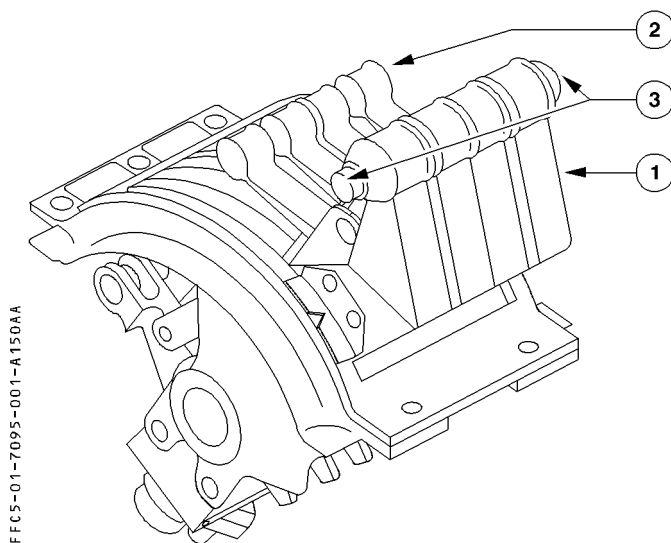


PEDESTAL



FFCS-01-7095-001-A150AA

① Thrust levers

(Refer to 1.70.35)

② Reverse control levers

When the thrust levers are not at idle, the reverse control levers are mechanically locked in the stowed position.

When the thrust levers are at idle, thrust reverser operation can be controlled by pulling back the reverse control levers.

A detent indicates the reverse idle position to the crew. For Engines 1 and 4, this position cannot be exceeded until complete deployment of the reversers of the two engines.

For reverse thrust application, the reverse control levers are pulled back as required.

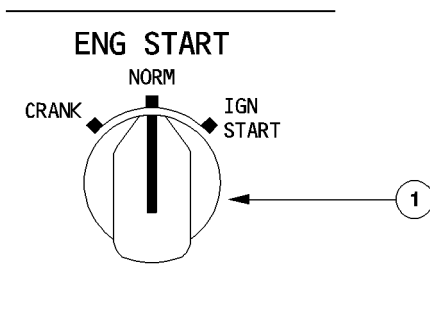
For stowage of reversers, the levers are moved forward then pushed down.

③ Autothrust instinctive disconnect pb

(Refer to 1.22.30)

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			SEQ 150	REV 16

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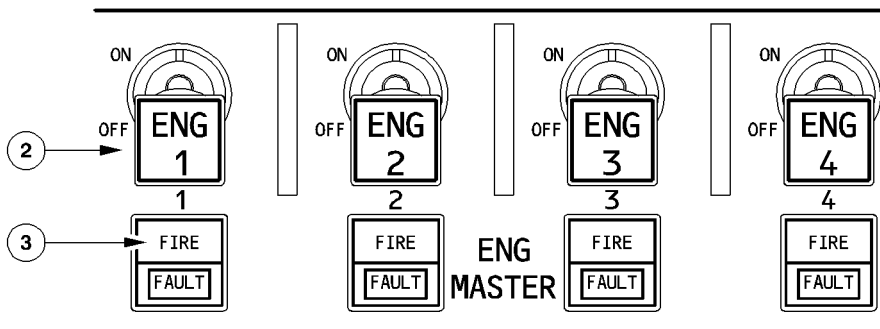
① ENG START Sel

- | | | |
|-----------|---|---|
| CRANK | : | The start valve opens, provided the MAN START pushbutton is ON.
Ignition is not supplied. |
| NORM | : | Continuous ignition A + B is automatically selected : <ul style="list-style-type: none"> – ENG ANTI ICE pushbutton is ON and relevant EIU is inoperative. – For 10 seconds, in the event of an engine flame-out condition detected by the FADEC (auto-relight function). – For 10 seconds, in the event of inadvertent cycling of the Master lever with the engine running, provided N3 is above 50 % and Master lever has been returned to the ON position. |
| IGN START | : | <ul style="list-style-type: none"> – If the engine master switch is ON and $N3 \geq \text{idle}$, continuous ignition is selected. – During an automatic start, the ignition will be selected : <ul style="list-style-type: none"> • On ground, when $N3 \geq 25 \%$. • In flight, at start sequence initiation (engine master switch selected ON). – During a manual start, the ignition is selected when the engine master switch is selected ON. |

Both pack valves automatically close during the crank or the start sequence (Refer to 1.21.20).

Note : On the ground, the ignition is automatically cut off at the end of the start sequence ($N3 \geq 50 \%$).

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② ENG MASTER sw 1 (2) (3) (4)

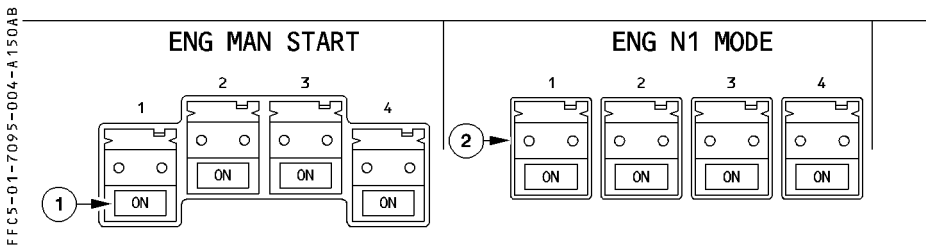
- ON** :
- Low pressure fuel valve will open (provided the ENG FIRE pushbutton is in).
 - During an automatic start, the high pressure fuel valve opens provided :
 - ENG START selector is at IGN / START
 - N3 is above 25 %
 - During a manual start, the high pressure fuel valve will open provided :
 - ENG START selector is at IGN / START
 - MAN START pushbutton is ON
- OFF** :
- A Closure signal is sent directly to the high pressure fuel valve and the low pressure fuel valve.
 - Controls the reset of both channels of the FADEC.

Note : Releasing ENG FIRE pushbutton permits engine shutdown by closing the low pressure fuel valve. There is a time delay of about 40 seconds at ground idle (the time delay is due to fuel left between low pressure valve and nozzles)

③ FIRE FAULT It 1 (2) (3) (4)

- FAULT It** :
- Illuminates amber associated with ECAM caution in case of:
 - an automatic start abort
 - a disagreement between the high pressure fuel valve position and its commanded position.

OVERHEAD PANEL



① ENG MAN START pb

ON : The start valve opens, provided ENG START selector is set to CRANK or IGN/START.
Both pack valves close during the start sequence.

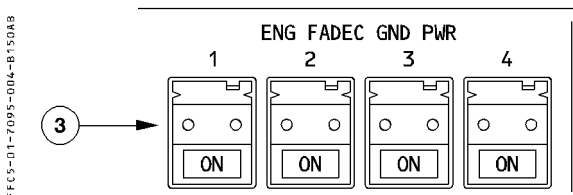
Note : The start valve automatically closes when N3 reaches 50 %.

Off : ON light illuminates blue.
When the ENG MAN START pushbutton is set OFF during a manual engine start, the start valve closes, provided the engine master switch is at OFF position.

② N1 MODE pb

ON : Thrust control reverts from EPR mode to N1 rated mode. Following an automatic reversion to N1, rated or unrated mode, pressing the pushbutton confirms the mode.
ON light illuminates blue.

Off : The FADEC controls the engine in EPR mode, if available.



③ ENG FADEC GND PWR pb

ON : The FADEC is supplied by the aircraft network for 5 minutes (except if the ENG FIRE pushbutton is released out, or if FADEC Generator is available).
The ON light illuminates with a delay of 2 seconds.

ECAM

GENERAL

The engine primary parameters are permanently displayed on the upper ECAM E/WD.

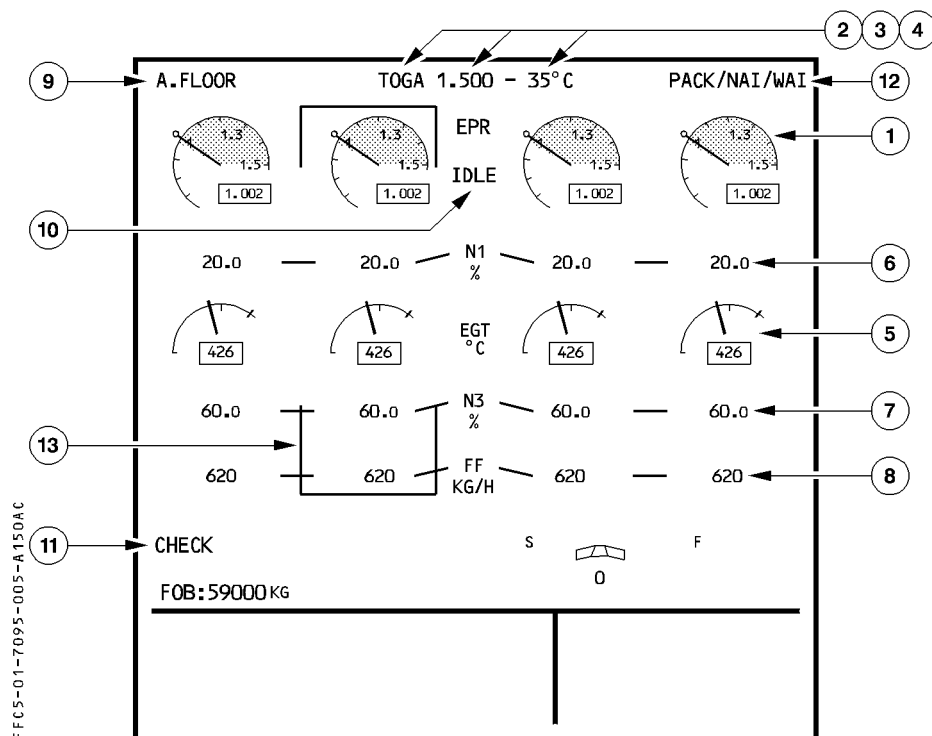
The secondary parameters are displayed on the lower ECAM SD, when selected either automatically or manually.

EPR mode is the normal mode. If EPR is unavailable, an automatic reversion to N1 mode occurs. Engine primary parameters are then displayed differently.

In case of all DMC ECAM channel failure, the engine primary parameters can be displayed on each ND using the ND selector on the EFIS control panel.

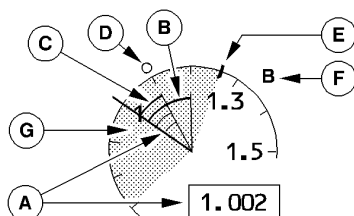
PRIMARY PARAMETER

EPR MODE ACTIVE



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		SEQ 150	REV 16

① Engine Pressure Ratio (EPR)



Ⓐ Actual EPR

The EPR needle and EPR digital indication are in green.

Ⓑ EPR Command (EPR trend)

The green needle corresponds to the EPR requested by the FADEC. In addition, next to the EPR trend needle, a green triangle indicates the direction of EPR tendency. These symbols are displayed when A/THR is active.

Ⓒ Transient EPR

Symbolizes the difference between the EPR command and the actual EPR. It is only displayed when A/THR is active.

Ⓓ EPR TLA (blue circle)

EPR corresponding to the thrust lever position (predicted EPR).

Ⓔ EPR MAX

The EPR MAX amber index is the EPR limit value corresponding to the full forward position of the thrust levers.

Ⓕ BUMP indication

B is displayed in green each time the pilot selects the bump function for takeoff.

Ⓖ EPR gray sector

The gray sector delimits the usable EPR range. Its limits are Idle EPR and TOGA EPR. Actual EPR can only be inside the gray sector.

The gray sector is displayed, if :

- The engine is at, or above, idle for more than one second,
- The engine is not failed,
- The engine is not in N1 mode,
- There is no REV message, and the engine is not in reverse mode.

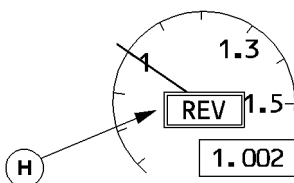
	POWER PLANT CONTROLS AND INDICATIONS	1.70.95 P 7	
		SEQ 150	REV 16

④ REV indication

The REV indication appears in amber, when at least one reverser cowl is unstowed or unlocked. It changes to green and is overbrightened when the reverser cowl is fully deployed and reverse mode is selected.

(If unlocked in flight, the amber indication first flashes for 9 seconds and then remains steady).

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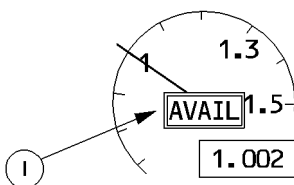
① AVAIL indication

This is displayed in green to indicate a successful engine start on ground.

It pulses in green to indicate a successful engine relight in flight.

It is triggered when the engine is at, or above, idle.

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② Thrust limit mode

TOGA, FLX, CLB, MCT limit mode selected by the thrust lever is displayed in blue.

If a derated takeoff has been selected by the crew, D04, D08, D12, D16, D20, D24, D32 or D40 will be displayed.

DCLB1 or DCLB2 is displayed during the climb phase, if the crew has selected a derated climb through the MCDU PERF CLB page.

The thrust limit mode of the engine (in EPR mode) having the highest thrust limit mode is displayed.

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		SEQ 150	REV 17

③ EPR rating limit

This is computed by the FADEC according to the thrust lever angle, and is displayed in green.
The second highest EPR limit value (of all engines having the same thrust limit mode) is displayed.

Note : – On ground, with the engines running, the displayed EPR rating limit corresponds to the TOGA thrust limit, whatever the thrust lever position.

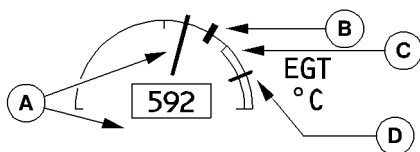
- On ground, with the engines running, and if FLEX mode (respectively DERATED mode) is selected, FLEX EPR (respectively DERATED EPR) is displayed, whatever the thrust lever position between IDLE and FLX / MCT.

④ FLEX temperature

If a FLEX temperature has been entered, via the MCDU, and validated by the FADEC, this temperature is displayed in blue.

⑤ EGT indicator

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Ⓐ Actual EGT

- It is normally green.
- It becomes amber above :
 - 700°C during ground start sequence, or
 - 850°C (except at takeoff).
- It becomes red :
 - During takeoff, if EGT exceeds 920°C, or 900°C during 20 seconds.
 - If EGT exceeds 900°C in all other cases.

Ⓑ EGT Max (amber)

700°C at ground engine start, then 850°C. It is available when either takeoff thrust is applied, or alpha floor is active, or reversers are selected.

Ⓒ Max permissible EGT

EGT redline is at 900°C. A red arc is displayed above 900°C to the end of the scale.

Ⓓ EGT exceedance

If the EGT red line is exceeded, a red mark appears at the max value achieved. It will disappear after a new start on ground, or after a maintenance action (MCDU).

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⑥ LP rotor speed N1

The N1 indication is displayed in percent, in digital format, in normal mode. If N1 actual value exceeds the N1 red limit value (92,5 %), the color changes from green to red, and a red cross appears next to the digital indication.

This red cross will only disappear after the next start on ground, or after a maintenance action through the MCDU.

In case of degraded N1 data, the last significant digit is displayed with two amber dashes across.

⑦ HP rotor speed N3

Digital indication is normally green, and twice as bright during engine start and located in a grey background box.

When the N3 is above 92.5 %, the indication becomes red and, a red cross appears next to the digital indication. The red cross will only disappear only after a new start on ground, or after a maintenance action through the MCDU.

When the N3 value is degraded (in case of loss of sensed N3), the last digit is superimposed by amber dashes.

⑧ Fuel flow

Green indication

⑨ A FLOOR message

Is displayed in amber, when the ECUs receive the corresponding signal from the FMGS.

⑩ DLE message

This legend appears in green, when at least three engines are at idle. It pulses for 10 seconds, then remains steady.

⑪ CHECK message

Is displayed in amber on the EWD and on both NDs, in case of a discrepancy between EPR, N1, N2, N3, EGT, FF values on FADEC-DMC bus and corresponding displayed information.

Note : When one parameter becomes invalid, two amber crosses replace the associated digital indication. For EPR and EGT parameters, the needle and the box around the digital display disappear.

12 Bleed Configuration

Depending on whether air conditioning, nacelle anti-ice, or wing anti-ice is selected, one or more of the following may be displayed in green : PACK, NAI, WAI.

Bleed configuration is displayed :

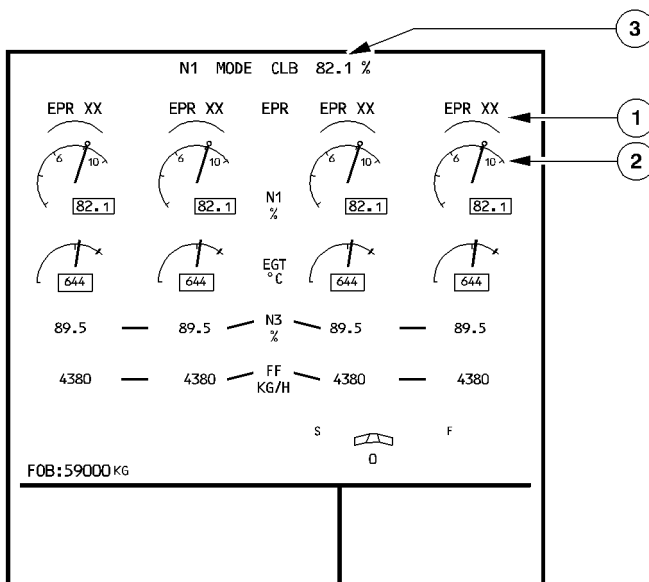
- On ground, if the thrust limit mode is TOGA, FLEX or DERATED.
- In flight, during the takeoff phase, or when the thrust limit mode is MCT.

13 Attention-Getting Box

A white attention-getting box appears around the engine parameters requiring specific monitoring for the following reasons :

- Red or amber parameter,
- Engine Start Sequence,
- Reverser cowl deployed or unstowed in flight,
- Engine failed.

REVERSION TO N1 MODE



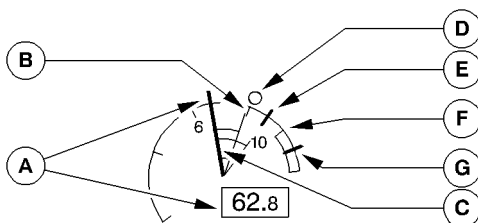
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		SEQ 150	REV 16

① Engine Pressure Ratio (EPR)

The EPR analogic indication is replaced by an amber curve.
 EPR XX is displayed in amber, if the engine is in N1 mode with the EPR invalid.
 EPR is displayed in amber, if the engine is in N1 mode with the EPR valid.
 AVAIL and REV indications are now displayed on the N1 dial.



② LP Rotor speed (N1)



Ⓐ Actual N1 (digits boxed grey)

- It is normally in green.
- It becomes red, if actual N1 exceeds max permissible N1 (92.5 %).

Ⓑ N1 Command (EPR trend)

The green needle corresponds to N1 demanded by the FADEC. In addition next to the N1 trend needle a green triangle indicates the direction of N1 tendency. These symbols are displayed when A/THR is active.

Ⓒ Transient N1

Symbolizes the difference between the N1 command and the actual N1. It is displayed only when A/THR is active in N1 rated mode.

Ⓓ N1 TLA (blue circle)

N1 corresponding to the thrust lever position (predict N1). Not displayed in reverse mode.

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④ EN1 MAX

It is not displayed in N1 unrated mode.

The N1 MAX amber index is the N1 limit value corresponding to the full forward, or full reverse position of the thrust levers.

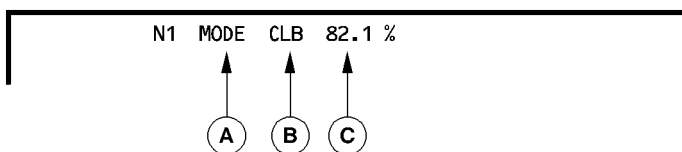
④ FMax permissible N1

N1 redline is represented by a red arc at the end of the scale beginning at 92.5 %.

④ GN1 exceedance

If the N1 redline is exceeded, a red mark appears and remains at the max value achieved. It will disappear after a new start on ground, or after a maintenance action (MCDU).

③ N1 MODE and N1 rating limit



④ AN1 MODE is displayed in white, when all engines are in backup N1 mode.

④ BThrust limit mode

TOGA, CLB, MCT limit mode, selected by the thrust lever, is displayed in blue.

Note : Flex and derated takeoff are not allowed in N1 mode.

④ CN1 rating limit

It is only computed in N1 rated mode by the FADEC, according to the thrust lever angle, and is displayed in green.

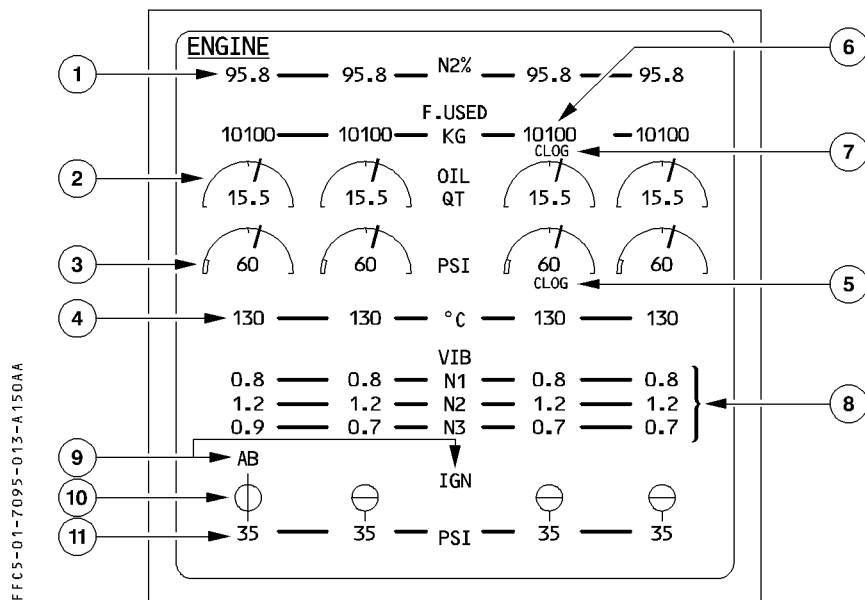
The displayed N1 limit value is the second highest N1 limit value of all engines having the highest thrust limit mode.

The associated N1 mode is displayed.

Note : On ground, if at least one engine is controlled in N1 unrated mode, the thrust limit mode and the N1 rating limit are replaced by amber crosses.

SECONDARY PARAMETERS

START CONFIGURATION



① IP rotor speed N2

Digital indication is normally in green.

When the N2 is above 99.2 %, the indication becomes red, and a red cross appears next to the digital indication. The red cross will disappear after a new start on ground, or after a maintenance action through the MCDU.

When the N2 value is degraded (in case of a triple N2 sensors failure), the last digit is superimposed by amber dashes.

② Oil quantity indication

The needle and the digital indication are normally in green.

The digital indication pulses if the oil quantity drops below 4 quarts.

(Also displayed on the ECAM CRUISE page).

Advisory is inhibited :

- At takeoff or go-around ;
- When reversers are selected ;
- In alpha floor mode.

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③ Oil pressure indication

The needle and the digital indication are normally in green.

The needle and the digital indication turn amber in case of low pressure, and turn red, if the oil pressure drops below 25 psi.

Note : *The scale is non linear : The first three quarters represent a range from 0 to 100 PSI, the last quarter from 100 to 400 PSI.*

④ Oil temperature indication

It is normally in green.

The indication becomes amber, if temperature exceeds 191°C.

⑤ Oil filter clog indication

CLOG message appears in amber, in case of excessive pressure loss accross the main or scavenge oil filter.

Note : *This is not an indication that the bypass valve is open.*

⑥ Fuel used indication

The fuel used value, computed by the FADEC, is displayed in green.

After a transmission interruption by the FADEC, if the displayed value is 100 kg less than the actual value, it is crossed by two amber dashes.

It is reset at engine start on ground.

It is also displayed on the ECAM CRUISE page, and on the ECAM FUEL page.

⑦ Fuel filter clog indication

The CLOG message appears in amber, in case of excessive pressure loss accross the fuel filter.

⑧ VIB indications

It is in green.

It pulses in case of advisory (N1 Vib > 3.3 units, N2 Vib > 2.7 units, N3 Vib > 2.7 units).

It is also displayed on the ECAM CRUISE page.

⑨ Ignition indication

IGN is displayed in white during the start sequence.

The selected ignitors "A", or "B", or "AB" are displayed in green when supplied.

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⑩ Start valve position indication

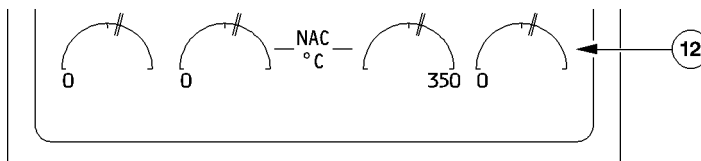
In line	– Green	:	Valve is fully open.
Crossline	– Green	:	Valve is fully closed.
In line	– Amber	:	Valve is abnormally fully open.
Crossline	– Amber	:	Valve is abnormally fully closed.

⑪ Engine bleed pressure

Bleed pressure upstream of the precooler is normally displayed in green.
It becomes amber below 15 psi with $N3 \geq 8\%$ or in case of overpressure.

AFTER START CONFIGURATION

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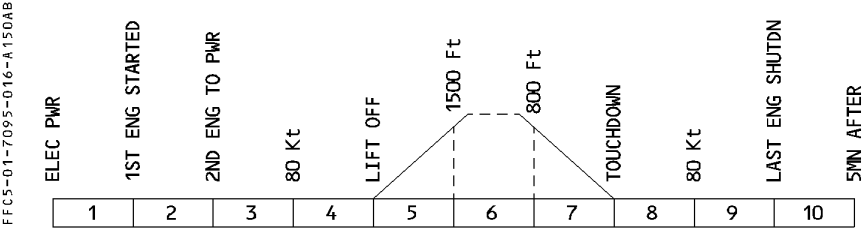
⑫ Nacelle temperature indication

Nacelle temperature needles are displayed in green. They pulse if the temperature exceeds 260°C.
The advisory threshold is indicated by a small mark on the arc.
NAC is displayed in white.
Nacelle temperature indications are removed during engine start.

Note : In case any parameter is invalid, the associated digital indication is replaced by two amber crosses.

For OIL QTY, OIL PR and NAC TEMP the needle is removed.

WARNINGS AND CAUTIONS



E / WD: FAILURE TITLE conditions	AURAL WARNING	MASTER LIGHT	SD PAGE CALLED	LOCAL WARNING	FLT PHASE INHIB
ALL ENG FLAME OUT Total engine flame-out	CONTI- NUOUS REPETITIV E CHIME	MASTER WARN	NIL	NIL	NIL
N1 OVERLIMIT N1 above 92.5 %					4, 8
N2 OVERLIMIT N2 above 99.2 %					
N3 OVERLIMIT N3 above 92.5 %					
TURBINE OVHT If turbine overheat detected					
EGT OVERLIMIT EGT above 850°C (900° at TO power)					SINGLE CHIME
OIL LO PR Oil pressure lower than 25 PSI	CRC	MASTER WARN			
MINOR FAULT At least a failure needing repairing before 150 hours is detected by the FADEC.	NIL	NIL	NIL		4, 5, 7, 8
CTL SYS FAULT VBV or VSV failure or loss of parameters (PS 3, T25, T3, N1, N2), or loss of FMV, VSV position, or burn staging valve failure, or RAC system failure.	SINGLE CHIME	MASTER CAUT			NIL
BLEED STATUS FAULT Bleed status not received by active FADEC channel.					3, 4, 5, 7, 8
ENG FAIL Eng core speed below idle with master sw ON and fire pb is not pushed.					NIL
ENG SHUT DOWN Eng master at OFF in phases 3 to 8, or eng fire pb pushed in phases 1, 2, 9 and 10.					
THR LEVERS NOT SET Flex or derated takeoff mode not selected by at least one FADEC.					1, 4 to 8, 10
ENG T.O. THRUST DISAGREE One FADEC at least selects a different thrust takeoff mode on ground.					
ENG STALL Stall detected (Not during start sequence).		ENG	4, 5, 7, 8		

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POWER PLANT
CONTROLS AND INDICATIONS

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POWER PLANT
CONTROLS AND INDICATIONS

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E / WD: FAILURE TITLE conditions	AURAL WARNING	MASTER LIGHT	SD PAGE CALLED	LOCAL WARNING	FLT PHASE INHIB
EIU FAULT Data bus between EIU and FADEC failed. Engine vib indication is lost	SINGLE CHIME	MASTER CAUT	NIL	NIL	3, 4, 5, 8
FADEC HI TEMP EEC internal temperature exceeds an acceptable working temperature					3 to 8
FADEC SYS FAULT One NOGO failure affects one or both channels channel failure or alternate fault or overspeed governor fault or sensor failure					4, 5, 6, 7, 8
FADEC FAULT Data bus between FADEC and ECAM failed			ENG		4, 5, 7, 8
FUEL FILTER CLOG			NIL		3, 4, 5, 7, 8
IGN A+B FAULT Both ignition circuit are failed					
IGN A(B) FAULT Ignition circuit A or B failed	NIL	NIL			NIL
TYPE DISAGREE Disagree between pin programming on FADEC and on FWC (engine rate)	SINGLE CHIME	MASTER CAUT	ENG		3 to 10
REV FAULT Loss of thrust reverser on one engine					3, 4, 5
REV PRESSURIZED Reverser system is pressurized while rev doors are stowed and locked with no deploy order (on ground)			1, 8, 9, 10		
REV UNLOCKED One reverser door not locked in stowed position with no deploy order					8, 9
REV INHIBITED Reverser is inhibited by maintenance action	NIL	NIL	NIL		3 to 8
THR LEVER FAULT Both resolvers on one thrust lever failed	SINGLE CHIME	MASTER CAUT	ENG		8
THR LEVER DISAGREE Disagree between both resolvers of a thrust lever					4, 5, 8
OIL PRESS Low oil pressure condition (depending on N3) but still higher than 25 PSI					3, 4, 5, 8
OIL LO TEMP Engine oil temp < 20°C (on ground before take-off)					4 to 8
OIL HI TEMP Engine oil temp above 191°C					4, 5, 7, 8
OIL FILTER CLOG It can be triggered only when N1 is less than 75% and altitude is below 20 000 ft.					3, 4, 5, 7, 8
THRUST LOCKED The thrust is frozen on one or more engine after an involuntary A/THR disconnection. This caution is recalled every 5 seconds until thrust levers are moved			NIL		2, 3, 4, 8, 9

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E / WD: FAILURE TITLE conditions	AURAL WARNING	MASTER LIGHT	SD PAGE CALLED	LOCAL WARNING	FLT PHASE INHIB
START VALVE FAULT The start valve is either stuck closed, or stuck open, or no starter air pressure is available (valve disagree)	SINGLE CHIME	MASTER CAUT	ENG	Associated FAULT It on ENG panel on pedestal (except in case of starter time exceeded)	3, 4, 5, 7, 8
START FAULT Start fault due to : . Stall, or . EGT overlimit, or . No light up, or . Low N1, or . Starter failure, or . Hung start, or . High tailwind start, or . THR levers not at idle. . Starter time exceeded.					
HP FUEL VALVE Fuel valve failed closed or open					
OVTHR PROT FAULT Fault in the overthrust protection system					
FADEC IDENT FAULT Contents of Data Entry Plug incompatible with EEC	NIL	NIL	NIL	NIL	2 to 8
LP SHAFT PROT LOSS This message is triggered by a disable turbine overspeed protection system fault					3 to 8
IGN SUPPLY FAULT					
OIL CHIP DETECTED					
EPR MODE FAULT	SINGLE CHIME	MASTER CAUT	ENG		1 to 8 4, 5
REVERSER LOCKED	NIL	NIL			3 to 7
REV MINOR FAULT	NIL	NIL	NIL		3 to 8
AIR EXCHANGER FAULT	SINGLE CHIME	MASTER CAUT			

MEMO DISPLAY

IGNITION message is displayed in green, either when selected automatically by the FADEC, or manually by the crew.