	<b>Powerplant installation definition</b>	Doc-Nr: TOM-TC-01-C1-010
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## Viper SD-4 RTC

### Powerplant installation definition

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## Amendments

Issue	Reason	Date
A	Initial issue	18.DEC 2015
B	Added stainless safety wire description	07.JAN 2016
C	References chapter revised General section updated Chapter 3 added Manifold pressure and fuel flow sensor relocation definition	23.FEB 2016
D	Coolant thermostat change, oil hoses change	28.JAN 2020
E	Coolant thermostat change	14.DEC 2021

## References

- /1/ SD4-A-6-001-N-1#6 Powerplant unit
- /2/ INSTALLATION MANUAL FOR ROTAX ENGINE TYPE 912 SERIES
- /3/ TOM-TC-01-DDP-9005.A Fire sleeves
- /4/ TOM-TC-01-DDP-4003.C Fuel, Oil and Coolant hoses
- /5/ TOM-TC-01-DDP-4009.A Gascolator
- /6/ TOM-TC-01-DDP-4010.B Electric fuel pump
- /7/ TOM-TC-01-DDP-4014.C Water thermostat
- /8/ TOM-TC-01-DDP-4015.A Oil thermostat
- /9/ TOM-TC-01-DDP-4016.A Air filter
- /10/ TOM-TC-01-DDP-4017.A Hot air hose
- /11/ TOM-TC-01-DDP-4018.A Drain fuel hose
- /12/ TOM-TC-01-DDP-4019.A Cold air hose
- /13/ TOM-TC-01-DDP-8013.B Airbox filter holder
- /14/ TOM-TC-01-DDP-8014.B Airbox chamber
- /15/ TOM-TC-01-DDP-8015.B Airbox cold air intake
- /16/ TOM-TC-01-DDP-8016.A Airbox warm air intake
- /17/ TOM-TC-01-DDP-8017.A Cylinder cooling air baffle
- /18/ TOM-TC-01-DDP-8018.A Cylinder cooling air intake
- /19/ TOM-TC-14-DDP-4028.A Screw connection set bent
- /20/ TOM-TC-14-DDP-4029.A Banjo fitting AN8
- /21/ TOM-TC-14-DDP-4030.A Banjo bolt
- /22/ TOM-TC-14-DDP-4031.A Push lock fitting AN8

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## 1 General

The purpose of this document is to define and describe the overall installation of ROTAX 912 series engine to the Viper SD-4 RTC airplane. It further describes the means of how the powerplant installation is attached to each other. This includes definition of cable/hose/Bowden/wire attachments and spots of those attachments. Spots are shown on representative Figures.

## 2 Bundling definition

The bundling used to fix single powerplant installation is defined in Table 1. Tie-wraps are used to bundle the oil, fuel, coolant hoses, Bowdens and electricity wires. When the Bowden cables that operate airbox conduit flaps, cold air intake conduit flap, carburetors, are set to their position, a 0.5mm thick stainless safety wire is used at their ends to secure them from unintended rotation. A 0.8 mm stainless safety wire is used to secure exhaust tubes joints, magnetic plug, oil system, airbox and gascolator.

Table 1 Bundling types

Bundling	Type	Part No.
Plastic locking tie-wrap	PLT1.5I-M69	8000-0161
	PLT2I-M69	8000-0022
	PLT1M-M69	8000-0010
Stainless safety wire	ø0,5 mm	1800-0082
	ø0,8 mm	1800-0080

### 2.1 Tie-wraps



Figure 1: Tie-wrap

Manufacturer:

PANDUIT  
United States  
18900 Panduit Drive  
Tinley Park, IL 60487

Supplier of tie-wraps:

SVK Elektronik s.r.o.  
Slavětínská 142  
190 14 Praha 9 Klánovice

**Table 2 PLT1.5I-M69 locking tie definition (8000-0161)**

Material	Flame Retardant Nylon 6.6
Color	Ivory
Cross Section	Intermediate
Locking Style	Locking
Min. Loop Tensile Strength Lbs. (N)	40 (178)
Continuous Use Temperature Range	-76° (-60°) - 212° (100°)
Plenum-Rated	No
Tool	GTS, GTSL, GS2B, PTS, PPTS, STS2
Length In (mm)	5.6 (142)
Thickness In (mm)	0.044 (1.1)
Bundle Diameter Range In. (mm)	0.06 (1.5) - 1.38 (35)
CE Compliant	Yes
CSA Certified	Yes
UL 62275 Compliant (Type 1, 11)	Yes
UL Listed (File #E56854)	No
UL Recognized (File #E56854)	Yes
Application	General
Installation Temperature	-4°F (-20°C) - 32°F (0°C)
Operating Temperature	-76°F (-60°C) - 212°F (100°C)
Part Features	One-piece locking wedge for consistent performance and reliability. Low thread force and high loop tensile strength.
Thickness (mm)	1.1
UV Resistant	No
Width In (mm)	0.142 (3.6)
RoHS Compliancy Status	Compliant

**Table 3 PLT2I-M69 locking tie definition (8000-0022)**

Material	Flame Retardant Nylon 6.6
Color	Ivory
Cross Section	Intermediate
Length (In.)	8.0
Length (mm)	203
Locking Style	Locking
Width (In.)	0.142
Width (mm)	3.6
Min. Loop Tensile Strength Lbs. (N)	40 (178)
Continuous Use Temperature Range	-76° (-60°) - 212° (100°)
Plenum-Rated	No
Tool	GTS, GTSL, GS2B, PTS, PPTS, STS2
Length In (mm)	8.0 (203)
Thickness In (mm)	0.045 (1.1)
Bundle Diameter Range In. (mm)	0.06 (1.5) - 2.00 (51)
CE Compliant	Yes
CSA Certified	Yes
UL 62275 Compliant (Type 1, 11)	Yes
UL Listed (File #E56854)	No
UL Recognized (File #E56854)	Yes
Installation Temperature	-4°F (-20°C) - 32°F (0°C)
Operating Temperature	-76°F (-60°C) - 212°F (100°C)
Part Features	One-piece locking wedge for consistent performance and reliability. Low thread force and high loop tensile strength.
RoHS Compliancy Status	Compliant

**Table 4 PLT1M-M69 locking tie definition (8000-0010)**

Material	Flame Retardant Nylon 6.6
Color	Ivory
Cross Section	Miniature
Length (In.)	3.9
Length (mm)	99
Locking Style	Locking
Width (In.)	0.098
Width (mm)	2.5
Min. Loop Tensile Strength Lbs. (N)	18 (80)
Continuous Use Temperature Range	-76° (-60°) - 212° (100°)
Plenum-Rated	No
Tool	GTS, GTSL, GS2B, PTS, PPTS, STS2
Length In (mm)	3.9 (99)
Thickness In (mm)	0.043 (1.1)
Bundle Diameter Range In. (mm)	0.06 (1.5) - 0.87 (22)
CE Compliant	Yes
CSA Certified	Yes
Mil. Std. Part Number	—
UL 62275 Compliant (Type 1, 11)	Yes
UL 62275 Compliant (Type 2, 21)	—
UL Listed (File #E56854)	No
UL Recognized (File #E56854)	Yes
Installation Temperature	-4°F (-20°C) - 32°F (0°C)
Operating Temperature	-76°F (-60°C) - 212°F (100°C)
Part Features	One-piece locking wedge for consistent performance and reliability. Low thread force and high loop tensile strength.
RoHS Compliance Status	Compliant



## 2.2 Safety wire



Figure 2: Stainless safety wire

Manufacturer:

AERO LOGISTICS s.r.o.  
Trieda 1. mája 35  
052 05, Spišská Nová Ves  
Slovakia

Meeting regulation: MS 209 95-C and ASTMA 580

### 3 Powerplant installation

For ROTAX 912 series to the Viper SD-4 RTC installation please refer to actual drawing No. SD4-A-6-001-N-1 and to TOM-TC-01-SM-08 Bolted joints actual procedure. This document serves to provide a clearer picture of how the powerplant hoses and wires should be guided and attached by different means.

### 4 Spots

This chapter defines which powerplant installation system is attached to which installation. Figures are used to define the bundling position. Table 5 serves as guidance for attached Figures to help to define each line and attachment.

**Table 5: Description of powerplant installation**

Pos.	Description
1	fuel line from gascolator to fuel vacuum pump /4/
2	oil line from engine to oil reservoir /4/
3	fuel line to fuel pressure sensor /4/
4	fuel restrictor line /4/
5	fuel line from fuel flow sensor to carburetors /4/
6	draining of carburettor float chamber to airbox
7	oil line from oil reservoir to oil thermometer /4/
8	carburettor suction compensation line
9	coolant expansion reservoir draining line
10	oil line from oil cooler to oil thermometer /4//20//21//22/
11	oil line from oil thermometer to oil pump /4//19/
12	oil line from oil thermometer to oil cooler /4//20//21//22/
13	fuel line from fuel vacuum pump to fuel pressure and fuel flow sensors and to restrictor line
14	oil reservoir draining line
15	fuel line bypass /4//6/
16	warm heating air distribution line /10/
17	fuel line to LHS carburettor /4/
18	fuel line to RHS carburettor /4/
19	drip tray and airbox draining line
20	fuel line from fuselage to gascolator /4/
21	coolant from cooler to engine (thermostat) /4/
22	vacuum fuel pump draining line /11/
23	left and right choke bowden cable
24	left and right throttle bowden cable
25	left and right heating flap bowden cable
26	airbox bowden cable
27	cylinder cooling air baffle bowden cable

Pos.	Description
28	cooling from cylinder head to thermostat /4/
29	cylinder head coolant reservoir
30	manifold pressure sensor line /4/
31	airbox /13//14/
32	airbox air filter /9/
33	cylinder cooling air baffle /17/
34	airbox cold air intake line /15/
35	airbox warm air intake line /16/
36	exhaust tubes joint connection (spring type secured with safety wire)
37	cylinder cooling air intake /18/
38	coolant thermostat /7/
39	oil thermostat /8/
40	fuel flow sensor
41	fuel pressure sensor
42	oil cooler
43	water cooler
44	coolant from thermostat to cooler /4/

#### ***4.1 Powerplant installation***

As seen on the next figures most of the fuel, oil, coolant and draining lines and Bowden cables are attached by plastic locking tie-wraps.

Fuel and oil lines are covered by orange fire-proof sleeves /3/ ended up with fire-proof sealing tape.

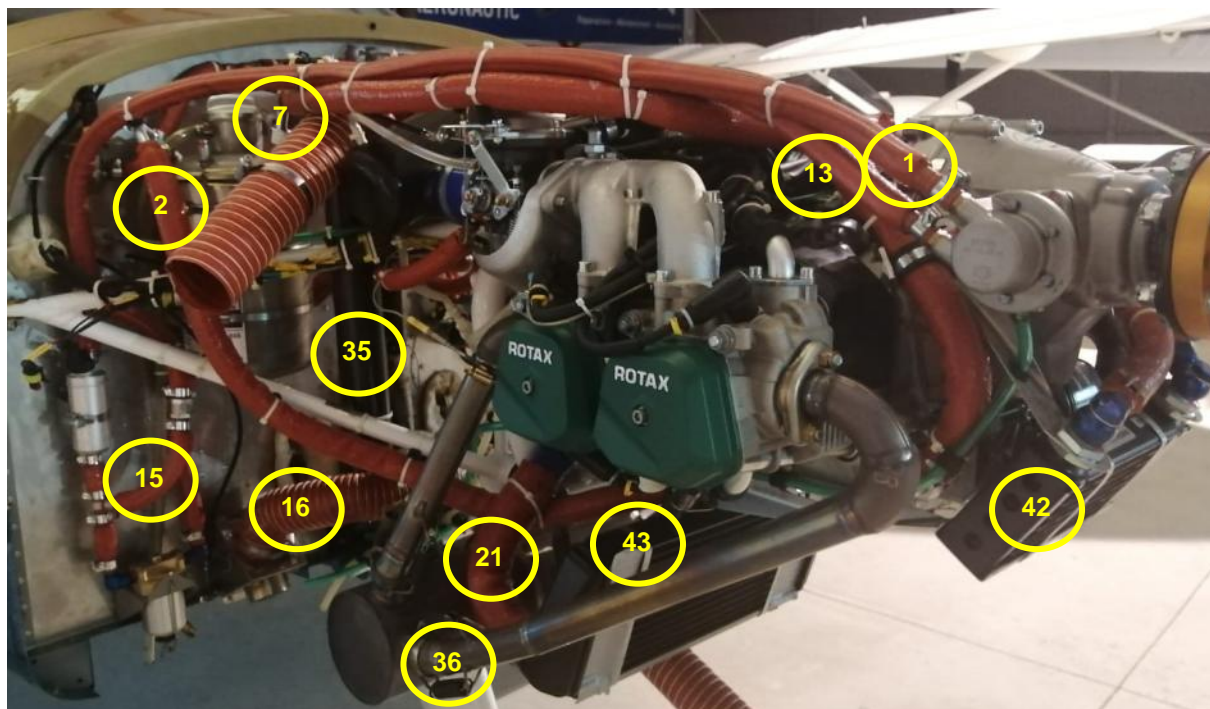


Figure 3: Viper SD-4 RTC Powerplant installation



Figure 4: Viper SD-4 RTC Powerplant installation



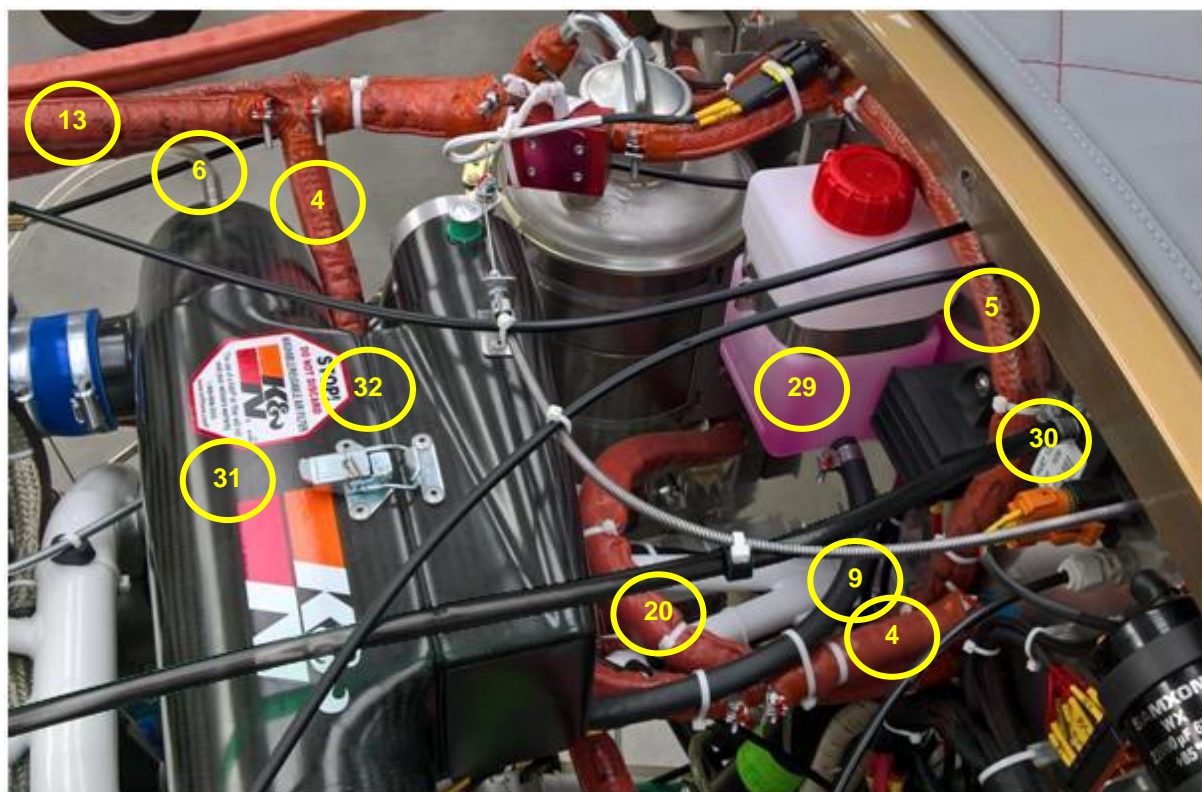


Figure 5: Viper SD-4 RTC Powerplant installation

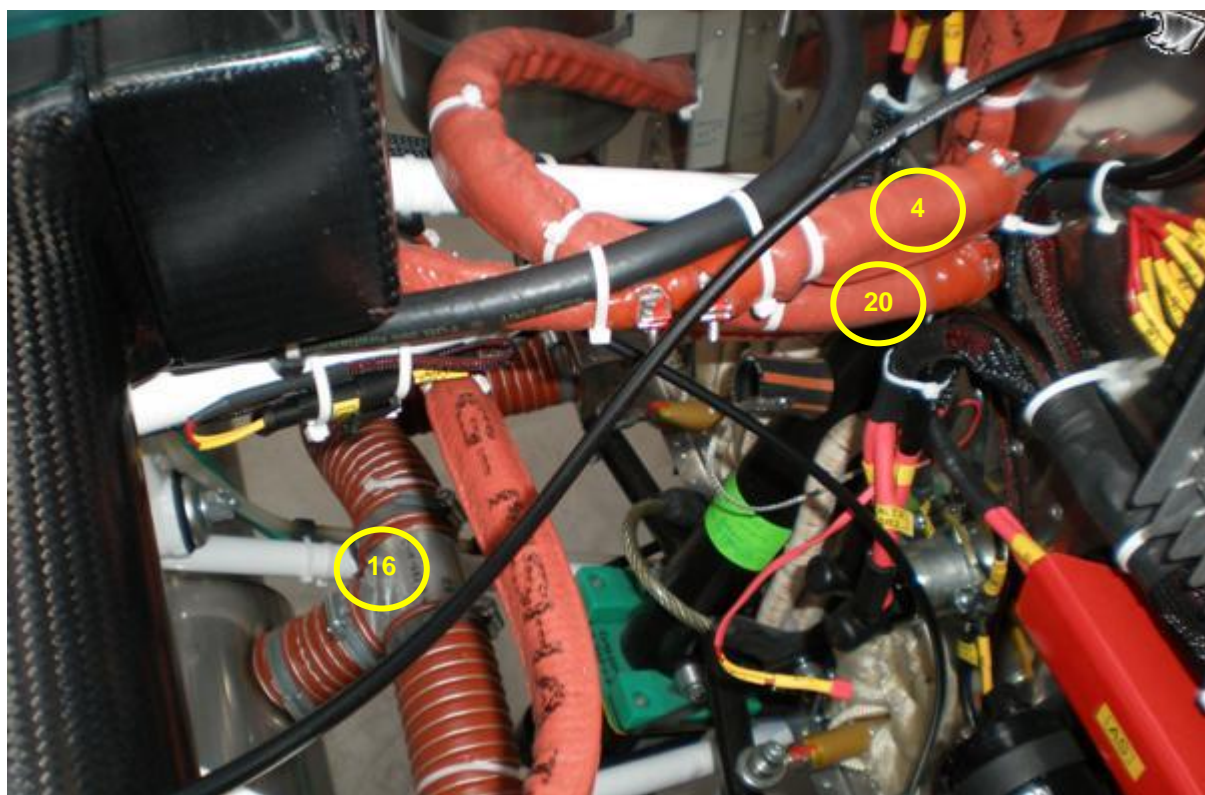


Figure 6: Viper SD-4 RTC Powerplant installation



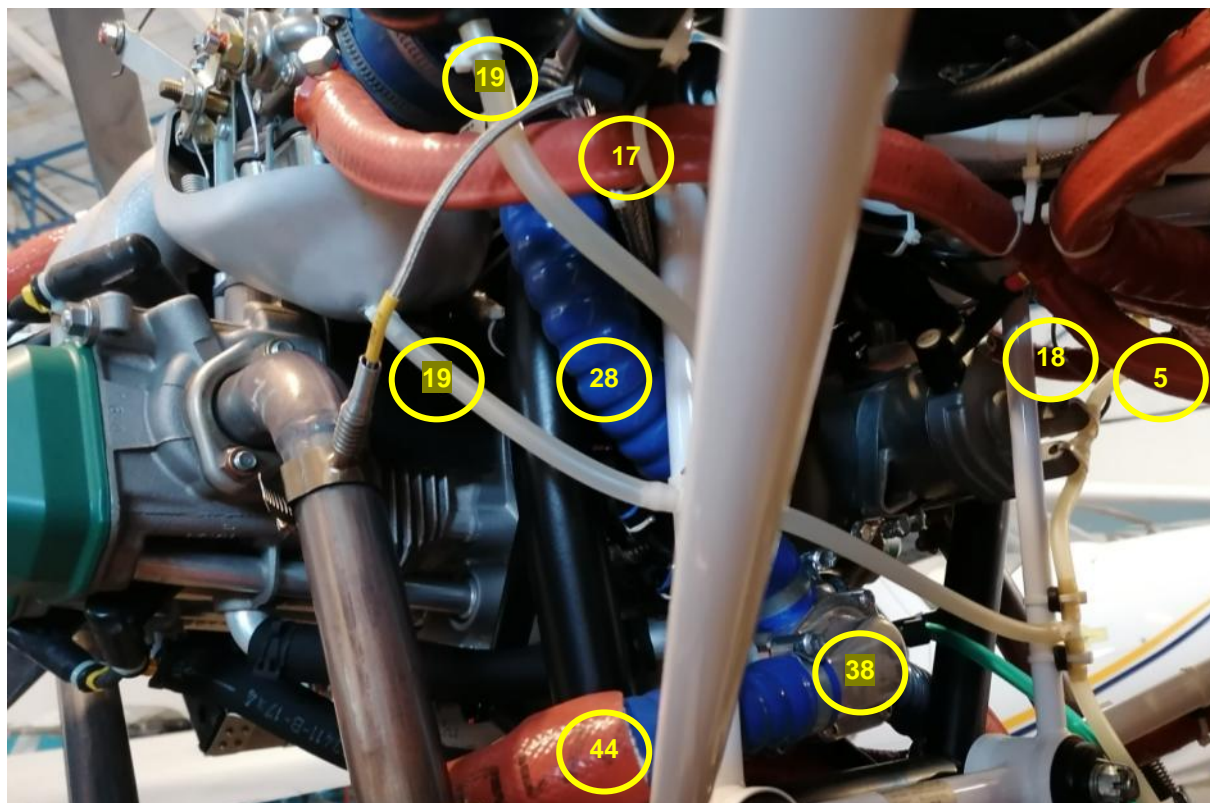


Figure 7: Viper SD-4 RTC Powerplant installation

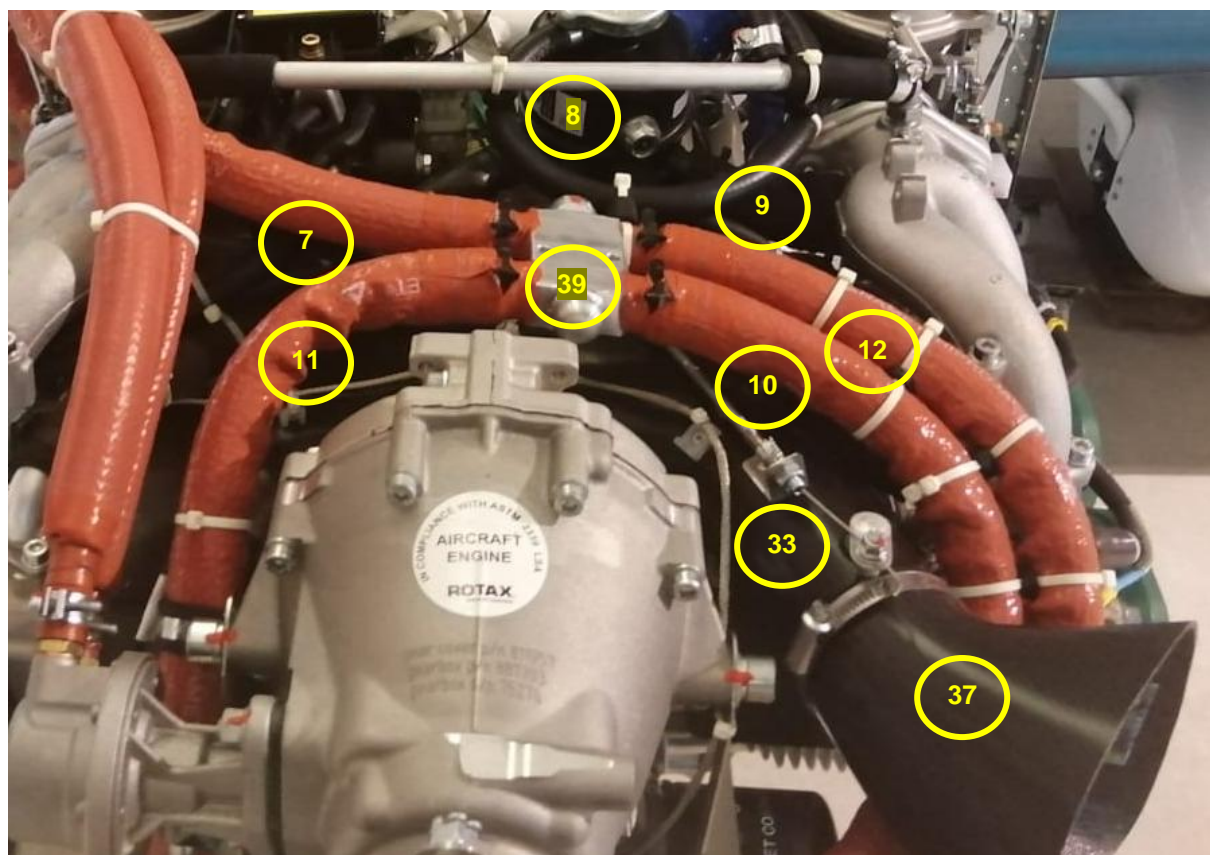


Figure 8: Viper SD-4 RTC Powerplant installation

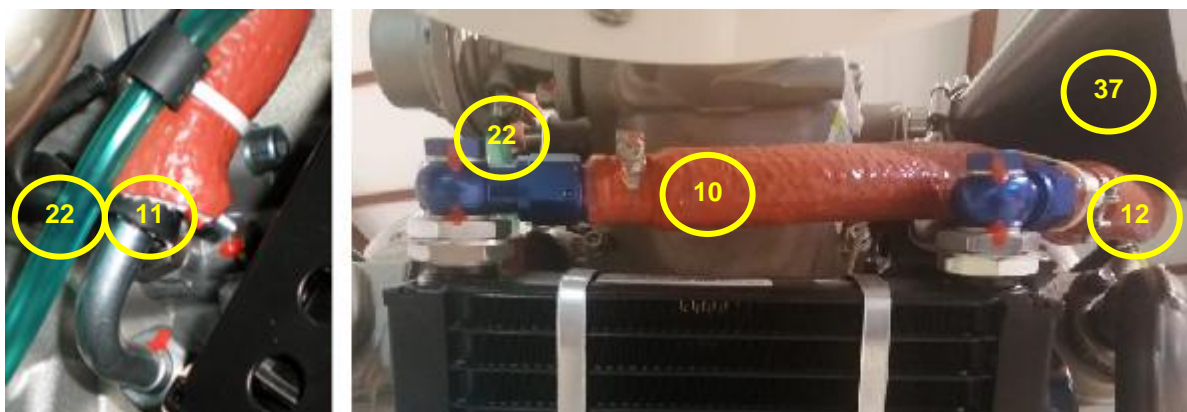


Figure 9: Viper SD-4 RTC Powerplant installation

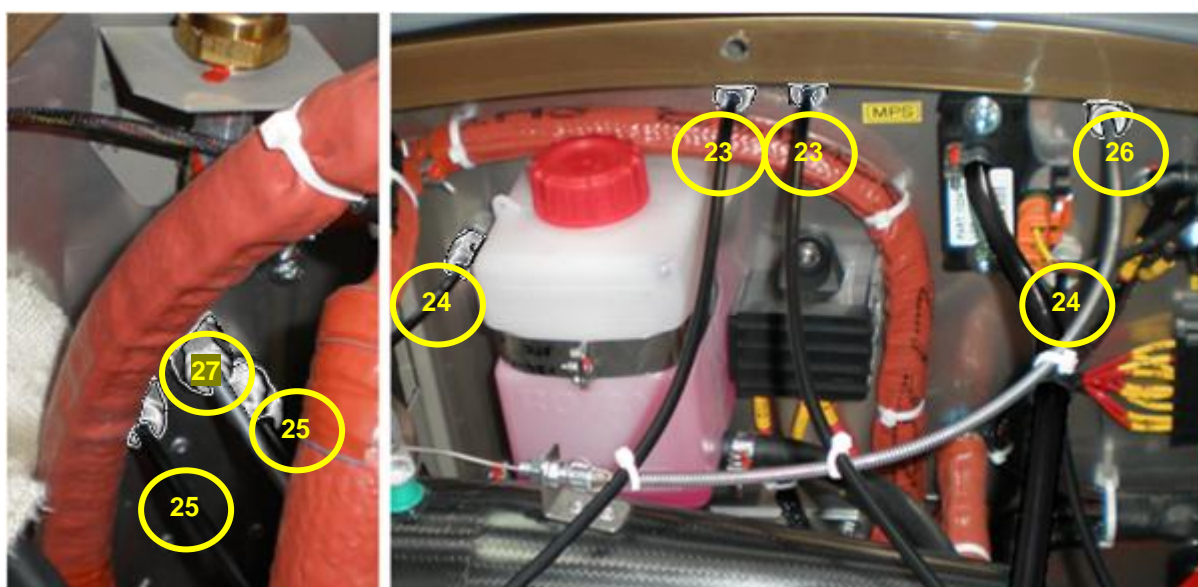


Figure 10: Viper SD-4 RTC Bowden cables installation



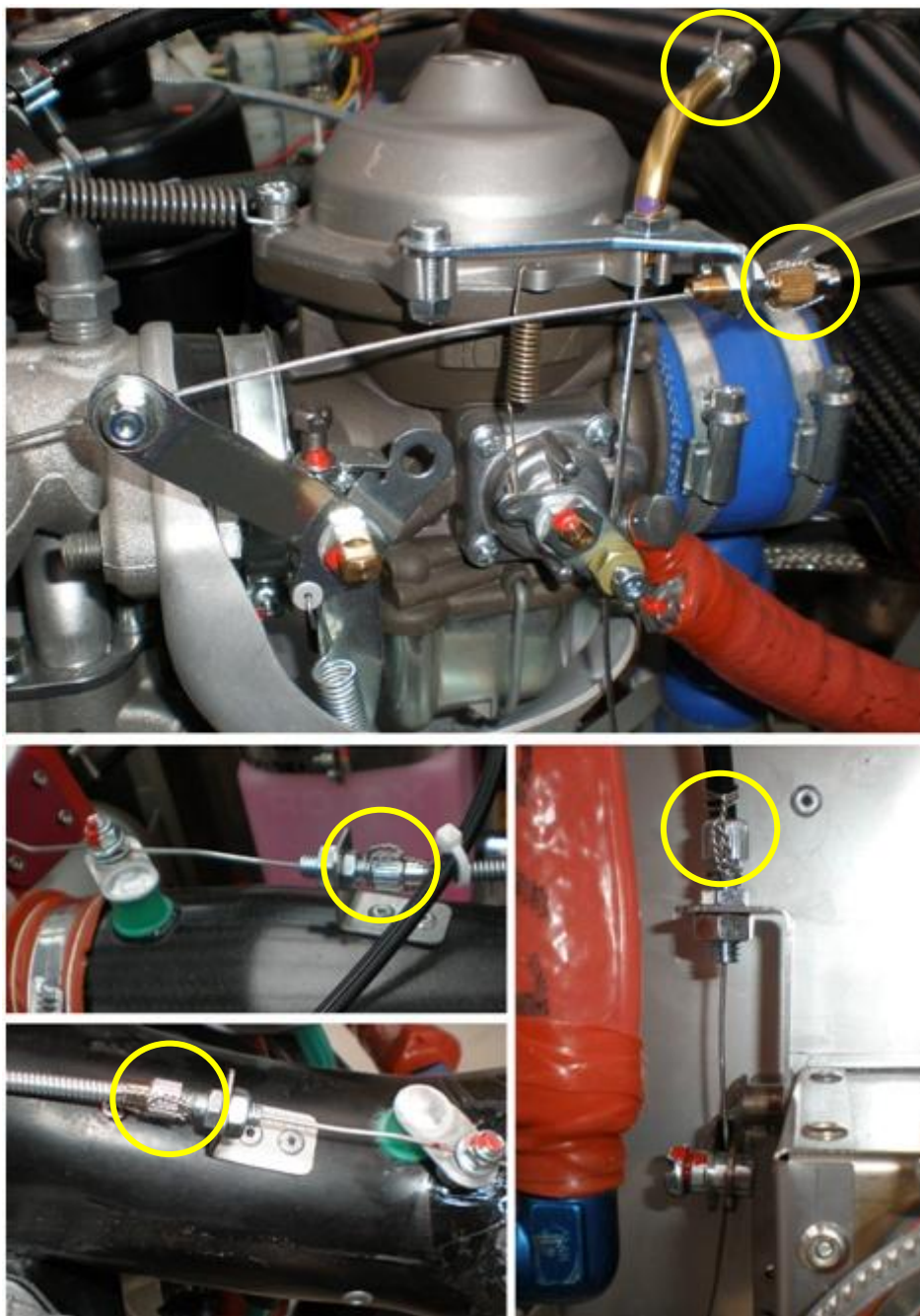


Figure 11: Stainless safety wire 0,5mm application – Bowden cable ends



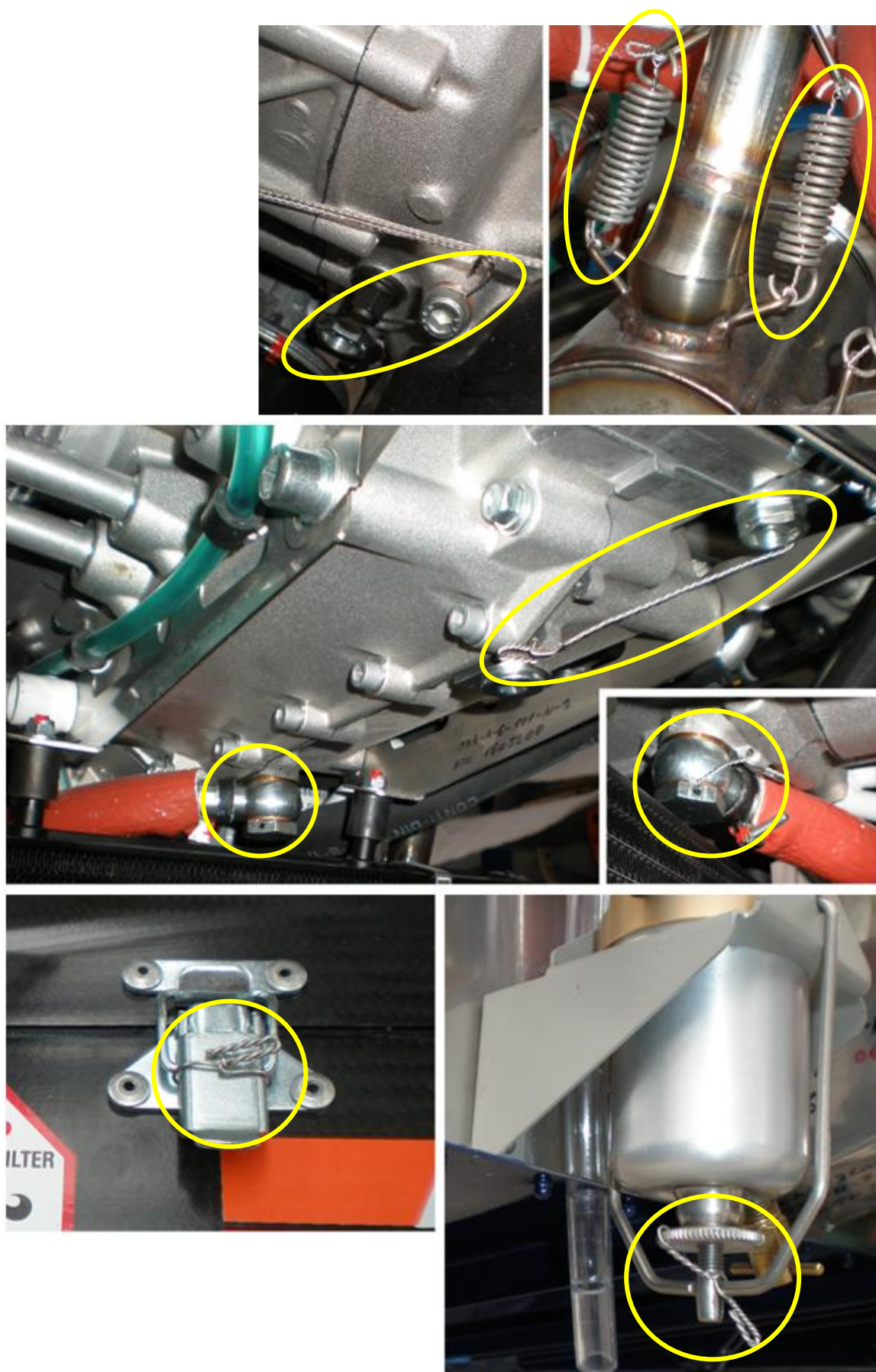


Figure 12: Stainless safety wire 0,8mm application – oil system, airbox, gascolator



Figure 13: Draining lines – fuel vacuum pump, oil reservoir



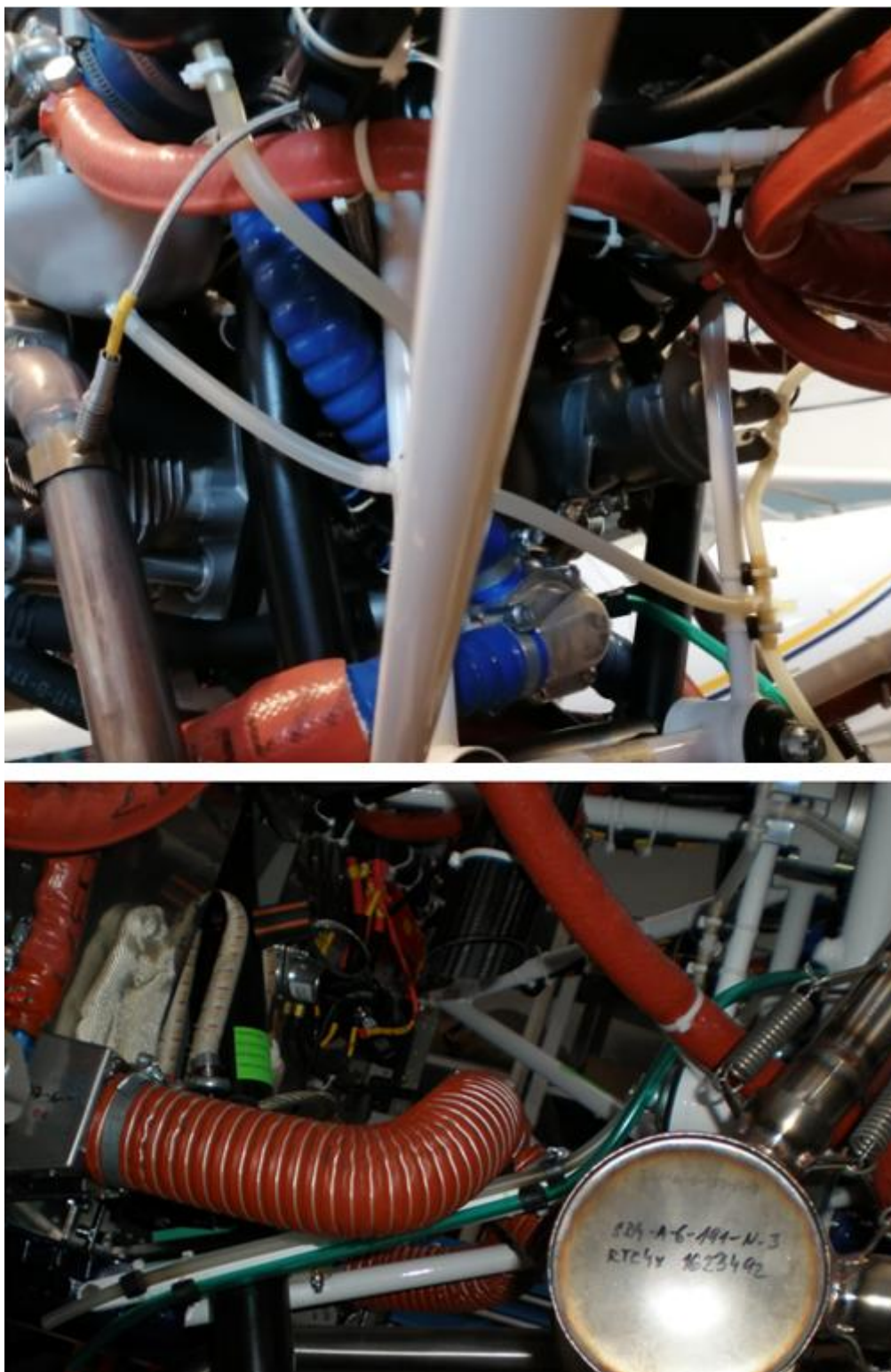


Figure 14: Draining lines – drip tray, airbox, fuel vacuum pump

