

## **Chapter 34**

### **Navigation**

## TABLE OF CONTENTS

Chapter	Title	
<b>34-00-00</b>	<b>GENERAL</b> .....	<b>3</b>
<b>34-10-00</b>	<b>FLIGHT ENVIRONMENT DATA</b> .....	<b>4</b>
34-10-01	Pitot/Static System .....	4
34-10-02	Altimeter .....	4
34-10-03	Airspeed Indicator .....	5
<b>34-15-00</b>	<b>MAINTENANCE PRACTICES</b> .....	<b>6</b>
34-15-01	Pressure Head Removal/Installation .....	6
34-15-02	Pitot Head Attachment Block Removal/Installation .....	6
34-15-03	Altimeter Removal/Installation .....	7
34-15-04	Airspeed Indicator Removal/Installation .....	7
<b>34-20-00</b>	<b>ATTITUDE AND DIRECTION</b> .....	<b>8</b>
34-20-01	Magnetic Compass .....	8
34-20-02	Turn and Bank Indicator .....	8
<b>34-25-00</b>	<b>MAINTENANCE PRACTICES</b> .....	<b>9</b>
34-25-01	Magnetic Compass Removal/Installation .....	9
34-25-02	Turn and Bank Indicator Removal/Installation .....	9

## **34-00-00**

## **GENERAL**

The Extra 300S is equipped with an altimeter, an airspeed indicator and a magnetic compass. Optional a turn and bank indicator is obtainable. The colour markings in instruments follow US-FAR, part 23 recommendation.

To get the pitot and static pressure a pitot/static head is installed at the LH wing leading edge.

## 34-10-00

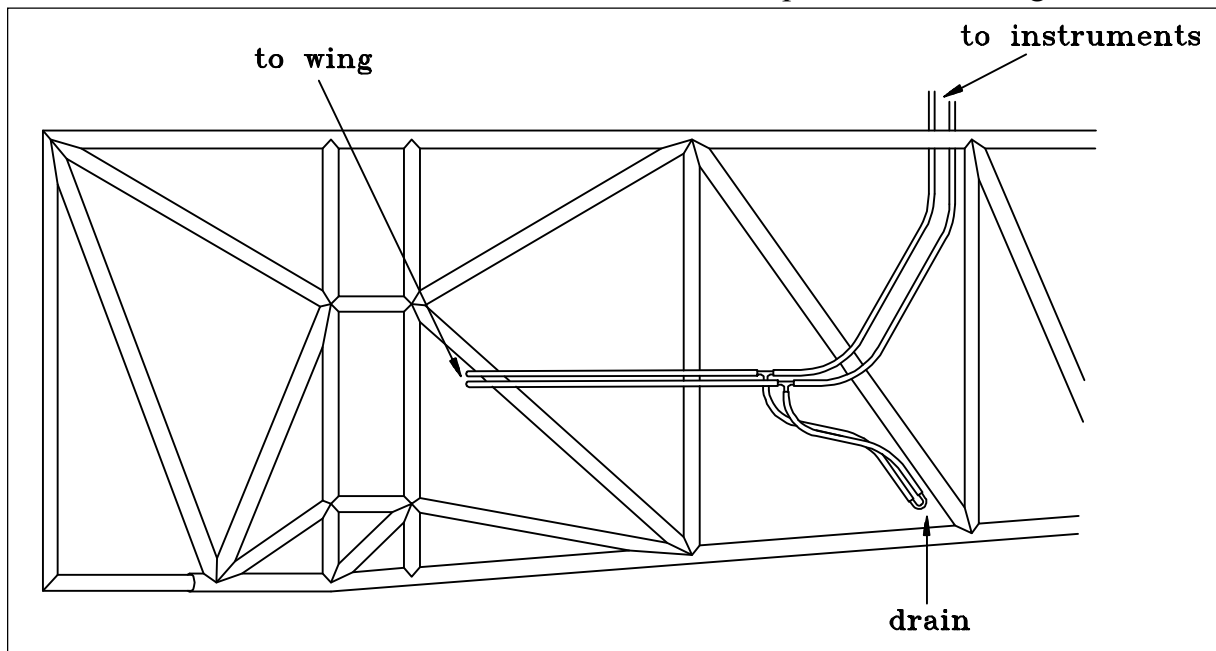
## FLIGHT ENVIRONMENT DATA

This Section describes that portion of the system which senses the environmental conditions and uses the data to influence navigation.

### 34-10-01

### Pitot/Static System

The pitot/static tube is designed to pick up pitot pressure and static pressure. It is screwed through the L.H. outboard leading edge into an attachment block located at the rear web of the main spar. From there the pressures are transmitted by means of a vinyl tubing which is routed through an aluminium tube inside the wing to the left side of the fuselage and further to the instrument panels. The ends of each vinyl tube are marked with the letters "P" or "S" for pitot resp. static pressure line. The pitot/static system can be drained by means of an U-shaped drain which is located at the left side of the cockpit as shown in Figure 1.



*Pitot/Static Drain  
Figure 1*

**34-10-02****Altimeter**

The altimeter is designed to measure pressure changes of the atmosphere by means of an aneroid capsule, the pressure changes corresponding to changes in altitude. In this instrument the shaft of pinion drives via gearwheels the pointer shaft of the large pointer. Further gearwheels are used to move the small pointer. The altimeter has a scale marked in feet (ft.). Three pointers provide an indication of the altitude; each full turn of the large pointer reads 1,000 feet, each full turn of the middle pointer 10,000 feet. By turning the knob at the bottom left of the instrument, the barometric pressure reading is set in millibars.

Barometric range: 946 thru 1050 millibars  
Reading range: -1,000 thru 20,000 feet  
Temperature range: -55°C thru +70°C

**34-10-03****Airspeed Indicator**

The airspeed indicator shows the speed of the aircraft relative to the atmosphere. The pitot airspeed indicator measures the difference between pitot pressure and static pressure, the former being picked up by the pitot head at the pitot location of the air flow and applied to the airspeed indicator via tubing, the latter also being picked up by the pitot head. The sensing element of the airspeed indicator is an open diaphragm which senses internally the pitot pressure and externally the static pressure, the difference between the two increasing with increasing speed. This difference produces distortion of the diaphragm which is translated to the pointer via a system of levers and gearwheels.

The reading of the airspeed indicator is in knots.

Max. operation altitude: 12,000 m  
Operating temperature range: -30°C thru +50°C

## **34-15-00**

## **MAINTENANCE PRACTICES**

### **34-15-01**

### **Pressure Head Removal/Installation**

The pressure head consists of an inner steel tube, an outer aluminium tube and a top cap which are screwed.

- 1 Unscrew the top cap.
- 2 Unscrew the outer aluminium tube.
- 3 Unscrew the inner steel tube.
- 4 Install in reverse sequence of removal applying silicone in the gap between the outer aluminium tube and the hole of the wing leading edge.

### **34-15-02**

### **Pitot Head Attachment Block Removal/Installation**

- 1 Remove the Pitot head per Chapter 34-15-01.
- 2 Remove the wing tip attachment plate with the lighting unit per Chapter 57-35-01.
- 3 Disconnect the vinyl tubing.
- 4 Remove the LN9348-05 stop nuts and the DIN125 M5 washers.
- 5 Disconnect the ground bonding leads.
- 6 Remove the attachment block.
- 7 Install in reverse sequence of removal. Use new stop nuts.

### **34-15-03**

#### **Altimeter Removal/Installation**

- 1 Remove the instrument access door.
- 2 Remove the vinyl tube.
- 3 Remove the attachment bolts and nuts.
- 4 Hand the altimeter under the instrument panel and remove.
- 5 Install in reverse sequence of removal.
- 6 Perform an operation test.

### **34-15-04**

#### **Airspeed Indicator Removal/Installation**

- 1 Remove the instrument access door.
- 2 Remove the vinyl tubing.
- 3 Remove the attachment bolts and nuts.
- 4 Hand the airspeed indicator under the instrument panel and remove.
- 5 Install in reverse sequence of removal. Observe correct installation of vinyl tubing: "Stat. Druck" = static pressure, "Meßdruck" = Pitot pressure.
- 6 Perform an operation test.

## **34-20-00**

## **ATTITUDE AND DIRECTION**

This Section describes that portion of the system which uses magnetic or inertia forces to sense and display the direction or attitude of the aircraft.

### **34-20-01**

#### **Magnetic Compass**

The magnetic compass shows the course of the aircraft in relation to magnetic north. Its measuring range is 360° in increments of 5°. Its case is filled with silicone oil to dampen the movements. The compass correction card is located as shown in Chapter 31.

The magnetic compass must be inspected whenever the engine, magnetizable metals or parts of the electrical resp. ignition system has been replaced, changed or added, otherwise per Chapter 05.

### **34-20-02**

#### **Turn and Bank Indicator**

The turn and bank indicator indicates the turning rate of the aircraft about its vertical axis. This instrument comprises an electrically driven gyro, suspended in a gimbal system and whose spin axis is parallel to the lateral axis of the aircraft. The gimbal is connected to the bar pointer of the indicator by a lever system. This bar pointer also indicates the rate at which the aircraft is turning.

In addition, the front of the instrument houses a sphere located in a globe filled with a damping fluid. The change in this indication shows the pilot whether the aircraft is slipping.



## **34-25-00**

## **MAINTENANCE PRACTICES**

### **34-25-01**

### **Magnetic Compass Removal/Installation**

- 1 Remove the instrument access door.
- 2 Remove the compass attachment bolts and nuts.
- 3 Remove the magnetic compass.
- 4 Install in reverse sequence of removal.
- 5 Perform a compass compensation and replace the compass correction card.

### **34-25-02**

### **Turn and Bank Indicator Removal/Installation**

- 1 Remove the instrument panel cover per Chapter 31-15-01.
- 2 Remove the indicator attachment bolts and nuts.
- 3 Disconnect the electrical wiring.
- 4 Hand the turn and bank indicator under the instrument panel and remove.
- 5 Install in reverse sequence of removal.
- 6 Perform an operation test.