calculated value determined with the value mentioned below.
10) If the values exceeds the limits, an adjustment must be done in order to correct the errors.
11) Remove the complete measuring tool.
12) Mount all camshaft covers.

Plunger lift (average value): see figure.

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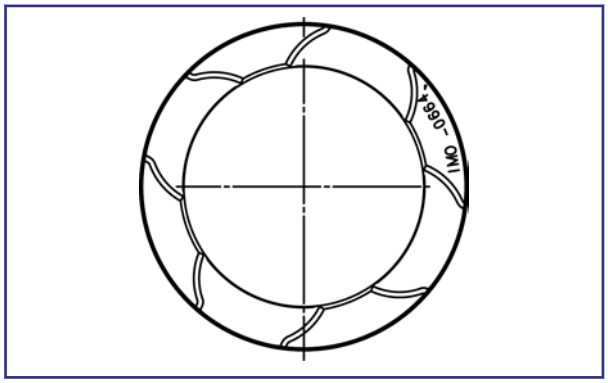
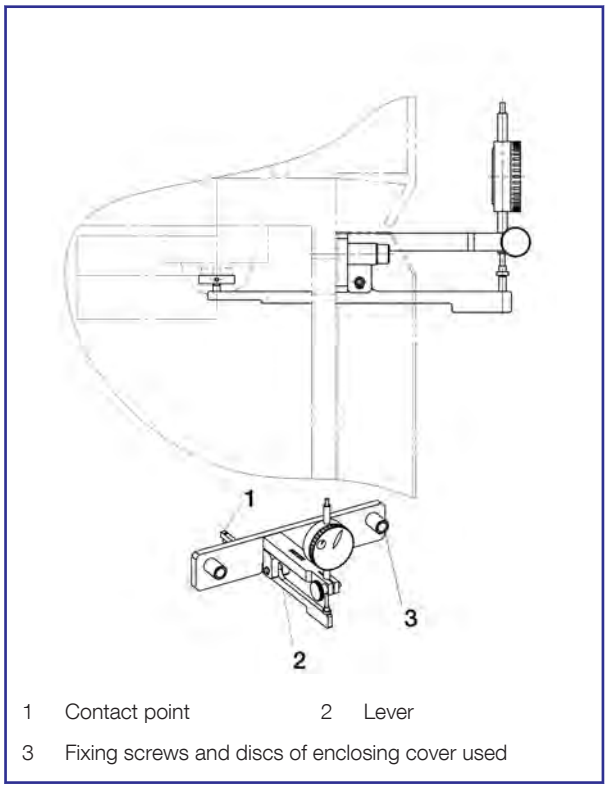
Pump type	Woodward			L'Orange		
Engine rpm	1000	1200		1000	1200	
Engine power rating	90 (kW/cyl)	100 (kW/cyl)	110 (kW/cyl)	90 (kW/cyl)	100 (kW/cyl)	110 (kW/cyl)
Max plunger lift	5.40 mm	5.93 mm	6.04 mm	5.40 mm	5.93 mm	6.04 mm



Requirements: Only to be used with piston crown marked with:
IMO-0664



1 Contact point 2 Lever

3 Fixing screws and discs of enclosing cover used

Safety precautions

- Engine stopped
- Shut-off starting air
- Shut off cooling water
- Shut off fuel oil
- Shut-off cooling oil
- Stop lub. oil circulation
- Press Blocking - Reset

Short Description

Dismounting, inspection and/or overhaul, and mounting of valve roller guides.

Starting Position

Cylinder unit has been removed from engine and dismantled.

Qualified Manpower

Duration in h	:	2
Number	:	1

Data

Data for pressure and tolerance	(Page 500.35)
Data for tightening torque	(Page 500.40)
Declaration of weight	(Page 500.45)

Special tools

Plate No.	Item No.	Note
52000	831	

Hand Tools

Feeler gauge, 0.1 mm

Replacement and wearing parts

Plate No.	Item No.	Quantity

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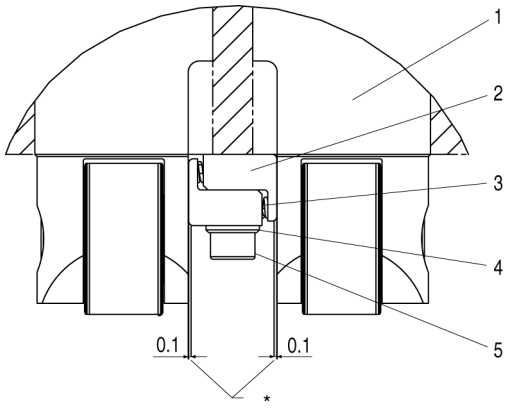
Inspection of Valve Roller Guides

1) Turn the water jacket upside down so the roller guides can slip out at the water jacket.
2) Examine the surface of the roller and the tappet housing for marks and secures, if any they must be polished away.
3) Blow clean the lubricating ducts in the tappet housing and the roller with air.
4) Examine the push rod, pin and ball cup for damage and replace if necessary.

Replacement of roller and shaft pin

1) Remove the lock screw.
2) Push out the axle.
   The roller and axle can now be replaced.
3) Mount the lock screw with loctite 275.

Mounting of guide for tappets



1	Roller guide	2	Guide piece
3	Compression spring	4	Washer
5	Cylindrical screw	*	Clearance adjusted with feeler gauge

Figure 1: Inspection of roller guide and roller

1) Mount item 2-3-4-5 on the water jacket assembly, see fig 1.
2) Press the two guides together, and slightly tighten the two M6 bolts (item 5).
3) Turn the tappets so that the plane surfaces point towards each other, and mount them in the water jacket.

Adjustment of guides for tappets

1) Final adjustment of guide-tappet clearance can only be done after the cylinder unit has been installed on the engine and cylinder cover nuts are tightened.
2) Turn the actual cylinder into overlap top dead centre. (Both inlet- and exhaust valve has lifted a few millimetres and the cams are now aligning the roller in correct position)

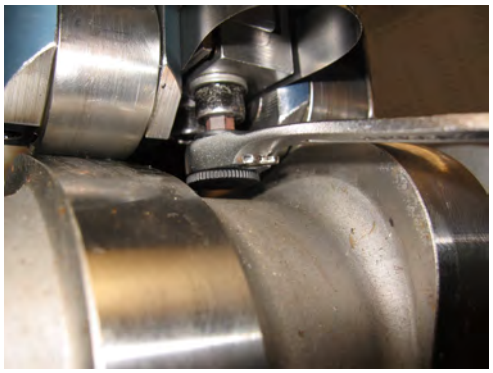


Figure 2: Brackets between roller guides

3) Put 0,1 mm feeler gauge on both sides of the guides and untighten the two M6 bolts (5). Make sure that there is full parallel contact on the feeler gauges. Tighten the two M6 bolts see fig. 2. (Re-check the feeler gauges has parallel contact and make sure the clearance between guide and tappet is 0.1 mm +0.1 / - 0) Remove the feeler gauges.
4) Turn the engine so that both rollers are on the circular part of the cams. Check that the tappets can turn free from side to side in the clearance. Adjustment is completed.

Plate Page 1 (2)	Cylinder Head	50501-19H

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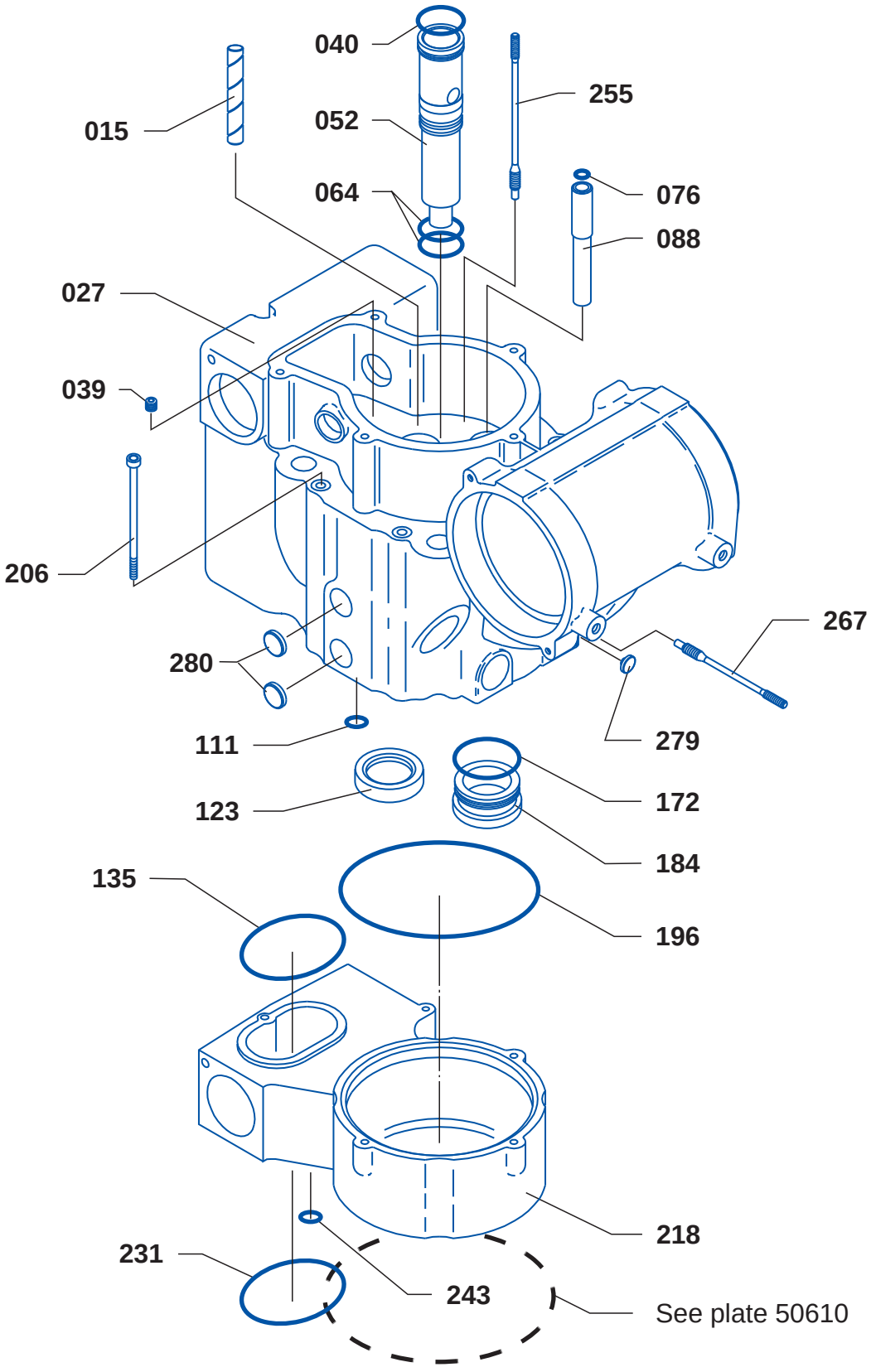

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Item no	Qty	Designation	Benævnelse
015	2/C	**Guide for valve bridge**	Styr for ventilbro
027	1/C	**Cylinder head, complete incl item 015, 039, 040, 052, 064, 076, 088, 123, 172, 184, 280**	Cylinderdæksel, komplet inkl item 015, 039, 040, 052, 064, 076, 088,123, 172, 184, 280
039	2/C	**Plug**	Prop
040	1/C	**O-ring**	O-ring
052	1/C	**Sleeve**	Foring
064	2/C	**O-ring**	O-ring
076	4/C	**O-ring**	O-ring
088	4/C	**Valve guide**	Ventilstyr
111	2/C	**O-ring**	O-ring
123	2/C	**Valve seat ring, inlet**	Ventilsædering, indstrømning
135	1/C	**O-ring**	O-ring
172	2/C	**O-ring**	O-ring
184	2/C	**Valve seat ring, exhaust**	Ventilsædering, udstødning
196	1/C	**O-ring**	O-ring
206	5/C	**Screw**	Skrue
218	1/C	**Water guide jacket**	Kølekappe
231	1/C	**O-ring**	O-ring
243	2/C	**O-ring**	O-ring
255	2/C	**Bolt**	Bolt
267	1/C	**Stud**	Tap
279	1/C	**Thrust piece**	Trykstykke
280	11/C	**Closing cover**	Frostprop

Item no	Qty	Designation	Benævnelse

When ordering spare parts, see also page 500.50.

*** = Only available as part of a spare parts kit.**
Qty/C = Qty/Cylinder
Qty/I = Qty/Individual

Ved bestilling af reservedele, se også side 500.50.

* = Kun tilgængelig som en del af et reservedelssæt.
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Qty/I = Qty/Individuelt

Plate Page 1 (2)	Valve Spindles and Valve Gear	50502-11H

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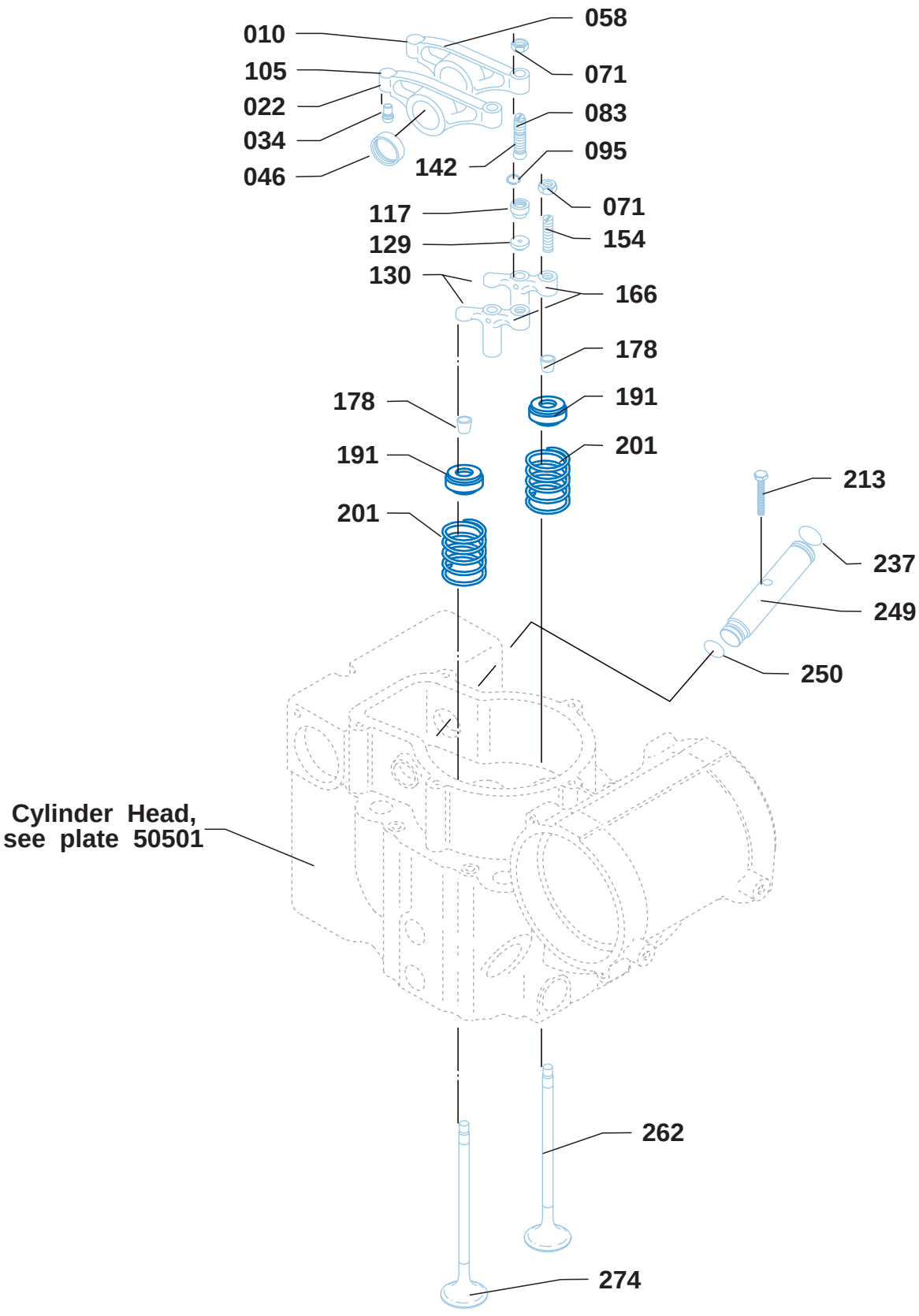

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Item no	Qty	Designation	Benævnelse
010	1/C	**Rocker arm, exhaust complete, incl. item 034, 046, 058, 071, 083**	Vippearm, udstøds, komplet inkl. item 034, 046, 058, 071, 083
022	1/C	**Rocker arm, inlet complete, incl. item 034, 046, 071, 083, 105**	Vippearm, indsugning komplet inkl. item 034, 046, 071, 083, 105
034	2/C	**Bolt**	Bolt
046	2/C	**Bearing bush**	Leje
058	1/C	**Rocker arm, exhaust**	Vippearm, udstøds
071	4/C	**Nut**	Møtrik
083	2/C	**Adjusting screw complete, incl. item 095, 117, 142**	Justérbar skrue komplet inkl. item 095, 117, 142
095	2/C	**Circlip**	Fjederring
105	1/C	**Rocker arm, inlet**	Vippearm, indsugning
117	2/C	**Thrust piece**	Trykstykke
129	2/C	**Thrust piece**	Trykstykke
130	2/C	**Valve bridge complete, incl. item 071, 129, 154, 166**	Ventilbro komplet, inkl. item 071, 129, 154, 166
142	2/C	**Adjusting screw**	Justérbar skrue
154	2/C	**Adjusting screw**	Justérbar skrue
166	2/C	**Valve bridge**	Ventilbro
178	4/C	**Conical ring 2/2**	Konisk ring 2/2
191	4/C	**Rotocap complete**	Rotationsgiver, komplet
201	4/C	**Spring**	Fjeder
213	1/C	**Screw**	Skrue
237	1/C	**O-ring**	O-ring
249	1/C	**Shaft**	Aksel
250	1/C	**O-ring**	O-ring
262	2/C	**Valve spindle, exhaust**	Ventilspindel, udstøds
274	2/C	**Valve spindle, inlet**	Ventilspindel, indsugn.

When ordering spare parts, see also page 500.50.

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Qty/C = Qty/Cylinder

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Qty/C = Qty/Cylinder

Plate Page 1 (2)	Cylinder Unit	50515-11H

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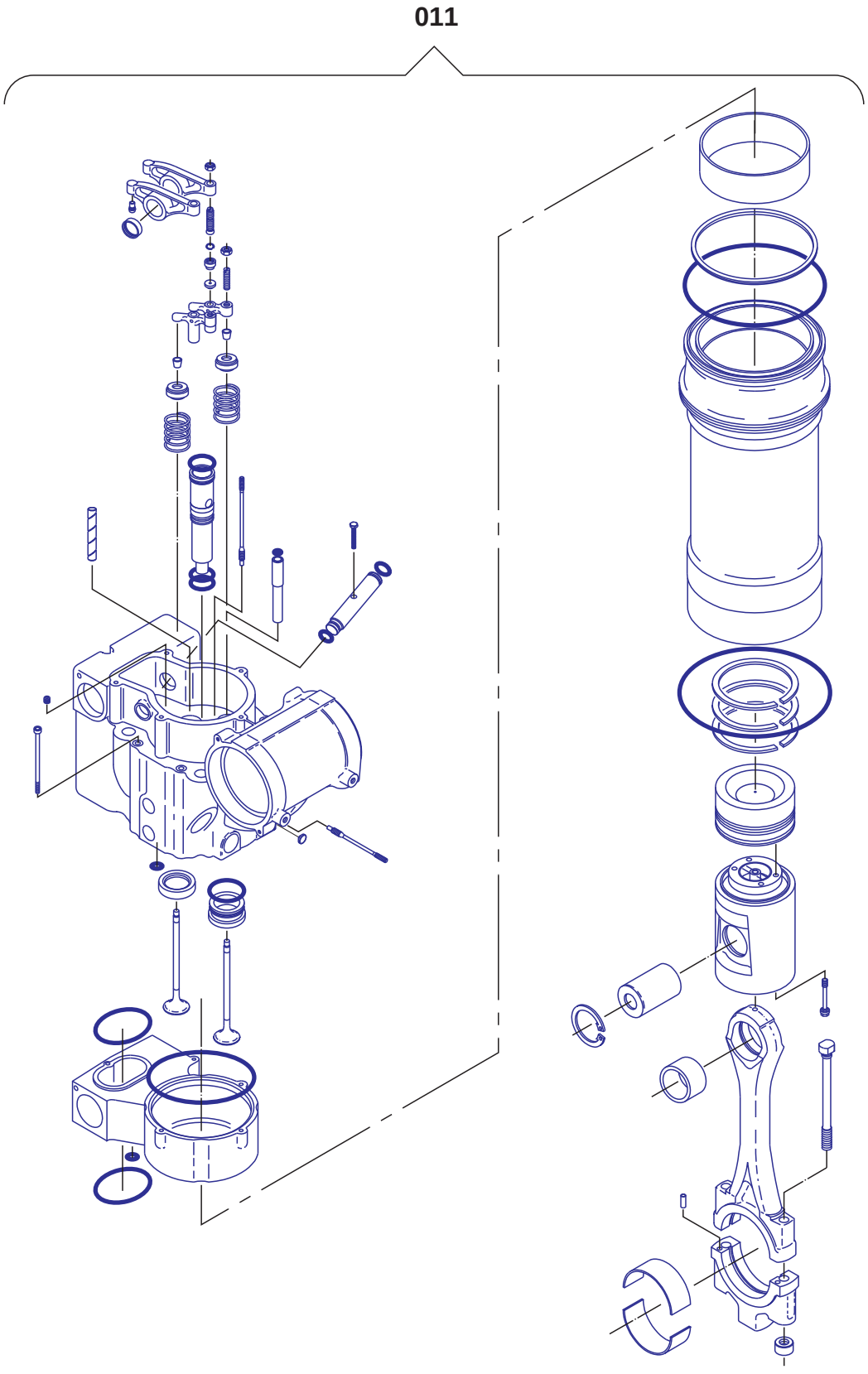

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Item no	Qty	Designation	Where to find in the engine instruction book	
011	1/C	**Cylinder unit, complete consisting of:**	**Plate 50515**	**Item 011**
	1/C	**Cylinder head**	**Plate 50501**	
	1/C	**Valve spindle and valve gear**	**Plate 50502**	
	1/C	**Piston and connecting rod**	**Plate 50601**	
	1/C	**Cylinder liner**	**Plate 50610**	

Qty/C = Qty/Cylinder

Plate Page 1 (2)	Piston and Connecting Rod	50601-27

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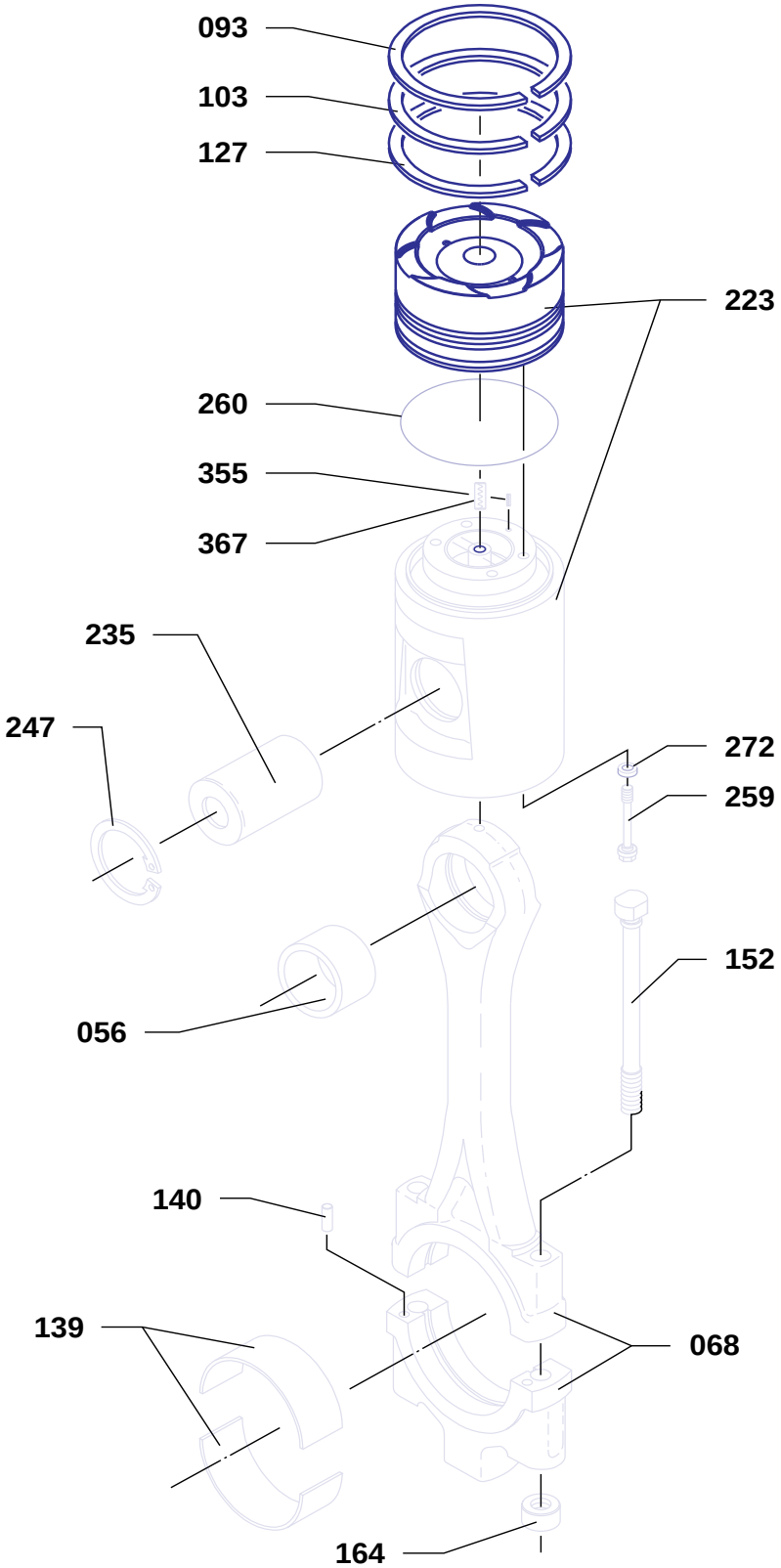

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Item No	Qty	Designation	Benævnelse
056	1/C	**Bush for connecting rod**	Plejlstangsbøsning
068	1/C	**Connecting rod 2/2**	Plejlstang 2/2
093	1/C	**Piston ring**	Stempelring
103	1/C	**Piston ring**	Stempelring
127	1/C	**Oil scraper ring**	Olieskrabering
139	1/C	**Connecting rod bearing 2/2**	Plejlstangsleje 2/2
140	2/C	**Cylindrical pin**	Cylindrisk stift
152	2/C	**Screw for connecting rod**	Plejlstangsskrue
164	2/C	**Nut**	Møtrik
223	1/C	**Piston 2/2, incl. item 259, 260 and 272**	Stempel 2/2, inkl. item 259, 260 og 272
235	1/C	**Piston pin**	Stempelpind
247	2/C	**Retaining ring**	Sikringsring
259	4/C	**Bolt**	Bolt
260	1/C	**O-ring**	O-ring
272	4/C	**Distance sleeve**	Skive
355	1/C	**Guide pin**	Styrestift
367	1/C	**Guide pin**	Styrestift

Item No	Qty	Designation	Benævnelse

When ordering spare parts, see also page 500.50.

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Plate Page 1 (2)	Camshaft (Valve Camshaft)	50705-25H

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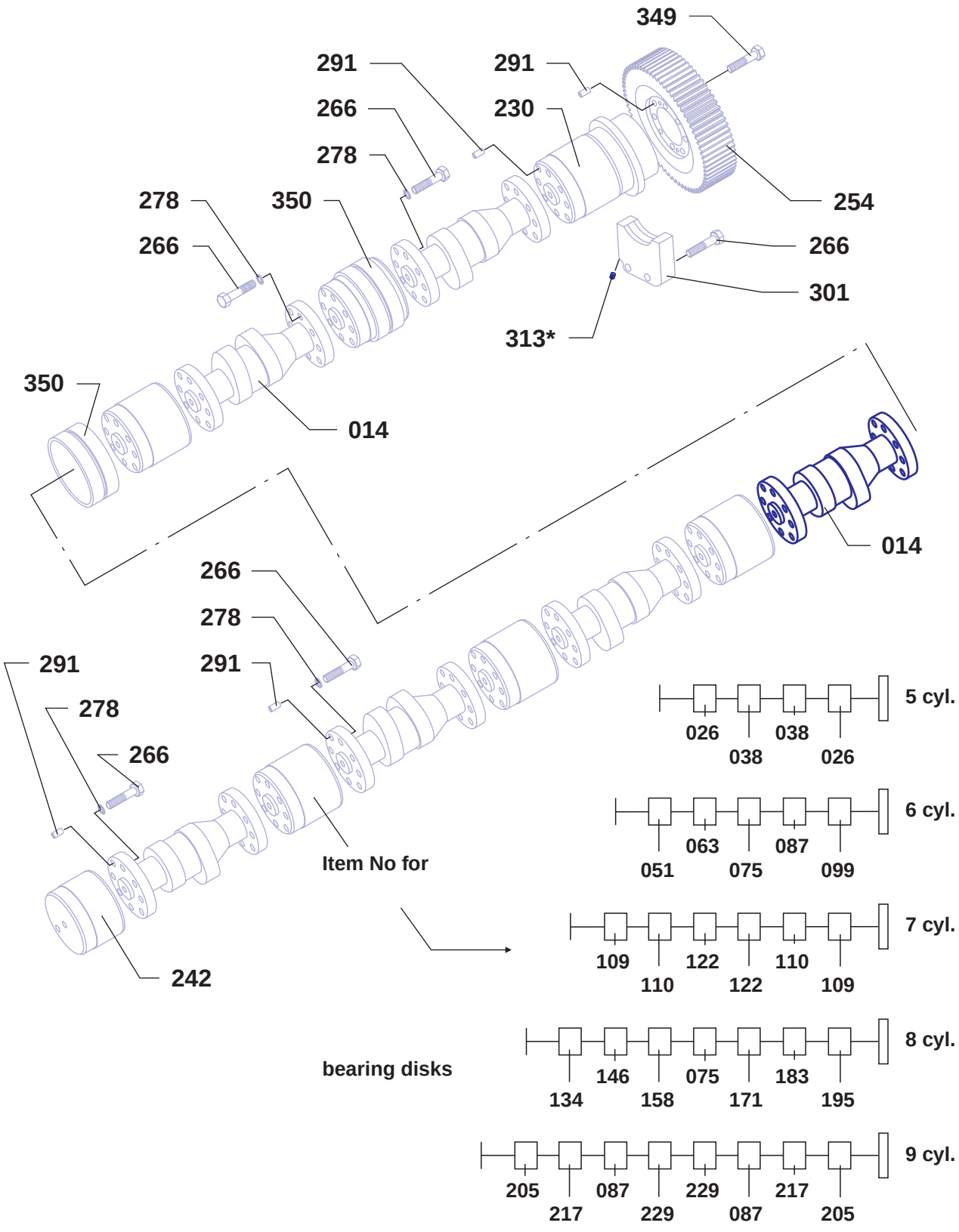

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Item No	Qty	Designation	Benævnelse
014	1/C	**Camshaft part piece, 5-6-7-8-9 cyl.**	Styreakselsektion, 5-6-7-8-9 cyl.
026	2/E	**Bearing disk, 5 cyl. engine**	Lejesøle, 5 cyl. motor
038	2/E	**Bearing disk, 5 cyl. engine**	Lejesøle, 5 cyl. motor
051	1/E	**Bearing disk, 6 cyl. engine**	Lejesøle, 6 cyl. motor
063	1/E	**Bearing disk, 6 cyl. engine**	Lejesøle, 6 cyl. motor
075		**Bearing disk**	Lejesøle
	1/E	**6 cyl. engine**	6 cyl. motor
	1/E	**8 cyl. engine**	8 cyl. motor
087		**Bearing disk**	Lejesøle
	1/E	**6 cyl. engine**	6 cyl. motor
	2/E	**9 cyl. engine**	9 cyl. motor
099	1/E	**Bearing disk, 6 cyl. engine**	Lejesøle, 6 cyl. motor
109	2/E	**Bearing disk, 7 cyl. engine**	Lejesøle, 7 cyl. motor
110	2/E	**Bearing disk, 7 cyl. engine**	Lejesøle, 7 cyl. motor
122	2/E	**Bearing disk, 7 cyl. engine**	Lejesøle, 7 cyl. motor
134	1/E	**Bearing disk, 8 cyl. engine**	Lejesøle, 8 cyl. motor
146	1/E	**Bearing disk, 8 cyl. engine**	Lejesøle, 8 cyl. motor
158	1/E	**Bearing disk, 8 cyl. engine**	Lejesøle, 8 cyl. motor
171	1/E	**Bearing disk, 8 cyl. engine**	Lejesøle, 8 cyl. motor
183	1/E	**Bearing disk, 8 cyl. engine**	Lejesøle, 8 cyl. motor
195	1/E	**Bearing disk, 8 cyl. engine**	Lejesøle, 8 cyl. motor
205	2/E	**Bearing disk, 9 cyl. engine**	Lejesøle, 9 cyl. motor
217	2/E	**Bearing disk, 9 cyl. engine**	Lejesøle, 9 cyl. motor
229	2/E	**Bearing disk, 9 cyl. engine**	Lejesøle, 9 cyl. motor
230	1/E	**Axial bearing disk**	Aksial lejesøle
242	1/E	**Bearing segment end**	Lejesøle, ende
254	1/E	**Spur wheel**	Cylindrisk tandhjul
266		**Screw**	Skrue
	72/E	**5 cyl. engine**	5 cyl. motor
	86/E	**6 cyl. engine**	6 cyl. motor
	100/E	**7 cyl. engine**	7 cyl. motor
	114/E	**8 cyl. engine**	8 cyl. motor
	128/E	**9 cyl. engine**	9 cyl. motor
278		**Washer**	Skive
	70/E	**5 cyl. engine**	5 cyl. motor
	84/E	**6 cyl. engine**	6 cyl. motor
	98/E	**7 cyl. engine**	7 cyl. motor
	112/E	**8 cyl. engine**	8 cyl. motor
	126/E	**9 cyl. engine**	9 cyl. motor
291		**Cylindrical pin**	Cylindrisk stift
	10/E	**5 cyl. engine**	5 cyl. motor
	12/E	**6 cyl. engine**	6 cyl. motor
	14/E	**7 cyl. engine**	7 cyl. motor
	16/E	**8 cyl. engine**	8 cyl. motor
	18/E	**9 cyl. engine**	9 cyl. motor
301	1/E	**Bearing plate, complete incl. item 313**	Lejeplade, komplet inkl item 313
313*	3/E	**Expander plug**	Ekspansionsprop
349	7/E	**Screw**	Skrue
350		**Camshaft bearing**	Styreakselleje
	6/E	**5 cyl. engine**	5 cyl. motor
	7/E	**6 cyl. engine**	6 cyl. motor
	8/E	**7 cyl. engine**	7 cyl. motor
	9/E	**8 cyl. engine**	8 cyl. motor
	10/E	**9 cyl. engine**	9 cyl. motor

When ordering spare parts, see also page 500.50.

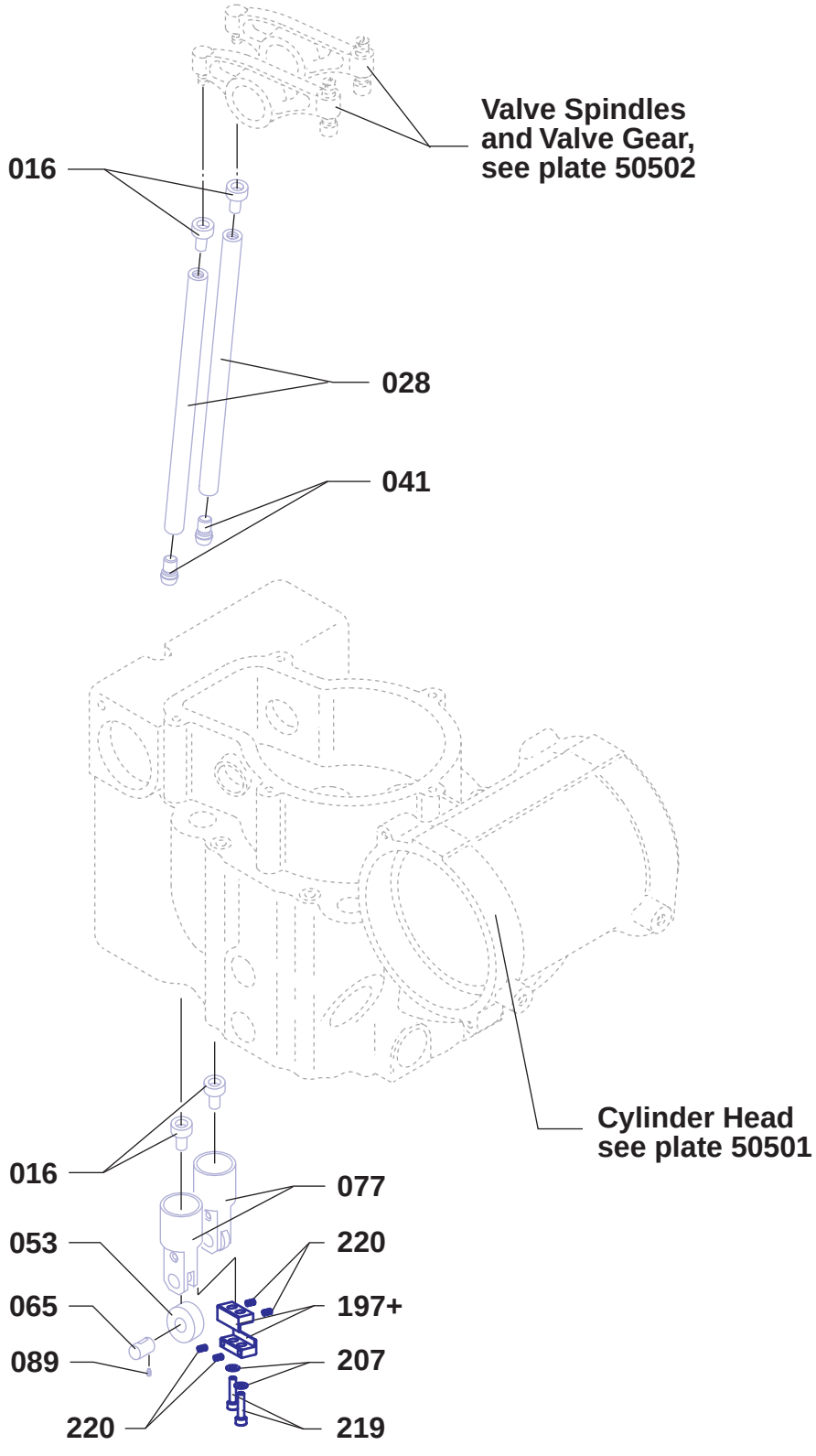
*** = Only available as part of a spare parts kit.**
Qty/E = Qty/Engine
Qty./C = Qty./Cylinder

Ved bestilling af reservedele, se også side 500.50.

* = Kun tilgængelig som en del af et reservedelssæt.
Qty/E = Qty/Motor
Qty./C = Qty./Cylinder

Plate Page 1 (2)	Roller Guide and Push Rods	50801-13H

L16/24



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Item No	Qty	Designation	Benævnelse
016	4/C	**Thrust piece**	Trykstykke
028	2/C	**Push rod**	Stødstang
041	2/C	**Bolt**	Bolt
053	2/C	**Roller**	Rulle
065	2/C	**Shaft**	Aksel
077	2/C	**Housing for roller guide**	Hus for rullestyr
089	2/C	**Screw**	Skrue
197+	2/C	**Guide piece**	Styrestykke
207	2/C	**Washer**	Skive
219	2/C	**Screw**	Skrue
220	4/C	**Spring**	Fjeder
		+ only available as a pair	+ kun tilgængelig som et par

Item No	Qty	Designation	Benævnelse

When ordering spare parts, see also page 500.50.

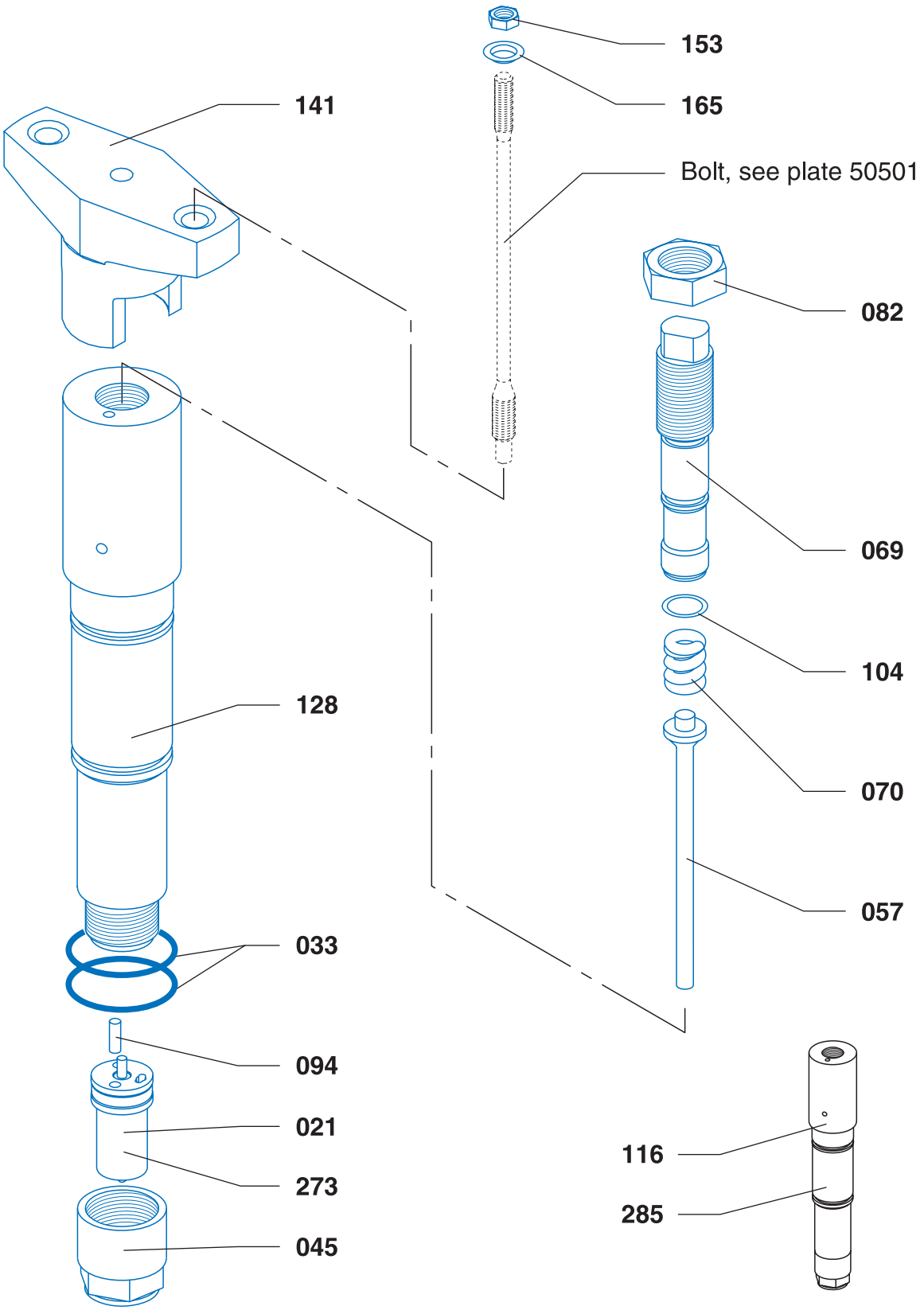
*** = Only available as part of a spare parts kit.**
Qty/C = Qty/Cylinder.

Ved bestilling af reservedele, se også side 500.50.

* = Kun tilgængelig som en del af et reservedelssæt.
Qty/C = Qty/Cylinder.

Plate Page 1 (2)	Fuel Injection Valve (L'Orange)	51402-12H

L16/24



08028-0D/H5250/94.08.12

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Item no	Qty	Designation	Benævnelse
021	1/V	**Injection nozzle, 1200 rpm engine**	Dyse, 1200 omdr. motor
033	2/V	**O-ring**	O-ring
045	1/V	**Nozzle nut**	Dysemøtrik
057	1/V	**Pressure bolt**	Bolt
069	1/V	**Adjusting spindle**	Justebar spindle
070	1/V	**Pressure spring**	Trykfjeder
082	1/V	**Nut**	Møtrik
094	2/V	**Cylindrical pin**	Cylindrisk stift
104	1/V	**O-ring**	O-ring
116	1/C	**Fuel injection valve, complete for 1200 rpm engine, incl. item 021, 033, 045, 057, 069, 070, 082, 094, 104, 128**	Brændselsventil, komplet for 1200 omdr. motor, inkl. item 021, 033, 045, 057, 069, 070, 082, 094, 104, 128
128	1/V	**Nozzle holder**	Dyseholder
141	1/V	**Pressure piece**	Spændestykke
153	2/V	**Nut**	Møtrik
165	2/V	**Sperical disc**	Skive
273	1/V	**Injection nozzle, 1000 rpm engine**	Dyse, 1000 omdr. motor
285	1/C	**Fuel injection valve, complete for 1000 rpm engine, incl. item 033, 045, 057, 069, 070, 082, 094, 104, 128, 273**	Brændselsventil, komplet for 1000 omdr. motor, inkl. item 033, 045, 057, 069, 070, 082, 094, 104, 128, 273

Item no	Qty	Designation	Benævnelse

08028-0D/H5250/94.08.12

When ordering spare parts, see also page 500.50.

*** = Only available as part of a spare parts kit.**
Qty/C = Qty/Cylinder
Qty/V = Qty/Valve

Ved bestilling af reservedele, se også side 500.50.

* = Kun tilgængelig som en del af et reservedelssæt.
Qty/C = Qty/Cylinder
Qty/V = Qty/Ventil

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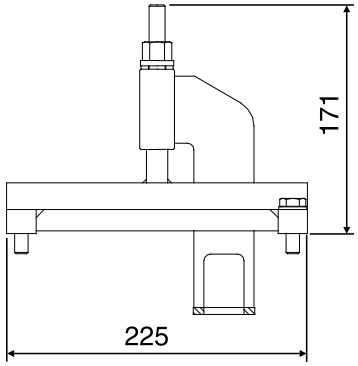
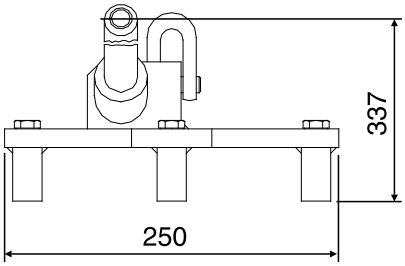
Section 505 Cylinder head		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Valve spring tightening device			1	52000	014	
Lifting tool for cylinder unit			1	52000	038	

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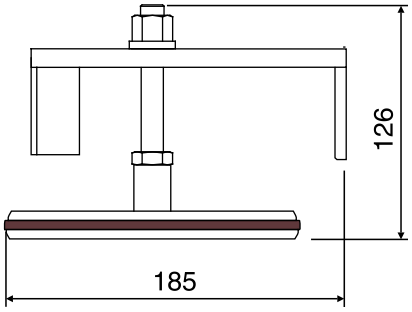
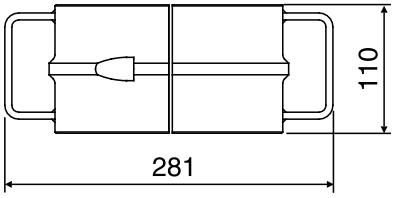
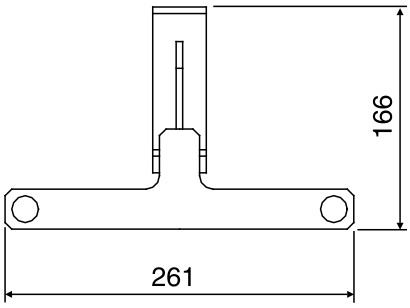
Section 506 Piston, connecting rod and cylinder liner		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Removing device for flame ring			1	52000	021	
Guide bush for piston			1	52000	045	
Fit and removal device for conn. rod bearing, incl. eye screws (2 pcs)			1	52000	069	

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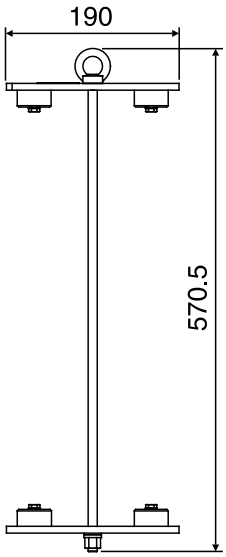
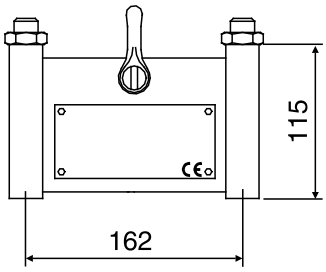
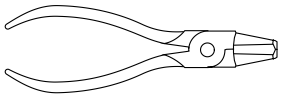
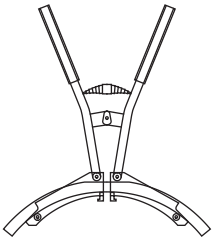
Section 506 Piston, connecting rod and cylinder liner		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Lifting device for cylinder liner			1	52000	082	
Lifting device for piston and connecting rod			1	52000	104	
Plier for piston pin lock ring			1	52000	177	
Piston ring opener			1	52000	190	

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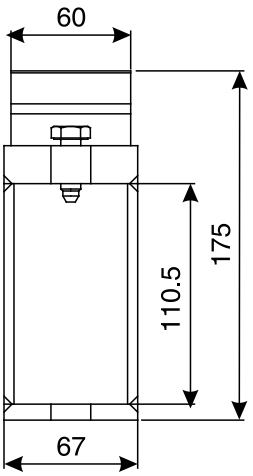
Section 506 Piston, connecting rod and cylinder liner		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Supporting device for connecting rod and piston in the cylinder liner			1	52000	212	

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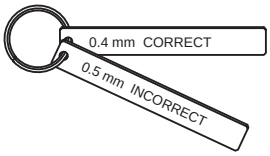
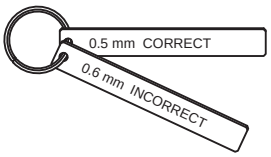
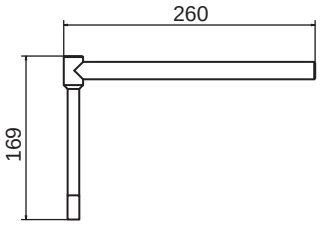
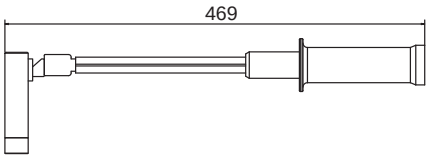
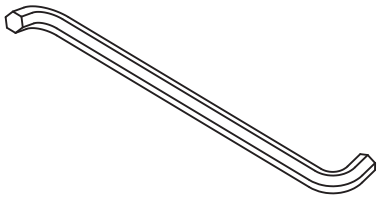
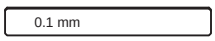
Section 508 Operating gear for inlet and exhaust valves		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Feeler gauge, 0.4-0.5 mm (inlet valve)			1	52000	010	
Feeler gauge, 0.5-0.6 mm (exhaust valve)			1	52000	034	
Socket wrench			1	52000	652	
Socket wrench and Torque Spanner			1 1	52000 52000	664 676	
Socket screw key			1	52000	831	
Feeler gauge for adjustment of roller guide			2	52000	640	

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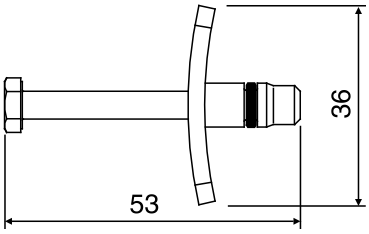
Section 510 Crankshaft and main bearings		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Dismantling tool for main bearing upper shell			1	52000	035	

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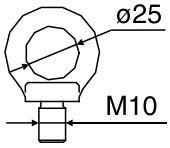
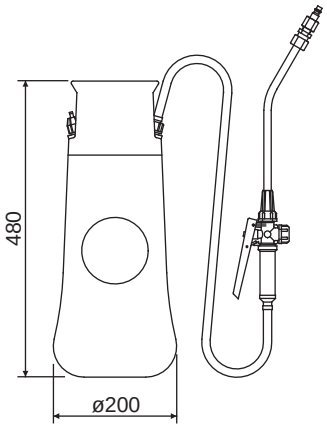
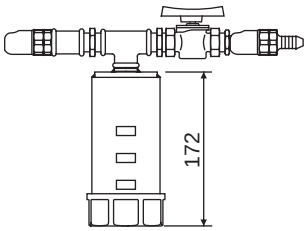
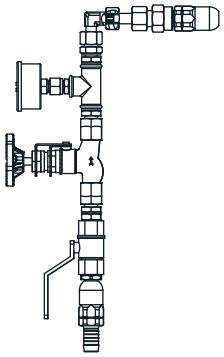
Section 512 Turbocharger system		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Eye screw for lifting of charge air cooler/lubricating oil cooler			2	52000	036	
Container complete for water washing of compressor side			1	51205	331	
Blowgun for dry cleaning of turbocharger			1	51210	303	
Water washing of turbine side, complete			1	51215	481	

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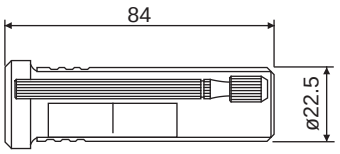
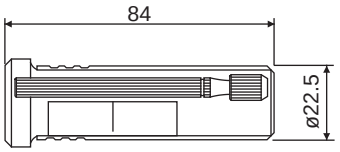
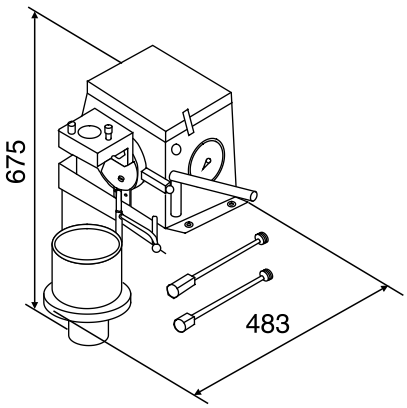
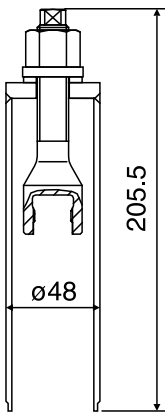
Section 514 Fuel oil system		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Cleaning tool for fuel injector, 1000 rpm			1	52000	013	
Cleaning tool for fuel injector, 1200 rpm			1	52000	848	
Pressure testing tool incl. bow			1 1	52000 52000	050 098	
Extractor device for injector valve			1	52000	407	

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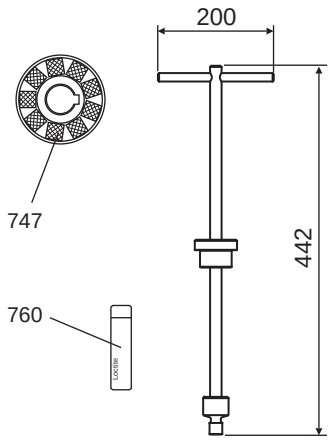
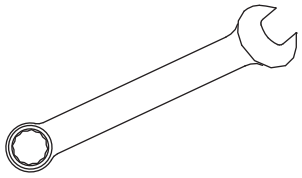
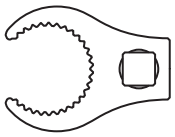
Section 514 Fuel oil system		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Grinding device for nozzle seat			1	52000	074	
Grinding paper			1	52000	747	
Loctite			1	52000	760	
Combination spanner, 32 mm			1	52000	772	
Crow foot, 32 mm			1	52000	784	

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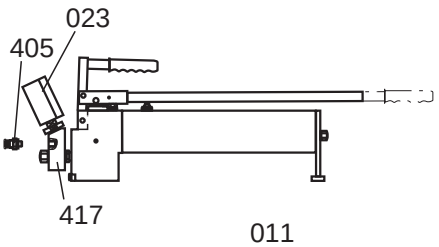
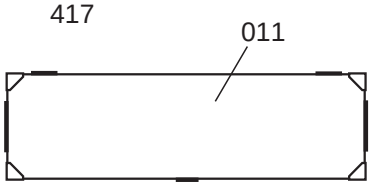
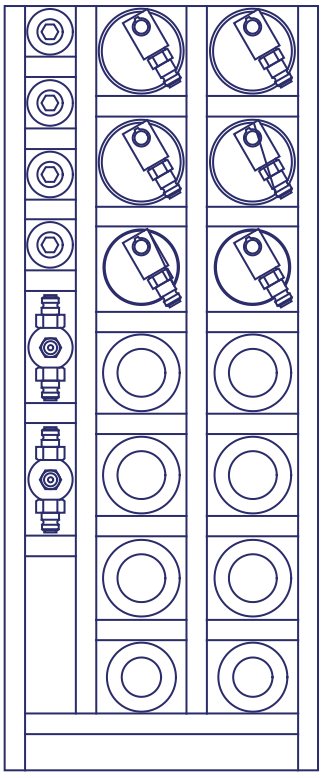
Section 520 Tools		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Hydraulic tools complete consisting of the following:				52000	806	
Pressure pump, complete			1	52000	011	
Manometer				52000	023	
Quick coupling				52000	405	
Distributor				52000	417	
	L x B x H = 886 x 256 x 334 mm					
Hydraulic tools box consisting of the following:				52000	633	
	L x B x H = 712 x 353 x 288 mm					

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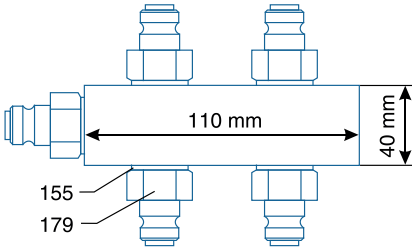
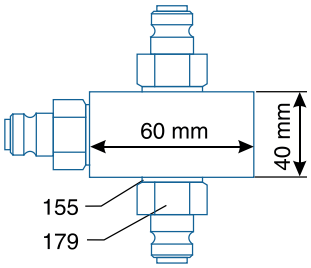
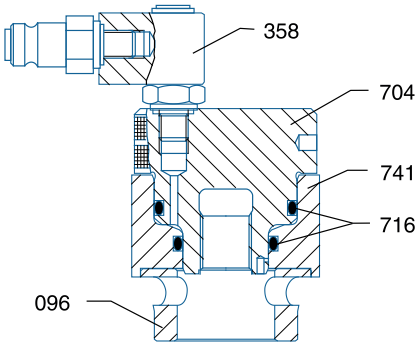
Section 520 Tools		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Distributing piece for cylinder head, complete.				52000	143	
Gasket				52000	155	
Quick coupling				52000	179	
Distributing piece for main bearing, complete.				52000	167	
Gasket				52000	155	
Quick coupling				52000	179	
Hydraulic tools for connecting rod, complete				52000	299	
Piston for hydraulic jack*				52000	704	
Set of O-rings with back-up ring				52000	716	
Cylinder for hydraulic jack*				52000	741	
Spacer piece				52000	096	
Angle piece complete				52000	358	
Hydraulic jack as item nos. 704, 716, 741				52000	586	
Spare parts for hydraulic tools for connecting rod				52000	251	
*not available as a single part						

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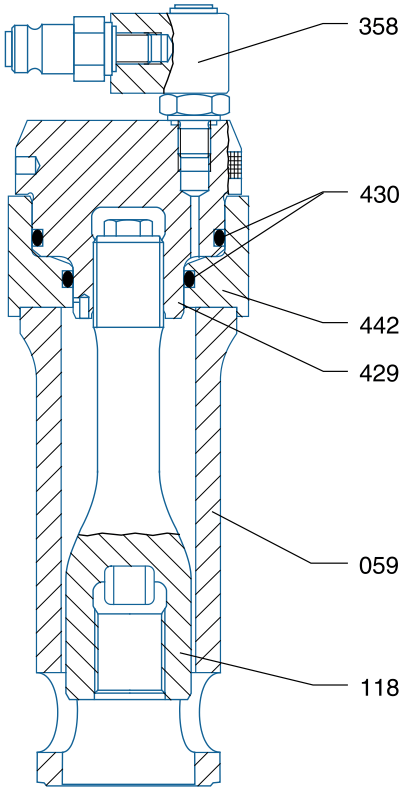
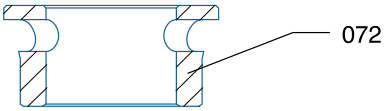
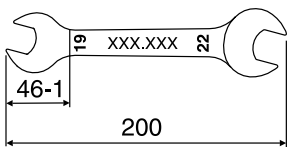
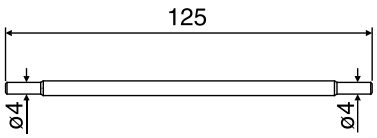
Section 520 Tools		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Hydraulic tools for cylinder head, complete				52000	275	
Piston for hydraulic jack*				52000	429	
Set of O-rings with back-up ring				52000	430	
Cylinder for hydraulic jack*				52000	442	
Spacer piece, long				52000	059	
Hydraulic jack as Item Nos. 429, 430, 442				52000	454	
Angle piece, complete				52000	358	
Spacer piece, short				52000	072	
Tension screw				52000	118	
Spare parts for hydraulic tools for cylinder head				52000	226	
Spare parts kit for angle piece				52000	322	
						
Spanner				52000	310	
Tommy bar				52000	334	
*not available as a single part						

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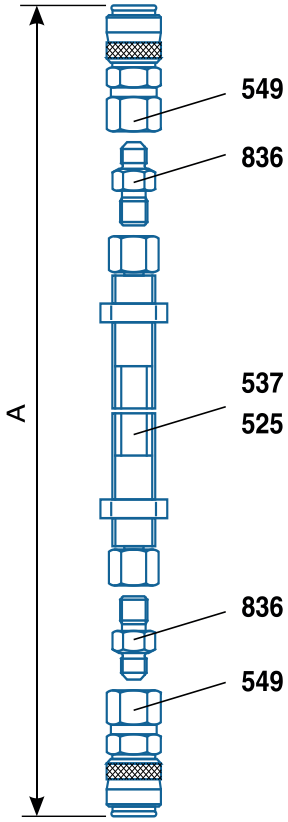
Section 520 Tools		Supply per Ship		Drawing		Remarks
Name	Sketch	Working	Spare	Plate no	Item no	
Hose with unions for cylinder head, 4 pieces complete, 500 mm				52000	180	
Hose with unions for connection of oil pump and distributing block, 1 pieces complete, 3000 mm				52000	202	
Hose, 3000 mm				52000	537	
Quick coupling with protecting cap				52000	549	
Hose, 500 mm				52000	525	
Adapter				52000	836	