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7.1 Introduction

This section describes systems of the airplane and its operation. Information on optional systems and equipment is available in section 9, Supplements.

7.2 Airframe

The airframe of SportStar RTC airplane is of semimonocoque, metal -composite structure consisting of metal reinforcement, frames and duralumin sheet skin.

7.2.1 Fuselage

The fuselage is of semimonocoque structure consisting of reinforcements and duralumin skin. Fuselage section is rectangular in the lower part and elliptic in the upper part. The fin is an integral part of fuselage. Top part of the fuselage including canopy frame is made of composite. The cockpit for two-member crew is located in the middle part of the fuselage that is accessible after uncovering the single-piece organic glass canopy. The engine compartment in the front part of the fuselage is separated from the cockpit by the steel fire wall to which the engine bed is attached.

7.2.2 Wing

The wing is of rectangular shape, single-spar structure with the auxiliary spar with suspended ailerons and split wing flaps. Riveting is used for connecting individual structural elements. Fiber-glass wing tips are riveted on the wing ends.

7.2.3 Horizontal Tail Unit (HTU)

The HTU of conventional type consists of the stabilizer and elevator with the trim tab. Single-spar structure of HTU consists of duralumin ribs, spar and skin. Top view of HTU is of rectangular shape.

7.2.4 Vertical Tail Unit

VTU is of trapezoidal shape. Its fin is an integral part of the fuselage. The rudder is suspended on the fin by means of two hinges. The VTU structure consists of the duralumin spar and skin.



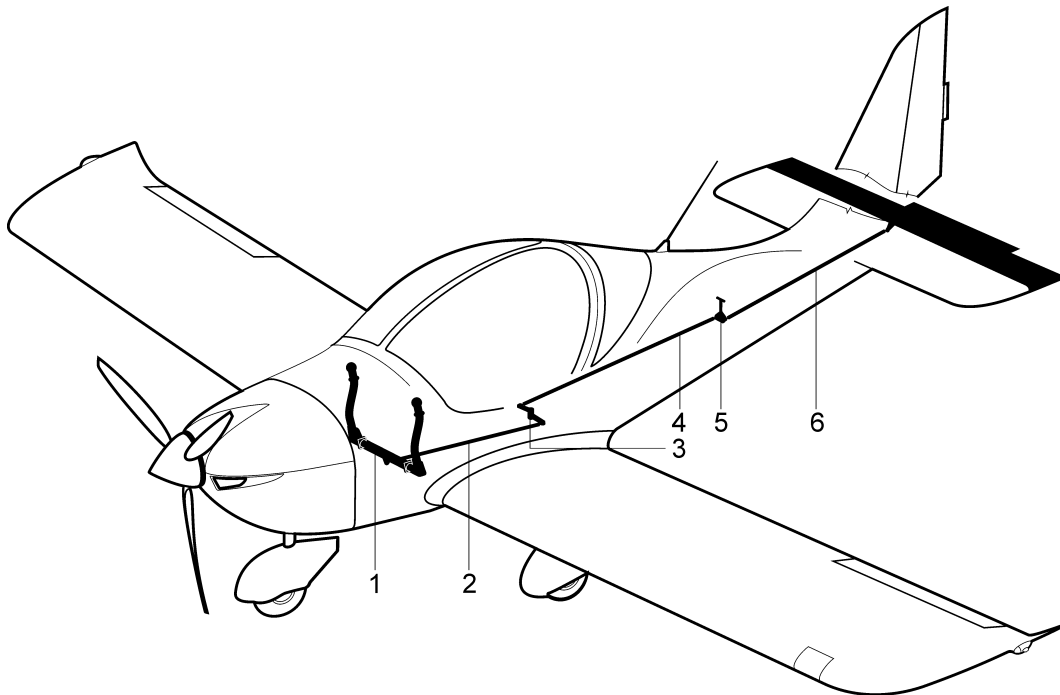
7.3 Control

Airplane control consists of ailerons, elevator and rudder. Directional control is connected by means of pull rods with nose landing gear control. Main landing gear brakes are controlled by pedals of directional control.

Airplane is equipped with dual control enabling flight with two-member crew.

7.3.1 Longitudinal Control

The longitudinal control is operated by the left control stick or the right control stick that are attached to the countershaft of manual control (1, Figure 7-1). The movement of the control stick is transferred from the countershaft by the pull-rod (2), led via the central channel (between the seats) in the cockpit, to the deflection of the two-armed lever (3) located under the floor in the baggage compartment. An angular deflection of the two-armed lever is transferred to a longitudinal movement of two pull-rods (4; 6) connected with the rocker arm (5) in the middle of the rear part of the fuselage. The rear pull-rod (6) is attached to the elevator lever.



Legend to Figure 7-1:

- | | | | |
|---|--------------------------------|---|------------|
| 1 | Countershaft of manual control | 4 | Pull-rod |
| 2 | Pull-rod | 5 | Rocker arm |
| 3 | Two-armed lever | 6 | Pull-rod |

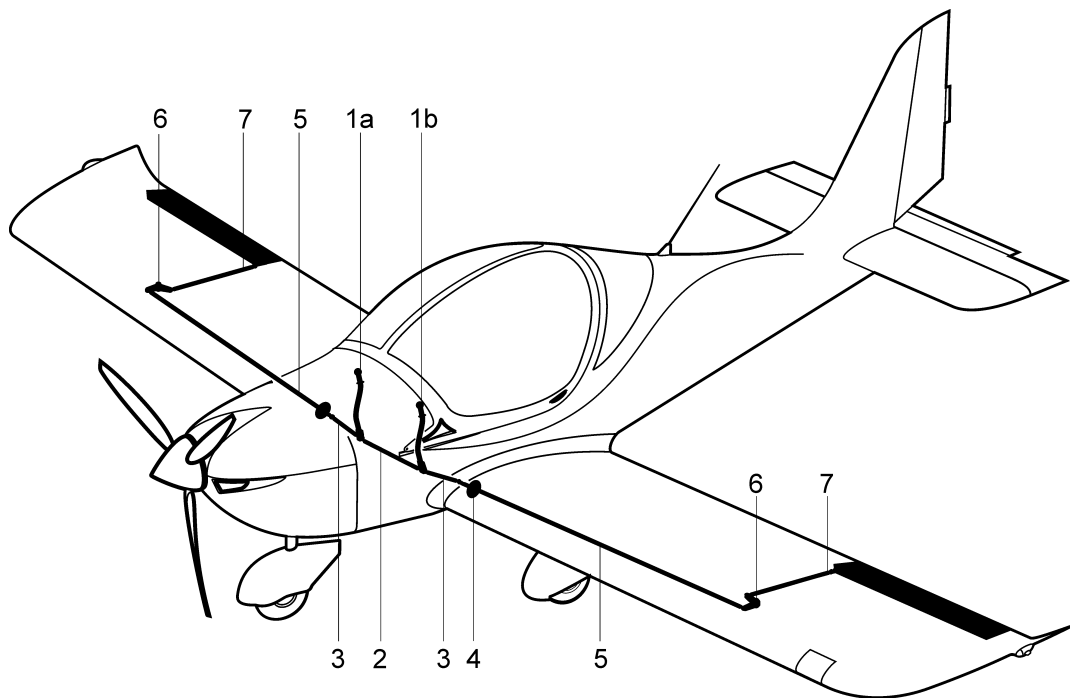
Figure 7-1 Longitudinal control



7.3.2 Lateral Control

The lateral control is controlled by the left control stick (1b, Figure 7-2) or by the right control stick (1a) attached to the countershaft of manual control. The size of lever swing to the left or to the right from the vertical position determines the size of the aileron deflection. The movement of the control stick is transferred by the system of pull-rods and by the angular lever to the pull-rod of aileron.

The control elements are located on the main spar brackets. The control sticks (1a; 1b) are mutually connected by the pull-rod (2). The pull-rods (3) connected with the pull-rods (5) are attached to the control sticks. The pull-rods (5) pass through the grommets in ribs No. 1 and are connected with the angular levers (6). The angular levers (6) transfer the movement to the pull-rods (7) connected with the levers on the ailerons. The bellcranks (6) are pivoted in the brackets in the wing.



Legend to Figure 7-2:

- | | | | |
|----|-----------------------|---|-----------|
| 1a | Control stick – right | 4 | Grommet |
| 1b | Control stick – left | 5 | Pull-rod |
| 2 | Connecting pull-rod | 6 | Bellcrank |
| 3 | Pull-rod | 7 | Pull-rod |

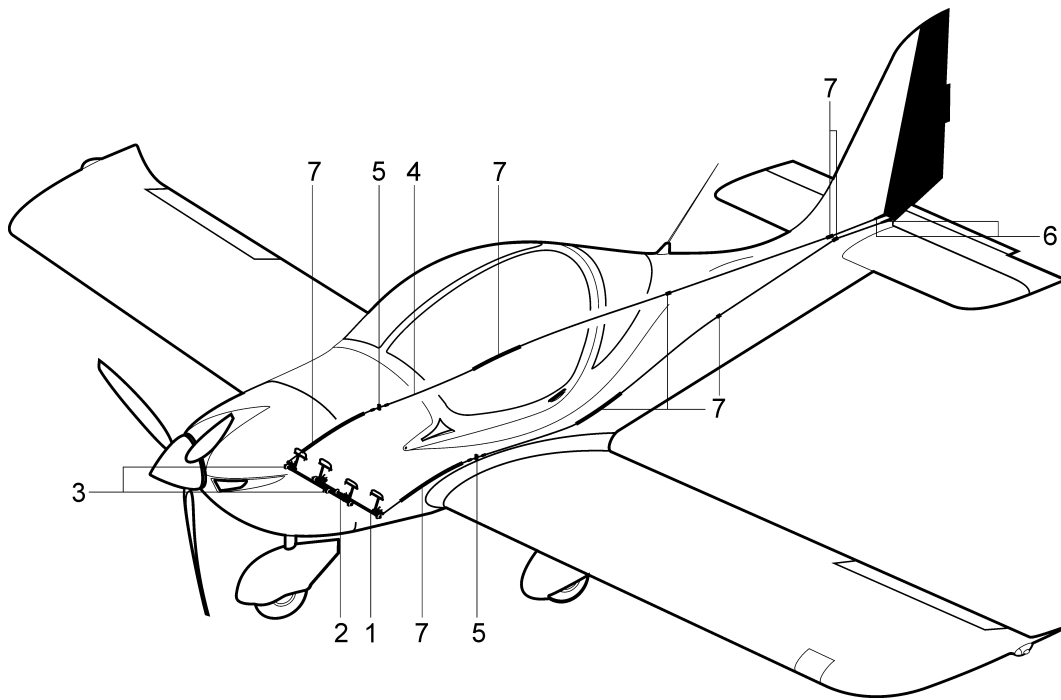
Figure 7-2 Lateral control



7.3.3 Rudder Control

Rudder control is controlled by pedals of foot control. The movement of the pedals is transferred to the rudder by the steel cables (4, Figure 7-3). The cables are attached to the left pedal of left foot control, to the right pedal of right foot control and to the attachments on the rudder. The route of cables of rudder control is led along the sides of the fuselage. The cables are led in the plastic guiding tubes (7) in the exposed places. The stops of cables are located in the area of fuselage frame No. 3.

The pedals of rudder control are connected with the nose landing gear by means of the adjustable pull-rods. The rudder deflecting and the nose landing gear steering are controlled via the movement of foot control pedals. The hydraulic pumps of brakes are also controlled by the foot control pedals.



Legend to Figure 7-3:

- | | | | |
|---|--------------------|---|-----------|
| 1 | Rear countershaft | 5 | Grommet |
| 2 | Front countershaft | 6 | End piece |
| 3 | Bearing | 7 | Tube |
| 4 | Cable | | |

Figure 7-3 Rudder control



The foot control pedals can be set in three positions

Adjustable foot control pedals NOT equipped with the remote position control

The steps to adjust the rudder pedals position:

1. Release the pin from the adjusting groove by pressing lever.
2. Set pedal to one of three possible positions.
3. Check on the pin locking-on in the adjusting groove.

WARNING

**RIGHT AND LEFT PEDAL OF RUDDER CONTROL
MUST BE ADJUSTED IN THE SAME POSITIONS
AND SECURED!**

Adjustable foot control pedals equipped with the remote position control

The steps to adjust the rudder pedals position:

WARNING

**THE RUDDER MUST BE IN NEUTRAL POSITION
BEFORE PEDALS ARE ADJUSTED! CHECK THAT
THE RUDDER IS CENTERED BEFORE
ADJUSTING!**

**DO NOT ADJUST FOOT CONTROL PEDALS
POSITION IN FLIGHT OR WITH ENGINE RUNNING!**

1. Check the engine is shut down.
2. Set the rudder in the neutral position (centered).
3. Assure the space aft of the rudder pedals (where your feet are positioned in flight) is clear, and no pressure is applied to the rudder pedals.
4. Pull the lever marked **ADJUSTABLE PEDALS LEVER** (located below the instrument panel on the RH and LH cockpit side), pedals will automatically move fully aft. Then release the lever.
5. Place feet on the pedals, apply light even pressure on pedals while slightly engaging the lever. The pedals will start to move forward.
6. Release lever and continue to push pedals forward using light even pressure. The pedals will automatically lock in the nearest position.
7. Repeat steps 4 and 5 to move pedals to the desired position.



7.3.4 Elevator Trim Tab Control

The elevator trim tab is located on the elevator trailing edge. It is controlled by the electromechanical strut connected with the angular lever on the trim tab via the pull-rod. In the upper part of both control sticks, there is a head with control buttons that serve for setting the trim tab deflections. The sense of control is: forwards (heavy on nose) or backwards (heavy on tail).

The electromechanical strut is mounted inside the elevator; the connector is attached to the bracket on the pull-rod of elevator control. The relative position of the trim tab is, in the case of the installation of analog instruments, indicated by the indicator on the instrument panel. The neutral position is located between the marks on the indicator.

7.3.5 Wing Flaps Control

The flap control lever is located between pilot seats. When a lock button located on the upper end of the lever is pressed, the lock pin is pulled out of the groove in the changing gate. The flaps can then be extended to a position for takeoff or landing (2 positions). The flap position is locked when the lock button is released.

The wing flaps are controlled by the manual lever **FLAPS** (1, Figure 7-4) that is located in the cockpit between the seats. The left wing flap (4) and the right wing flap (5) are connected by means of the torsion shaft (3). The pins on both ends of the torsion shaft fit in the guiding grooves in the end ribs of wing flaps. The deflection of the manual lever is transferred by the pull-rod (2) to the deflection of the angular lever on the torsion shaft. By swiveling the torsion shaft, the eccentric pins on the lever perform a circular movement and by the guiding grooves of the root ribs, they carry the wing flaps. The wing flaps are opened and closed by a sliding movement of the eccentric pins inside the grooves. The eccentricity of the pins allows the adjustment of wing flap setting by swiveling the pins.

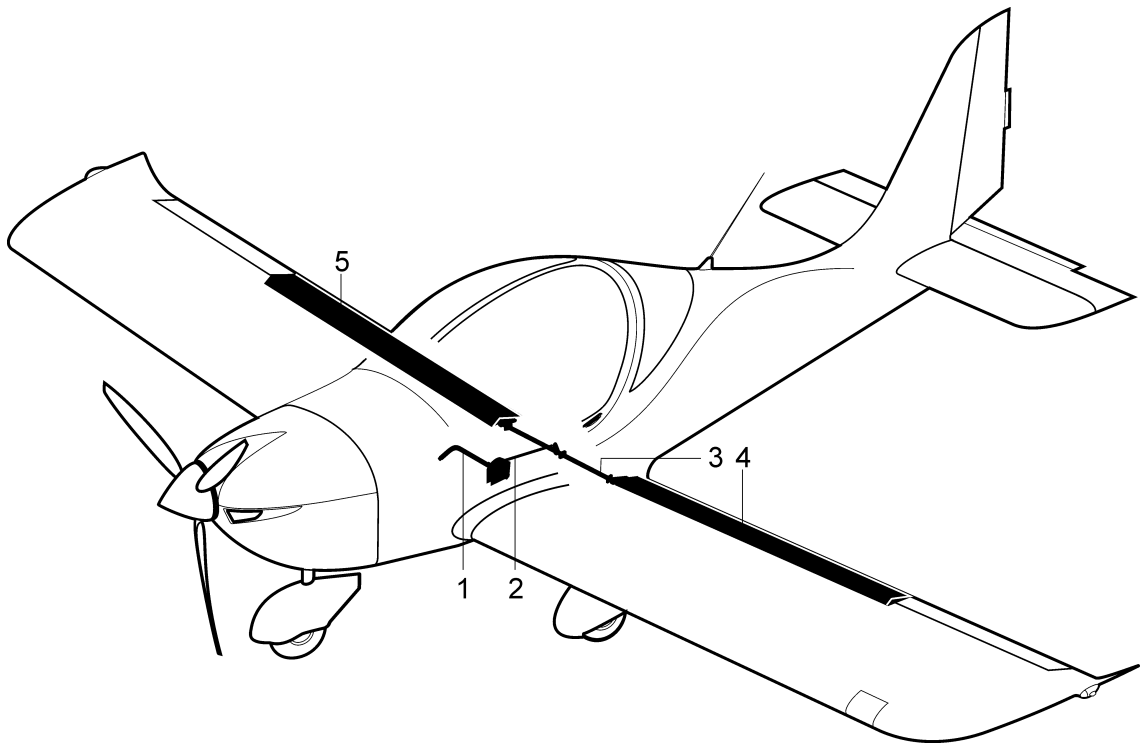
The position of the lever of wing flap control is locked by the pin in the slots of the slotted link mechanism. By pressing the button on the upper end of the lever, the locking pin slides out of the cutouts in the slotted piece. The wing flaps are locked and can be set to the required position. The position of wing flaps is locked by releasing the locking button when the pin fits in the cutout in the slotted piece.

There can be installed **FLAPS** amber warning light on the left side of the instrument panel. The **FLAPS** warning light is on when the wing flaps control lever is in position for takeoff or landing (2 positions).



The wing flaps can be set to four positions.

RETRACTED	0°
TAKEOFF	15°
LANDING (1st position)	30°
LANDING (2nd position)	50°



Legend to Figure 7-4:

- | | |
|-----------------|---------------|
| 1 Lever | 4 Wing flap L |
| 2 Pull-rod | 5 Wing flap R |
| 3 Torsion shaft | |

Figure 7-4 Wing flaps control



7.4 Controls in the Cockpit and Instrument Panel

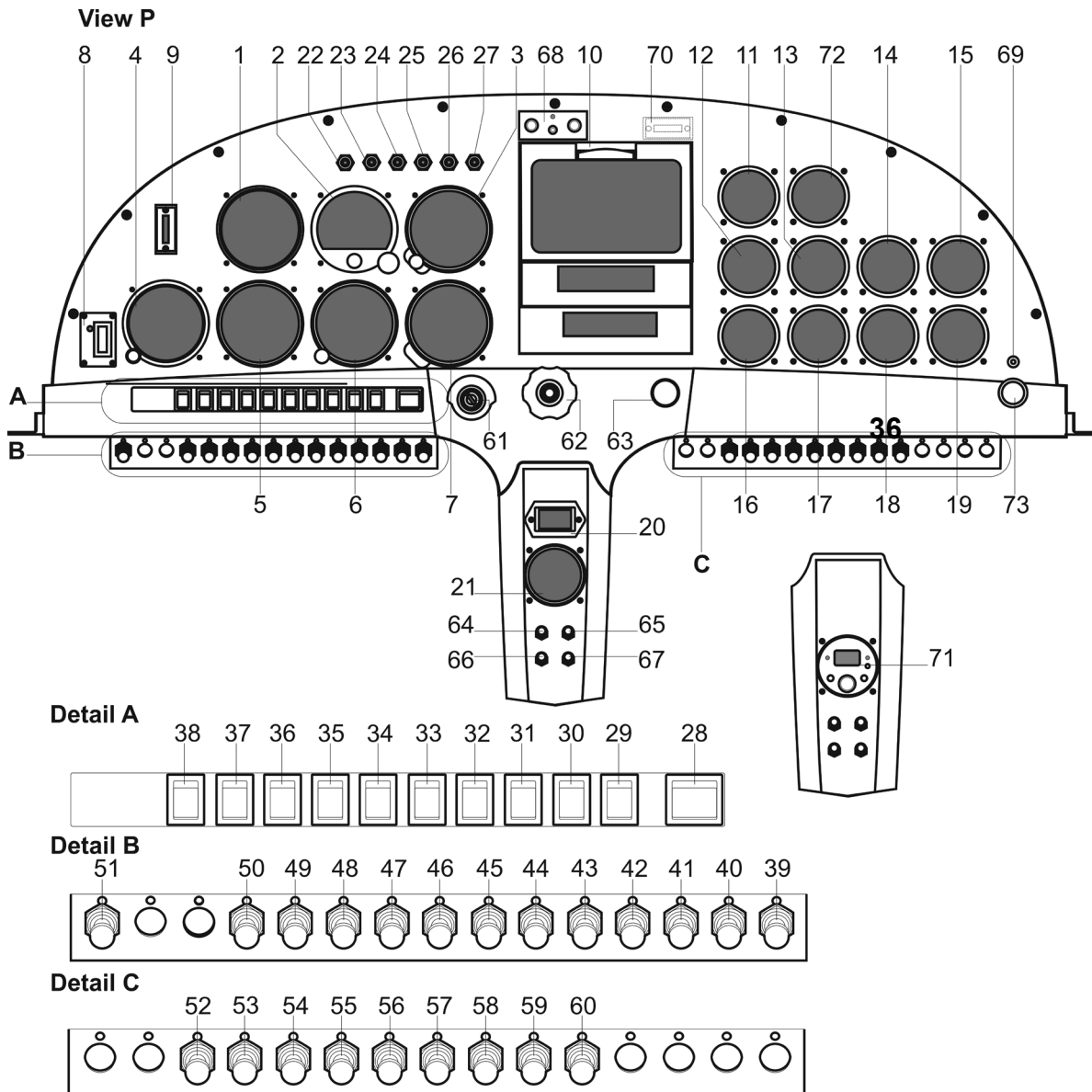


Figure 7-5 SportStar's RTC instrument panel – standard version

Legend to Figure 7-5:

- | | | | |
|---|-------------------------|-------------------------------------|----------------------|
| 1 | Airspeed indicator | 38 | Socket 12 V |
| 2 | Artificial horizon | Detail B - circuit breakers: | |
| 3 | Altimeter | 39 | Accumulator (30 A) |
| 4 | CDI indicator | 40 | Flight clock (1 A) |
| 5 | Turn and bank indicator | 41 | Generator (25 A) |
| 6 | Directional gyro | 42 | Turn indicator (2 A) |



7	Vertical speed indicator	43	Artificial horizon (3 A)
8	ELT remote control	44	Direction gyro (3 A)
9	Trim indicator	45	Beacon / strobe lights (7.5 A)
10	COMM/NAV/GPS bay	46	Position lights (2 A)
11	Engine speed indicator	47	Landing light (4 A)
12	Oil temperature indicator	48	Fuel pump (3 A)
13	Cylinder head temperature ind. or Coolant temperature ind. – see Note on page 2-6	49	Signalling (1 A)
14	Fuel press indicator	50	Trim (1 A)
15	Voltmeter	51	Stall warning system (1 A)
16	Oil pressure indicator		Detail C - circuit breakers:
17	Fuel quantity indicator	52	Engine speed indicator (1 A)
18	Fuel quantity indicator	53	Engine instruments (1 A)
19	Outside air temperature ind.	54	Fuel press / quantity ind. (1 A)
20	Engine hours indicator	55	Voltmeter / OAT (1 A)
21	Flight clock	56	COMM (1 A)
22	Pitot heating annunciator (if inst.)	57	NAV equipment (4 A)
23	Ground power source annunciator (if inst.)	58	ATC transponder (5 A)
24	Parking brake annunciator	59	Altitude encoder (2A)
25	Wing flaps annunciator	60	GPS (3A)
26	Opened canopy annunciator	61	Switch box
27	Charging annunciator	62	Throttle lever
	Detail A – switches:	63	Choke lever
28	Master switch	64	Cold air lever
29	Avionics	65	Carburettor preheater lever
30	Turn indicator	66	Hot air lever
31	Artificial horizon	67	Air distribution lever: canopy/cockpit
32	Directional gyro	68	Intercom
33	Beacon	69	Audio input (if installed)
34	Position lights	70	ELT remote control – alter. location
35	Landing light	71	Flight clock – alternative location
36	Fuel pump	72	Engine boost air indicator
37	Intercom	73	Socket 12V



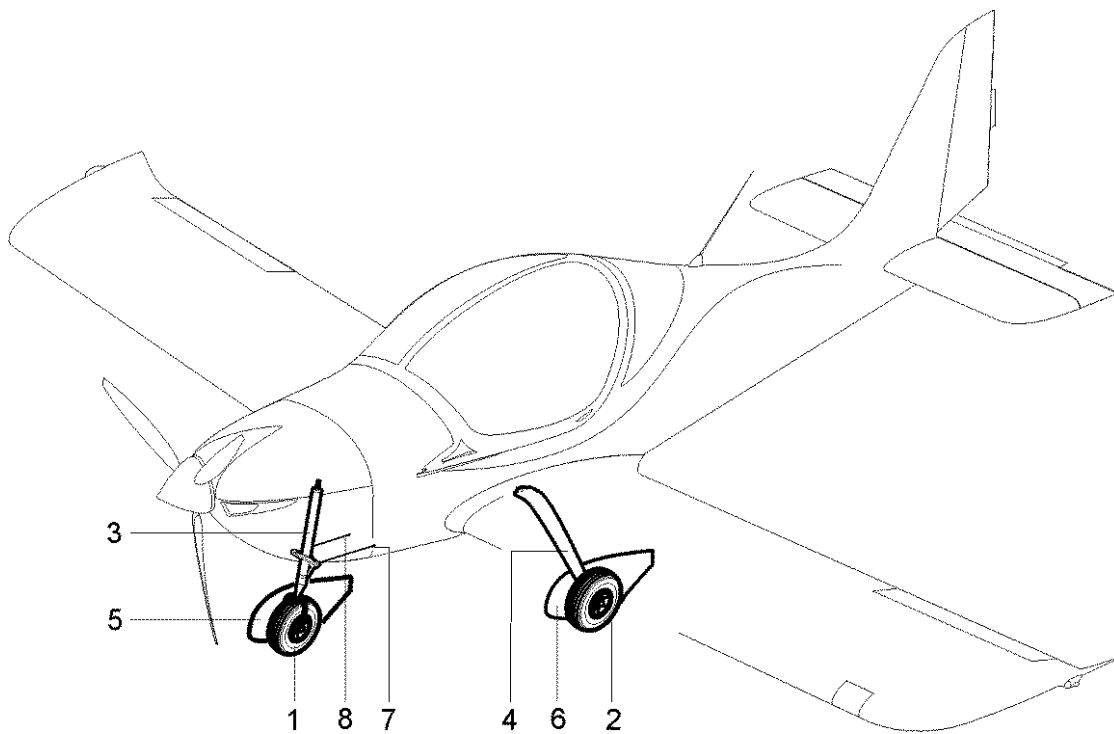
7.5 Inside and Outside Marking and Placards

Placard list and markings are mentioned in the Airplane Maintenance Manual for SportStar RTC airplane.

7.6 Landing Gear and Brakes

7.6.1 Landing Gear

The airplane is equipped with a sort of fixed nose landing gear. Main landing gear legs (4, Figure 7-6) are produced from composite spring. Nose landing gear leg (1) is welded from two pieces - the tube and the yoke- in which the nose wheel is mounted. The nose landing gear is spring-loaded by rubber blocks. The nose wheel is controllable, wheel control is coupled with rudder control by means of two pull rods (7, 8). Wheels can be fitted with fiber-glass aerodynamic pants (5, 6).



Legend to Figure 7-6:

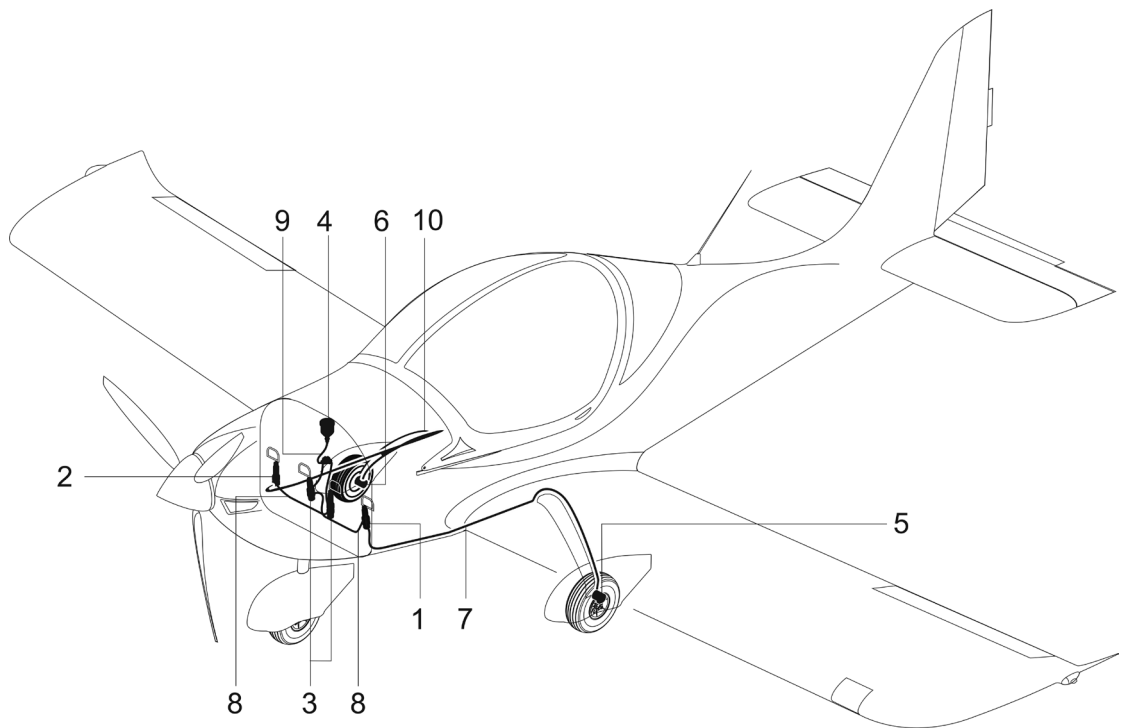
- | | | | |
|---|-----------------------|------|-------------------------|
| 1 | Nose wheel | 5 | Nose wheel pant |
| 2 | Main wheel with brake | 6 | Main wheel pant |
| 3 | Nose landing gear leg | 7, 8 | Nose wheel control rods |
| 4 | Main landing gear leg | | |

Figure 7-6 Landing gear



7.6.2 Brakes

The SportStar RTC airplane is equipped with disk hydraulic brakes on main landing gear wheels (Figure 7-7). Brake system is composed of brake pedals (these are a part of rudder control pedals), brake pumps (1, 2, 3), hoses for leading brake liquid (7, 9, 9, 10), brake yokes with wheel cylinders and brake pads. By depressing the brake pedals compression of brake pumps occurs, which generates pressure in brake circuit and hydraulic cylinders press the brake pads onto the brake disks. Braking pressure can be regulated only by force of brake pedals depressing.



Legend to Figure 7-7:

- | | | | |
|---|-----------------------|----|---------------------------|
| 1 | Brake pump | 6 | Right wheel brake |
| 2 | Brake pump | 7 | Hose to left wheel brake |
| 3 | Brake pump | 8 | Brake liquid hose |
| 4 | Brake fluid reservoir | 9 | Brake liquid hose |
| 5 | Left wheel brake | 10 | Hose to right wheel brake |

Figure 7-7 Braking system



The mechanical manually controlled parking brake is installed in the airplane.

PARKING BRAKE handle is located below the left pilot seat.

In the case of the installation a brake system with Beringer components, the parking brake controller is installed:

- On the central console, if innovated interior panels are installed
- On the central panel, if original interior panels are installed.

Applying parking brake

1. Brake pedalspress and hold
2. **PARKING BRAKE** handle / controllerpull to brake
3. Brake pedalsrelease

Releasing parking brake

1. Brake pedalspress and hold
2. **PARKING BRAKE** handle / controllerpush to release
3. Brake pedalsrelease

7.7 Seat and Safety Harnesses

SportStar RTC airplane is a two-seat airplane with side-by-side seats. Seats are fixed, non-adjustable and fitted with light upholstery.

Each of seats is fitted with four-point safety harness which is composed of safety belts, shoulder straps and lock. The safety harness is anchored in the fuselage sides behind the seats and on the seat sides.

7.8 Baggage Compartment

Baggage compartment is positioned behind seat rests.

Maximum weight of baggage is 55 lbs (25 kg) and is stated on the placard in the baggage compartment. The baggage compartment is fitted with rubber net for baggage fixation.

7.9 Canopy

The cockpit canopy is of a semi drop shape. The framework is made of composite. The organic glass is glued to the canopy composite frame.

The canopy is attached to the fuselage in the front part by two swivel pins by means of which it can be folded up forwards. In order to make opening easier, the actual weight of canopy is balanced by two gas struts, besides the canopy is provided with holders on the lower framework for easier handling. The canopy is provided with the lock in the rear upper part of framework for locking.



7.10 Power Unit

7.10.1 General

The engine ROTAX 912 ULS (100 hp) is used to power SportStar RTC airplane. ROTAX 912 ULS is a four-cylinder, four-stroke engine with opposite cylinders, central cam shaft, OHV valve mechanism and maximum take-off power of 100 hp (73.5 kW) at 5800 RPM.

The on-ground adjustable, composite, 3-blade propeller WOODCOMP KLASSIC 170/3/R. is standard mounted on the engine ROTAX 912 ULS.

7.10.2 Engine Control

Engine power is controlled by means of **THROTTLE** lever, which is located in the middle of the instrument panel and which controls engine power range from idle up to maximum take-off. Engine power controller is mechanically interconnected with the flap on carburetors.

If the throttle lever is fully pushed in, then this position corresponds to maximum engine power. If the throttle lever is fully pulled out, then this position corresponds to idle (1600 – 1700 RPM set by airplane manufacturer). Rapid changes in engine power setting can be made by pressing down the round button on the lever body and by its pulling out or pushing in. Small changes in power setting can be performed through lever turning (clockwise - power increase).

WARNING

DO NOT APPLY AN EXCESSIVE FORCE IF THE THROTTLE LEVER IS CLOSE TO FULLY PULLED POSITION, OTHERWISE IT CAN CAUSE DAMAGE TO THE THROTTLE LEVER.

In the case of a throttle control damage as a result of excessive tightening when the controller starts “skipping“ due to a stripped thread, then such “skipping“ can lead to an increase of the engine idle speed.

The throttle lever is fitted with the locking ring, clockwise turning of which ensures locking of the lever in requested position.



7.10.3 Engine Instruments

The following instruments located on the instrument panel serve for engine performance monitoring:

RPM indicator

The electrical RPM indicator is controlled by signal from the generator RPM transmitter. Working range of the RPM indicator is 0 - 8000 RPM. Color code is stated in section 2, page 2-6.

Cylinder head or coolant thermometer – see Note on page 2-6

The cylinder head or coolant thermometer transmitter senses temperature of cylinder No. 3 or coolant of cylinder No. 3. Working range of the thermometer is 50 ÷ 150 °C. Color code is stated in section 2, page 2-6.

Oil thermometer

Oil temperature on engine input is measured by the sensor located behind the oil pump. Working range of oil thermometer is 50 ÷ 150 °C. Color code is stated in section 2, page 2-5.

Oil pressure indicator

Oil pressure on the oil input into engine is measured by means of sensor which is located behind the oil filter. Working range is 0 ÷ 10 bar. Color code is stated in section 2, page 2-5.

7.10.4 Engine Cooling System

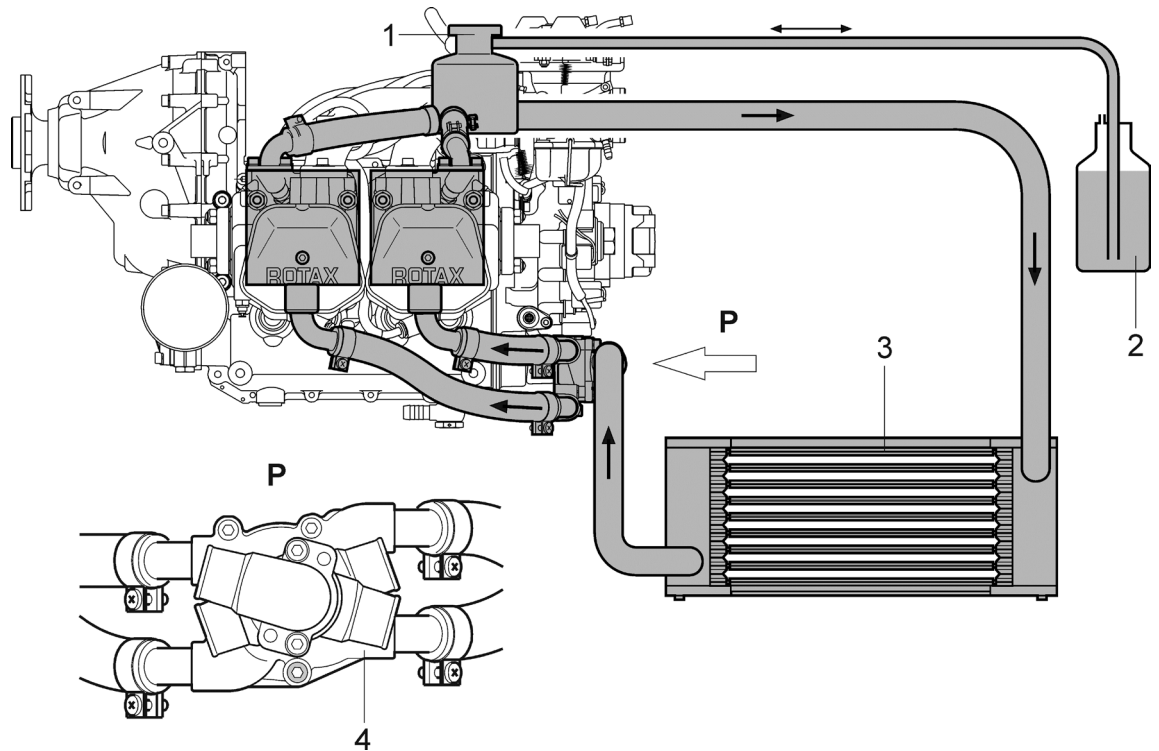
Engine cooling is combined, cylinder heads are cooled by water, and cylinders are cooled by air.

Cooling circuit of cylinder heads is designed as a closed system containing pump, expansion tank (1) with pressure closure, cooling liquid cooler (3) and overflow bottle (3). Scheme of cylinder head cooling system is shown in Fig. 7–8.

When changing, the cooling liquid is filled up through the cap of expansion tank (1).

During airplane operation the cooling liquid is replenished:

- up to top the expansion tank (1)
- between the lines of maximum and minimum level into overflow bottle (3).



Legend to Figure 7-8:

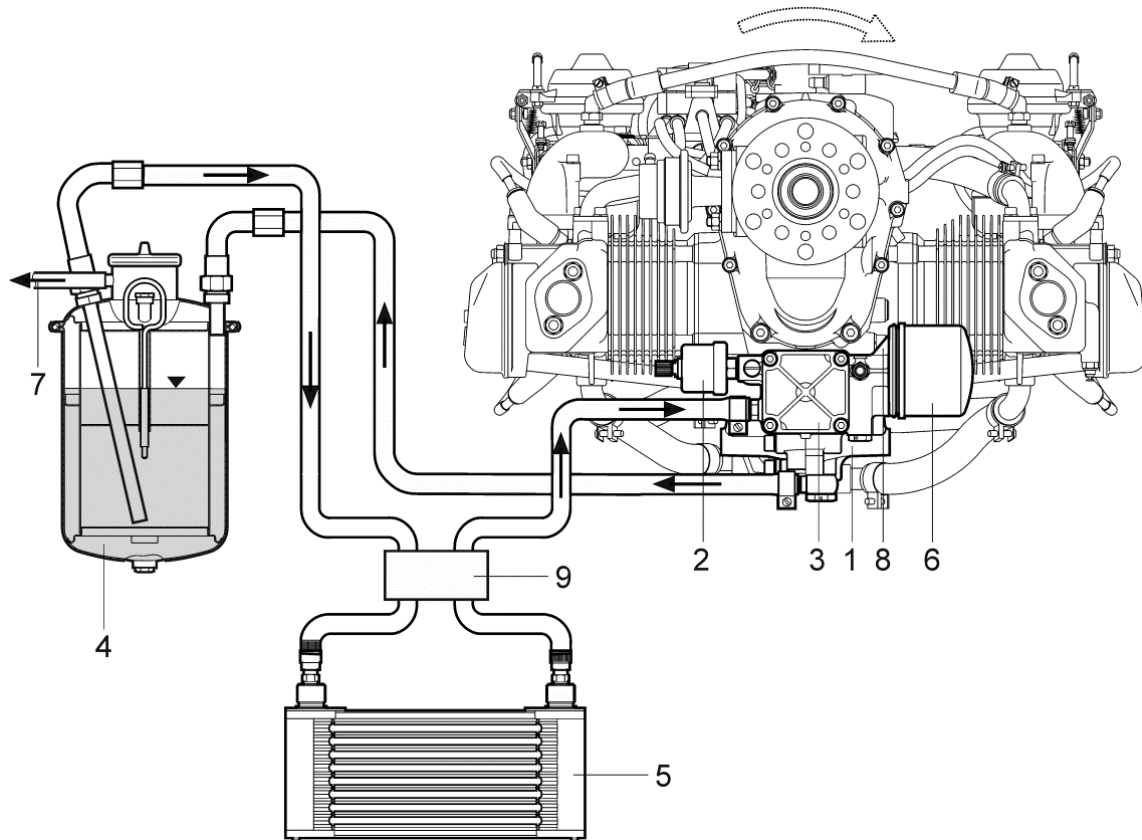
- | | | | |
|---|-----------------|---|-----------------------|
| 1 | Expansion tank | 3 | Cooling liquid cooler |
| 2 | Overflow bottle | 4 | Pump |

Figure 7-8 Scheme of cylinder head cooling system

7.10.5 Engine Lubrication System

The engine is equipped with the lubrication system with the dry sump and the oil pump that has a built-in pressure reducing valve (1, Figure 7-9) and a sensor of oil pressure (2). The oil pump (3), that is driven by the camshaft, takes the engine oil from the tank (4) through the thermostat (9), oil cooler (5) and the oil is forced through the oil filter (6) to the individual lubrication points in the engine. The oil flows down from the lubrication points to the bottom of the crankcase, and from there it is forced to the oil tank by means of the pressure shocks from the pistons. The venting of the system is realized by the outlet (7) on the oil tank. The sensor of oil temperature (8) is located on the pump body and it measures the oil temperature on the inlet; the sensor of oil pressure (2) is installed along with the pressure reducing valve in the oil pump.

Oil pressure and temperature are indicated on instruments in right side of the instrument panel. Oil is replenished through the lid in the upper part of the oil tank (4).



Legend to Figure 7-9

- | | |
|--------------------------|-----------------------------|
| 1 Reduction valve | 6 Oil filter |
| 2 Sensor of oil pressure | 7 Venting of oil system |
| 3 Oil pump | 8 Sensor of oil temperature |
| 4 Oil tank | 9 Thermostat |
| 5 Oil cooler | |

Figure 7-9 Scheme of engine lubrication system

7.10.6 Engine Intake System

Engine intake system ensures delivery of sufficient air into engine. Air is taken into the engine through openings on the engine covers through the air filters. The intake system can be equipped with carburetor heating system. Hot air from the heat exchanger (located on the exhaust collector) is taken to the mixing chamber. Amount of in-taken hot air is regulated by flaps in mixing chamber inlets. Flaps are controlled by the **CARBURET. PREHEAT.** knob on the instrument panel.



7.10.7 Ignition System

The engine is equipped with the double contactless ignition system. Each ignition circuit has own source of energy, control unit, 2 ignition coils and 4 spark plugs. It is fully autonomous on the other circuit of accumulator. High voltage current is distributed to the spark plugs through high-voltage cables. Ignition sequence of individual engine cylinders: 1-4-2-3.

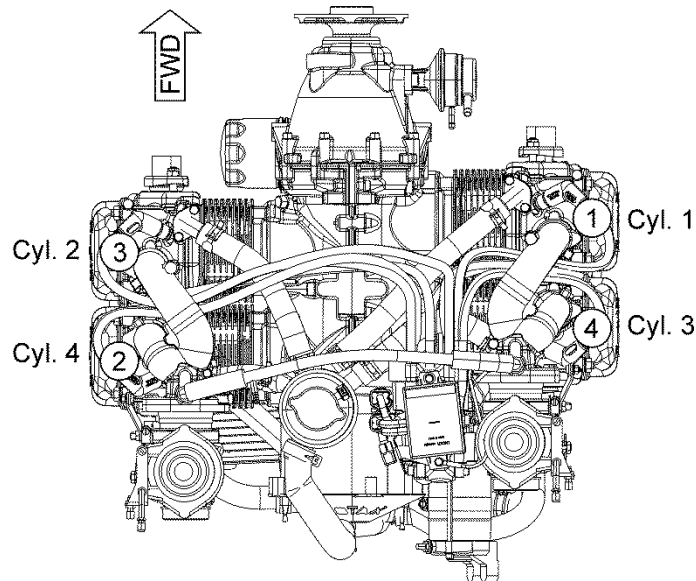


Figure 7-10 Ignition sequence

Ignition circuits are controlled by the ignition switch on the instrument panel.

Positions of ignition switch:

- | | |
|--------------|---------------------------------------------------------|
| OFF | engine ignition is off |
| R | only ignition circuit B is on |
| L | only ignition circuit A is on |
| BOTH | both circuits are on |
| START | both circuits are on and starter is cranking the engine |



7.11 Fuel System

Fuel system serves for keeping fuel in the airplane and it's feeding to the engine. Fuel system of SportStar RTC airplane is composed of integral fuel tanks (1, 2 Figure 7-11), fuel line, fuel selector (4), check valve (5), fuel filter (5), mechanical fuel pump - located on the engine (11), electrical fuel pump (6), distributors (9, 10), distribution pipes of fuel with return branch, fuel gauges (13, 14), fuel pressure indicator (12) and fuel tanks draining valves (15). Overflow fuel from engine fuel pump (11) is led via hose under the aircraft.

7.11.1 Fuel Tanks

Fuel is contained in the wing integral tanks (1, 2) having volume 60 l each. Each tank is fitted with air venting (output is under the wing tip) and draining valve (15) on the bottom side of the wing.

Fuel is led from the tanks through the hoses to the fuel selector (4) located on a central console under the instrument panel and then through a fuel filter (5), the fuel pumps (6, 11), distributors (9, 10) to the carburetors (7, 8). Fuel return hose goes from the fuel distributor (9) into the fuel selector (4) and from there to fuel tanks (1, 2) which the fuel is drawing off. See figure 7-11 for Scheme of fuel system.

7.11.2 Fuel Selector

The fuel selector (4) serves for tank selection and fuel delivery interruption in case of engine fire or long parking of airplane.

To move selector from **OFF** (closed) position it necessary pull the safety button on the fuel selector, turn the handle from the **OFF** position to the left and then release safety button. Now the handle can be freely moved between **LEFT** and **RIGHT** position. Safety button prevents unintentionally switch the selector to **OFF** position.

To move selector to **OFF** (closed) position it is necessary pull the safety button on the fuel selector, turn the handle to the **OFF** position and then release safety button. Now the handle is blocked in the **OFF** position. Safety button prevents unintentionally switch the selector from the **OFF** position during parking.

7.11.3 Fuel Filter

The fuel filter (5) separates all mechanical impurities from fuel. The fuel filter is located in the cockpit on the left airframe panel.

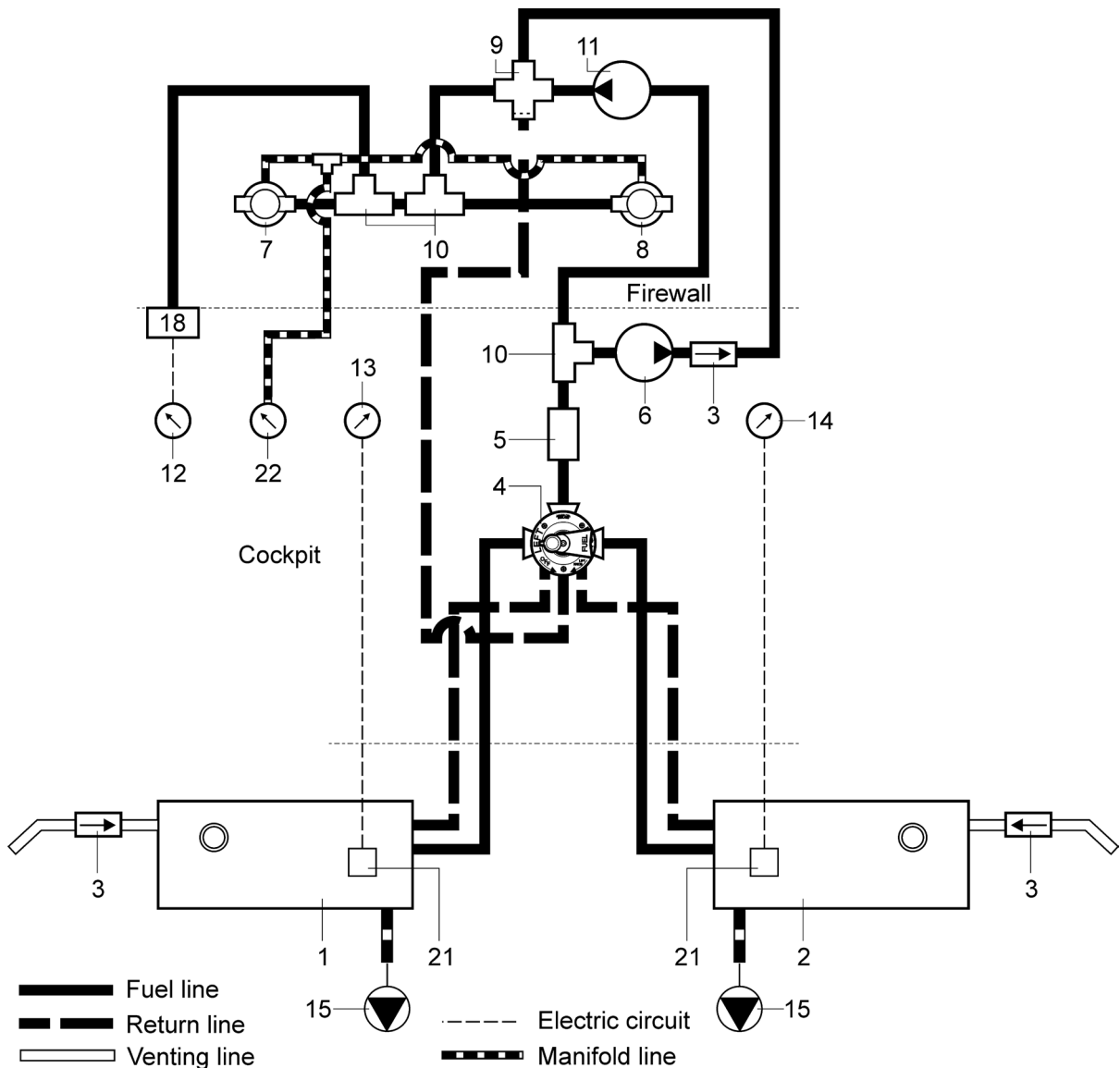


7.11.4 Indication of Fuel Quantity

Fuel quantity is measured by a float fuel gauge sensor (21) in each tank and indicated on fuel gauges (13, 14) on the instrument panel. LH fuel gauge indicates fuel quantity in the left tank, RH indicator in the right tank. True fuel quantity is indicated only on ground and in level flight and it takes approx. 2 minutes to level fuel after transition from climb/descent.

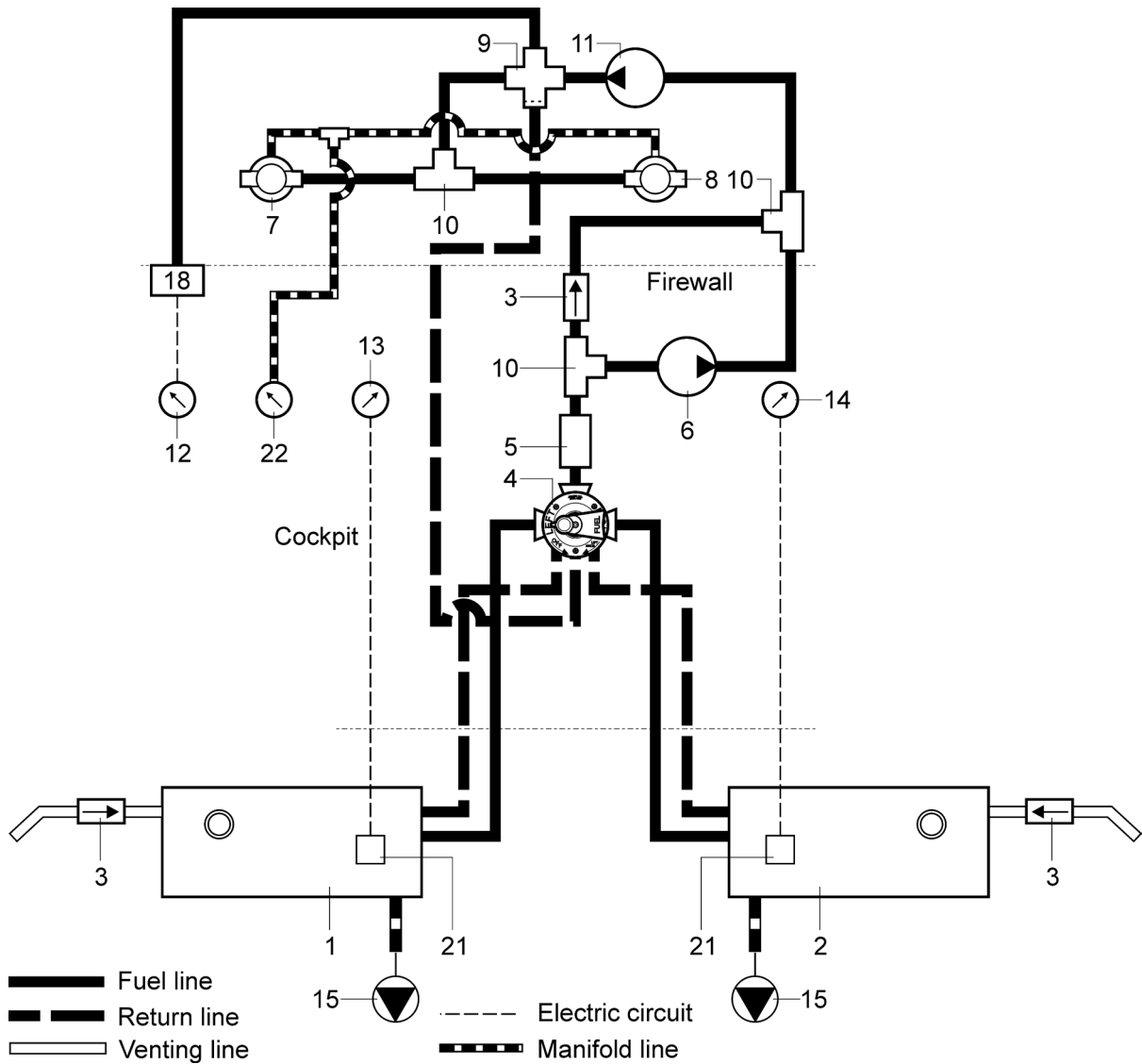
7.11.5 Fuel Tank Draining

Draining of the fuel tank is specified in Section 8, para 8.5.2.



Original version of the fuel system

Figure 7-11 Scheme of fuel system (sheet 1 of 3)



New version of the fuel system

Figure 7-11 Scheme of fuel system (sheet 2 of 3)



Legend to Figure 7-11

- | | |
|--------------------------|---------------------------------------------------------------------------------|
| 1 Left fuel tank | 12 Fuel pressure indicator |
| 2 Right fuel tank | 13 Fuel quantity indicator of left tank |
| 3 Check valve | 14 Fuel quantity indicator of right tank |
| 4 Fuel cock | 15 Drain valve |
| 5 Fuel filter | 16 - |
| 6 Electric fuel pump | 17 - |
| 7 Left carburetor | 18 Fuel pressure sensor |
| 8 Right carburetor | 19 Manifold pressure sensor (only if the the adjustable propeller installed) |
| 9 Four-way distributor | 20 Flow meter |
| 10 Three-way distributor | 21 Fuel level sensor in tank |
| 11 Engine fuel pump | 22 Manifold pressure indicator (only if the the adjustable propeller installed) |

Figure 7-11 Scheme of fuel system (sheet 3 of 3)



7.12 Electrical System

The airplane is equipped with 14 V DC electrical installation (see Figure 7-12). A generator with power of 250 W is the primary source of electrical energy. The secondary source of energy is the accumulator 12 V/15 Ah (12 V/20 Ah optionally) that is located in the engine compartment on the fire wall. It is used for engine starting and in case of generator failure as an emergency source of energy and also serves as the smoothing filter of power system.

DC voltage is distributed to individual systems by main bus bar. Each system is protected by circuit breaker. If overloading of any of the circuits occurs, then the circuit breaker is pulled out. Circuit breakers are listed in the Aircraft Maintenance.

CAUTION

DO NOT USE CIRCUIT BREAKERS FOR NORMAL SWITCHING OFF OF THE SYSTEMS.

After switching **MASTER SWITCH** on and by turning the ignition key to **START** position the starter is activated. The starter is power supplied from the accumulator before engine start. After engine has been started and idle RPM reached, generator starts supplying current into electrical network.

7.12.1 Lighting

Airplane can be equipped with an external lighting.

External lighting can be composed of position lights and anti-collision beacons which are located in wing tip and landing headlight which is located in left wing leading edge or in the lower engine cowling. Position lights are switched by **POS. LIGHTS** switch and anti-collision beacon by **BEACON** switch. Landing headlight is switched by **LDG LIGHT** switch.

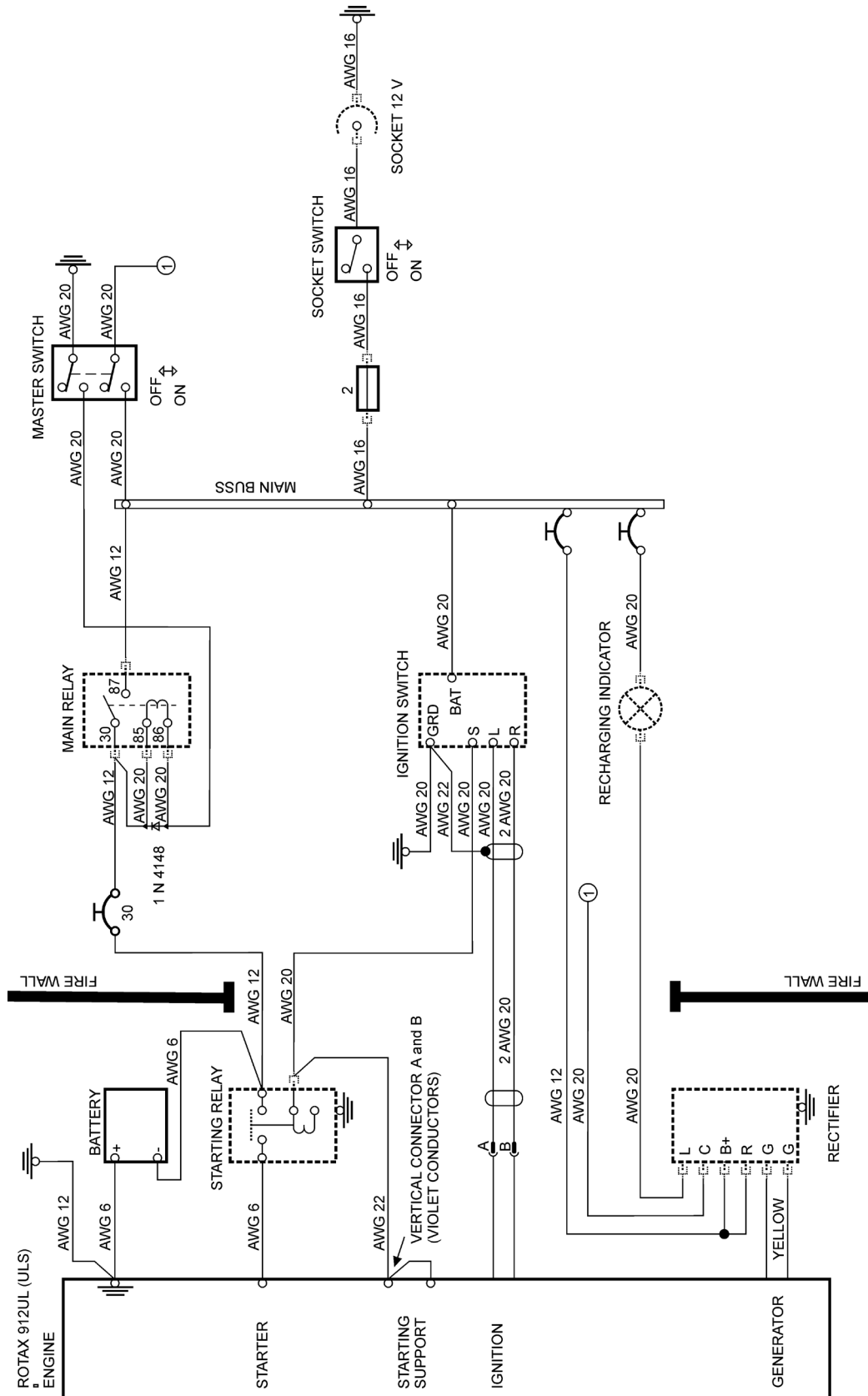


Figure 7-12 Scheme of electrical system



7.13 Pitot-static System

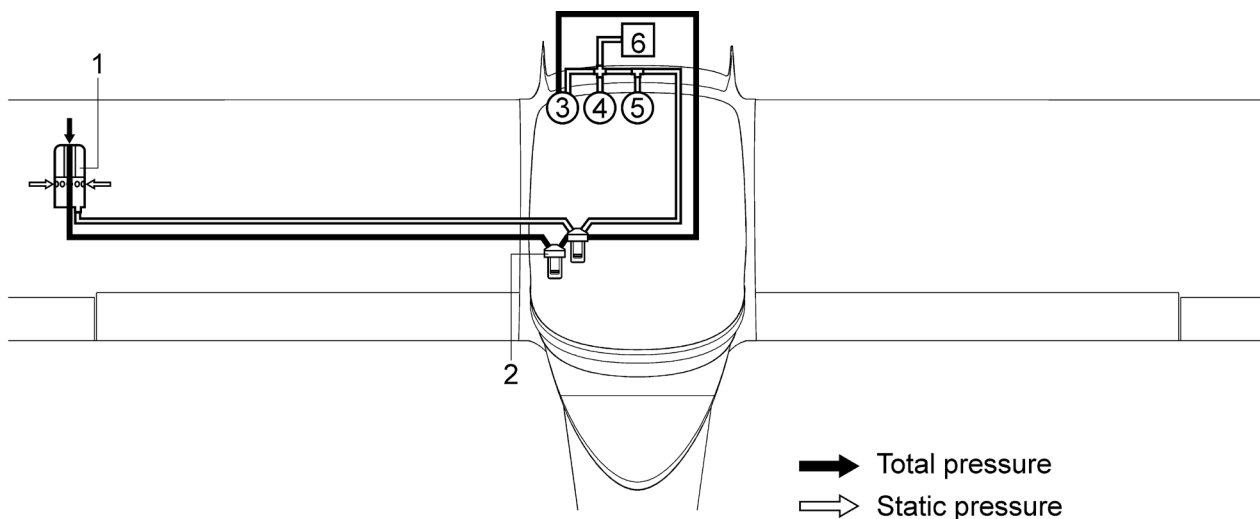
Pitot-static tube (1, Figure 7-13) for sensing static and total pressure is located under the left half of the wing. Total pressure is sensed through the opening in the Pitot-static tube face. Static pressure is sensed through openings on the tube circumference. System of pressure distribution to individual instruments is made by means of flexible plastic hoses.

Static pressure is led to altimeter (5), airspeed indicator (3), vertical speed indicator (4) and altitude encoder (6). Total pressure is led only to the airspeed indicator (3).

Both hose systems (total and static) are equipped with draining sumps (3) located inside the cockpit in front of the left pilot's seat under. These reservoirs are visible and can be checked from outside the fuselage bottom. If water appear in the draining sumps, unscrew the covers from the sumps and slightly blow into the Pitot-static head. Then screw the covers back and check the tightness of pitot-static system – see AMM for details.

CAUTION

AVOID BLOWING INTO THE PITOT-STATIC SYSTEM WITH THE CONDENSATE RESERVOIR COVER IS CLOSED - IT MAY CAUSE AN INSTRUMENT MALFUNCTION.



Legend to Figure 7-13

- | | |
|----------------------|----------------------------|
| 1 Pitot-static tube | 4 Vertical speed indicator |
| 2 Drain sumps | 5 Altimeter |
| 3 Airspeed indicator | 6 Altitude encoder |

Figure 7-13 Scheme of pitot-static system

7.14 Supplementary Equipment

7.14.1 Stall Speed Warning System

The sensor of stall speed warning is located on the left wing leading edge. When approaching the critical angle of attack (stall speed proximity) the flap is reset and electrical circuit connected as a result of pressure differences acting on the front and the rear part of the flap. During stall speed warning the acoustic signaling is activated which lasts throughout the time of occurrence.



7.14.2 Ventilation and Heating System

Cockpit ventilation is ensured by 2 eye-ball vents (14, Figure 7-14) located on the left and right of the tip-up canopy frame. Vents are connected to the NACA inlets (14) through tip-up canopy frame front flaps.

Cockpit heating is ensured by hot air from the heat exchanger (2). The heat exchanger is located on the exhaust collector (18). Air from ambient atmosphere is warmed up in the exhaust collector and then led through the mixing chamber (6) on the firewall and hoses to the cockpit floor or to the hot air outputs through the instrument panel cover as well as into the hollow spaces in the canopy frame for canopy glass defrosting.

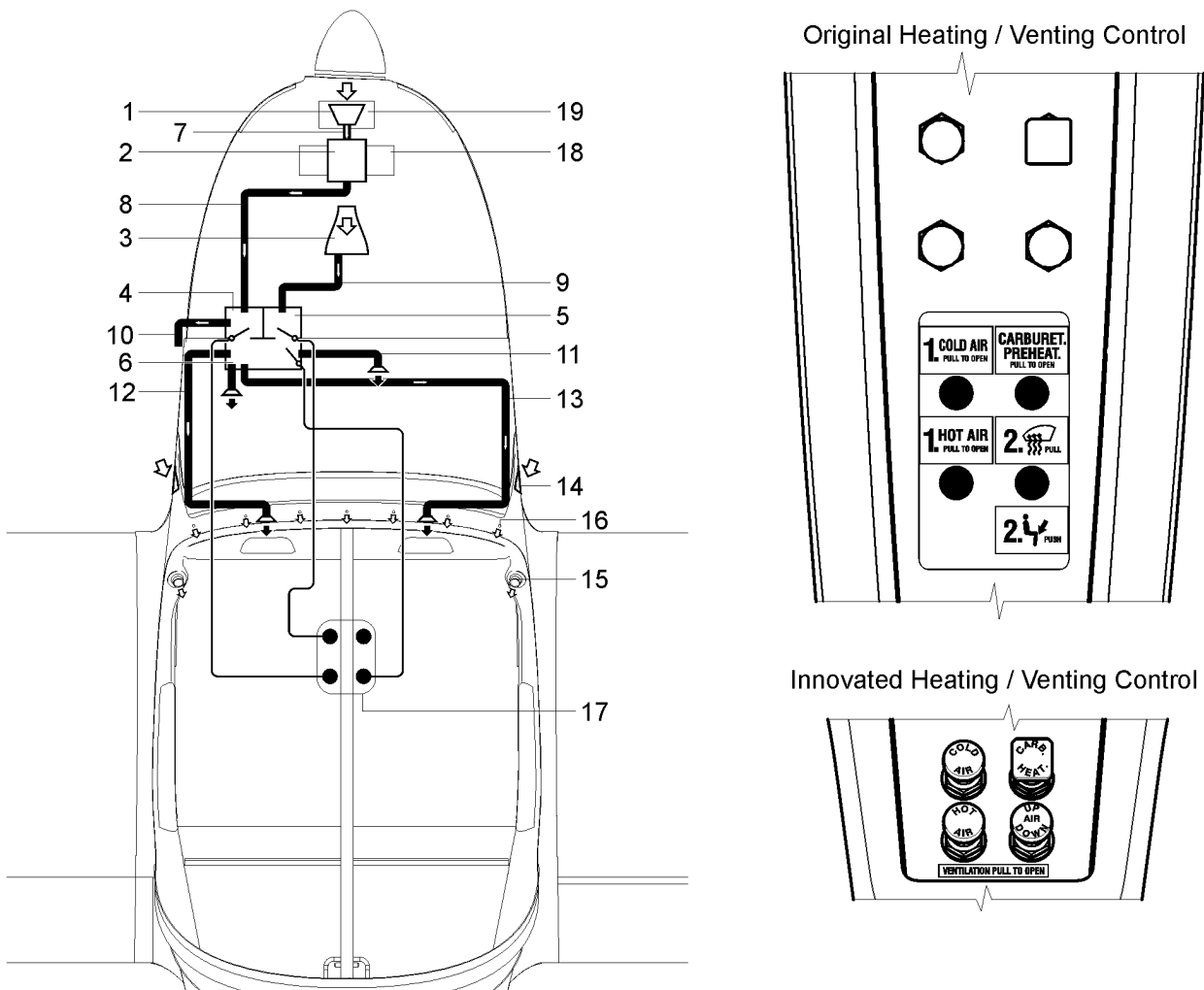


Figure 7-14 Scheme of ventilation and heating system (page 1 of 2)



Legend to Figure 7-14

- | | |
|--------------------|--------------------------|
| 1 Air inlet | 11 Hose |
| 2 Heat exchanger | 12 Hose |
| 3 NACA inlet | 13 Hose |
| 4 Hot air chamber | 14 NACA inlet |
| 5 Cold air chamber | 15 Eye-ball vent |
| 6 Mixing chamber | 16 Air outlets |
| 7 Hose | 17 Controls |
| 8 Hose | For information: |
| 9 Hose | 18 Exhaust collector |
| 10 Hose | 19 Cooling liquid cooler |

Figure 7-14 Scheme of ventilation and heating system (page 2 of 2)

Hot air quantity is regulated by the **HOT AIR** knob, cold air quantity is regulated by the **COLD AIR** knob on the instrument panel. Proportion of the cold and hot air in the heating system can be set continuously. **UP AIR DOWN** knob on the serves for air routing to the cockpit floor or on the canopy glass.



7.15 Navigation and Communication Equipment

Descriptions of operation of navigation and communication equipment see section 9 - Supplements.