

AgustaWestland AW109

for Flight Simulator X



Operations Manual

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I. GENERAL

1. Overview

The A109E is a high-speed, high-performance, multi-purpose helicopter powered by two Pratt & Whitney Canada PW206C engines, with a four-bladed fully articulated main rotor system, two-bladed tail rotor and a retractable tricycle-type landing gear.

The airframe consists of two major assemblies: the forward fuselage and the aft fuselage (tail boom).

The forward fuselage comprises of the nose section, the cabin and the rear section. The nose section includes an upper compartment for the electrical and electronic equipment, and a lower compartment which accommodates the hydraulic system accumulators, the nose landing gear and the other hydraulic components.

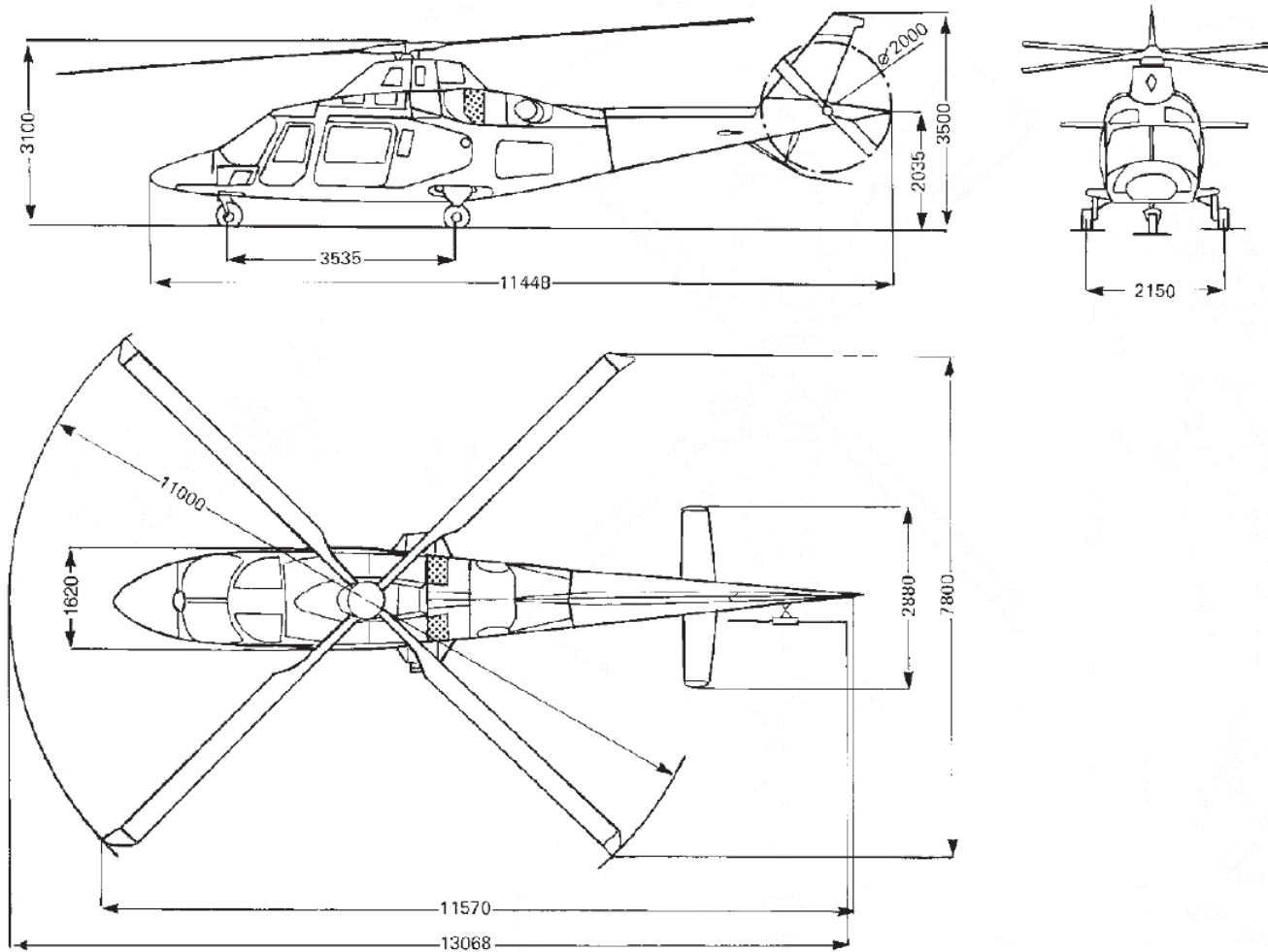
The cabin includes the crew compartment (cockpit) and the passenger compartment. Seating is provided for the pilot (right side) and a passenger (or copilot) on the left side in the cockpit, and up to six passengers in the relevant rear compartment. The rear section accommodates the fuel tanks, the main landing gear compartments, the baggage compartment and the electrical and electronic equipment compartment.

The upper deck, located above and aft of the cabin area, accommodates the hydraulic system reservoirs and filter groups, the main transmission, oil coolers and engines.

The tail boom is bolted to the forward fuselage and supports the tail rotor and the relevant drive system. The tail boom includes elevators, vertical upper and lower fins, tail skid and the tail cone.

2. Dimensions and performance

Crew:	1 (2) pilot
Capacity:	4-7 passengers
Length:	13.1 m / 42.88 ft
Height:	3.5 m / 11.48 ft
Width:	7.8 m / 25.59 ft
Empty weight:	1569 kg / 3.461 lb
Max takeoff weight:	2849 kg / 6.283 lb
Max airspeed:	285 km/h / 154 knots
Range:	964 km / 521 nm
Service ceiling:	5974 m / 19.600 feet
Powerplant:	Pratt & Whitney Canada PW206C engines 567 hp

Dimensions overview

II. SYSTEM DESCRIPTIONS

1. Power plant

The A109E is powered by two Pratt & Whitney Canada PW206C engines. The PW206C engine is a lightweight, free turbine, turboshaft engine incorporating a single-stage centrifugal compressor driven by a single stage compressor turbine. Metered fuel is sprayed into the reservoir flow annular combustion chamber through twelve (12) individual fuel nozzles mounted around the gas generator case. A single channel, Fully Authority Digital Electronic Control (FADEC) with a mechanical backup (FMM "FUEL MANAGEMENT MODULE") ensures accurate control of the engine output speed and fast response changes in power demand.

The PW206C consists of two modules:

- Turbomachinery module
- Reduction gearbox module

The turbomachinery module comprises the cold section and the hot section, while the reduction gearbox provides to reduce power turbine speed to one suitable for rotorcraft transmission operation. The engine oil system is subdivided into two independent circuits, each connected to the respective engine.

The engine oil system is of the dry-sump type and is supplied from an engine internal tank (one for each engine). Lubrication of different engine components is assured by a pump assembly, composed of a pressure pump and two scavenge pumps, driven by the accessory gearbox, and a pressure circuit filter. An electrical signal supplies by no.1 or no.2 FADEC to DAU which sends signal to EDU1 that displays #1 OIL PRES and #2 OIL PRES caution legends. Two magnetic chip detectors, one located in the bottom of the accessory gearbox, the other in the scavenge pumps outlet, are electrically connected with EEC and DAU which sends signal to EDU1 that displays #1 OIL CHIPS and #2 OIL CHIPS caution legends.

The operation of the oil system is fully automatic and therefore no action is required from the pilot except for monitoring the system through EDUs display.

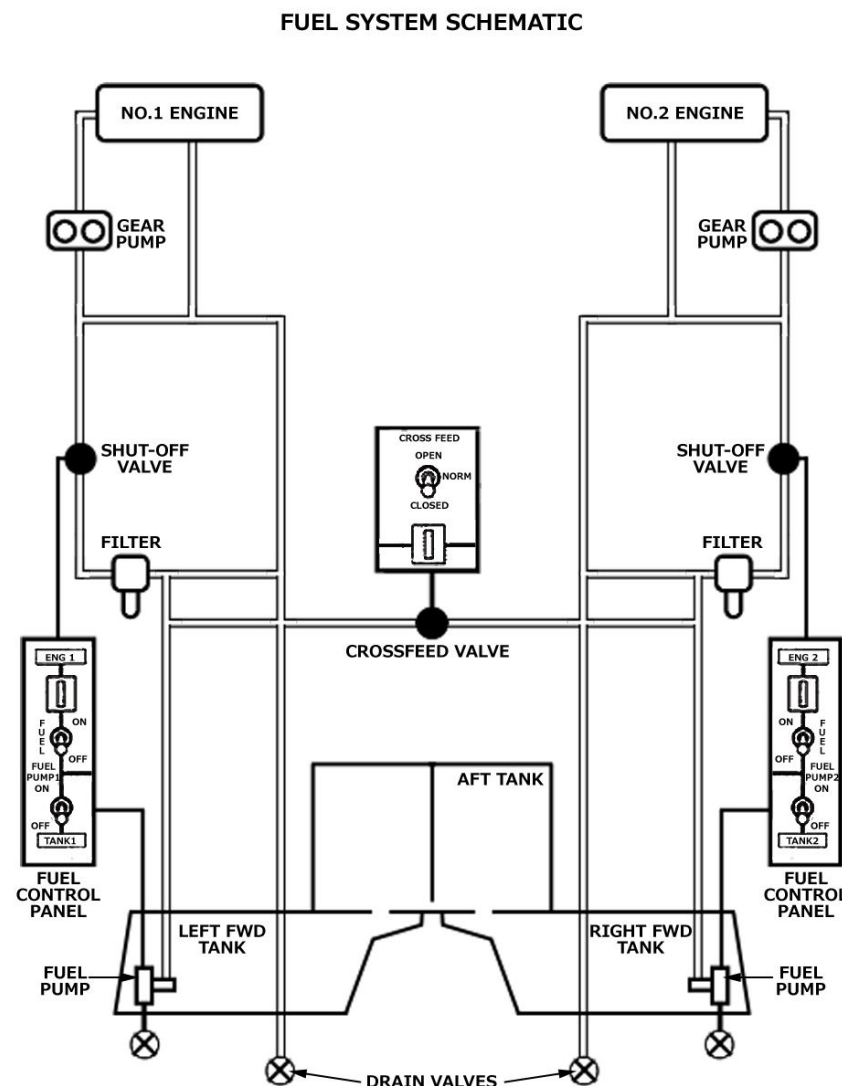
2. Fuel system

The fuel system (figure 7-9) consists of the following sub -systems:

- Storage system
- Distribution system
- Indication system

The storage system consists of two main tanks and one main rear tank. Each forward tank supplies fuel to the associated engine. The distribution system consists of two identical independent circuits, each connected to associated engine.

Each circuit comprises one fuel pump, a filter assembly, a shut off valve, a pressure transmitter and a differential pressure switch. A crossfeed valve allows the fuel to supply both engines from only one tank. The indicating system comprises the pressure indicating and fuel quantity indicating system and the fuel caution circuit.



3. Flight controls

The flight control systems provide the the correct control responses when the pilot makes control selections, giving him positive control of the attitude, speed and altitude of the helicopter. The A109E incorporates conventional helicopter flight controls: collective, cyclic and antitorque operated by cockpit controls: collective pitch lever, cyclic stick and tail rotor pedals. A mixing unit in the collective/cyclic control systems integrates the control inputs from both systems and provides a common output to the collective/cyclic actuators.

4. Hydraulic system

Two independent systems supply the power to operate the flight control system and are used to provide the hydraulic power for operation of the main rotor servo actuators (both systems) and the tail rotor servo actuator (no.1 system only). In addition the no.2 system is used to provide the hydraulic power to the utility hydraulic system, necessary for operation of the landing gear and brakes. The hydraulic power consists of the no.1, no.2 and utility subsystems.

The no.1 system system, which operates at a maximum pressure of 1550 psi, consists of a suction circuit, a pressure circuit, a return circuit and a bypass circuit. The hydraulic fluid is contained in the reservoir located on the right side of the cabin roof. The fluid is sucked by a pump, driven by main transmission, and is supplied to the servo actuators through the filter group and the accumulator. The system is controlled by the hydraulic control panel, located on the front console, operated by the pilot. A ground test fitting is provided, pressure monitoring circuit and a low pressure monitoring circuit. The no.1 system supplies the main rotor servo actuators and the tail rotor servo actuators.

The no.2 system is similar to no.1 system. It supplies the main rotor servo actuators and the utility hydraulic system.

The utility system receives the power pressure from no.2 hydraulic system and supplies the pressure to operate the landing gear, wheel brakes, rotor brake and nose gear centering lock. There are two sources of pressure energy supplied by this system:

MAIN (NORMAL) to provide energy to operate landing gear actuators, landing gear uplocks, nose gear centering lock, wheel brakes (toe brakes) and wheel brakes (park selector).

EMERGENCY: to provide energy to operate landing gear uplocks (unlocks), landing gear actuators (lower and lock), wheel brakes (park selector operation) and nose gear centering lock.

5. Electrical system

The electrical system is powered by single wire circuit with common ground return through the helicopter structure.

The helicopter power supplies are:

- 28 V dc
- 115 V ac 400 hz single phase
- 26 V ac 400 Hz single phase

Two generators, a battery and, for ground handling, an external power receptacle, are the dc power main sources. Two static inverters, powered by dc voltage, are the ac sources. Both dc and ac powers are distributed through a bus bar system and operated by control switches located on the overhead console. The electrical system is interfaced with the IDS for voltage, current, advisory, caution and warning indications.

DC System

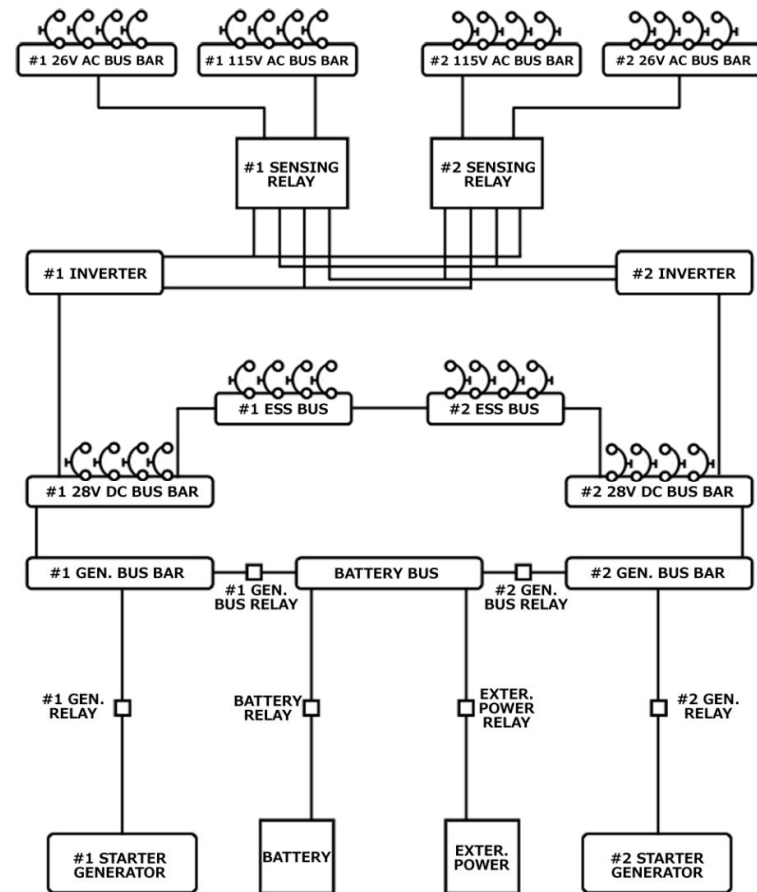
The dc electrical system is a 28 V direct current single conductor system, using the helicopter structure as a negative ground. The main components of the systems are two starter generators, two dc control boxes, battery, external power receptacle and one dc relay box.

The helicopter is equipped with a 24 V, 27 or 22 Ah or with a 25.2 V, 28 Ah nickel-cadmium battery located in the nose compartment. A temperature switch, inside of the battery and connected to the IDS, detects the internal temperature of the battery, giving a BATT HOT warning message on the EDU 1 in case of battery overtemperature.

The helicopter is provided with an external power receptacle on the rear right side of the fuselage. A microswitch, activated by the receptacle door, gives the EXT PWR ON advisory message on the EDU 1 when the door is in the open condition.

Two starter-generators, installed each on the proper engine reduction gear-box, provide engine start when operated as an electric starter motor; after the engine start, the started generator,

driven by the engine, reverts into a dc generator providing the necessary 28 V dc power.



ELECTRICAL POWER SYSTEM SCHEMATIC

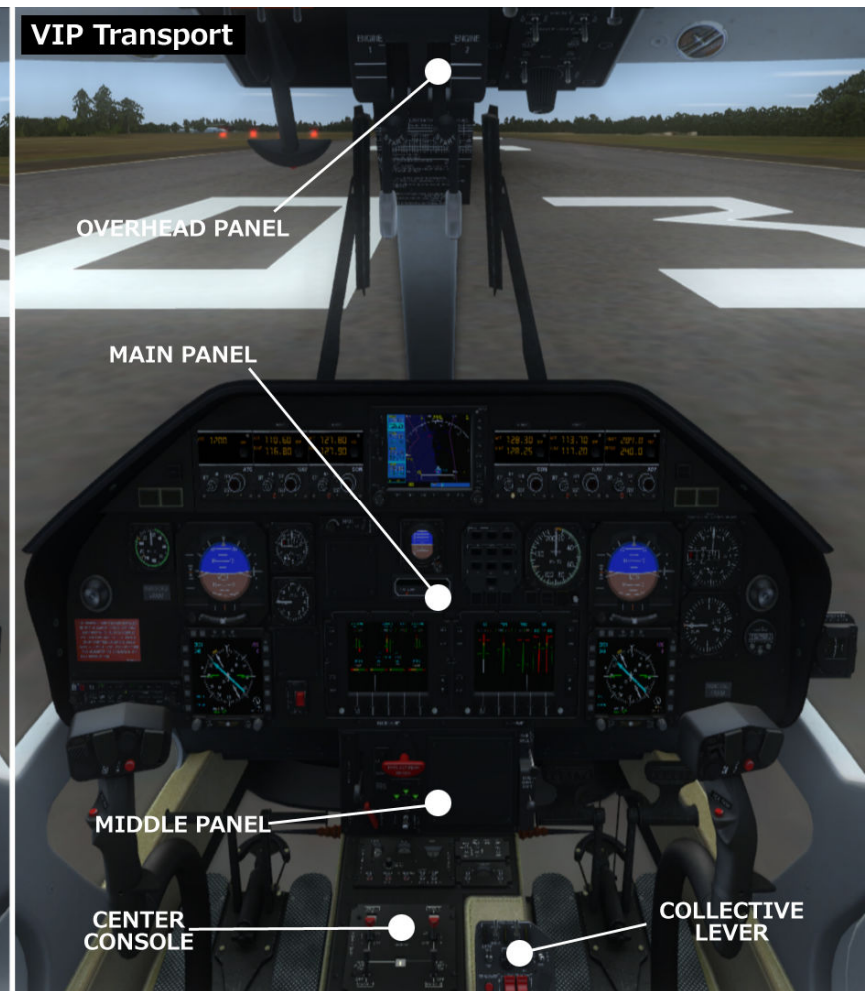
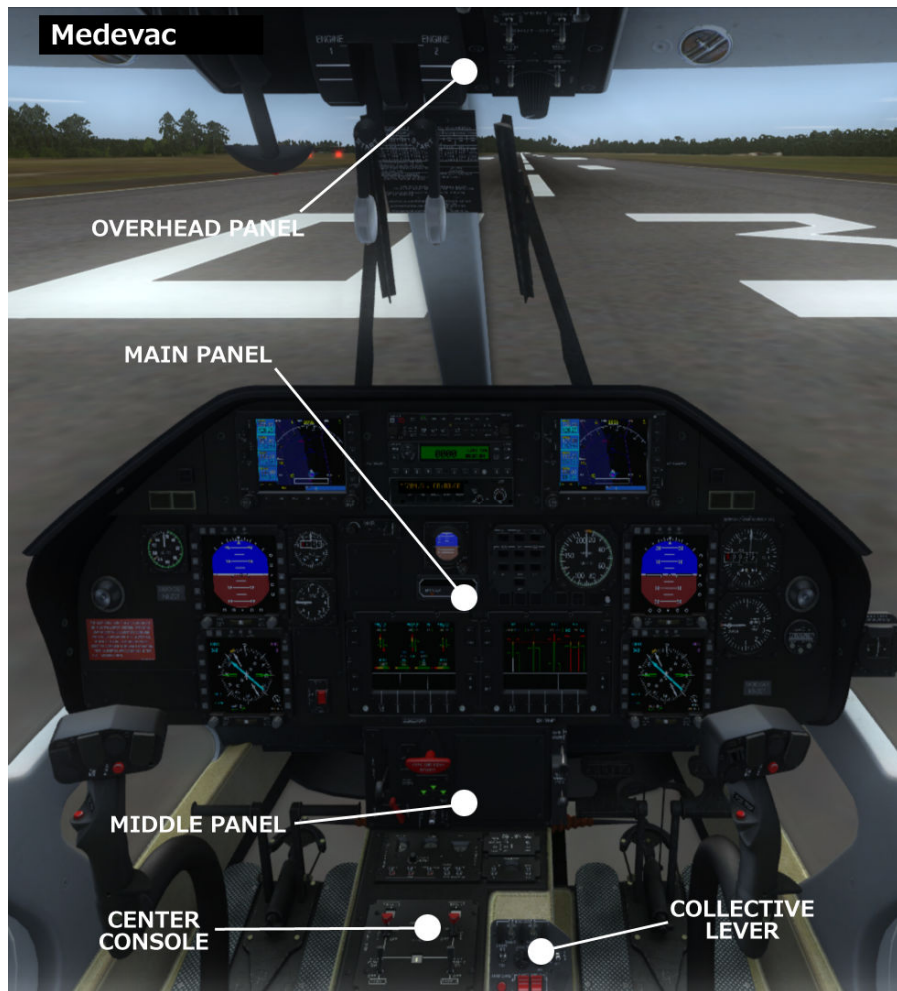
AC system

The alternate power is supplied by two 250 VA single phase static inverters via two sensor relays. The inverters require 28 V dc power input supplied by the dc main bus no.1, through the INV 1 circuit breaker and INV 1 ON/OFF switch, and the dc main bus no.2, through the INV 2 circuit breaker and INV 2 ON/OFF switch.

The circuit breakers and control switches are located on the overhead console. Each inverter supplies 115 V ac and 26 V ac to its own 115 V ac and 26 V ac distribution busses to which the helicopter ac loads are connected. In the event of an inverter failure, the relative sensing relay deenergizes, connecting the failed inverter busses to the other operating inverter.

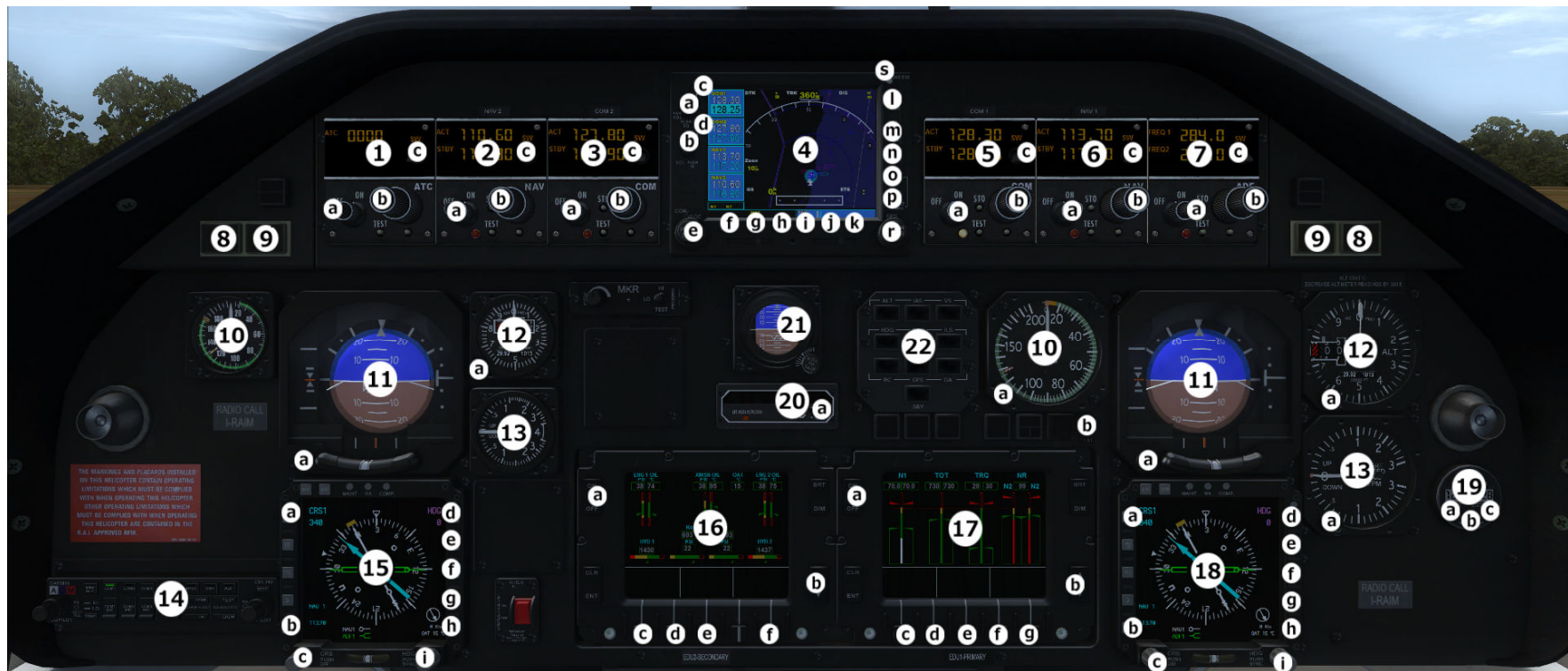
III. PANELS

Overview



1. MAIN PANEL

Medevac



1. Transponder radio

- a) ON/OFF knob
- b) Frequency adjust knobs
- c) Frequency swap

2. NAV 2 radio

- a) ON/OFF knob
- b) Frequency adjust knob
- c) Frequency swap

3. COM 2 radio

- a) ON/OFF knob

- c) Frequency swap

- b) Frequency adjust knobs

- c) Frequency swap

4. GPS

- a) COM frequency select for adjust
- b) NAV frequency select for adjust

- c) COM frequency swap button

- d) NAV frequency swap button
- e) Frequency adjust knobs (mouse wheel) and COM/NAV select (left click)

- f) NRST button

- g) OBS button
- h) MSG button
- i) FLP button
- j) TERR button
- k) PROC button
- l) RNG button
- m) DTO button
- n) MENU button
- o) CLR button
- p) ENTER button
- r) Group/page adjust knobs
(mouse wheel) and
CURSOR (left click)
- s) ON/OFF

5. COM 1 radio

- a) ON/OFF knob
- b) Frequency adjust knob
- c) Frequency swap

6. NAV 1 radio

- a) ON/OFF knob
- b) Frequency adjust knob
- c) Frequency swap

7. ADF radio

- a) ON/OFF knob

- b) Frequency adjust knob
- c) Frequency swap

8. MASTER CAUTION

Annunciator

9. MASTER WARNING

Annunciator

10. Airspeed

- a) IAS bug set
- b) IAS gauge test

11. Attitude

- a) Attitude cage button

12. Altimeter

- a) Altimeter reference
pressure adjust knob

13. Vertical speed

- a) VS bug set

14. Audio panel**15. HSI 2**

- a) Show MAP in ARC mode
- b) NAV bearing needle
source select

- c) Course adjust knob
- d) HSI/CDI needle source
select
- e) ARC/HSI mode
- f)-g) Zoom in/out
- h) ADF bearing needle
source select
- i) Heading bug adjust

16. EDU 1 display

- a) ON/OFF button
- b) Message scroll button
- c) MENU
- d) AUX mode
- e) MAIN mode
- f) TEST

17. EDU 2 display

- a) ON/OFF button
- b) Message scroll
- c) MENU
- d) START mode
- e) CRUISE mode
- f) OEI mode
- g) TEST

18. HSI 1

- a) Show MAP in ARC mode
- b) NAV bearing needle
source select
- c) Course adjust knob
- d) HSI/CDI needle source
select
- e) ARC/HSI mode
- f)-g) Zoom in/out
- h) ADF bearing needle
source select
- i) Heading bug adjust

19. Chronometer

- a) Stopwatch reset button
- b) Mode select button
- c) Start/stop button

20. DME

- a) Source select/OFF knob

21. Backup attitude**22. Autopilot**

VIP Transport**1. GPS**

- a) COM frequency select for adjust
- b) NAV frequency select for adjust
- c) COM frequency swap button
- d) NAV frequency swap button

- e) Frequency adjust knobs (mouse wheel) and COM/NAV select (left click)
- f) NRST button
- g) OBS button
- h) MSG button
- i) FLP button
- j) TERR button
- k) PROC button

- l) RNG button
- m) DTO button
- n) MENU button
- o) CLR button
- p) ENTER button
- r) Group/page adjust knobs (mouse wheel) and CURSOR (left click)
- s) ON/OFF

2. Audio panel**3. GARMIN GTX330**

- a) VFR (1200 preset)
- b) ON
- c) OFF
- d) Numeric keys
- e) Time mode select
- f) Frequency set cursor
- g) Start/stop for chrono mode
- h) Chrono reset

4. ADF radio

- a) ADF 1/2 frequency select
- b) ETE / flight time select
- c) Flight time reset
- d) ON/OFF knob
- e) Frequency adjust knobs

5. GPS

- a) COM frequency select for adjust
- b) NAV frequency select for adjust
- c) COM frequency swap button
- d) NAV frequency swap button
- e) Frequency adjust knobs (mouse wheel) and COM/NAV select (left click)
- f) NRST button
- g) OBS button
- h) MSG button
- i) FLP button
- j) TERR button
- k) PROC button
- l) RNG button
- m) DTO button

- n) MENU button
- o) CLR button
- p) ENTER button
- r) Group/page adjust knobs (mouse wheel) and CURSOR (left click)
- s) ON/OFF

6. MASTER CAUTION
Annunciator**7. MASTER WARNING**
Annunciator**8. Airspeed**

- a) IAS bug set
- b) IAS gauge test

9. Attitude indicator**10. HSI 2**

- a) Show MAP in ARC mode
- b) NAV bearing needle source select
- c) Course adjust knob
- d) HSI/CDI needle source select
- e) ARC/HSI mode
- f)-g) Zoom in/out
- h) ADF bearing needle source select

- i) Heading bug adjust

11. Altimeter

- a) Altimeter reference pressure adjust knob

12. Vertical speed**13. Backup attitude****14. DME**

- a) Source select knob

15. EDU 1 display

- a) ON/OFF button
- b) Message scroll button
- c) MENU
- d) AUX mode
- e) MAIN mode
- f) TEST

16. EDU 2 display

- a) ON/OFF button
- b) Message scroll
- c) MENU
- d) START mode
- e) CRUISE mode
- f) OEI mode
- g) TEST

17. HSI 1

- a) Show MAP in ARC mode
- b) NAV bearing needle source select
- c) Course adjust knob
- d) HSI/CDI needle source select
- e) ARC/HSI mode
- f)-g) Zoom in/out
- h) ADF bearing needle source select
- i) Heading bug adjust

18. Altimeter

- a) Altimeter reference pressure adjust knob

19. Vertical speed

- a) VS bug set

20. Chronometer

- a) Stopwatch reset button
- b) Mode select button
- c) Start/stop button

21. Autopilot



AUTOPILOT INSTRUCTIONS

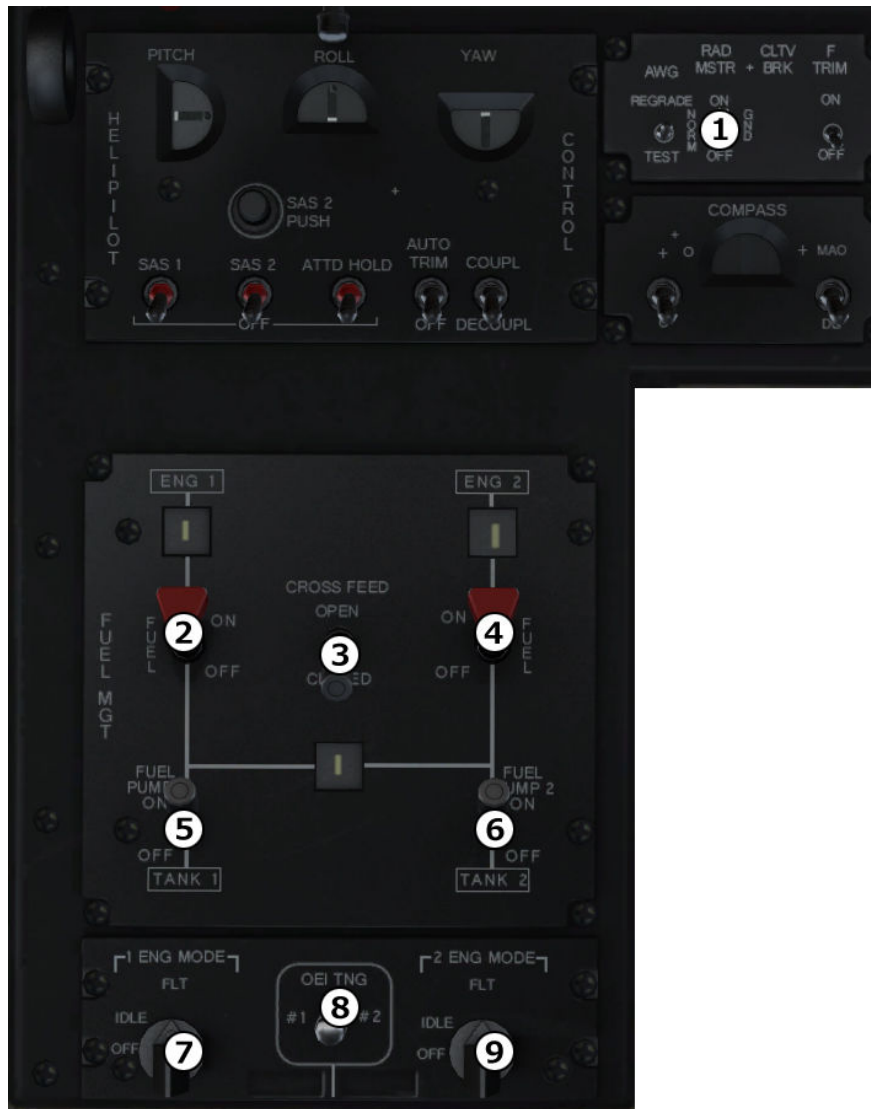
The Autopilot (AP) of the Nemeth Designs/Milviz AW109 is capable of holding altitude, heading, indicated airspeed, vertical speed, VOR course, ILS course and track the GPS flight plan. The AP can be activated with the standby (SBY) button. When the AP is activated the different hold modes can be engaged by their corresponding buttons. ALT mode holds the altitude on which the ALT button is pressed. IAS model holds the indicated airspeed that is set with the marker bug of the pilot's IAS indicator. VS mode holds the vertical speed that is set with the marker bug of the pilot's VS indicator. HDG mode holds the heading that is set with the heading bug of the HSI (mouse wheel). NAV mode holds the HSI course of the VOR that is set on the NAV1 radio. ILS mode holds the localizer and glideslope of the ILS course that is set on the NAV1 radio. GPS mode holds the track that is active on the GPS.

VS mode overrides the ALT mode. NAV mode overrides the HDG mode. ILS mode overrides the ALT, VS, HDG, and GPS modes however if there is no ILS glideslope the VS mode remains active. The GPS mode overrides the HDG and NAV modes.

1. Altitude hold
2. Indicated airspeed hold
3. Vertical speed hold
4. Heading hold
5. Nav course hold
6. Instrumental landing system hold
7. GPS track hold
8. Standby (AP engage/disengage)

Note: To work properly the AP requires the autorudder function to be disabled in FSX realism settings. Also note, engaging 2 or more buttons that do a similar function will cause the AP to function incorrectly, such as using the HDG and NAV buttons at the same time.

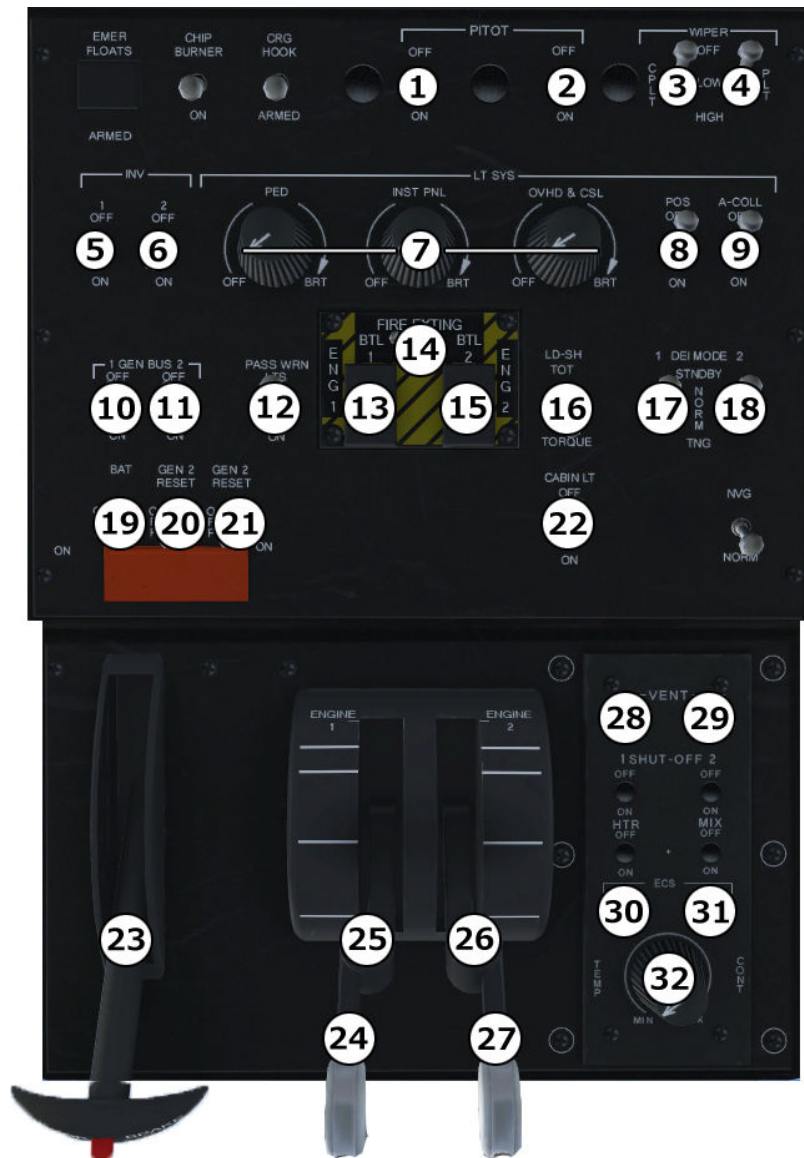
2. CENTER CONSOLE



1. Master avionics switch
2. Engine No.1 fuel cutoff switch
3. Fuel crossfeed switch
4. Engine No.2 fuel cutoff switch
5. No.1 main fuel pump switch
6. No.2 main fuel pump switch
7. Engine No.1 mode switch
8. Engine training mode switch
9. Engine No.2 mode switch

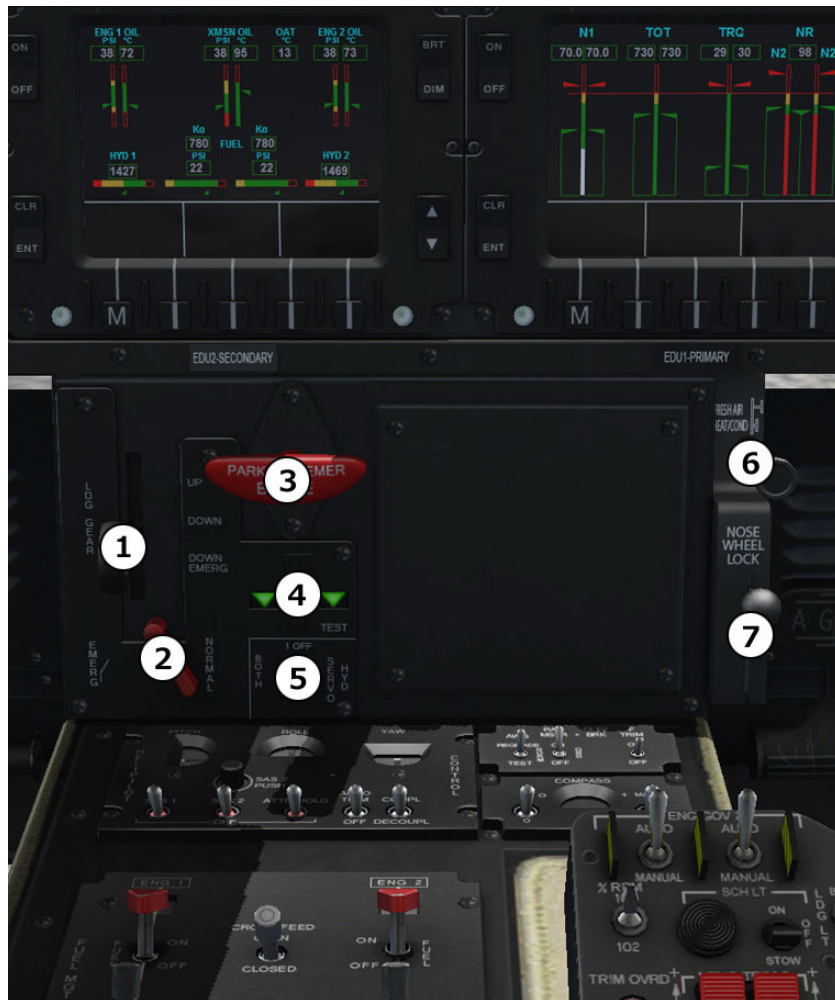
Note: HELIPILLOT is not functional in this release.

3. OVERHEAD PANEL



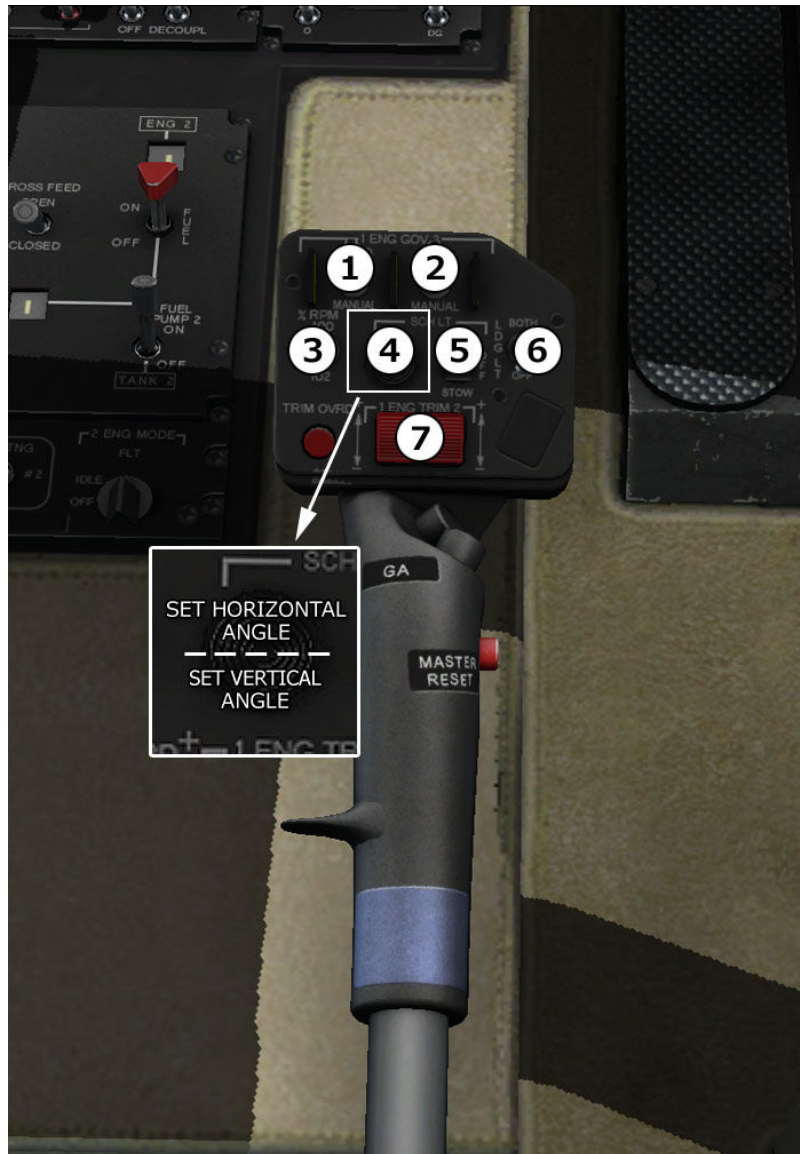
1. Pitot heat no.1 switch
2. Pitot heat no.2 switch
3. Copilot wiper switch
4. Pilot wiper switch
5. Inverter no.1 switch
6. Inverter no.2 switch
7. Interior light knobs
8. Position light switch
9. Anti-collision light switch
10. Generator no.1 bus switch
11. Generator no.2 bus switch
12. Passengers warning light switch
13. Engine no.1 fire extinguish button/fire warning annunciator
14. Fire extinguisher bottle no1./no.2 select
15. Engine no.2 fire extinguish button / fire warning annunciator
16. Load/share select switch (keep matched engine torque or TOT)
17. Engine no.1 de-ice switch
18. Engine no.2 de-ice switch
19. Battery switch
20. Generator no.1 switch
21. Generator no.2 switch
22. Cabin light switch
23. Rotor brake lever
24. Engine no.1 control lever (manual gov. mode)
25. Engine no.1 starter button (manual gov. mode)
26. Engine no.2 starter button (manual gov. mode)
27. Engine no.2 control lever (manual gov. mode)
28. Cabin ventilation system switch
29. Cockpit ventilation system switch
30. Environmental control system (ECS) master switch
31. ECS mode select switch
32. ECS temperature adjust knob

4. MIDDLE PANEL



1. Landing gear control lever
2. Landing gear control mode select switch
3. Parking brake handle
4. Landing gear annunciators
5. Hydraulic/servo switch
6. Air source select lever (outside/ECS). When the ECS is active and the temperature is set correctly on the ECS section of the overhead panel this lever removes the moisture from the windows when it's in ECS (HEAT/COND) position.
7. Nose wheel lock

5. COLLECTIVE LEVER



1. Engine no.1 governing mode select switch
2. Engine no.2 governing mode select switch
3. NR/N2 speed to 102%
4. Search light control knob
5. Search lights ON/OFF switch
6. Landing light ON/OFF switch (OFF / nose only / nose and wing beams)
7. Engine trim switches

IV. CHECKLISTS

1. PRE-START CHECK

All switches: _____ OFF or CLOSED.
 Nose wheel lock: _____ ON (lever up).
 Parking brake: _____ ON (pull out and turn).
 Cyclic stick: _____ Centered
 Collective lever: _____ Full down
 Engine power levers: _____ OFF (full aft).
 ENG 1 and 2 MODE switches: _____ OFF (fully counterclockwise).
 LD-SH switch: _____ As required.

NOTE

The LD - SH switch allows the pilot to keep matched engine torque or TOT, as required.

OEI TNG switch (if installed): _____ Off position (centered), check.
 Altimeter: _____ Set.
 STATIC source switch: _____ NORM and protected.
 LDG GEAR control lever: _____ DOWN, check.
 SERVO (Main hydraulic): _____ NORM.
 External power (if used): _____ Connect.

NOTE

Be sure that the external power source supplies not less than 28 volts. The battery is automatically disconnected when an external power source is connected to the helicopter. Check that BATT OFF caution message is displayed on EDU 1 if the external power is used.

Battery: _____ ON.
 GEN BUS 1 and 2: _____ ON.
 GEN 1 and 2: _____ ON
 Electronic Display Units (EDU 1 and EDU 2): _____ Check on.

NOTE

Both EDUs are automatically activated when the helicopter is electrically powered: EDU 1 in CRUISE mode and EDU 2 in

Fuel quantity: _____ Check.
 RPM switch (on collective control): _____ Set 100%.

Engine power levers: _____ FLIGHT position.
No.1 ENG GOV switch: _____ AUTO.
No.2 ENG GOV switch: _____ AUTO.
ENG TRIM toggle switches: _____ Verify the operation, then leave the engine power levers in the FLIGHT position

NOTE

Each engine trim toggle switch controls the respective power lever from IDLE to FLIGHT position when in AUTO mode, and from IDLE to MAX position when in MANUAL mode.

NOTE

Both engine power levers should always be operated through the toggle switches located on the collective control stick. They shall be operated manually only in case of failure of the remote control, or before starting, to position the levers to FLIGHT.

ENG 1 FUEL switch: _____ ON - Fuel valve indicator, vertical.
FUEL PUMP 1 switch: _____ ON - FUEL PUMP 1 caution message out, check pressure
ENG 2 FUEL switch: _____ ON - Fuel valve indicator vertical.
FUEL PUMP 2 switch: _____ ON - FUEL PUMP 2 caution message out, check pressure.

2. NORMAL START

Either engine may be started first. Either engine may be started using either the auto or the manual mode

NOTE

It is recommended the normal engine starts be made using the auto mode.

Collective control: _____ Flat pitch, check.
Rotor brake: _____ Disengaged (lever full forward).
EDU 1: _____ Select START page.

Engine 1 start

ENG 1 MODE switch: _____ IDLE.

NOTE

It is recommended to start the engine to IDLE, nevertheless, if necessary, it is possible to start to FLIGHT by setting the ENG MODE switch directly to FLT.

Gas Producer (N1): _____	Note increasing and START legend vertically displayed.
Engine temperature (TOT): _____	Note increasing and IGN legend vertically displayed.
Engine oil pressure: _____	Check.
Engine N°1 starter: _____	Deactivated when N1 is 50%. START and IGN legends automatically suppressed.
Main hydraulic system: _____	As NR increases, check rise in main hydraulic pressure.
Hydraulic utility system: _____	As NR increases, check pressure rise in both systems
No.1 engine power turbine speed (N2): _____	Check stabilized to IDLE speed of 65% ± 1%.

NOTE

*If the engine has been started directly to FLT (flight) the N2 will stabilize to 100%.
Avoid any cyclic movement except to prevent hitting blade stops below 85% rotor RPM.*

Engine and transmission oil: _____	Check pressure and temperature.
ENG 1 MODE switch: _____	FLT

Engine 2 start

Repeat above procedure to start engine No.2

Engine parameters: _____	Check within limits.
External power: _____	Disconnect (if used). Check BATT OFF caution message out.
INV 1 and 2 switches: _____	ON.
RAD- MSTR switch: _____	ON.
Clock: _____	Set.
Rotor speed (NR): _____	100% check

3. QUICK ENGINE START

This procedure can be followed whenever the situation requires to speed up the takeoff.

CAUTION

It is not advised to accomplish this procedure on battery.

Collective control: _____	Flat pitch, check.
Rotor brake: _____	Disengaged (lever full forward).
EDU 1: _____	Select START page.
ENG 1 MODE switch: _____	FLT.
ENG 2 MODE switch: _____	FLT, when engine 1 gas producer (N1) is above 10%.

NOTE

Avoid to operate the ENG MODE switches simultaneously.

Gas producer (N1): _____	Note increasing and START legend vertically displayed.
Engine Temperature (TOT): _____	Note increasing and IGN legend vertically displayed
Engine No.1 and No.2 starters: _____	Deactivated when N1 are 50%. START and IGN
Legends automatically suppressed.	
Main hydraulic system: _____	As NR increases check rise in main hydraulic pressure.
Hydraulic utility system: _____	As NR increases, check pressure rise in both systems
Engine power turbine speed (N2): _____	Check both stabilized to ~100%

NOTE

Avoid any cyclic movement except to prevent hitting blade stops below 85% rotor RPM.

Engine and transmission parameters: _____	Check within limits.
External power: _____	Disconnect (if used). Check BATT OFF caution message out
INV 1 and 2 switches: _____	ON.
RAD-MSTR switch: _____	ON.
Clock: _____	Set.
Rotor speed (NR): _____	~100% check.

4. SYSTEMS CHECK

Engine and transmission oil: Pressure and temperature within limits.

NOTE

The transmission oil pressure can be in the cautionary range (yellow band) provided that the oil temperature is below 65°C.

SERVO (Main Hydraulic): _____	NORM, check. Make small clockwise cyclic movements, collective and pedals movements.
CROSS FEED switch: _____	NORM (bar vertical)
FUEL PUMP 1: _____	OFF. Note activation of FUEL PUMP 1 caution message on EDU 1, automatic operation of crossfeed valve, XFEED advisory message on EDU 2 activated.
FUEL PUMP 1: _____	ON. FUEL PUMP 1 caution message out and crossfeed valve automatically closed and XFEED advisory message suppressed.
FUEL PUMP 2: _____	OFF. Note activation of FUEL PUMP 2 caution message on EDU 1, automatic operation of crossfeed valve, XFEED advisory message on EDU 2 activated.
FUEL PUMP 1: _____	OFF. Note activation of FUEL PUMP 1 and 2 caution messages, crossfeed valve still open and XFEED message still present. Verify operation of engine driven fuel pumps.
FUEL PUMP 1 and 2: _____	ON. FUEL PUMP 1 and 2 caution messages out and crossfeed valve automatically closed and XFEED message suppressed.
PITOT heat: _____	ON (single), PITOT 1 (2) HEAT advisory message displayed; then OFF.
Inverter 1: _____	OFF. Check INV 1 caution message displayed. Check for proper reading (115 V) on both AC systems on EDU 2 AUX display.
Inverter 1: _____	ON. Check INV 1 caution goes out.
Inverter 2: _____	OFF. Check INV 2 caution message displayed. Check for proper reading (115 V) on both AC systems on EDU 2 AUX display.
INVerter 2: _____	ON. Check INV 2 caution goes out.
Cyclic stick: _____	Friction fully unlocked, freedom of movement. Set communication and navigation frequencies as required and check audio panel
Altimeters: _____	Set and check.

Hydraulic system: _____ Check.

5. TAXIING

Nose wheel lock: _____ OFF
 Collective and cyclic: _____ Increase the collective slowly then move the cyclic stick forward moderately to start movement.
 Pedal brakes: _____ Check operation.
 Pedal control: _____ As required to select the direction.
 Collective and pedal brakes: _____ To reduce speed and to stop, lower the collective and apply pedal brakes.
 Nose wheel lock: _____ ON

NOTE

If the nose wheel is not aligned forward it will be self-centered and locked as soon as the helicopter lifts off.

6. HOVER TAKE-OFF

Collective pitch: _____ Increase slowly and lift the helicopter to a hover.

CAUTION

The helicopter is free of ground resonance. However if, for some reason, ground resonance should occur, lift the helicopter free of the ground immediately. If unable to become airborne, lower collective and shut-down engines.

Tail rotor pitch: _____ Apply as necessary to maintain direction.
 Flight instruments: _____ Check.
 Engine instruments: _____ Within limits.
 Main hydraulic system instruments: _____ Within limits.
 Utility hydraulic system instruments: _____ Within limits.

NOTE

In hover the helicopter has a slight inclination to the left. During lift-off correct as necessary.

Cyclic and collective: _____ Apply as necessary to accelerate and climb smoothly, reaching take-off power at approximately 60 knots.

MAIN UTIL CHRG caution message: _____ Displayed during landing gear operation. Out after the landing gear is locked.

Utility hydraulic systems: _____ Pressure within limits.

RPM switch: _____ Set 100%.

NOTE

*RPM shall be set to 102% during take-off and landing in the airspeed range from 0 knot to 60 knots and in hovering condition.
NR/N2 speed : ~100% stabilized, check.*

8. IN FLIGHT**NOTE**

During IFR flight, the pilot is recommended to cross check the flight instruments indication for consistency, including the ADI stand-by indicator.

Collective: _____ Adjust as necessary to keep engine parameters within limits.

Load Share (LD-SH) switch: _____ As required.

NOTE

The LD-SH switch allows the pilot to keep matched engine torque or TOT, as required.

Airspeed: _____ Maintain within limits shown on airspeed placard.

Landing light: _____ OFF, if used. LANDING LT ON advisory message out.

Pitot heat: _____ As required.

CAUTION

Turn Pitot heat on for flight in visible moisture and in rain regardless of ambient temperature.

Altitude: _____ As desired.

NOTE

Refer to applicable operating rules for high altitude oxygen requirements.

Landing gear lever: _____ DOWN when flying below 200 ft height AGL.

CAUTION

*Do not operate landing gear at speeds above 120 knots.
Do not fly with landing gear extended at speeds above 120 knots.*

HYD UTIL CHRGR caution message: _____ Displayed during landing gear operation.
Out after the landing gear is locked.
Utility hydraulic systems: _____ Pressure within limits

10. SHUTDOWN

Collective lever: _____ Check fully down.
Cyclic stick: _____ Centered and trimmed.
Pedals: _____ Centered.

NOTE

*Do not apply collective in this phase and during subsequent rotor deceleration, particularly in windy conditions.
Avoid any cyclic movement except to prevent hitting blade stops below 85% rotor RPM.*

ENG 1 and 2 MODE switches: _____ Set to IDLE then to OFF.

NOTE

If necessary the engine may be shut-down directly from FLT.

Fuel pumps 1 and 2: _____ OFF. FUEL PUMP 1 and 2 caution messages displayed.

CAUTION

During shutdown check that the N1 speed decelerates freely. Note any abnormal noise or rapid rundown and take corrective action as required per Maintenance Manual.

ENG 1 and 2 FUEL switches: _____ OFF. Fuel valve indicators horizontal.
CROSS FEED switch: _____ CLOSED. Crossfeed indicator vertical.
Pitot heat: _____ OFF.
Cockpit lights: _____ OFF.
External lights: _____ OFF.
Landing light: _____ OFF, if used.
Miscellaneous switches: _____ OFF.
RAD-MSTR (Radio Master) switch: _____ OFF.

Power levers: _____ OFF (full aft).

NOTE

Move both engine power levers to OFF before turning off the electrical power in order to avoid fuel spillage on the ground.

Battery and Generators 1 and 2: _____ OFF.

Inverters 1 and 2: _____ OFF.

11. POST FLIGHT CHECK

Landing gear lever lock _____ NORMAL and lockwired.

If conditions require, perform the following:

Pitot, intake and exhaust covers _____ *Installed*

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SUPPORT

All support issues can be answered by registering at our forums at <http://aussiex.org/forum/index.php?/forum/105-nemeth-designs-support-forum/> or alternately email support@nemethdesigns.com

We hope you enjoy this product and enjoy flying the Nemeth Designs/Milviz AW109!

The ND/Milviz Team

