

D-MOTOR International © AIRCRAFT ENGINE

ENGINE INSTALLATION MANUAL

Engine type : LF26 – 4 Cylinder



Publication :

© D-Motor International bvba, february 2019

Supersedure Notice

This manual is a revision of the instruction published in 2013 (and changes). Instructions in this document replace the instructions of previous D-Motor International Publications – Engine Owners Manual.

Effective Changes for this manual / document

February 2019			
April 2019, GKG			

Published and printed in belgium by D-Motor International, bvba.

Copyright ©2013,2015,2019 D-Motor International, bvba.

All rights reserved.

This material may not be reprinted, republished, broadcast, or otherwise altered without the publisher's written permission. This manual is provided without express, statutory, or implied warranties. The publisher will not be held liable for any damages caused by or alleged to be caused by use, misuse, abuse, or misinterpretation of the contents. Content is subject to change without notice. Other products and companies mentioned herein may be trademarks of the respective owners.

Content

Blank Page (intentionally).....	4
INTRODUCTION	5
D-MOTOR Engines	5
SCOPE AND PURPOSE OF THIS DOCUMENT	5
Warning	5
Advisories	5
Order of Precedence	6
Updates/Changes Distribution	6
Suggestions and corrections	6
Contact Information	7
TOA (Table of Amandments)	8
MAIN SECTION.....	9
Fuel Circuit.....	9
General overview of the LF26 Fuel system	9
System with second tank.....	10
Circuit parts installation	11
Two fuel tank instalation	11
Oil circuit installation – Lubrication system	13
Water circuit.....	14
Electric Wiring	16
System with dual fuel pump.....	17
Electrical wiring – cable loom.....	18
Wiring diagram (ECU <> Host (engine) and sensors.....	19
Ignition Coil connection.....	21
Voltage regulator connections	22
The LF26 exploded views.....	23

Blank Page (intentionally)

INTRODUCTION

D-MOTOR Engines

The D-Motor LF 26/LF39 is a 100% water cooled boxer motor with side steered valves for direct driven propellers. The motor has a lambda probe and performance map controlled multi field injection with double ignition.

The 300W/25A generator is fully integrated; the oil and cooling liquid pumps are directly driven by the camshaft. The fuel pressure is hold at a constant level by a pressure regulator, which is connected to the back flow circuit. An intake air preheating is not required and not installed.

The entire motor is controlled and surveyed by the ECU (**E**lectronic **C**ontrol **U**nit). As an option a second ECU, battery and fuel pump can be installed as a redundant system.

During the use of the motor following data and information are constantly collected, analysed and interpreted by the ECU.

The Engine is a Top quality European Product (produced and assembled in Belgium).

<https://www.d-motor.eu>

SCOPE AND PURPOSE OF THIS DOCUMENT

This document provides information tot he maintenance and/or installation staff.

Please check the service bulletins that are published on our corporate website and/or or D-Motor Dropbox system.

Warning

This is a non-certified aircraft engine ; the possibility of engine failure exists at all times. Do not operate this engine over densely populated areas. Do not operate this engine over terrain where a safe, power off landing cannot be performed.

The operating and maintenance instructions supplied with this engine must be followed at all times. Flying any aircraft involves the risk of injury or death, building and maintaining your own aircraft requires great personal responsibility.

Advisories

This document utilizes three types of advisories; defined as follows:

WARNING

A warning emphasizes information which, if disregarded, could result in severe injury to personnel or equipment failure.

CAUTION

Emphasizes certain information or instructions, which if disregarded, may result in damage to the engine or accessories.

NOTE

Provides special interest information, which may facilitate performance of a procedure or operation of equipment.

Warnings and cautions precede the steps to which they apply; notes are placed in the manner which provides the greatest clarity. Warnings, cautions, and notes do not impose undue restrictions. Failure to heed advisories will likely result in the undesirable or unsafe conditions the advisory was intended to prevent. Advisories are inserted to ensure maximum safety, efficiency, and performance. Abuse, misuse, or neglect of equipment can cause eventual engine malfunction or failure.

Order of Precedence

WARNING

The aircraft operator must use the airframe manufacturer's operating instructions found in the Airplane Flight Manual/ Pilot's Operating Handbook (AFM/POH) while operating the aircraft unless the AFM/POH directs otherwise.

Updates/Changes Distribution

Document updates are available on our web site upon notification of official document approval. Printed publication subscribers receive printed changes and revisions as they are released.

Document revisions are released if the update changes more than 50% of the contents of a publication. Revisions replace the previous version of a publication from cover to cover.

Minor corrections are released as change pages to the original publication, identified with a change number and effective change date in the page footer. Information on the page that changed from the previous edition is identified by a vertical, six-point black line referred to as a "change bar" in the outside margin of the page. A change page replaces only the previous edition of the affected page.

Suggestions and corrections

D-Motor International solicits and encourages user comments regarding suggested changes to this manual. Direct recommended changes or questions to the attention of "Publications" at the address listed in this section, "Contact Information" or send comments via e-mail to info@d-motor.eu. Notify our Customer Service Department immediately, using our telephone number, if you discover incorrect information which adversely affects safety !! Thank you !!

Contact Information

D-Motor International factory representatives are available to answer technical questions and encourages suggestions regarding products, parts, or service. If customers have an inquiry or require technical assistance, they should contact their local D-Motor dealer/distributor or field representative. To contact a factory representative, refer to the contact information below:

D-Motor International, bvba

Houtekiestraat 11
B-8540 DEERLIJK

BELGIUM

Customer service department : +32 (0)56 498149

helpdesk@d-motor.eu

<https://www.d-motor.eu>



WARNING

Before starting the engine, read the Operators Manual, as it contains important safety relevant information. Failure to do so may result in personal injuries including death. Consult the original equipment manufacturers handbook for additional instructions!

TOA (Table of Amandments)

Current N°	Chapter	Page	Change date	Remark	Date approval	Date inclusion	Signature
00	INTRO						

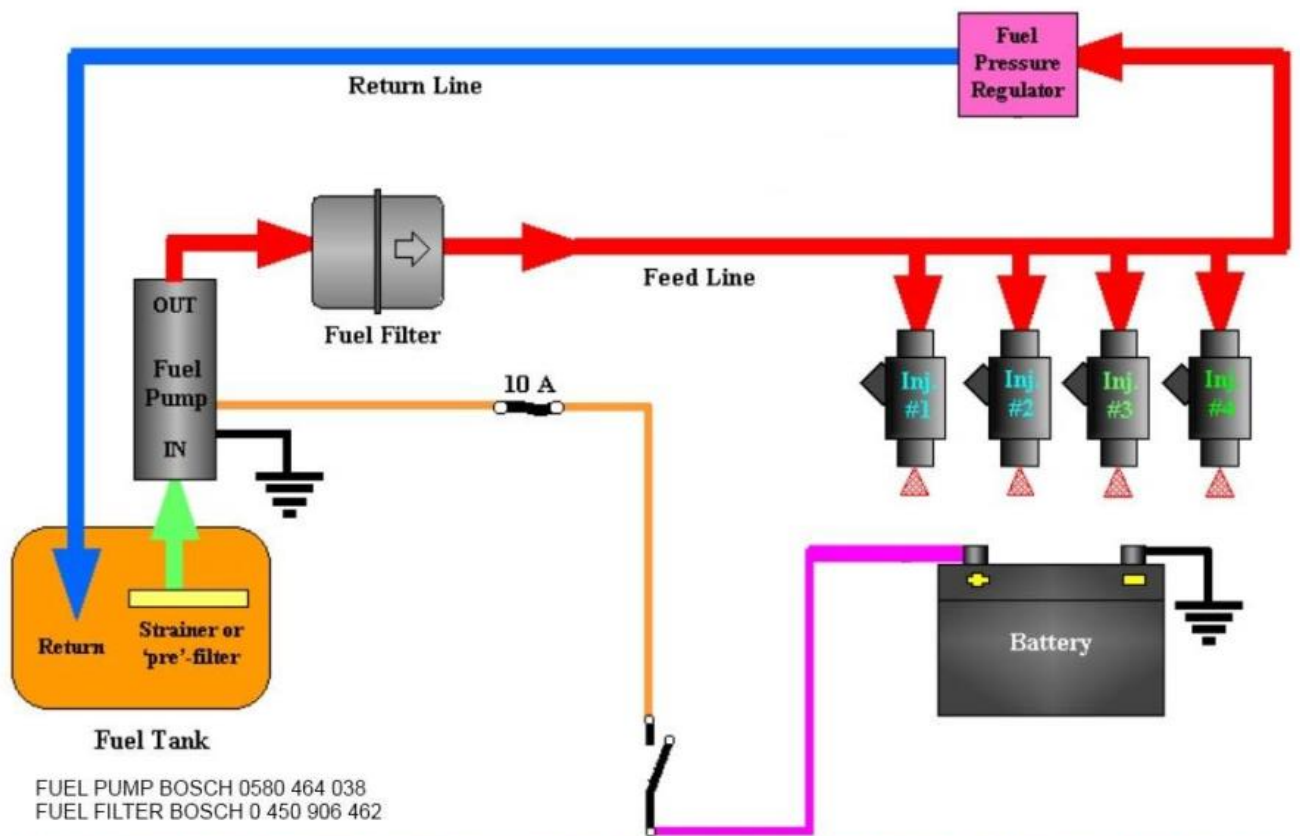
Before operating the engine, carefully read this Operators Manual. The Manual provides you with basic information on the safe operation of the engine. If any passages of the Manual are not clearly understood or in case of any questions, please contact an D-Motor International® authorized aircraft engines dealer/distributors or their independent service center. D-Motor International wishes you much pleasure and satisfaction flying your aircraft powered by this D-Motor®-aircraft engine.

MAIN SECTION

Fuel Circuit

1. General overview fuel system
2. Circuit parts installation
3. System with two fuel pumps
4. Two fuel tank installation

General overview of the LF26 Fuel system



IF INSTALLATION WITH TWIN PUMPS : NEVER LET BOTH PUMPS RUN TOGETHER TO AVOID DAMAGE TO FUEL PRESSURE REGULATOR

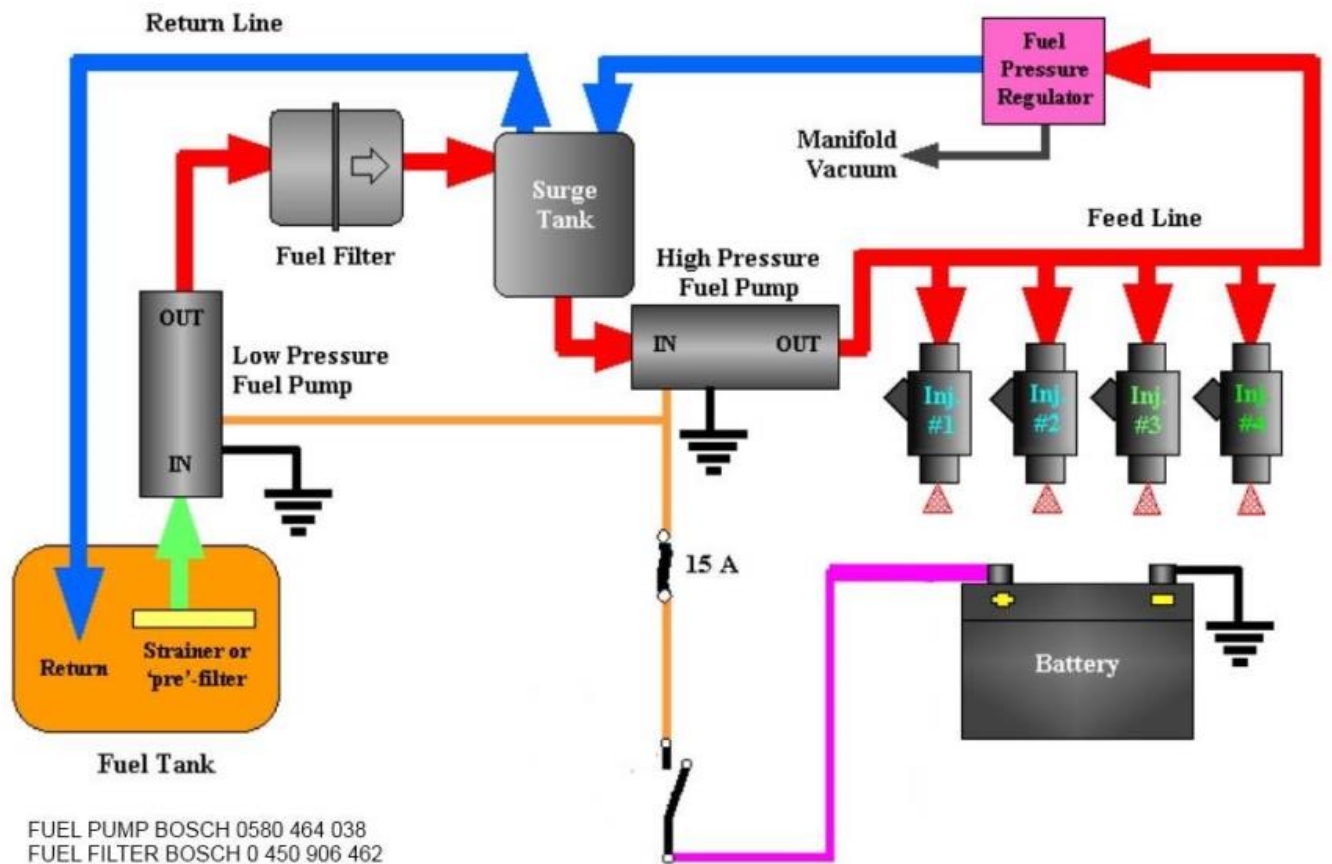
Blue : return line

Red : Fuel feed line

Fuel pressure regulator : is delivered as part separate from engine (standard enclosed).

Fuse : use 10 amps / 12 Volt fuse to battery

System with second tank



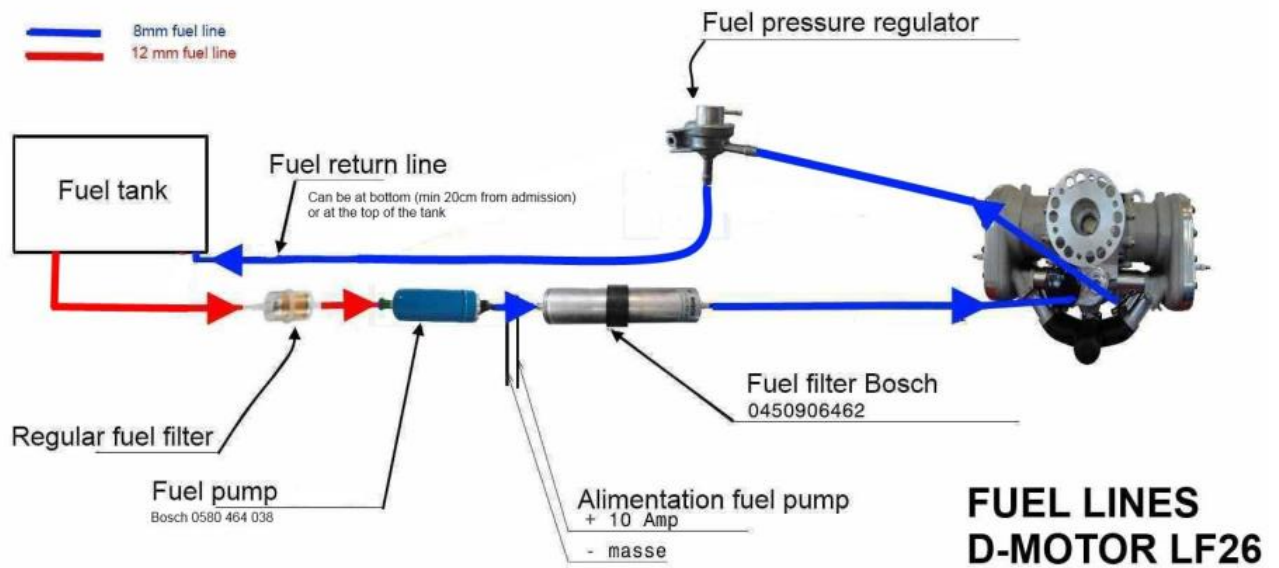
FUEL PUMP BOSCH 0580 464 038
FUEL FILTER BOSCH 0 450 906 462

IF INSTALLATION WITH TWIN PUMPS : NEVER LET BOTH PUMPS RUN TOGETHER TO AVOID DAMAGE TO FUEL PRESSURE REGULATOR

! Provide 15 amps fuse

Avoid running both pumps at the same time >> possible damage to fuel pressure regulator

Circuit parts installation



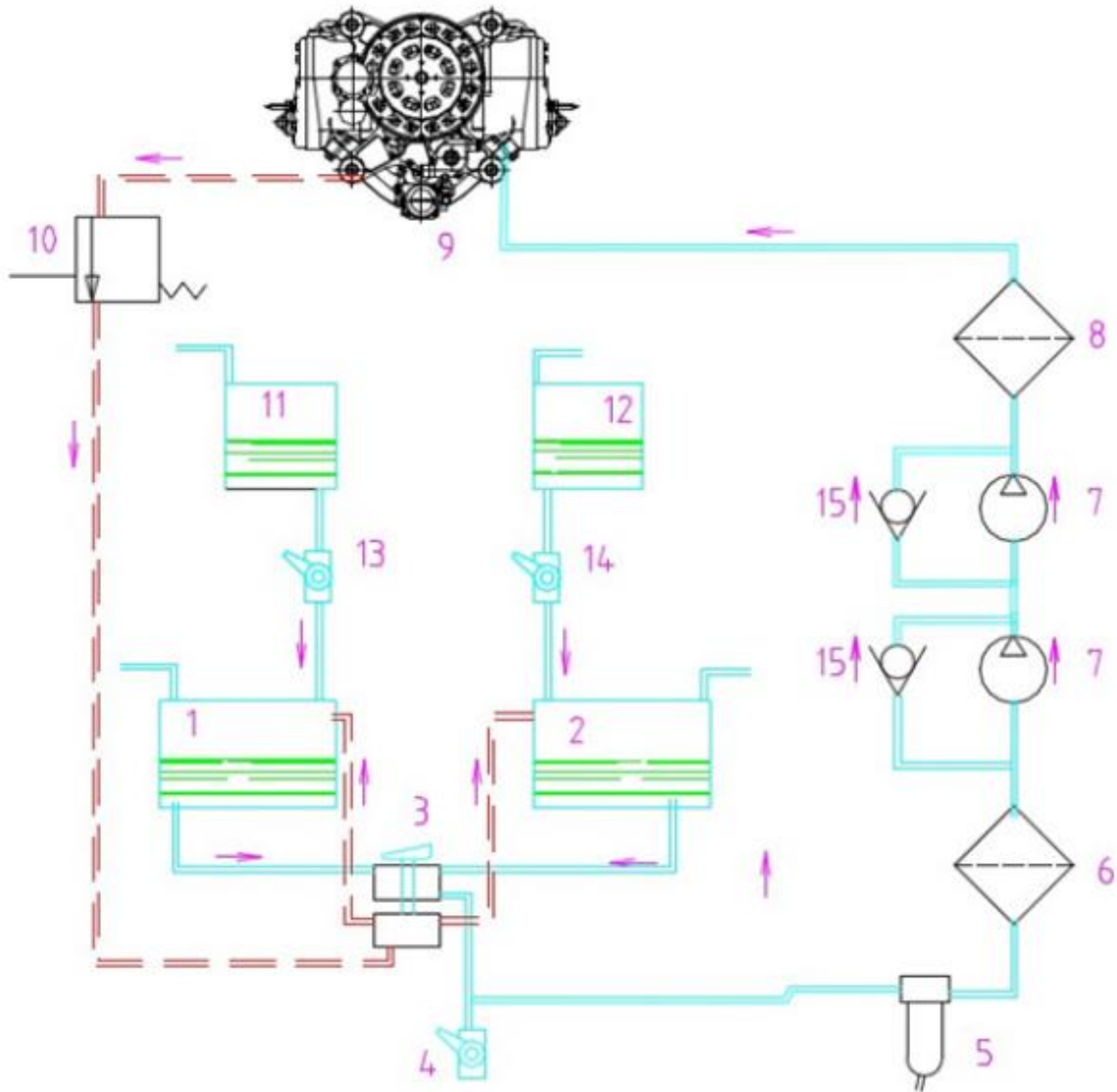
Two fuel tank instalation

In this setup there are two main tanks (for fixed wing Lef tand Right) and two Auxiliary tanks (Left and Right)

Selection is made by a regular Fuel tank selector valve

The red line : return line

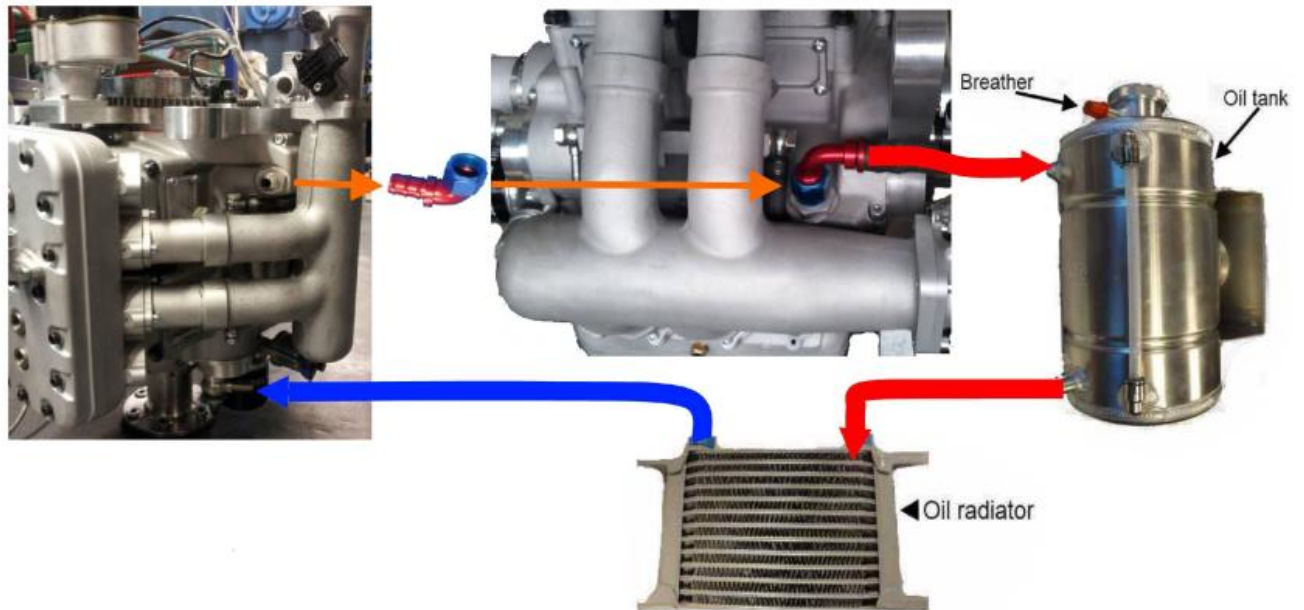
The blue line : Feed lines



LEGENDA

- | | |
|---------------------------------------|-------------------------|
| 1 - Left MAIN tank | 10 - Pressure regulator |
| 2 - Right MAIN tank | 11 - Left AUX tank |
| 3 - Fuel tank selector valve | 12 - Right AUX tank |
| 4 - Draining faucet | 13 - LH AUX tank faucet |
| 5 - Gascolator | 14 - RH AUX tank faucet |
| 6 - Coarse filter (inside gascolator) | 15 - Check Valve |
| 7 - Fuel pump CRP5008 | |
| 8 - Fine filter BOSCH 0450906462 | |
| 9 - Engine fuel injection system | |

Oil circuit installation – Lubrication system



! DO NOT FORGET TO BLEED OIL SYSTEM AT START UP IF YOU DO NOT HAVE OIL PRESSURE

The LF26 engine is provided with a dry sump forced lubrication system.

NOTE:

The oil flows from the engine to the oil tank and via the oil cooler (oil radiator) back to the engine.

The three elbows are delivered separate from the engine (enclosed in the starter package)

NOTE:

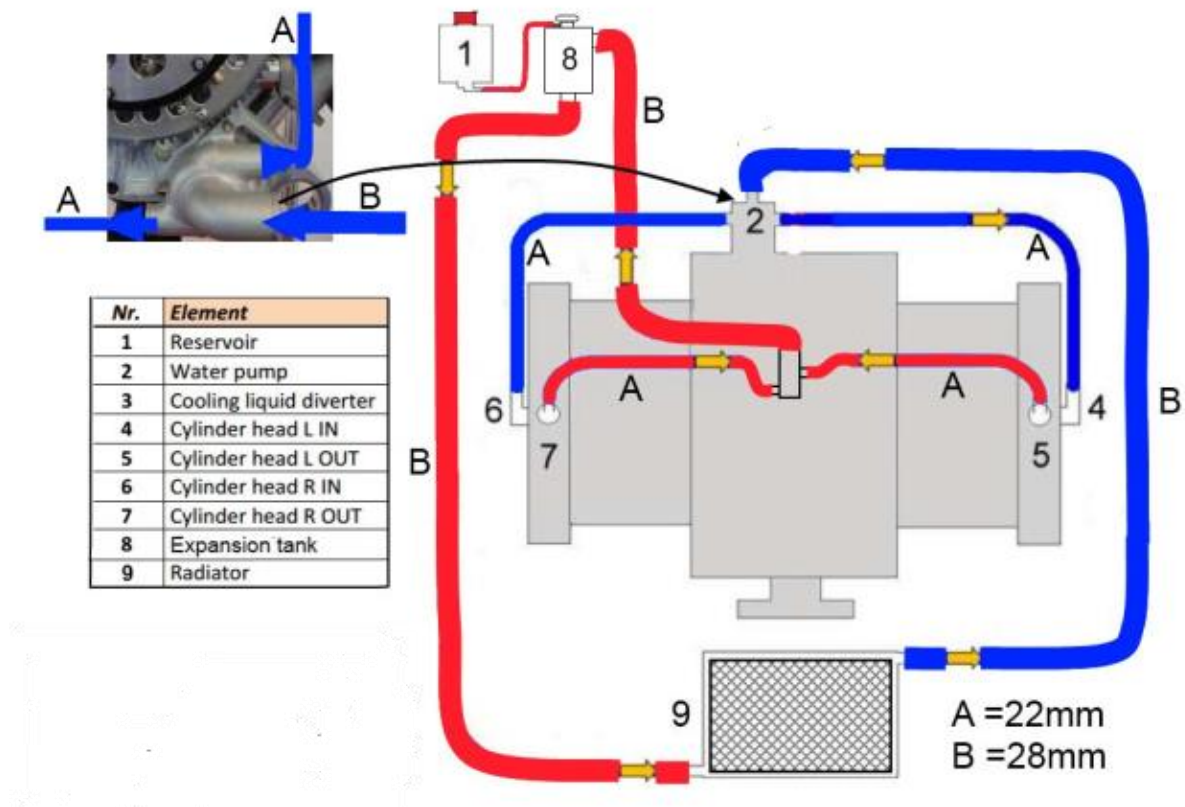
For the completion of the lubrication system only the following connections need to be established:

Oil circuit

- oil tank (outlet)
- oil radiator
- engine

Water circuit

Liquid circuit (no heat exchanger)



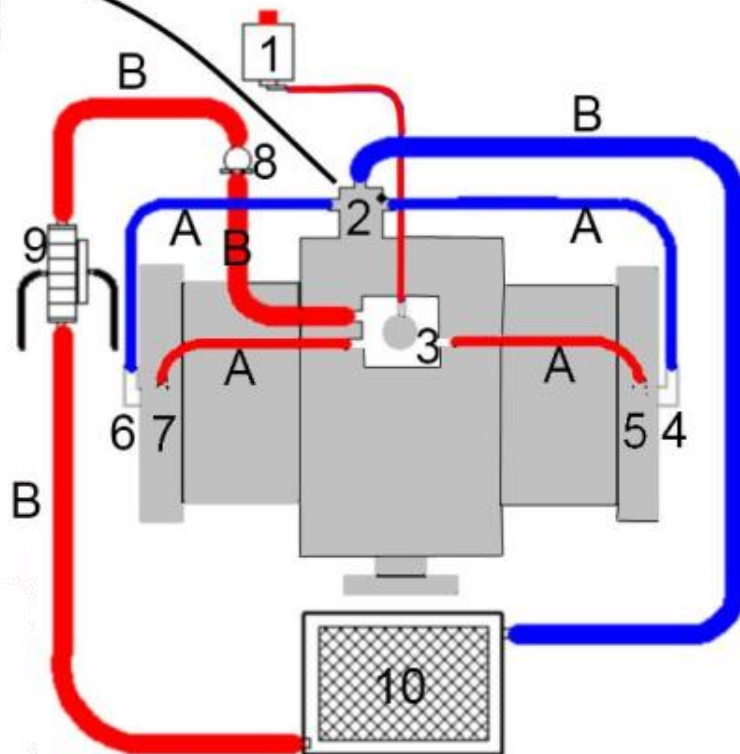
Liquid circuit with heat exchanger



A = 22mm

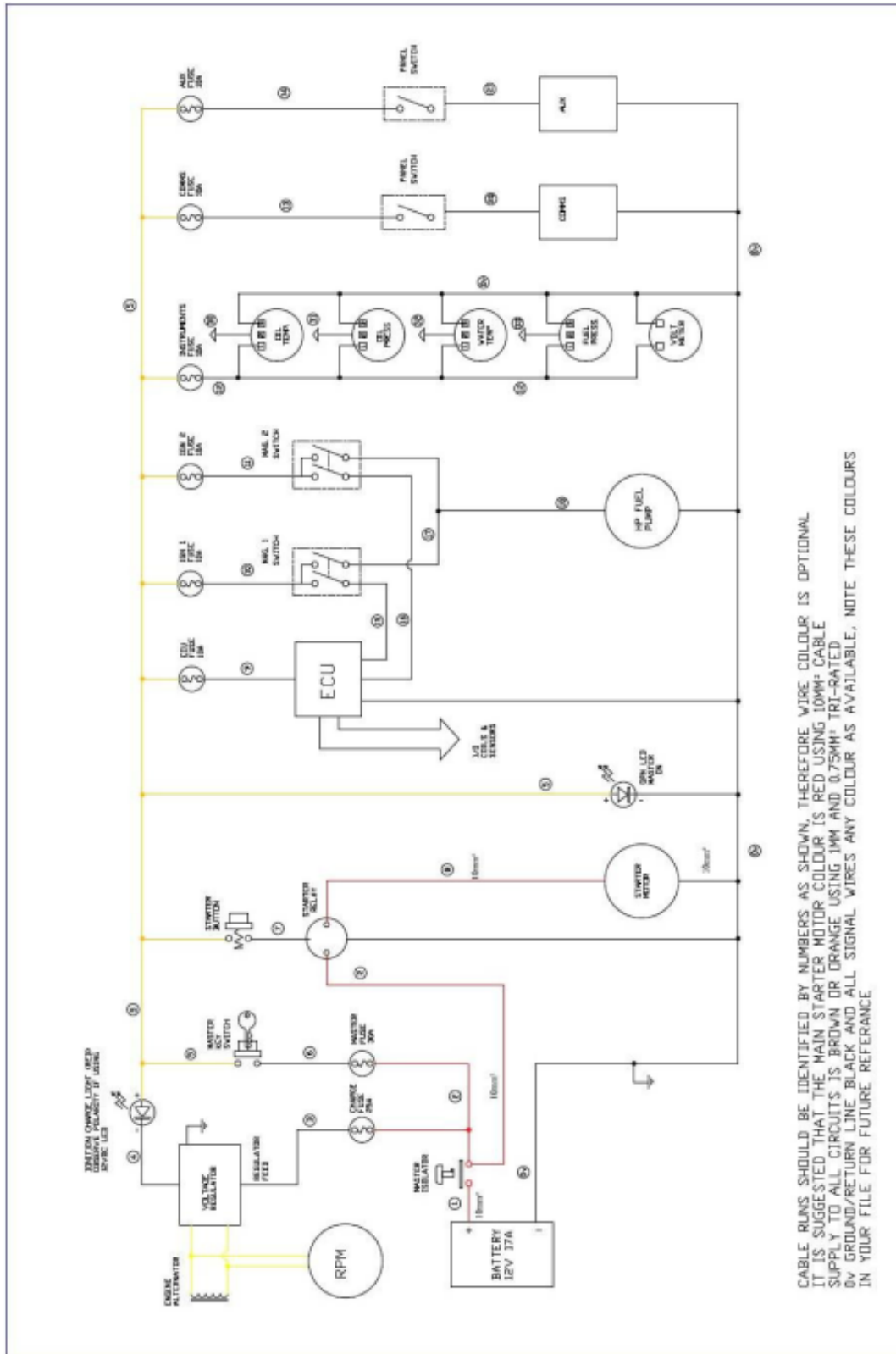
B = 28MM

Nr.	Element
1	Reservoir
2	Water pump
3	Cooling liquid diverter
4	Cylinder head L IN
5	Cylinder head L OUT
6	Cylinder head R IN
7	Cylinder head R OUT
8	Thermostat
9	Heat exchanger
10	Radiator

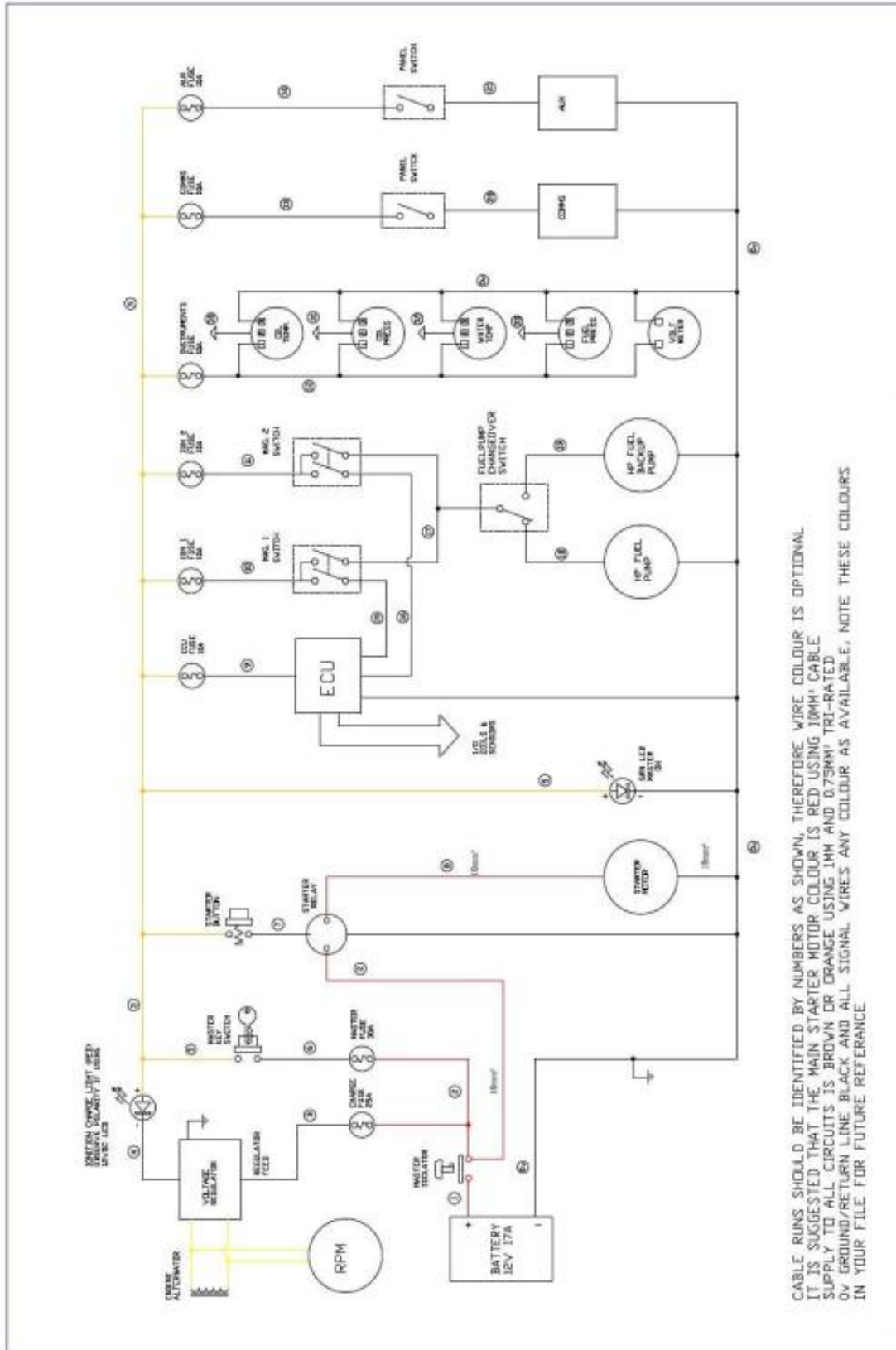


Electric Wiring

System with single fuel pump

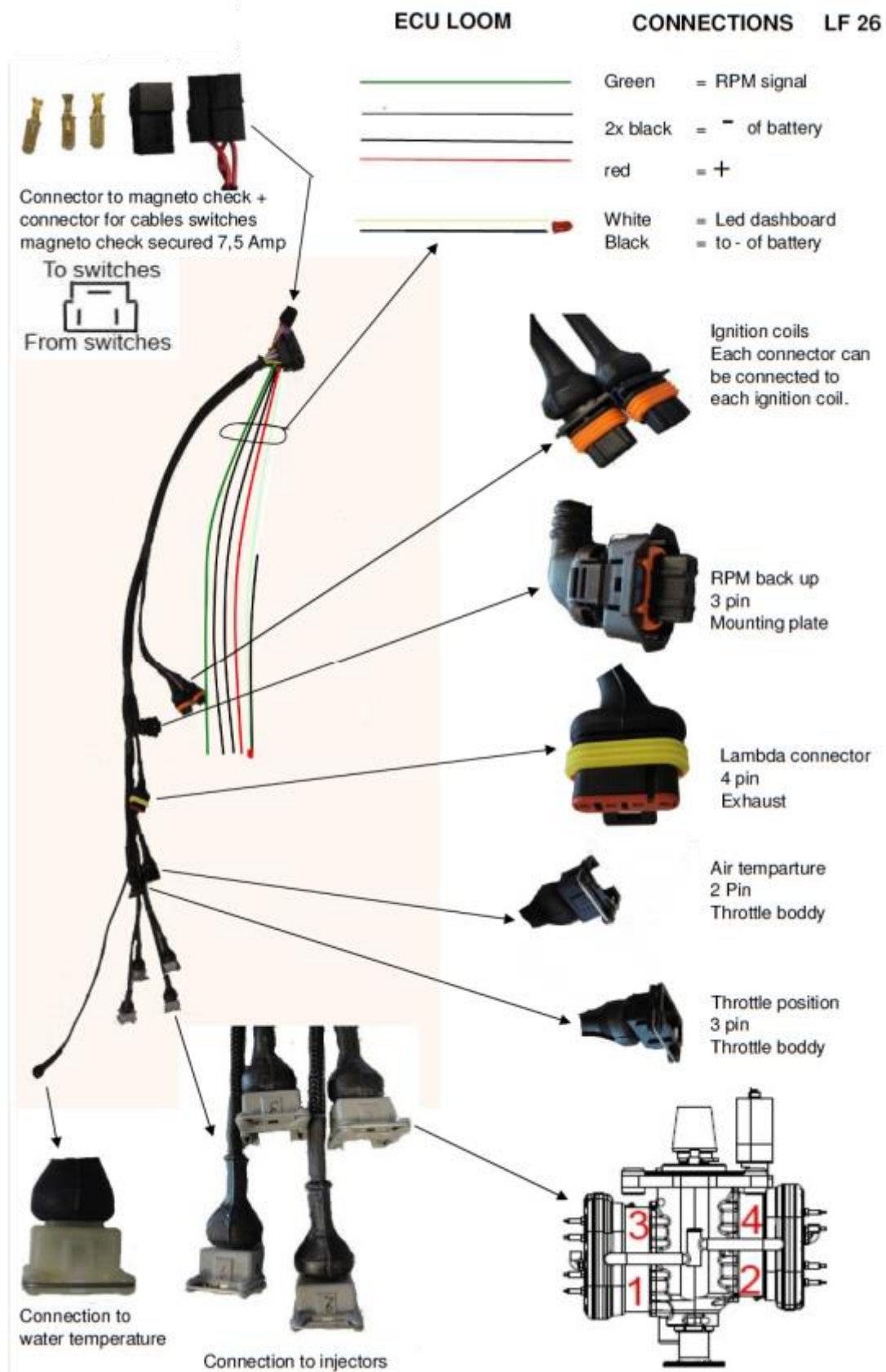


System with dual fuel pump



CABLE RUNS SHOULD BE IDENTIFIED BY NUMBERS AS SHOWN, THEREFORE WIRE COLOUR IS OPTIONAL. IT IS SUGGESTED THAT THE MAIN STARTER MOTOR COLOUR IS RED USING 10MM² CABLE SUPPLY TO ALL CIRCUITS IS BROWN OR ORANGE USING 1MM AND 0.75MM² TRI-RATED 0V GROUND/RETURN LINE BLACK AND ALL SIGNAL WIRES ANY COLOUR AS AVAILABLE, NOTE THESE COLOURS IN YOUR FILE FOR FUTURE REFERENCE

Electrical wiring – cable loom



Wiring diagram (ECU <> Host (engine) and sensors

The connectors on the ECU basic cable loom have 4 positions.
Each of the positions lead tot he host or to the sensors.



Position 3 : preferred connection tot he HOST

Host				
L1	BAT1-	Host		
L2	BAT1+	Host		
L3	BAT2+	Host		
M1	BAT2-	Host		
M2	LAMP1	Host	AWG22	black
M3	LAMP2	Host	AWG22	white
N2	RPM	Host	AWG22	gray
N3	START	Host	AWG22	green
Tube	7,5			

Position 4 : preferred connection tot he Lambda sensor

Lambda		Total		
		cm		
X1	L RE	46,3	AWG22	black
X2	LH+	46,3	AWG22	gray
X3	LIPN	46,3	AWG22	yellow
Y1	LRT	46,3	AWG22	green
Y2	LH-	46,3	AWG22	white
Y3	L APE	46,3	AWG22	red
Tube	4,5	033		

This is how to connect the Injection system:

AWG20 Red/Black = +12V ECU1

AWG20 Brown = -12V ECU 1

AWG20 Red/White = +12V ECU2

AWG20 Brown = -12V ECU 2

AWG20 Pink = Oil Temperature sensor

AWG20 Gray = OIL lamp switch

AWG20 Purple = Oil pressure sensor

AWG20 Green = CHT sensor

AWG22 Black = Warning light ECU1

AWG22 White = Warning light ECU2

AWG22 Gray = RPM output (2 pulses /rev) (sometimes external pull upp resistor needed)

AWG22 Green = Start prevent relais.

Ignition Coil connection

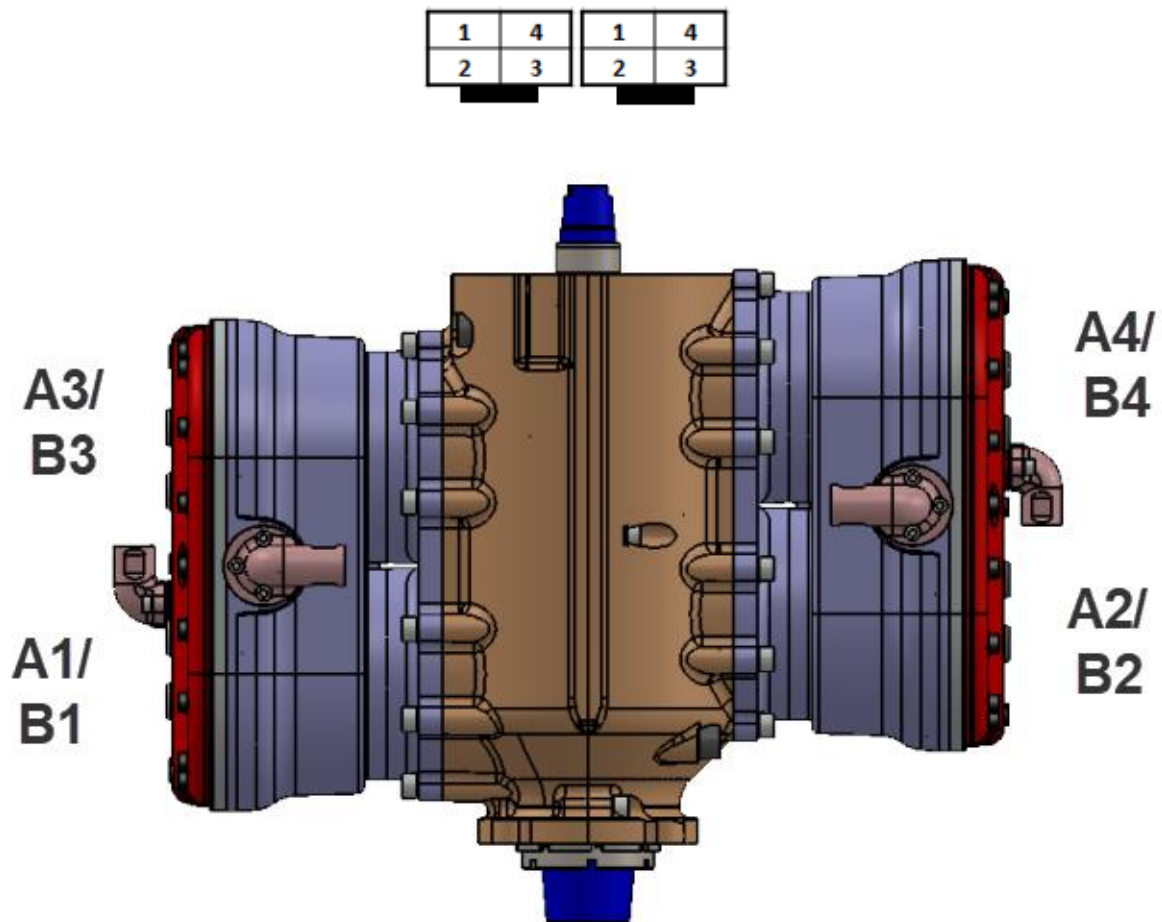
There are two ignition coils for the LF26 (4 cylinder engine).

The setup is as follows

1	4
2	3

Connection to the system is in this view below (Connection 2 and 3)

The cable order (coil to cylinder) is as follows :



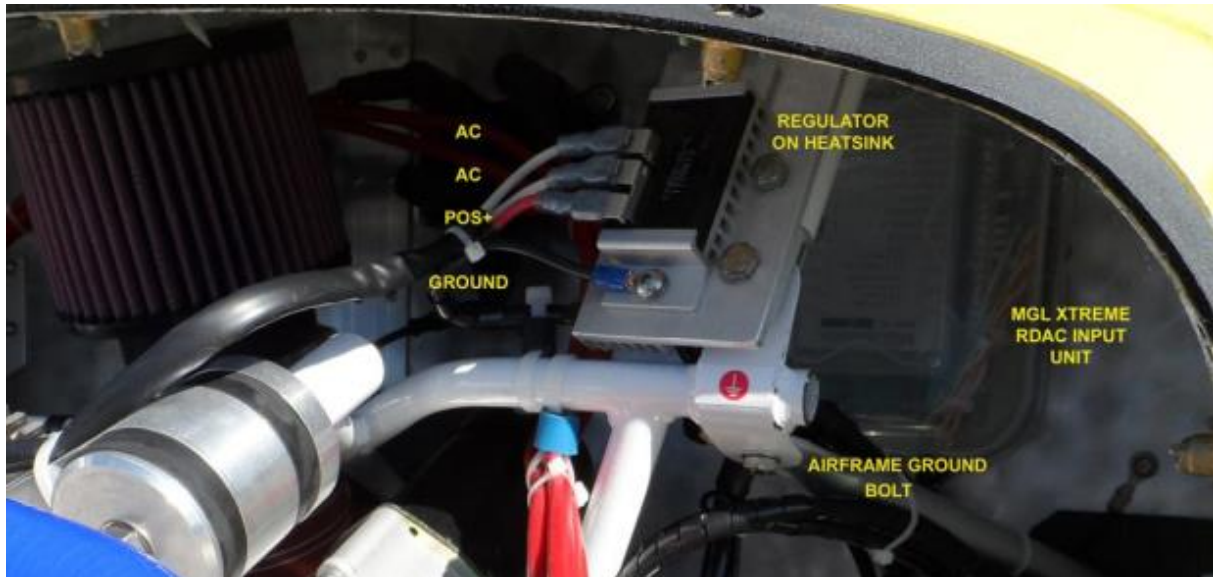


Voltage regulator connections

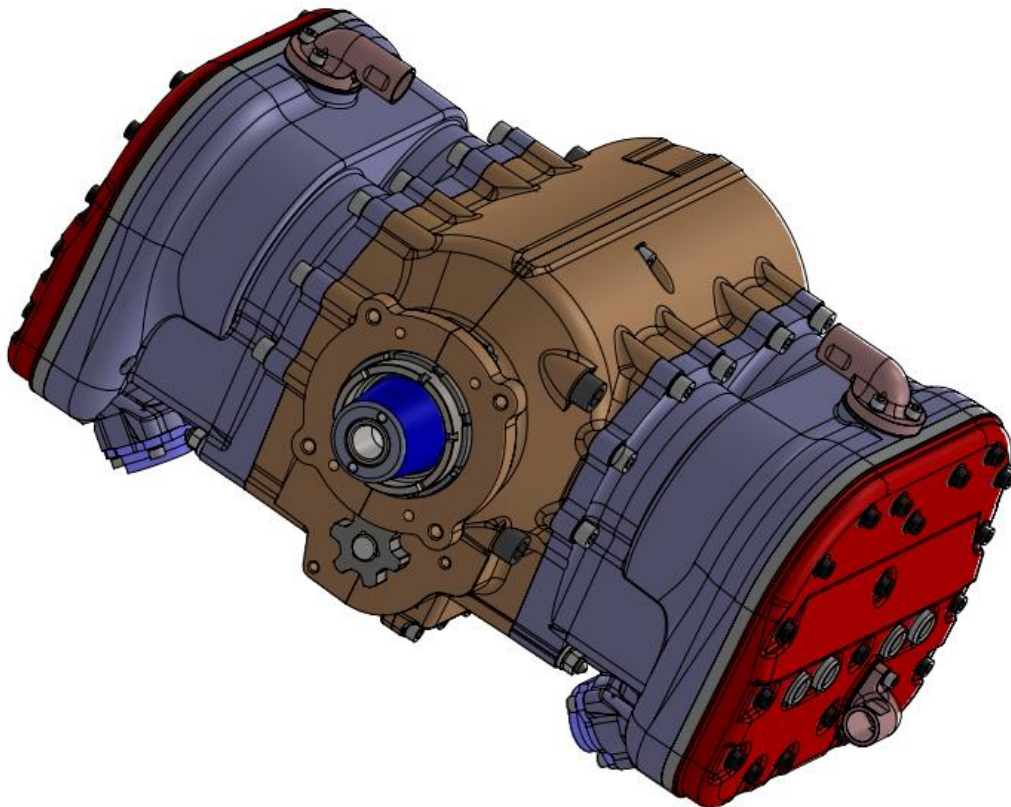
The voltage regulator is mounted on the engine.
See (picture below).

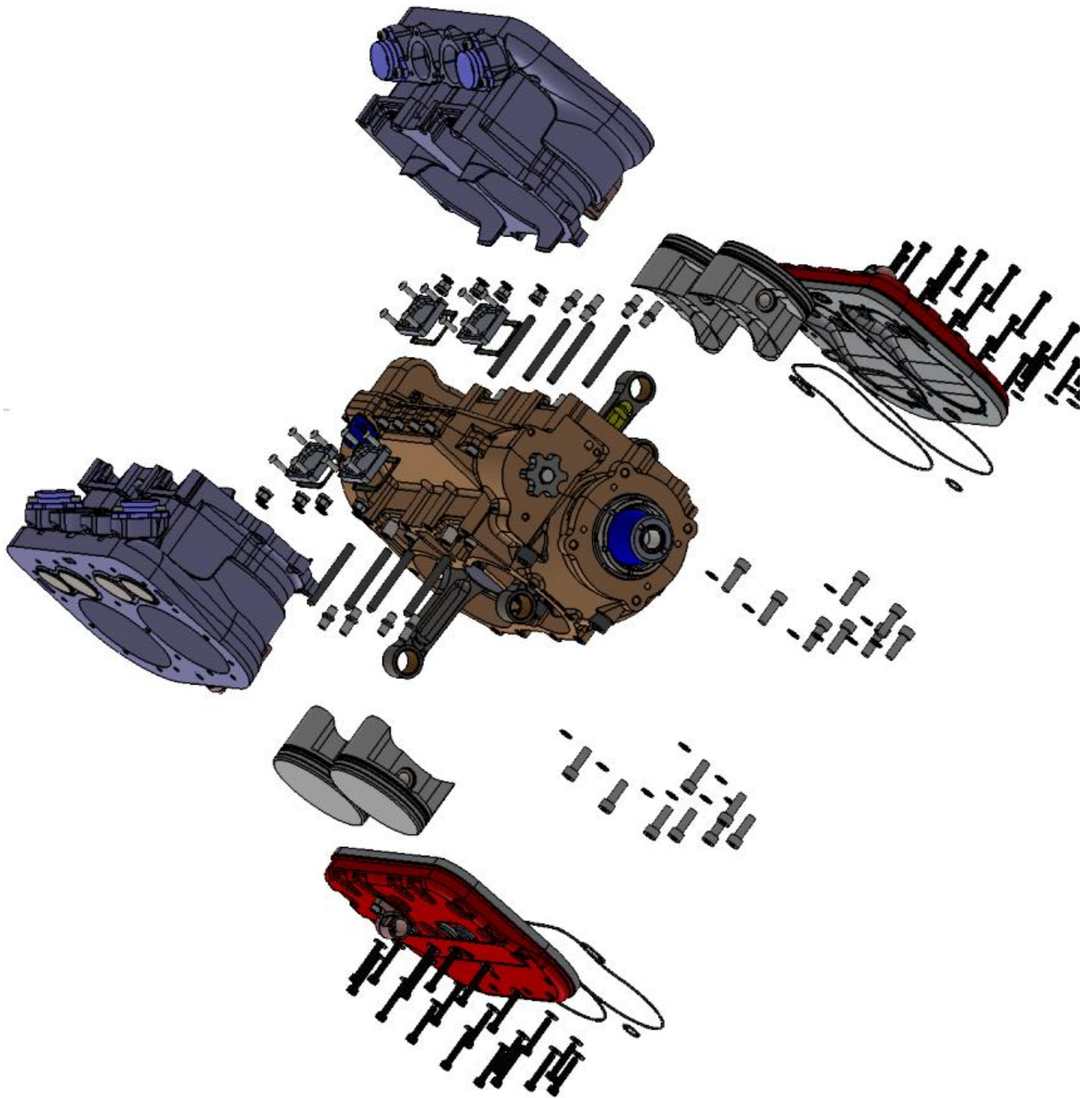
From top to bottom (connectors on the left hand side) :

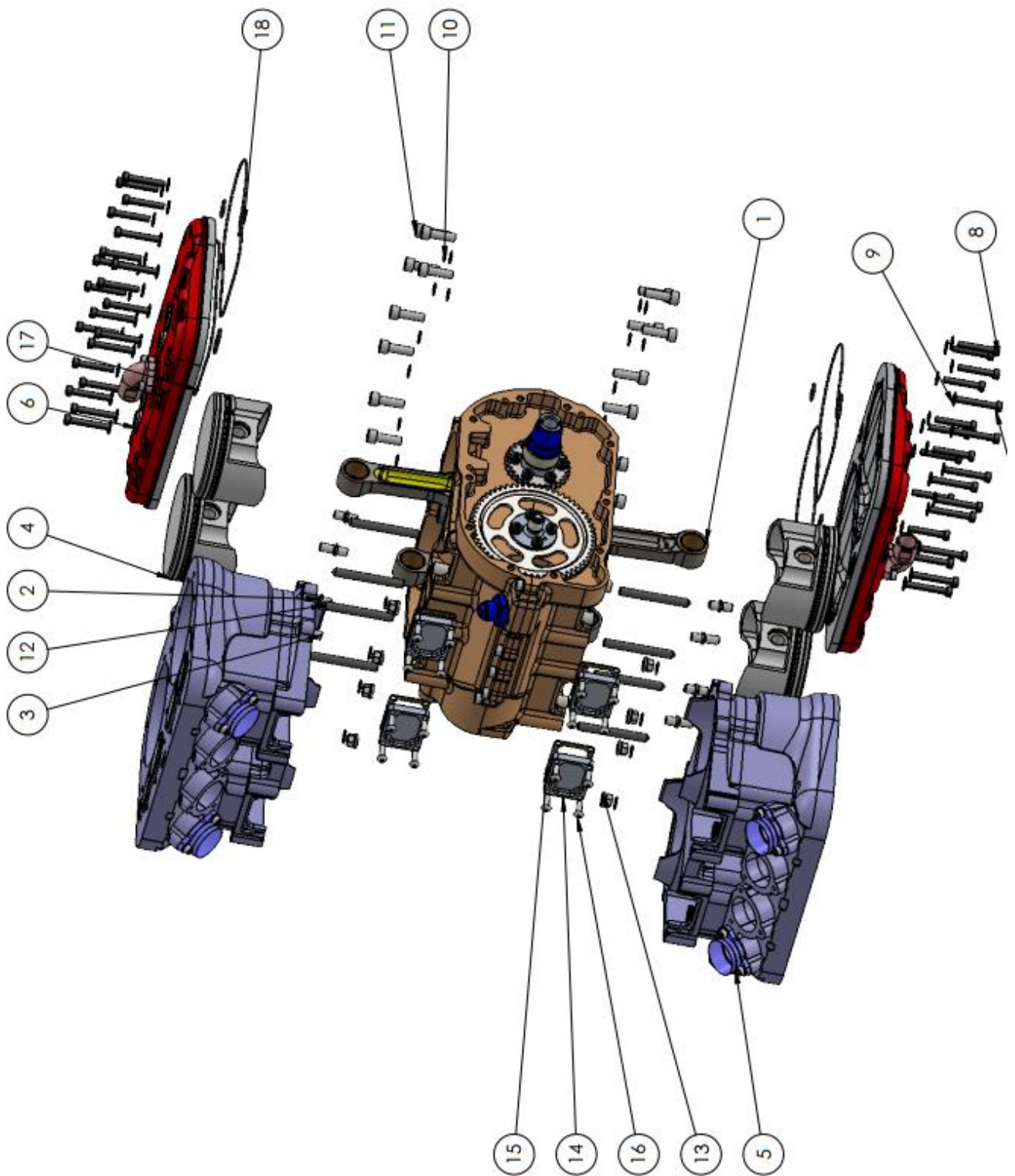
- A) AC
- B) AC
- C) POS (12VDC +)
- D) Body = Ground (OVDC)

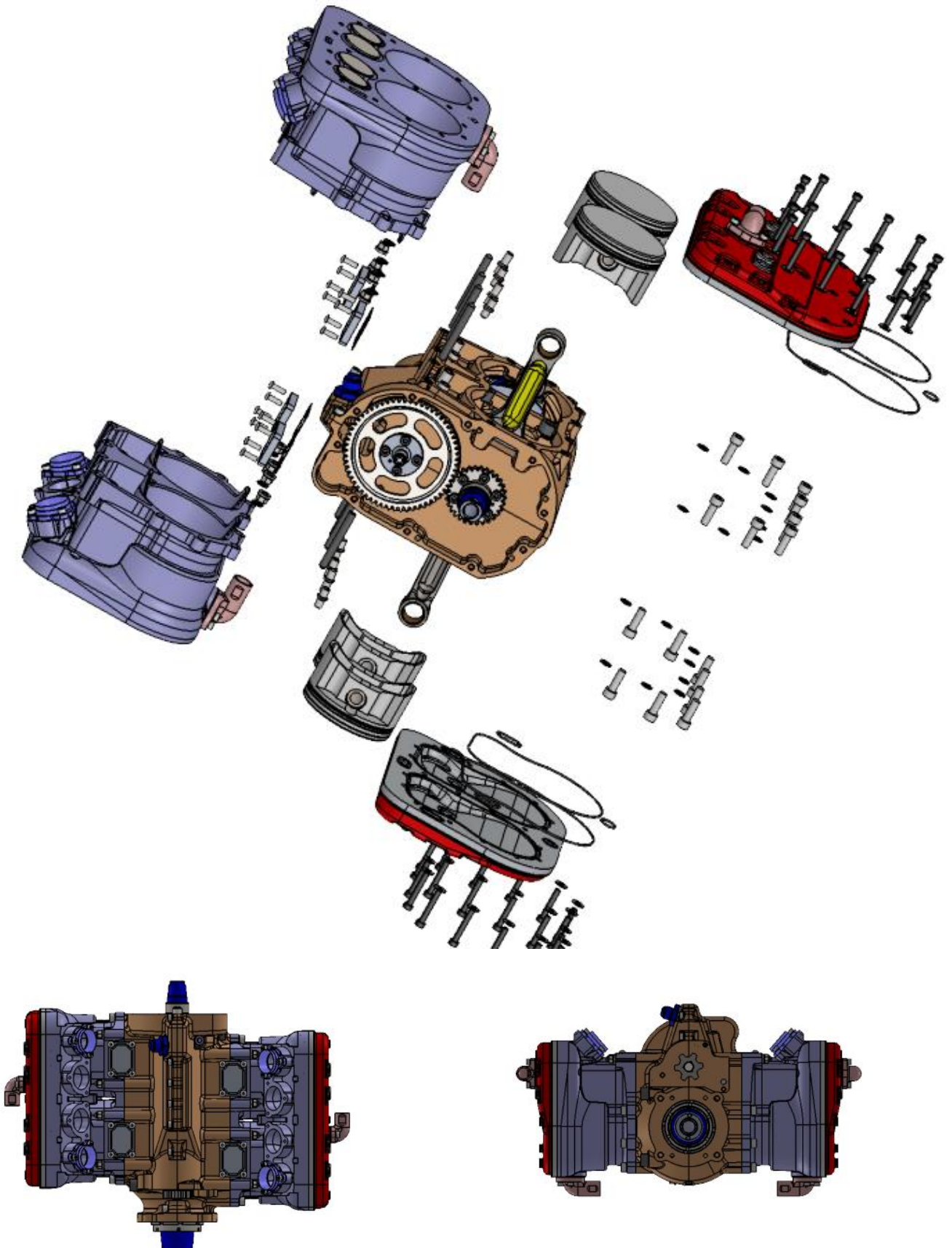


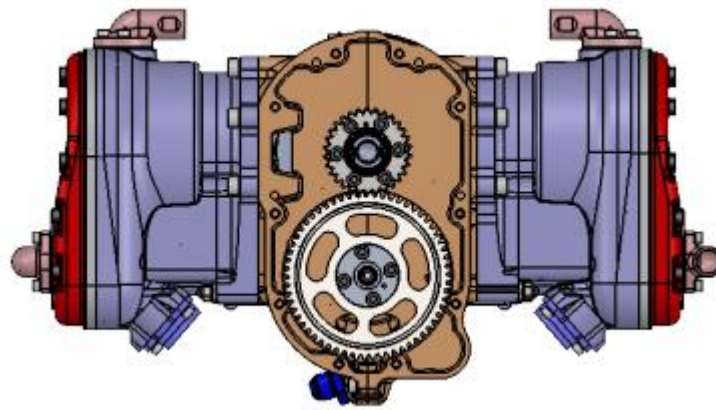
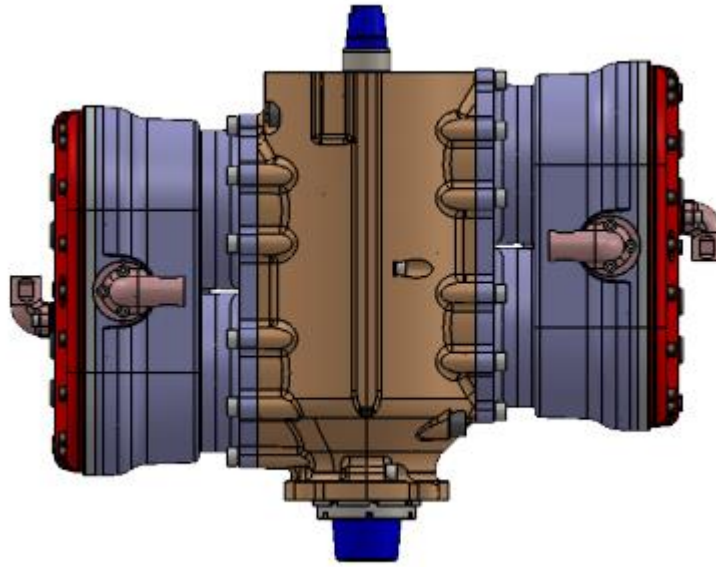
The LF26 exploded views – dimension views and COG





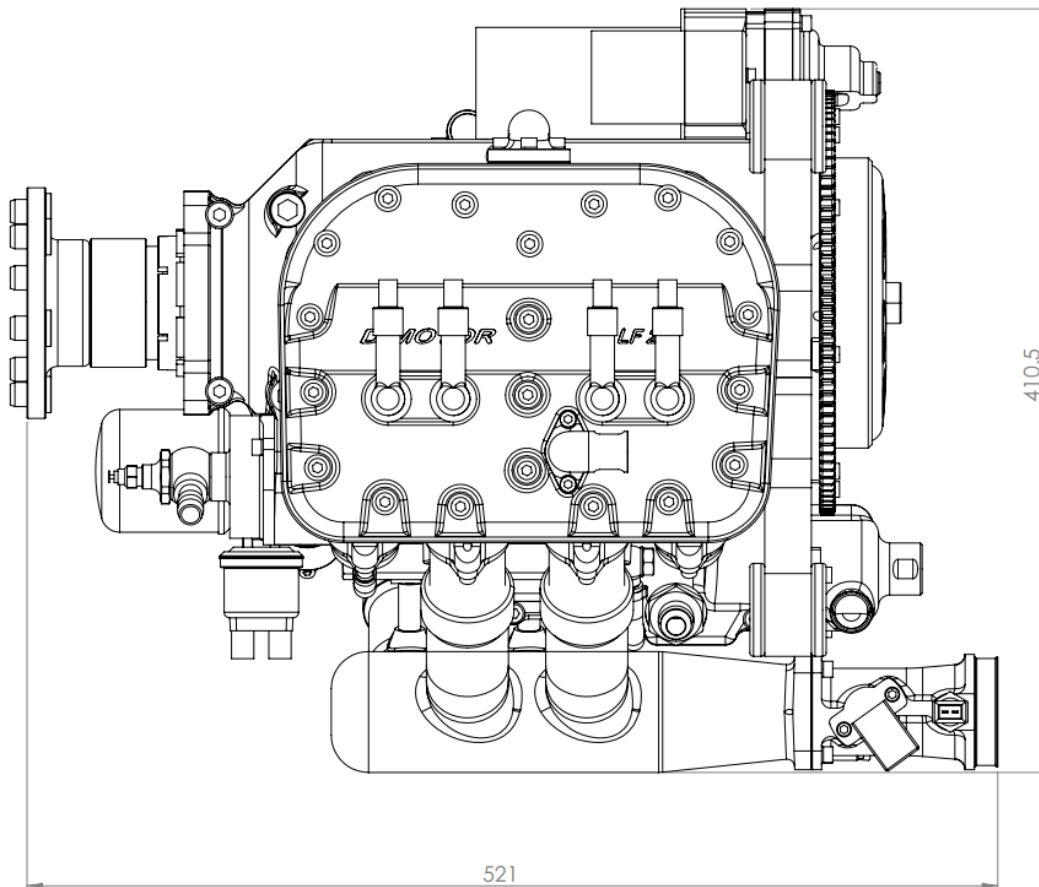
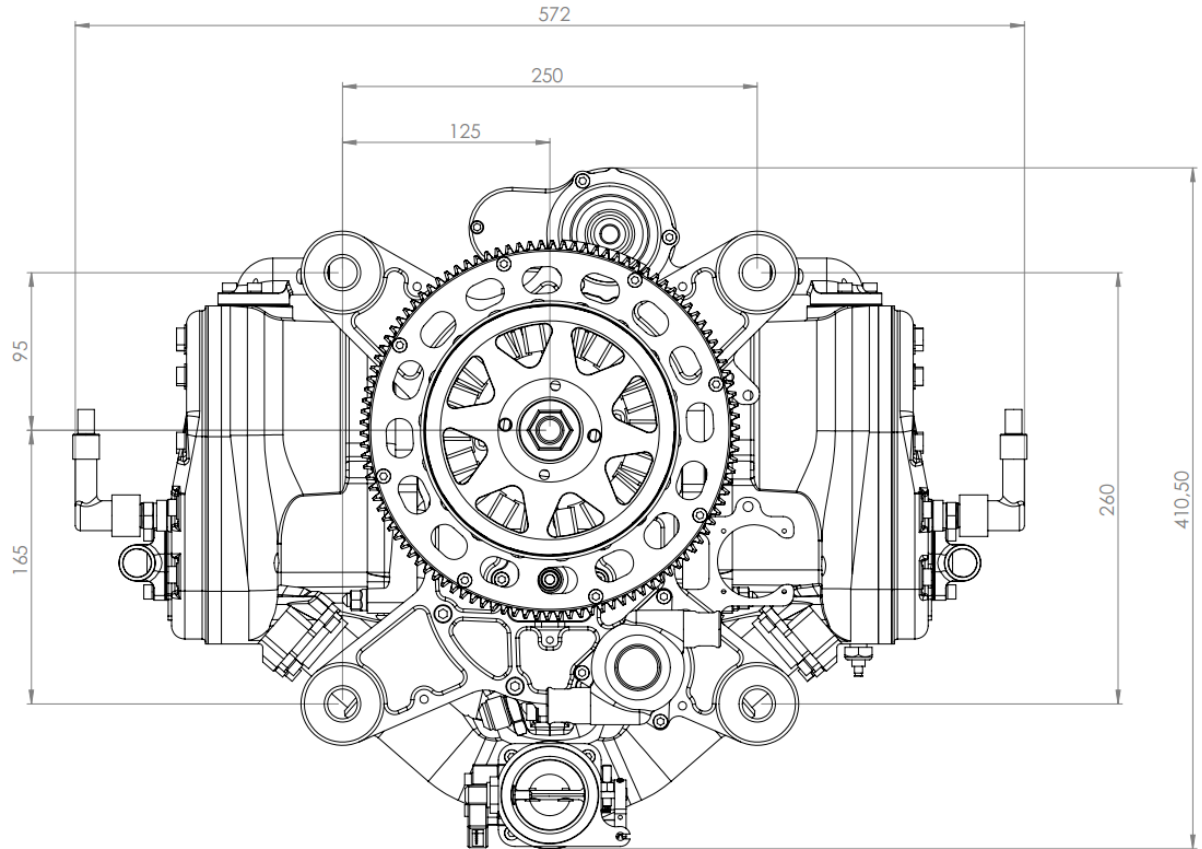






Top and front view

Dimensions :



center off mass in length

