

**BID SPECIFICATIONS**

**FOR**

**DG HUNTER UNITS 5-11**  
**SPARE PARTS**  
**ELECTRIC PRODUCTION**

**CITY OF ALEXANDRIA  
(OWNER)**

**MAYOR  
JACQUES ROY**

**COUNCIL MEMBERS  
LEE RUBIN  
REDDEX WASHINGTON  
JAMES "JIM" VILLARD  
ELIZABETH FELTER  
CHARLES L. "CHUCK" FOWLER JR.  
CYNTHIA PERRY  
GARY JOHNSON**

**CITY CLERK  
DONNA JONES**

**DIRECTOR OF UTILITIES  
MICHAEL MARCOTTE**

**JANUARY 2023**

**PAN AMERICAN ENGINEERS, LLC  
P.O. BOX 8599 (71306)  
1717 JACKSON STREET (71301)  
ALEXANDRIA, LOUISIANA  
(318)473-2100  
PAE Job No. 12281**

CITY OF ALEXANDRIA  
DG HUNTER UNITS 5-11  
SPARE PARTS  
ELECTRIC PRODUCTION

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CITY OF ALEXANDRIA  
DG HUNTER UNITS 5-11  
SPARE PARTS  
ELECTRIC PRODUCTION

I. ADVERTISEMENT

**ADVERTISEMENT FOR BID**

CITY OF ALEXANDRIA, LOUISIANA  
PURCHASING DEPARTMENT

**BID # 2408 DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRICAL DISTRIBUTION**

Separate sealed bids for DG HUNTER UNITS 5-11 – SPARE PARTS, will be received by the CITY OF ALEXANDRIA at the CITY COUNCIL MEETING CHAMBERS, ALEXANDRIA CITY HALL, ALEXANDRIA, LOUISIANA, until 10:00 AM CST CDT, TUESDAY, March 7, 2023, and then at said office publically opened and read aloud.

Complete bid packet, bid specifications may be obtained at the City of Alexandria’s website, [www.cityofalexandria.com](http://www.cityofalexandria.com) under the heading “Business”, and drop down to “RFP/RFQ/RFI/BIDS”. There is no charge to download bid documents from the City’s website.

Pursuant to LA R.S. 38:2212.1 B.(4)(a), vendors have the option to submit their bids electronically. Please find bid related documents and place electronic bids at [www.centralbidding.com](http://www.centralbidding.com) . For questions regarding the electronic bidding process, please call Central Bidding at 225-810-4814.

Questions and/or request for clarification of bid specifications are to be in written form only, either mailed or emailed to Thomas C. David, Jr., Pan American Engineers, 1717 Jackson Street, Alexandria, LA 71301; Emailed to: [Tom@paealex.com](mailto:Tom@paealex.com) and must be received within ten (10) calendar days of the scheduled receipt of bids.

**Address for Postal Delivery:**

City of Alexandria  
Donna Jones, City Clerk  
PO Box 71  
Alexandria, LA 71309-0071

**Address for Courier or Overnight Delivery:**

City of Alexandria  
Donna Jones, City Clerk  
915 Third Street, 1<sup>st</sup> Floor  
Alexandria, LA 71301  
Phone: 318-449-5047

**Address for Electronic Bid Submission:**

[www.centralbidding.com](http://www.centralbidding.com)  
Phone: 225-810-4814

PLEASE PUBLISH THREE (3) TIMES:

Friday, January 27, 2023  
Friday, February 3, 2023  
Friday, February 10, 2023

CITY OF ALEXANDRIA

DG HUNTER UNITS 5-11

SPARE PARTS

ELECTRIC PRODUCTION

## II. BID COVER SHEET

CITY OF ALEXANDRIA BID SPECIFICATIONS FOR:  
DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTIONS



Wilma Kelly  
Purchasing Manager

**City of Alexandria**  
Purchasing Department  
P. O. Box 71  
Alexandria, Louisiana  
71309-0071

The logo for Alexandria, Louisiana, featuring a stylized house and a star above the text "Alexandria Louisiana".  
Office: (318) 441-6180  
Fax: (318) 441-6185

Sealed bids will be received until **10:00 AM, Tuesday, March 7, 2023**, and publicly opened in the Council Chambers or Council Committee Room.

City of Alexandria Bid # **2408**  
Page: 1 of 25 & Appendix A  
Date Specifications Prepared: 1/25/2023

Bid Bond Requirements: A bid bond or check for N/A% of the total amount of bid.

Performance Bond Requirements: In the event bid is accepted, a performance bond shall be required in the amount of N/A%.

**Please file bid with the following:**  
**Donna Jones, City Clerk**  
**City of Alexandria**  
**915 Third Street**  
**P. O. Box 71**  
**Alexandria, LA 71309-0071**  
**Phone: 318-449-5047**

**INTRODUCTION**

**DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTION**

It is the intent of the City of Alexandria to secure pricing on Spare Parts, for use by the City of Alexandria Electric Production Department for the Wartsila Reciprocating Internal Combustion Engines and ancillary parts. Said material is to be inventoried by the City of Alexandria Electric Production Department. Quantities given are estimated and not guaranteed. All products shall be new and of current manufacture.

***Completed bid should be returned as issued by the City of Alexandria with ALL PAGES intact and all columns filled in. Incomplete columns or missing pages, to include addendum pages, may result in the bidder's (or proposer's) entire bid being rejected.***

Questions and/or clarifications of bid specifications must be submitted in written form only, either mailed, faxed, or e-mailed to the attention of Thomas C. David, Jr., Pan American Engineers, 1717 Jackson Street, Alexandria, LA 71301; Email: tom@paealex.com and must be received within 10 calendar days of the scheduled receipt of bids.

**Bidder Information:**

Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Telephone #: ( ) \_\_\_\_\_ Fax #: ( ) \_\_\_\_\_  
Authorized Printed Name and Title: \_\_\_\_\_  
Authorized Signature: \_\_\_\_\_

CITY OF ALEXANDRIA

DG HUNTER UNITS 5-11

SPARE PARTS

ELECTRIC PRODUCTION

### III. GENERAL CONDITIONS

**CITY OF ALEXANDRIA BID SPECIFICATIONS FOR:  
DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTION**

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**GENERAL CONDITIONS FOR BIDDERS - PLEASE READ CAREFULLY**

1. Pursuant to LA R.S 38:2212.1. C.(1)(2), any manufacturer's preference in this proposal is descriptive, but non-restrictive, and is used only to indicate minimum requirement for type, grade and quality unless otherwise specified.
2. Pursuant to LA R.S. 38:2212 B.(1), the provisions and requirement of this bid shall not be considered as informalities and shall not be waived by the City of Alexandria. Therefore, conditions and specifications on this bid form shall be strictly enforced and any and all alterations, deviations, and non-compliance to said conditions and specifications, either on the bid form or by separate attachment, shall be grounds for immediate disqualification.
3. Preference shall be given to bidders quoting F.O.B. Destination (the City of Alexandria using department), FREIGHT PREPAID, unless otherwise requested.
4. Each bidder shall submit his proposal on the proposal form furnished by the City of Alexandria Purchasing Department. The complete bid package must be returned as issued by the City with all pages intact and all specification response columns filled in. Incomplete columns or missing pages, to include addendum pages, shall result in the vendor's entire bid package being rejected.
5. Literature, brochures, and other related paperwork attached to the bid should be identified with the name of the bidder and bid item number.
6. In case of a mathematical discrepancy between unit price and extensions, the unit price shall prevail.
7. Pursuant to LA R.S. 38:2212 F., the bid specifications may contemplate a fixed escalation or de-escalation in accordance with the United States Bureau of Labor Statistic's Consumer Price Index or the Producer Price Index. Bids based on specifications which are subject to a recognized escalation index shall be legal and valid for any item of a public work, at the discretion of the City.
8. Pursuant to LA R.S. 38:2212.1. F., any public procurement unit may participate in a cooperative purchasing agreement with the City of Alexandria to acquire quantities of the above listed items under a contract with the City of Alexandria for items awarded by public bid, pursuant to the cooperative purchasing provisions of Part VII of Chapter 17 of Subtitle III of Title 39 of the Louisiana Revised Statutes of 1950, R.S. 39:1701 et seq.
9. The City of Alexandria reserves the right to award by item or by total bid, unless otherwise specified in the bid specifications. (Price(s) should be itemized.)
10. All erasures or corrections on the bid form must be initialed and the City of Alexandria may rely on the apparent authority represented by the initials.



**CITY OF ALEXANDRIA BID SPECIFICATIONS FOR:  
DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTION**

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**General Conditions for Bidders - Please Read Carefully (Continued)**

11. The City of Alexandria reserves the right to reject for cause any and all bids or parts of bids, or accept bids most beneficial to the City.
  
12. Any bid submitted which contains additions, conditional or alternate bids, or irregularities which may make the proposal incomplete, indefinite, or ambiguous as to its meaning, thus requiring clarification after the specified date and time of bid opening shall be rejected.
  
13. Bids shall be opened publicly in the City Council Chambers or Council Committee Room.
  
14. Cash discounts may be accepted, but SHALL NOT be considered in making award.
  
15. Regarding a bid for purchase of materials, supplies or services, not to include construction of any public works, a written notice of acceptance mailed or otherwise furnished to the successful bidder shall result in a binding contract without further action by either party.
  
16. When any bid is accepted for the construction or doing of any public works, a written contract shall be executed by and between the City of Alexandria and the Contractor. No contract shall be binding upon the City until it has been executed by the City and delivered to the successful bidder. Should the bidder to whom the contract is awarded fail to execute the contract, the award shall then be made to the next lowest responsible bidder, or re-advertised for public bid, said decision to be in the sole judgment of the City of Alexandria. This action may result in the loss of bidding privileges for a period of one (1) year.
  
17. The City of Alexandria shall schedule for payment the invoices for articles or services purchased under this bid within thirty (30) days after due and proper delivery accompanied by invoice.
  
18. The City of Alexandria is exempt from all sales taxes. A sales tax exempt form shall be furnished by the City of Alexandria Purchasing Department, if requested.
  
19. Bidder(s) awarded item(s) by the City of Alexandria shall be responsible for supplying all products at the awarded price(s). Failure may result in the City's cancellation of the remaining items awarded.
  
20. Regarding Service Contracts and Procurement Contracts, the terms of the contract shall be binding upon any and all parties involved until goods and supplies are delivered, services have been rendered, and/or work has been completed and accepted by the Mayor on behalf of the City of Alexandria and all payments required to be made to the Contractor have been made. However, a contract may be terminated under any and all of the following conditions:
  - (a) By mutual agreement and consent of either party upon thirty (30) days written notice to the other party;
  
  - (b) By the Mayor, on behalf of the City of Alexandria, as a consequence of the failure of the Contractor to comply with the terms and conditions of the contract or the progress or quality of work to

**CITY OF ALEXANDRIA BID SPECIFICATIONS FOR:  
DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTION**

be performed in a satisfactory manner, proper allowance being made for circumstances beyond the control of the Contractor; or

**General Conditions for Bidders - Please Read Carefully (Continued)**

(c) By satisfactory completion of all services and obligations described in the contract.

If the contract is terminated for any of the terms and conditions authorized in sub-paragraph (b) above, Contractor shall be formally notified in writing by the City of Alexandria Purchasing Department by means of certified mail informing him of cancellation of the contract, giving specific reasons for said cancellation. Contractor shall have the right to appeal to the City Council within ten (10) days from the date that said notification is placed in the U.S. Mail. Contractor's appeal shall be accomplished by means of a letter addressed to the City Council and delivered to the City Clerk, stating that an appeal to the decision of cancellation is desired. The City Council shall thereafter hold a hearing on the appeal, giving all parties the opportunity to present any and all evidence concerning the decision of cancellation. After hearing the appeal, the city Council may, by a majority vote, sustain, modify, or reverse the findings for said decision and shall provide, if requested by Contractor, a written determination of its findings.

21. Contractors submitting bids for Public Works construction projects in excess of \$1.00 must show his Contractor's License Number on the front of the bid envelope, except for certain projects for which a Contractor's License Number is not required by the State Contractor's Licensing Board. Failure to comply with this directive shall result in automatic bid rejection, furthermore, any Contractor who submits a bid for a type of construction for which he is not properly licensed shall be acting in violation of LA R.S. 37:2163, and shall be subject to all provisions for violation and penalties thereof. Contractors who are owned by, and are submitting a bid as a subsidiary of a parent company, whose name is listed in the State of Louisiana's Roster of Licensed Contractors, may do so by including a letter of proof of ownership from the parent company with the submitted bid package. The letter must be signed as per LA R.S. 38:2212 B.(5)(a)(b)(c) (see Item #22 below).

22. All bids submitted via USPS (registered or certified), overnight courier or hand delivered, shall be signed by hand and in ink by an authorized company representative per LA R.S. 38:2212 B.(5)(a)(b)(c), which states:

(c)(i) Evidence of agency, corporate, or partnership authority shall be required for submission of a bid to the division of administration or the State of Louisiana. The authority of the signature of the person submitting the bid shall be deemed sufficient and acceptable if any of the following conditions are met:

(aa) The signature on the bid is that of any corporate officer listed on the most current annual report on file with the Secretary of State, or the signature on the bid is that of any member of a partnership or partnership in commendam listed in the most current partnership records on file with the Secretary of State.

(bb) The signature on the bid is that of an authorized representative of the corporation, partnership, or other legal entity and the bid is accompanied by a corporate resolution, certification as to the corporate principle, or other documents indicating authority which are acceptable to the public entity.

**CITY OF ALEXANDRIA BID SPECIFICATIONS FOR:  
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(cc) The corporation, partnership, or other legal entity has filed in the appropriate records of the Secretary of State in which the public entity is located, an affidavit, resolution, or other acknowledged or authentic document indicating the names of all parties authorized to submit bids for public contracts.

**General Conditions for Bidders - Please Read Carefully (Continued)**

Such document on file with the Secretary of State shall remain in effect and shall be binding upon the principal until specifically rescinded and canceled from the records of the office.

23. In-State preferences shall not apply to procurements involving federal funds.

24. Pursuant to LA R.S. 38:2212 O.(2)(a)(b), any modifications of plans and specifications will be made through an addendum. No addendum shall be issued within seventy-two (72) hours of the bid opening, excluding weekends and legal holidays, without the extension of the bid opening date. An extension of at least seven (7) but no more than thirty (30) working days is required but, re-advertising is not required. The addendum shall be transmitted by any one of the following methods: (1) facsimile transmission; (2) e-mail; (3) by hand; or (4) posted on the City of Alexandria's website ([www.cityofalexandria.com](http://www.cityofalexandria.com)) and posted on Central Bidding's website ([www.centrauctionhouse.com](http://www.centrauctionhouse.com)) if applicable.

25. All Federal Transit Administration (FTA) funded procurements, including operating assistance funding contracts, are to follow the *Master Agreement*, to include all applicable federal clauses.

a. Any bidder that is found listed on the Federal Government's *System for Award Management* (SAM) website, at [www.sam.gov/portal/sam](http://www.sam.gov/portal/sam), under the advanced search feature for *Excluded Parties List System* (EPLS), shall automatically be rejected for the award of this bid, by Category and/or in its entirety. This applies to any portion of the bid that is a procurement funded by FTA.

26. Under the City's *AFEAT (Alexandria Fairness, Equality, Accessibility, and Teamwork Program)*, participation by minority and/or disadvantaged business enterprise firms is encouraged. Inquiries about the *AFEAT* Program should be directed to the Division of Finance. As a part of its RFP response, each Bidder ***shall*** submit documentation of its bona fide effort to secure subcontractors that meet the City's *AFEAT* goals. Each bidder ***shall*** also submit proof of engagement of any subcontractor selected because of its solicitations. The Bidder's bona fide efforts and engagement(s) are a consideration in bid review and rating.

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IV. BID FORM

**CITY OF ALEXANDRIA BID SPECIFICATIONS FOR:  
DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTION**

**BID FORM**

NOTE:

1. Part numbers and descriptions are based off of Wäertsilä North America Spare Part Catalog.
2. Product data sheets for each Wäertsilä North America Part number are included in Appendix A to this Bid Form and shall be for illustrative purposes only.
3. If Bidder is not able to provide a price for a certain Spare Part, Bidder shall denote such by writing "N/A" in the "Unit Cost" Column of the Bid Form.
4. Prices shall NOT include freight costs or DDP-Hub/U.S. Duties; only goods. All freight and DDP-HUB/ U.S. Duties charges will be determined on an order-by-order basis, dependent on the volume and weight of the particular spare parts order; with shipping charges mutually agreed upon prior to processing Purchase Order. Anticipate all shipments to the City of Alexandria Electric Production Department at 1011 N Third Street, Alexandria, LA 71303, unless otherwise directed by the City.
5. Prices are US Dollars as of the date of Bid Submission and subject to exchange rate modifications as noted herein.
6. Bids will be awarded by specific item, category, or total low bid, whichever is most beneficial to the City.
7. Exchange Rate: All amounts payable and calculations under this Agreement shall be in United States dollars. Where amounts payable or calculated under this Agreement are in a currency other than United States dollars, conversion of such amounts to United States dollars shall be made at the conversion rate as reported in the Wall Street Journal on the last working day of the applicable calendar month. Such payments shall be without deduction of exchange, collection or other charges.
8. Price Adjustments: The Unit Cost for each item shall be automatically adjusted on an on-going basis based on the exchange rate as described above without further action on the part of the parties.

The Unit Cost for each Bid Item for each Purchase Order shall be determined as follows:

$$UC = (BP * BER) / ER$$

Where,

UC = Unit Cost for the Line Item for the current Purchase Order in United States Dollars;

ER = Exchange Rate for converting United States Dollars to the applicable foreign currency as reported in the Wall Street Journal on the last

working day of the most recent calendar month as of the date of the Purchase Order;

BP = Bid Price for the Line Item in United States Dollars; and

BER = Base Exchange Rate for converting United States Dollars to the applicable currency as reported in the Wall Street Journal as of the Bid Date.

If Contractor wishes to have the price adjusted based on an Exchange Rate, the Contractor must indicate the foreign currency the price adjustment will be

based on here: \_\_\_\_\_ (British Pound, Euro, etc.)

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
<b>Category 1 - Engine Safety Spare Parts</b>				
1	100003	Anti polishing ring	1	x _____/ea
2	100023	O-ring	1	x _____/ea
3	100110	Cylinder liner	1	x _____/ea
4	100113	O-ring	1	x _____/ea
5	100341	Thrust bearing kit	1	x _____/ea
6	100142	Sealing set	1	x _____/ea
7	100142	Sealing kit for hydraulic jack	1	x _____/ea
8	100342	Main bearing kit	1	x _____/ea
9	111005	Big End Bearing Shell, Lower	1	x _____/ea
10	111006	Big End Bearing Shell, Upper	1	x _____/ea
11	111016	Bearing Kit	1	x _____/ea
12	111010	Connecting Rod, Lower Part	1	x _____/ea
13	111011	Connecting Rod, Upper Part	1	x _____/ea
14	111015	Shim	1	x _____/ea
15	113001	Piston	1	x _____/ea
16	113009	Securing Ring	1	x _____/ea
17	113010	Gudgeon Pin	1	x _____/ea

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
18	113012	Piston Ring Set	1 x _____	/ea
19	120001	Cylinder Heat Complete	1 x _____	/ca
20	120013	Valve Guide	1 x _____	/ea
21	120015	Sealing Set for Cylinder Head Replacement	1 _____	/ca
22	120021	Seat ring for inlet valve	1 x _____	/ca
23	120022	Seat ring for outlet valve	1 x _____	/ca
24	120054	Sealing set for cylinder head overhaul	1 x _____	/ca
25	120095	Ignition coil	1 x _____	/ca
26	121001	Exhaust valve, complete	1 x _____	/ca
27	121007	Inlet valve, complete	1 x _____	/ca
28	123001	Starting valve	1 x _____	/ca
29	124002	Spark plug	1 x _____	/ca
30	124043	Sealing set	1 x _____	/ca
31	124044	Prechamber control valve	1 x _____	/ca
32	145001	Push rod	1 x _____	/ca

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
33	145018	Valve tappet	1	x _____/ea
34	156383	Spare part set	1	x _____/ca
35	1562001	Turbocharge shroud ring	1	x _____/ca
36	1561184	Turbocharge nozzle	1	x _____/ca
37	1561300	Turbocharge Short cartridge	1	x _____/ca
38	1561301	Turbocharge Short cartridge installation kit	1	x _____/ca
39	164025	Main gas admission valve	1	x _____/ca
40	164089	Spare part set	1	x _____/ca
41	181077	Service kit	1	x _____/ca
42	182062	Sealing set	1	x _____/ca
43	191051	Sealing set	1	x _____/ca
44	200009	Screw	1	x _____/ca
45	200011	Nut	1	x _____/ca
46	200029	Gasket	1	x _____/ca
47	200079	Bellows	1	x _____/ca
48	200081	Bellows	1	x _____/ca
49	200084	Screw	1	x _____/ca



Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
50	200085	Nut	1	x _____/ea
51	200334	Positioner	1	x _____/ea
52	200347	Sealing ring	1	x _____/ea
53	202009	Bellows	1	x _____/ea
54	202053	Screw	1	x _____/ea
55	202148	Sealing ring	1	x _____/ea
56	202149	Nut	1	x _____/ea
57	202358	Screw	1	x _____/ea
58	207992	Butterfly valve	1	x _____/ea
59	471063	Filter cartridge	1	x _____/ea
60	471126	Sealing set	1	x _____/ea
61	473081	Sealing set	1	x _____/ea
62	474043	Sealing set	1	x _____/ea
63	476009	Sealing set	1	x _____/ea
64	504103	Knock sensor	1	x _____/ea
65	504128	Temperature sensor	1	x _____/ea
66	5071072	Control unit CCM	1	x _____/ea

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
67	5071289	Ignition module	1	x _____/ca
68	5071318	Electronic unit IOM	1	x _____/ca
69	516292	Control unit	1	x _____/ca
70	516387	Engine safety module	1	x _____/ca
71	516541	Pressure sensor	1	x _____/ca
72	516596	Fuse	1	x _____/ca
73	516597	Fuse	1	x _____/ca
74	800264	Sealing set for hydraulic tightening tool	1	x _____/ca
75	CV519	IP-converter	1	x _____/ca
76	PT201	Pressure sensor	1	x _____/ca
77	PT401	Pressure sensor	1	x _____/ca
78	PT 471	Pressure sensor, LT water CAC inlet	1	x _____/ca
79	PT 601	Pressure sensor, Charge air engine inlet	1	x _____/ca
80	PT700	Pressure sensor	1	x _____/ca
81	PT901	Pressure sensor, Main gas	1	x _____/ca
82	PT911	Pressure sensor	1	x _____/ca
83	ST173	Speed pick-up	1	x _____/ca

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
84	ST1174	Speed pick-up	1 x _____	/ea
85	ST1196P	Speed sensor	1 x _____	/ca
86	ST196S	Speed sensor	1 x _____	/ca
87	ST197P	Speed sensor	1 x _____	/ca
88	ST197S	Speed sensor	1 x _____	/ca
89	TE201	Temperature sensor	1 x _____	/ca
90	TE401	Temperature sensor, HT water engine inlet	1 x _____	/ca
91	TE402	Temperature sensor	1 x _____	/ca
92	TE432	Temperature sensor	1 x _____	/ca
93	TE471	Temperature sensor, LT water CAC inlet	6 x _____	/ca
94	TE482	Temperature sensor, LT water LOC inlet	1 x _____	/ca
95	TE600	Temperature sensor, Air TC inlet	4 x _____	/ca
96	TE601	Temperature sensor	3 x _____	/ca

CATEGORY 1 TOTAL: \$ \_\_\_\_\_

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
<b>Category 2 - Auxiliary Systems Safety Spare Parts</b>				
Auxiliary Modules				
MOD 051 - 111 W34 EAM 1-C				
CR SECTION - MOD-1001A				
97	B00055	FINE FILTER G5XP4-D	1 x _____	/ea
98	V00082	SPARE PART SET STEM SEAL FOR ARI FIG VALVES	1 x _____	/ea
99	V00083	BODY GASKET FOR ARI FIG VALVES	1 x _____	/ea
100	V00086	SPARE PART SET FOR DP34 ACTUATOR	1 x _____	/ea
101	12EB364500003	SERVICE KIT FOR PUMP EBARA CDU 120/315	1 x _____	/ea
102	75204	HEATING ELEMENT 54KW	1 x _____	/ea
103	77682	HEATING ELEMENT 27KW	1 x _____	/ea
104	VIDA009	AIR VENTING VALVE DN15, PN10	1 x _____	/ea
<b>CATEGORY 2 TOTAL: \$ _____</b>				
<b>Category 3 - Auxiliary Systems Safety Spare Parts</b>				
Fuel Oil System				
Flexible Connections				
CR SECTION - SAG-1001A				
105	FH104	FLEXIBLE HOSE D28	1 x _____	/ea
106	FH108	FLEXIBLE HOSE DN80	1 x _____	/ea
107	FH110	FLEXIBLE HOSE DN25	1 x _____	/ea
<b>CATEGORY 3 TOTAL: \$ _____</b>				

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
<u>Category 4 - Auxiliary Systems Safety Spare Parts</u> Gas System ZAC 051-111 Compact Gas Ramp CR SECTION - ZAC-1001A				
108	1980298	FILTER ELEMENT FOR 1.78.1.160.500 DN80	1 x _____	/ea
109	3030069	O-RING FOR 1.78.1.160.500 DN80	1 x _____	/ea
110	652001	Urea Pump Complete	1 x _____	/ea
111	B00055	FINE FILTER G5XP4-D	1 x _____	/ea
112	P00016	PRESSURE TRANSMITTER	1 x _____	/ea
113	T00025	TEMPERATURE SENSOR	1 x _____	/ea
114	V00391	BODY/BONNET GASKET KIT FOR GX VALVE DN50	1 x _____	/ea
115	V00387	SERVICE KIT PTFE PACKING KIT FOR GX VALVE DN50	1 x _____	/ea
116	RGX750X0032	ACTUATOR 750 REPAIR KIT FOR GX VALVE DN50	1 x _____	/ea
117	V00388	GASKET SET FOR GX VALVE DN25	1 x _____	/ea
118	V00387	SERVICE KIT PTFE PACKING KIT FOR GX VALVE DN25	1 x _____	/ea
119	V00483	ACTUATOR 225 REPAIR KIT FOR GX VALVE DN25	1 x _____	/ea

CATEGORY 4 TOTAL: \$ \_\_\_\_\_

Bid Item No. Wartsila Part No. Description Qty Unit Cost

**Category 5 - Auxiliary Systems Safety Spare Parts**

Lubricating Oil System  
 Flexible Connections  
CR SECTION - SAG-1001A

120	FH213	RUBBER BELLOW DN40	1	x	_____	/ca
121	FH214	RUBBER BELLOW DN40	1	x	_____	/ca
122	FH701	HOSE FOR CRANKCASE VENT PIPE	1	x	_____	/ca
123	FH708	FLEXIBLE HOSE FOR NATURAL GAS	1	x	_____	/ca

CATEGORY 5 TOTAL: \$ \_\_\_\_\_

**Category 6 - Auxiliary Systems Safety Spare Parts**

Engine Lubricating Oil System  
QBF 05I- 111 OIL MIST SEPARATOR UNIT  
CR SECTION - QBF-1001A

124	B00032	SERVICE KIT 1	1	x	_____	/ca
125	B00035	SERVICE KIT 2	1	x	_____	/ca
126	B00037	SERVICE KIT 4	1	x	_____	/ca
127	0100-3L-0008-4- X+FBIE+A1133+HMGR+GSSE	CONVERTER VACON0100-3L-0008-4-X+HMGR+FBIE	1	x	_____	/ca

CATEGORY 6 TOTAL: \$ \_\_\_\_\_

**Bid Item No.**      **Wartsila Part No.**      **Description**      **Qty**      **Unit Cost**

Category 7 - Auxiliary Systems Safety Spare Parts

Compressed Air System

Flexible Connections

CR SECTION - SAG-1001A

128	FH301	FLEXIBLE HOSE DN32	1	x _____/ca
129	FH311	FLEXIBLE HOSE OD12	1	x _____/ca

TSA 901 STARTING AIR UNIT DUAL WP311L

CR SECTION - TSA-1001A

130	WP311L-6KF	SUPPLIER RECOMMENDED SAFETY SPARE PARTS	1	x _____/ca
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TSB 901-904 STARTING AIR BOTTLE

CR SECTION - TSB-1001A

131	00100	SUPPLIER RECOMMENDED SAFETY SPARE PARTS	1	x _____/ca
-----	-------	---	---	------------

CATEGORY 7 TOTAL: \$ \_\_\_\_\_

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
<b>Category 8 - Auxiliary Systems Safety Spare Parts</b>				
Cooling System				
Flexible Connections				
<u>CR SECTION - SAG-1001A</u>				
132	FH401	RUBBER BELLOW DN125	1	x _____ /ca
133	FH402	RUBBER BELLOW DN125	1	x _____ /ca
134	FH404	FLEXIBLE HOSE OD12	1	x _____ /ca
135	FH406	RUBBER BELLOW DN40	1	x _____ /ca
136	FH414	RUBBER BELLOW DN125	1	x _____ /ca
137	FH416	FLEXIBLE HOSE OD12	1	x _____ /ca
138	FH451	RUBBER BELLOW DN125	1	x _____ /ca
139	FH4831	FLEXIBLE HOSE OD12	1	x _____ /ca
140	FH4832	FLEXIBLE HOSE OD12	1	x _____ /ca

CATEGORY 8 TOTAL: \$ \_\_\_\_\_



Bid Item No. Wartsila Part No. Description Qty Unit Cost

**Category 9 - Auxiliary Systems Spare Parts**

Engine Cooling System

VEA 051-111 EXPANSION VESSEL

CR SECTION - VEA-1001A

141 VEA003 LEVEL SWITCH 1 x \_\_\_\_\_/ea

VCA 051-112 RADIATOR

CR SECTION - VCA-1001A

142 9460005842 SAFETY SWITCH KEM316U/U3/EMC 1 x \_\_\_\_\_/ea

FAN MOTOR W-DA284T-F PAD 480/60 NEMA

143 9460065948 FAN BLADE MW1236/5-5/42/PAG/2WL/41.275/9.525/A 1 x \_\_\_\_\_/ea

6308-C3 BEARING

145 6308-C3 BEARING 1 x \_\_\_\_\_/ea

6308-C3 BEARING

146 6310-C3 BEARING 1 x \_\_\_\_\_/ea

CATEGORY 9 TOTAL: S \_\_\_\_\_

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
<b>Category 10 - Auxiliary Systems Safety Spare Parts</b> <u>Plant Cooling System</u> VBA 901-902 MAINTENANCE WATER TANK CR SECTION - VBA-1001A				
147	12EB364500003	SERVICE KIT FOR PUMP EBARA CDU 120/315	1	x _____/ea
148	181001	Lubricating Oil Pump Complete	1	x _____/ea
149	182018	Pre Lubricating Oil Pump Complete	1	x _____/ea
150	182017	Flexible Coupling	1	x _____/ea
151	191001	HT Water Pump Complete	1	x _____/ea
152	191002	L.T Water Pump Complete	1	x _____/ea
153	191056	Shaft (HT, L.T Pumps)	1	x _____/ea
154	12EB364500003	SERVICE KIT FOR PUMP EBARA CDU 120/315	1	x _____/ea

CATEGORY 10 TOTAL: \$ \_\_\_\_\_

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
<b>Category 11 - Auxiliary Systems Safety Spare Parts</b>				
Charge Air System				
NGA 051-111 CHARGE AIR FILTER DL-16-F5				
<u>CR SECTION - NGA-1001A</u>				
155	CV321	Solenoid Valve	1	x _____/ea
156	CV331	Solenoid Valve	1	x _____/ea
157	357017	Main Starting Valve	1	x _____/ea
158	217048	Main Starting Valve Repair Kit	1	x _____/ea
159	592*592*360/6F5	Airbag 592x592x360/6F5	1	x _____/ea
CATEGORY 11 TOTAL: \$ _____				
<b>Category 12 - Auxiliary Systems Safety Spare Parts</b>				
Exhaust Gas System				
Flexible Connections				
<u>CR SECTION - SAG-1001A</u>				
160	FH501	EXHAUST GAS BELLOW DN500	1	x _____/ea
NHA 051-111 EXHAUST GAS MODULE				
<u>CR SECTION - NHA-1001A</u>				
161	4437-1	FLOW SWITCH	1	x _____/ea
162	435510142-30	VENTILATION FAN	1	x _____/ea
163	131-14	BELLOW	1	x _____/ea

Bid Item No.	Wartsila Part No.	Description	Qty	Unit Cost
NHA 010 PSE 001-003 RUPTURE DISC CR SECTION - NHA-1001A				
164	124026	Pre Chambe Control Valve Seat	1	x _____/ca
165	124028	Pre Chamber Control Valve	1	x _____/ca
166	124029	Pre Chamber Control Valve Rod	1	x _____/ca
167	124034	Pre Chamber Control Valve Yoke	1	x _____/ca
168	124025	Pre Chamber Control Valve Yoke	1	x _____/ca
169	124032	Pre Chamber Control Valve Guide	1	x _____/ca
170	501108	Pre Chamber Control Valve Spring	1	x _____/ca
171	124001	Square Part Kit for Ignition Coil	1	x _____/ca
172	289276	Pre Chamber Complete	1	x _____/ca
173	164125	Cartridge Set (Gas Admission Valve)	1	x _____/ca
174	SE518	Turbo Sensor	1	x _____/ca
175	67111620003-S / CV-S-L-W-RLD	RUPTURE DISC (SET) CV-S-L-W-RL DN 1200	1	x _____/ca

CATEGORY 12 TOTAL: \$ \_\_\_\_\_

Bid Item No. Wartsila Part No.

Description

Qty Unit Cost

**Category 13 - Safety Spare Parts for Flexible Coupling DCB - GS 658.5 SM50**

CR SECTION - SAE-1001A

176	3584438	TUBE GS 8.5 - Material No. PAAE031447	1	x _____/ea
177	3584441	RUBBER BLOCK 8.5 SM50 - Material No. PAAE 049601	1	x _____/ea

CATEGORY 13 TOTAL: \$ \_\_\_\_\_

**Category 14 - Safety Spare Parts for Generator AMG 1120L/T10 DSE**

CR SECTION - BAG-1001A

178	9893305	OPERATIONAL SPARE PART PACKAGE FOR AMG 1120 Serial No.: 4639159-65 Material No.: PAAE178180 INCLUDING: 1. AVR 2. RECTIFIER DIODE (SET) 3. VARISTOR 4. AIR-FILTERS (SET) 5. BEARING RTD 6. BEARING SHELL (SUITABLE FOR DE & NDE) 7. BEARING OIL RING 8. BEARING LABYRINTH SEAL	1	x _____/ea
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CATEGORY 14 TOTAL: \$ \_\_\_\_\_

**Bid Item No.**      **Wartsila Part No.**      **Description**      **Qty**      **Unit Cost**

Category 15 - Safety Spare Parts for Control System

CR SECTION - BFA-1001A  
CFA 901 COMMON CONTROL PANEL

SUPPLIER RECOMMENDED SAFETY SPARE PARTS  
Material No.: PAAR297173

1 x \_\_\_\_\_/ca

CR SECTION - CFC-1001A  
CFC 051- 111 GENSET CONTROL PANEL

SUPPLIER RECOMMENDED SAFETY SPARE PARTS  
Material No.: PAAF297174

1 x \_\_\_\_\_/ca

CATEGORY 15 TOTAL: \$ \_\_\_\_\_

Category 16 - Safety Spare Parts for EAM Panel

CR SECTION - BJA-1001A  
BJA 051- 111 ENGINE AUXILIARY MODULE PANEL

SUPPLIER RECOMMENDED SAFETY SPARE PARTS  
Material No.: PAAF297175

1 x \_\_\_\_\_/ca

CATEGORY 16 TOTAL: \$ \_\_\_\_\_

Category 17 - Safety Spare Parts for Frequency Converters, Radiators

CR SECTION - BLP-1001A  
BLP 051- 111 FREQUENCY CONVERTER

FREQUENCY CONVERTER UNIT  
Material No.: PAAF109778

1 x \_\_\_\_\_/ca

CATEGORY 17 TOTAL: \$ \_\_\_\_\_

Bid Item No. Warsila Part No. Description Qty Unit Cost

Category 18 - Safety Spare Parts for Turbo Charger

183	1562094	Compressor Outlet Casing	1	x	_____	/ca
184	1562005	Diffuser	1	x	_____	/ca
185	1561019	Compressor Insert	1	x	_____	/ca
186	SE528	Speed Pick-Up	1	x	_____	/ca
187	Cable for SE528	Cable Set	1	x	_____	/ca
188	1562070	Packing Ring	1	x	_____	/ca
189	156500	O-Ring	1	x	_____	/ca
190	156501	O-Ring	1	x	_____	/ca
191	1561184	Nozzle	1	x	_____	/ca

CATEGORY 18 TOTAL: \$ \_\_\_\_\_

GRAND TOTAL: \$ \_\_\_\_\_

CITY OF ALEXANDRIA

DG HUNTER UNITS 5-11

SPARE PARTS

ELECTRIC PRODUCTION

## V. BID SPECIFICATIONS



CITY OF ALEXANDRIA BID SPECIFICATIONS FOR:  
DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTION

**BID SPECIFICATIONS**

1. **SCOPE:** The following bid specifications are to be used as minimum and maximum standards for DG HUNTER UNITS 5-11 – SPARE PARTS – ELECTRIC PRODUCTION. All quoted products shall either meet or exceed the following specifications.
2. Unless otherwise stated, the use of manufacturer's name and product numbers are for descriptive purposes and to establish general quality levels only, they are not intended to be restrictive.
3. The purpose of this bid is to secure pricing on Spare Parts, for use by the City of Alexandria Electric Production Department for the Wärtsilä Reciprocating Internal Combustion Engines and ancillary parts.
4. Successful Bidders agree to honor the quoted prices for a minimum one (1) year period from bid award date. Contingent upon the availability of funds and the ability of the successful Bidders to honor the quoted prices, the City reserves the right to renew the existing contract for an additional two (2) years in one (1) year increments with a thirty (30) day funding out clause. Not less than forty-five (45) days before the end of the Contract term, the successful Bidders shall notify the City, in writing, of their intentions with respect to renewal.
5. **Parts Manufacturer:** The existing plant was constructed utilizing Wärtsilä equipment as such the Bid Specifications for Spare Parts are developed around specific Spare Parts manufactured by Wärtsilä or authorized Wärtsilä Affiliates. Certain parts are easily substituted and can be priced by other suppliers, assuming 100% compatibility with the original installed equipment.
6. **Product Data Sheets:** The Product Data Sheets for the individual Spare Parts being priced is attached as Appendix A. Note that the Product Data Sheets are not all inclusive of every Spare Part noted on the Bid Form.

CITY OF ALEXANDRIA  
DG HUNTER UNITS 5-11  
SPARE PARTS  
ELECTRIC PRODUCTION

APPENDIX A  
PRODUCT DATA SHEETS

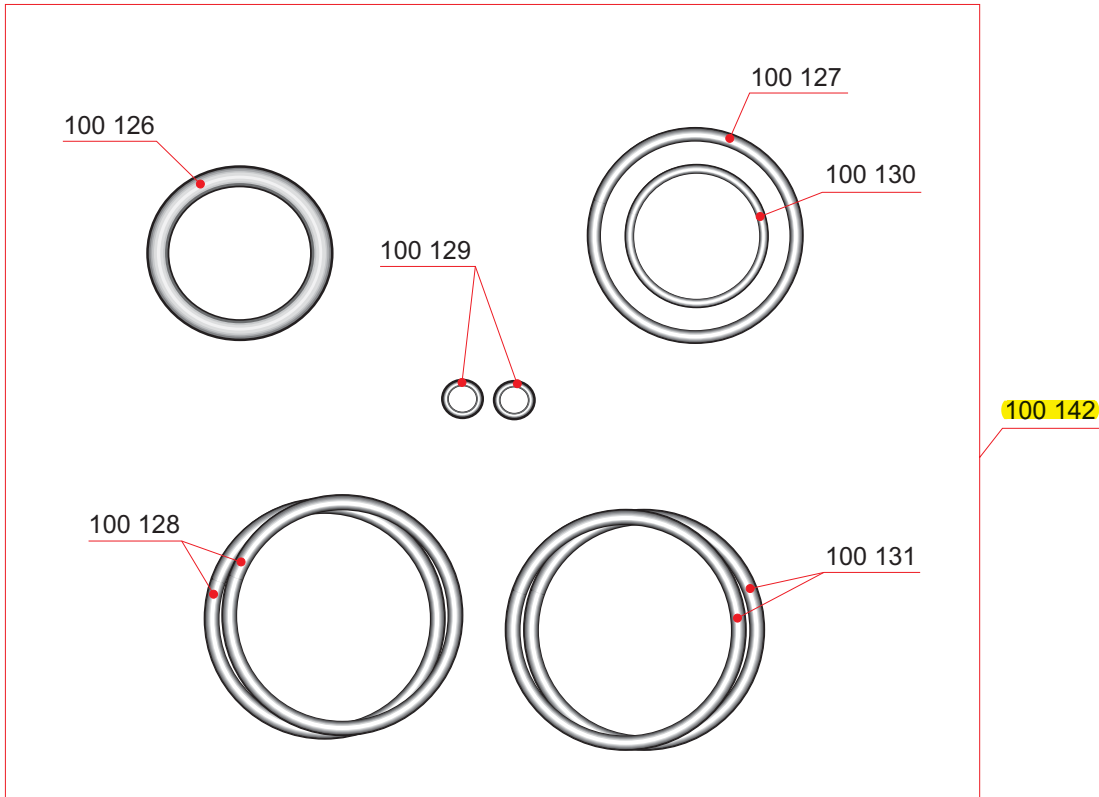
CITY OF ALEXANDRIA

DG HUNTER UNITS 5-11 - SPARE PARTS  
ELECTRIC PRODUCTION

APPENDIX A  
PRODUCT DATA SHEETS

APPENDIX A

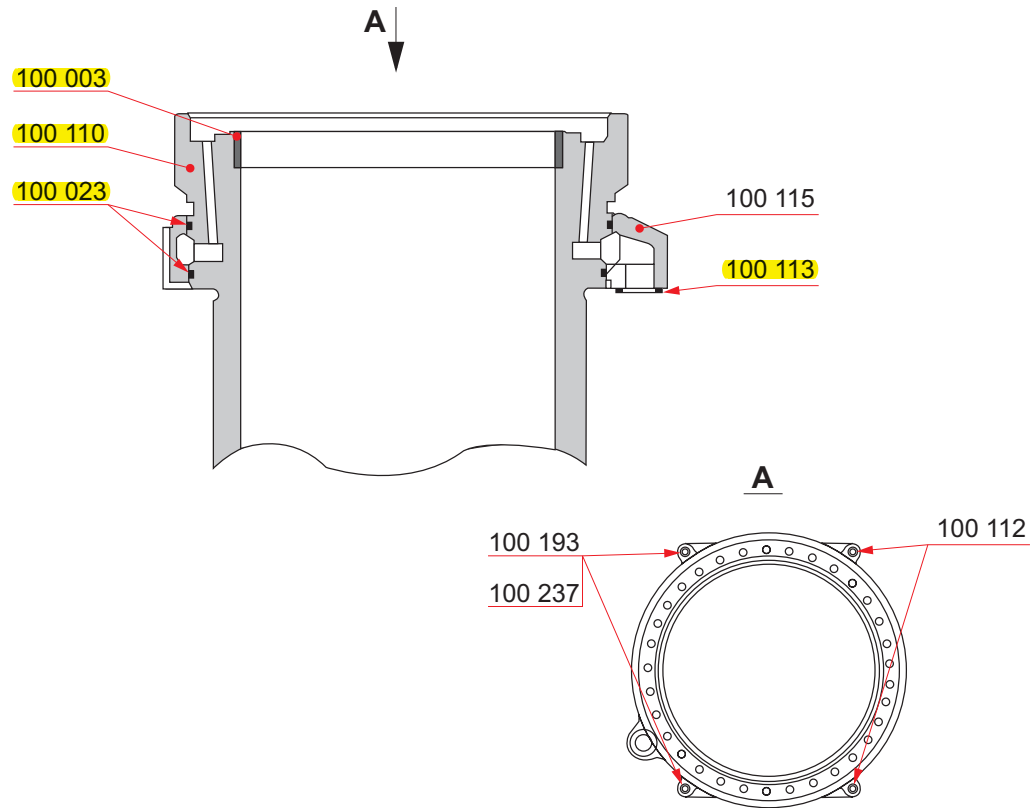
Hydraulic jack for main bearing cap



Part No.	Description	Qty [Pcs]	Wt. [Kg]
100 142	Sealing set	1	-
100 126	O-ring (1)	1	-
100 127	O-ring (1)	1	-
100 128	O-ring (1)	2	-
100 129	O-ring (1)	2	-
100 130	O-ring (1)	1	-
100 131	O-ring (1)	2	-

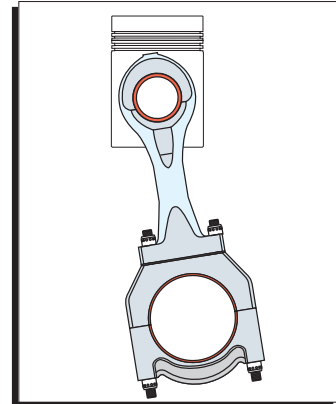
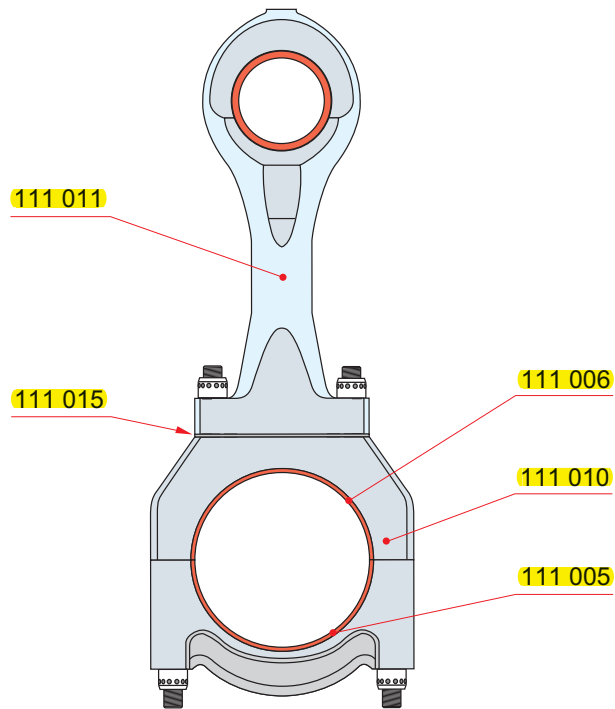
NOTE! (1) Not available separately.

### Cylinder liner with anti-polishing ring



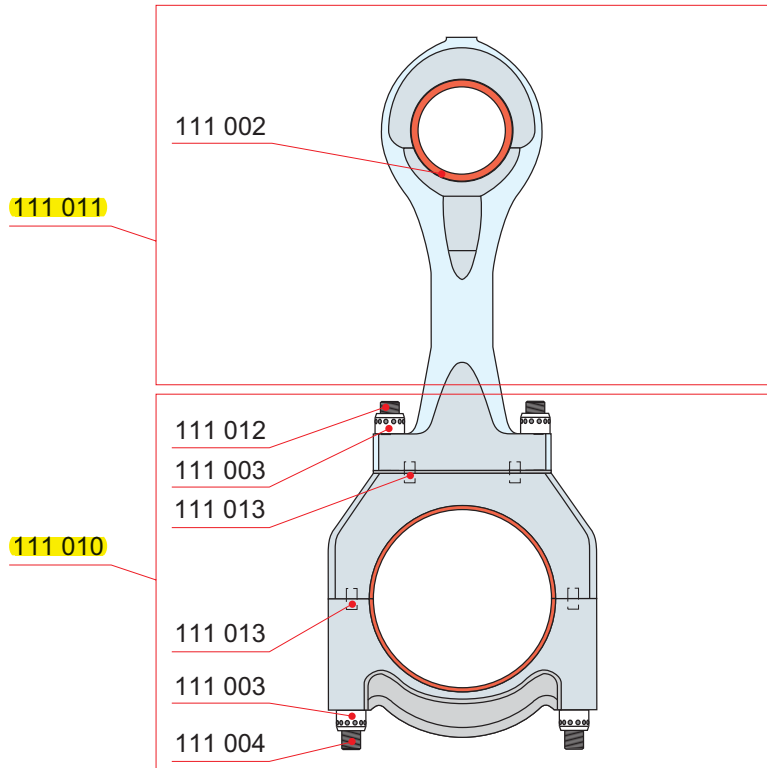
Part No.	Description	Qty [Pcs]	Wt. [Kg]
100 003	Anti-polishing ring	1	-
100 023	O-ring	2	-
100 110	Cylinder liner	1	-
100 112	Screw	2	-
100 113	O-ring	1	-
100 115	Water jacket	1	-
100 193	Screw	2	-
100 237	Clamp	2	-

Connecting rod



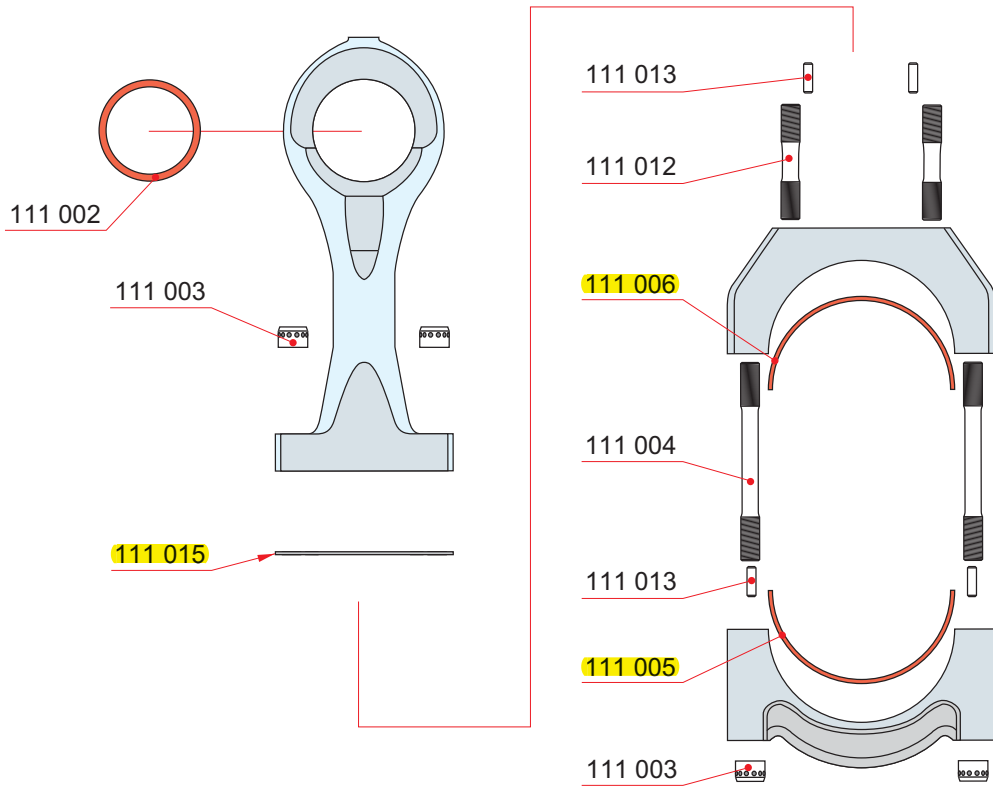
Part No.	Description	Qty [Pcs]	Wt. [Kg]
111 005	Big end bearing shell, lower	1	-
111 006	Big end bearing shell, upper	1	-
111 010	Connecting rod, lower part	1	80.2
111 011	Connecting rod, upper part	1	77.0
111 015	Shim	1	-

Connecting rod



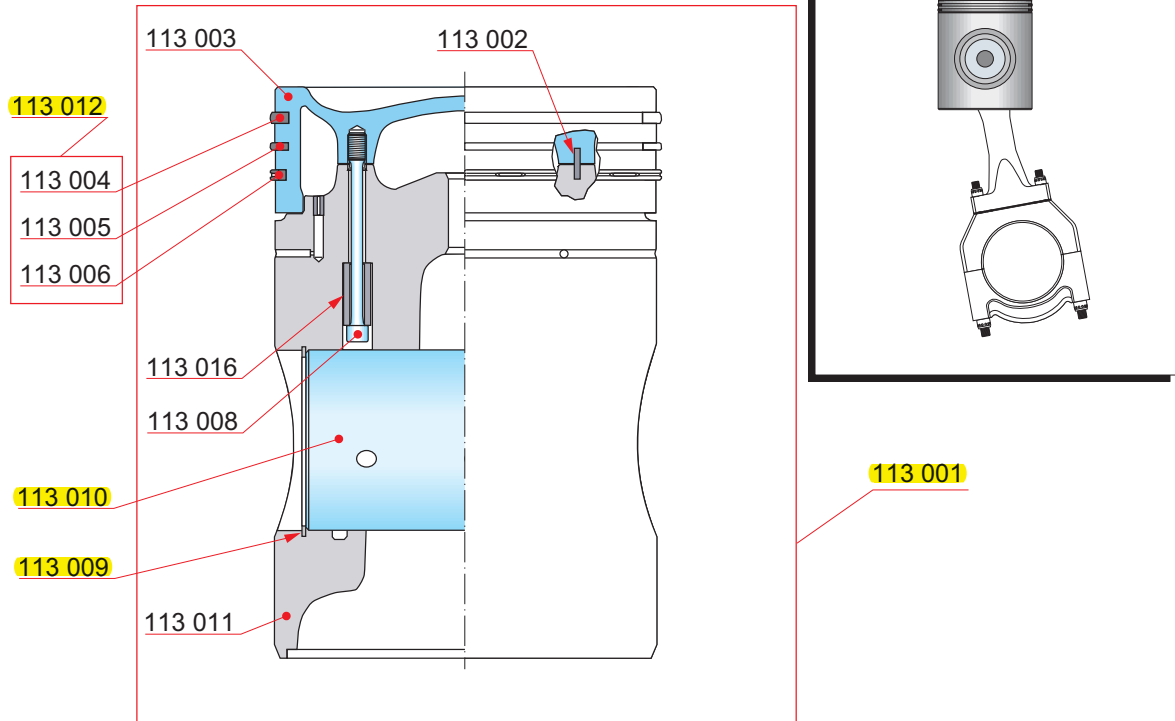
Part No.	Description	Qty [Pcs]	Wt. [Kg]
111 010	Connecting rod, lower part	1	80.2
111 003	Nut	8	0.2
111 004	Screw	4	1.3
111 012	Screw	4	0.8
111 013	Pin	4	-
111 011	Connecting rod, upper part	1	77.0
111 002	Gudgeon pin bearing bush	1	3.8

### Connecting rod





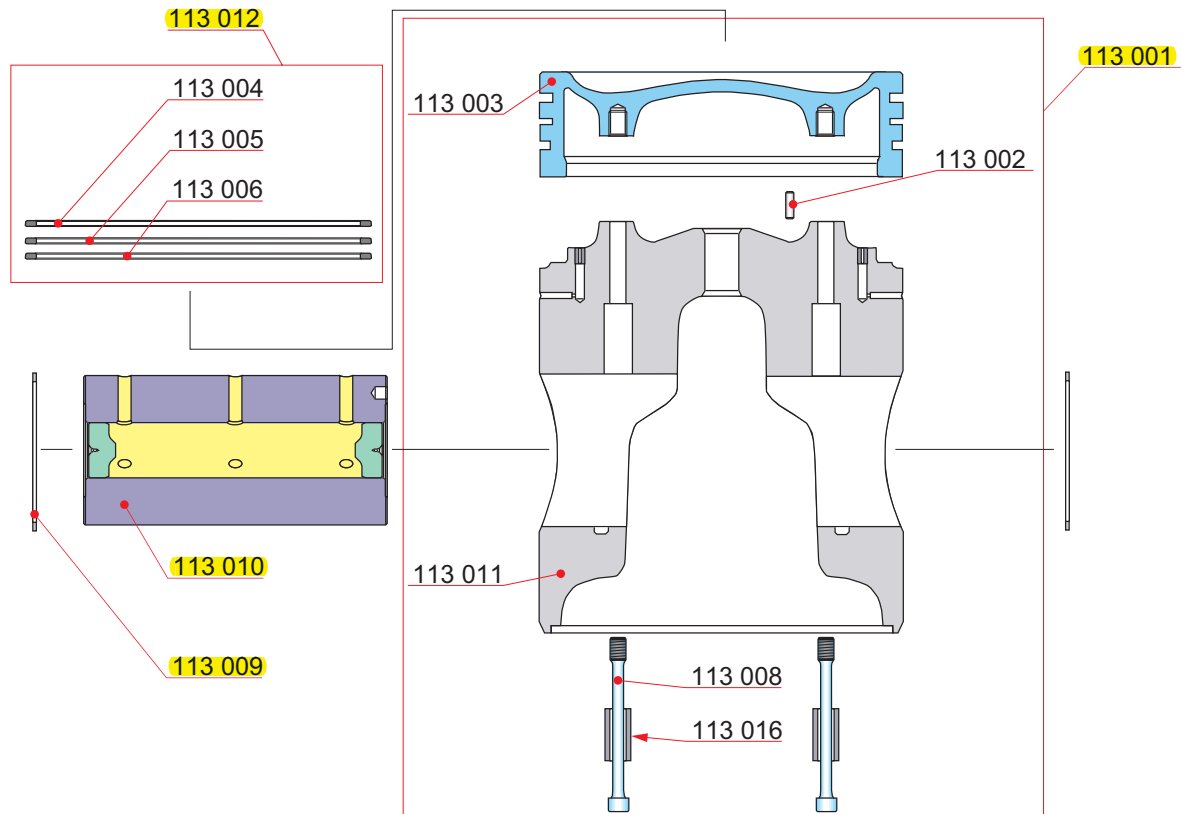
Piston



Part No.	Description	Qty [Pcs]	Wt. [Kg]
113 001	Piston	1	12.5
113 002	Pin	1	0.7
113 003	Piston crown	1	0.5
113 008	Screw	4	0.2
113 011	Piston skirt	1	43.0
113 016	Bush	4	0.1
113 012	Piston ring set	1	-
113 004	Piston ring I	1	0.7
113 005	Piston ring II	1	0.3
113 006	Piston ring III	1	0.3
113 009	Securing ring	2	0.1
113 010	Gudgeon pin	1	0.1

# APPENDIX A

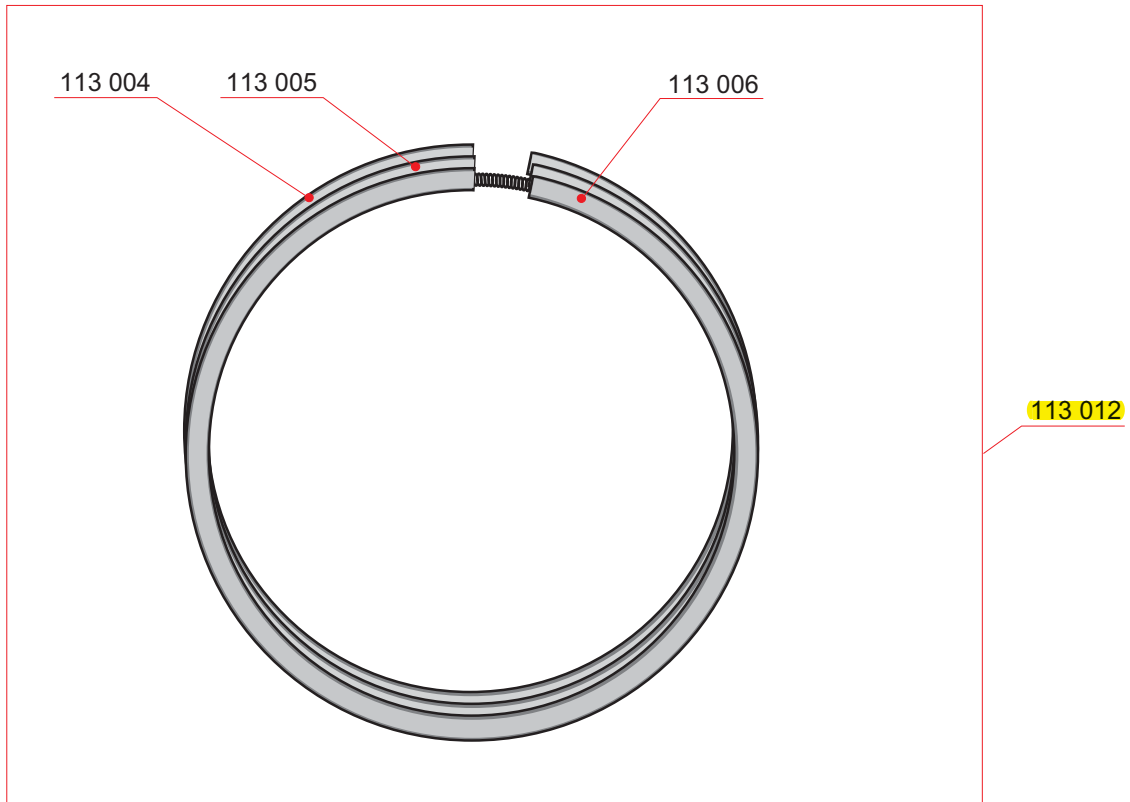
## Piston



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>113 001</b>	<b>Piston</b>	<b>1</b>	<b>12.5</b>
113 002	Pin	1	0.7
113 003	Piston crown	1	0.5
113 008	Screw	4	0.2
113 011	Piston skirt	1	43.0
113 016	Bush	4	0.1
<b>113 012</b>	<b>Piston ring set</b>	<b>1</b>	<b>-</b>
113 004	Piston ring I	1	0.7
113 005	Piston ring II	1	0.3
113 006	Piston ring III	1	0.3
<b>113 009</b>	<b>Securing ring</b>	<b>2</b>	<b>0.1</b>
<b>113 010</b>	<b>Gudgeon pin</b>	<b>1</b>	<b>0.1</b>

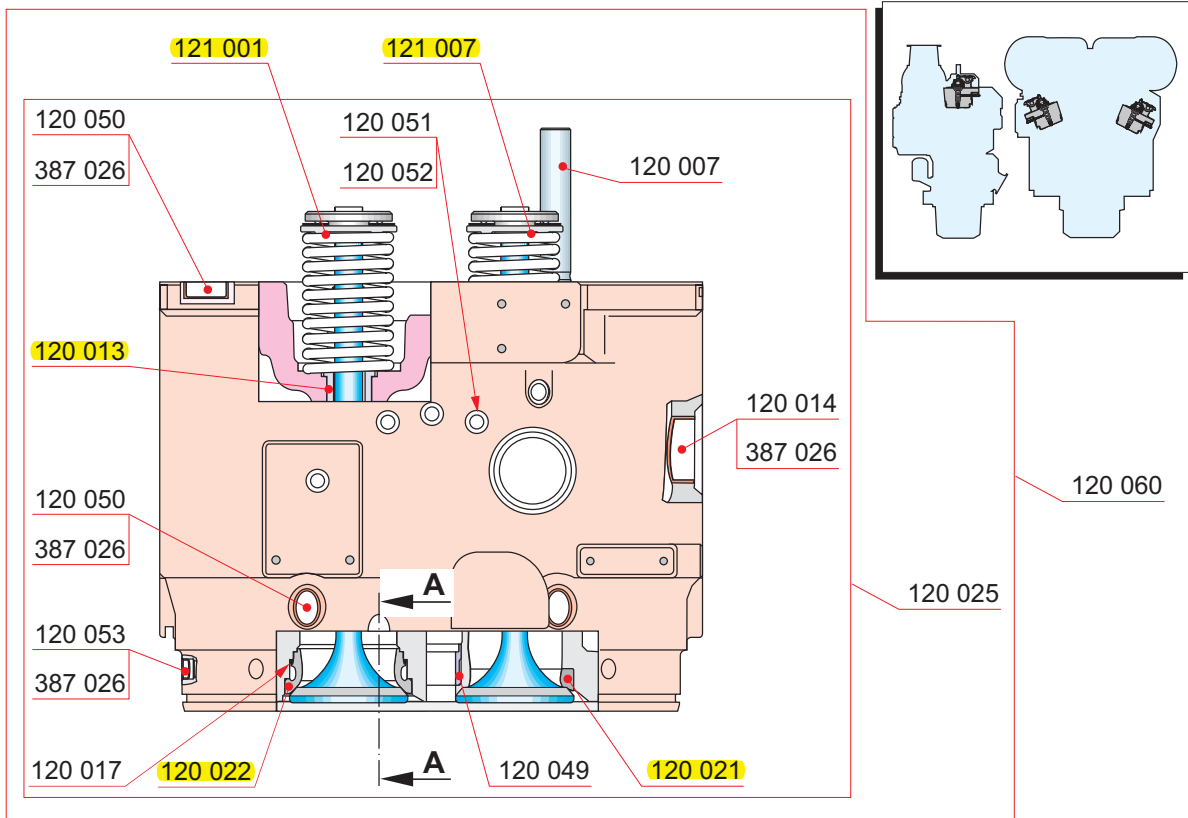
# APPENDIX A

## Piston



Part No.	Description	Qty [Pcs]	Wt. [Kg]
113 012	Piston ring set	1	-
113 004	Piston ring I	1	0.7
113 005	Piston ring II	1	0.3
113 006	Piston ring III	1	0.3

## Cylinder head

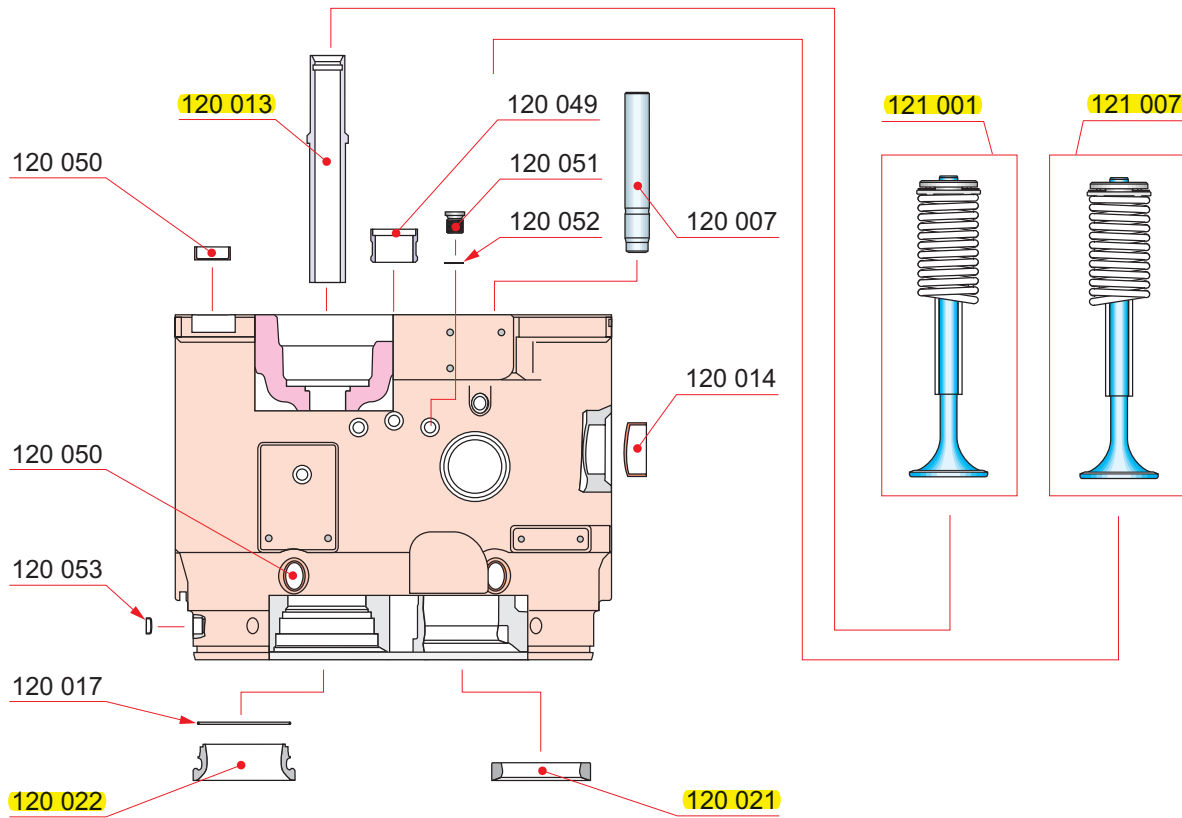


Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 060	Cylinder head with inlet and exhaust valve (1)	1	-
121 001	Exhaust valve, compl.	2	-
121 007	Inlet valve, compl.	2	-
120 025	Cylinder head (2)	1	-
120 007	Yoke pin	2	-
120 013	Valve guide	4	-
120 014	Sealing push-in cap	5	-
120 017	O-ring	2	-
120 021	Seat ring for inlet valve	2	-
120 022	Seat ring for outlet valve	2	-
120 049	Sleeve	1	-
120 050	Sealing push-in cap	13	-
120 051	Plug	2	-
120 052	Sealing ring	2	-
120 053	Sealing push-in cap	8	-
387 026	Glue compound	1	-

NOTE! (1) With valves

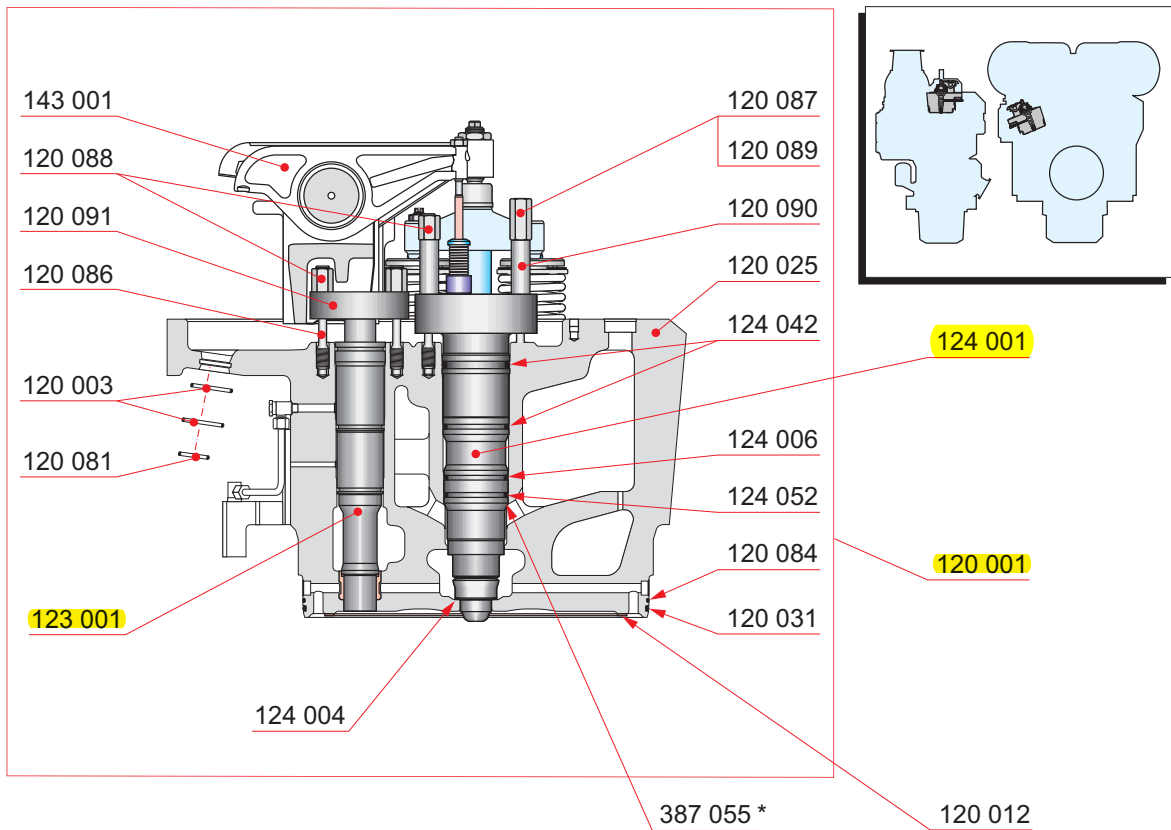
NOTE! (2) Without valves

**Cylinder head**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 007	Yoke pin	2	-
120 013	Valve guide	4	-
120 014	Sealing push-in cap	5	-
120 017	O-ring	2	-
120 021	Seat ring for inlet valve	2	-
120 022	Seat ring for outlet valve	2	-
120 049	Sleeve	1	-
120 050	Sealing push-in cap	13	-
120 051	Plug	2	-
120 052	Sealing ring	2	-
120 053	Sealing push-in cap	8	-
121 001	Exhaust valve, compl.	2	-
121 007	Inlet valve, compl.	2	-

**Cylinder head with starting valve**



Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>120 001</b>	<b>Cylinder head</b>	<b>1</b>	<b>-</b>	NOTE!	(4) See section 124-		
120 003	O-ring	2	-	NOTE!	*) Prechamber O-rings to be slightly lubricated.		
120 025	Cylinder head (1)	1	319				
120 031	O-ring	1	-				
120 081	O-ring	1	-				
120 084	O-ring	1	-				
120 086	Screw	2	0.2				
120 087	Screw	2	0.2				
120 088	Nut	3	-				
120 089	Nut	1	0.1				
120 090	Sleeve	2	0.2				
120 091	Yoke	1	1.5				
<b>123 001</b>	<b>Starting valve (2)</b>	<b>1</b>	<b>6.4</b>				
124 004	Gasket	1	-				
124 006	O-ring	1	-				
124 042	O-ring	2	-				
124 052	O-ring	1	-				
143 001	Rocker arms with bracket (3)	1	46.5				
120 012	Gasket	1	0.2				
<b>124 001</b>	<b>Prechamber (4)</b>	<b>1</b>	<b>-</b>				
387 055	Contact lubrication *	1	-				

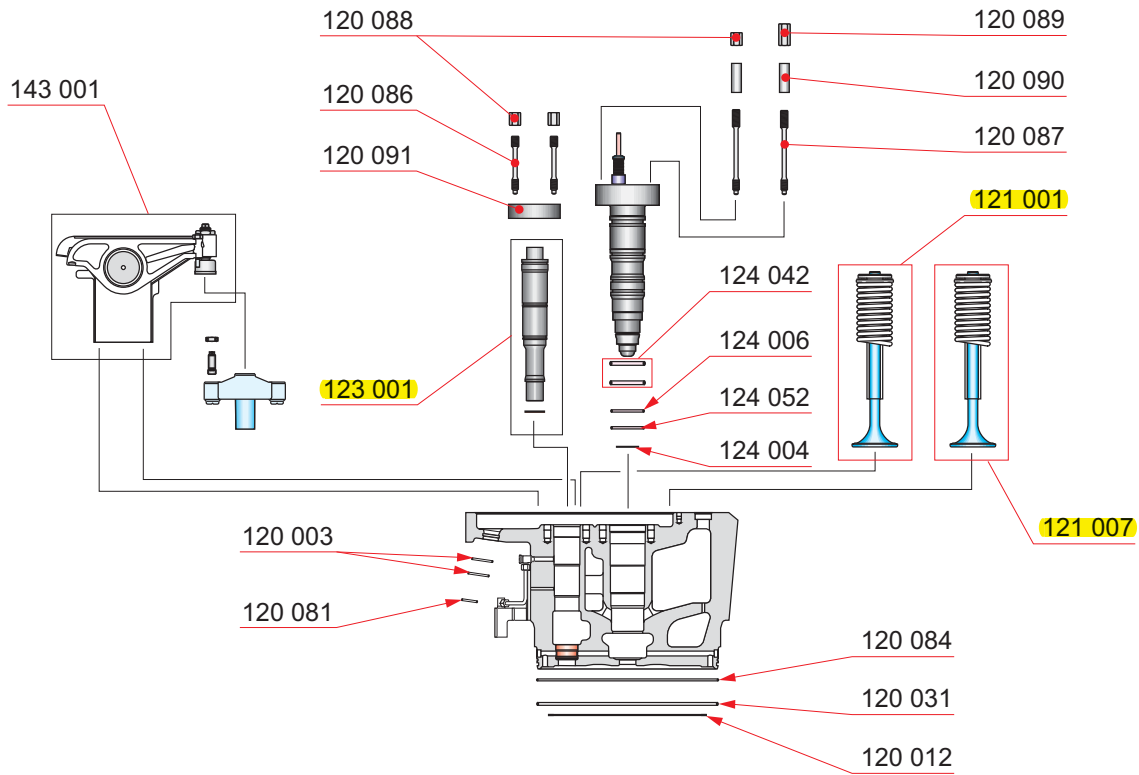
NOTE! (1) See section 120-

NOTE! (2) See section 123-

NOTE! (3) See section 143-

APPENDIX A

Cylinder head with starting valve



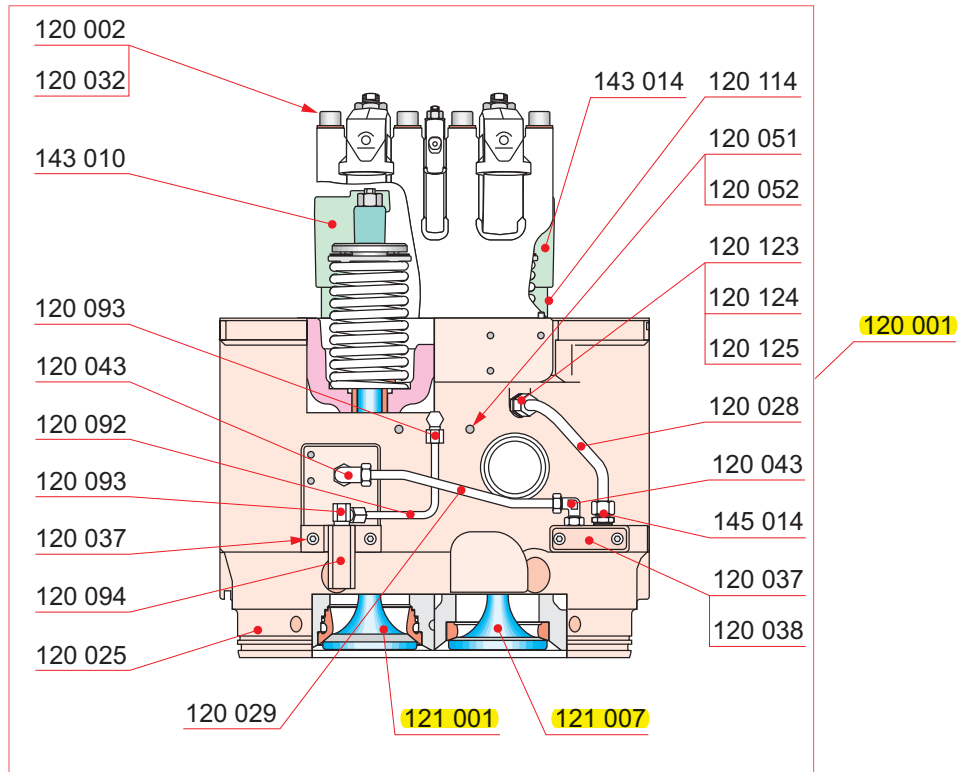
Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 003	O-ring	2	-	NOTE!	(5) See section 121-		
120 012	Gasket	1	0.2				
120 031	O-ring	1	-				
120 081	O-ring	1	-				
120 084	O-ring	1	-				
120 086	Screw	2	0.2				
120 087	Screw	2	0.2				
120 088	Nut	3	-				
120 089	Nut	1	0.1				
120 090	Sleeve	2	0.2				
120 091	Yoke	1	1.5				
121 001	Exhaust valve, compl. (5)	2	-				
121 007	Inlet valve, compl. (5)	2	-				
123 001	Starting valve (2)	1	6.4				
124 004	Gasket	1	-				
124 006	O-ring	1	-				
124 042	O-ring	2	-				
124 052	O-ring	1	-				
143 001	Rocker arms with bracket (3)	1	46.5				

NOTE! (2) See section 123-

NOTE! (3) See section 143-

APPENDIX A

Cylinder head with starting valve

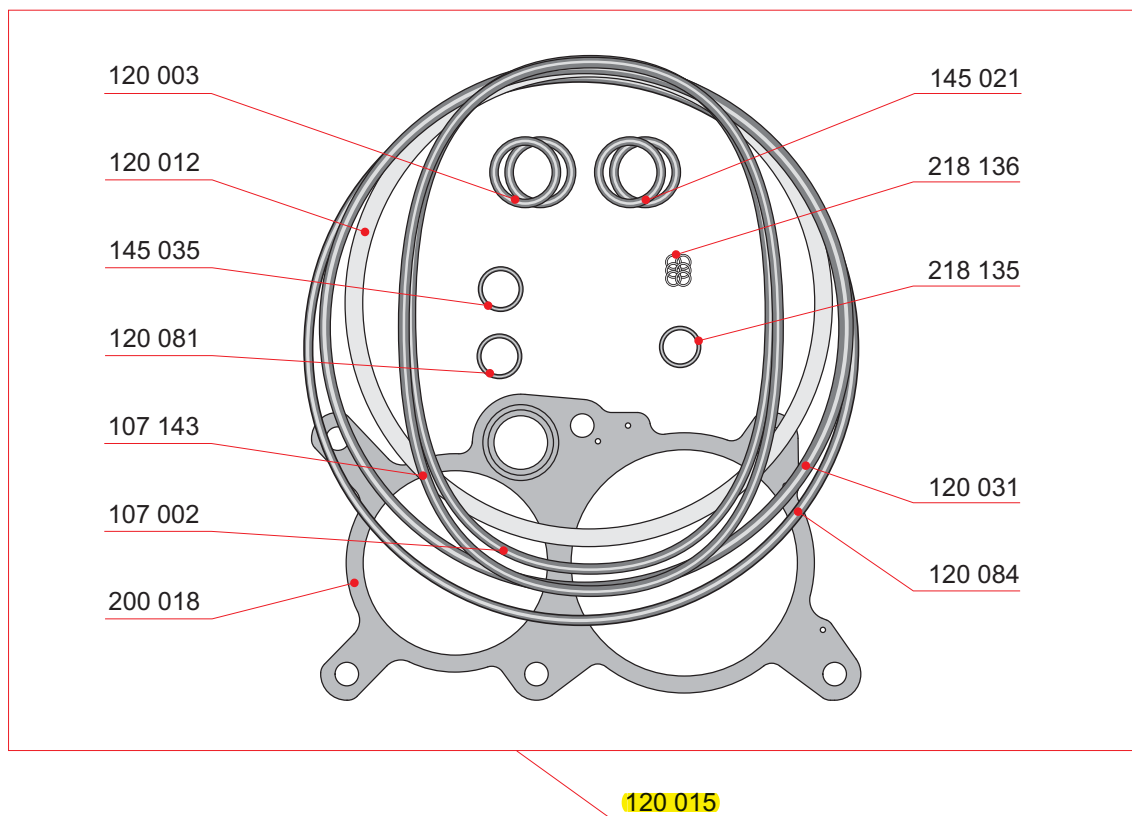


Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 001	Cylinder head	1	-	145 014	Pipe union	1	-
120 002	Screw	6	0.3				
120 025	Cylinder head (1)	1	319	NOTE!	(1) See section 120-		
120 028	Pipe	1	-	NOTE!	(3) See section 143-		
120 029	Pipe	1	0.1	NOTE!	(5) See section 121-		
120 032	Washer	6	-				
120 037	Screw	4	-				
120 038	Connection piece	1	0.6				
120 043	Pipe union	2	0.2				
605 002	O-ring	1	-				
605 023	O-ring	1	-				
605 024	Retaining ring	1	-				
120 051	Plug	2	-				
120 052	Sealing ring	2	-				
120 092	Pipe	1	0.5				
120 093	Pipe union	2	-				
120 094	Connection piece	1	1.6				
120 114	Pin	2	-				
120 123	Nut	1	-				
120 124	Cutting ring	1	-				
120 125	Pipe union	1	-				
121 001	Exhaust valve, compl. (5)	2	-				
121 007	Inlet valve, compl. (5)	2	-				
143 010	Yoke for exhaust valve, compl. (3)	1	2.8				
143 014	Yoke for inlet valve, compl. (3)	1	2.8				



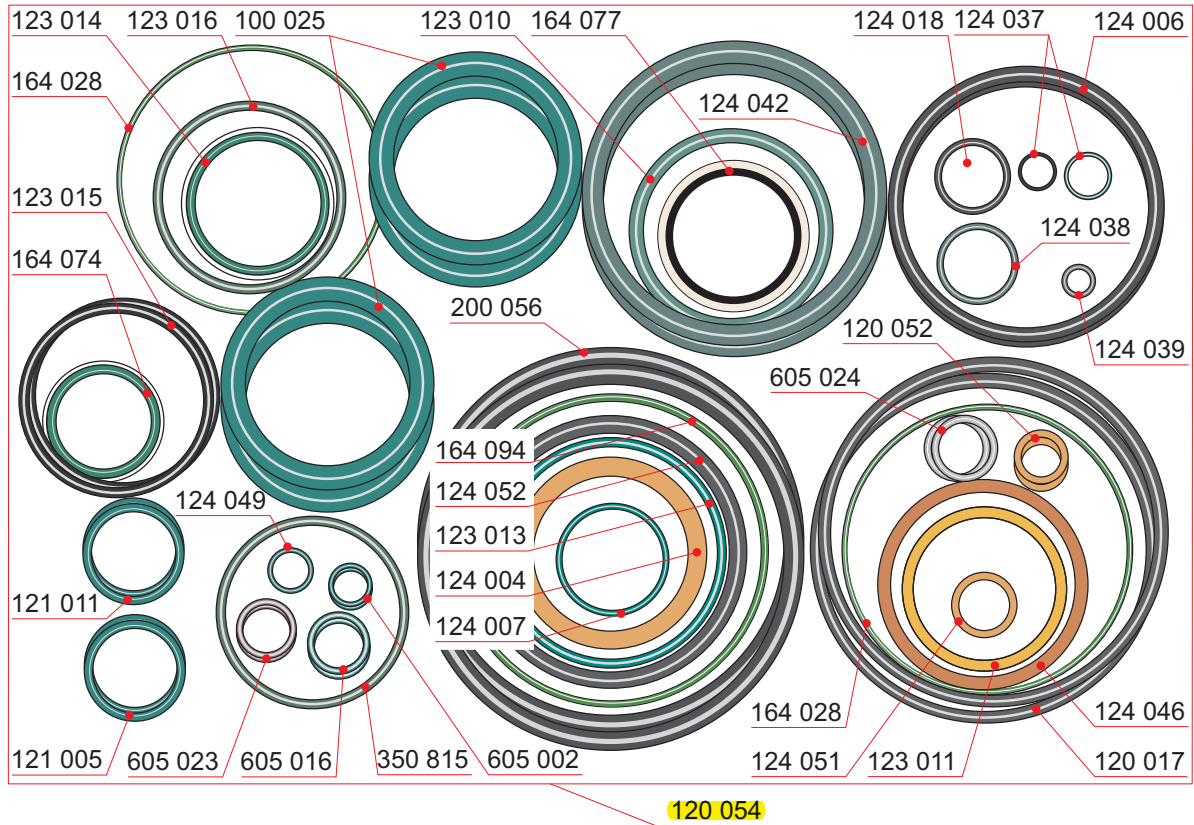
## APPENDIX A

### Cylinder head with starting valve



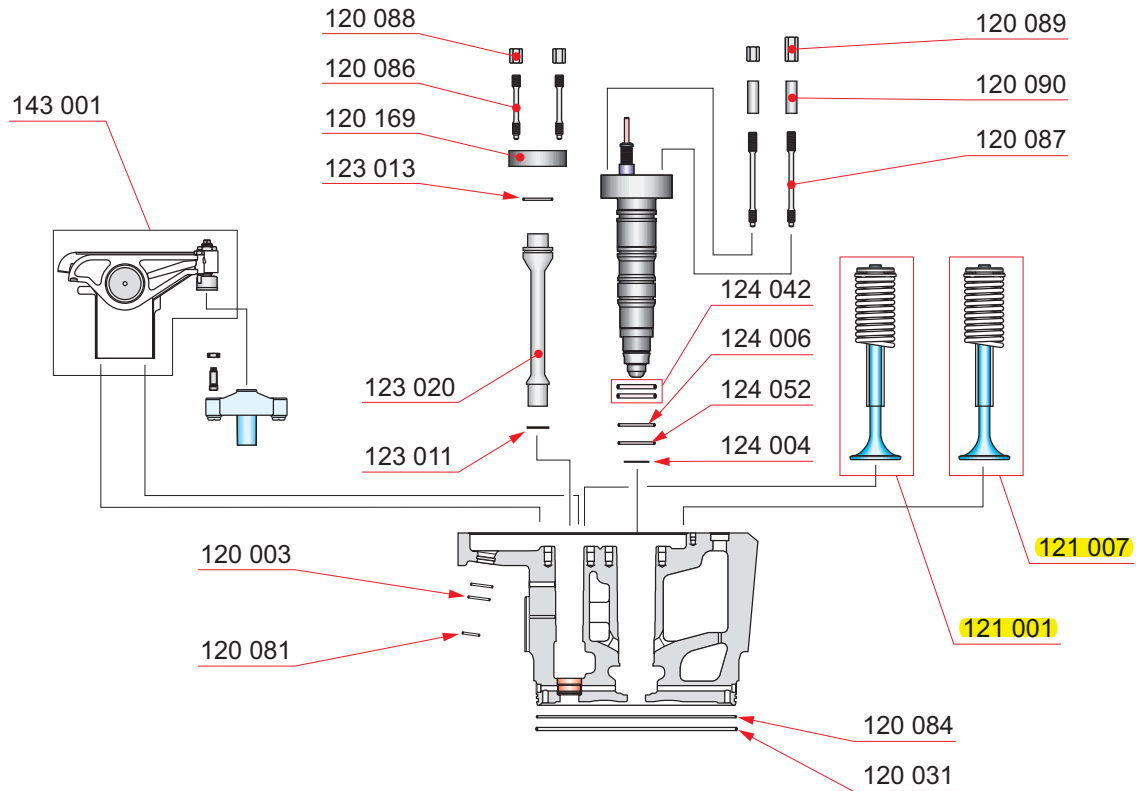
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>120 015</b>	<b>Sealing set for cylinder head replacement</b>	<b>1</b>	<b>0.6</b>
107 002	Hose gasket	1	-
107 143	Hose gasket	1	-
120 003	O-ring	2	-
120 012	Gasket	1	0.2
120 031	O-ring	1	-
120 081	O-ring	1	-
120 084	O-ring	1	-
145 021	O-ring	2	-
145 035	O-ring	1	-
200 018	Gasket	1	0.3
218 135	O-ring	1	0.2
218 136	O-ring	6	-

**Cylinder head with starting valve**



Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>120 054</b>	<b>Sealing set for cylinder head overhaul</b>	<b>1</b>	<b>0.4</b>	164 074	O-ring	2	-
100 025	O-ring	4	-	164 077	O-ring	1	-
120 017	O-ring	2	-	164 094	O-ring (1)	1	-
120 052	Sealing ring	2	-	200 056	O-ring	2	-
121 005	O-ring	2	-	350 815	O-ring	1	-
121 011	O-ring	2	-	605 002	O-ring	2	-
123 010	O-ring	1	-	605 016	Sealing ring	2	-
123 011	Sealing ring	1	-	605 023	O-ring	2	-
123 013	O-ring	1	-	605 024	Retaining ring	2	-
123 014	O-ring (1)	1	-				
123 015	O-ring	1	-	NOTE!	(1) Not used in all installations.		
123 016	O-ring	1	-	NOTE!	(2) Choose right O-rings according to your prechamber valve type.		
124 004	Gasket (3)	2	-	NOTE!	(3) The brighter bronze coloured prechamber gasket is of harder material, see service bulletin 3412Q062 for more information.		
124 006	O-ring (2)	2	-	NOTE!	(4) Choose right O-ring according to your prechamber valve type.		
124 018	O-ring	1	-	NOTE!	(5) Select o-ring with the same size that is replaced.		
124 037	Sealing ring	1	-				
124 038	O-ring (1)	1	-				
124 039	O-ring (4)	1	-				
124 042	O-ring (2)	2	-				
124 046	Sealing ring (1)	1	-				
124 049	O-ring (4)	1	0.2				
124 052	O-ring (2)	1	-				
164 028	O-ring (5)	1	-				
164 028	O-ring (5)	1	-				
124 007	O-ring	1	-				
124 051	Seal ring (1)	1	-				

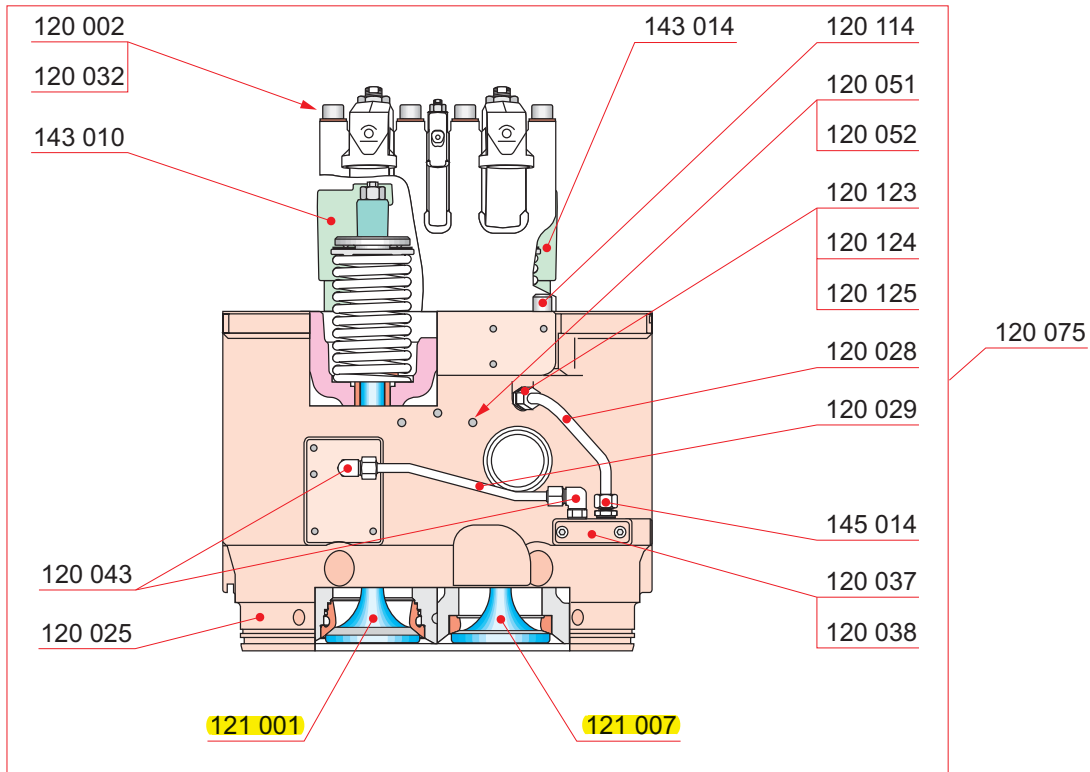
**Cylinder head without starting valve**



Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 003	O-ring	2	-	NOTE!	(5) See section 121-		
120 031	O-ring	1	-				
120 081	O-ring	1	-				
120 084	O-ring	1	-				
120 086	Screw	2	-				
120 087	Screw	2	-				
120 088	Nut	3	-				
120 089	Nut	1	-				
120 090	Sleeve	2	-				
120 091	Yoke	1	-				
121 001	Exhaust valve, compl. (5)	2	-				
121 007	Inlet valve, compl. (5)	2	-				
123 011	Sealing ring	1	-				
123 013	O-ring	1	-				
123 020	Dummy	1	-				
124 004	Gasket	1	-				
124 006	O-ring	1	-				
124 042	O-ring	2	-				
124 052	O-ring	1	-				
143 001	Rocker arms with bracket (3)	1	-				

NOTE! (3) See section 143-

**Cylinder head without starting valve**

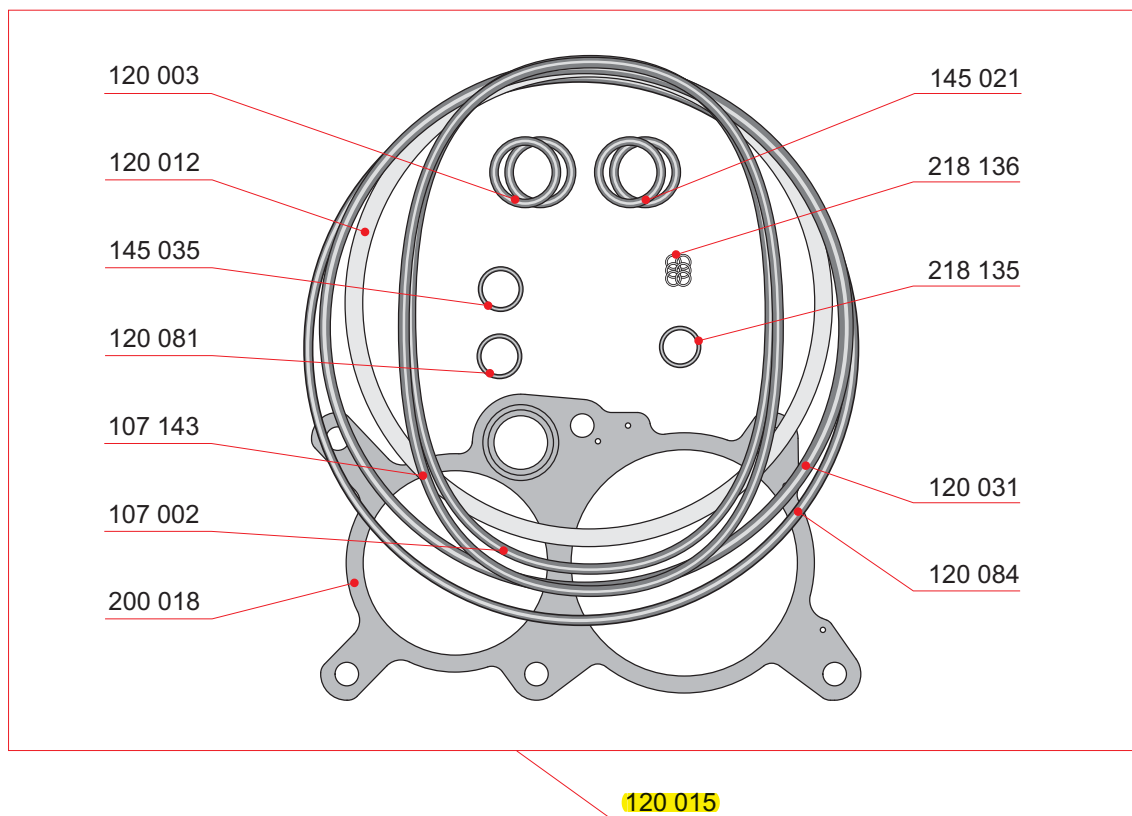


Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 075	Cylinder head	1	-	NOTE!	(3) See section 143-		
120 002	Screw	6	-	NOTE!	(5) See section 121-		
120 025	Cylinder head (1)	1	-				
120 028	Pipe	1	-				
120 029	Pipe	1	-				
120 032	Washer	6	-				
120 037	Screw	2	-				
120 038	Connection piece	1	-				
120 043	Pipe union	2	-				
605 002	O-ring	1	-				
605 023	O-ring	1	-				
605 024	Retaining ring	1	-				
120 051	Plug	2	-				
120 052	Sealing ring	2	-				
120 114	Pin	2	-				
120 123	Nut	1	-				
120 124	Cutting ring	1	-				
120 125	Pipe union	1	-				
121 001	Exhaust valve, compl. (5)	2	-				
121 007	Inlet valve, compl. (5)	2	-				
143 010	Yoke for exhaust valve, compl. (3)	1	-				
143 014	Yoke for inlet valve, compl. (3)	1	-				
145 014	Pipe union	1	-				

NOTE! (1) See section 120-

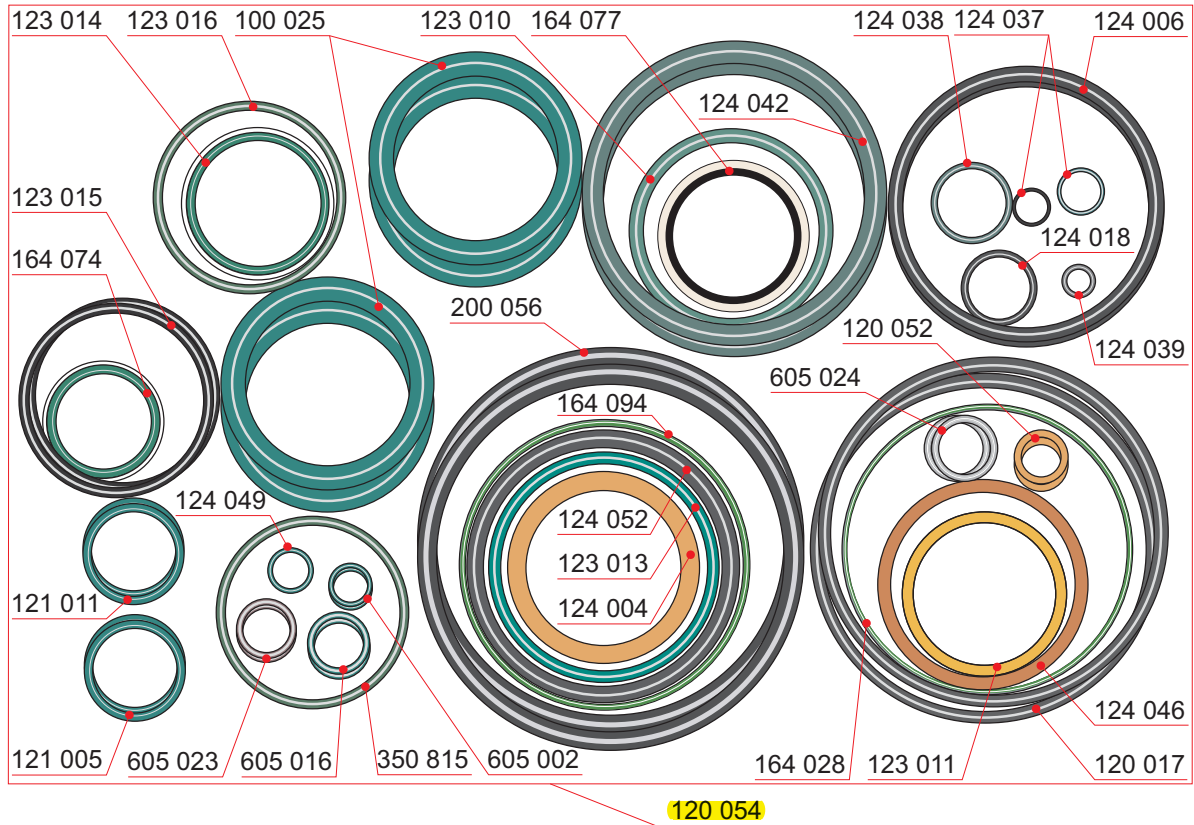
## APPENDIX A

### Cylinder head without starting valve



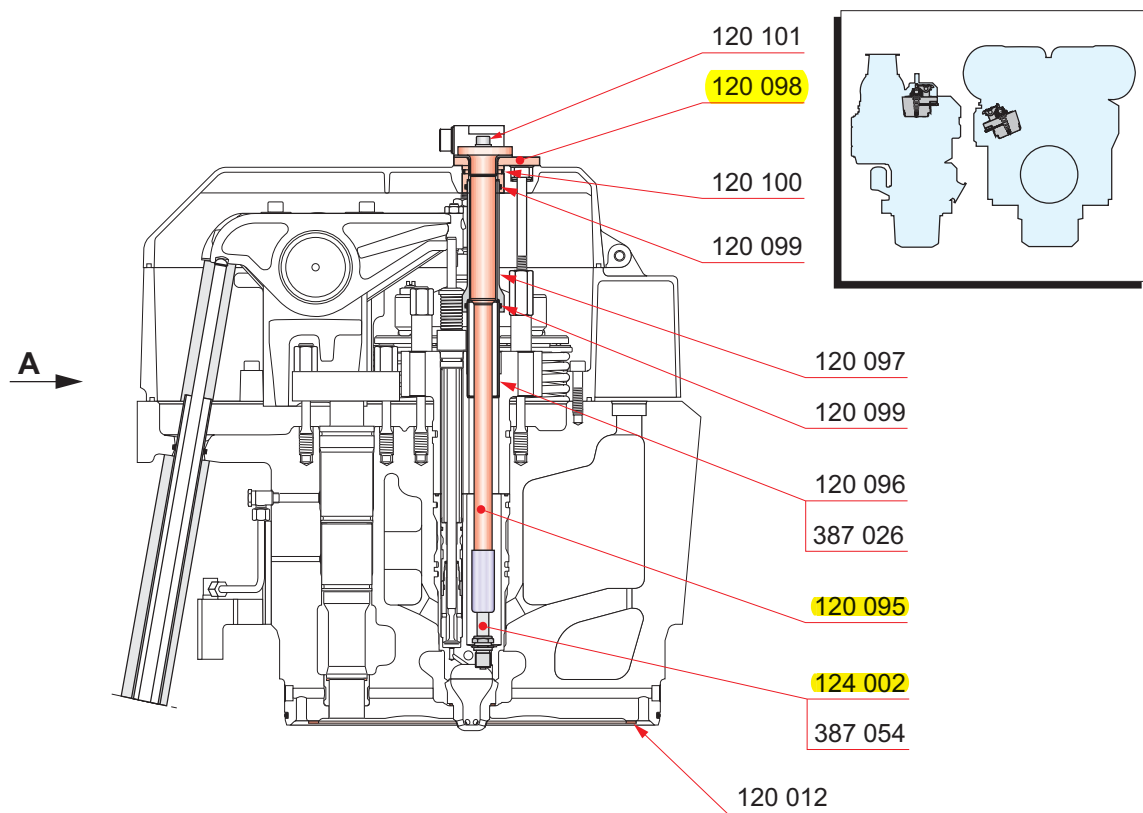
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>120 015</b>	<b>Sealing set for cylinder head replacement</b>	<b>1</b>	<b>-</b>
107 002	Hose gasket	1	-
107 143	Hose gasket	1	-
120 003	O-ring	2	-
120 012	Gasket	1	-
120 031	O-ring	1	-
120 081	O-ring	1	-
120 084	O-ring	1	-
145 021	O-ring	2	-
145 035	O-ring	1	-
200 018	Gasket	1	-
218 135	O-ring	1	-
218 136	O-ring	6	-

**Cylinder head without starting valve**



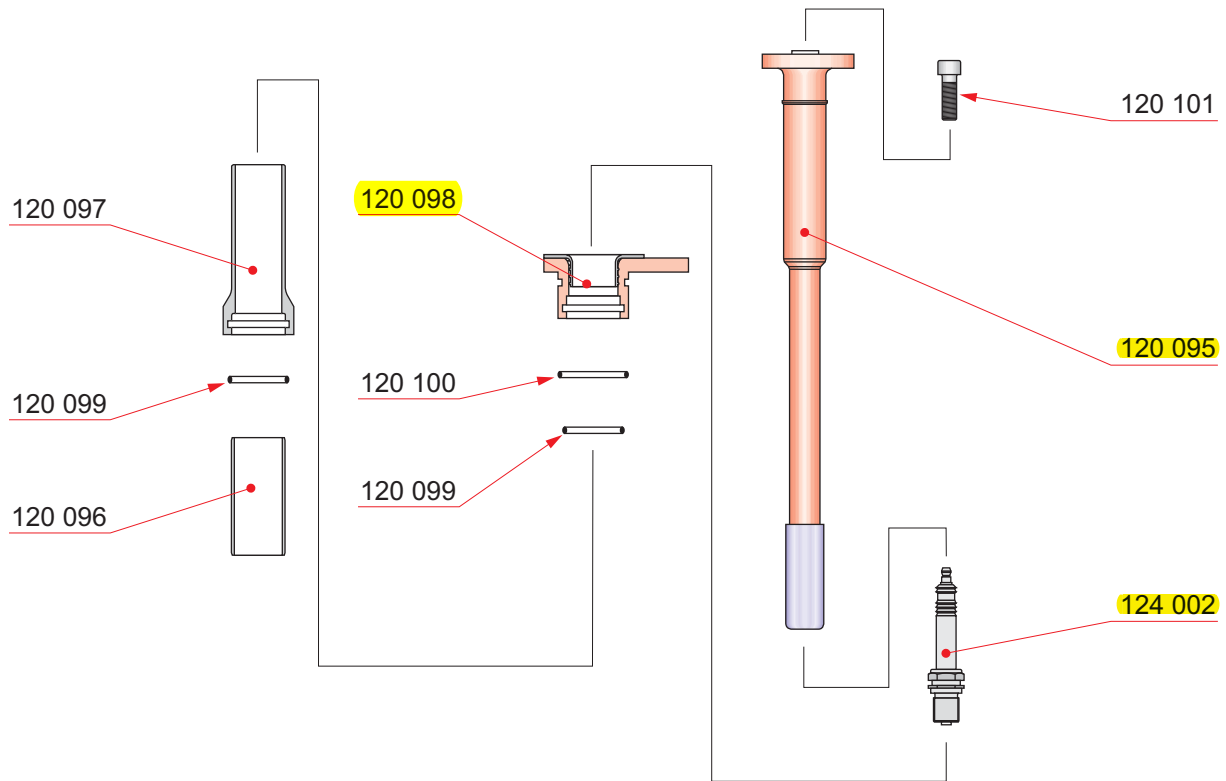
Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>120 054</b>	<b>Sealing set for cylinder head overhaul</b>	<b>1</b>	<b>-</b>	200 056	O-ring	2	-
100 025	O-ring	4	-	350 815	O-ring	1	-
120 017	O-ring	2	-	605 002	O-ring	2	-
120 052	Sealing ring	2	-	605 016	Sealing ring	2	-
121 005	O-ring	2	-	605 023	O-ring	2	-
121 011	O-ring	2	-	605 024	Retaining ring	2	-
123 010	O-ring	1	-	NOTE!	(1) Not used in all installations.		
123 011	Sealing ring	1	-	NOTE!	(2) Choose right O-rings according to your prechamber valve type.		
123 013	O-ring	1	-	NOTE!	* Choose right O-ring according to your prechamber valve type.		
123 014	O-ring (1)	1	-				
123 015	O-ring	1	-				
123 016	O-ring	1	-				
124 004	Gasket	2	-				
124 006	O-ring (2)	2	-				
124 018	O-ring	1	-				
124 037	Sealing ring	1	-				
124 038	O-ring	1	-				
124 039	O-ring *	1	-				
124 042	O-ring (2)	2	-				
124 046	Sealing ring (1)	1	-				
124 049	O-ring *	1	-				
124 052	O-ring (2)	1	-				
164 028	O-ring	1	-				
164 074	O-ring	2	-				
164 077	O-ring	1	-				
164 094	O-ring (1)	1	-				

## Cylinder head equipment



Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 012	Gasket	1	-
120 095	Ignition coil	1	-
120 096	Pipe	1	-
120 097	Sealing bush	1	-
120 098	Flange	1	-
120 099	O-ring	2	-
120 100	O-ring	1	-
120 101	Screw	2	-
124 002	Spark plug	1	-
387 026	Glue compound	1	-
387 054	Contact lubrication	1	-

**Cylinder head equipment**

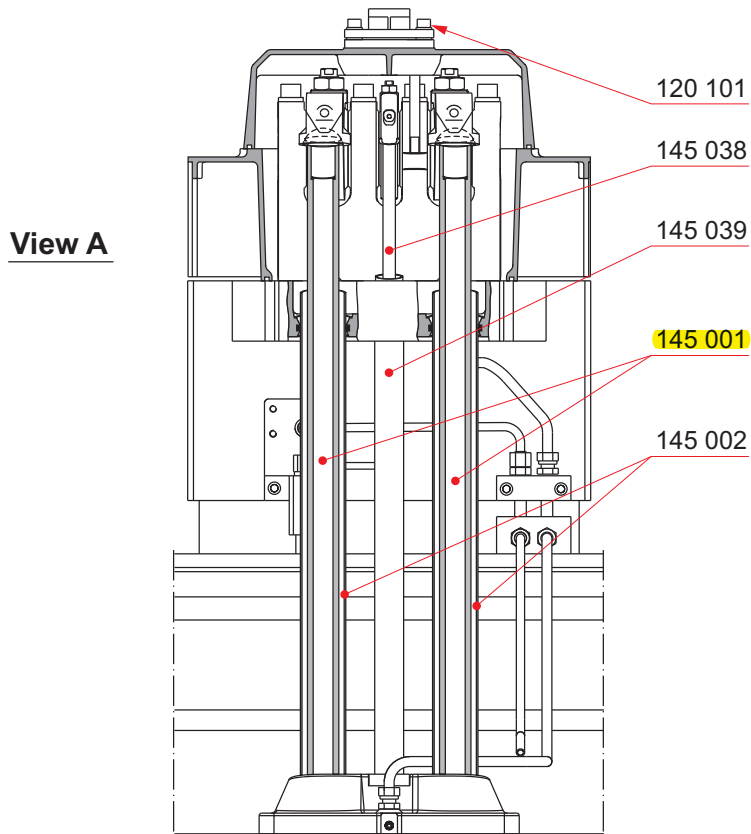


Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 095	Ignition coil	1	-
120 096	Pipe	1	-
120 097	Sealing bush	1	-
120 098	Flange	1	-
120 099	O-ring	2	-
120 100	O-ring	1	-
120 101	Screw	2	-
124 002	Spark plug	1	-



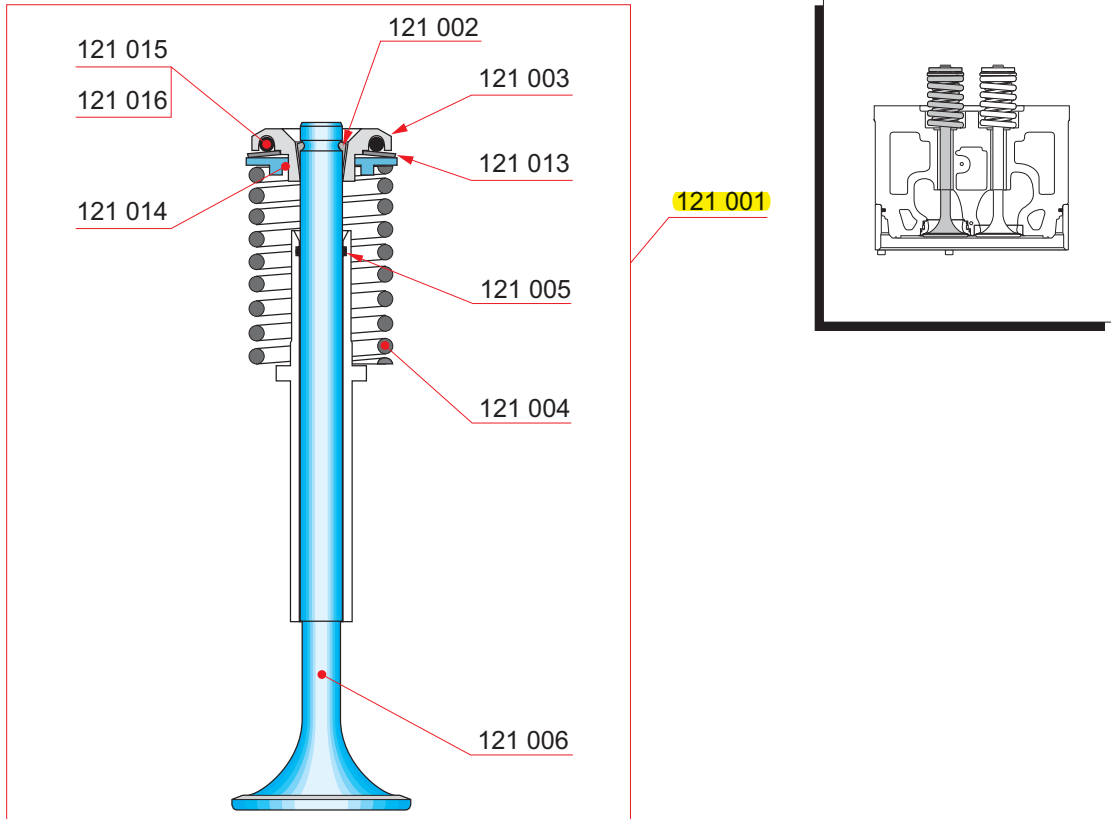
# APPENDIX A

## Cylinder head equipment



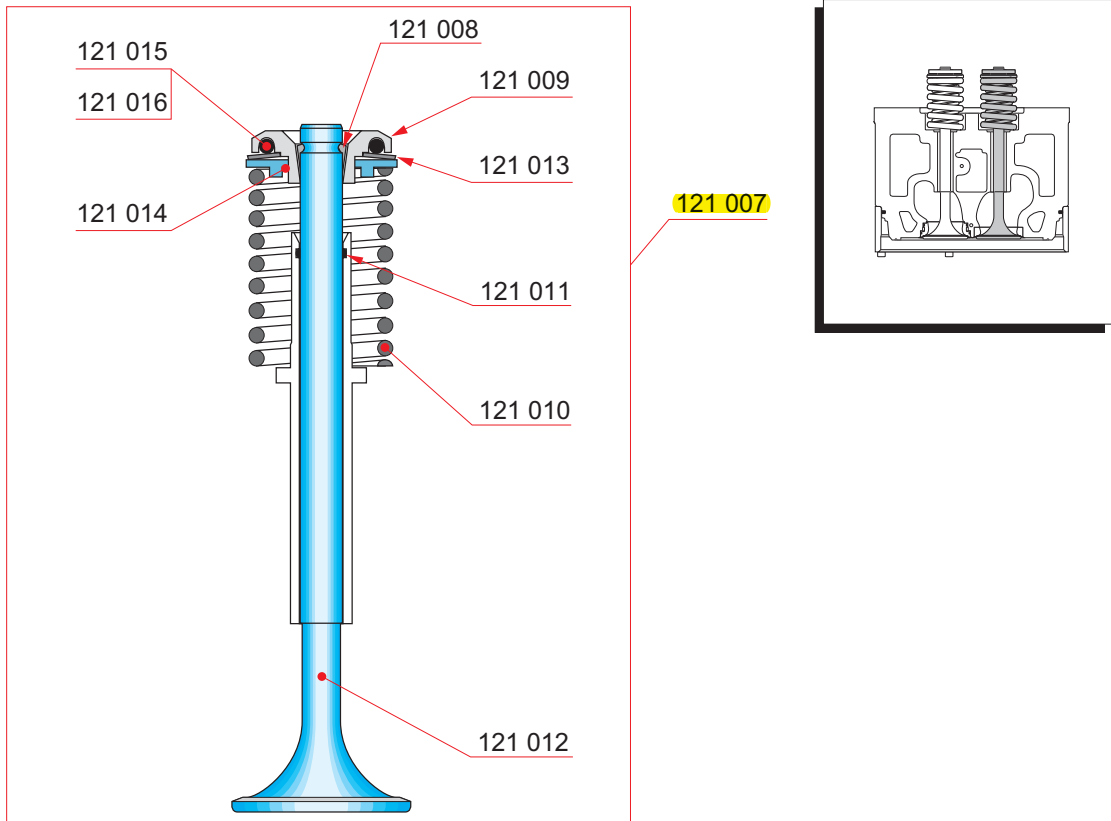
Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 101	Screw	2	-
145 001	Push rod	2	-
145 002	Protecting pipe	2	-
145 038	Push rod	1	-
145 039	Protecting pipe	1	-

**Exhaust valve assembly**



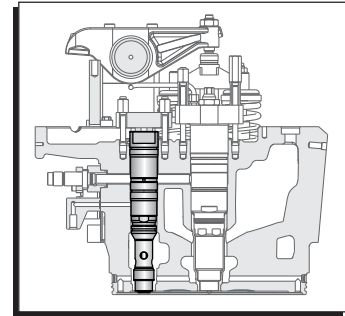
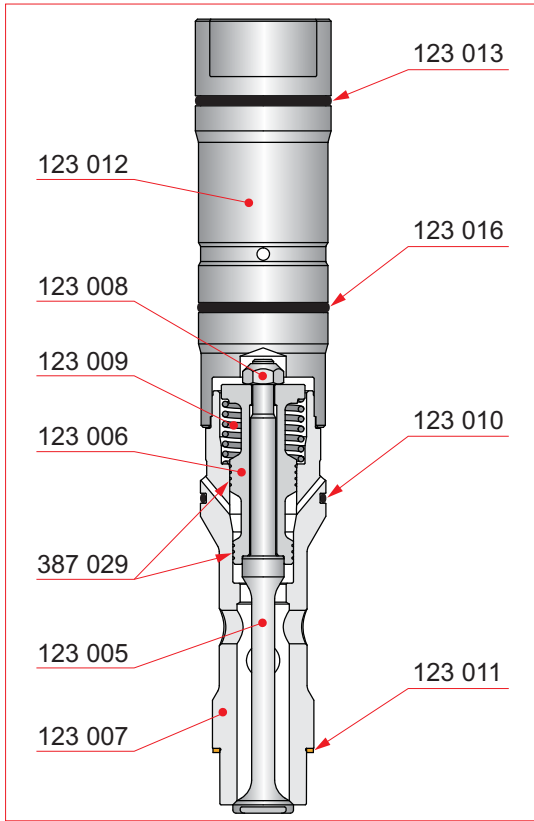
Part No.	Description	Qty [Pcs]	Wt. [Kg]
121 001	Exhaust valve, compl.	1	5.3
121 002	Valve cotter pair	1	-
121 003	Rotocap	1	0.7
121 013	Spring plate	1	-
121 014	Retainer ring	1	-
121 015	Spring	7	-
121 016	Ball	7	-
121 004	Spring	1	1.5
121 005	O-ring	1	-
121 006	Exhaust valve	1	2.9

**Inlet valve assembly**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>121 007</b>	<b>Inlet valve, compl.</b>	<b>1</b>	<b>-</b>
121 008	Valve cotter pair	1	-
121 009	Rotocap	1	0.7
121 013	Spring plate	1	-
121 014	Retainer ring	1	-
121 015	Spring	7	-
121 016	Ball	7	-
121 010	Spring	1	1.5
121 011	O-ring	1	-
121 012	Inlet valve	1	3.1

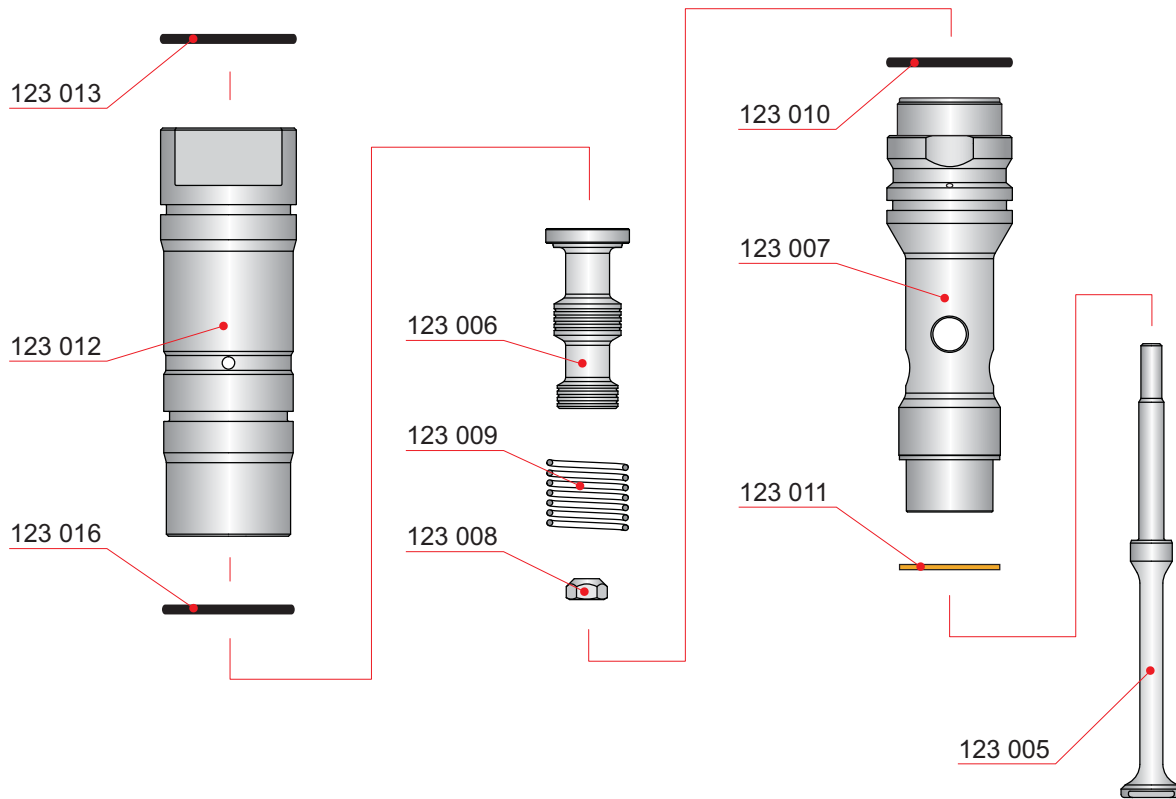
**Starting valve**



**123 001**

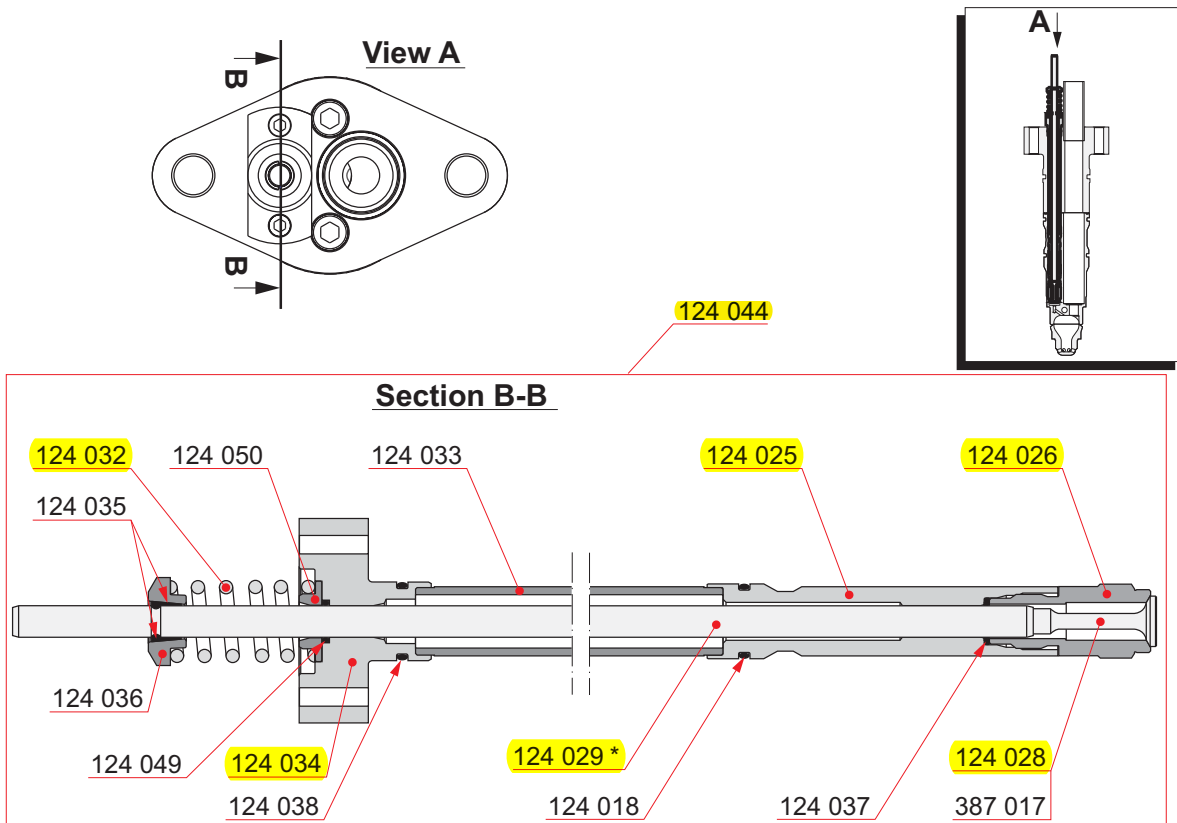
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>123 001</b>	<b>Starting valve</b>	<b>1</b>	<b>-</b>
123 005	Spindle	1	-
123 006	Piston	1	-
123 007	Housing	1	-
123 008	Nut	1	-
123 009	Spring	1	-
123 010	O-ring	1	-
123 011	Sealing ring	1	-
123 012	End piece	1	-
123 013	O-ring	1	-
123 016	O-ring	1	-
387 029	Assembly compound	1	-

Starting valve



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>123 001</b>	<b>Starting valve</b>	<b>1</b>	-
123 005	Spindle	1	-
123 006	Piston	1	-
123 007	Housing	1	-
123 008	Nut	1	-
123 009	Spring	1	-
123 010	O-ring	1	-
123 011	Sealing ring	1	-
123 012	End piece	1	-
123 013	O-ring	1	-
123 016	O-ring	1	-

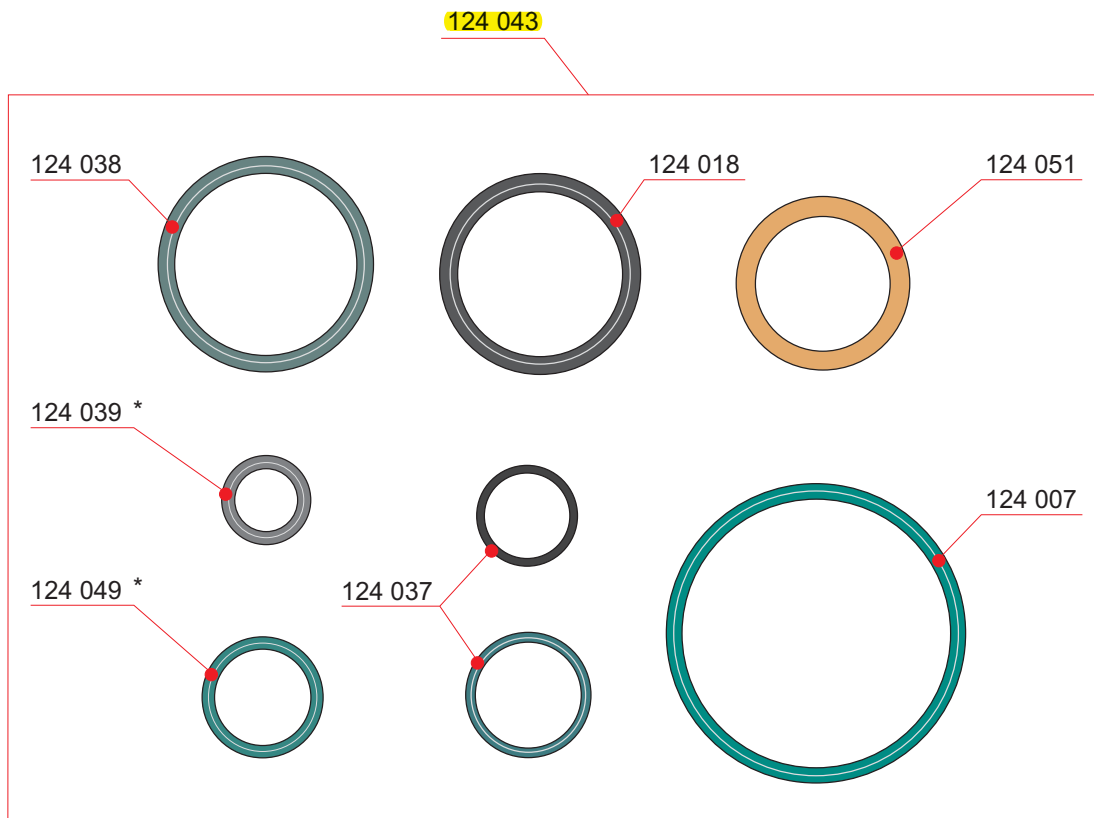
**Prechamber control valve**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
124 044	Prechamber control valve	1	-
124 018	O-ring	1	-
124 025	Valve guide	1	0.2
124 026	Valve seat	1	-
124 028	Valve	1	-
124 029	Rod *	1	0.1
124 032	Spring	1	-
124 033	Extension	1	0.2
124 034	Yoke	1	0.3
124 035	Valve cotter pair	1	-
124 036	Spring retainer	1	-
124 037	Sealing ring	1	-
124 038	O-ring	1	-
124 049	O-ring	1	0.2
124 050	Spring guide	1	-
387 017	Glue compound	1	-

NOTE! \*) To be lubricated with engine oil before mounting.

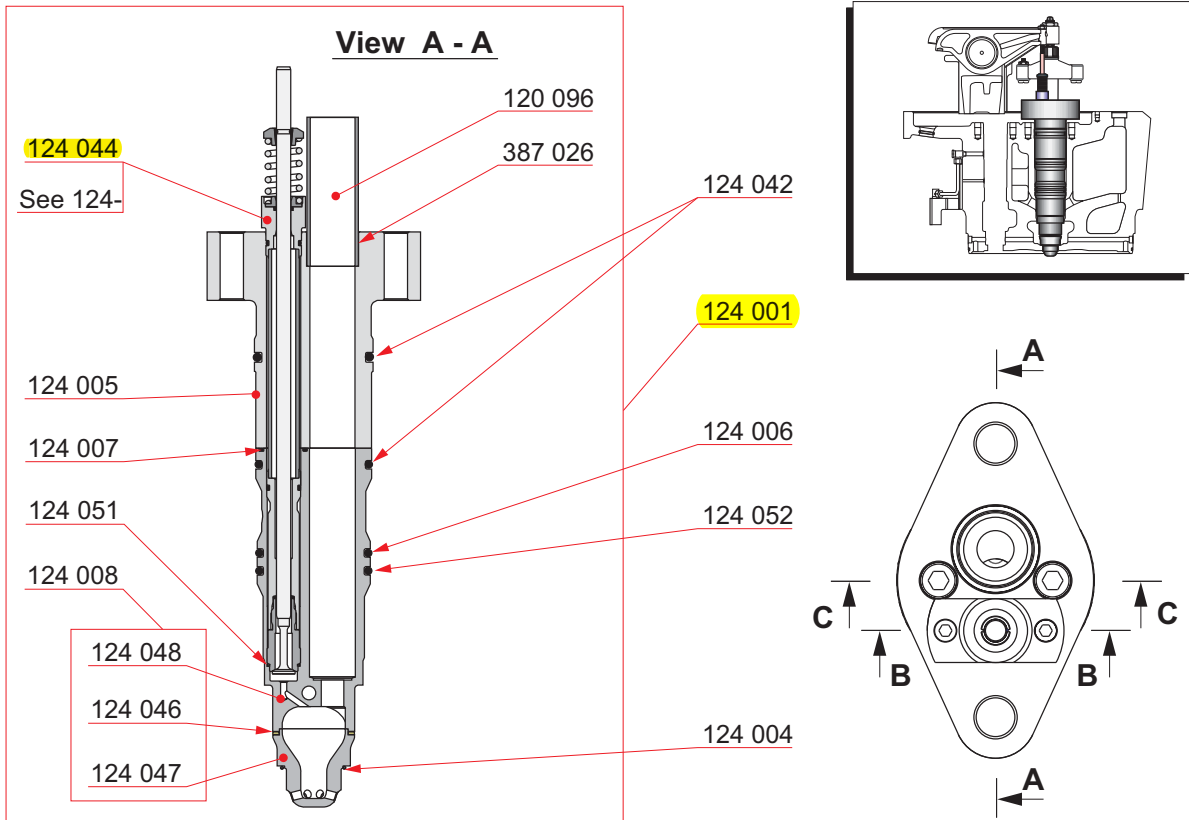
**Prechamber control valve**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>124 043</b>	<b>Sealing set</b>	<b>1</b>	<b>-</b>
124 007	O-ring	1	-
124 018	O-ring	1	-
124 037	Sealing ring	1	-
124 038	O-ring (1)	1	-
124 039	O-ring *	1	-
124 049	O-ring *	1	0.2
124 051	Seal ring (1)	1	-

NOTE! (1) Not used in all installations.  
 NOTE! \* Choose right O-ring according to your prechamber valve type.

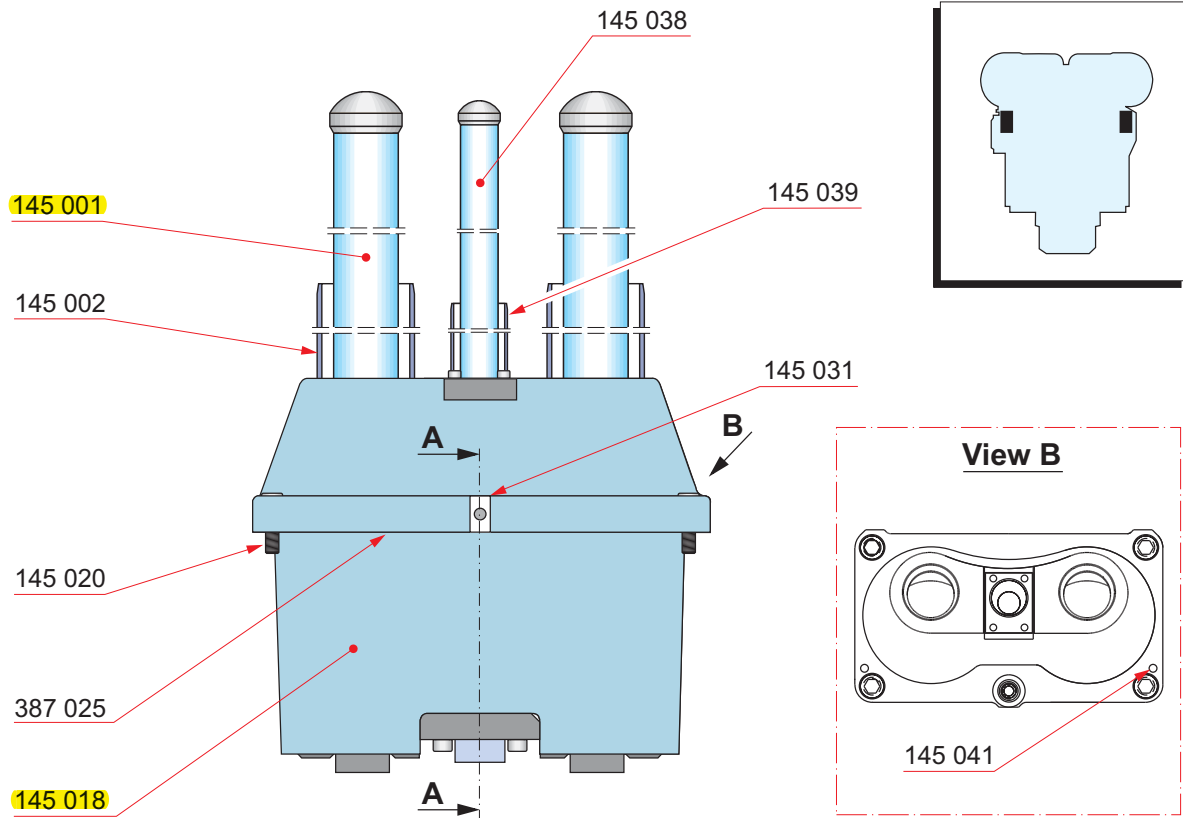
**Prechamber**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>124 001</b>	<b>Prechamber</b>	<b>1</b>	<b>-</b>
120 096	Pipe	1	-
124 005	Yoke	1	-
124 007	O-ring	1	-
124 008	Prechamber	1	-
124 046	Sealing ring	1	-
124 047	Prechamber, lower part	1	-
124 048	Prechamber, upper part	1	-
<b>124 044</b>	<b>Prechamber control valve</b>	<b>1</b>	<b>-</b>
124 004	Gasket	1	-
124 006	O-ring	1	-
124 042	O-ring	2	-
124 051	Seal ring	1	-
124 052	O-ring	1	-
387 026	Glue compound	1	-

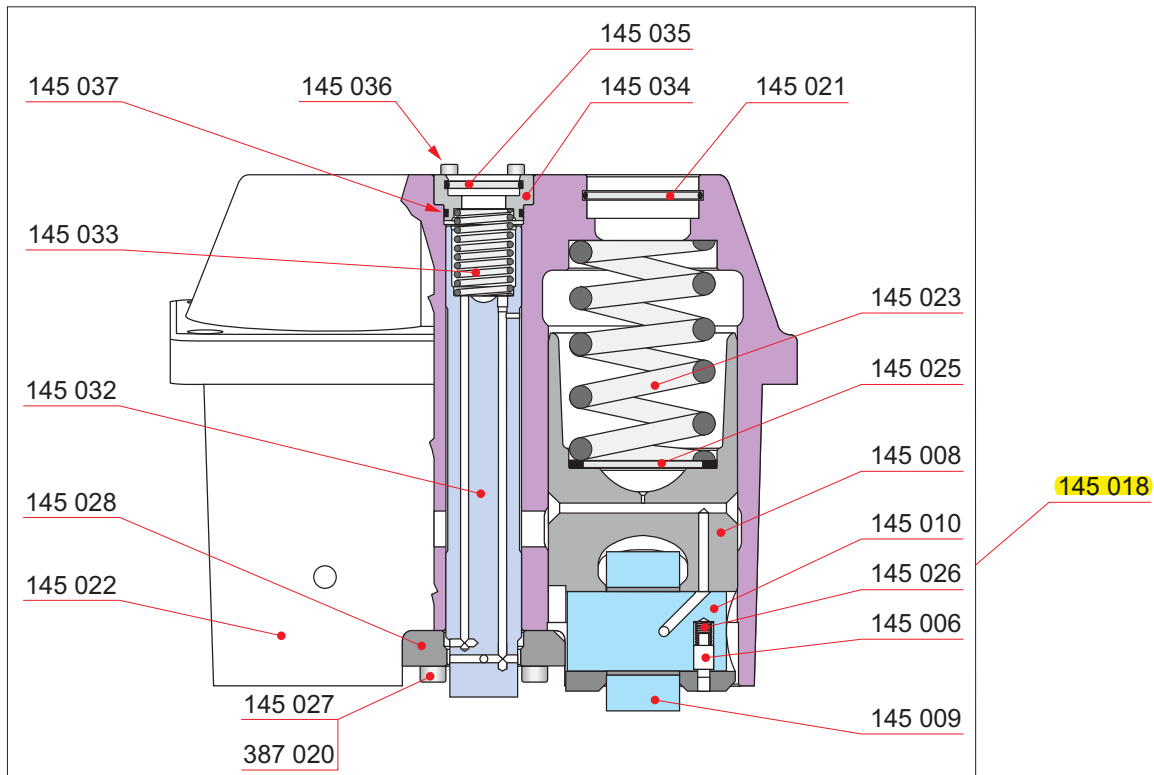


**Valve tappet with guide block**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
145 001	Push rod	2	-
145 002	Protecting pipe	2	-
145 018	Valve tappet	1	-
145 020	Screw	4	-
145 031	O-ring	1	-
145 038	Push rod	1	-
145 039	Protecting pipe	1	-
145 041	Spring pin	2	-
387 025	Glue compound	1	-

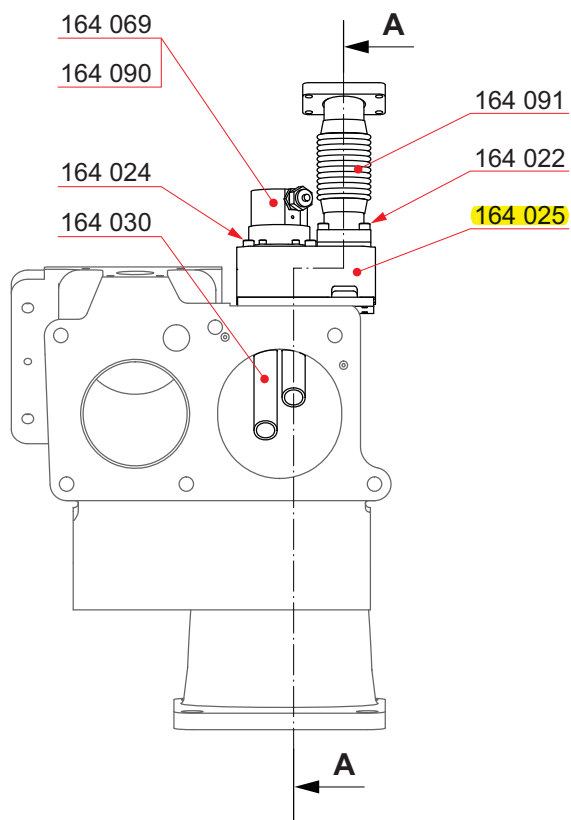
**Valve tappet with guide block**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>145 018</b>	<b>Valve tappet</b>	<b>1</b>	<b>-</b>
145 006	Pin	2	-
145 008	Valve tappet	2	-
145 009	Tappet roller (1)	2	-
145 010	Roller pin	2	-
145 021	O-ring	2	-
145 022	Housing	1	-
145 023	Spring	2	-
145 025	Washer	2	-
145 026	Spring	2	-
145 027	Screw	4	-
145 028	Guiding plate	1	-
145 032	Valve tappet	1	-
145 033	Spring	1	-
145 034	Cover	1	-
145 035	O-ring	1	-
145 036	Screw	4	-
145 037	O-ring	1	-
387 020	Glue compound	1	-

NOTE! (1) Bearing bush included.

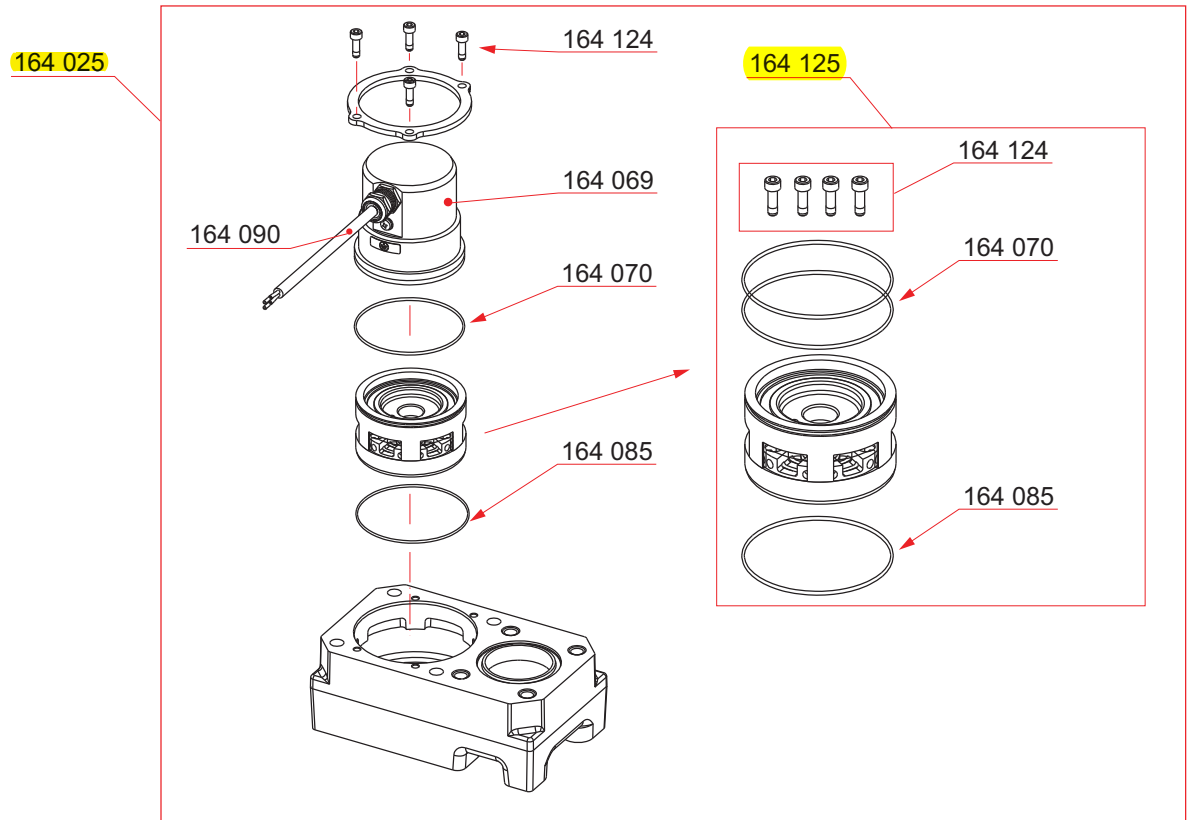
### Main gas admission valve



Part No.	Description	Qty [Pcs]	Wt. [Kg]
164 022	Screw	4	-
164 024	Screw	4	-
<b>164 025</b>	<b>Main gas valve</b>	<b>1</b>	<b>3.8</b>
164 069	Coil	1	1.7
164 090	Cable (1)	1	-
164 030	Pipe	1	1.8
164 091	Bellows	1	3.0

NOTE! (1) L= 3700 mm

**Main gas admission valve**



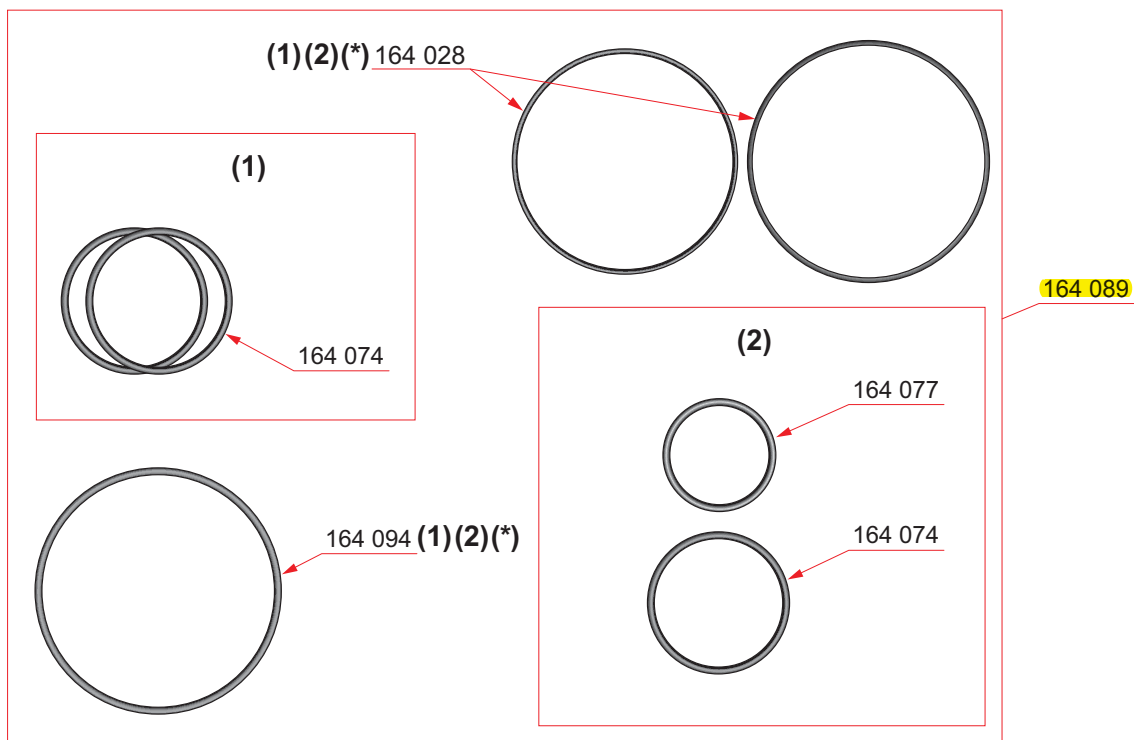
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>164 025</b>	<b>Main gas valve</b>	<b>1</b>	<b>3.8</b>
164 069	Coil	1	1.7
164 090	Cable (1)	1	-
<b>164 125</b>	<b>Cartridge set</b>	<b>1</b>	<b>3.7</b>
164 070	O-ring (2) *)	2	-
164 085	O-ring (2)	1	-
164 124	Screw set	1	0.1

NOTE! (1) L= 3700 mm

NOTE! (2) Components are not available as single parts

NOTE! \*) Amount depends on installation.

## Main gas admission valve



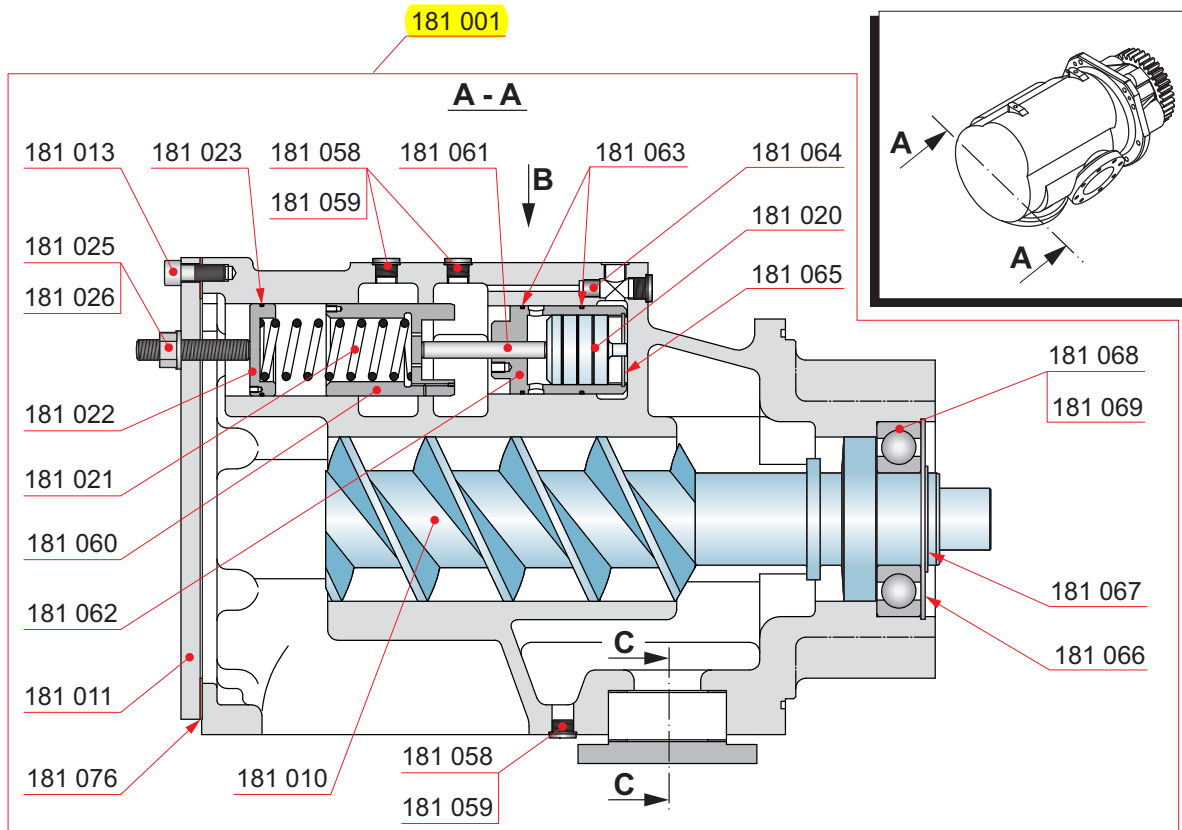
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>164 089</b>	<b>Spare part set</b>	<b>1</b>	<b>0.1</b>
164 028	O-ring *	1	-
164 028	O-ring *	1	-
164 074	O-ring (1)	2	-
164 074	O-ring (2)	1	-
164 077	O-ring (2)	1	-
164 094	O-ring *	1	-

NOTE! (1) Used for Wärtsilä engines.

NOTE! (2) Used for Vasa engines.

NOTE! \*) Select o-ring with the same size that is replaced.

**Lubricating oil pump**

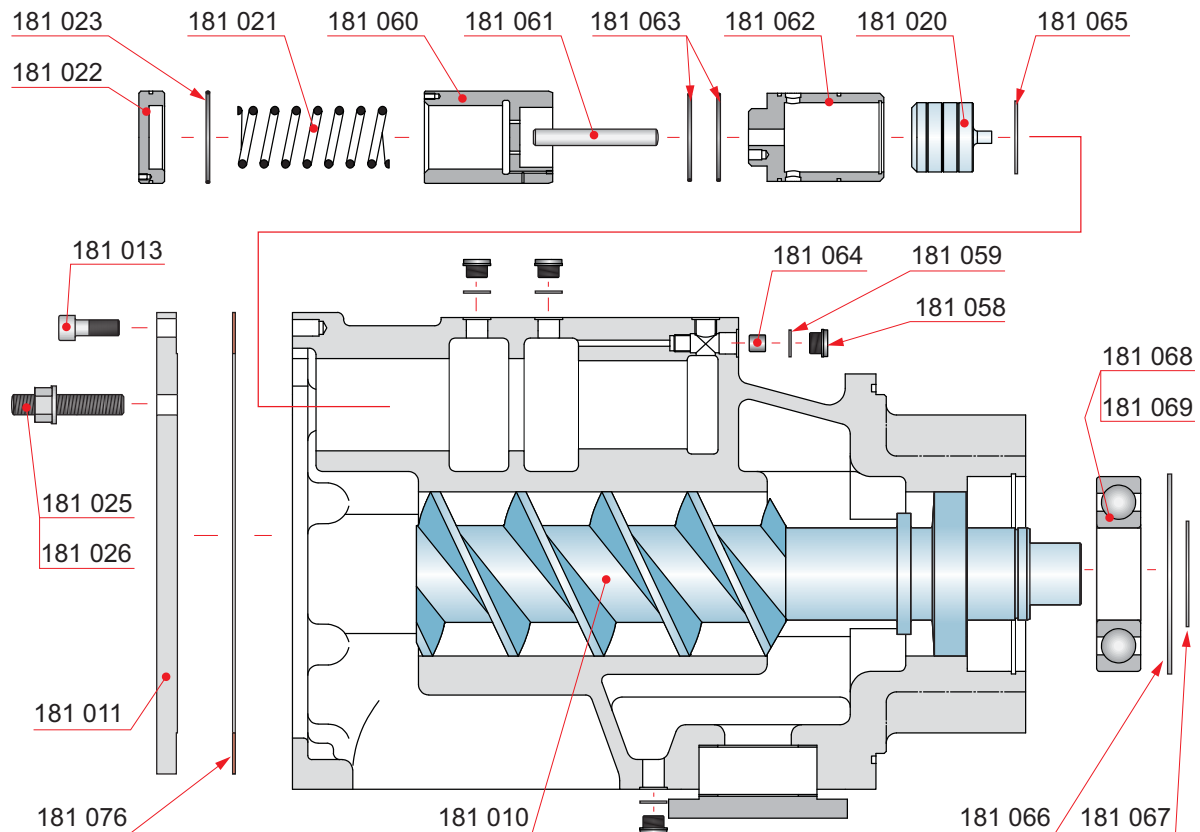


Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>181 001</b>	<b>Lubricating oil pump</b>	<b>1</b>	<b>-</b>	NOTE!	(3) Included in Spindle set 181 079		
181 010	Drive shaft (3)	1	80.0				
181 011	Cover	1	-				
181 013	Screw	9	-				
181 020	Piston (2)	1	-				
181 021	Compression spring (2)	1	-				
181 022	Spring holder (2)	1	-				
181 023	O-ring (2)	1	-				
181 025	Screw (2)	1	-				
181 026	Nut (2)	1	-				
181 058	Screw (1) (2)	7	-				
181 059	Sealing ring (1) (2)	7	-				
181 060	Valve cone (2)	1	-				
181 061	Cylindrical pin (2)	1	-				
181 062	Valve sleeve (2)	1	-				
181 063	O-ring (2)	2	-				
181 064	Non-return valve (2)	1	-				
181 065	Circlip (2)	1	-				
181 066	Circlip (1)	1	0.2				
181 067	Circlip (1)	1	-				
181 068	Spacer ring	1	-				
181 069	Ball bearing (1)	1	5.0				
181 076	Gasket (2)	1	-				

**NOTE!** (1) Included in Service kit 181 077  
 NOTE! (2) Included in Valve kit 181 078

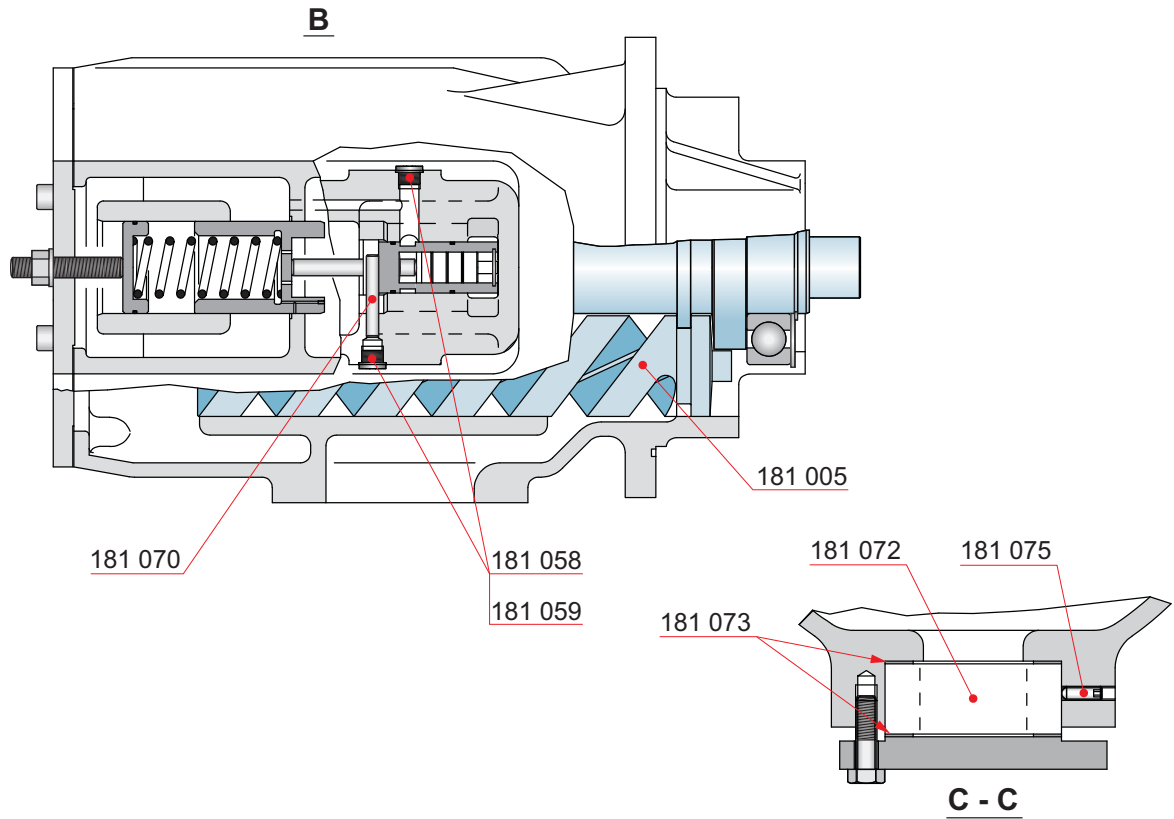
APPENDIX A

Lubricating oil pump



Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
181 010	Drive shaft (3)	1	80.0	<b>NOTE!</b>	<b>(1) Included in Service kit 181 077</b>		
181 011	Cover	1	-	<b>NOTE!</b>	<b>(2) Included in Valve kit 181 078</b>		
181 013	Screw	9	-	<b>NOTE!</b>	<b>(3) Included in Spindle set 181 079</b>		
181 020	Piston (2)	1	-				
181 021	Compression spring (2)	1	-				
181 022	Spring holder (2)	1	-				
181 023	O-ring (2)	1	-				
181 025	Screw (2)	1	-				
181 026	Nut (2)	1	-				
181 058	Screw (1) (2)	7	-				
181 059	Sealing ring (1) (2)	7	-				
181 060	Valve cone (2)	1	-				
181 061	Cylindrical pin (2)	1	-				
181 062	Valve sleeve (2)	1	-				
181 063	O-ring (2)	2	-				
181 064	Non-return valve (2)	1	-				
181 065	Circlip (2)	1	-				
181 066	Circlip (1)	1	0.2				
181 067	Circlip (1)	1	-				
181 068	Spacer ring	1	-				
181 069	Ball bearing (1)	1	5.0				
181 076	Gasket (2)	1	-				

**Lubricating oil pump**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
181 005	Drive shaft (3)	2	30.0
181 058	Screw (1) (2)	7	-
181 059	Sealing ring (1) (2)	7	-
181 070	Threaded pin (2)	1	-
181 072	Non-return valve	1	0.5
181 073	Gasket	2	-
181 075	Threaded pin	1	-

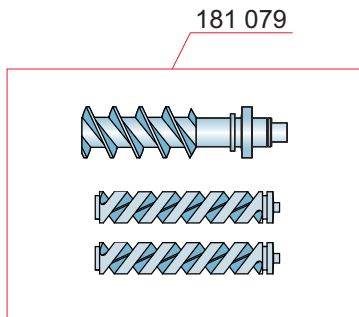
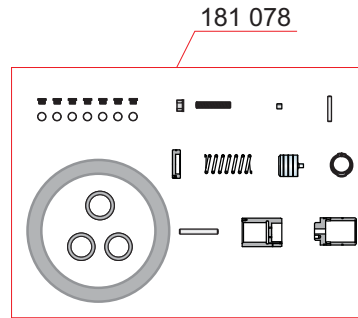
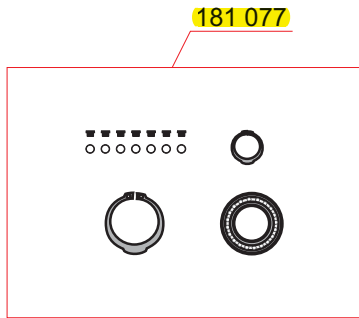
**NOTE!** (1) Included in Service kit 181 077

**NOTE!** (2) Included in Valve kit 181 078

**NOTE!** (3) Included in Spindle set 181 079



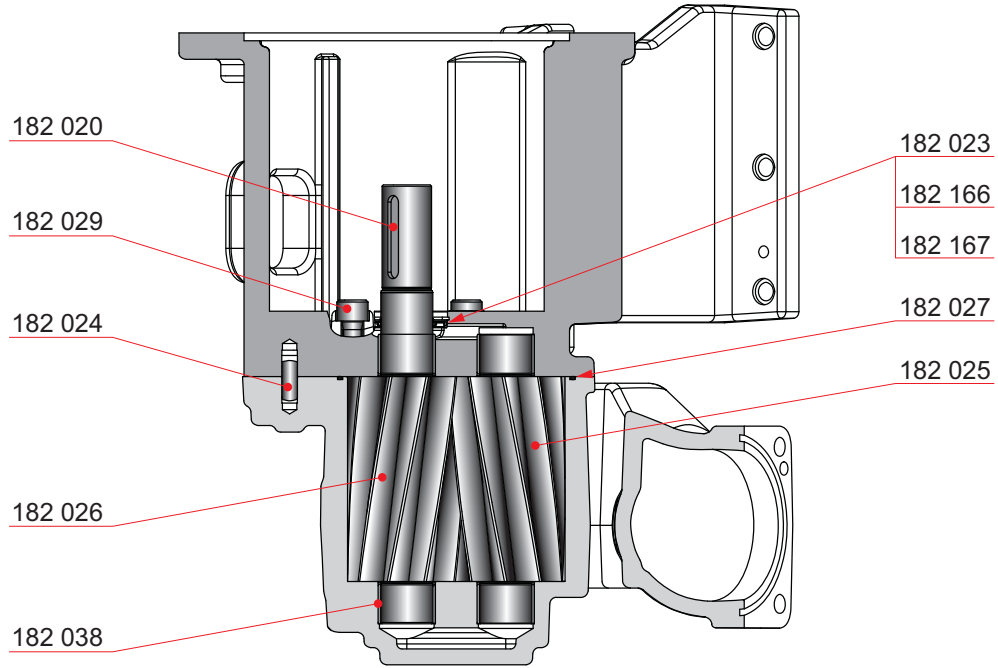
## Lubricating oil pump



Part No.	Description	Qty [Pcs]	Wt. [Kg]
181 077	Service kit	1	-
181 078	Valve kit	1	-
181 079	Spindle set	1	140

**Prelubricating oil pump**

**Section B - B**

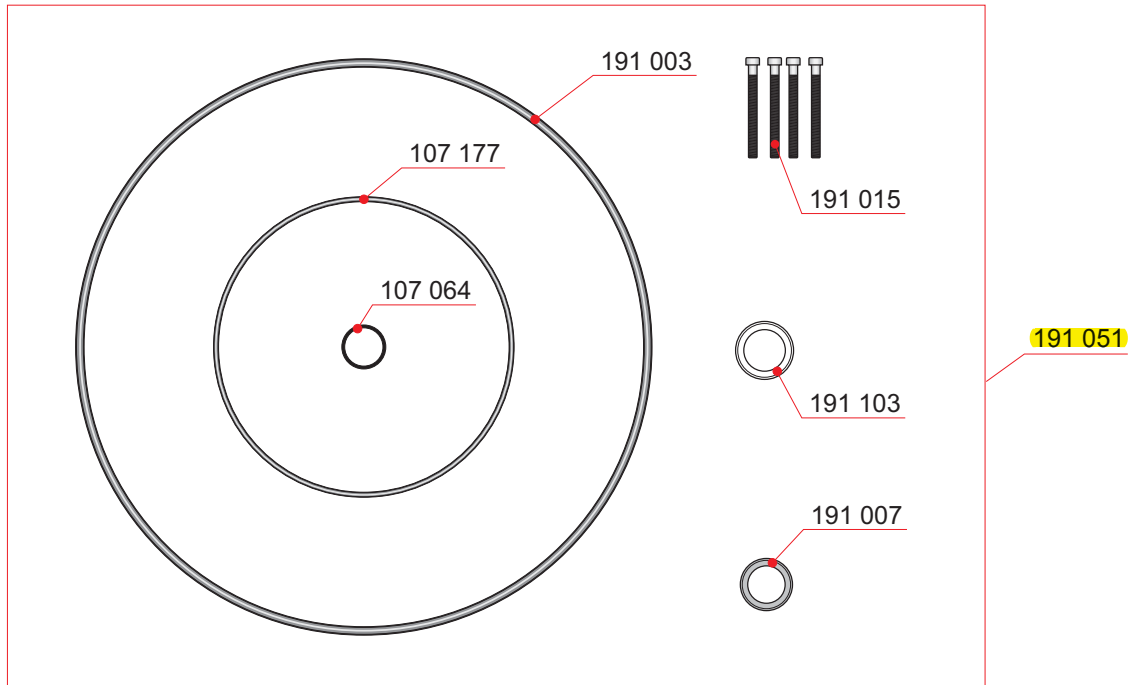


Part No.	Description	Qty [Pcs]	Wt. [Kg]
182 020	Key	1	-
182 023	Seal (2)	1	-
182 024	Pin	2	-
182 025	Gear shaft	1	5.6
182 026	Drive gear shaft	1	6.5
182 027	O-ring (2)	1	-
182 029	Screw	4	0.3
182 038	Bearing bush	4	-
<b>182 062</b>	<b>Sealing set (1)</b>	<b>1</b>	<b>-</b>
182 166	Retainer ring	1	-
182 167	Shim ring	1	-

NOTE! (1) Sealing set includes items marked  
(2)

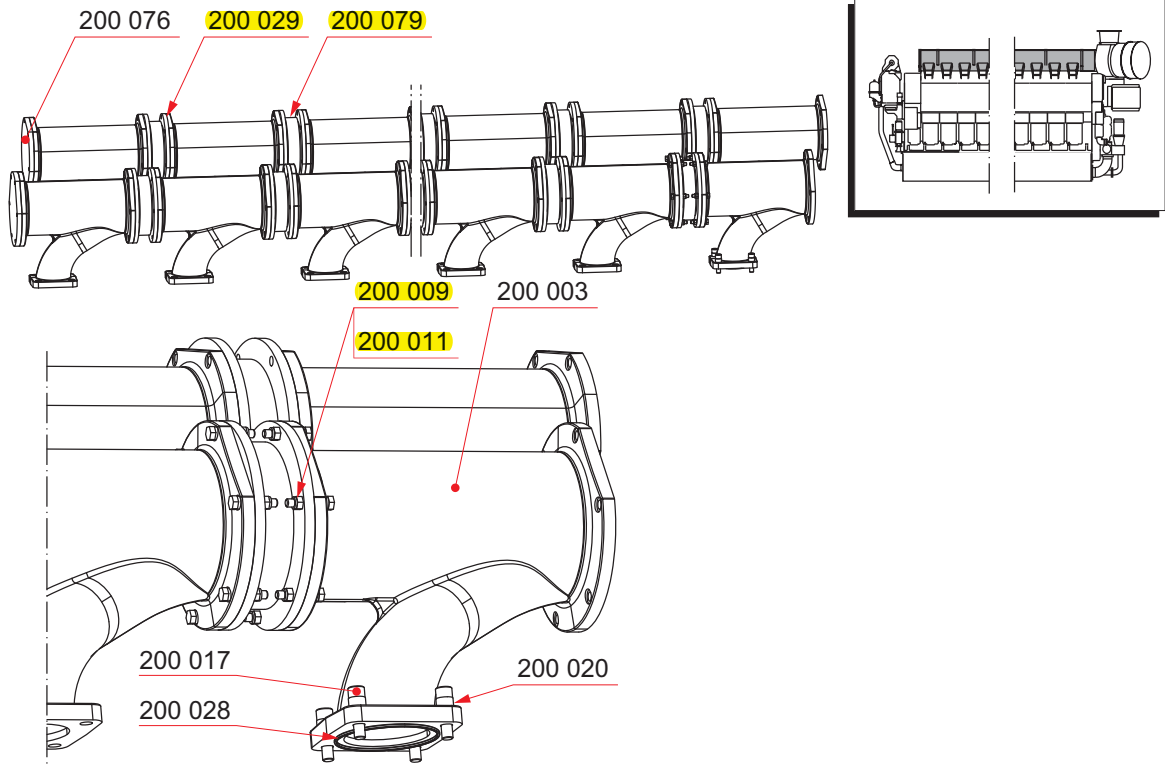
# APPENDIX A

## Water pump



Part No.	Description	Qty [Pcs]	Wt. [Kg]
191 051	Sealing set	1	0.4
107 064	O-ring	1	-
107 177	O-ring	1	-
191 003	O-ring	1	-
191 007	Shaft seal	1	0.1
191 015	Screw	4	-
191 103	Shaft seal	1	-

**Exhaust system**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
200 003	Exhaust pipe	*	-
200 009	Screw	*	-
200 011	Nut	*	-
200 017	Screw	*	-
200 020	Distance piece	*	-
200 028	Sealing ring	*	-
200 029	Gasket	*	-
200 076	End flange	2	-
200 079	Bellows	*	-

NOTE! \* See page 2

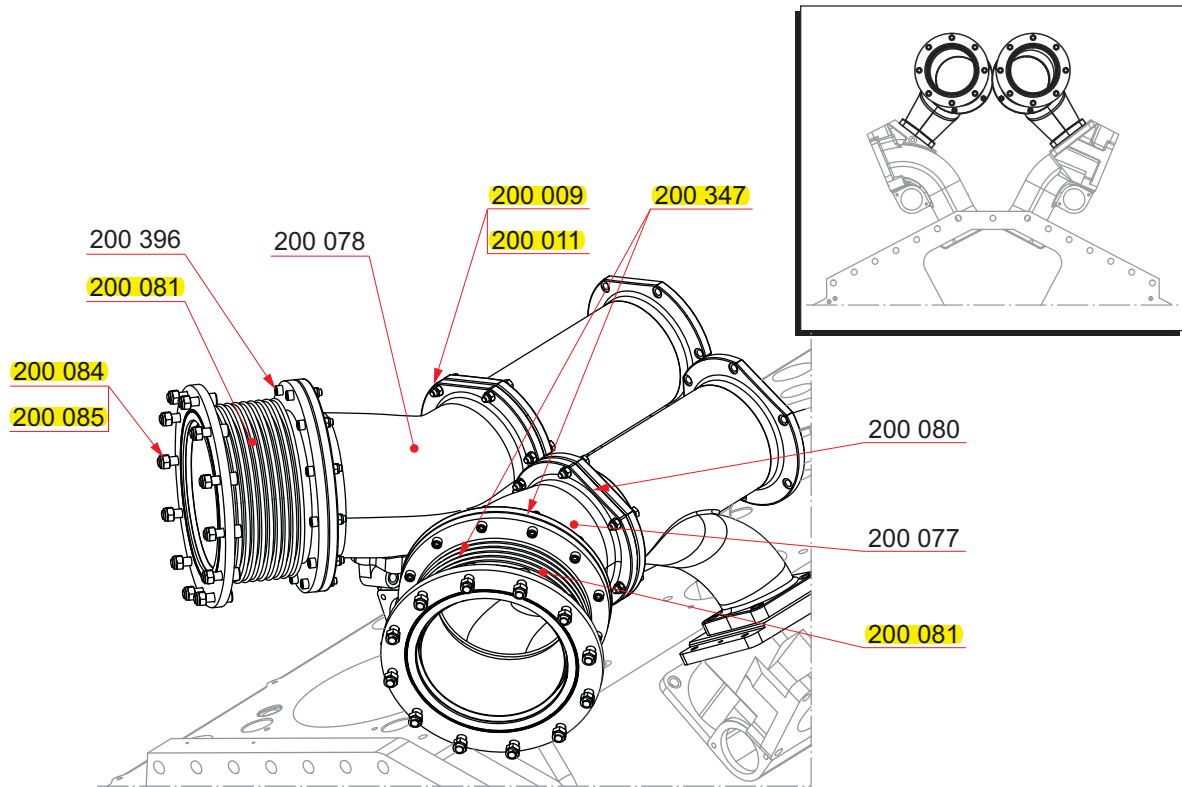
APPENDIX A

**Exhaust system**

Quantity according to number of cylinders

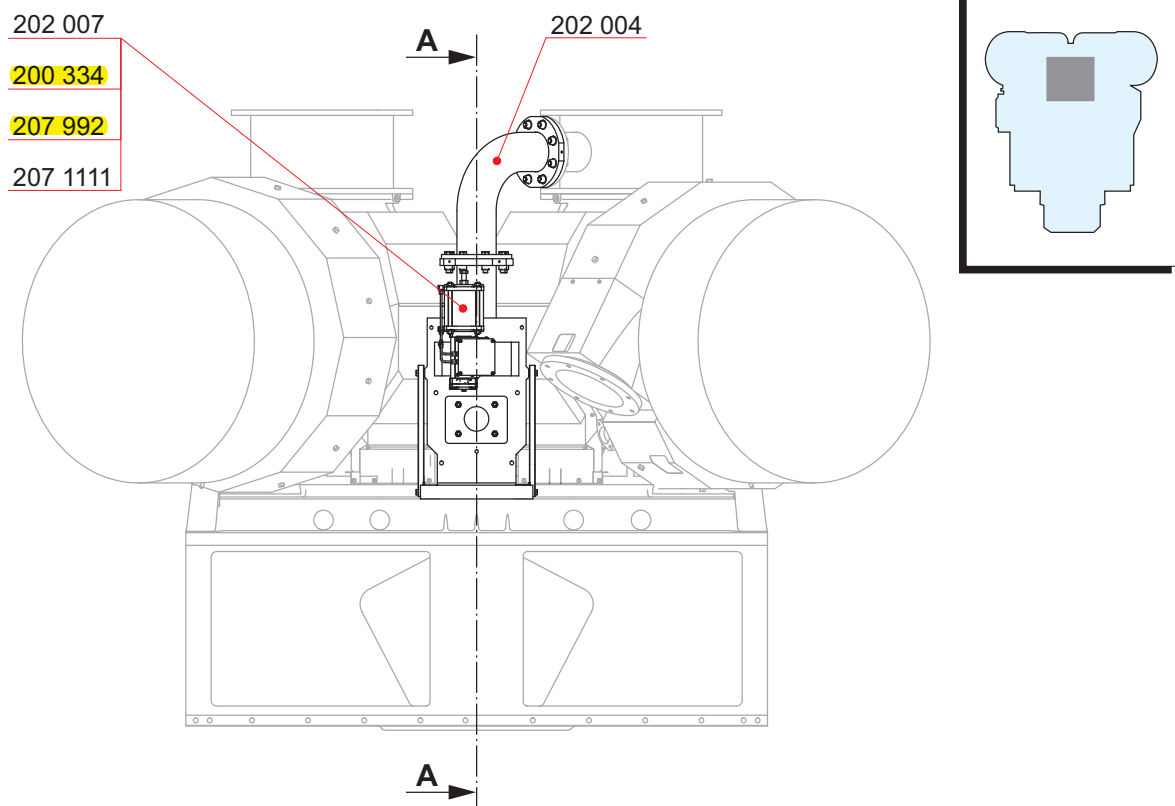
Part No. and Description	Quantity in pieces			
	12V	16V	18V	20V
200 003 Exhaust pipe	10	16	18	20
200 009 Screw	120	180	204	228
200 011 Nut	120	180	204	228
200 017 Screw	40	64	72	80
200 020 Distance piece	40	64	72	80
200 028 Sealing ring	10	16	18	20
200 029 Gasket	20	30	34	38
200 079 Bellows	10	14	16	16

Connection piece for exhaust gas



Part No.	Description	Qty [Pcs]	Wt. [Kg]
200 009	Screw	12	-
200 011	Nut	36	-
200 077	Connection piece	1	-
200 078	Connection piece	1	-
200 080	Sealing ring	2	-
200 081	Bellows	2	-
200 084	Screw	24	-
200 085	Nut	24	-
200 347	Sealing ring	4	-
200 396	Screw	24	-

## Wastegate system



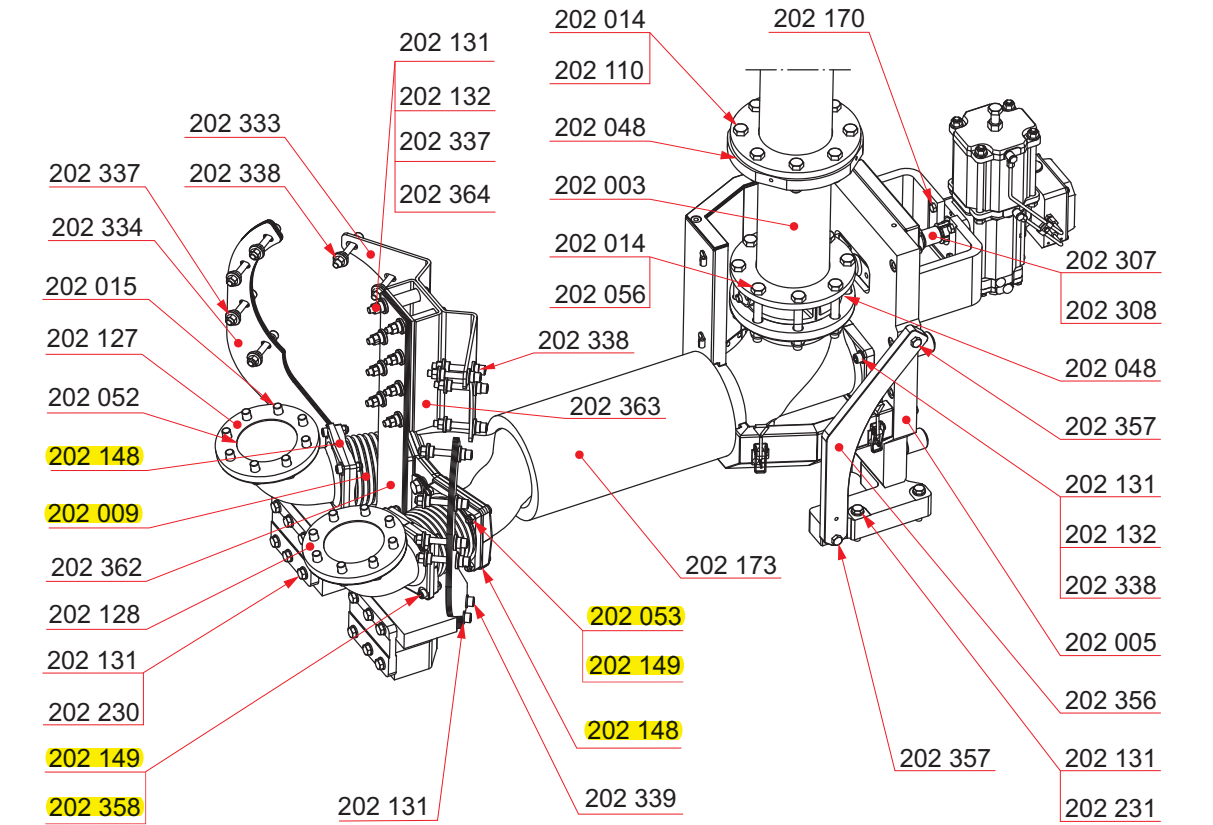
Part No.	Description	Qty [Pcs]	Wt. [Kg]
202 004	Pipe (1)	1	-
202 007	Valve (2)	1	19.6
200 334	Positioner	1	1.5
207 992	Butterfly valve	1	9.0
207 1111	Actuator	1	10.6

NOTE! (1) See section 202-

NOTE! (2) See section 207-

# APPENDIX A

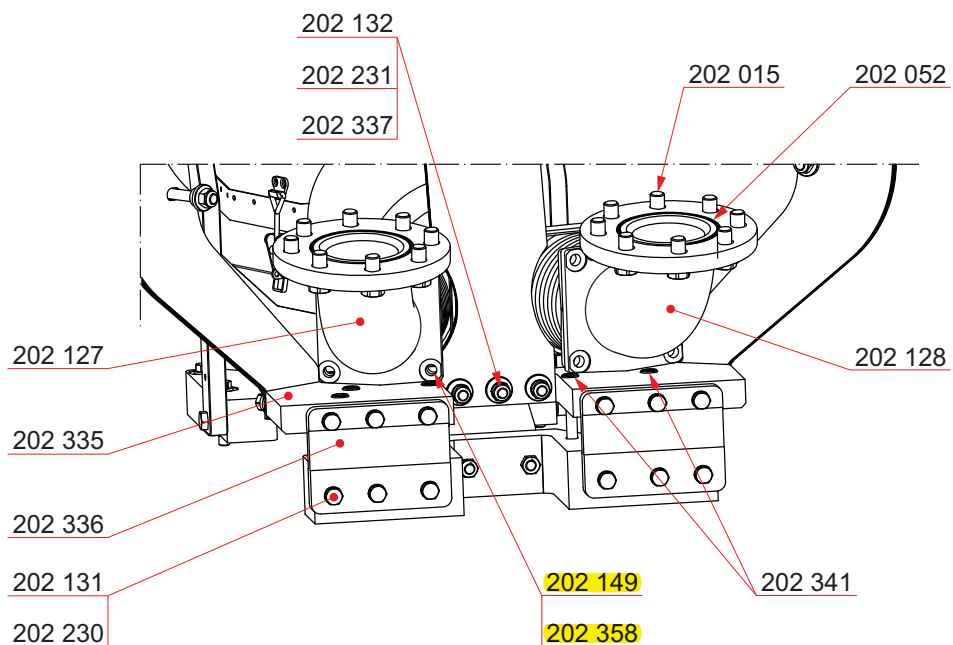
## Wastegate system



Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
202 003	Pipe	1	13.7	202 334	Support	10	0.7
202 005	Bracket	1	116	202 337	Distance sleeve	43	-
202 009	<b>Bellows</b>	<b>2</b>	<b>2.6</b>	202 338	Screw	20	-
202 014	Nut	16	-	202 339	Screw	4	-
202 015	Screw	18	-	202 356	Support arm	2	4.3
202 048	Sealing ring	3	-	202 357	Screw	4	-
202 052	Sealing ring	2	-	202 358	<b>Screw</b>	<b>8</b>	<b>-</b>
202 053	<b>Screw</b>	<b>8</b>	<b>-</b>	202 362	Support	5	1.0
202 056	Screw	8	0.2	202 363	Support	1	5.2
202 110	Screw	8	0.1	202 364	Screw	8	0.1
202 127	Pipe	1	10.4				
202 128	Pipe	1	10.4				
202 131	Washer	44	-				
202 132	Nut	33	-				
202 148	<b>Sealing ring</b>	<b>4</b>	<b>-</b>				
202 149	<b>Nut</b>	<b>16</b>	<b>-</b>				
202 170	Screw	4	-				
202 173	Exhaust pipe	1	56.8				
202 230	Screw	12	-				
202 231	Screw	9	-				
202 307	Distance piece	1	0.8				
202 308	Key	1	-				
202 333	Support	1	5.0				

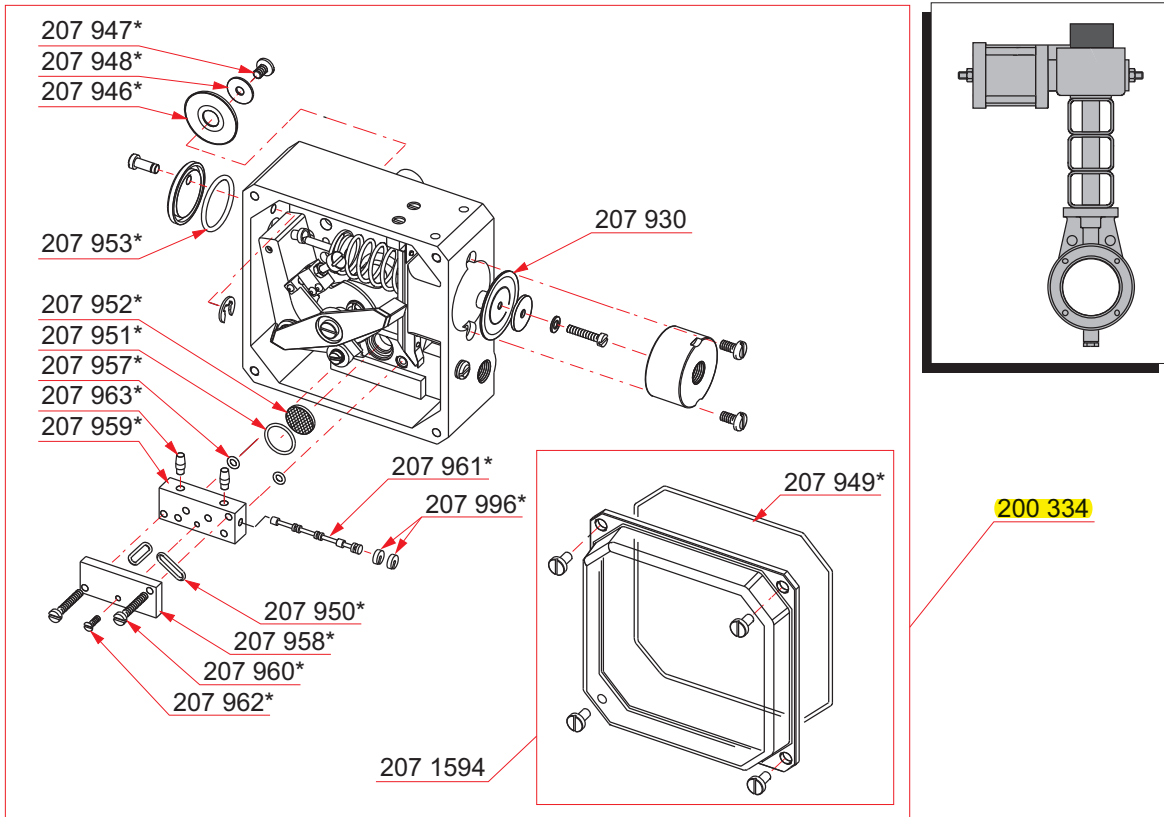


## Wastegate system



Part No.	Description	Qty [Pcs]	Wt. [Kg]
202 015	Screw	18	-
202 052	Sealing ring	2	-
202 127	Pipe	1	10.4
202 128	Pipe	1	10.4
202 131	Washer	44	-
202 132	Nut	33	-
202 149	Nut	16	-
202 230	Screw	12	-
202 231	Screw	9	-
202 335	Bracket	1	17.0
202 336	Support	2	2.2
202 337	Distance sleeve	43	-
202 341	Screw	4	0.1
202 358	Screw	8	-

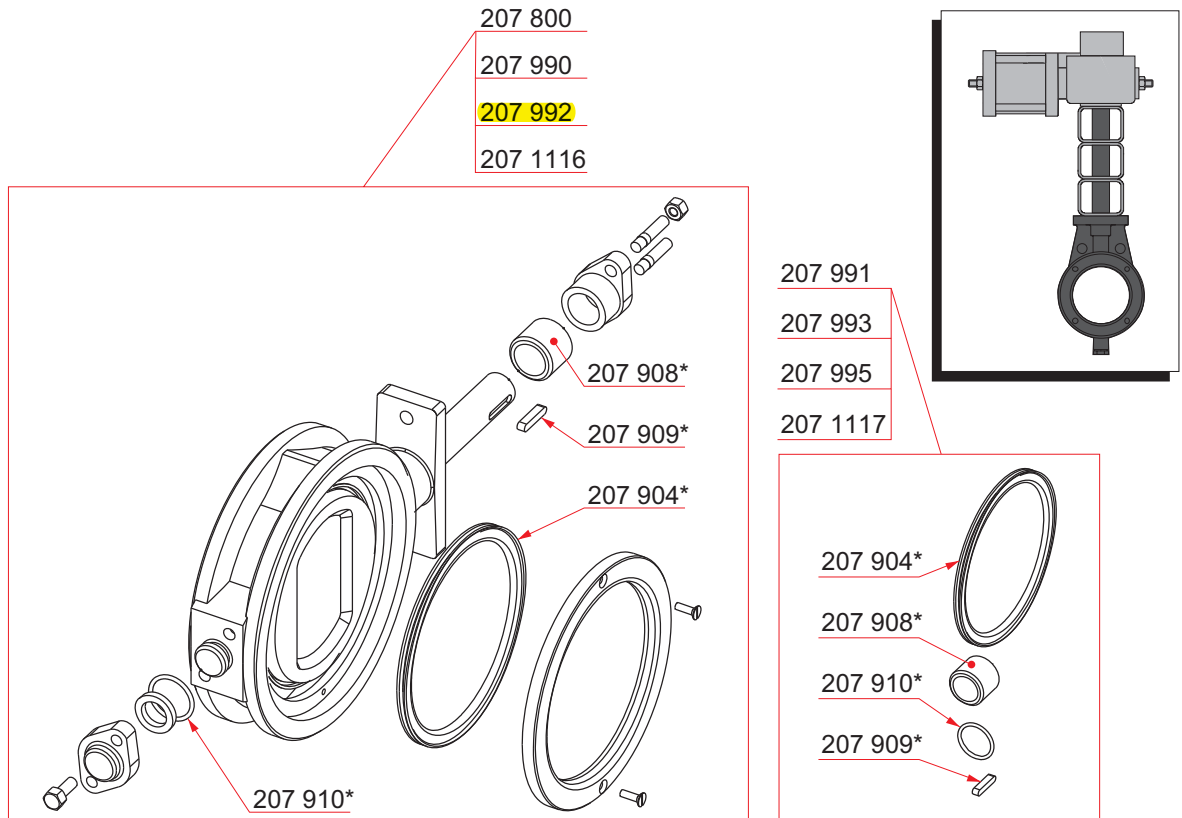
**Positioner for butterfly valve**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>200 334</b>	<b>Positioner</b>	<b>1</b>	<b>-</b>
207 930	Diaphragm	1	-
207 946	Diaphragm *	1	-
207 947	Screw *	1	-
207 948	Washer *	1	-
207 950	O-ring *	2	-
207 951	O-ring *	1	-
207 952	Filter *	1	-
207 953	O-ring *	1	-
207 957	O-ring *	2	-
207 958	Plate *	1	-
207 959	Housing *	1	-
207 960	Screw *	2	-
207 961	Spool assembly *	1	-
207 962	Screw *	1	-
207 963	Silencer *	2	-
207 996	Clip *	2	-
207 1594	Cover	1	-
207 949	O-ring *	1	-

NOTE! \*) Components are not available as single parts.

## Butterfly valve



Part No.	Description	Qty [Pcs]	Wt. [Kg]
207 800	Butterfly valve (1)	1	-
207 990	Butterfly valve (1)	1	-
<b>207 992</b>	<b>Butterfly valve (1)</b>	<b>1</b>	<b>-</b>
207 1116	Butterfly valve (1)	1	-
207 904	Seat *)	1	-
207 908	Stuffing box *)	1	-
207 909	Key *)	1	-
207 910	Gasket *)	1	-
207 991	Sealing set (1)	1	-
207 993	Sealing set (1)	1	-
207 995	Sealing set (1)	1	-
207 1117	Sealing set (1)	1	-
207 904	Seat *)	1	-
207 908	Stuffing box *)	1	-
207 909	Key *)	1	-
207 910	Gasket *)	1	-

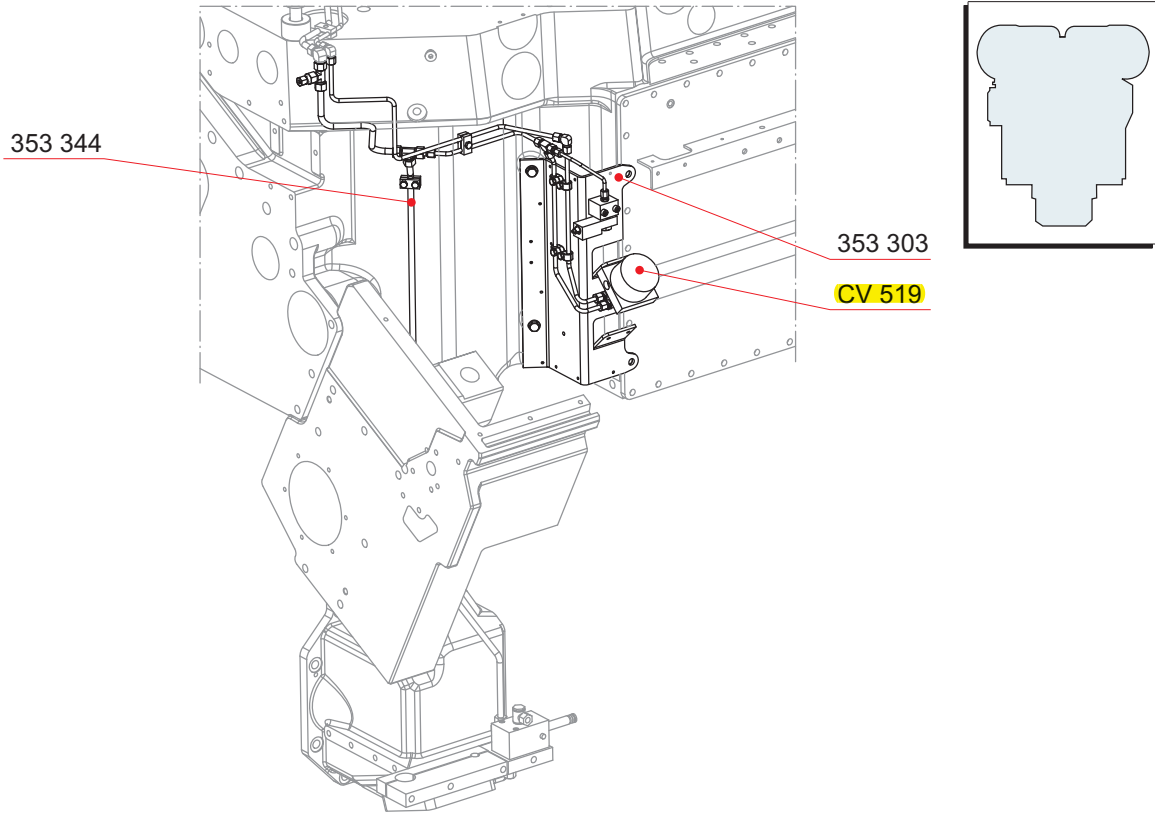
NOTE! (1) See page 2.

NOTE! \*) Components are not available as single parts. When ordering spare parts give butterfly valve type number.

**Butterfly valve**

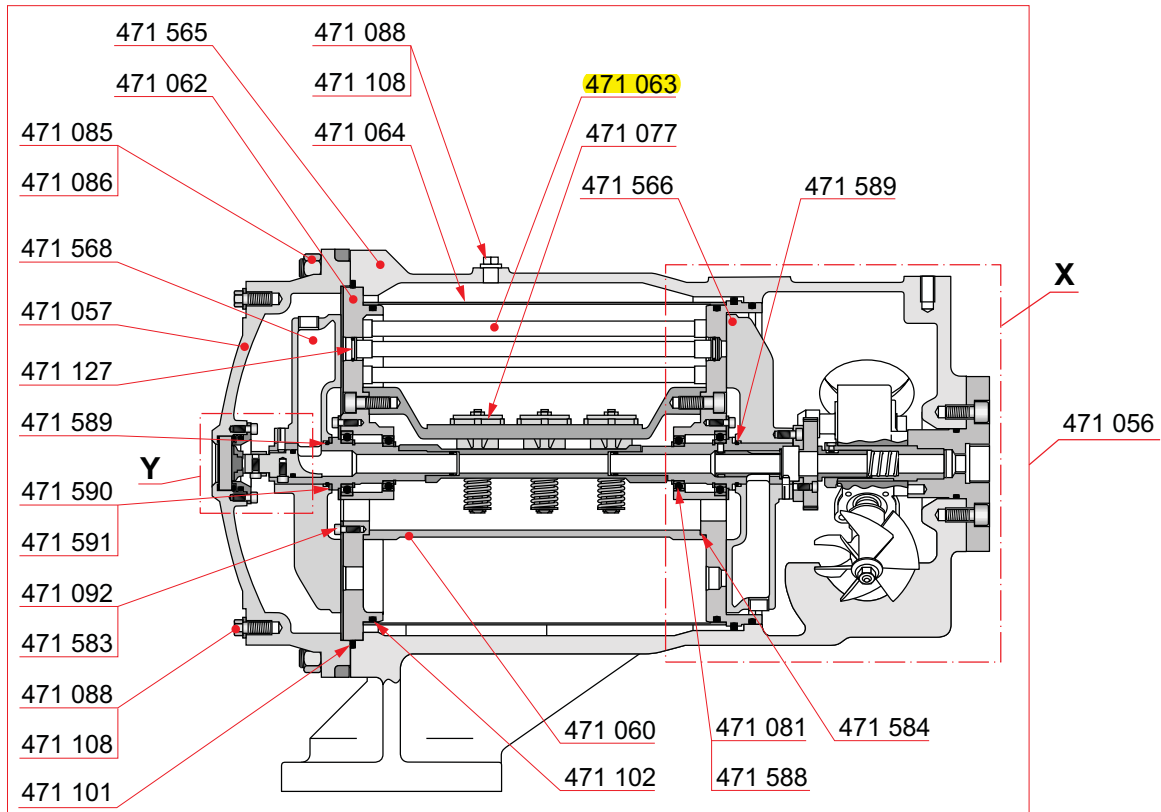
Type	Code	Code for sealing set
DN 80	207 1116	207 1117
DN 100	207 990	207 991
<b>DN 125</b>	<b>207 992</b>	<b>207 993</b>
DN 150	207 800	207 995

**Air pipes for waste gate**



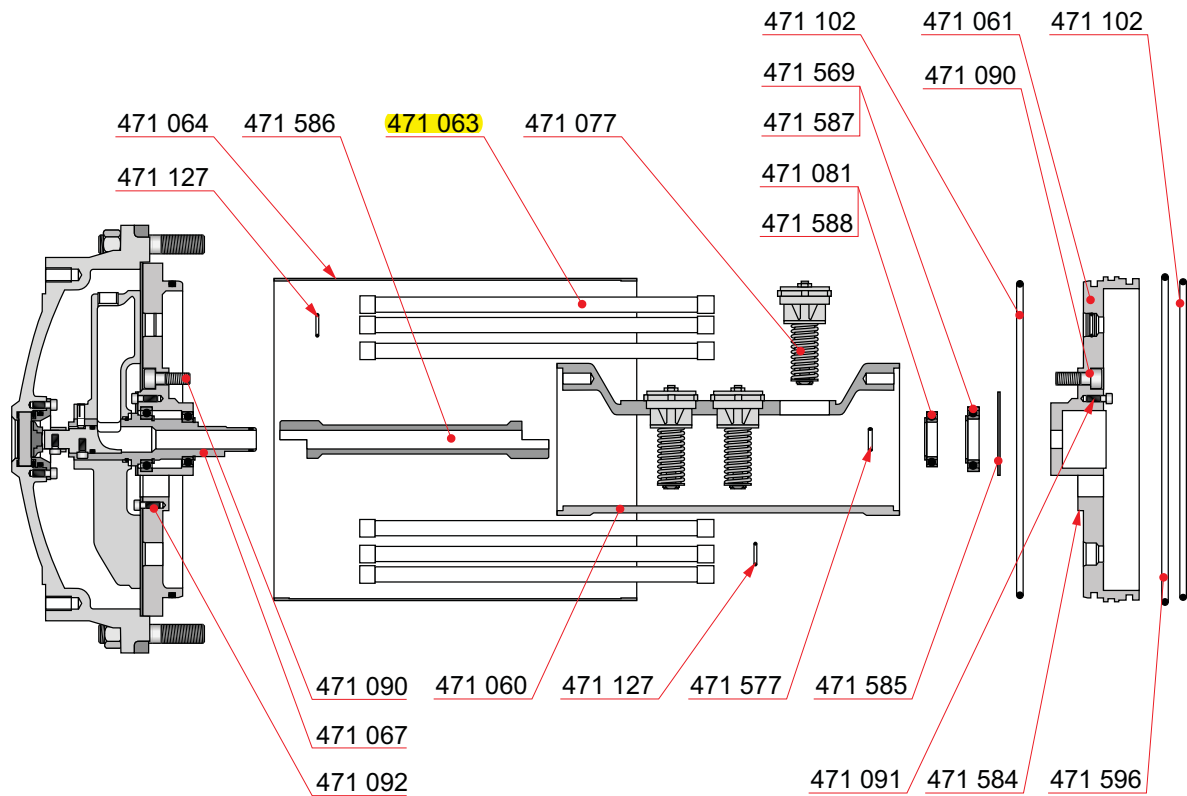
Part No.	Description	Qty [Pcs]	Wt. [Kg]
353 303	Supporting plate	1	-
353 344	Pipe	1	-
CV519	I/P converter	1	-

**Lubricating oil filter**



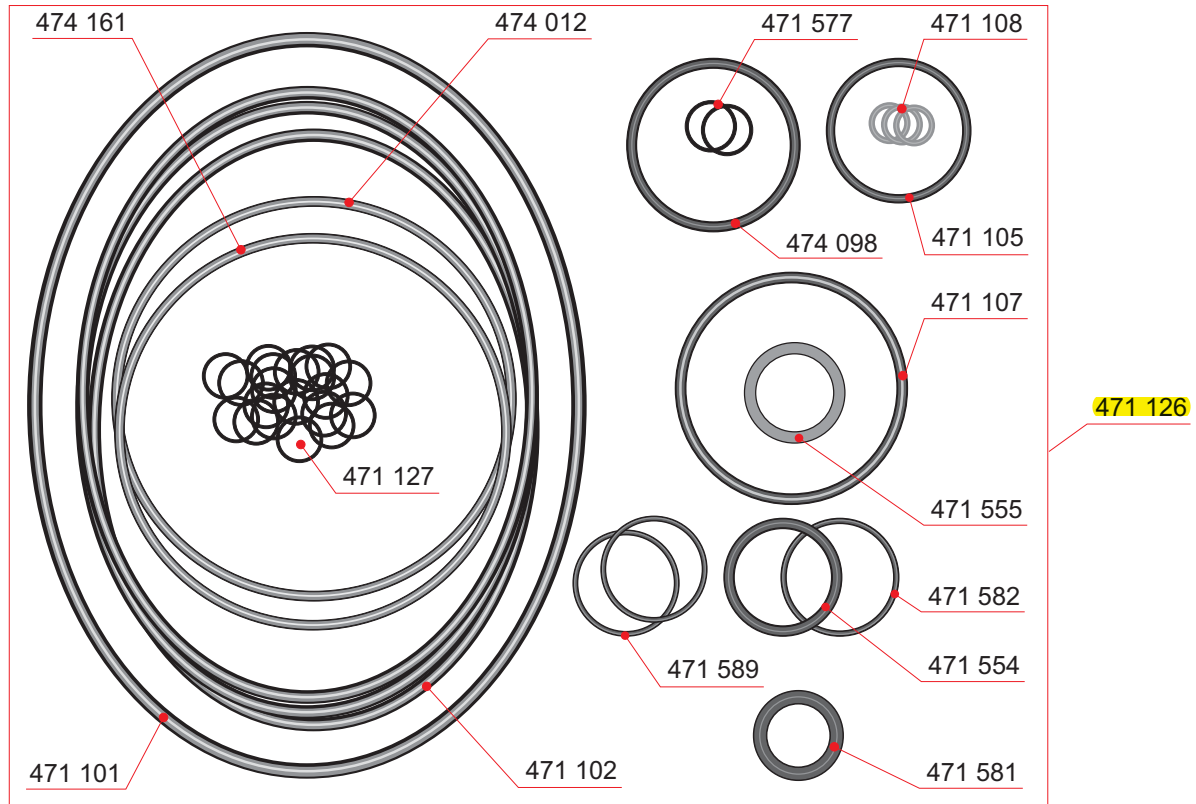
Part No.	Description	Qty [Pcs]	Wt. [Kg]
471 056	Lubricating oil filter	1	-
471 057	Cover	1	11.0
471 060	Tube stack	1	1.5
471 062	Plate	1	1.0
471 063	Filter cartridge	78	-
471 064	Filter cartridge	1	1.0
471 077	Valve	6	0.1
471 081	Ball bearing	2	-
471 085	Screw	8	-
471 086	Nut	8	-
471 088	Screw	3	-
471 092	Screw	3	-
471 101	O-ring	1	-
471 102	O-ring	3	-
471 108	Gasket	3	-
471 127	Cord ring	156	-
471 565	Housing	1	11.0
471 566	Distributor	1	0.6
471 568	Distributor	1	0.6
471 583	Pin	1	-
471 584	Pin	2	-
471 588	Locking ring	2	-
471 589	O-ring	2	-
471 590	Washer	2	-
471 591	Support disc	2	-
471 603	Candles tool kit	1	-

Lubricating oil filter



Part No.	Description	Qty [Pcs]	Wt. [Kg]
471 060	Tube stack	1	1.5
471 061	Plate	1	1.0
471 063	Filter cartridge	78	-
471 064	Filter cartridge	1	1.0
471 067	Shaft	2	1.0
471 077	Valve	6	0.1
471 081	Ball bearing	2	-
471 090	Screw	6	-
471 091	Screw	6	-
471 092	Screw	3	-
471 102	O-ring	3	-
471 127	Cord ring	156	-
471 569	Ball bearing	2	0.1
471 577	O-ring	2	-
471 584	Pin	2	-
471 585	Bracket	2	-
471 586	Pipe	1	1.1
471 587	Locking ring	2	-
471 588	Locking ring	2	-
471 596	Guide ring	1	-

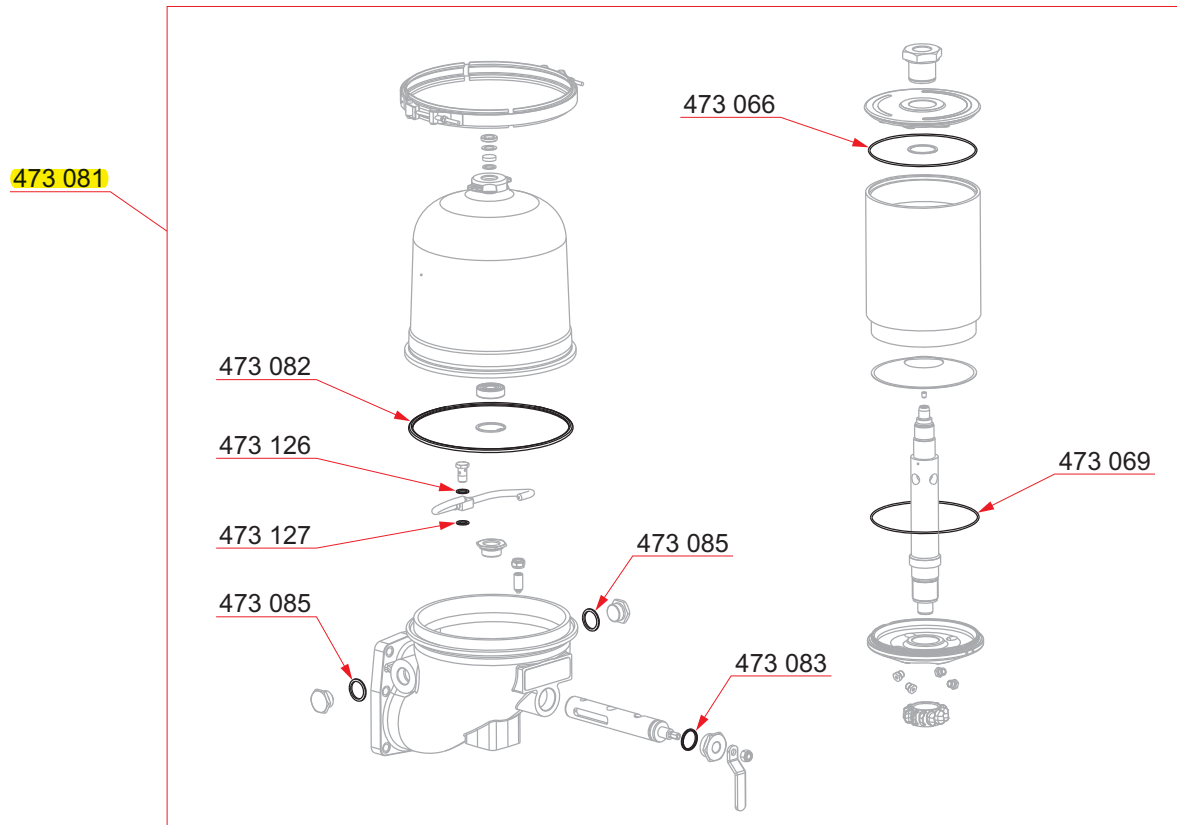
Lubricating oil filter



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>471 126</b>	<b>Sealing set</b>	<b>1</b>	<b>1.5</b>
471 101	O-ring	1	-
471 102	O-ring	3	-
471 105	O-ring	1	-
471 107	O-ring	1	-
471 108	Gasket	3	-
471 127	Cord ring	156	-
471 554	O-ring	1	-
471 555	Gasket	1	-
471 577	O-ring	2	-
471 581	O-ring	1	-
471 582	O-ring	1	-
471 589	O-ring	2	-
474 012	O-ring	1	-
474 098	O-ring	1	-
474 161	O-ring	1	-



## Centrifugal filter

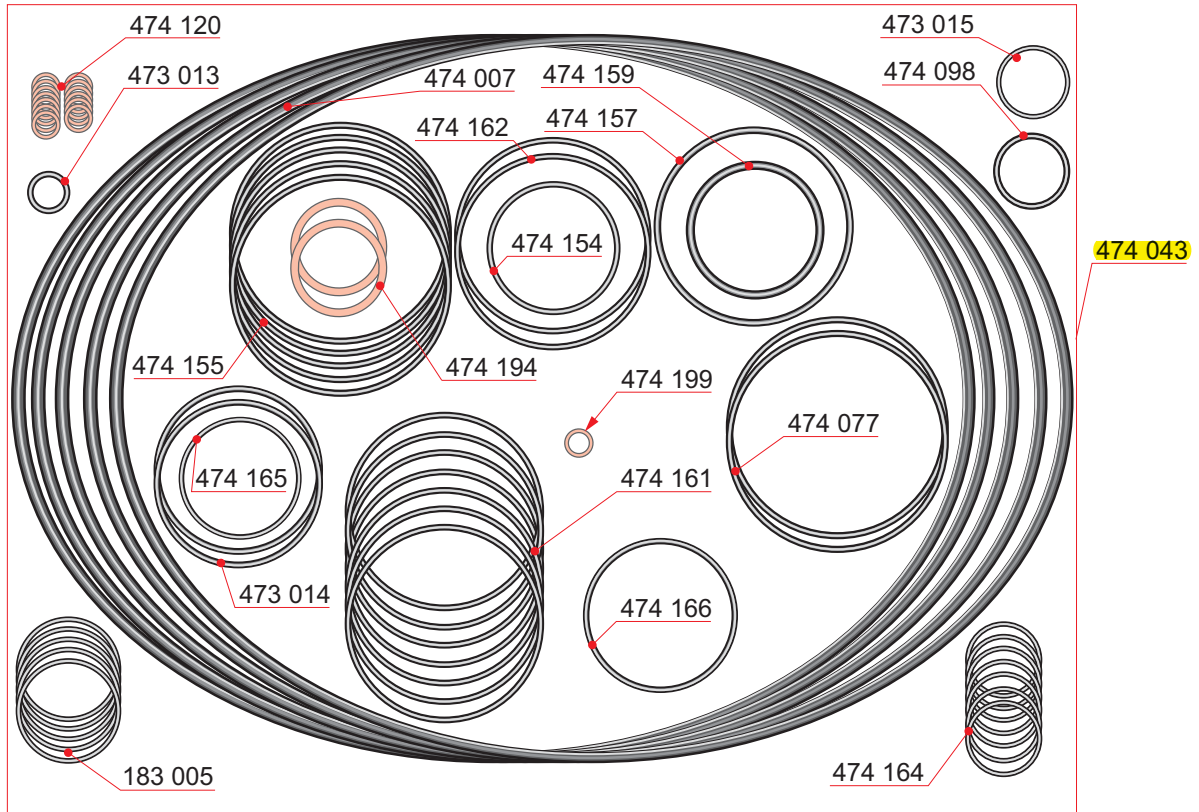


Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>473 081</b>	<b>Sealing set</b>	<b>1</b>	<b>-</b>
473 066	O-ring (1)	1	-
473 069	O-ring (1)	1	-
473 082	O-ring (1)	1	-
473 083	O-ring (1)	1	-
473 085	Sealing ring (1)	2	-
473 126	Sealing ring (1)	1	-
473 127	Sealing ring (1)	1	-

NOTE! (1) Parts included in set are not delivered separately.

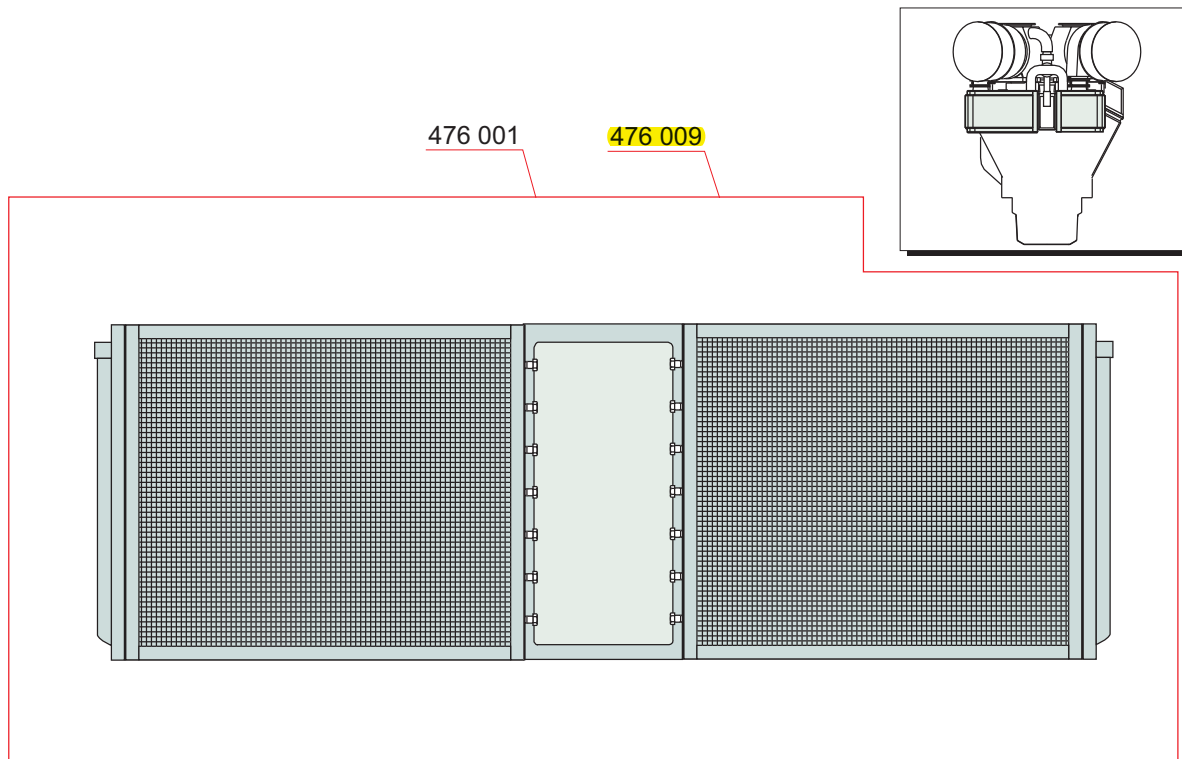
APPENDIX A

Lube oil module



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>474 043</b>	<b>Sealing set</b>	<b>1</b>	<b>1.0</b>
183 005	O-ring	5	-
473 013	O-ring	1	-
473 014	O-ring	2	-
473 015	O-ring	1	-
474 007	Gasket	5	0.1
474 077	O-ring	2	-
474 098	O-ring	1	-
474 120	Sealing ring	13	-
474 154	O-ring	1	-
474 155	O-ring	5	-
474 157	O-ring	1	-
474 159	O-ring	1	-
474 161	O-ring	7	-
474 162	O-ring	2	-
474 164	O-ring	6	-
474 165	O-ring	1	-
474 166	O-ring	1	0.1
474 194	Sealing ring	2	-
474 199	Sealing ring	1	-

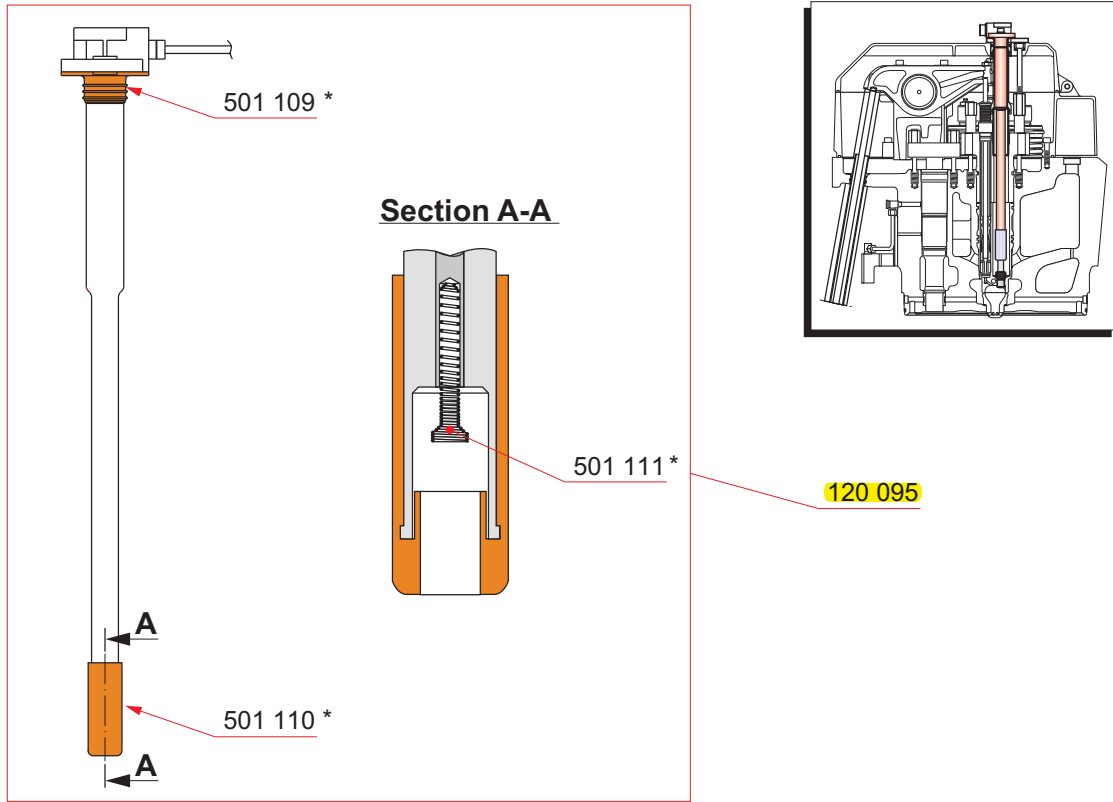
## Charge air cooler



Part No.	Description	Qty [Pcs]	Wt. [Kg]
476 001	Charge air cooler	1	-
476 009	Sealing set (1)	1	-

NOTE! (1) When ordering, please state the serial number and the manufacturer of the air cooler.

**Spare part kit for ignition coil**

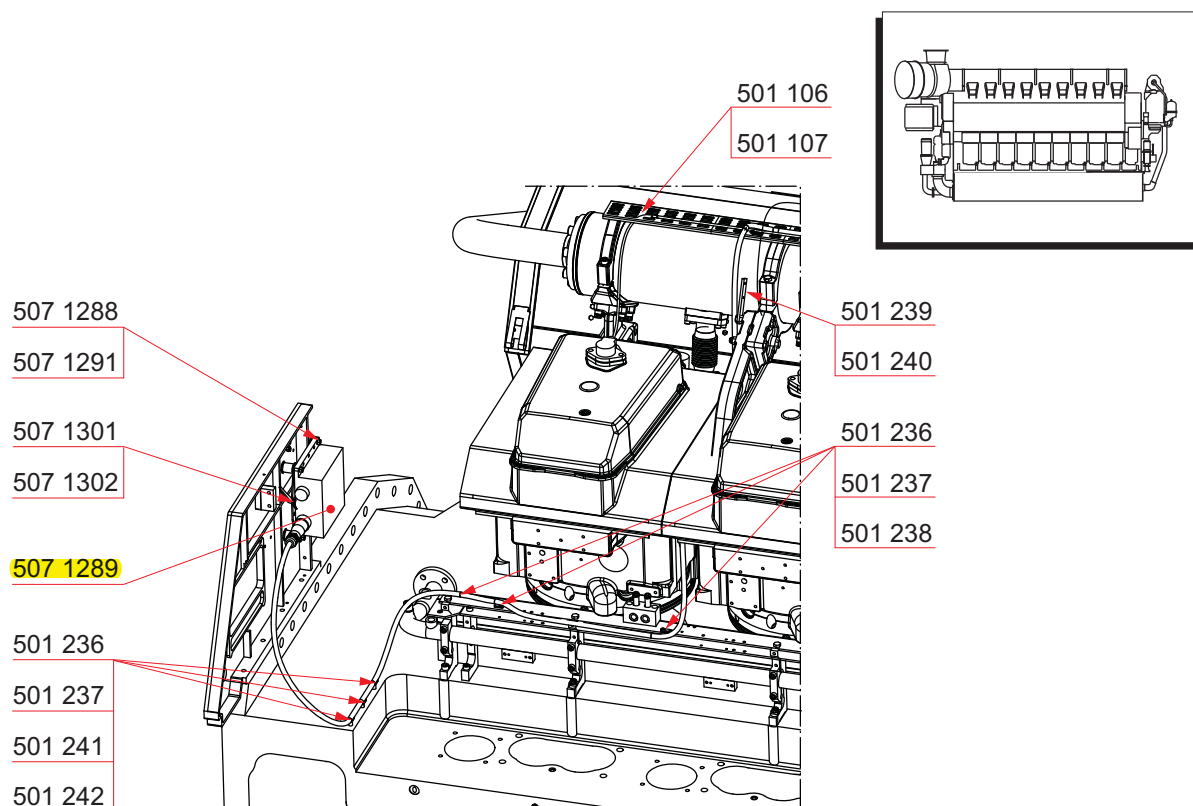


Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 095	Ignition coil	1	-
501 109	Grommet *	1	-
501 110	Boot *	1	-
501 111	Spring *	1	-

NOTE! \*) Components are not available as single parts.

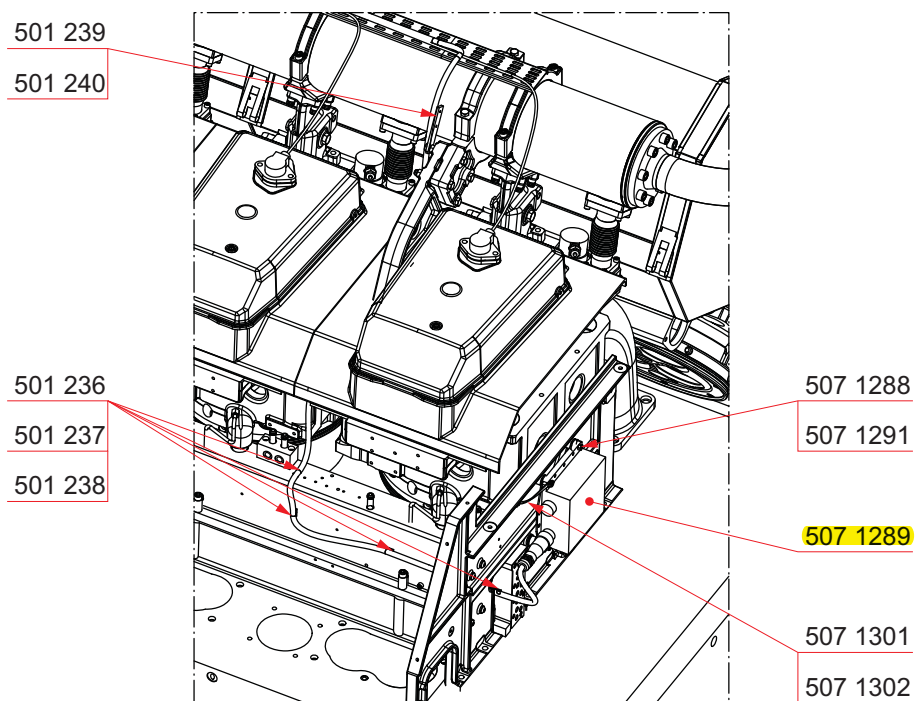
NOTE! \*) See page 2.

## Electrical equipment for ignition system



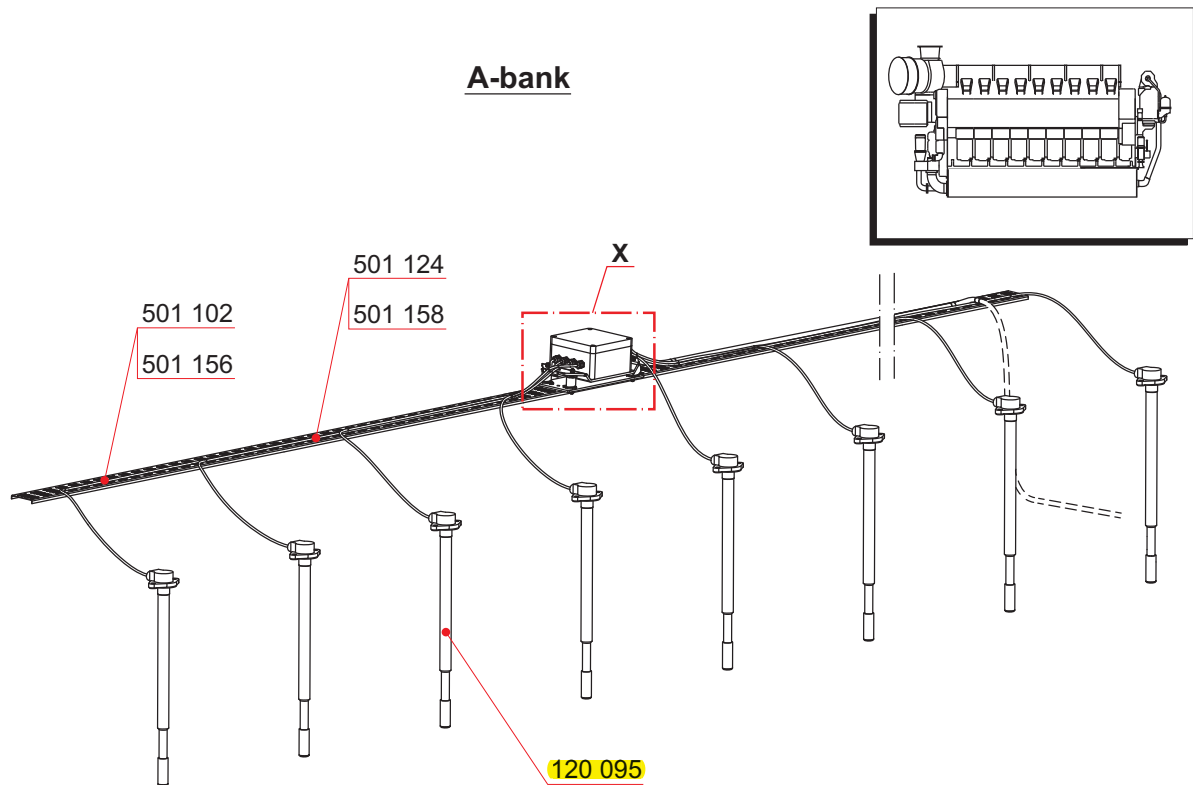
Part No.	Description	Qty [Pcs]	Wt. [Kg]
501 106	Screw	20	-
501 107	Washer	20	-
501 236	Steel strip	10	-
501 237	Cable clamp	10	-
501 238	Screw	7	-
501 239	Pipe clamp	2	0.1
501 240	Nut	2	-
501 241	Screw	3	-
501 242	Distance sleeve	3	-
507 1288	Damper	8	-
<b>507 1289</b>	<b>Ignition module</b>	<b>2</b>	<b>3.5</b>
507 1291	Nut	8	-
507 1301	Cable set	2	-
507 1302	Screw	2	-

## Electrical equipment for ignition system



Part No.	Description	Qty [Pcs]	Wt. [Kg]
501 236	Steel strip	10	-
501 237	Cable clamp	10	-
501 238	Screw	7	-
501 239	Pipe clamp	2	0.1
501 240	Nut	2	-
507 1288	Damper	8	-
507 1289	Ignition module	2	3.5
507 1291	Nut	8	-
507 1301	Cable set	2	-
507 1302	Screw	2	-

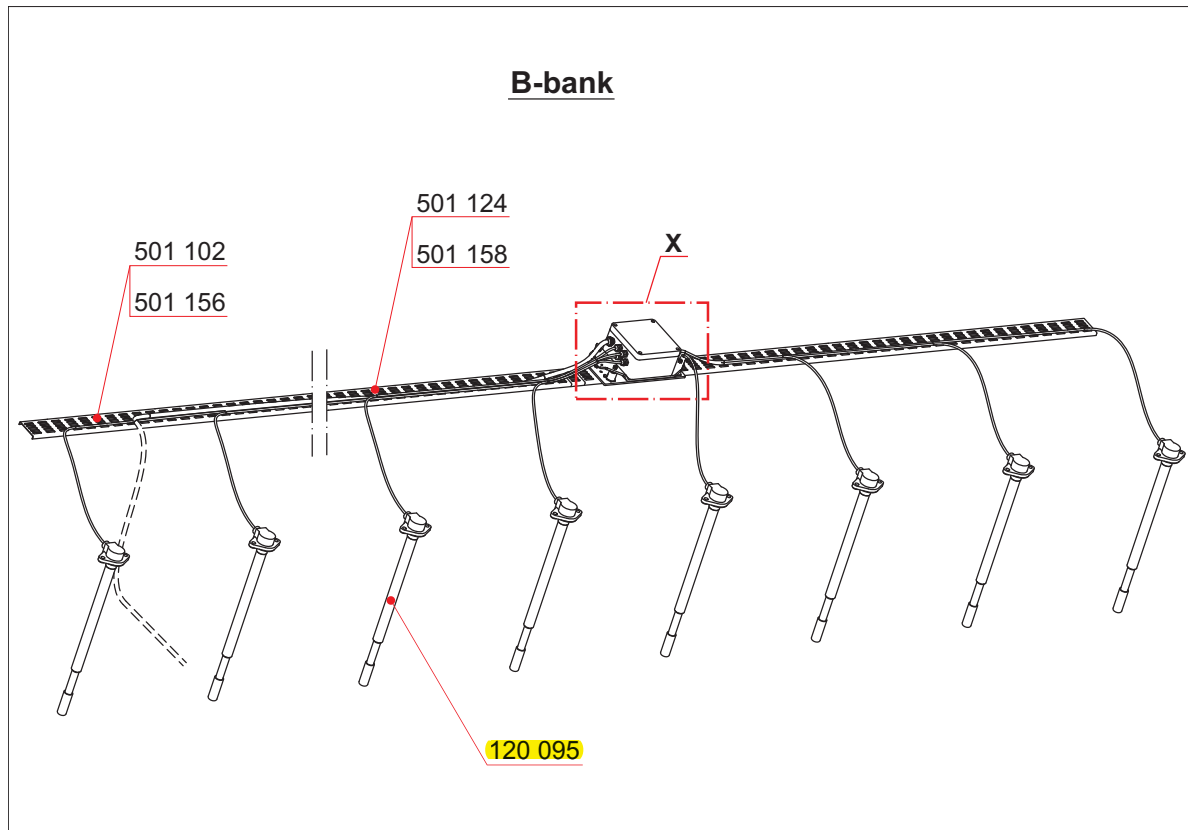
**Electrical equipment for ignition system**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 095	Ignition coil (1)	*	-
501 102	Cable tray **	1	-
501 124	Clamp	*	-
501 156	Steel strip	*	-
501 158	Screw	*	-

NOTE! (1) See 120-  
 NOTE! \*) See page 4.  
 NOTE! \*\*) Length needed when ordering

**Electrical equipment for ignition system**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
120 095	Ignition coil (1)	*	-
501 102	Cable tray **	1	-
501 124	Clamp	*	-
501 156	Steel strip	*	-
501 158	Screw	*	-

NOTE! (1) See 120-

NOTE! \*) See page 4.

NOTE! \*\*) Length needed when ordering



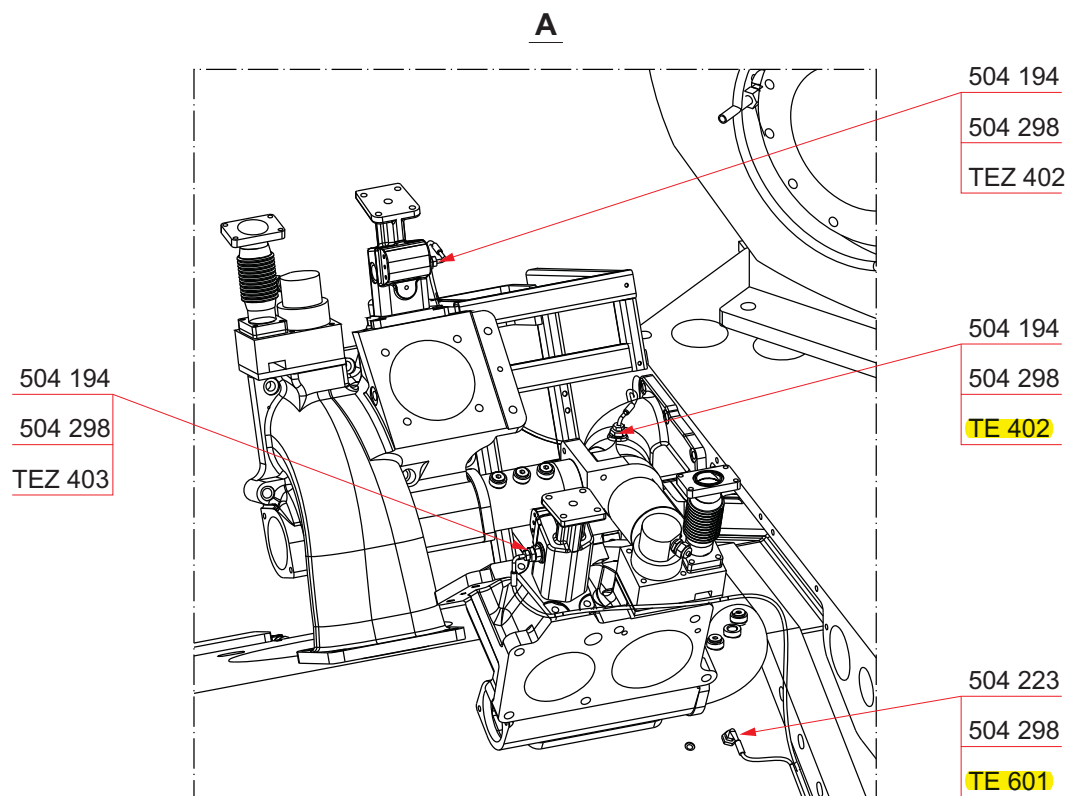
## APPENDIX A

### Electrical equipment for ignition system

Quantity according to number of cylinders

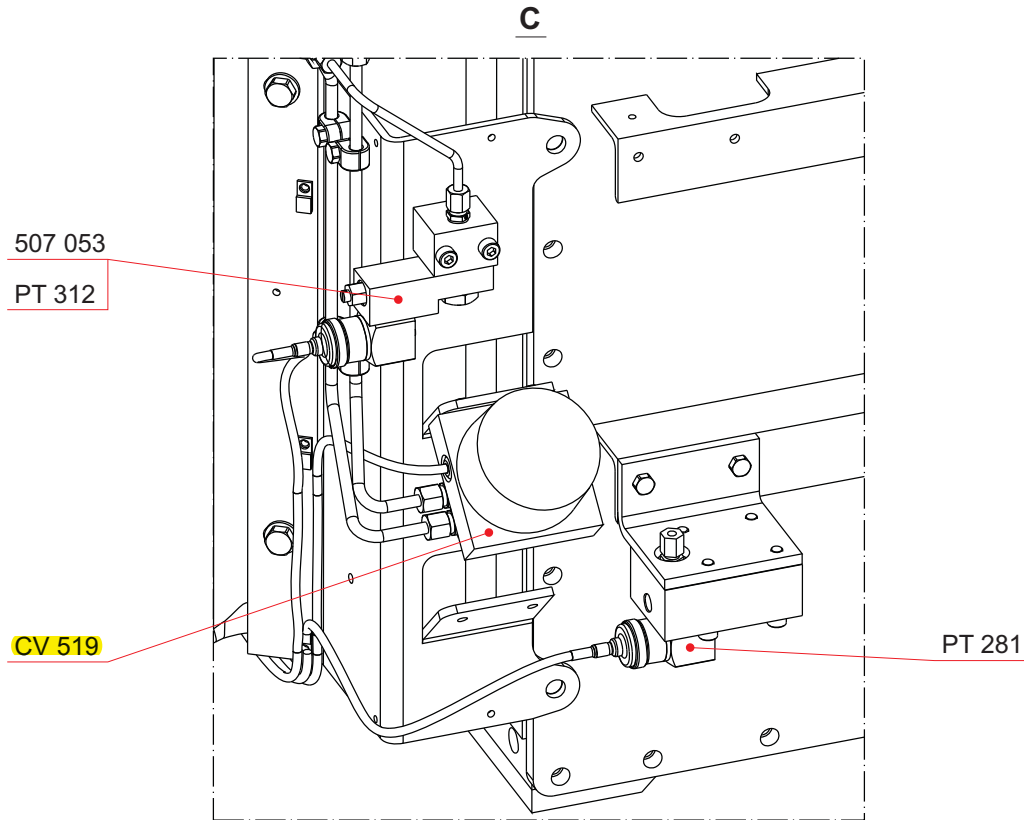
Part No. and Description	Quantity in pieces	
	16V	20V
120 095 Ignition coil	8	10
501 124 Clamp	2	4
501 156 Steel strip	15	20
501 158 Screw	4	8

Electrical equipment at free end



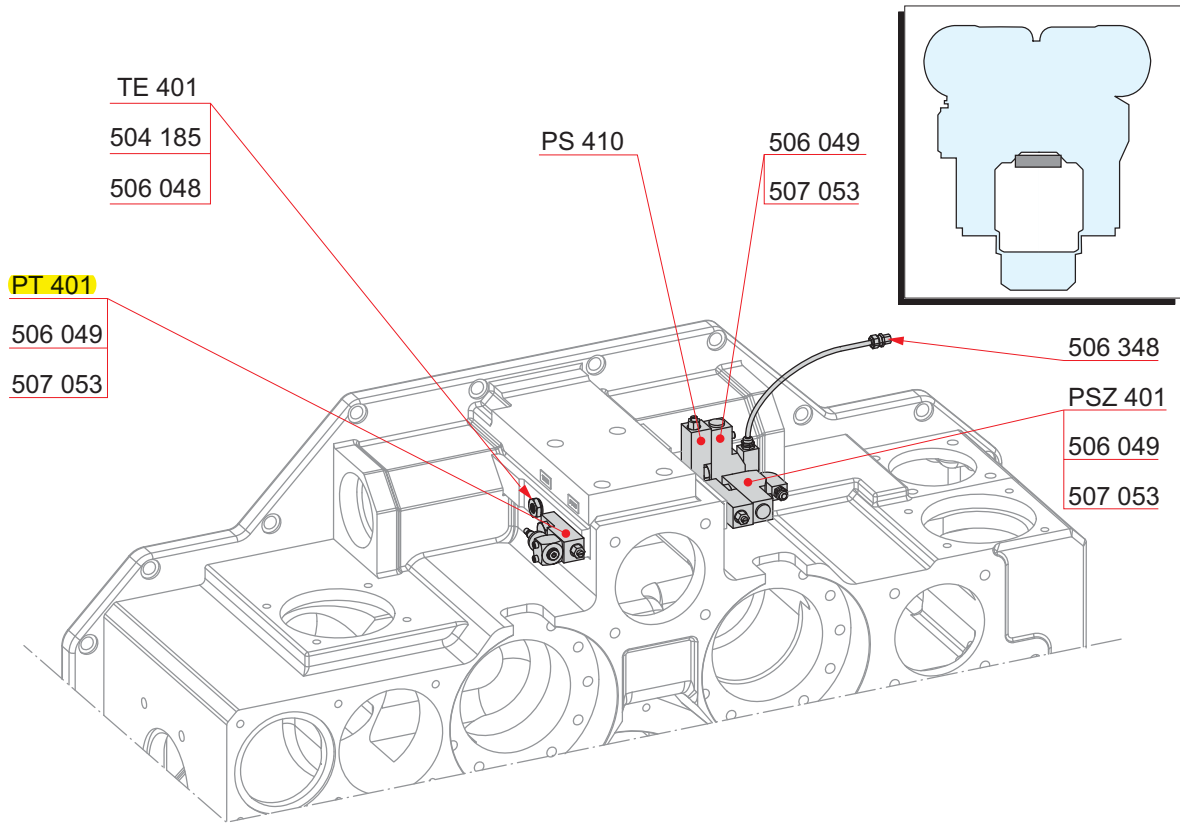
Part No.	Description	Qty [Pcs]	Wt. [Kg]
504 194	Protecting well	5	0.2
504 223	Protecting well	2	0.3
504 298	Sealing ring	9	-
<b>TE402</b>	<b>Temperature sensor, HT water, after engine</b>	<b>1</b>	<b>-</b>
<b>TE601</b>	<b>Charge air temperature, inlet</b>	<b>1</b>	<b>-</b>
TEZ402	Temperature sensor, HT-water outlet	1	-
TEZ403	Temperature sensor, HT-water outlet	1	-

Electrical equipment at free end



Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 053	Pressure gauge valve	2	0.6
CV519	I/P converter	1	-
PT281	Pressure transmitter	1	-
PT312	Pressure sensor	1	-

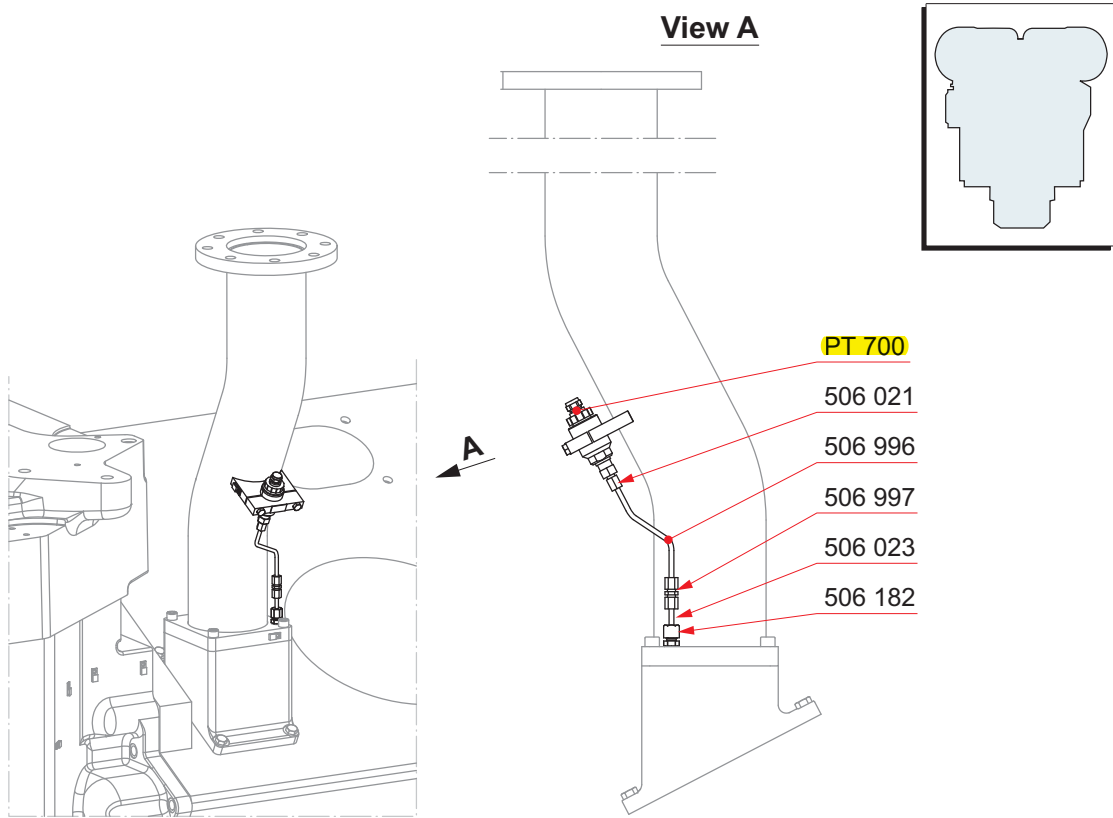
**Sensors on pump cover**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
504 185	Protection well	1	-
506 048	Sealing ring	1	-
506 049	Screw *)	4	-
506 348	Cable gland *)	1	-
507 053	Pressure gauge valve *)	2	-
PS410	Pressure sensor *)	1	-
PSZ401	Pressure sensor *)	1	-
<b>PT401</b>	<b>Pressure sensor</b>	<b>1</b>	<b>-</b>
TE401	Temperature sensor, HT water, before engine *)	1	-

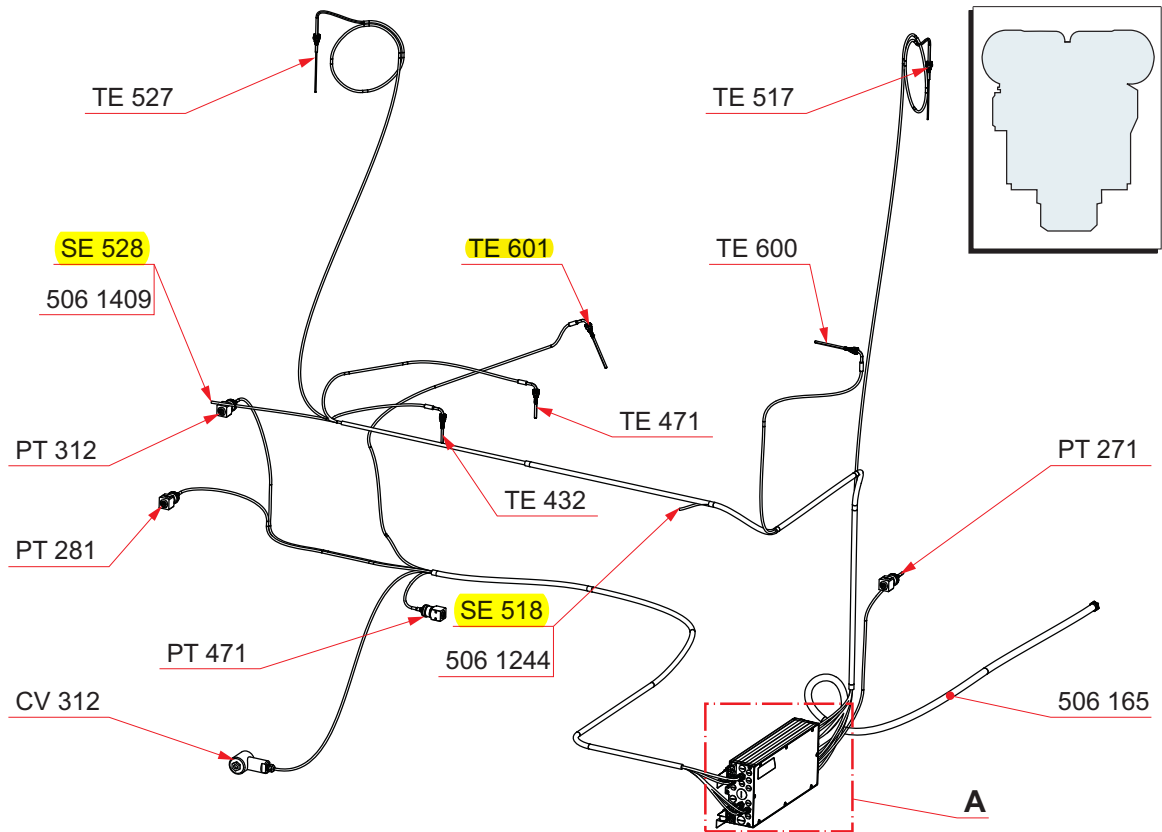
NOTE! \*) Amount depends on installation.

**Sensor for crankcase pressure**



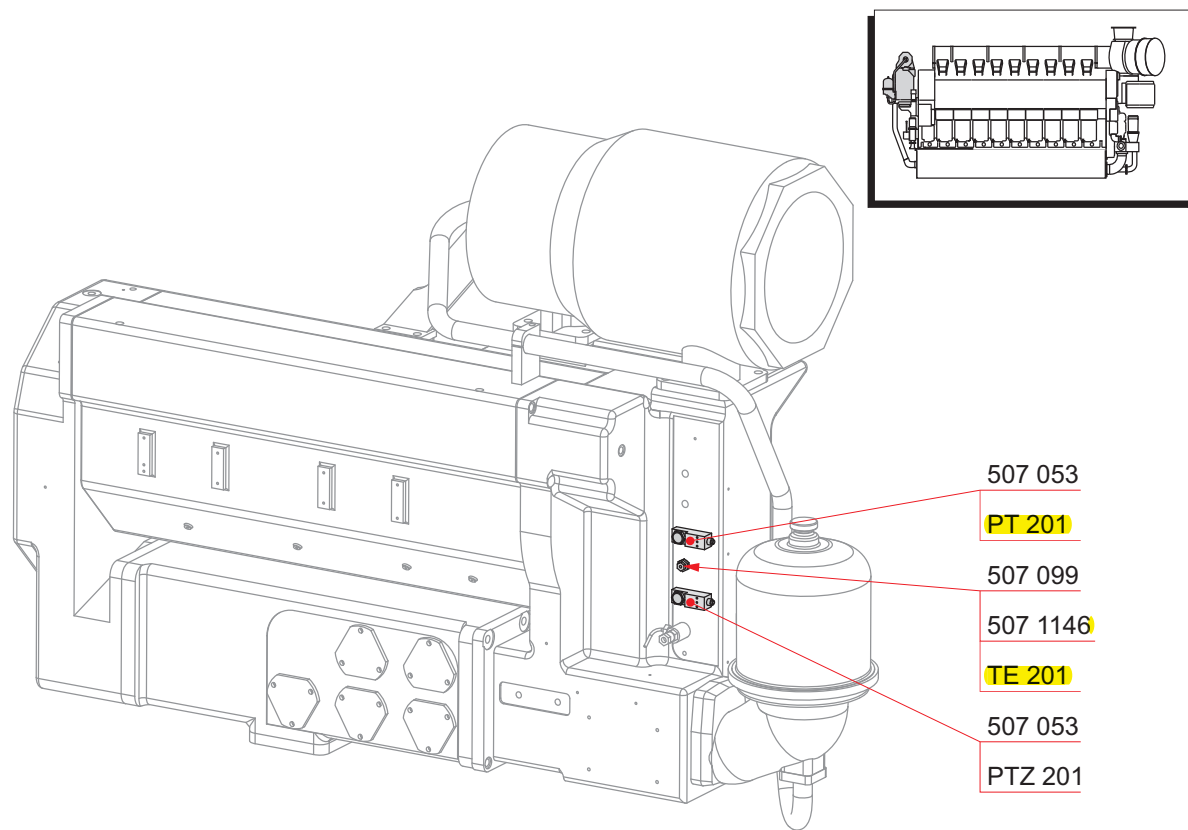
Part No.	Description	Qty [Pcs]	Wt. [Kg]
506 021	Pipe union	1	-
506 023	Pipe	1	-
506 182	Pipe union	1	-
506 996	Pipe	1	-
506 997	Pipe union	1	-
<b>PT700</b>	<b>Pressure sensor</b>	<b>1</b>	<b>-</b>

**Electrical equipment in free end**



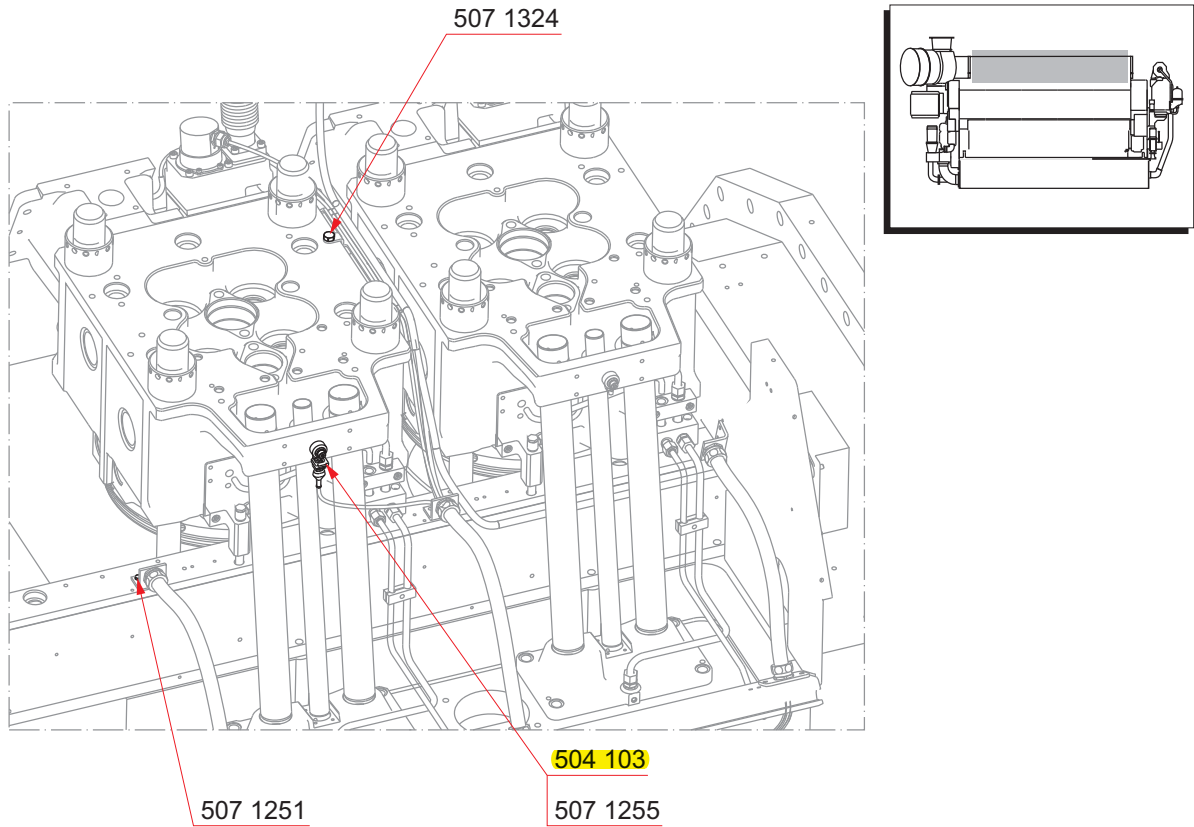
Part No.	Description	Qty [Pcs]	Wt. [Kg]
506 165	Cable	3	0.2
506 1244	Cable	1	0.7
506 1409	Cable set	1	1.3
CV312	Solenoid valve	1	0.6
PT271	Pressure sensor	1	0.8
PT281	Pressure transmitter	1	0.8
PT312	Pressure sensor	1	0.8
PT471	Pressure sensor	1	0.8
SE518	Speed pick-up	1	-
SE528	Speed pick-up	1	-
TE432	Temp.transmitter, HT water, after TC	1	0.6
TE471	LT water temperature, before charge air cooler	1	0.6
TE517	Temperature sensor	1	1.5
TE527	Temperature sensor	1	1.5
TE600	Temperature sensor	1	0.6
TE601	Charge air temperature, inlet	1	0.6

**Electrical equipment, lube oil module**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 053	Pressure gauge valve	3	-
507 099	Sealing ring	1	-
507 1146	Protecting cap	1	-
PT201	Pressure sensor	1	-
PTZ201	Pressure sensor	1	-
TE201	Temperature sensor	1	-

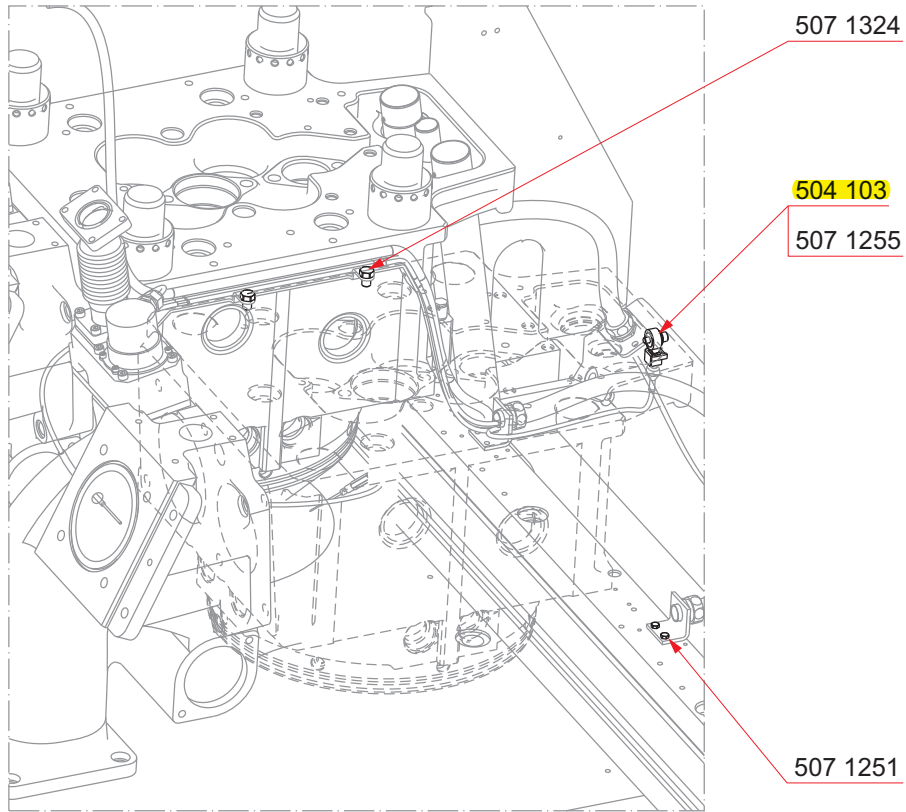
## Electrical equipment for cylinder



Part No.	Description	Qty [Pcs]	Wt. [Kg]
504 103	Knock sensor	1	-
507 1251	Screw	2	-
507 1255	Screw	1	-
507 1324	Screw	2	-

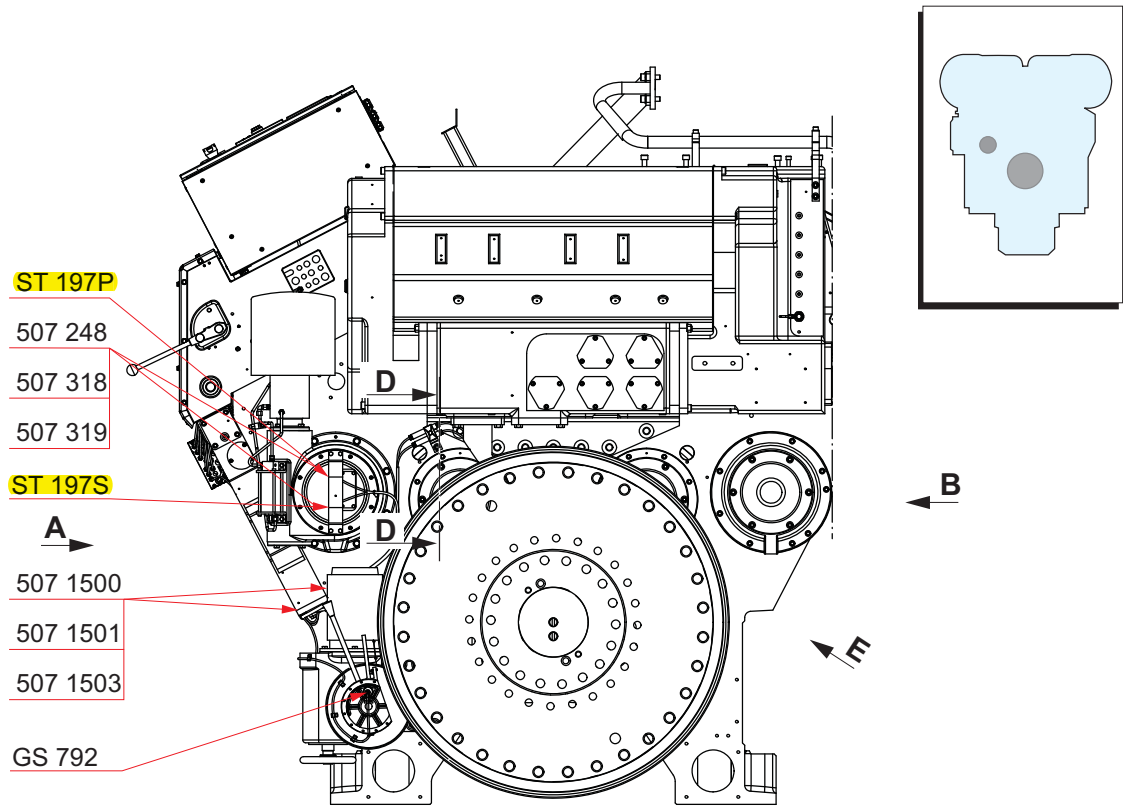


**Electrical equipment for cylinder**



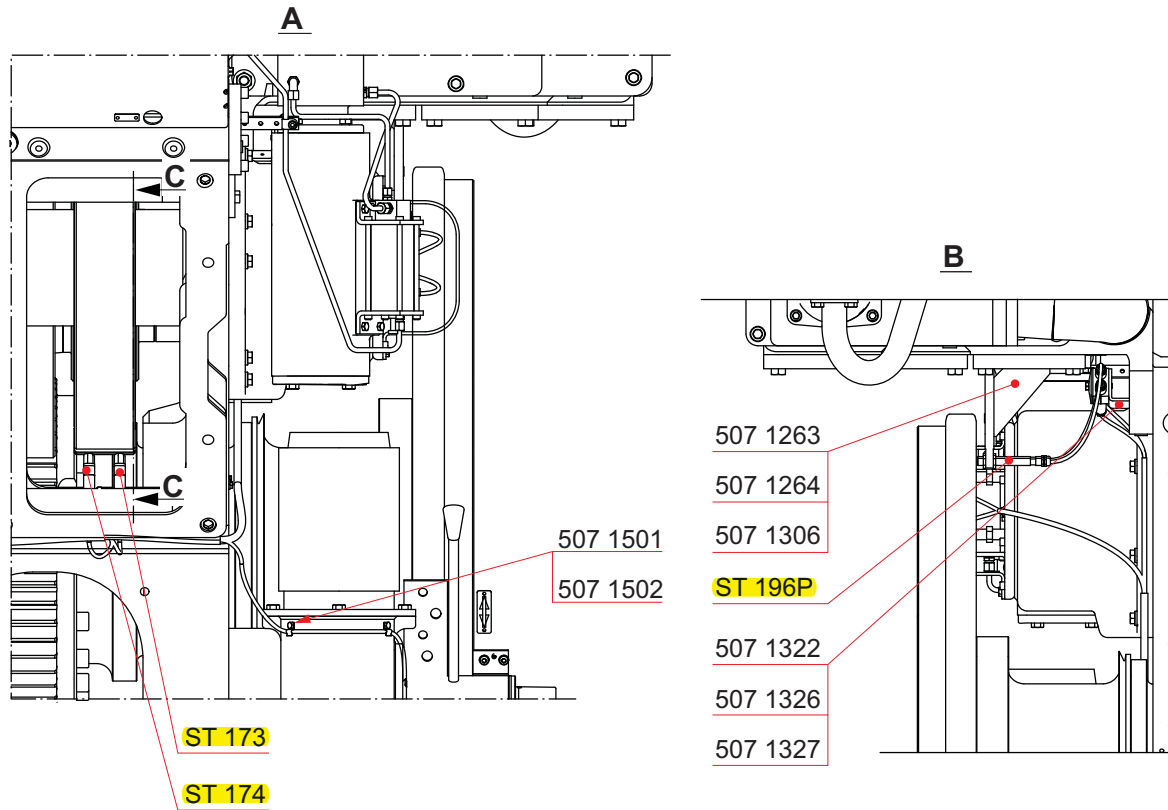
Part No.	Description	Qty [Pcs]	Wt. [Kg]
504 103	Knock sensor	1	-
507 1251	Screw	2	-
507 1255	Screw	1	-
507 1324	Screw	2	-

Electrical equipment



Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 248	Screw	2	-
507 318	Lead-through piece	4	0.1
507 319	O-ring	4	-
507 1500	Cable clamp	9	-
507 1501	Screw	15	-
507 1503	Steel strip	9	-
GS792	Limit switch	1	0.5
ST197P	Limit switch	1	0.5
ST197S	Limit switch	1	0.5

Electrical equipment

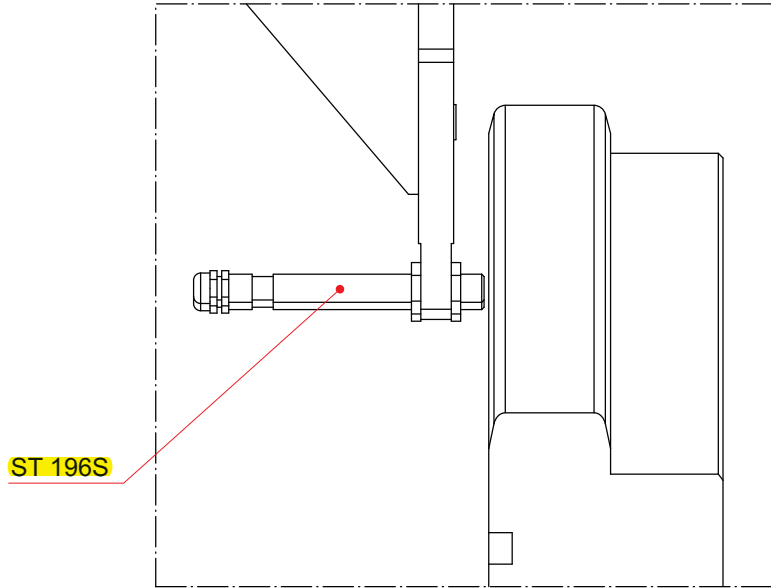


Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 1263	Support *)	1	8.8
507 1264	Screw *)	4	-
507 1306	O-ring *)	1	-
507 1322	Screw *)	1	-
507 1326	Cable clamp *)	1	0.2
507 1327	Washer *)	1	-
507 1501	Screw	15	-
507 1502	Fastener	6	-
ST196P	Speed sensor	1	0.6
ST173	Speed pick-up	1	0.5
ST174	Speed pick-up	1	0.5

NOTE! \*) Not used in all installations.

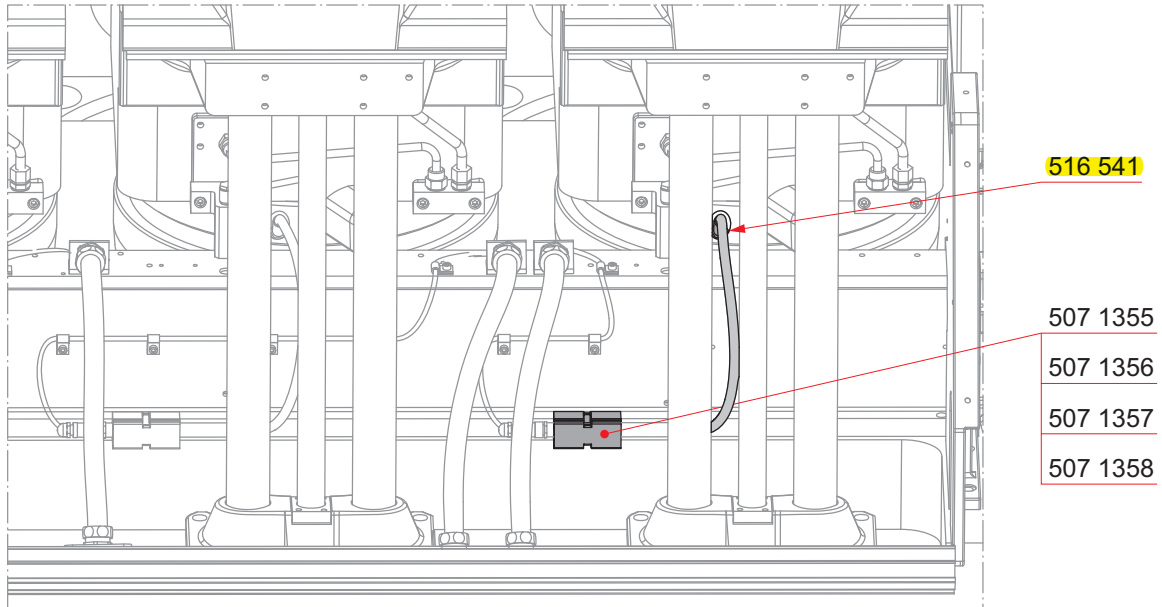
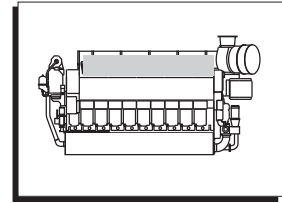
Electrical equipment

**D - D**



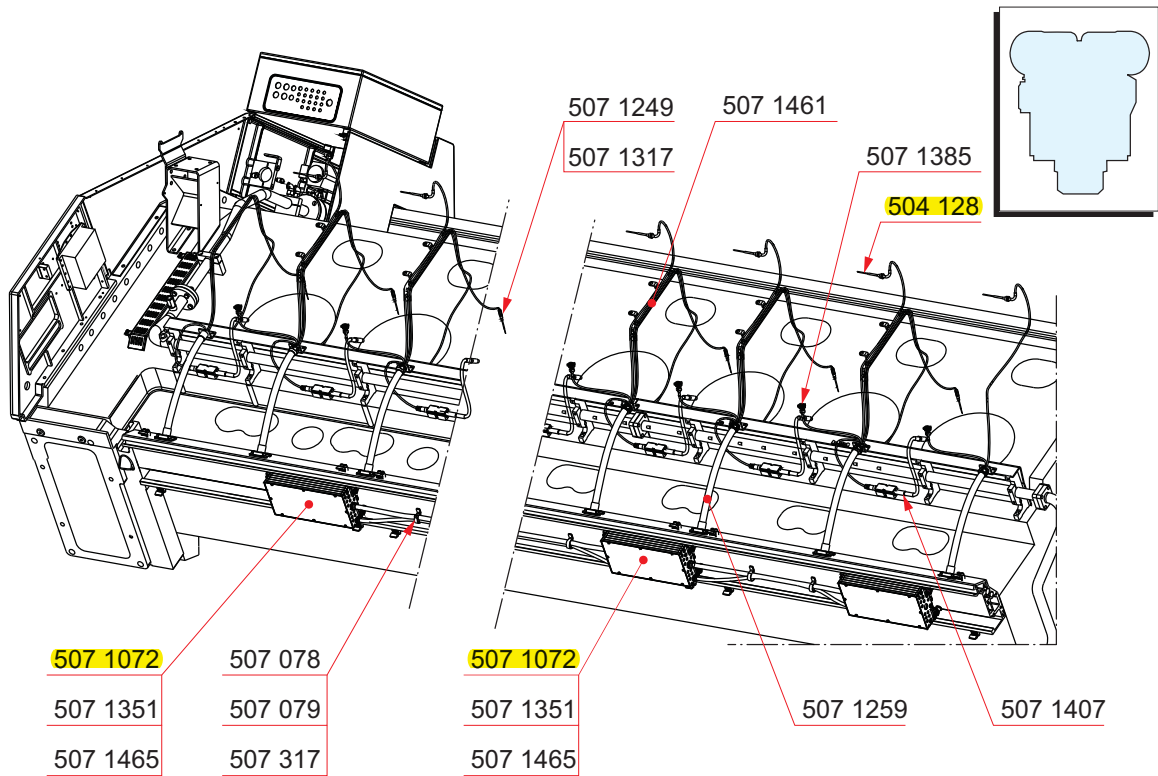
Part No.	Description	Qty [Pcs]	Wt. [Kg]
ST196S	Speed sensor	1	0.6

**Electrical equipment for cylinder**



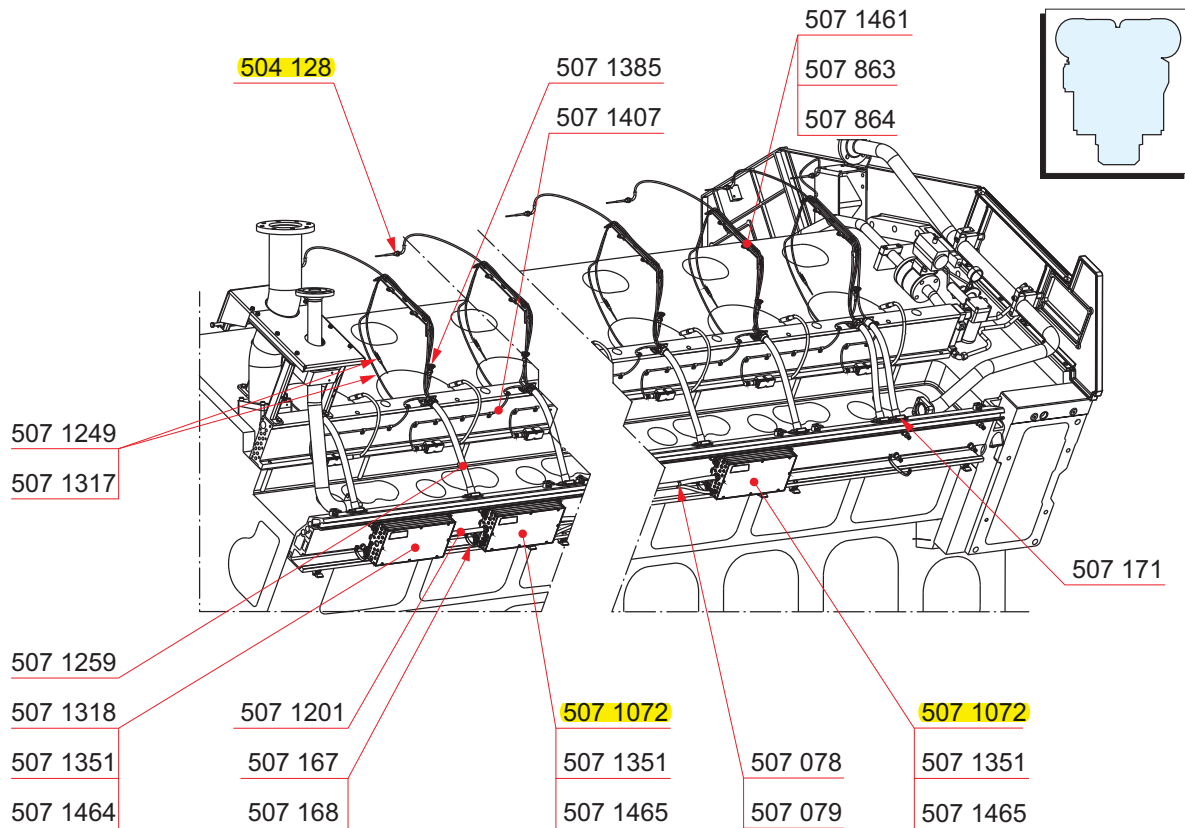
Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 1355	Holder	1	-
507 1356	Cover	1	-
507 1357	Screw	2	-
507 1358	Steel strip	1	-
516 541	Pressure transducer	1	-

**Electrical equipment, B bank**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
504 128	Temperature sensor	10	-
507 078	Clamp	23	-
507 079	Screw	23	-
507 317	Steel strip	23	-
507 1072	Control unit CCM	4	-
507 1249	Thermoelement	20	-
507 1259	Metal hose	11	-
507 1317	Adapter	20	-
507 1351	Corrosion protection	4	-
507 1385	Cable set	10	-
507 1407	Cable set	10	-
507 1461	Cable rail	9	-
507 1465	Connector set for CCM	4	-

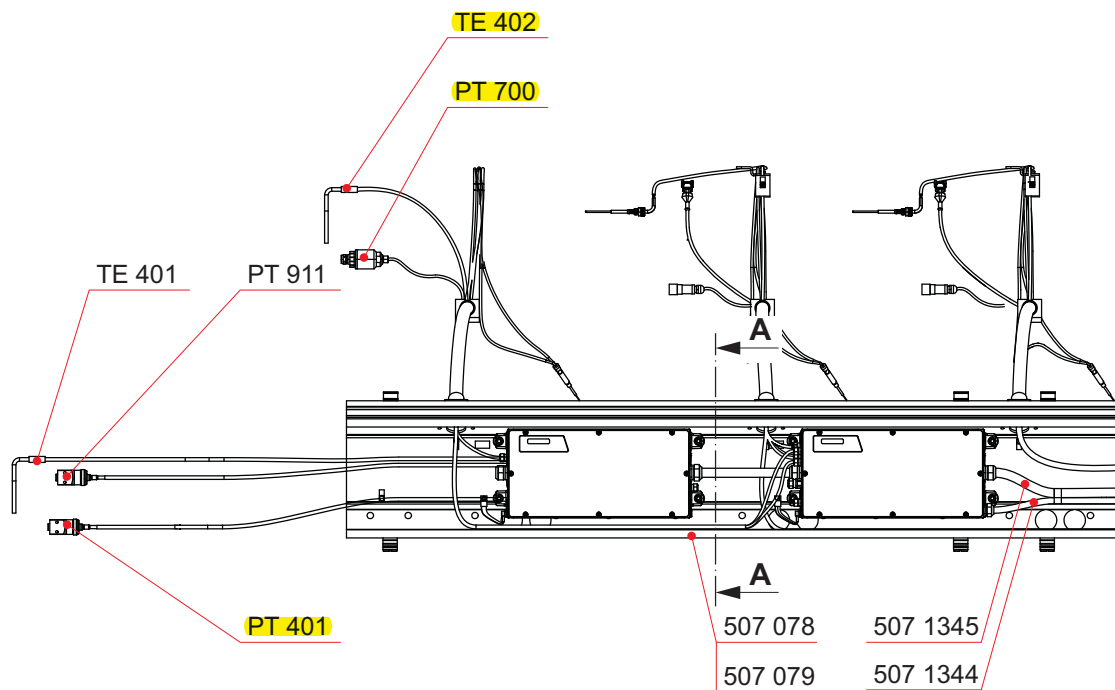
**Electrical equipment, A bank**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
504 128	Temperature sensor	10	-
507 078	Clamp	20	-
507 079	Screw	20	-
507 167	Cable set	6	-
507 168	Screw	11	-
507 171	Screw	22	-
507 1072	Control unit CCM	4	-
507 1201	Cable (1)	1	-
507 1249	Thermoelement	20	-
507 1259	Metal hose	11	-
507 1317	Adapter	20	-
507 1318	Electronic unit IOM	1	-
507 1351	Corrosion protection	5	-
507 1385	Cable set	10	-
507 1407	Cable set	10	-
507 1461	Cable rail	9	-
507 863	Cable clamp	5	-
507 864	Screw	5	-
507 1464	Connector set for IOM	1	-
507 1465	Connector set for CCM	4	-

NOTE! (1) L= 2000 mm

Electrical equipment, A bank

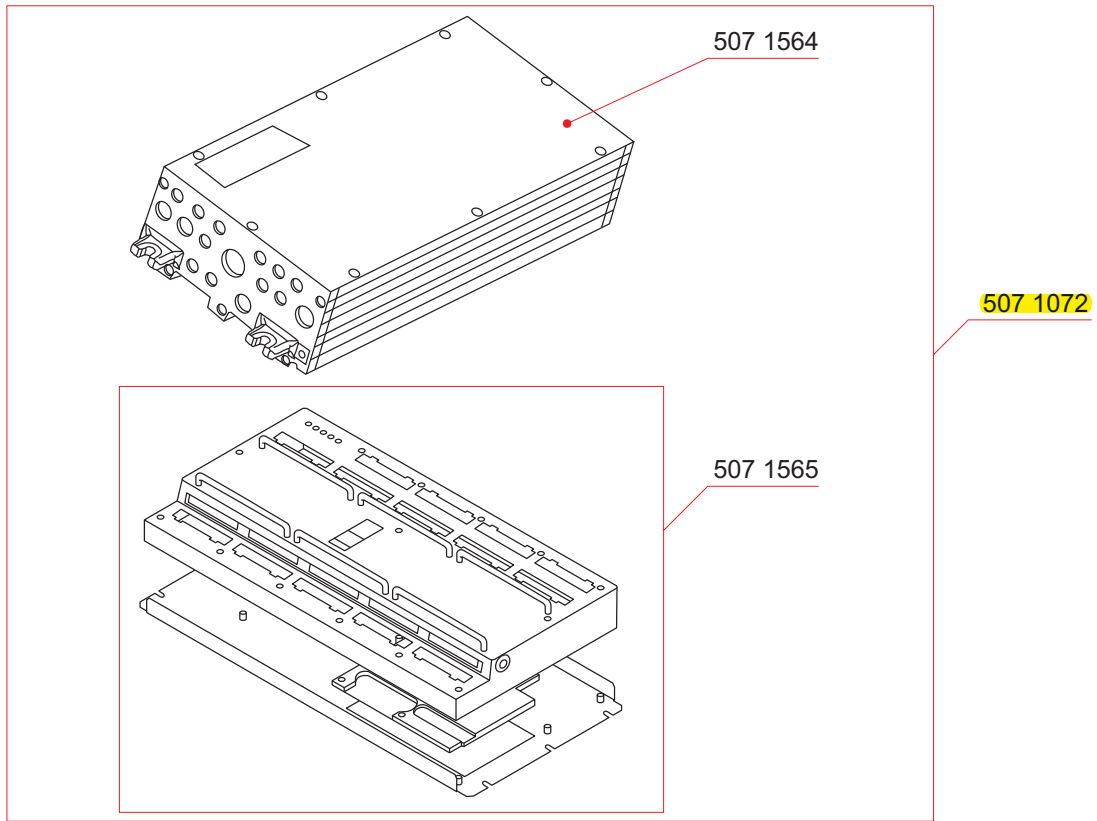


Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 078	Clamp	20	-
507 079	Screw	20	-
507 1344	Cable (1)	1	-
507 1345	Cable (1)	1	-
PT401	Pressure sensor	1	-
PT700	Pressure sensor	1	-
PT911	Pressure sensor	1	-
TE401	Temperature sensor, HT water, before engine	1	-
TE402	Temperature sensor, HT water, after engine	1	-

NOTE! (1) L= 7000 mm



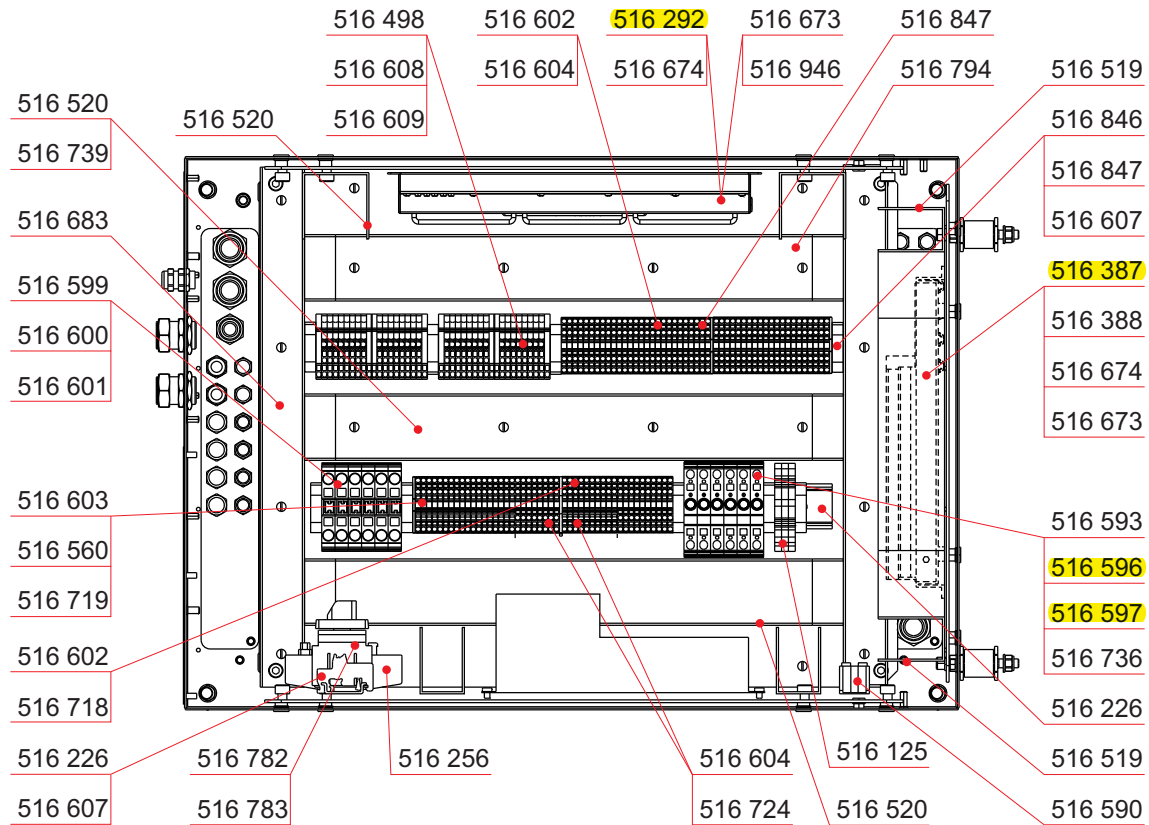
### Cylinder control module



Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 1072	Control unit CCM	1	-
507 1564	Box	1	-
507 1565	Electronic unit	1	-

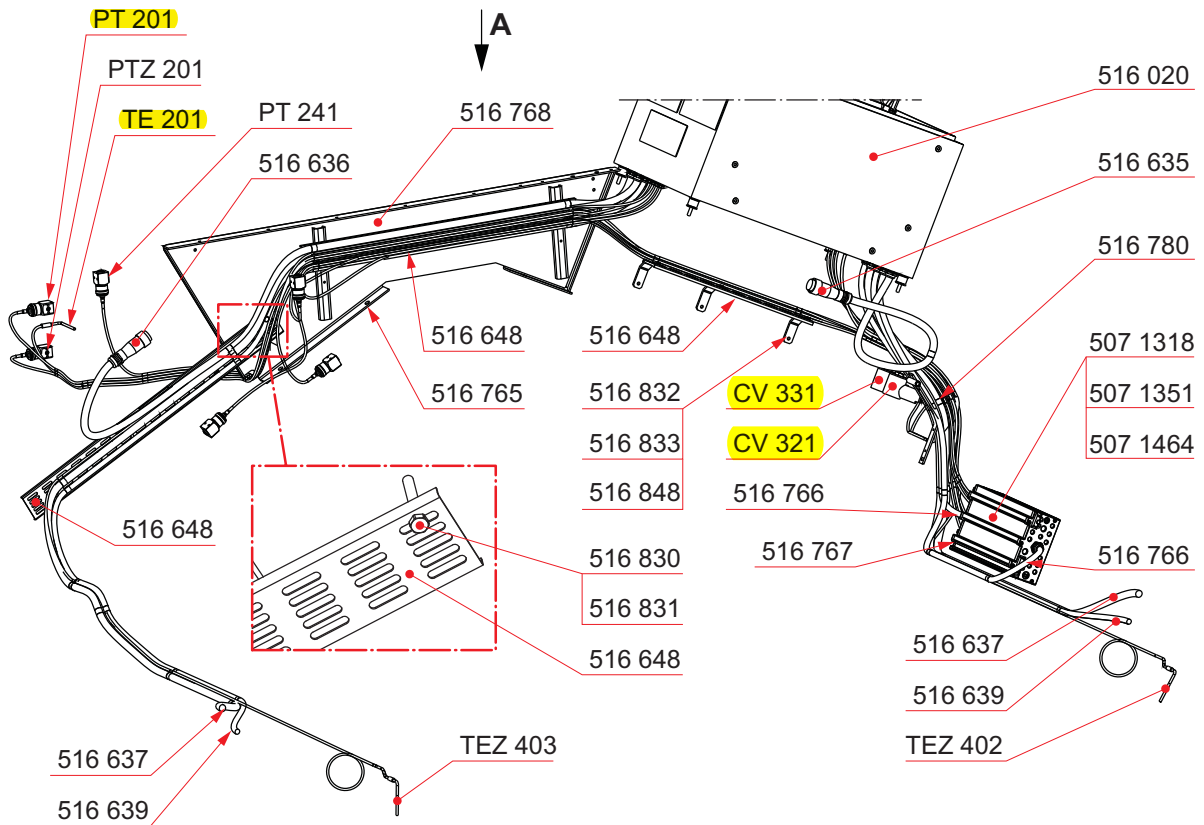
## APPENDIX A

### Electrical equipment



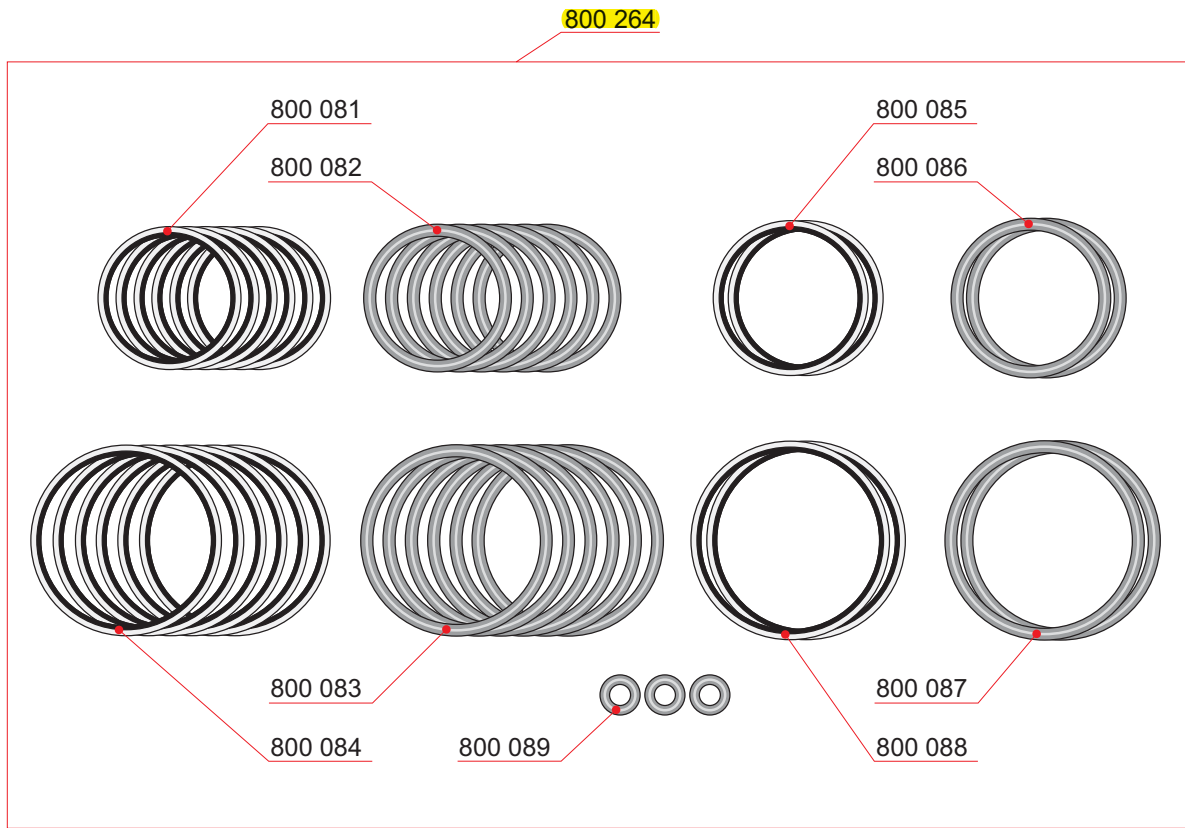
Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
516 125	Relay	3	-	516 609	Ground receptacle	8	-
516 226	Terminal strip rail	1	-	516 673	Resistor 22 kR	4	-
516 256	Electronic unit	1	-	516 674	Resistor 120 R	2	-
516 292	Control unit	1	-	516 683	Holder for tie wrap	20	-
516 387	Engine safety module	1	-	516 718	Terminal strip	10	-
516 388	Connector	1	-	516 719	Terminal strip	18	-
516 498	Plug 8-pin	8	-	516 724	Jumper	2	-
516 519	Cable tray *	1	-	516 736	Fixed bridge	1	-
516 520	Cable tray *	1	-	516 739	Cable *	1	-
516 560	Terminal strip	8	-	516 782	Switch	1	-
516 590	Diode	2	-	516 783	Terminal	1	-
516 593	Fuse terminal	6	-	516 794	Cable *	1	-
516 596	Fuse 1A	4	-	516 846	Terminal strip	7	-
516 597	Fuse 4A	2	-	516 847	Terminal strip	7	-
516 599	Terminal strip	2	-	516 946	Connector	1	-
516 600	Terminal strip	2	-				
516 601	Terminal strip	2	-	NOTE!	*) Length needed when ordering.		
516 602	Terminal strip	58	-				
516 603	Terminal strip	2	-				
516 604	End plate	4	-				
516 607	End clamp	12	-				
516 608	Receptacle, DIN-rail mounting	32	-				

Electrical equipment



Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
507 1318	Electronic unit	1	-	PT241	Lube oil pressure, filter inlet	1	-
507 1351	Corrosion protection	1	-	PTZ201	Pressure sensor	1	-
507 1464	Connector set for IOM	1	-	TE201	Temperature sensor	1	-
516 020	Connecting box (*)	1	-	TEZ402	Temperature sensor, HT-water outlet	1	-
516 635	Cable set	1	-	TEZ403	Temperature sensor, HT-water outlet	1	-
516 636	Cable set	1	-	NOTE!	(1) L = 11.5 m		
516 637	Cable (1)	1	-	NOTE!	(2) L = 7000 mm		
516 639	Cable (1)	1	-	NOTE!	(4) L = 2160 mm		
516 648	Cable tray (4)	1	-	NOTE!	(5) L = 3100 mm		
516 765	Screw	3	-	NOTE!	(6) L = 30 mm		
516 766	Cable (2)	1	-	NOTE!	*) See 516-		
516 767	Cable (5)	1	-				
516 768	Cover	1	-				
516 780	Cable rail	1	-				
516 830	Pipe (6)	1	-				
516 831	Screw	1	-				
516 832	Screw	6	-				
516 833	Pipe clamp	3	-				
516 848	Washer	6	-				
CV321	Solenoid valve	1	-				
CV331	Solenoid valve	1	-				
PT201	Pressure sensor	1	-				

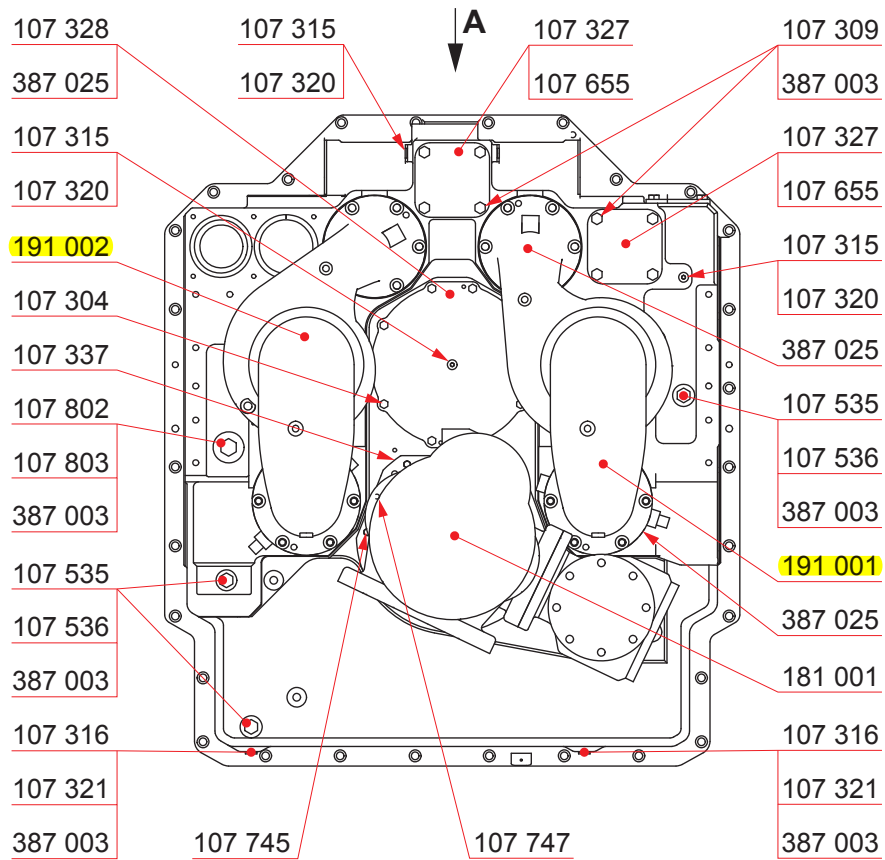
Hydraulic tightening tools



Part No.	Description	Qty [Pcs]	Wt. [Kg]
800 264	Sealing set for hydraulic tightening tool	1	-
800 081	Support ring	6	-
800 082	O-ring	6	-
800 083	O-ring	6	-
800 084	Support ring	6	-
800 085	Support ring	2	-
800 086	O-ring	2	-
800 087	O-ring	2	-
800 088	Support ring	2	-
800 089	O-ring	3	-

## APPENDIX A

### Pump cover

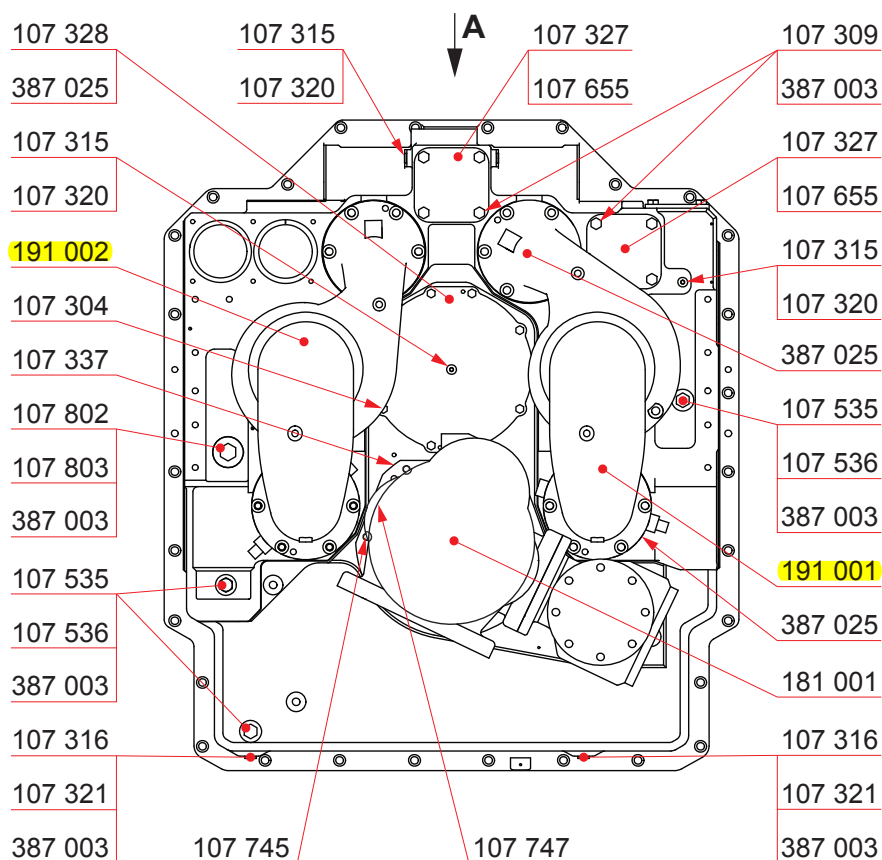


Part No.	Description	Qty [Pcs]	Wt. [Kg]
107 304	Screw	8	-
107 309	Screw	12	-
107 315	Plug	6	-
107 316	Plug	2	-
107 320	Sealing ring	6	-
107 321	Sealing ring	2	-
107 327	Blind flange	2	4.8
107 328	Flange	1	5.3
107 337	O-ring	2	-
107 535	Plug	3	0.3
107 536	Sealing ring	3	-
107 655	O-ring	2	-
107 745	Screw	8	-
107 747	Cylindrical pin	3	-
107 802	Sealing ring	1	-
107 803	Plug	1	0.8
181 001	Lubricating oil pump	1	-
<b>191 001</b>	<b>HT water pump</b>	<b>1</b>	<b>-</b>
<b>191 002</b>	<b>LT water pump</b>	<b>1</b>	<b>-</b>
387 003	Glue compound	1	-
387 025	Glue compound	1	-

NOTE! Clockwise rotating engine

## APPENDIX A

### Pump cover



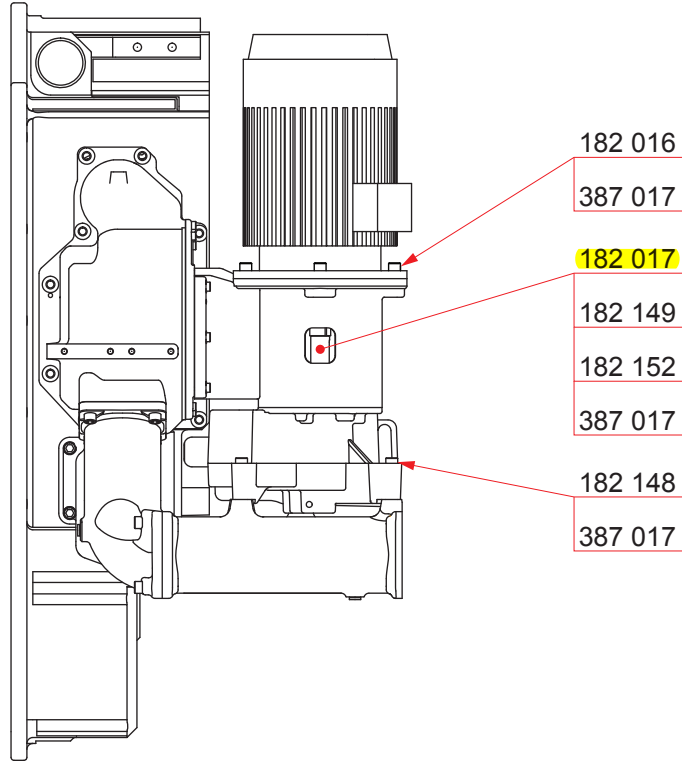
Part No.	Description	Qty [Pcs]	Wt. [Kg]
107 304	Screw	8	-
107 309	Screw	12	-
107 315	Plug	6	-
107 316	Plug	2	-
107 320	Sealing ring	6	-
107 321	Sealing ring	2	-
107 327	Blind flange	2	4.8
107 328	Flange	1	5.3
107 337	O-ring	2	-
107 535	Plug	3	0.3
107 536	Sealing ring	3	-
107 655	O-ring	2	-
107 745	Screw	8	-
107 747	Cylindrical pin	3	-
107 802	Sealing ring	1	-
107 803	Plug	1	0.8
181 001	Lubricating oil pump	1	-
191 001	HT water pump	1	-
191 002	LT water pump	1	-
387 003	Glue compound	1	-
387 025	Glue compound	1	-

NOTE! Counter-clockwise rotating engine

APPENDIX A

Prelubricating oil pump

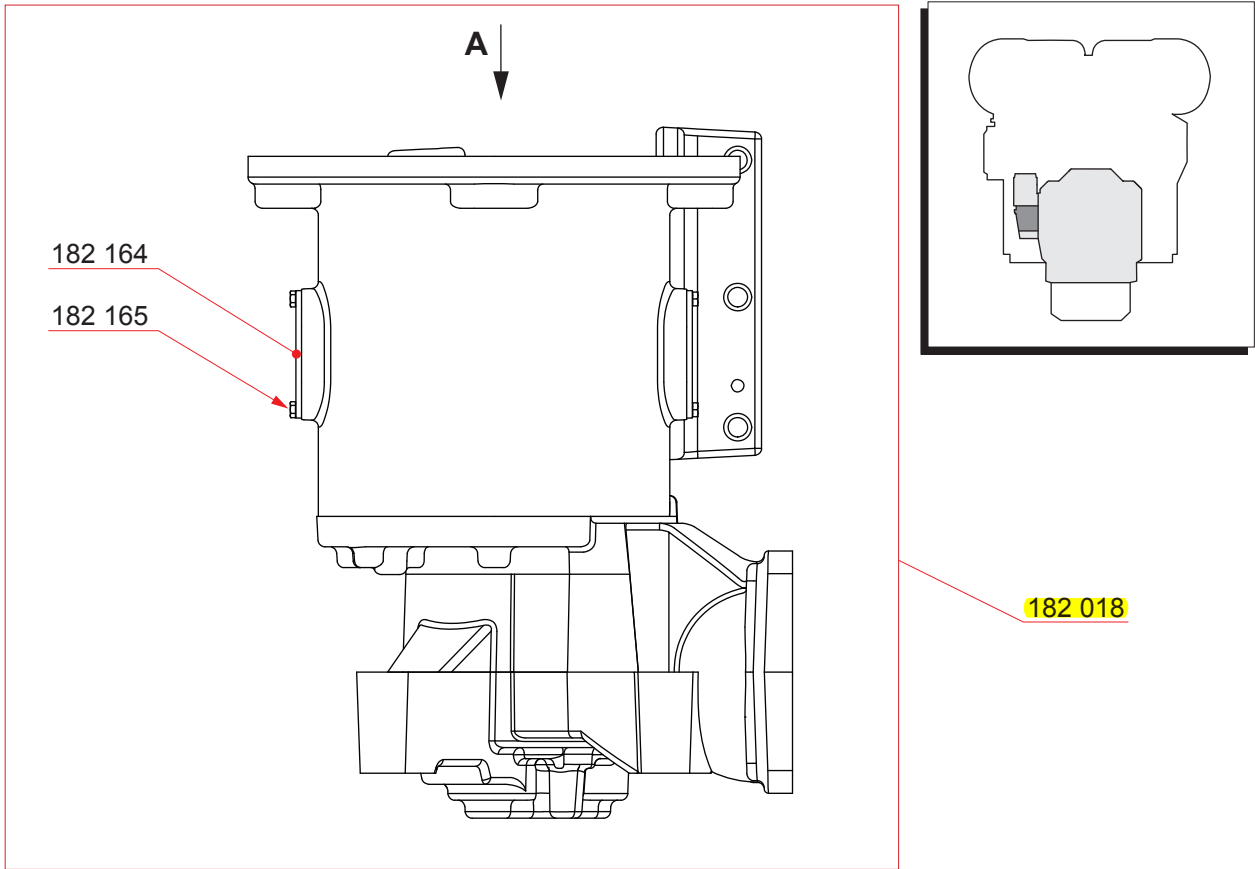
A



Part No.	Description	Qty [Pcs]	Wt. [Kg]
182 016	Screw	4	-
182 017	Flexible coupling	1	3.3
182 148	Screw	3	0.2
182 149	Screw	2	-
182 152	Key	1	-
387 017	Glue compound	1	-

APPENDIX A

**Prelubricating oil pump**

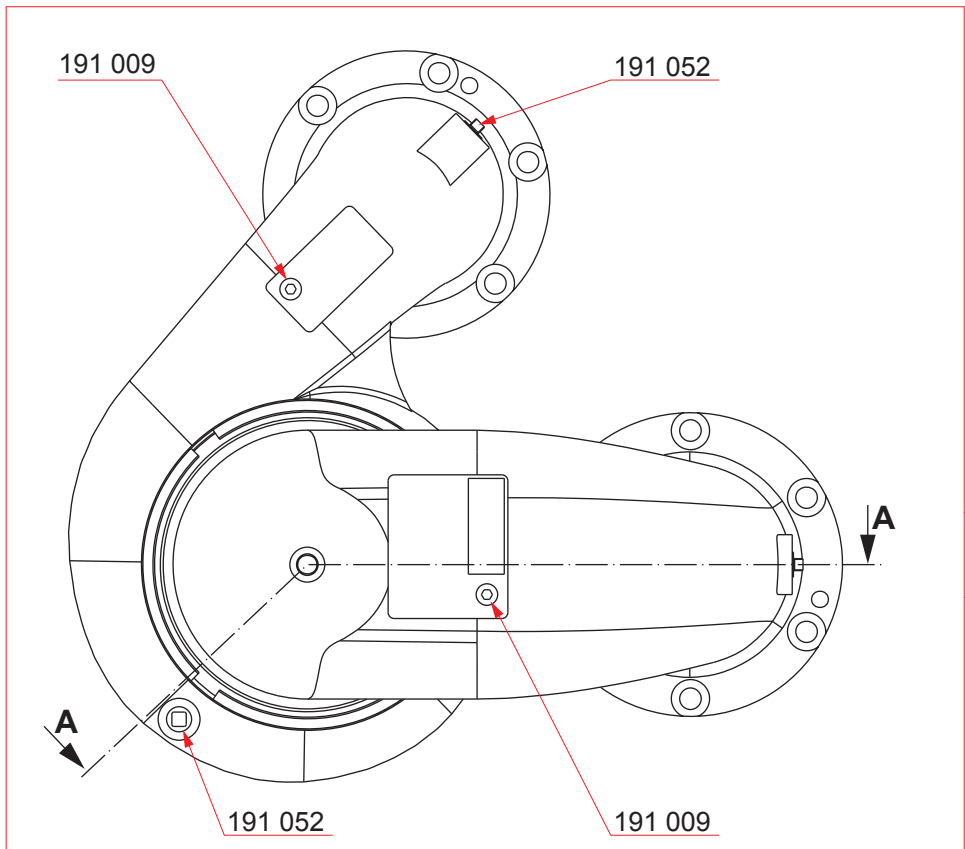


Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>182 018</b>	<b>Prelubricating oil pump</b>	<b>1</b>	<b>-</b>
182 164	Cover	2	-
182 165	Screw	4	-



APPENDIX A

Water pump

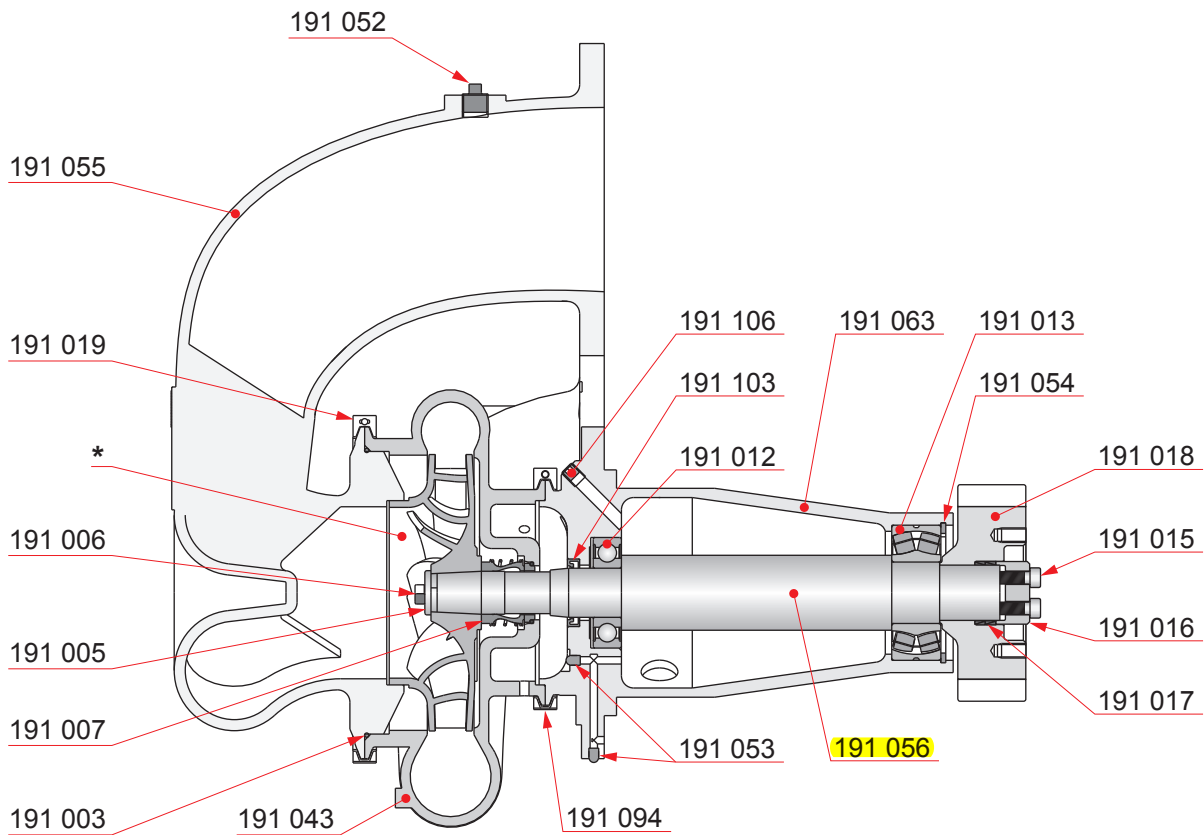


Part No.	Description	Qty [Pcs]	Wt. [Kg]
191 001	HT water pump	1	-
191 002	LT water pump	1	-
191 009	Plug	2	0.2
191 052	Plug	3	-

APPENDIX A

Water pump

Section A-A

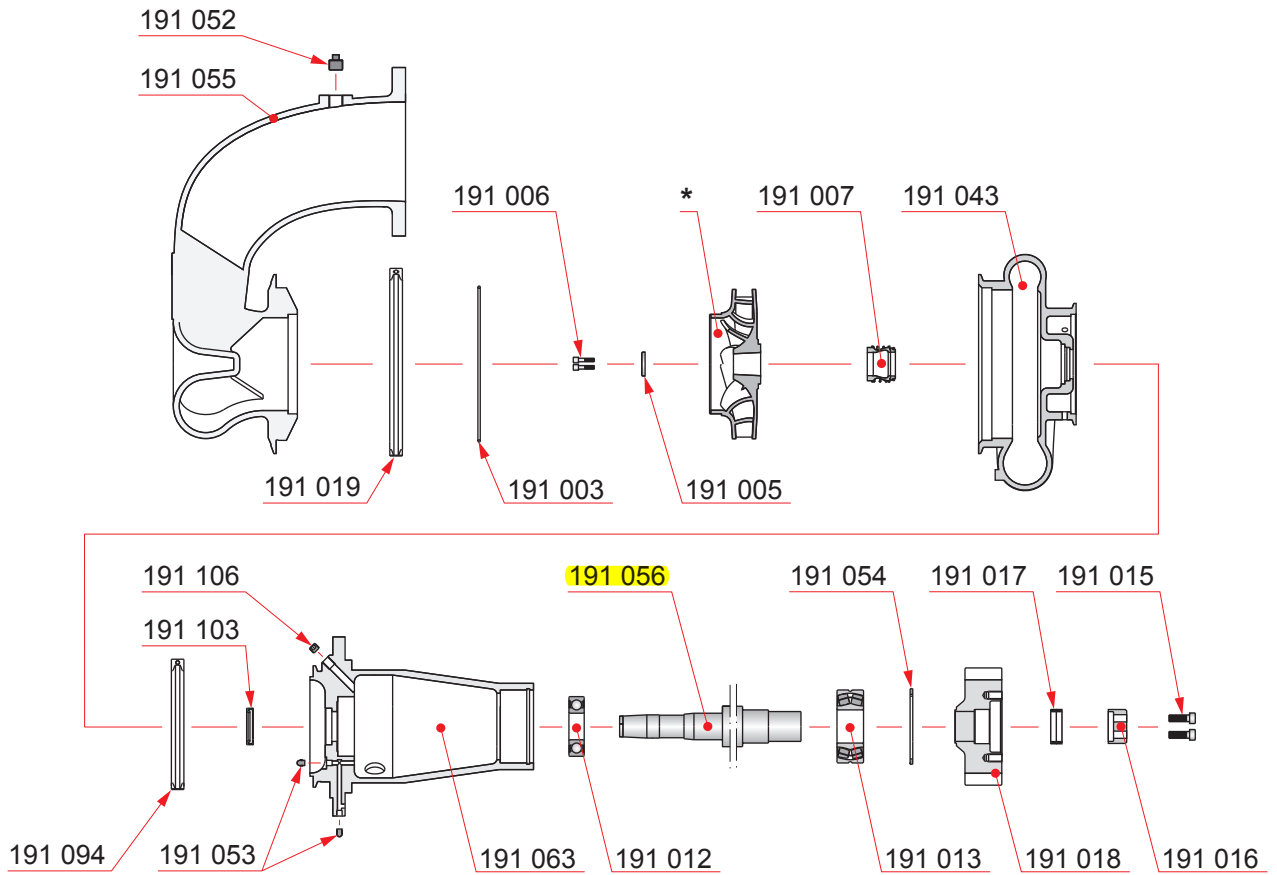


Part No.	Description	Qty [Pcs]	Wt. [Kg]
191 003	O-ring	1	-
191 005	Washer	1	-
191 006	Screw	2	-
191 007	Shaft seal	1	0.1
191 012	Bearing	1	0.6
191 013	Bearing	1	1.9
191 015	Screw	4	-
191 016	Pressure plate	1	0.3
191 017	Pair of friction rings	2	-
191 018	Drive gear wheel	1	3.2
191 019	Clamp ring	1	0.3
191 043	Chamber	1	28.5
191 052	Plug	3	-
191 053	Shield plug	4	0.2
191 054	Retainer ring	1	-
191 055	Housing	1	36.0
<b>191 056</b>	<b>Shaft</b>	<b>1</b>	<b>7.0</b>
191 063	Bearing housing	1	20.0
191 094	Clamp ring	1	0.5
191 103	Shaft seal	1	-
191 106	Plug	1	0.2

NOTE! \*) Impeller, see page 4.

APPENDIX A

Water pump

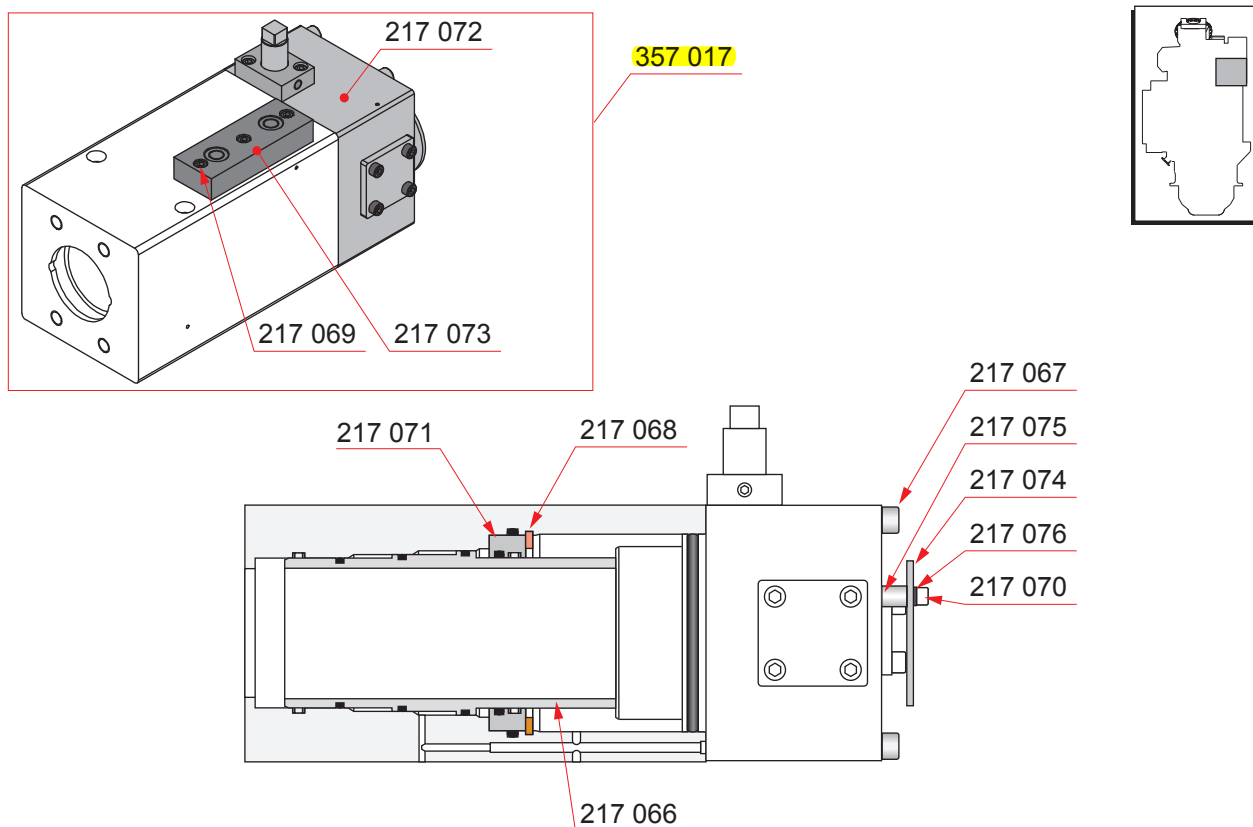


Part No.	Description	Qty [Pcs]	Wt. [Kg]
191 003	O-ring	1	-
191 005	Washer	1	-
191 006	Screw	2	-
191 007	Shaft seal	1	0.1
191 012	Bearing	1	0.6
191 013	Bearing	1	1.9
191 015	Screw	4	-
191 016	Pressure plate	1	0.3
191 017	Pair of friction rings	2	-
191 018	Drive gear wheel	1	3.2
191 019	Clamp ring	1	0.3
191 043	Chamber	1	28.5
191 052	Plug	3	-
191 053	Shield plug	4	0.2
191 054	Retainer ring	1	-
191 055	Housing	1	36.0
<b>191 056</b>	<b>Shaft</b>	<b>1</b>	<b>7.0</b>
191 063	Bearing housing	1	20.0
191 094	Clamp ring	1	0.5
191 103	Shaft seal	1	-
191 106	Plug	1	0.2

NOTE! \*) Impeller, see page 4.

## APPENDIX A

### Starting valve



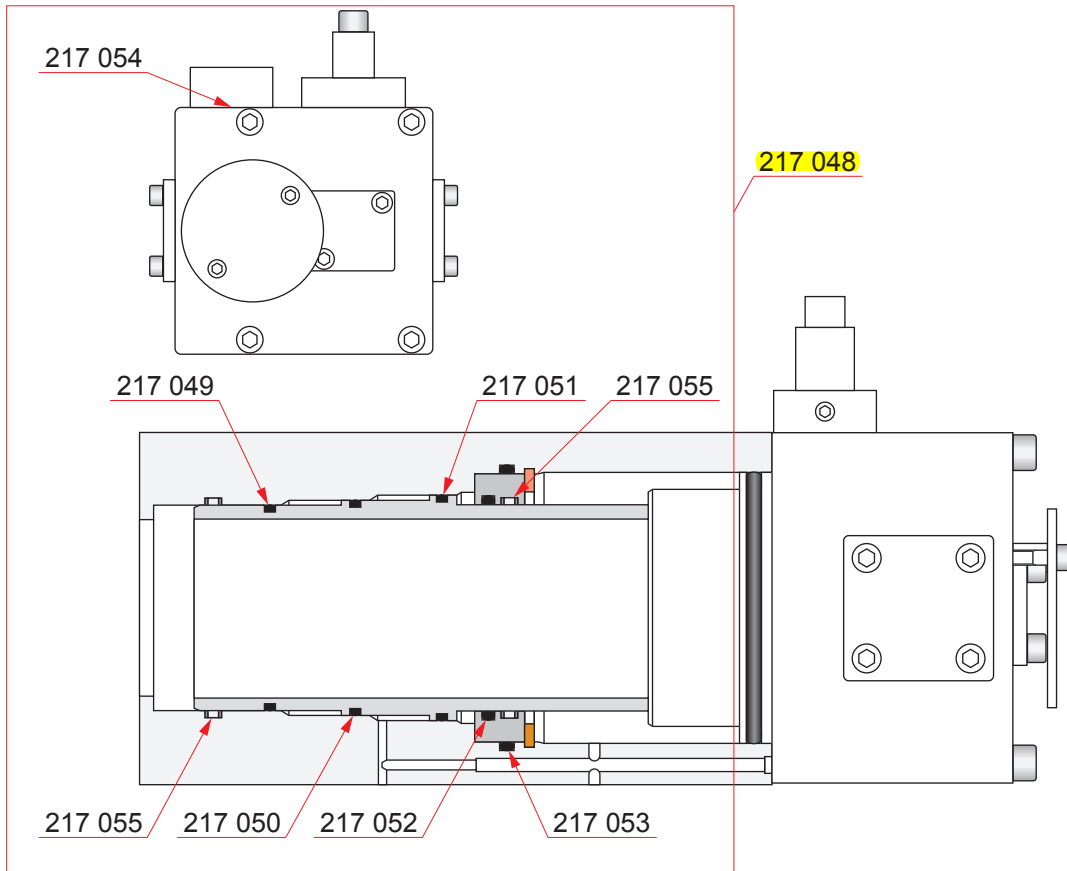
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>357 017</b>	<b>Main starting valve</b>	<b>1</b>	<b>-</b>
217 066	Piston	1	-
217 067	Screw	4	-
217 068	Locking ring	1	-
217 069	Screw	3	-
217 070	Screw	2	-
217 071	Sealing ring	1	-
217 072	Starting valve assembly (1) (2)	1	-
217 073	Plate	1	-
217 074	Disc	1	-
217 075	Pipe	2	-
217 076	Washer	2	-

NOTE! (1) See page 4.

NOTE! (2) Not available separately.

APPENDIX A

Starting valve



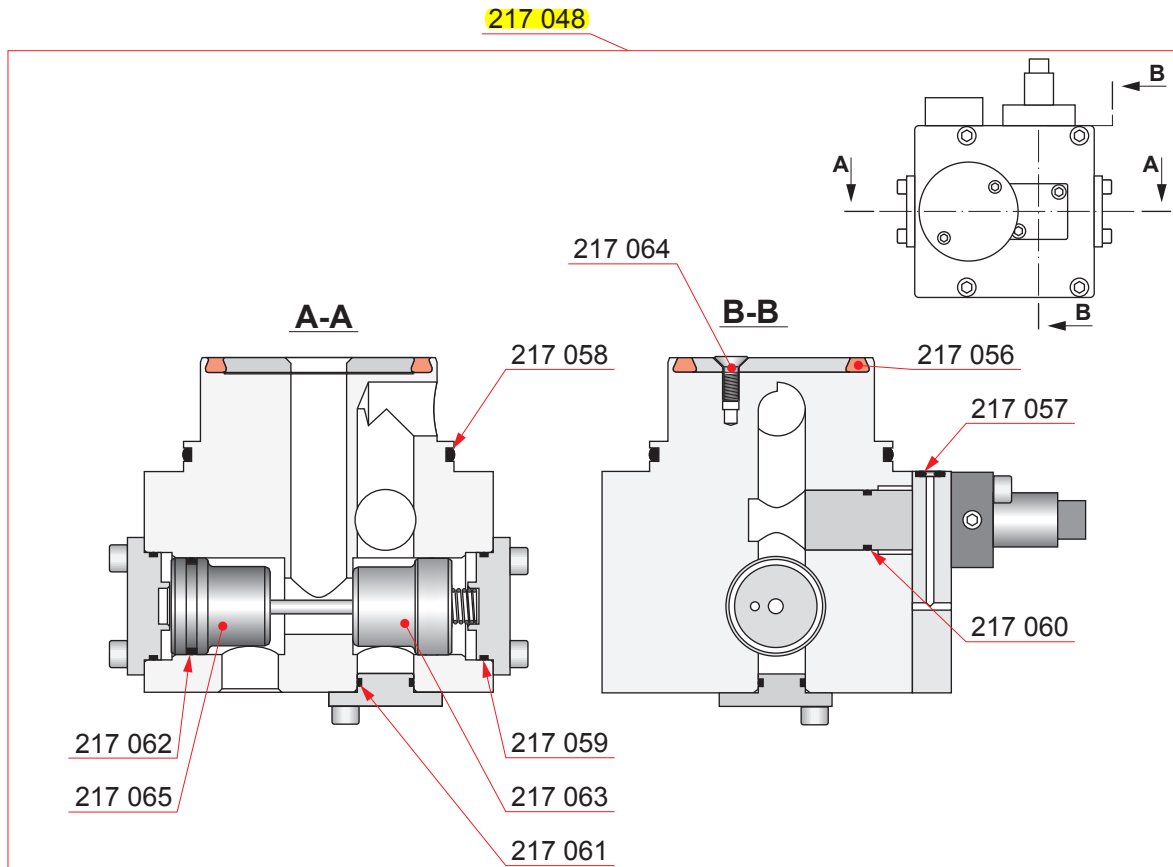
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>217 048</b>	<b>Repair kit</b>	<b>1</b>	<b>-</b>
217 049	O-ring *	1	-
217 050	O-ring *	1	-
217 051	O-ring *	1	-
217 052	O-ring *	1	-
217 053	O-ring *	1	-
217 054	O-ring *	2	-
217 055	Slide ring *	2	-

NOTE! All parts marked with \* are included in the Repair kit

NOTE! Parts included in Repair kit are not available separately

## APPENDIX A

### Starting valve



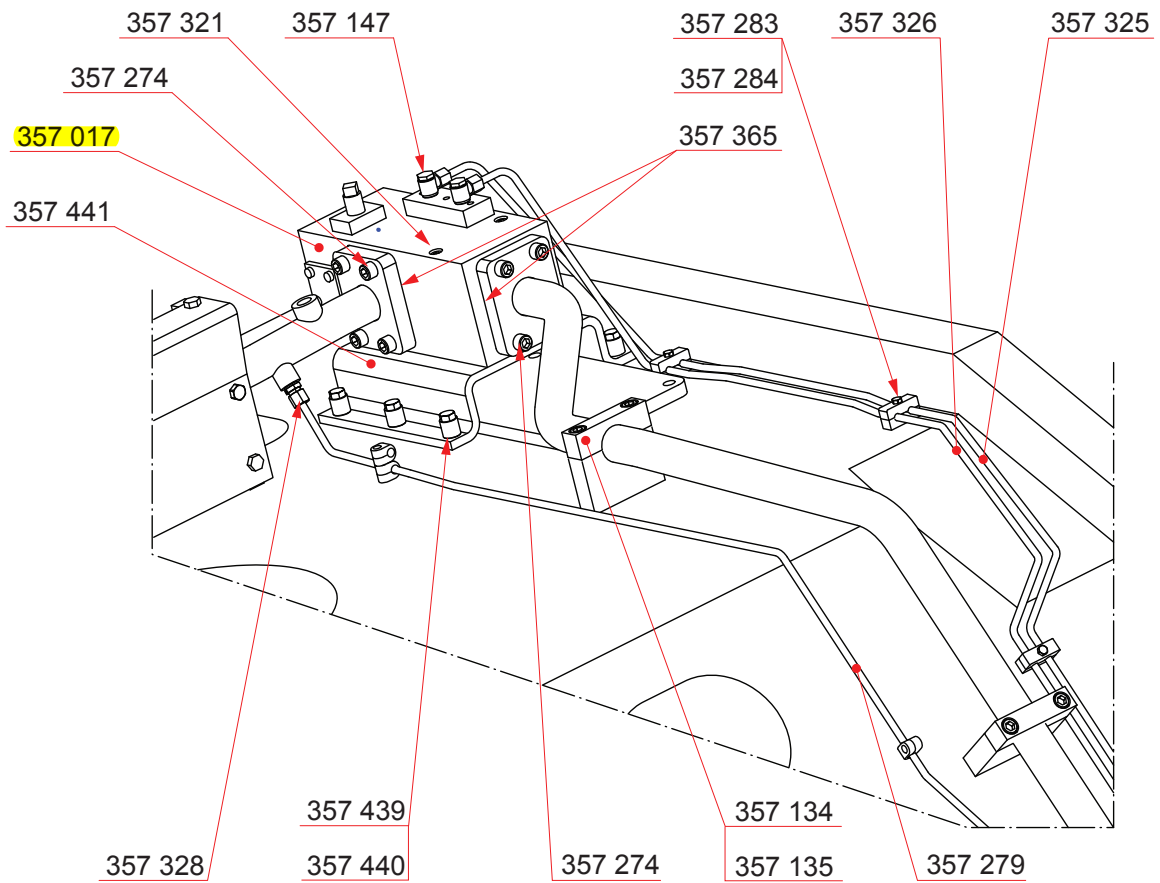
Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>217 048</b>	<b>Repair kit</b>	<b>1</b>	<b>-</b>
217 056	Seal *	1	-
217 057	O-ring *	1	-
217 058	O-ring *	1	-
217 059	O-ring *	2	-
217 060	O-ring *	1	-
217 061	O-ring *	1	-
217 062	O-ring *	1	-
217 063	Piston *	1	-
217 064	Screw *	4	-
217 065	Piston *	1	-

NOTE! All parts marked with \* are included in the Repair kit

NOTE! Parts included in Repair kit are not available separately

APPENDIX A

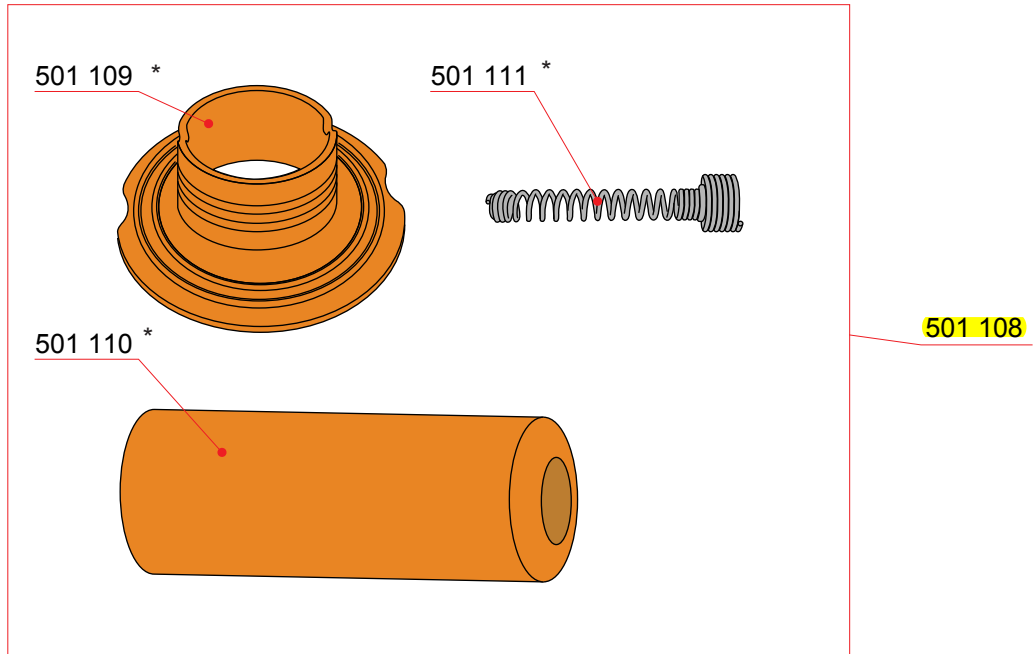
**Starting air system with slow turning system**



Part No.	Description	Qty [Pcs]	Wt. [Kg]
<b>357 017</b>	<b>Main starting valve</b>	<b>1</b>	<b>11.5</b>
357 134	Pipe clamp	2	1.4
357 135	Screw	4	0.1
357 147	Pipe union	2	-
357 274	Screw	8	-
357 279	Pipe	1	0.5
357 283	Pipe clamp	4	-
357 284	Screw	4	-
357 321	Screw	2	-
357 325	Pipe	1	0.4
357 326	Pipe	1	0.4
357 328	Pipe union	1	-
357 365	O-ring	2	-
357 439	Distance sleeve	6	-
357 440	Screw	6	-
357 441	Bracket	1	6.5

APPENDIX A

Spare part kit for ignition coil



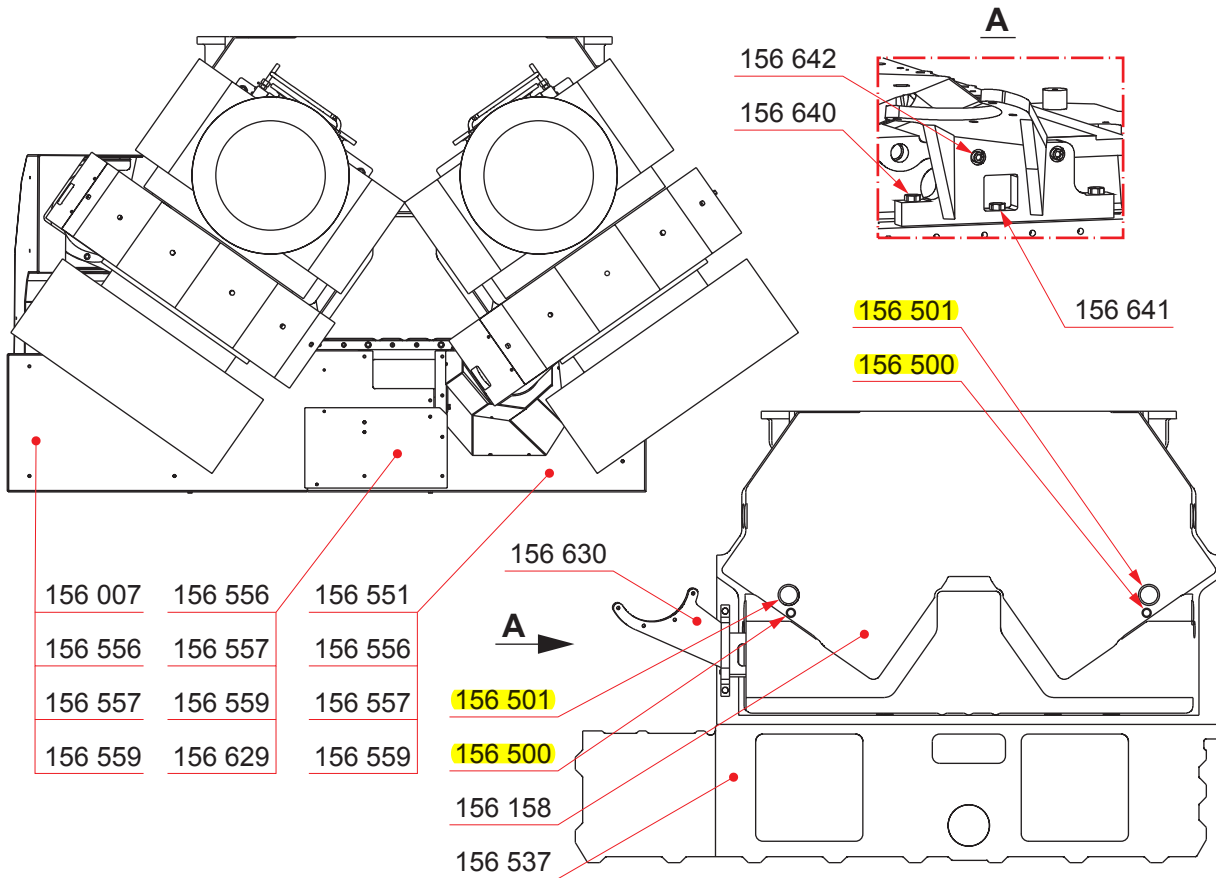
Part No.	Description	Qty [Pcs]	Wt. [Kg]
501 108	Spare part kit	1	-
501 109	Grommet *	1	-
501 110	Boot *	1	-
501 111	Spring *	1	-

NOTE! \*) Components are not available as single parts.



APPENDIX A

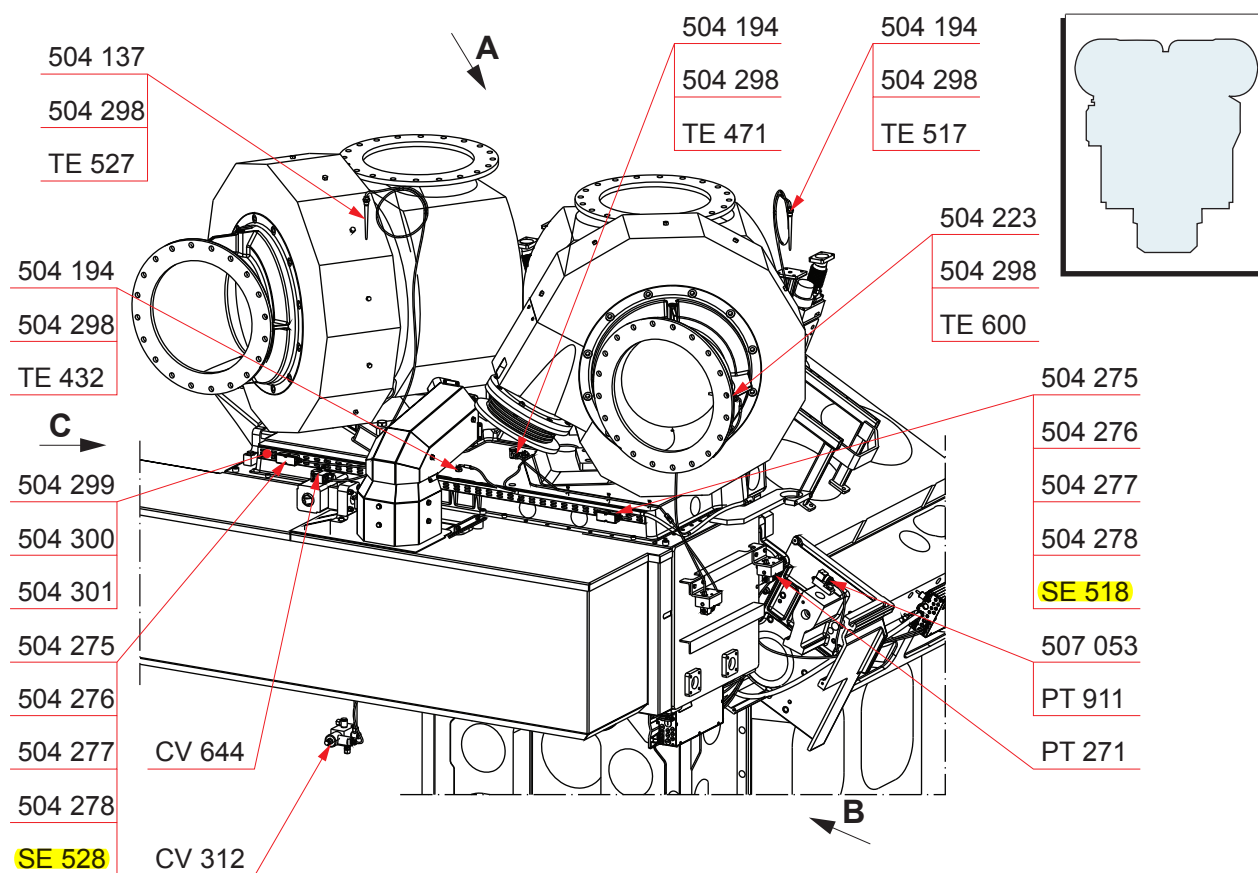
Charge air system



Part No.	Description	Qty [Pcs]	Wt. [Kg]
156 007	Cover	1	23.6
156 158	Bracket	1	2283
156 500	O-ring	2	-
156 501	O-ring	2	-
156 537	Air duct	1	820
156 551	Cover	1	11.2
156 556	Screw	19	-
156 557	Screw	62	-
156 559	Washer	85	-
156 629	Cover	1	4.6
156 630	Support	1	25.0
156 640	Screw	2	0.1
156 641	Screw	1	-
156 642	Screw	2	0.1

APPENDIX A

Electrical equipment at free end



Part No.	Description	Qty [Pcs]	Wt. [Kg]	Part No.	Description	Qty [Pcs]	Wt. [Kg]
504 137	Protecting well	2	0.4	TE600	Temperature sensor	1	-
504 194	Protecting well	5	0.2				
504 223	Protecting well	2	0.3	NOTE!	(1) Not used in all installations.		
504 275	Holder	2	-	NOTE!	*) Length needed when ordering.		
504 276	Cover	2	-				
504 277	Steel strip	2	-				
504 278	Screw	5	-				
504 298	Sealing ring	9	-				
504 299	Distance sleeve	6	-				
504 300	Cable tray *)	1	0.7				
504 301	Screw	6	-				
507 053	Pressure gauge valve	2	0.6				
CV312	Solenoid valve	1	-				
CV644	Antisurge valve (1)	1	-				
PT271	Pressure sensor	1	-				
PT911	Pressure sensor	1	-				
SE518	Speed pick-up	1	-				
SE528	Speed pick-up	1	-				
TE432	Temp.transmitter, HT water, after TC	1	-				
TE471	LT water temperature, before charge air cooler	1	-				
TE517	Temperature sensor	1	-				
TE527	Temperature sensor	1	-				