



360 COPILOT'S KIT

For missions requiring a second crew member the cockpit equipment may be completed by the following :

- Dual controls
- Co-pilot's instruments
- Second windscreen wiper
- Second utility lamp

Weight increase : 12.3 kg — 27.6 lb.





OPTIONAL EQUIPMENT TECHNICAL SPECIFICATION

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DUAL CONTROLS

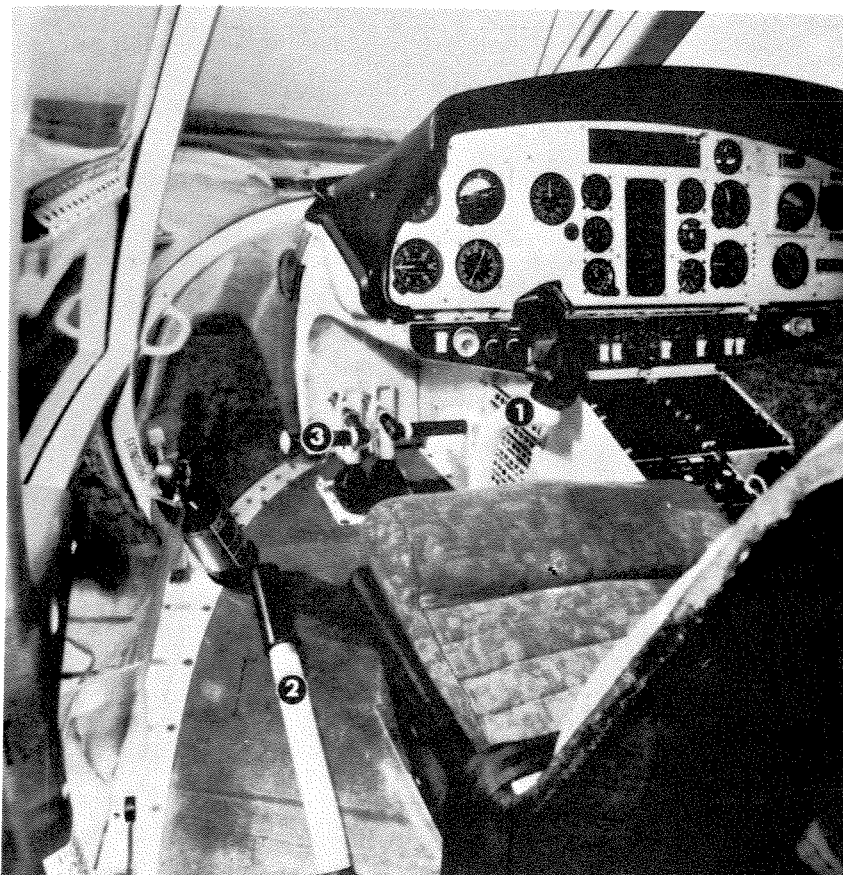
For training flights or those requiring two pilots, the aircraft may be fitted with dual controls, including :

- 1 cyclic pitch stick (1)
- 1 collective pitch lever (2)
- 2 tail rotor control pedals (3)

All components are easily installed on the torque shafts existing in the basic aircraft version, after removal of the blanking plates from the controls passages in the floor.

The cyclic pitch stick grip is fitted with :

- 1 radio press-to-talk switch
- 1 A.F.C.S. magnetic brake release switch
- 1 A.F.C.S. disengage switch.



Weight increase : 5.3 kg — 11.6 lb.

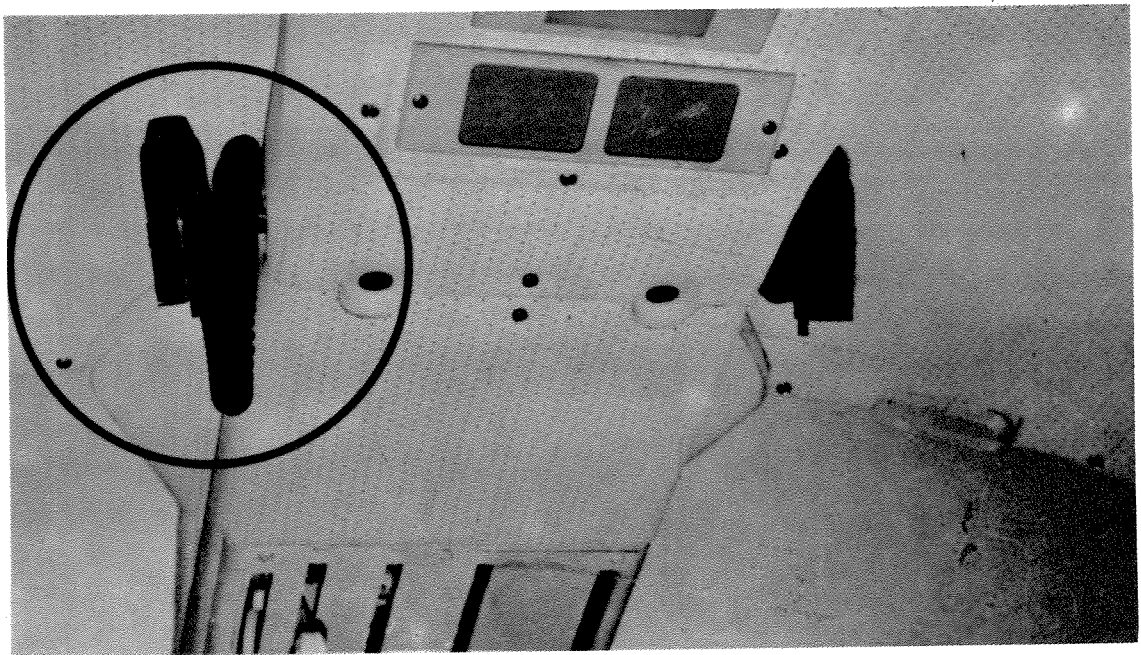




SECOND UTILITY LAMP

A second utility lamp with white or red beam powered through a spiral extendable cord (approx. 1.70 m - 5.5 ft long) is fitted on the cabin ceiling accessible to the copilot.

A built-in potentiometer is provided for switching on the lamp and adjusting beam intensity (red or white)



Weight increase : 0.27 kg — 0.5 lb.



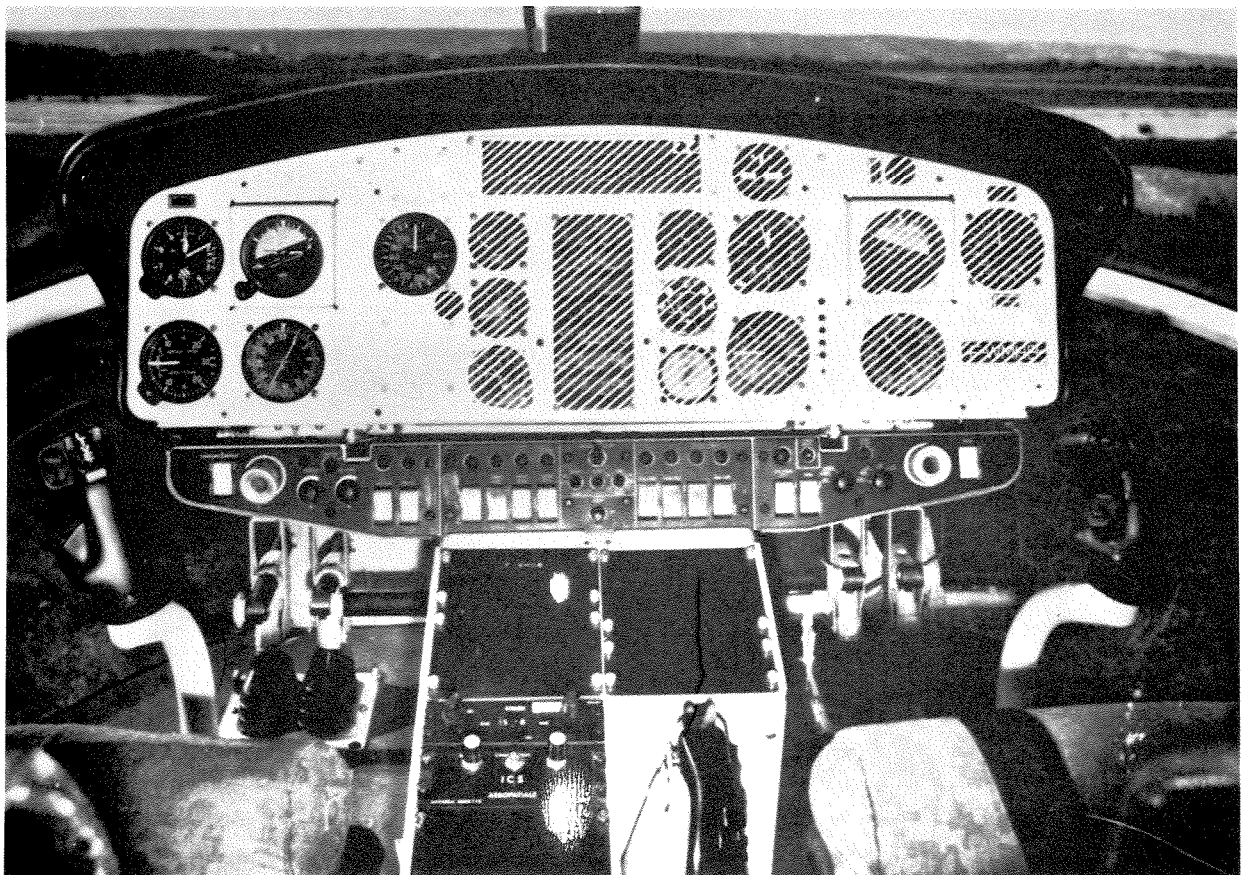
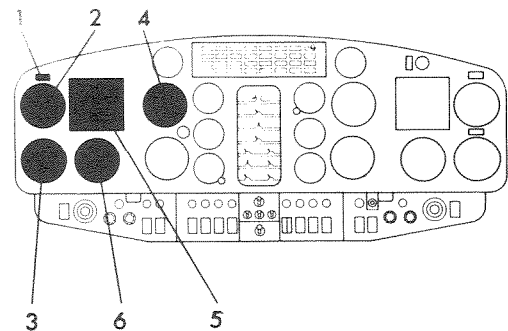




CO-PILOT'S INSTRUMENTS

The standard instruments installed on the pilot's (starboard) side of the instrument panel, may be completed, if necessary, by duplicate instruments, mounted on the port side, which include :

- 1 general warning light (1)
- 1 altimeter (2)
- 1 vertical speed indicator (3)
- 1 airspeed indicator (4)
- 1 gyro horizon (5)
- 1 radio-magnetic indicator (6)



Weight increase : 3.7 kg — 8.1 lb.





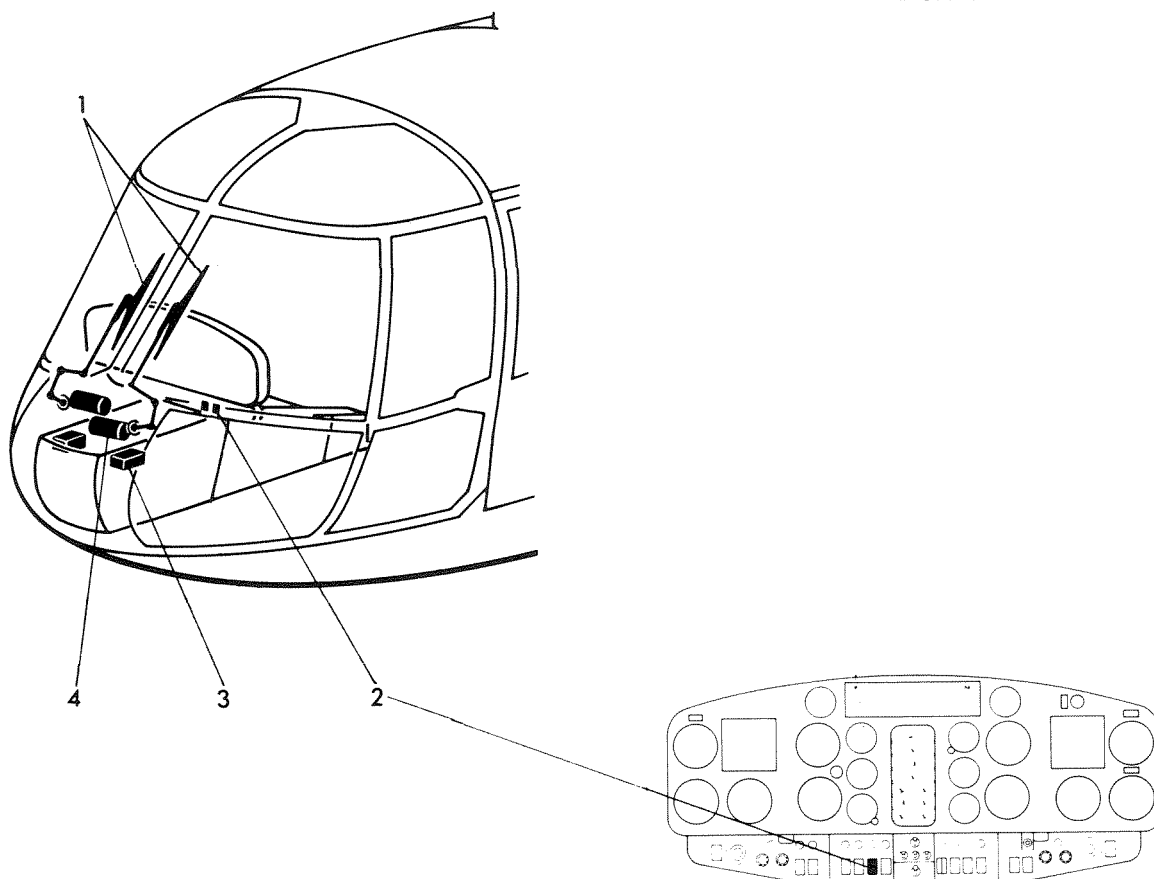


SECOND WINDSCREEN WIPER

A second windscreen wiper, opposite hand to the one on the basic aircraft version, is installed on the port windscreen to improve visibility in rainy weather.

It is driven by an electric motor, independent of the first, provided with a separate control switch, and having two sweep speeds.

- 1 - Wiper blade
- 2 - 3-position switch
- 3 - Motor control unit
- 4 - Electric motor



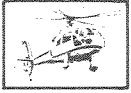
Weight increase : 3 kg — 6.6 lb.



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AIR CONDITIONER

The cabin is air conditioned by a turbo-refrigeration unit provided with a thermostat to maintain a constant preset temperature.

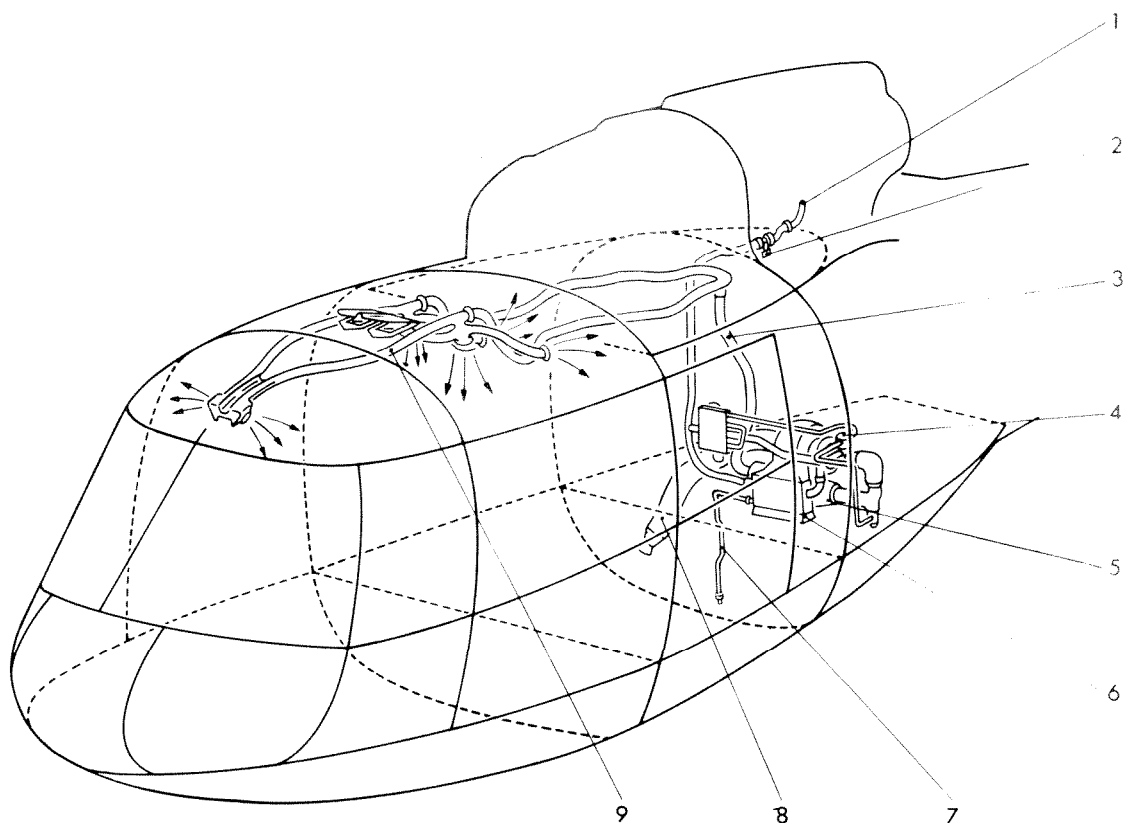
The installation is fully insulated and comprises :

- A SEMCA turbo-refrigeration unit complete with a radiator.
Radiator cooling air enters the system through two special louvres protected by grilles on the underside of the lower structure.
- A pressurized P2 bleed air supply system for the turbo-refrigeration unit, provided with a manually-operated regulator valve.
- An exhaust duct for radiator cooling air.
- A water separator and drain line.
- A compressed air regulator system designed to maintain the water separator temperature above freezing. The system includes :
 - A filter.
 - A pressure reducing valve.
 - An anti-icing valve.
 - An anti-icing thermostat.
 - Component interconnection lines.
- A distribution system connected to the cabin overhead ventilation system.
- A mechanical control located on the control quadrant. The air conditioner installation has no effect on cabin useful volume.

The complete air conditioner unit is installed in the baggage compartment against the cabin aft bulkhead.



AIR CONDITIONER INSTALLATION DIAGRAM

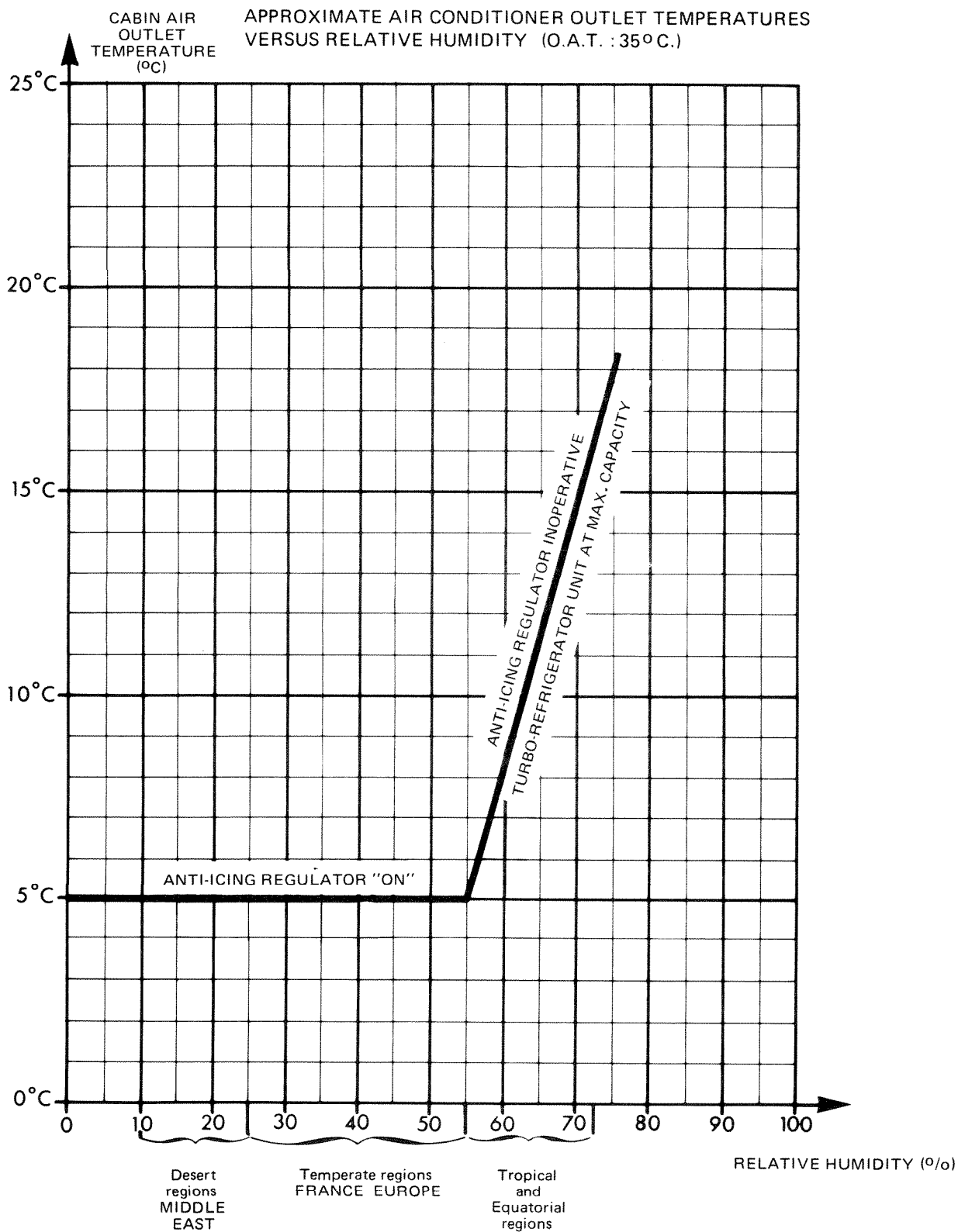


- 1 - P2 compressed air supply
- 2 - Manually-operated valve
- 3 - Distribution lines
- 4 - Turbo-refrigeration unit
- 5 - Water separator
- 6 - Radiator
- 7 - Water separator drain
- 8 - Radiator cooling air exhaust
- 9 - Cabin ventilation system



OPTIONAL EQUIPMENT TECHNICAL SPECIFICATION

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360 C 77.01

AG.7
P.3



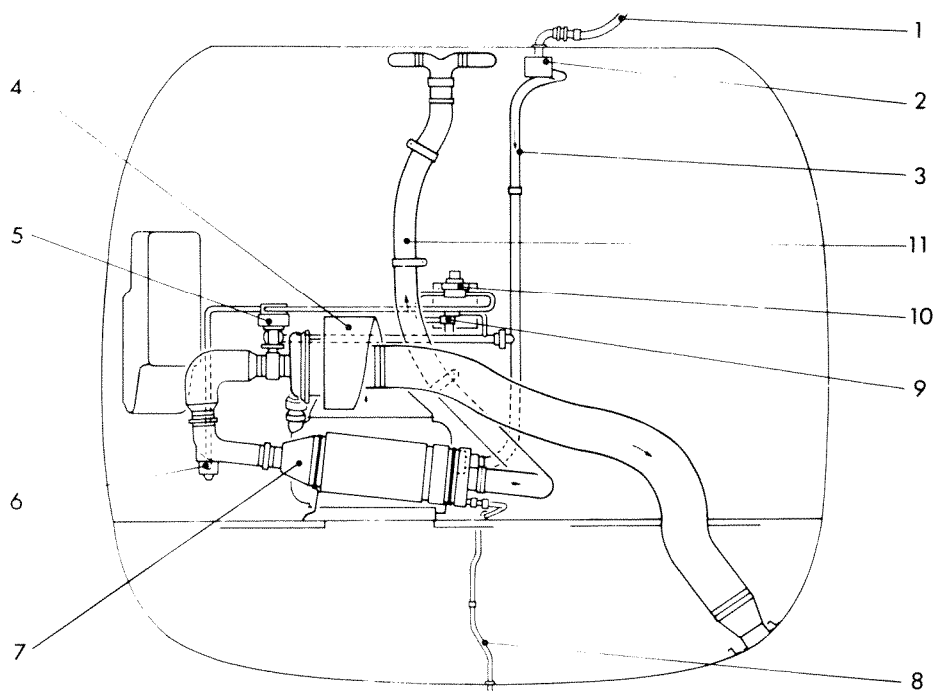
Cabin air conditioning is achieved by expansion of pressurized air in a turbine impeller.

Compressed air bled from the engine P2 system is circulated through the manually - operated valve to the radiator where, prior to expansion, it is cooled to below 100°C by an airstream drawn from outside the aircraft by a fan mounted on the turbine impeller shaft. The fan is also designed to slow the turbine impeller.

Radiator outflow air is then cooled by adiabatic expansion in the turbine impeller.

This process is accompanied by the formation of small superfused water droplets caused by partial condensation of the water vapour contained in the P2 air prior to expansion.

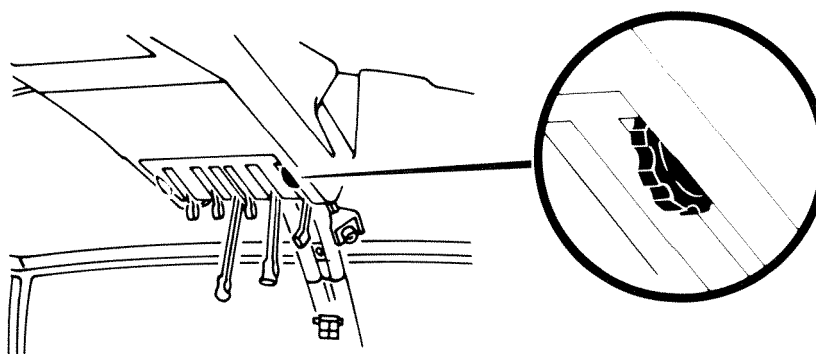
In order to prevent icing at the turbine outlet and in the cabin cool - air distribution lines, the air temperature is maintained at 3 to 5°C above freezing by means of an anti - icing valve. This is controlled by the airflow past the anti - icing thermostat located upstream of the water separator inlet.



- 1 - P2 compressed air bleed
- 2 - Manually-operated valve
- 3 - Pressurized air supply line
- 4 - Turbo-refrigeration unit
- 5 - Anti-icing valve
- 6 - Anti-icing thermostat
- 7 - Water separator
- 8 - Water separator drain line
- 9 - Filter
- 10 - Pressure reducing valve
- 11 - Cool air distribution duct

AIR CONDITIONER CONTROL

A control wheel and rack on the overhead quadrant controls the turbo-refrigerator P2 compressed air supply valve via a flexible ball-type control.



Temperature regulation is achieved as follows :

Temperature variations at the water separator inlet modify the thermostat bypass airstream, causing the regulator valve to adjust the amount of hot air added to the turbine outflow so that the temperature is maintained between 3 and 5° C.

The temperature - regulated air is dehumidified in the water separator, which is provided with a water drain at the base of the unit.

The air is then ducted to the cabin overhead ventilation system lines.

Cooled air is distributed through the 6 ventilation outlets in the cabin ceiling.

EFFECTS ON AIRCRAFT PERFORMANCE

■ TAKE - OFF

- No effect on maximum take - off weights specified in the Flight Manual;

The air - conditioner must be shut off during take - off.

■ CRUISING FLIGHT

- Available power is decreased by approximately 32.5 Kw
- Fuel consumption in cruising flight is increased by 11 kg/h
- Cruising range is reduced by approximately 5%

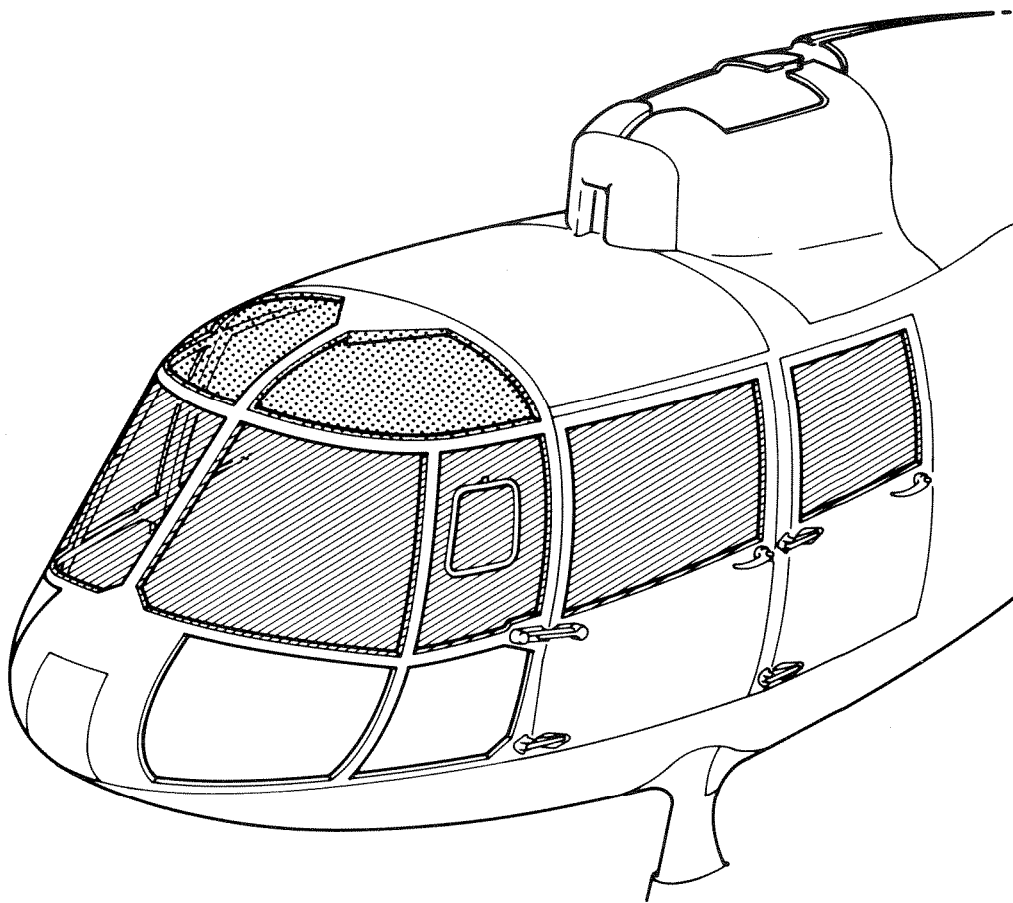
Weight increase : 21.0 kg — 46.3 lb.



TINTED PLEXIGLAS WINDOWS

In order to eliminate sunlight glare which can interfere with flying, and to improve passenger comfort, the canopy windscreens and upper side windows as well as the cabin forward and aft door windows may be replaced by green tinted plexiglas windows. (The overhead windows on the basic aircraft are tinted green as standard equipment).

To ensure unhindered nighttime visibility — particularly when landing in confined areas — the clear lower windows cannot be replaced by tinted windows.



INCOMPATIBILITY

The installation of the two tinted windscreens precludes the installation of heated windscreens.

Weight increase : None







HEATED WINDSCREENS

To preserve unhindered crew visibility under canopy icing or misting conditions, the two plexiglas windcreens may be replaced by heated windcreens.

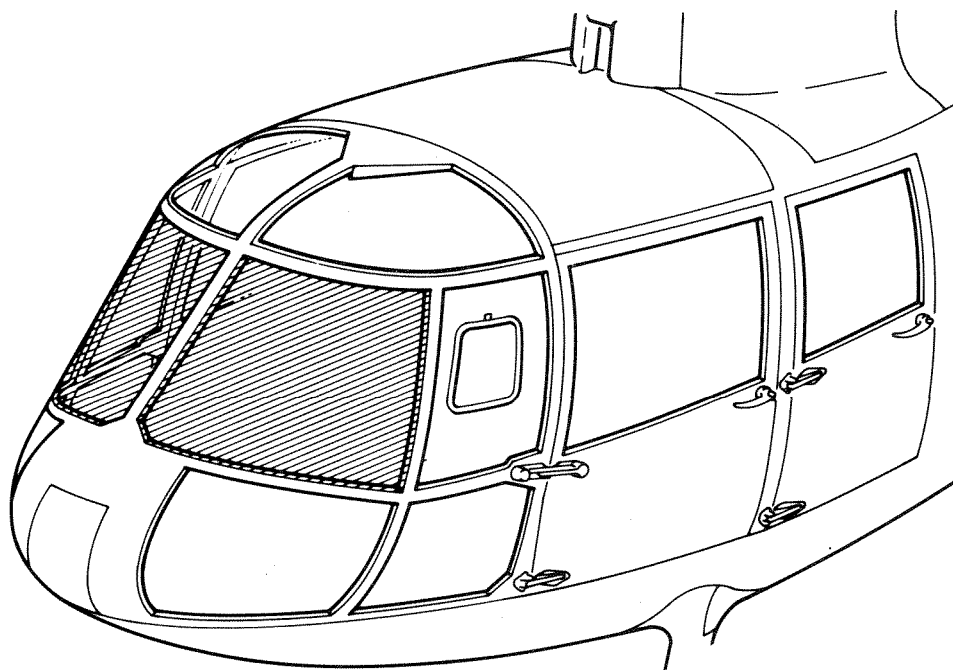
The installation comprises :

- 2 heated transparent panels
- 2 temperature regulators which control the electrical supply to the windcreens according to changes in outside air temperature
- a dual switch on the electrical control panel
- 2 warning lights on the failure warning panel

Each heated windscreen consists of two layered transparent panels specially treated to resist thermal shocks, bonded to either side of a central transparent plastic panel equipped with :

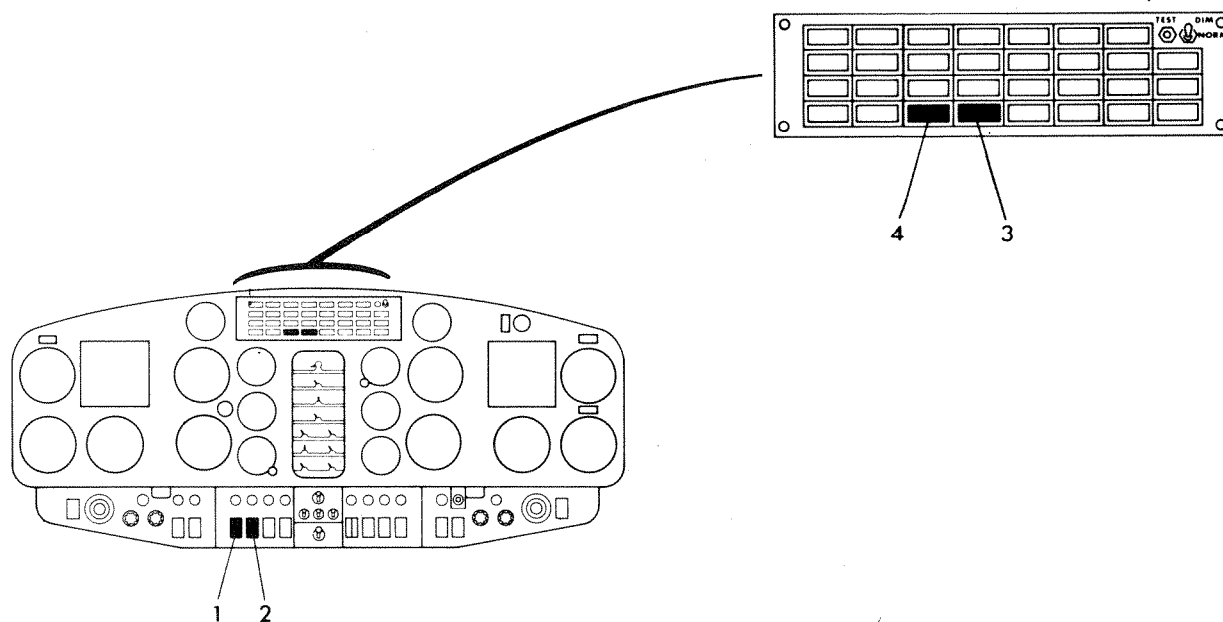
- a heating network
- 2 temperature sensors (one sensor is operative; the second stand-by sensor need only be connected to the regulator circuit for quick replacement of a damaged sensor).

The heating networks and temperature sensors consist of very fine electrical wire.



If heated windcreens are installed on the aircraft, the standard A.C. generating system must be replaced by a 4.5 kVA A.C. generating system (refer to the relevant optional equipment specification sheet).

CONTROLS AND INDICATORS



- 1 - Starboard heated windscreen switch (pilot's windscreen)
- 2 - Port heated windscreen switch
- 3 - Temperature sensor or regulator failure warning light - st'b'd windscreen
- 4 - Temperature sensor or regulator failure warning light - port windscreen

INCOMPATIBILITY

The installation of heated windscreens precludes the installation of tinted windscreens

Weight increase : 19.0 kg -- 41.8 lb.



A.C. GENERATING SYSTEM 4.5 kVA, 115/200 Volts, 400 Hz

The standard 0.5 kVA A.C. generating system may be replaced by a 4.5 kVA A.C. supply for certain equipment items (e. g. heated windscreens). The optional A.C. generating system comprises :

- a 115/200 V - 400 Hz generating system, including :
 - an engine-driven 2-phase 4.5 kVA alternator,
 - an alternator switch with a reset pushbutton in case the protective circuitry is triggered,
 - an A.C. supply failure warning light.
- a 26 V - 400 Hz supply consisting of :
 - a transformer fed from one phase of the 2-phase supply, with an output power rating of 100 VA.

The power supply system is protected against under- and over- frequencies, under- and over- voltages and short-circuits.

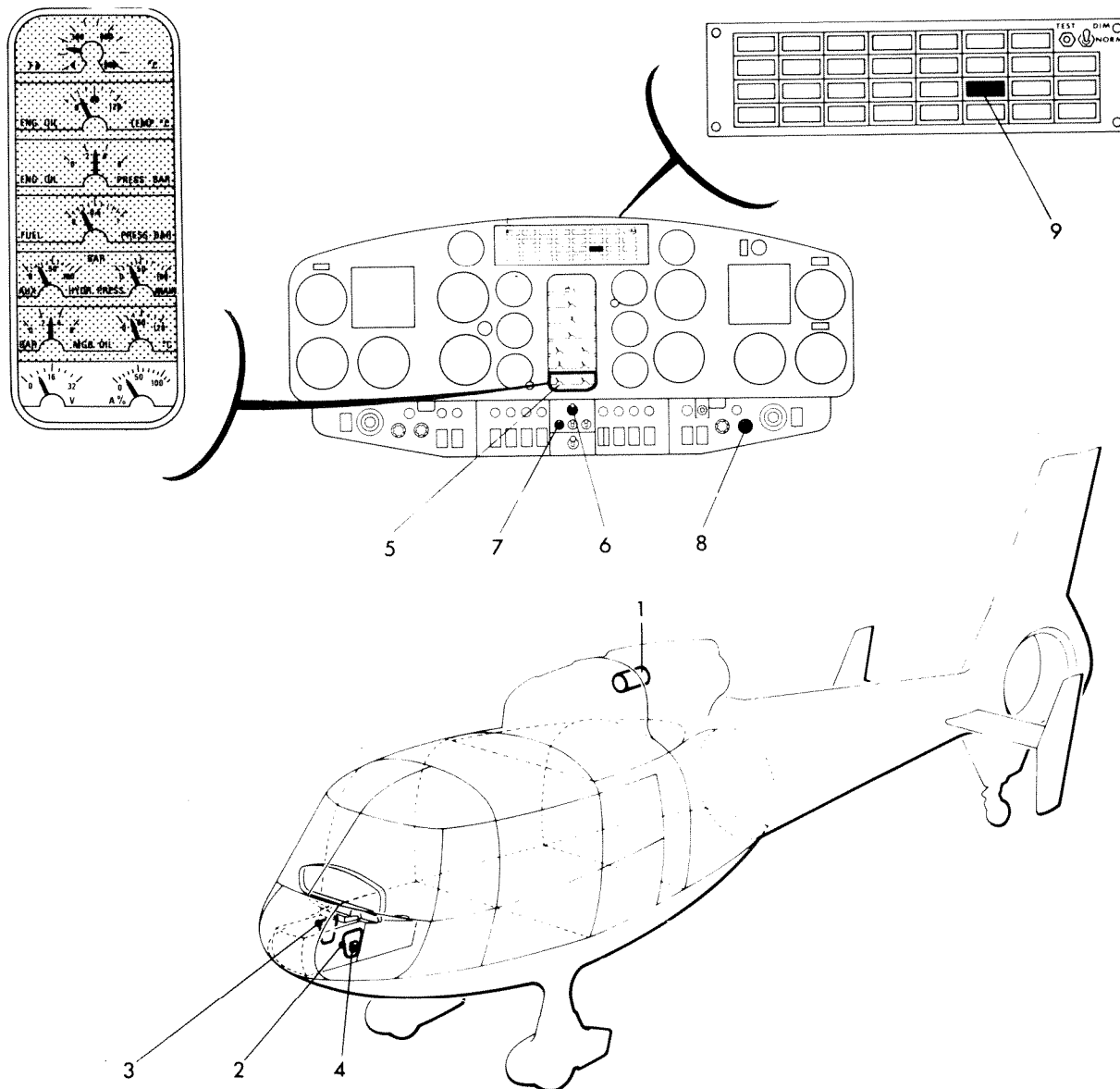
This alternator is installed in place of the standard unit mounted on the basic aircraft version.



OPTIONAL EQUIPMENT TECHNICAL SPECIFICATION

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CONTROLS AND INDICATORS



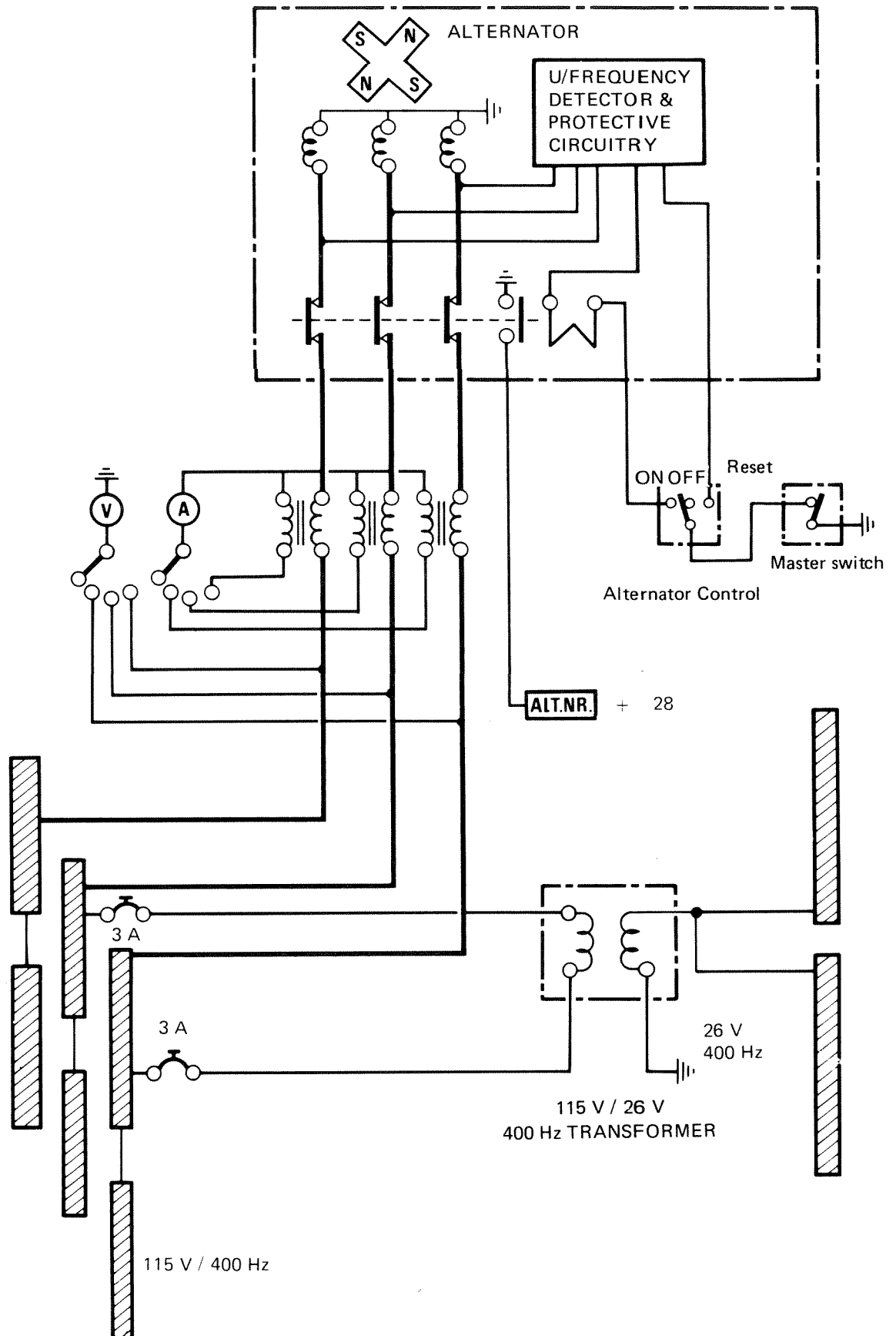
- 1 - Alternator
- 2 - Port distribution panel
- 3 - Starboard distribution panel
- 4 - Step-down transformer 200 V → 26 V
- 5 - Voltmeter and ammeter
- 6 - Electrical Master Switch (emergency cut-off)
- 7 - Alternator switch
- 8 - Voltmeter/ammeter selector
- 9 - A.C. power supply failure warning light

Weight increase : 7,0 kg - 15.4 lb

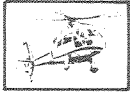


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A.C. GENERATING SYSTEM BLOCK DIAGRAM







SKID-TYPE LANDING GEAR

Replacement of standard tricycle landing gear main legs by skid-type landing gear allows landing on restricted surfaces.

This equipment consists of :

- 2 cross-members (front and rear) attached to the lower fuselage structure by means of 2 bearings each, and shaped to form 4 landing gear struts.
- 2 steel tubes, bent upwards at front and rear ends to form the skids, are bolted to the struts.
- 2 dampers mounted on the forward struts.
- 4 removable fairings covering the landing gear struts.
- 2 steps.
- A modification to the position of the fuel filler neck.

As a supplement to airborne equipment,

- 2 slip-on handling wheels.
- 1 jack handle.

Are supplied with the skid-type landing gear assembly.

The standard landing gear tail wheel is retained

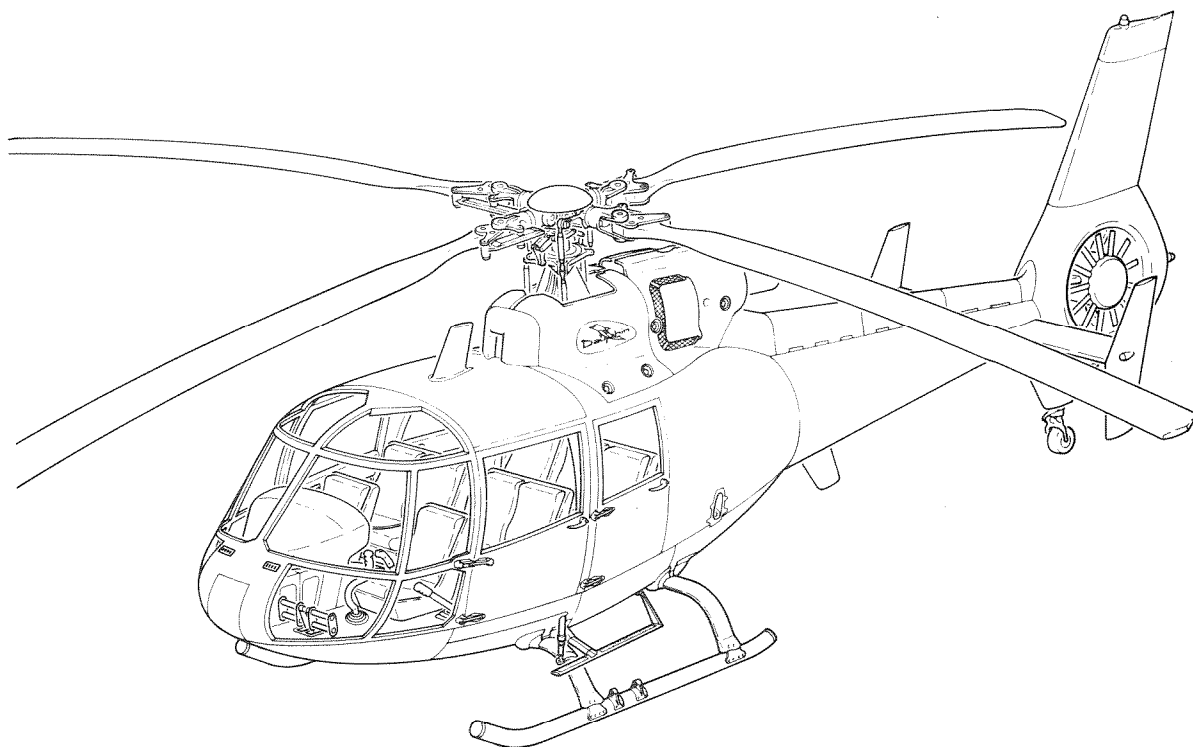
It protects the tail unit in the event of impact, during a pronounced nose-up landing, and facilitates helicopter handling when landing gear is fitted with drag-shoe handling wheels. These wheels are mounted on the skids, between the landing gear struts.



OPTIONAL EQUIPMENT TECHNICAL SPECIFICATION

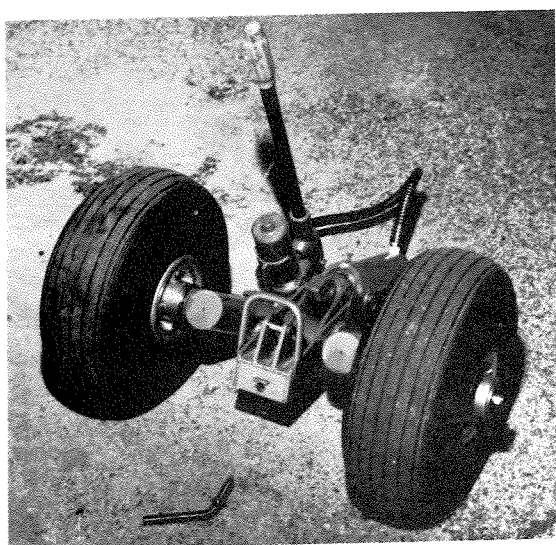
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FAIRED SKID-TYPE LANDING GEAR



HANDLING WHEELS

INSTALLED



TWIN WHEELS



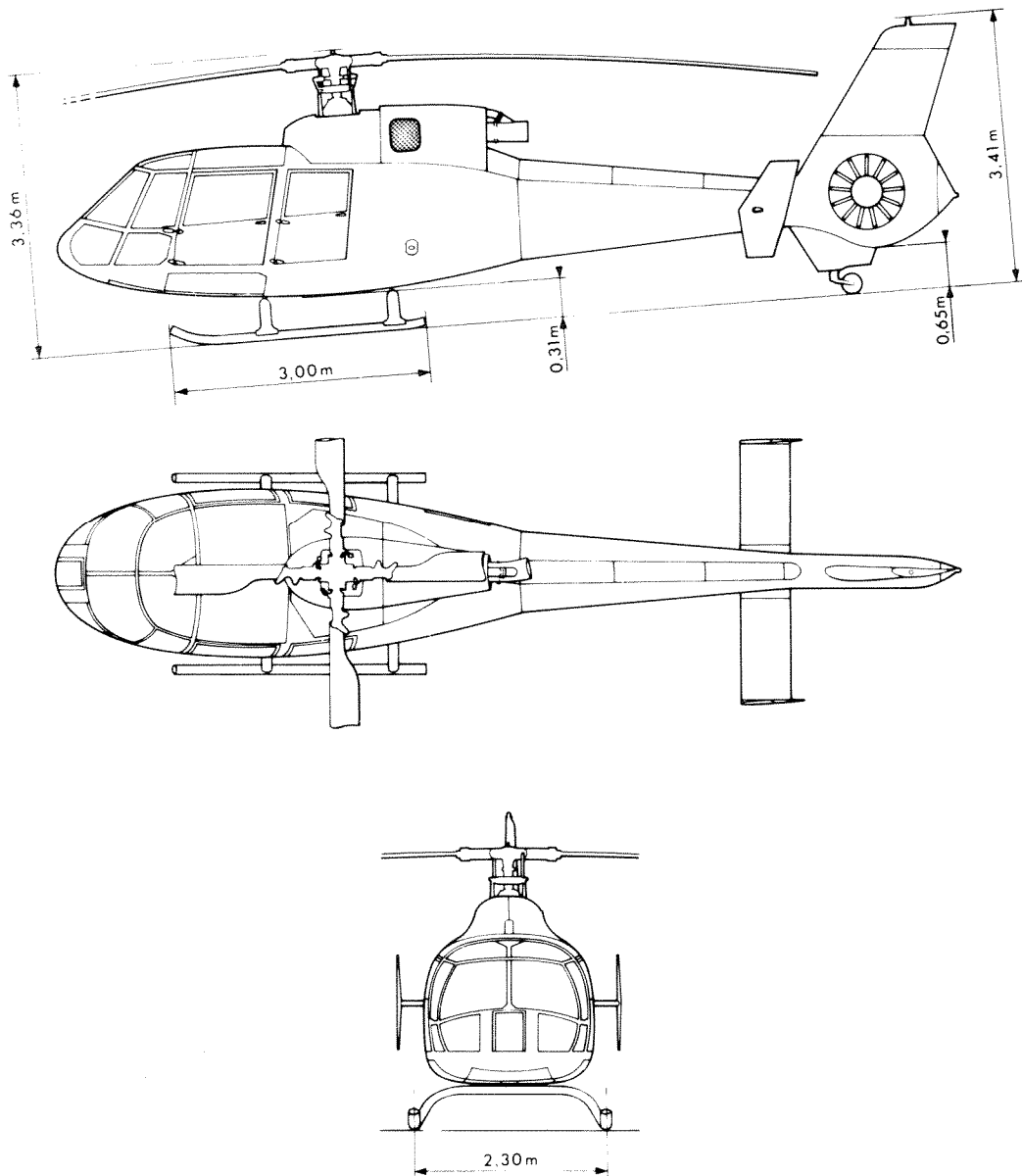
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Overall dimensions and ground clearance of a DAUPHIN fitted with skid-type landing gear are given below :

PERFORMANCE RESTRICTIONS

Installation of skid-type landing gear has no appreciable effect on level flight cruising speeds or range.



Additional weight : 15.0 kg 33.0 lb.





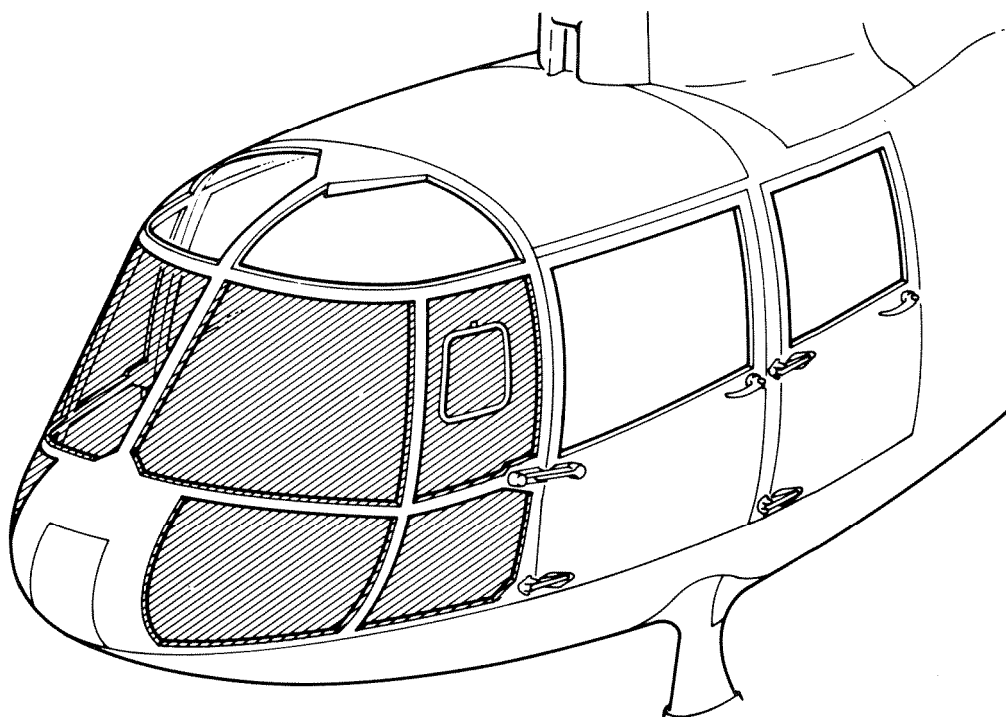
AMBER SCREENS FOR INSTRUMENT FLIGHT TRAINING

Amber screens may be mounted inside the cabin for daytime instrument flight training.
The blind-flying assembly comprises :

- 8 amber screen panels secured to the canopy
- a pair of special tinted glasses.

The screens are clipped to the transparent panels by means of quater-turn fasteners and press studs.

The screens are designed for quick installation and removal.



Weight increase : 6.0 kg – 13.2 lb.







PROVISOIRE

AUTOMATIC FLIGHT CONTROL SYSTEM

Extended instrument flying and perfect stability in flight for an unlimited period, even without pilot intervention on the flying controls (i.e. «hands-off» flight) are possible after installation of a SFIM 145 automatic pilot system.

This two-channel automatic flight control system provides :

- Stability and control in pitch and roll channels (attitude stabilization)
- Heading hold, by the roll channel in cruising flight (according to speed)
- Airspeed hold.

If outside forces act on the helicopter, the attitude and heading return to their initial values in an extremely short time, with excellent damping conditions.

The A.F.C.S. thus enables the pilot to release the flying controls (sticks and pedals) to read a map, to check VOR or ADF bearing, or to engage radio procedures in controlled areas, without modification of the pitch, roll and heading attitudes.

The A.F.C.S. is a fly-through system, which means that it offers no resistance to pilot-initiated override maneuvers.

It ensures control on both the roll and pitch channels by actuating the appropriate flying controls. The channels are completely independent and may be engaged separately.

The installation includes :

- 1 computer containing plug-in electronic circuit boards
- 1 control unit including :
 - 1 A.F.C.S. engage push-button
 - 2 channel engage switches
 - 1 «altitude hold» and «speed hold» function engage switch
- 2 motor-driven automatic trim mechanisms (pitch and roll) to maintain datum attitudes without restabilization in the event of significant flight parameter variations (power, speed, configuration). Installation of the trim provision entails deletion of the cyclic stick friction lock.
- 1 Airspeed sensor with electric signal output.

The installation is completed by a number of A.F.C.S. -related standard equipment items :

- 3 electric controls located on the cyclic pitch stick grip.
 - 1 A.F.C.S. release switch
 - 1 magnetic brake release switch
 - 1 four-position trim push-button.





OPTIONAL EQUIPMENT TECHNICAL SPECIFICATION

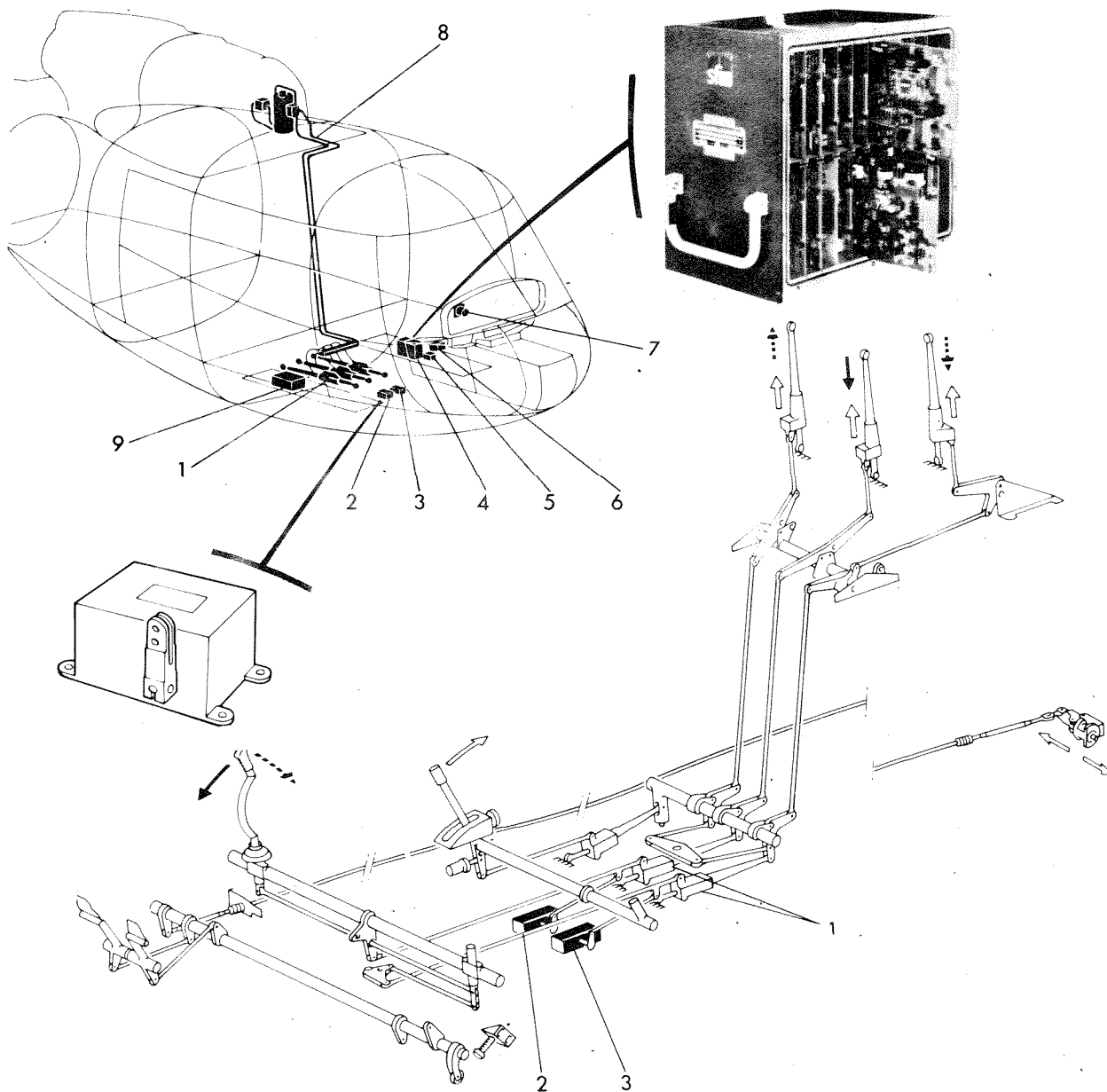
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- 1 gyro horizon installed on the instrument panel, providing attitude data about the pitch and roll axes.
- 1 gyromagnetic compass which transmits heading data to the R.M.I.
- 2 auxiliary servo-controls, installed in the flying controls rack, which receive electric signals from the A.F.C.S.

These servo-controls are supplied by the L.H. hydraulic system. If the system pressure falls below a pre-set limit, a low-pressure light illuminates on the central warning panel.

- Power supply : 28 V dc, and single-phase 115 V / 400 Hz ac (20 VA).

A.F.C.S. INSTALLATION DIAGRAM



- 1 - Auxiliary servo-control with electric signal input
- 2 - Pitch trim
- 3 - Roll trim
- 4 - AFCS computer
- 5 - Airspeed sensor

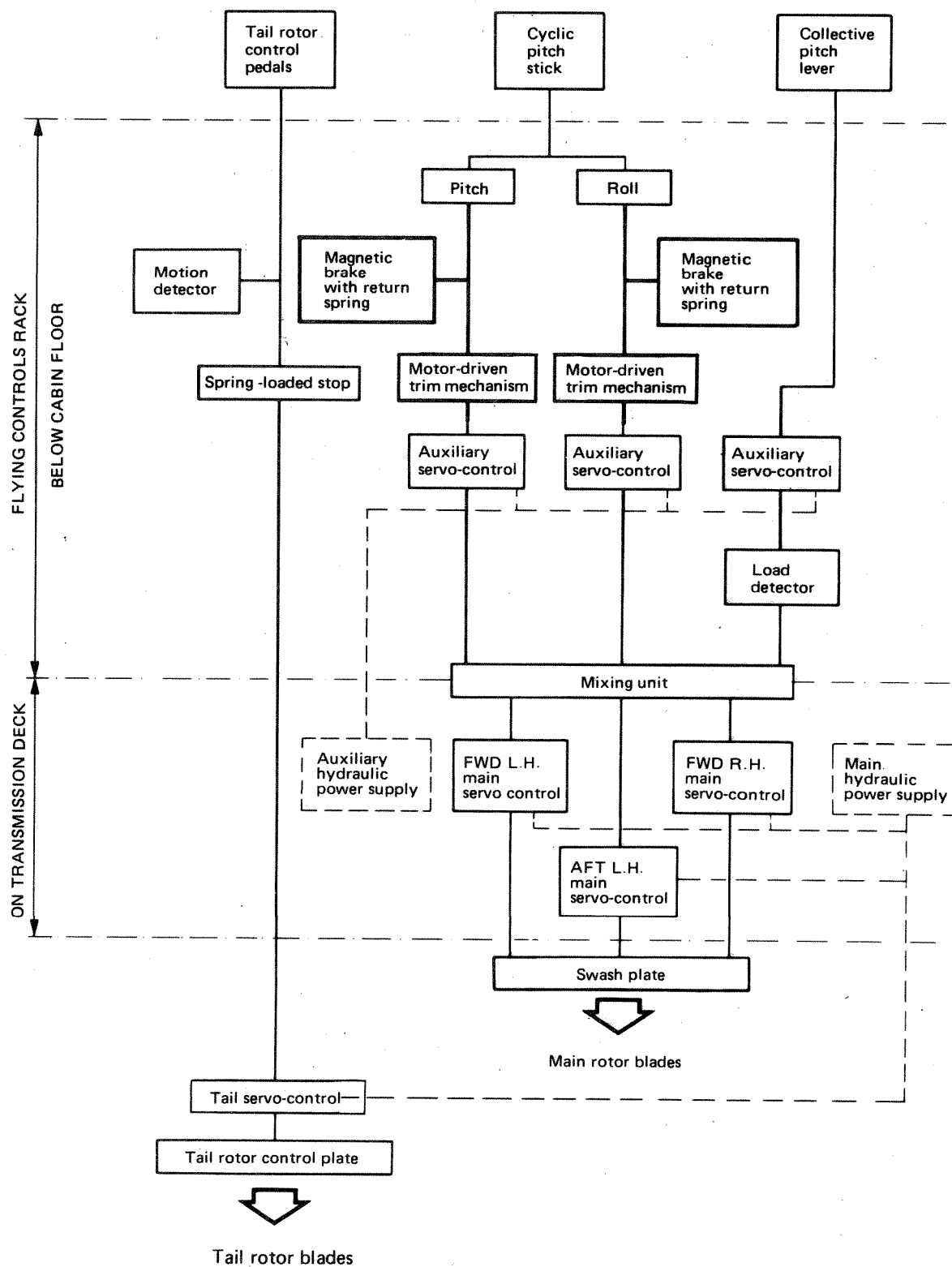
- 6 - AFCS control unit
- 7 - Gyro horizon
- 8 - Auxiliary hydraulic system
- 9 - Gyromagnetic compass



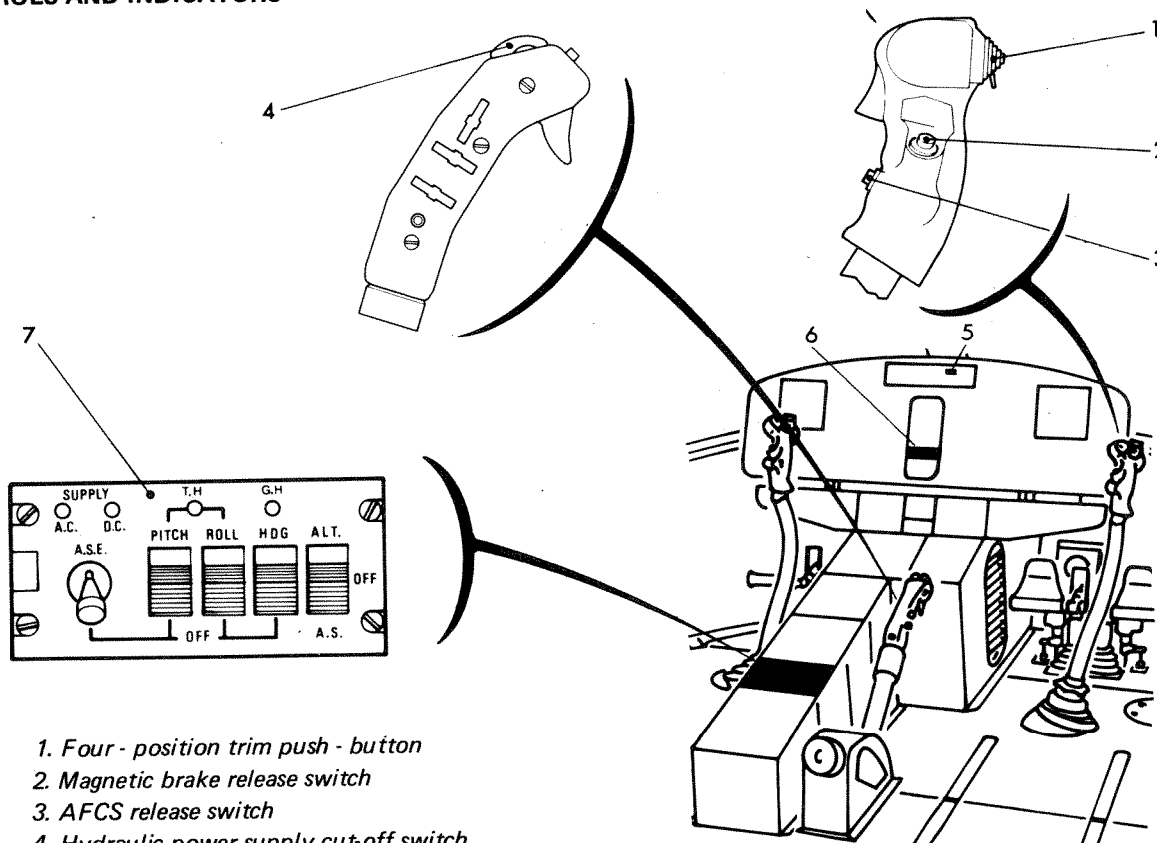
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BLOCK DIAGRAM OF FLYING CONTROLS COMPLETE WITH A.F.C.S.



CONTROLS AND INDICATORS



1. Four - position trim push - button
2. Magnetic brake release switch
3. AFCS release switch
4. Hydraulic power supply cut-off switch
5. Auxiliary hydraulic system low-pressure warning light
6. Dual hydraulic pressure indicator
7. AFCS control unit.

If operational conditions require minor heading or attitude changes (operation of rescue hoist, transport of sling loads, etc...) The pilot moves the controls slightly against auto-pilot action and releases them as soon as the required correction is obtained. The A.F.C.S. stabilizes the aircraft in this new position.

If operational conditions require major rapid maneuvering (initiating forward flight...) the pilot disables auto-pilot action by depressing the release button, located on the cyclic stick, at the beginning of the maneuver.

During the maneuver the A.F.C.S. maintains its damping role.

As soon as the aircraft is stabilized, the pilot releases the button to reengage the auto-pilot action. The A.F.C.S. maintains the aircraft in this new attitude.

Installation of the A.F.C.S. does not affect the maneuverability or handling of the aircraft and does not impose any operational limits.

In the event of A.F.C.S. failure, the aircraft may be controlled manually.

Additional weight : 15.0 kg 33.0 lb.



EMERGENCY FLOTATION GEAR

The emergency flotation gear installation provides sufficient aircraft buoyancy in case of ditching to allow for the evacuation of the pilot and passengers as well as helicopter salvage.

This equipment complies with civil aviation standards on ditching (maintaining the aircraft afloat for at least 30 minutes in high sea, with the cabin floor at the waterline ± 5 cm for a gross weight of 2900 kg).

The installation comprises :

- 2 containers, on either side of the aircraft, secured by four mounting brackets to the lower structure (on aircraft with tricycle landing gear) or to the undercarriage struts (on aircraft with skid-type landing gear). Each container accommodates a float divided into 6 compartments, which is protected and held folded by canvas sheets attached to the container and interlaced with snap-wire.
- 4 nitrogen cylinders, one pair per container, provided to inflate the floats. Each cylinder is fitted with an electrically-actuated percussion head which includes :
 - 1 pressure gauge externally visible for monitoring the cylinder charge
 - 1 capsule containing two separate high-speed fuse plugs, supplied via fully independent electrical circuits : the fusion of a single plug is sufficient to operate the head.
 - The cylinders must be removed for refilling.
 - The filler orifice is designed for connection to a test rig.
- A single control common to the 4 cylinders.

Each float, connected to two inflation cylinders, constitutes an independent unit. Each float compartment (RH or LH) is provided with an inflation port complete with a non-return valve on the supply line, a manual inflation connector and a relief valve. Each compartment is capable of withstanding rated pressure when the adjoining compartment is deflated.

A structural doubler, with a non-slip covering on its upper face, facilitates cabin access.

CONTROL & INDICATING

The flotation gear control unit mounted on the interseat console, includes :

- 1 system ON/OFF («MARCHE - ARRET») switch
- 1 twin-contact squib-firing pushbutton protected by a breakable cap.

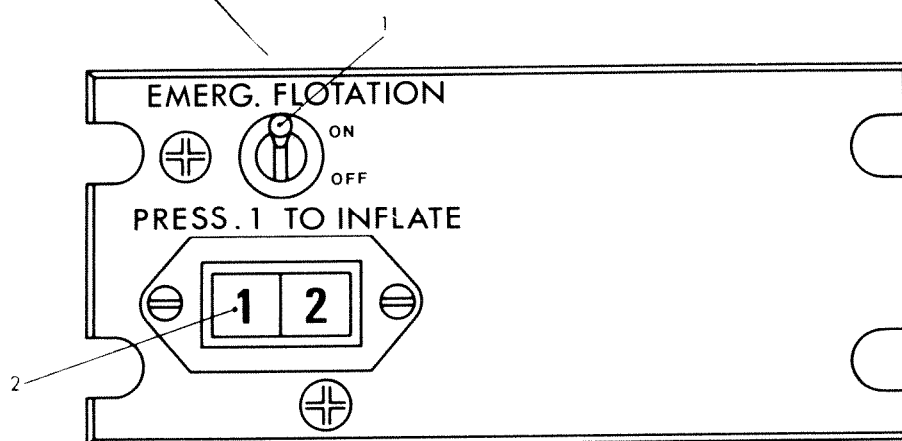
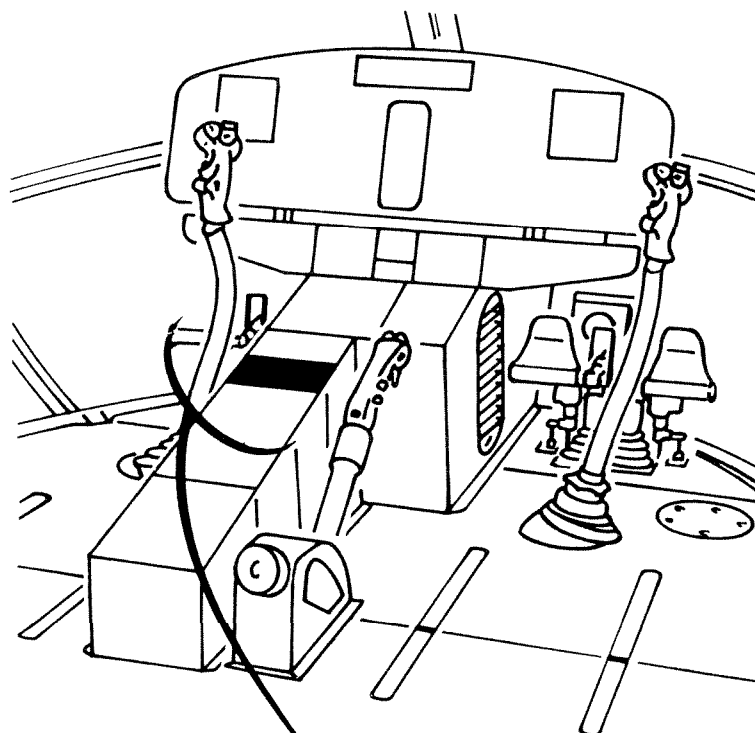




OPTIONAL EQUIPMENT TECHNICAL SPECIFICATION

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- An electrical continuity test provision for all circuit electrical connectors, wired to a double indicator lamp in the firing button
- Unit faceplate lighting is provided by two independent circuits connected to the aircraft lighting circuit.



1. ON/OFF switch
2. Firing push button



Float inflation, when initiated by the pilot or copilot, requires from 0.5 to 2 seconds maximum at sea level in standard atmosphere after the squibs are fired. During inflation, the snap-wire retaining the float covers is broken and the floats are released.

In the event of accidental inflation in flight, the aircraft may be landed on runway or hard ground without damaging the floats, which are positioned slightly above ground level when the aircraft is supported on its landing gear.

Emergency flotation gear may be installed without jacking up the helicopter, after removal of the footrests and landing gear fairings.

The emergency flotation gear installation comprises the following items :

- Mounting provisions
 - structural reinforcements
 - mounting brackets.
 - Fixed components

| | | |
|--|---|--|
| <ul style="list-style-type: none"> ● mounting brackets on fuselage or undercarriage ● electrical circuit | } | <div style="display: inline-block; text-align: center;">①</div> 8.0 kg 17.6 lb <div style="display: inline-block; text-align: center;">②</div> |
|--|---|--|
 - Removable components

| | | |
|---|---|---|
| <ul style="list-style-type: none"> ● containers ● float bracket ● floats ● inflation cylinders and lines ● electrical circuit ● control unit. | } | <div style="display: inline-block; text-align: center;">①</div> 158.0 kg 348.3 lb <div style="display: inline-block; text-align: center;">②</div> |
|---|---|---|
- ① aircraft with tricycle landing gear (standard)
 ② aircraft with skid landing gear (under development)

PERFORMANCE RESTRICTIONS

The installation reduces cruising speed by :

- 3 % with floats stowed,
- 7 % with floats unfolded and inflated.



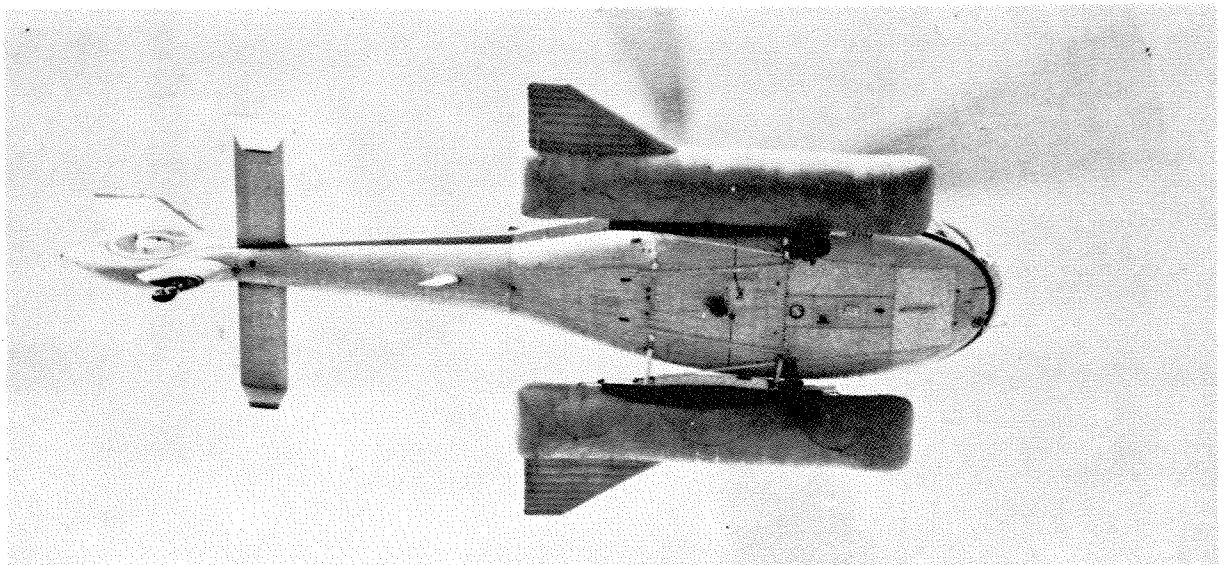
EMERGENCY FLOTATION GEAR STOWED

EMERGENCY FLOTATION GEAR INFLATED

ON THE GROUND
(aircraft supported by)
landing gear wheels)



IN FLIGHT



Additional weight : 174.0 kg 374.7 lb.



SAND FILTER

The dynamic sand filter is designed to protect the turboshaft engine in sand-laden air, thus preventing premature wear of compressor blades.

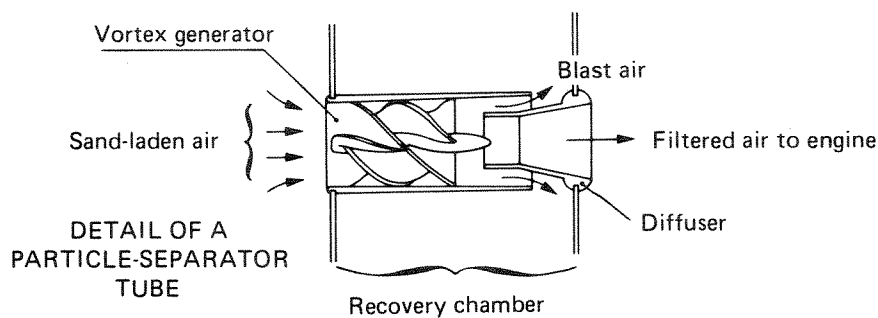
The dynamic sand filter installation comprises :

- A filter consisting of two shells secured by two clamps to the engine air intakes.

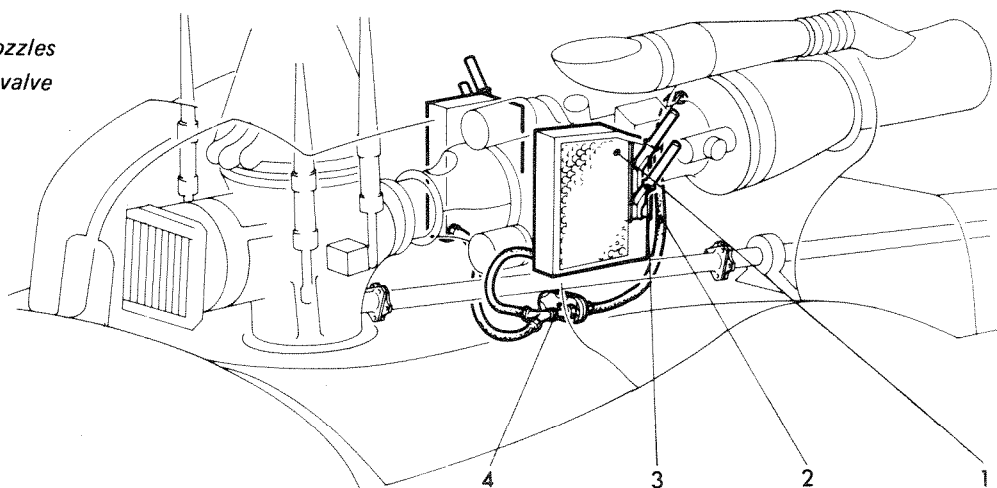
Each filter shell contains :

- A filter unit comprising particle-separator tubes and vortex generators aligned parallel to the engine centreline.
 - A duct directing the filtered air to the engine air intake
 - A sand-laden air exhaust duct.
 - Four induction nozzles, fed from P2 compressor bleed air, which generate the airstream to blast sand from the exhaust duct.
- A pressurized P2 air supply system controlled by a motorized valve.
 - An electrical control and indicating circuit.

SAND FILTER INSTALLATION DIAGRAM



- 1 - Filter
- 2 - P2 line
- 3 - Exhaust nozzles
- 4 - Motorized valve



The system is switched on by the pilot during take-off or landing under sandy conditions.

Outside air is drawn into the filter through the separator tubes in which it is spun along a spiral vortex generator.

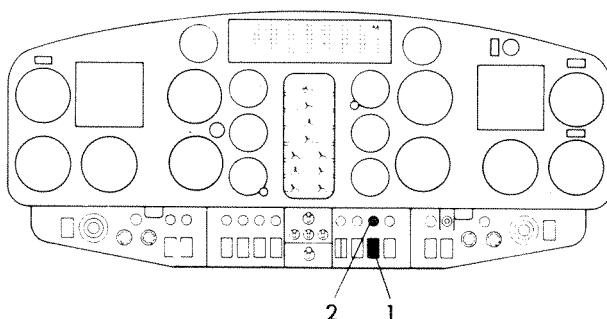
Centrifugal force drives the sand against the walls of the separator tube where it is exhausted through nozzles under P2 pressure. The filtered air is ducted to the engine air intakes.

CONTROL AND INDICATOR

Sand filter control and indicating provisions include :

- A «SAND FILT» switch on the electrical control panel, which controls the position of the P2 supply motorized valve.
- An indicator lamp located above the switch, which illuminates when the motorized valve is fully open.

The lamp may be tested by means of the TEST pushbutton on the failure warning panel.



- 1. switch
- 2. indicator lamps

A limit switch cuts off power to the P2 valve motor when the valve reaches fully open or fully closed position.

The sand filter installation includes two sub-assemblies :

- Fixed components 4 kg 8.8 lb.
 - P2 supply line
 - Electrical circuits
- Removable components 11 kg 24.2 lb.
 - Mounting clamps
 - Filter units

EFFECTS ON AIRCRAFT PERFORMANCE

- Take-off : Restricted maximum take-off weight
Refer to curves in «Performance» chapter of Flight Manual
- Hover flight : Fuel consumption increased by approx. 3.5 kg/h.
- Cruising flight : No effect

INCOMPATIBILITY

The anti-icing shields mounted as standard equipment on the engine air intakes must be removed to permit installation of the sand filters.

Weight increase : 15 kg — 33.0 lb.