A340-200 / 300 / 500 / 600 Family

Differences Brochure

This brochure describes the various differences between each member of the A340 Family: The A340-200/300/500/600.
It is presented in modular format, whereby each chapter deals with a specific ATA chapter.
Each chapter can thus be read independently of the others.
Anything not covered in this brochure can be considered to be identical between the 3 variants. As such, many selections have not been reiterated.
In addition, as many modifications are available on both, these similarities have been omitted.
Furthermore, retrofits to the A340-200/300/500/600 standards have not been taken into account.
Changes to the basic standards have, however, been included.
This brochure is provided for information purposes only, and its contents will not be updated.
It must not be used as an official reference.
For technical data or operational procedures, please refer to the relevant Airbus Industrie documentation.

Chapter 1- General

A340-200 - PATHFINDER TO PROFITABILITY

Carrying 261 passengers in a three-class cabin layout and in a super-high comfort configuration of 239 seats, the **A340-200** has a range of 8000 nautical miles. Powered by CFM56-5C engines, the A340 is designed to do what four-engined aircraft do best: Offer greater range at lower cost than any other long-range widebody. The **A340-200** is the ideal aircraft for low-risk development of challenging new markets, profitably operating new direct non-stop services where other airliners cannot; and, with a range of 8000nm, it can fly further than any commercial airliner in service today.

THE A340-300 - UNIQUELY MATCHED TO THE NEW COMPETITIVE ENVIRONMENT

Carrying 295 passengers in a three-class cabin layout, the **A340-300** has a range of 7300 nautical miles. Powered by CFM56-5C engines, the **A340-300** was made for the 300-seat long-range market. It offers lower costs than competing aircraft – over any range. The ability to generate profits on routes, not viable with older or oversized equipment, increases flexibility and gives access to new markets. Direct point-to-point services and increased flight frequencies provide the marketing advantage required to win high-yield traffic, while the luxurious and spacious cabin helps keep it.

THE A340-500 - THE ULTRA LONG-RANGE MACHINE

Carrying 313 passengers in a three-class cabin layout, the **A340-500** has a range of 8500 nautical miles. Powered by Rolls-Royce Trent 500 engines, the **A340-500** is the longest-range airliner in the world. A six-frame stretch over the **A340-300**, the **A340-500** offers the longest range capability of all the A330/A340 family. It will allow airlines to fly non-stop even further than with today's longest range aircraft, the **A340-200**. It will reliably and profitably expand the possibilities for direct non-stop services between distant centers not served today, with four-engine capability for uncompromized security and comfortable travel on the longest journeys.

THE A340-600 - THE BIGGEST AIRBUS JETLINER YET

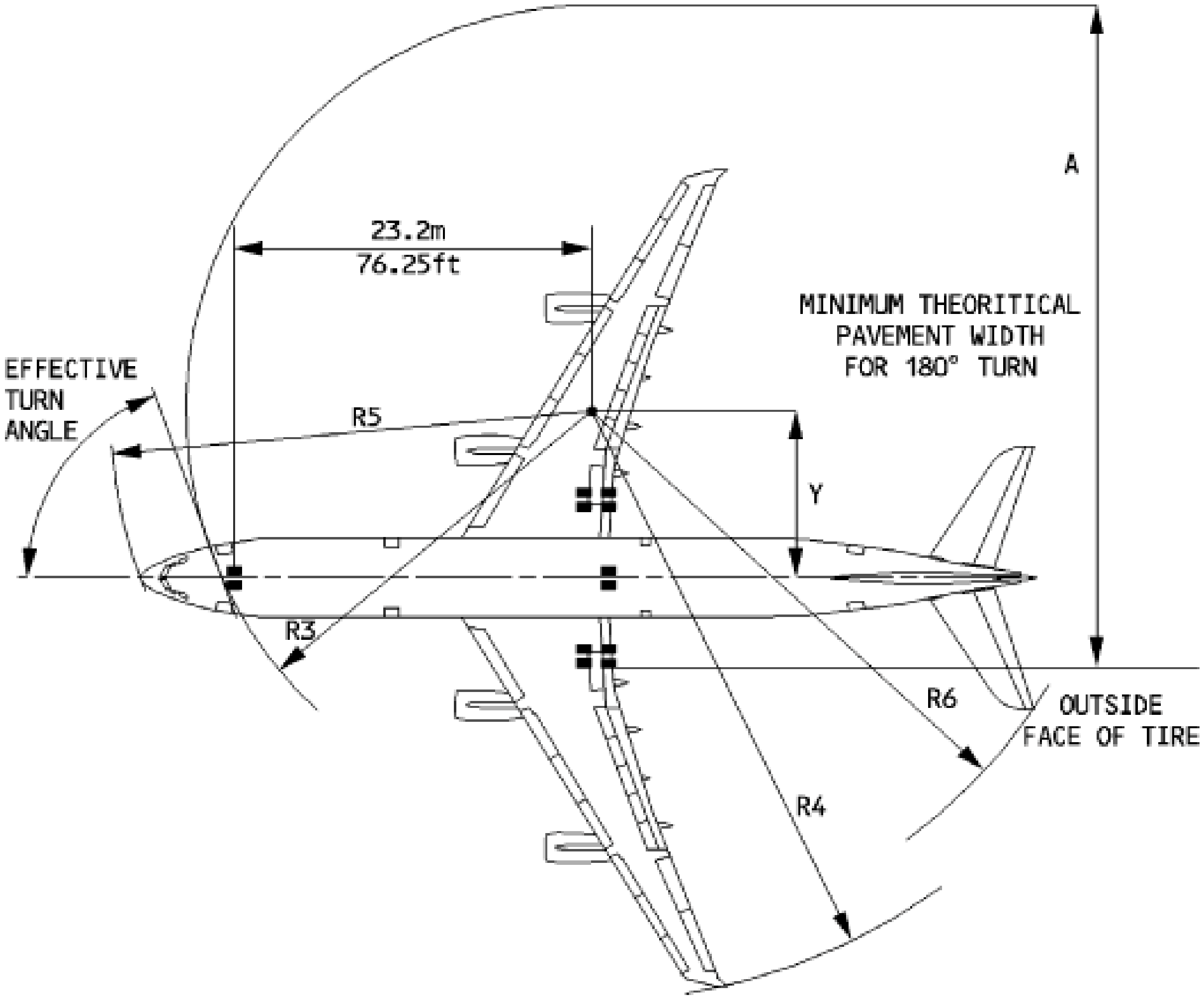
Carrying 380 passengers in a three-class cabin layout, the **A340-600** has a range of 7500 nautical miles. Powered by Rolls-Royce Trent 500 engines, the **A340-600** is the ideal economic replacement for first-generation 400-seat aircraft. This twenty-frame (over the **A340-300**), super-stretch A340 provides similar passenger capacity to competition but with twice the underfloor cargo pallet capability, and at incomparably lower trip and seat costs. With the innovative Airbus approach to developing the vast lower deck, airlines are given new ways to increase seat count, improve in-flight service and offer innovative travel products.

GROUND MANEUVERING

MINIMUM TURNING DISTANCES

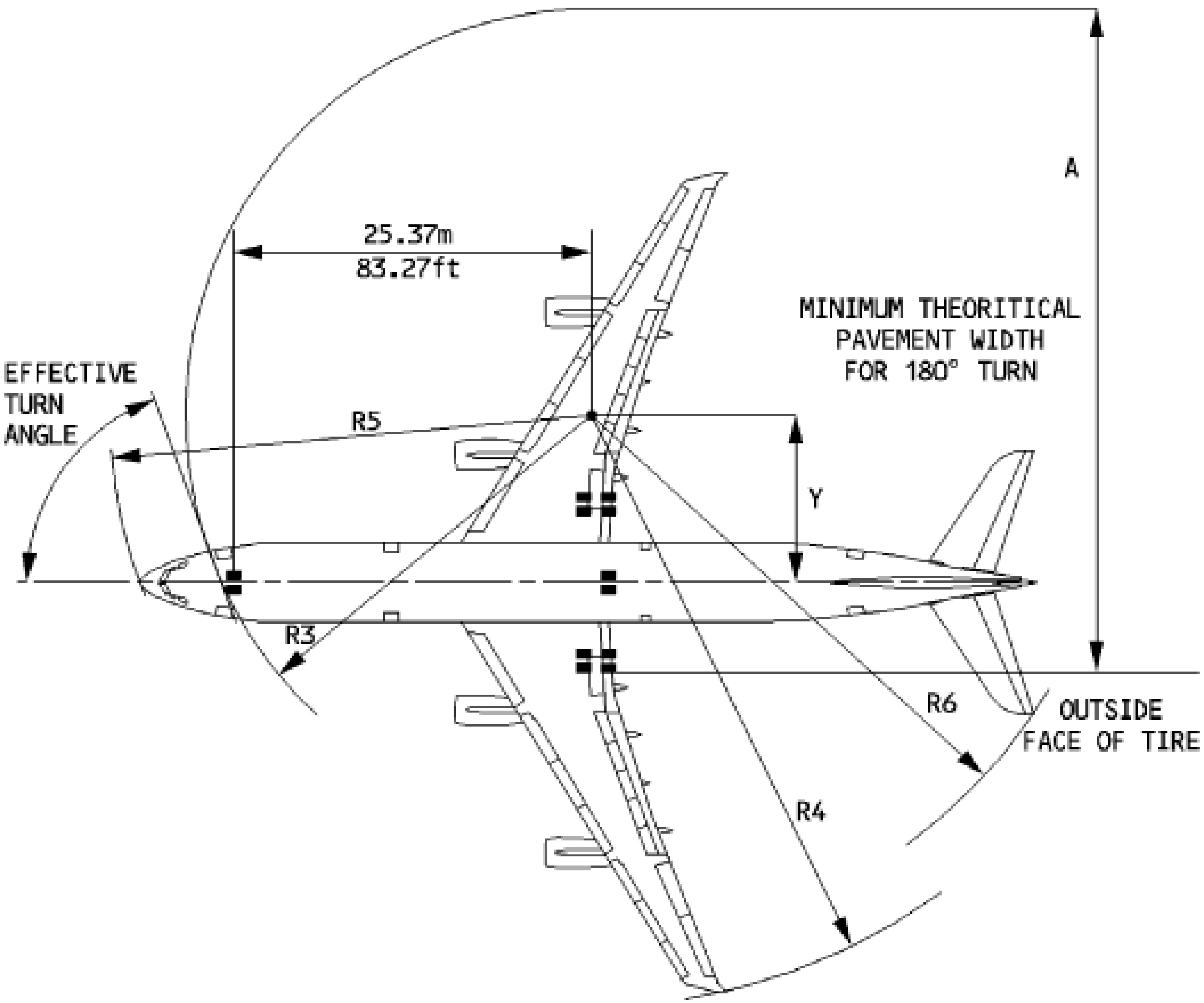
A340-200

NWS limit angle		65°
Y	14 m 46ft	
A	48m 157ft	
R3	28m 91ft	
R4	45m 148ft	
R5	33m 109ft	
R6	38m 124ft	



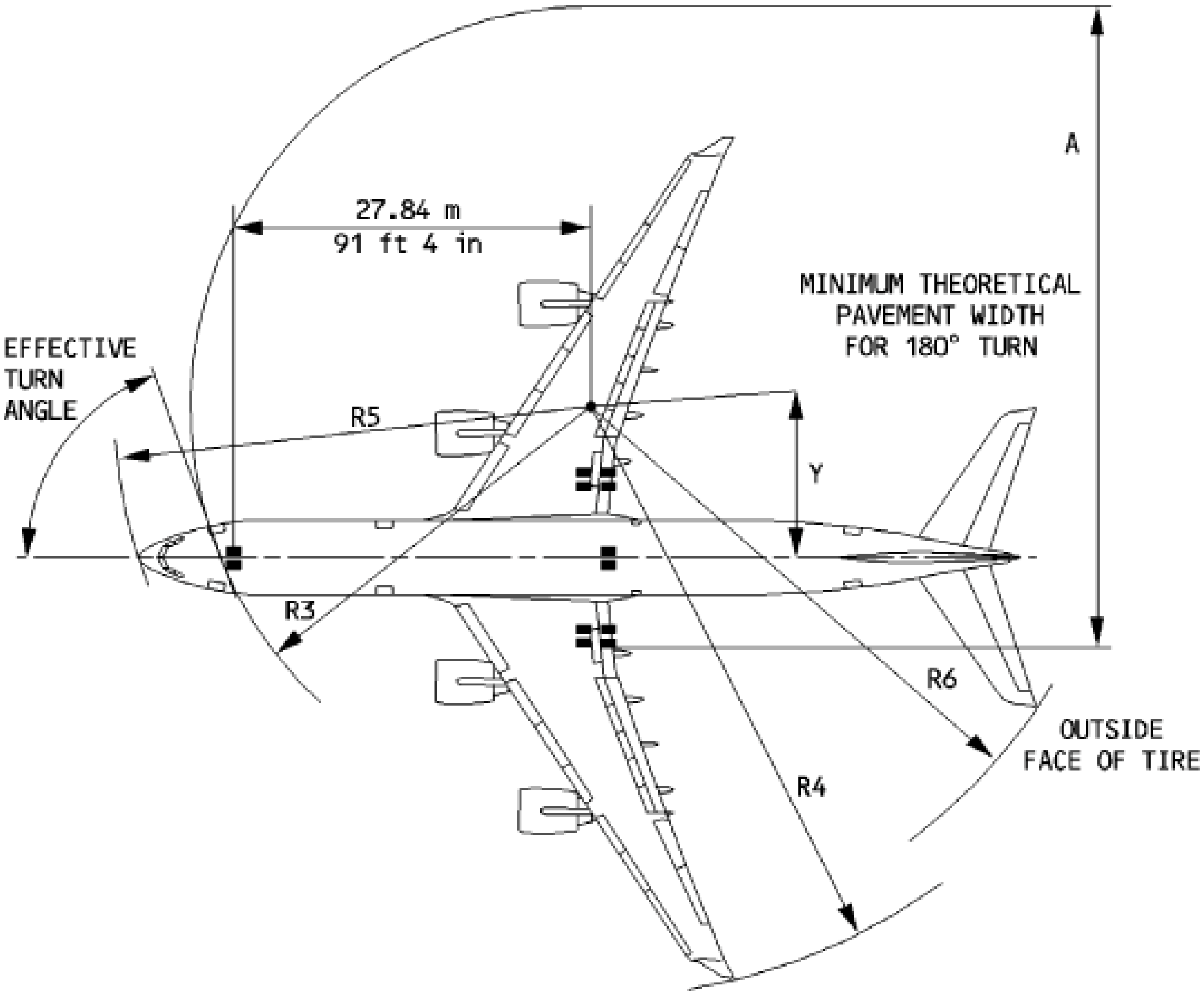
A340-300

NWS limit angle		72°
Y	13 m 43ft	
A	48m 157ft	
R3	29m 100ft	
R4	44m 144ft	
R5	35m 114ft	
R6	39m 128ft	



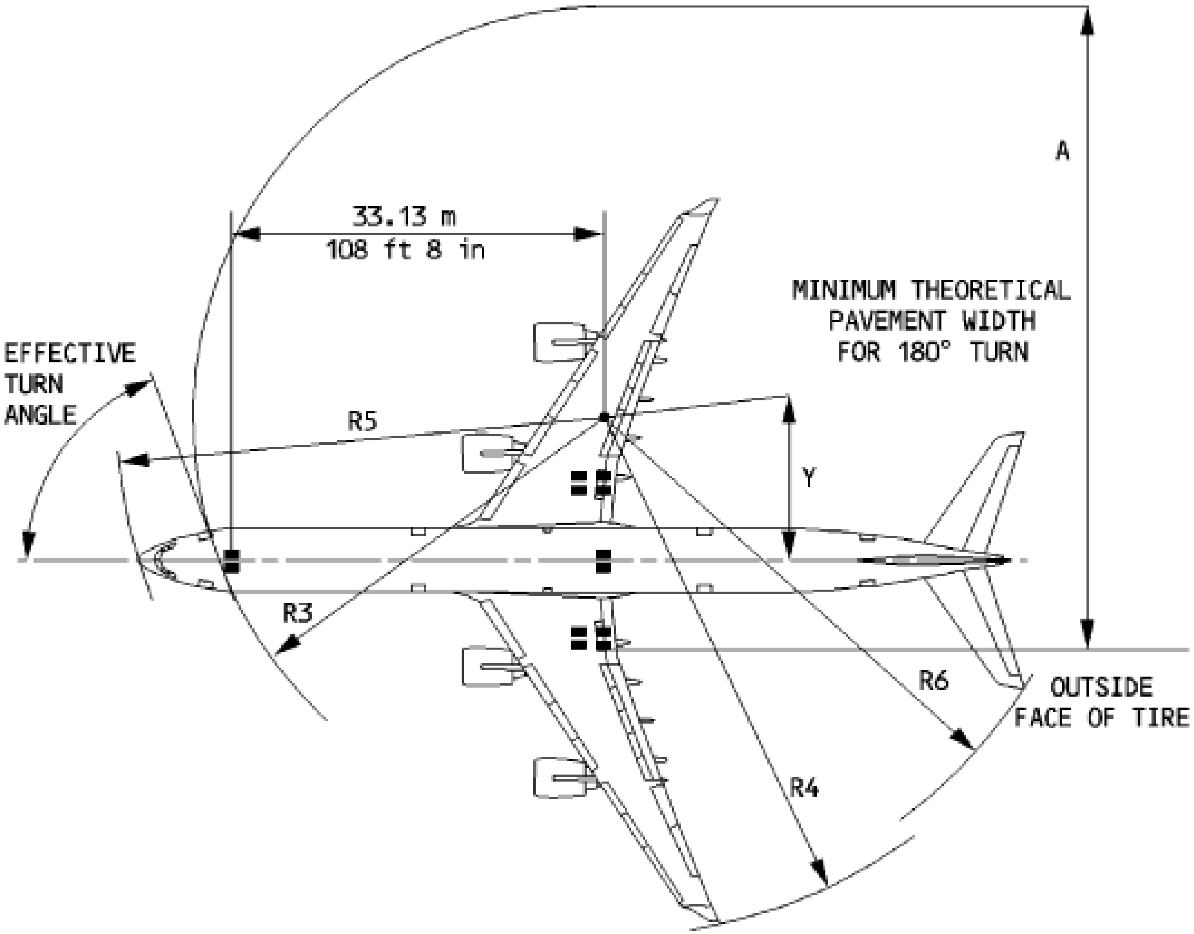
A340-500

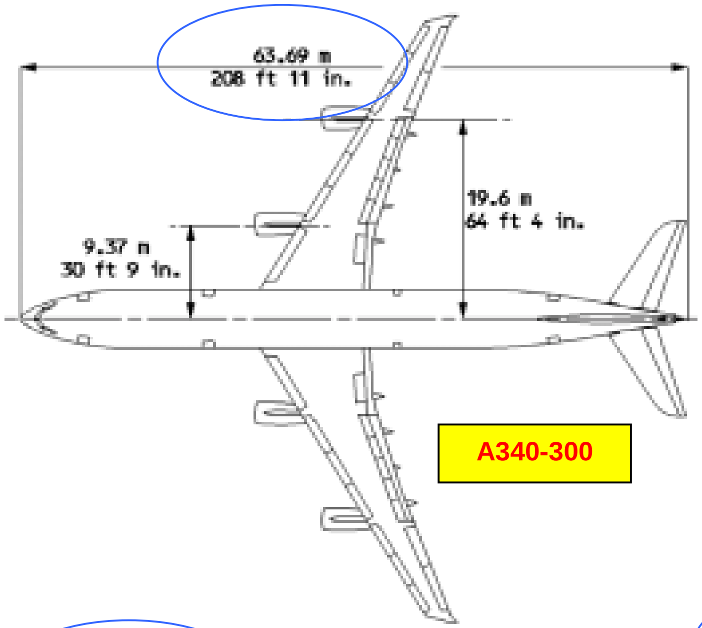
NWS limit angle		70°
Y	13 m 42ft	
A	50.5m 166ft	
R3	31.5m 103ft	
R4	46m 150.5ft	
R5	37m 121ft	
R6	41.5m 135ft	

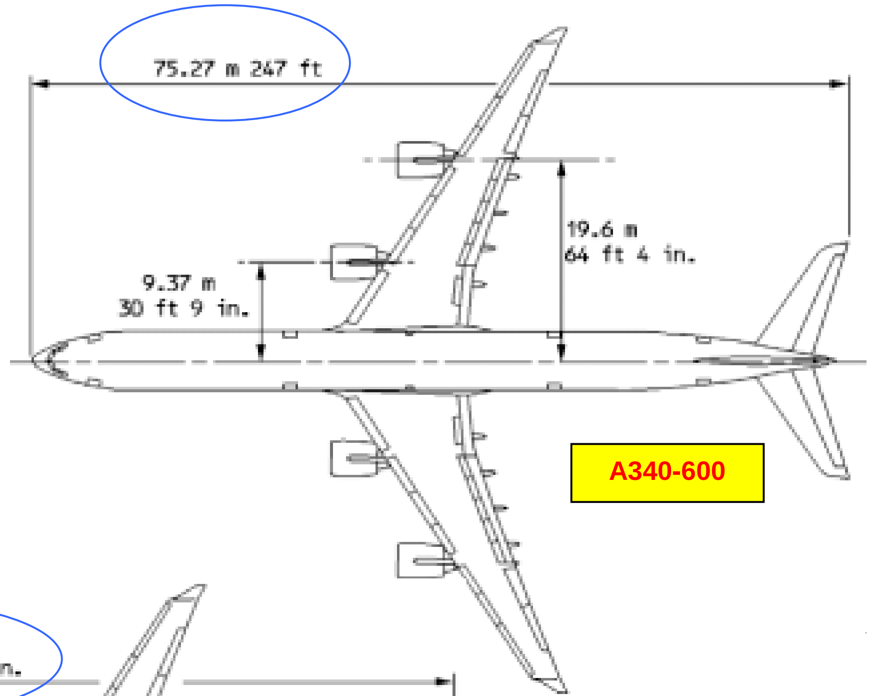


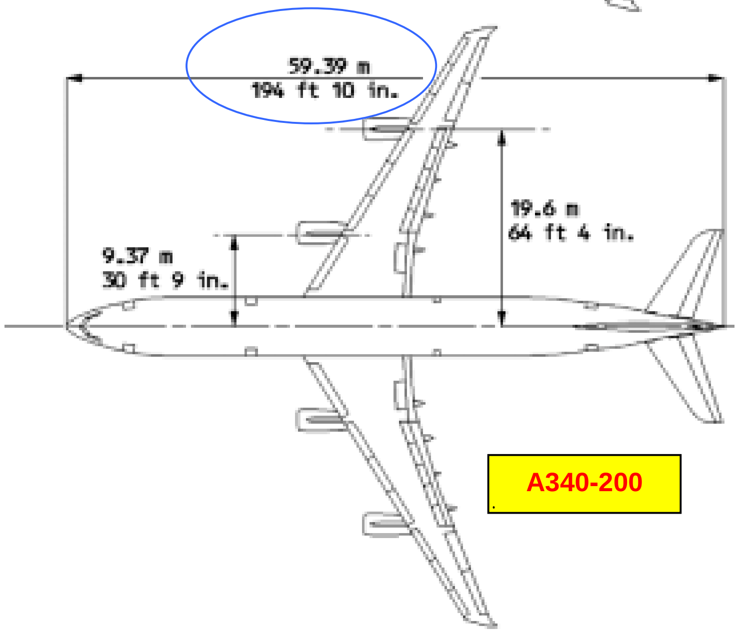
A340-600

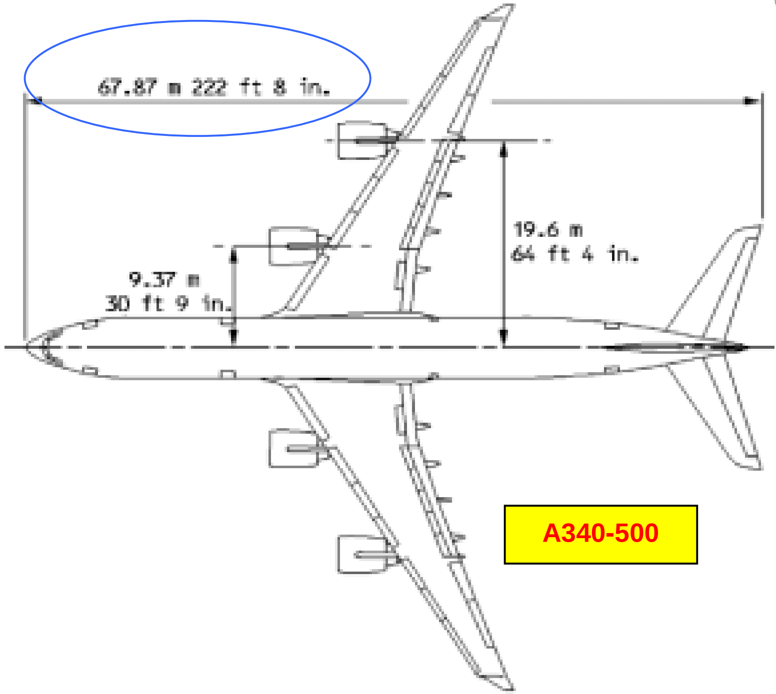
NWS limit angle		76°
Y	15 m 51ft	
A	59m 193ft	
R3	37m 122ft	
R4	48m 158ft	
R5	43m 140ft	
R6	45m 147ft	

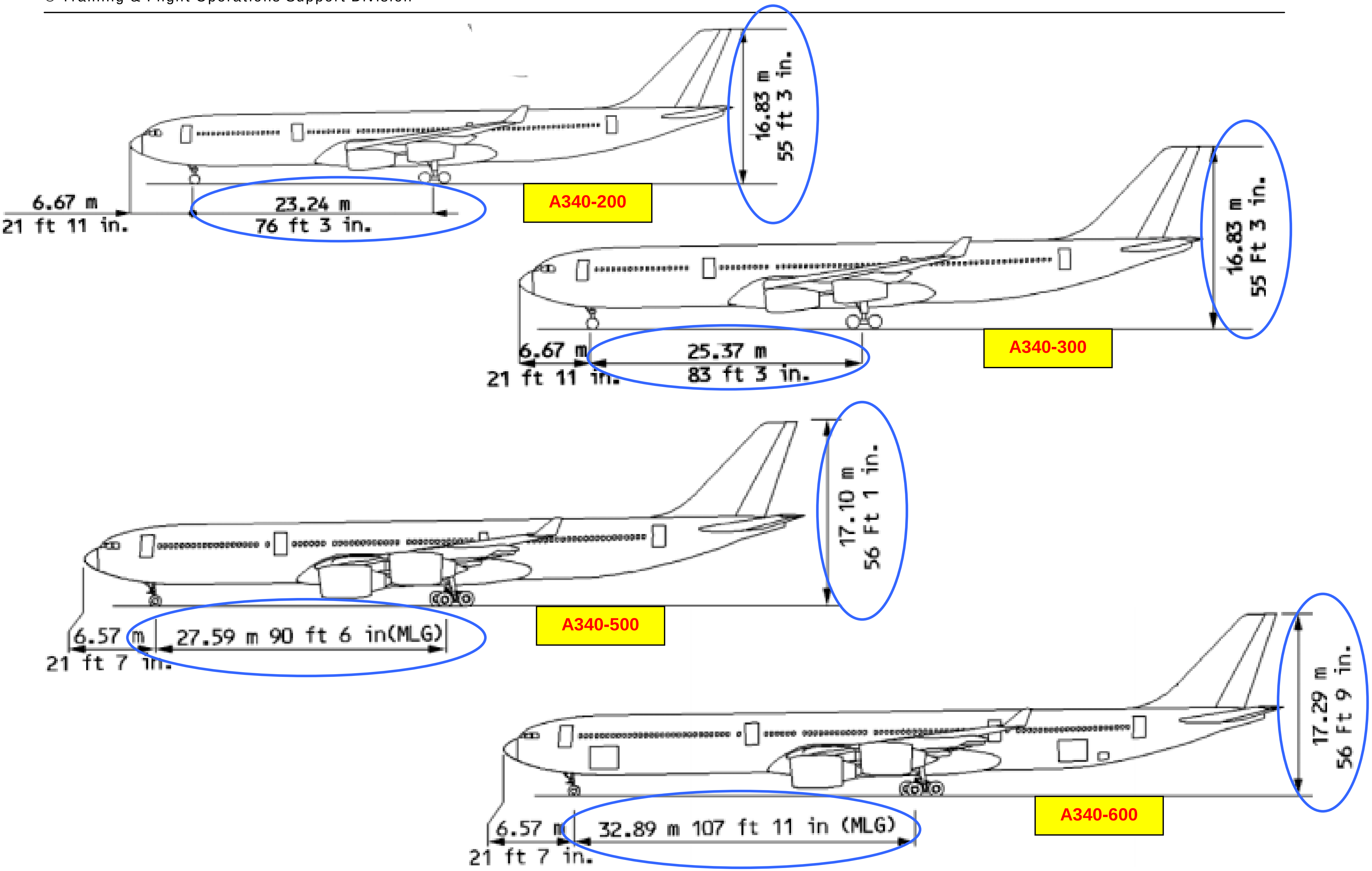


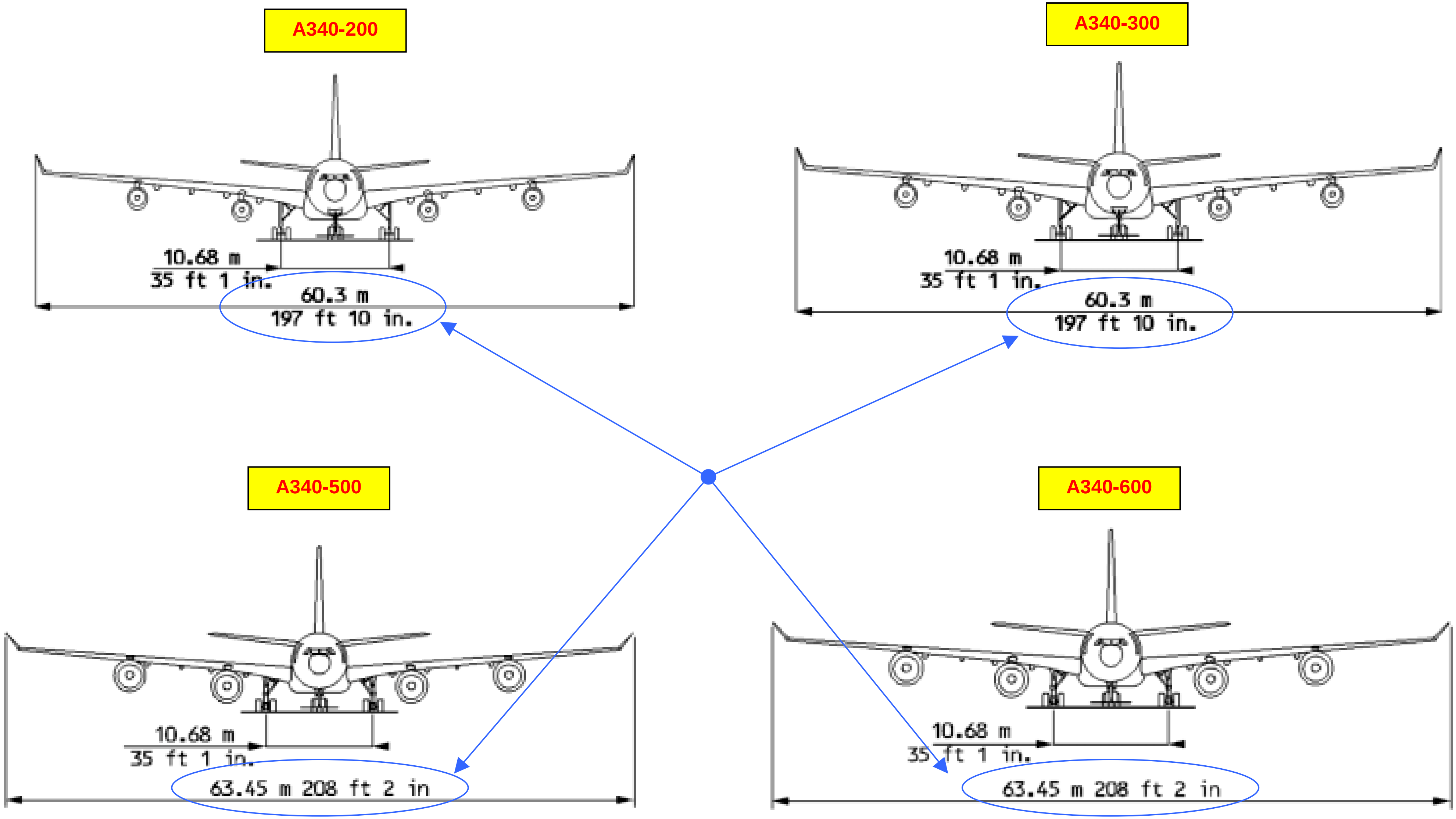

63.69 m
208 ft 11 in.
19.6 m
64 ft 4 in.
9.37 m
30 ft 9 in.
A340-300


75.27 m 247 ft
19.6 m
64 ft 4 in.
9.37 m
30 ft 9 in.
A340-600

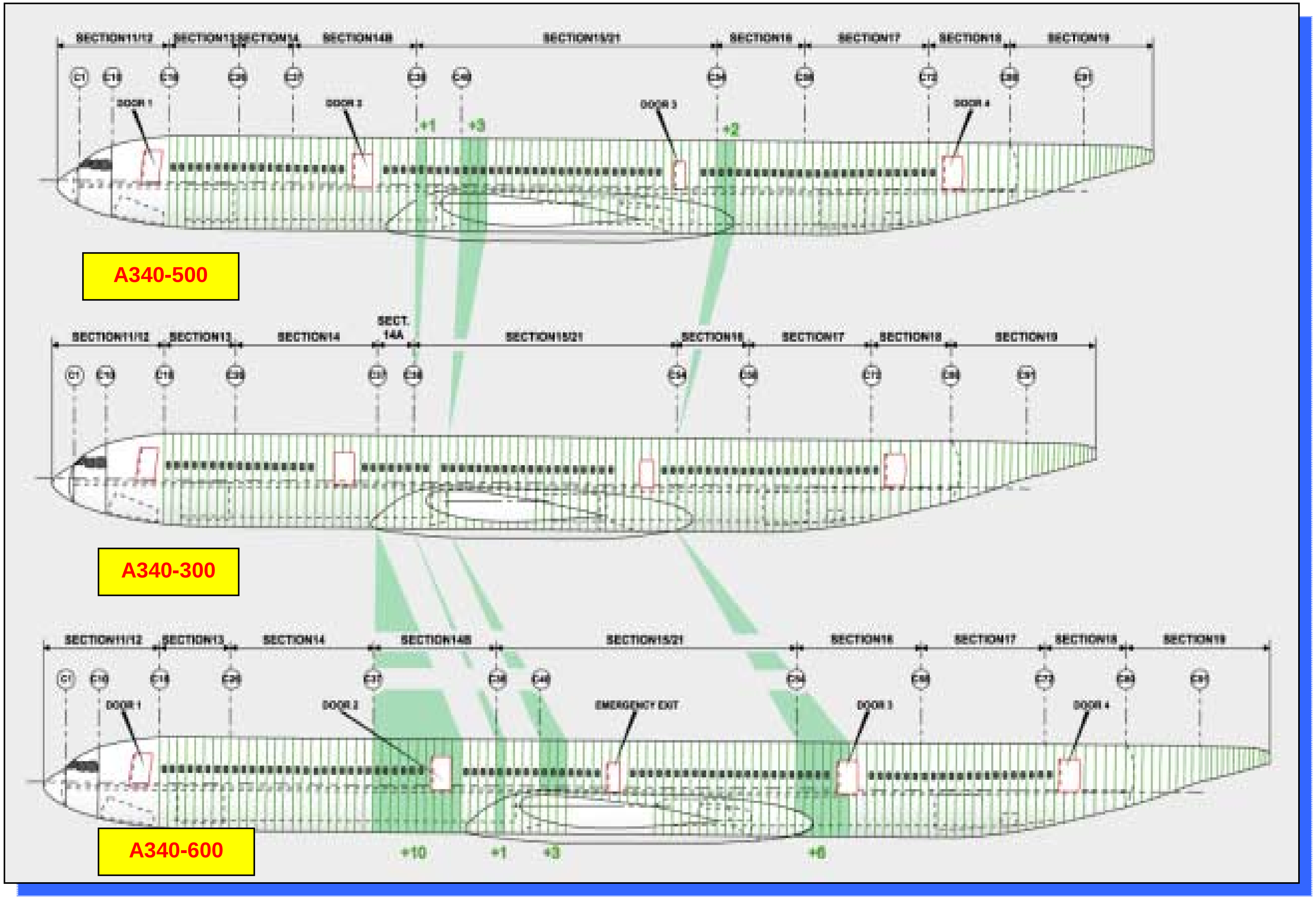

59.39 m
194 ft 10 in.
19.6 m
64 ft 4 in.
9.37 m
30 ft 9 in.
A340-200


67.87 m 222 ft 8 in.
19.6 m
64 ft 4 in.
9.37 m
30 ft 9 in.
A340-500


16.83 m
55 ft 3 in.
6.67 m
21 ft 11 in.
23.24 m
76 ft 3 in.
A340-200
16.83 m
55 Ft 3 in.
6.67 m
21 ft 11 in.
25.37 m
83 ft 3 in.
A340-300
17.10 m
56 Ft 1 in.
6.57 m
21 ft 7 in.
27.59 m 90 ft 6 in(MLG)
A340-500
17.29 m
56 Ft 9 in.
6.57 m
21 ft 7 in.
32.89 m 107 ft 11 in (MLG)
A340-600

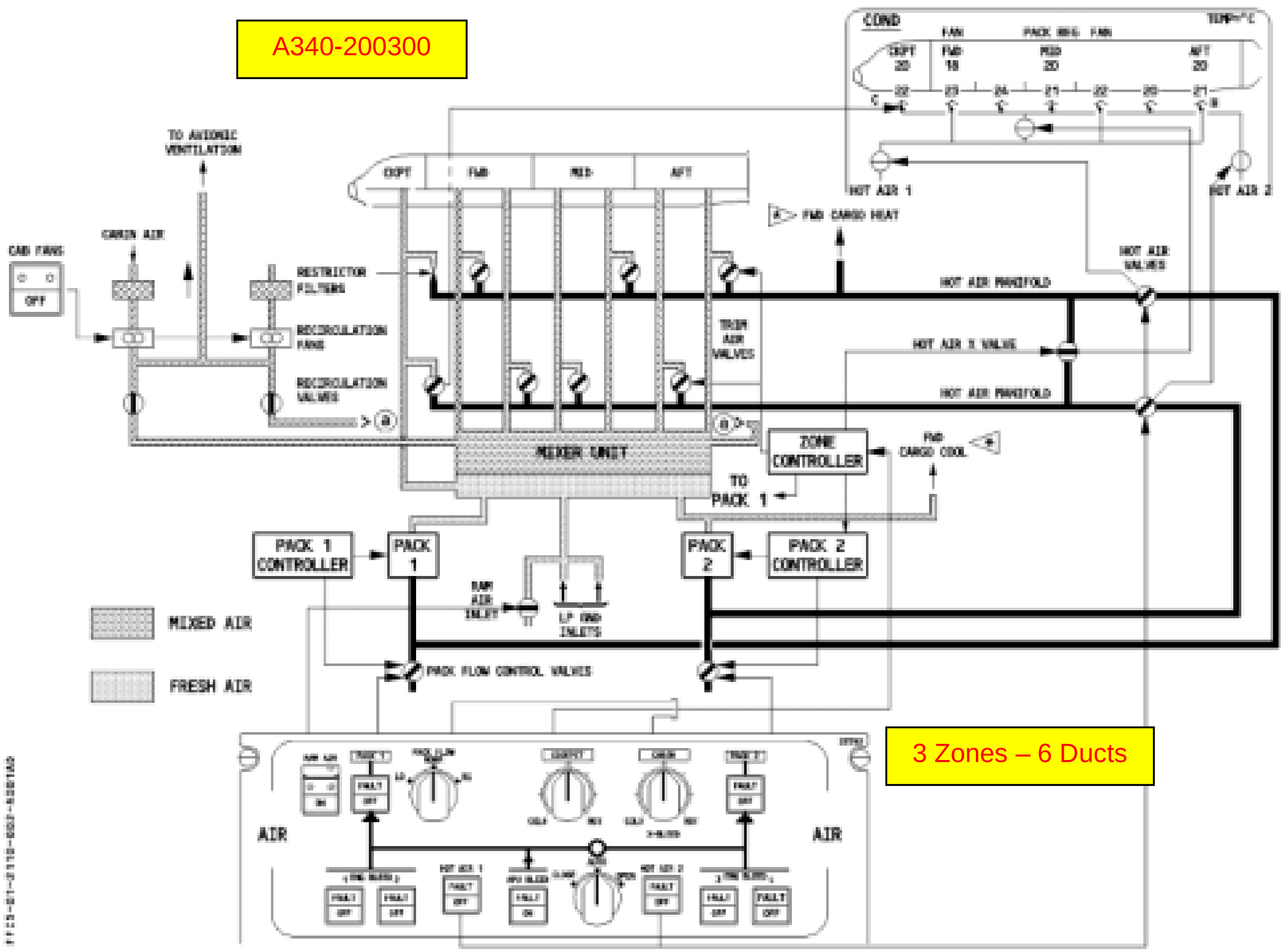

A340-200
10.68 m
35 ft 1 in.
60.3 m
197 ft 10 in.
A340-300
10.68 m
35 ft 1 in.
60.3 m
197 ft 10 in.
A340-500
10.68 m
35 ft 1 in.
63.45 m 208 ft 2 in
A340-600
10.68 m
35 ft 1 in.
63.45 m 208 ft 2 in

A340-500/600 Frame Additions



Chapter 2- ATA 21 Air Conditioning/Pressurization/Ventilation

A new Air Management system has been introduced on the **A340-500/600**, which adapts the pack flow and the recirculated flow to that value which is required to fulfill the actual cabin and cargo demands concerning airflow and temperature. By this, the fuel consumption influenced by the air conditioning system can be reduced, which results in many benefits for the airline. The goals of the Air Management System are to:

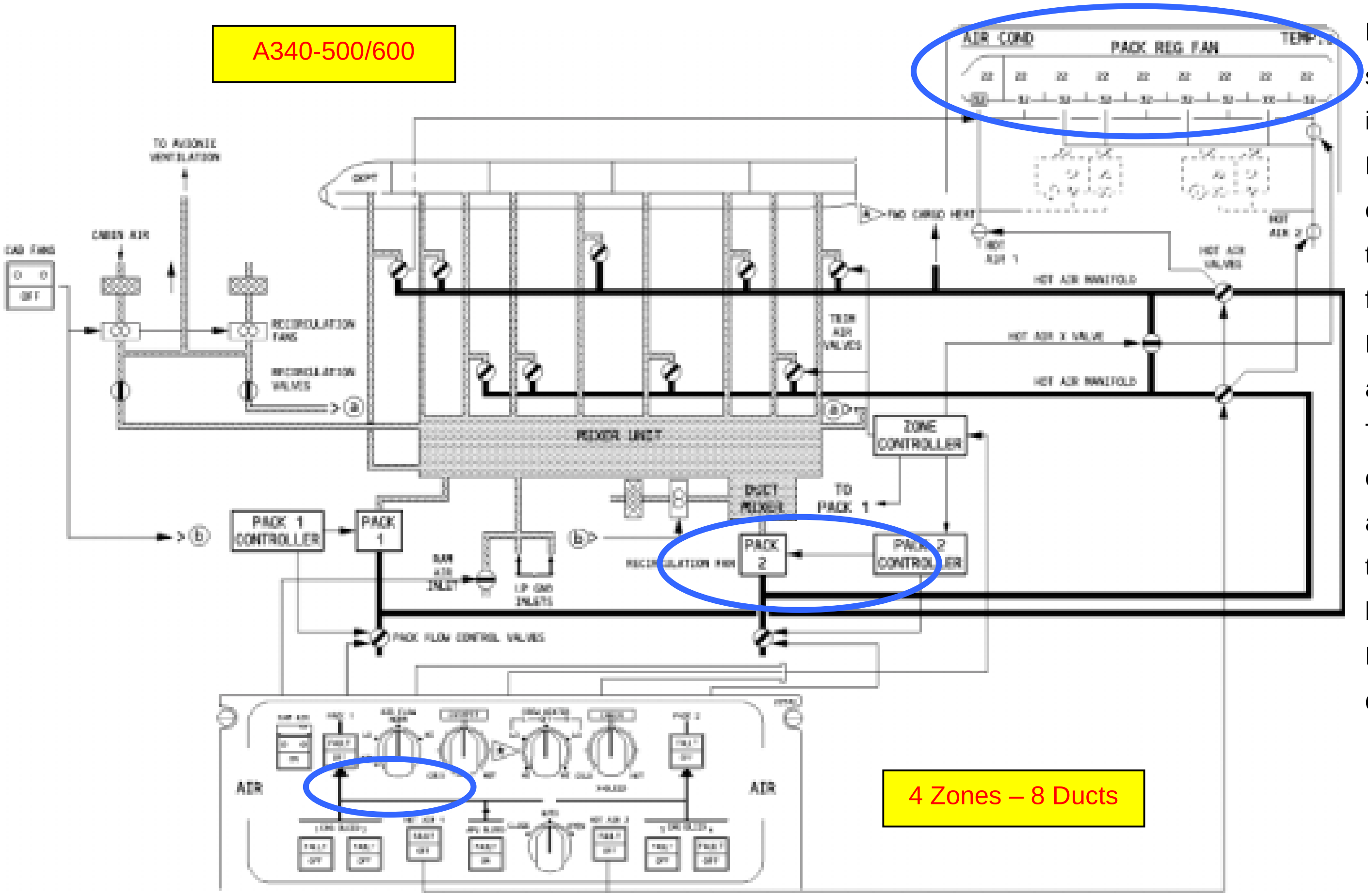


- Improve the fuel efficiency of the air conditioning system while keeping a high comfort level.
- Increase the humidity in the cabin for a higher passenger comfort.
- Maintain a constant ventilation rate in the cabin.

With the airflow control present on the **A340-200/300**, only the fresh (pack) airflow can be controlled. The recirculation airflow, supplied by today's constant speed recirculation fans, is a function of the pressure in the system and thus depends on the pack flow. Therefore, different flow selections result in different total airflows and air exchange rates. When the flow is selected (e.g. to save fuel, if the seats are not fully occupied), not only does the fresh (pack) airflow decrease but also the total (pack + recirculated) airflow. A high flow selection to increase the air exchange rate increases the fresh (pack) airflow by 20%. This increases fuel consumption on one hand, but, on the other hand the total airflow will only increase by 8% due to pressure increase on the system.

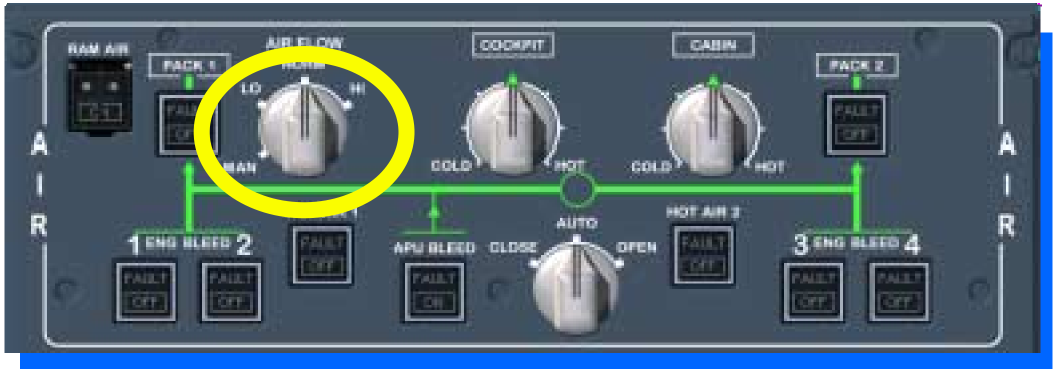
On the **A340-500/600,** the air exchange rate will be independent of the operating conditions, due to the introduction of variable speed recirculation fans and active recirculation flow control. Thus, if a lower flow is selected, fuel will be saved while the total airflow and its contribution to comfort is kept. Furthermore, with Air Management, the air exchange rate can be significantly increased with only a slightly increased fresh (pack) airflow. Air Management will improve fuel efficiency by controlling the fresh (pack) airflow according to the actual seat layout and the seat load factor.

Fresh air is supplied from the packs. This airflow directly affects the fuel consumption. The air is equally distributed over the whole cabin length. After leaving the cabin, this airflow is split: Some air will leave the aircraft through the outflow valves, the remainder will be recirculated by the recirculation system. Leakages are neglected. The air is equally distributed over the whole cabin length.



A340-200/300

A340-500/600



The **A340-500/600** airflow selector has four position: LO, NORM, HI and MAN.

- LO represents 80% of NORM flow, when there is no cargo cooling selection.
- HI is the equivalent of NORM flow + 200 pack airflow liters/sec.

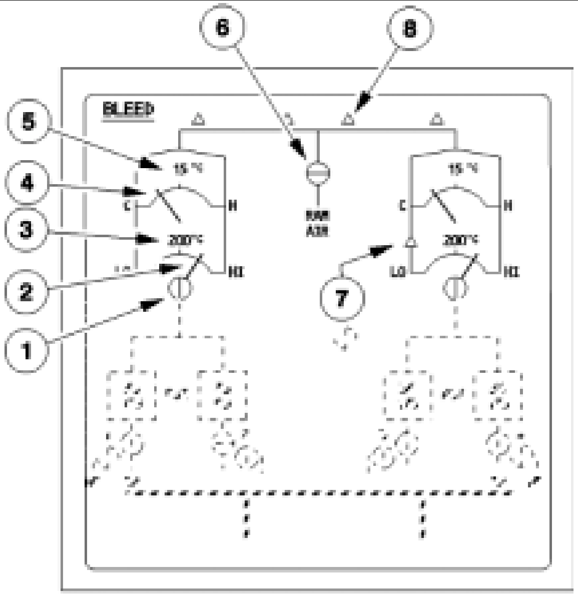
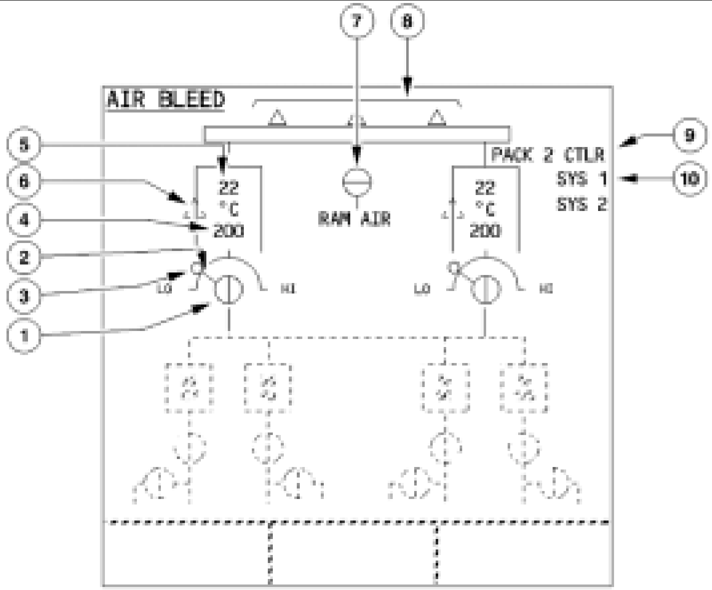
LO, NORM and HI operate with automatic air management system. MAN operates without air management system.

The air management system keeps the total airflow (pack airflow + cabin recirculated airflow) constant. It computes both the pack airflow quantity and the cabin recirculated airflow quantity taking into account:

- The airflow selector position;
- The number of passengers (which is enter in the MCDU INIT A page);
- The number of seats;
- The cargo cooling selection.

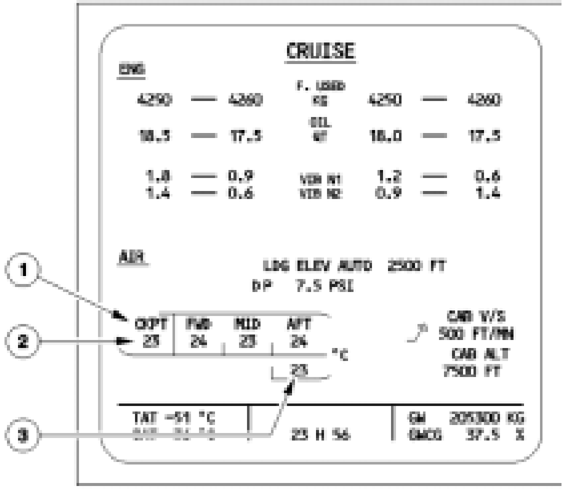
If one bleed fails, maximum flow is limited to 108%.
In single pack operations, or with APU bleed supply, any selection is irrelevant since, in such cases, a high flow is automatically regulated.

ECAM Bleed Page

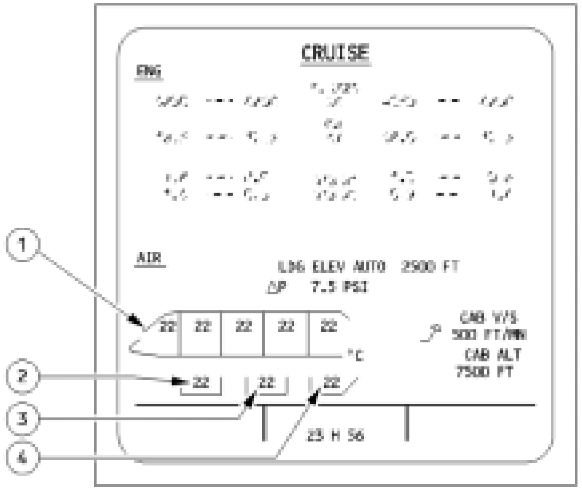
	A340-200/300	A340-500/600
		
1.	Pack flow control valve	Pack flow control valve
2.	Pack flow indication	Pack flow indication
3.	Pack compressor outlet temperature indication	Target airflow
4.	Temperature control valve position indication	Pack compressor outlet temperature indication
5.	Pack outlet temperature indication	Pack outlet temperature indication
6.	Emergency RAM AIR inlet indication	Bypass mode
7.	By pass valve indication	Emergency Ram Air inlet indication
8.	Users indication	Users indication
9.	-	Pack controller status
10.	-	Pack controller active system

ECAM Cruise Page

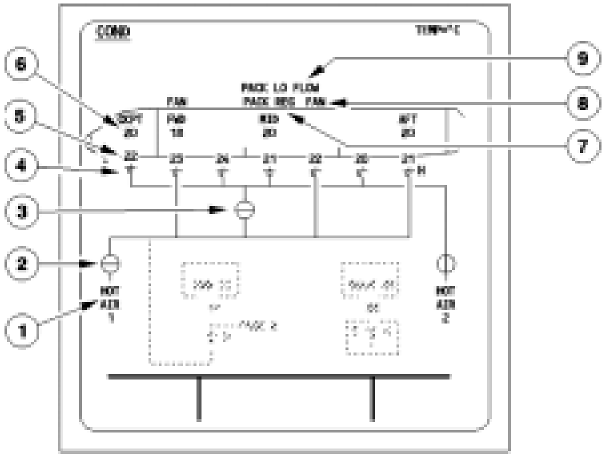
A340-200/300

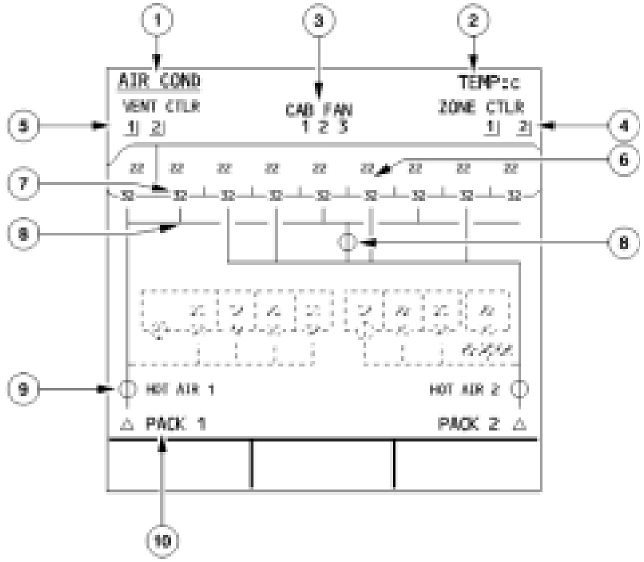


A340-500/600



ECAM Cond Page





A340-200/300/500/600 Generic Differences

- Eight Cabin Zones
- Flight deck mixed air supply
- Cockpit and crew rest compartment humidifier provisions
- Three recirculation fans with variable flow
- Increased number of recirculation filters

Chapter 3 – ATA 23 Communications

& Chapter 4 – ATA 24 Electrical

Airbus Flight Information Services (AFIS)

The AFIS concept is designed to allow the aircraft to receive data and communications from a number of external sources (satellite, data radio, gatelink, etc), and to use an onboard server distribute information and services to the various users. There will be dedicated terminals for the cockpit crew, cabin crew and maintenance personnel to allow access to operational information onboard. Passenger terminals and in-seat outlets will provide access to a variety of passenger services. The system will be standard on all **A340-500/600** aircraft.

Initially, the following applications are envisaged:

Flight Operations (cockpit crew)	Passengers	Maintenance
Pilot – Electronic logbook – Weight and Balance – Performance Data – Operational Checklists – Access to flight information services – Charts and Maps – Crew e-mail – Airline specific applications – A/C Documentation Cargo – Cargo Monitoring	Passengers – E-mail – Intranet – News/sports – Live television – Internet – E-commerce Cabin Crew – PAX data-base – Crew e-mail – Cabin E- Logbook – A/C Documentation – Credit Card validation – Cabin inventory – Quality monitoring – Reservation	Maintenance – Maintenance documentation (TSM,AMM) – Maintenance improvements (Tools) – A/C condition monitoring – Electronic logbook – Data loading – E-mail – Operational s/w and data-base storage – FOQA download – Equipment List

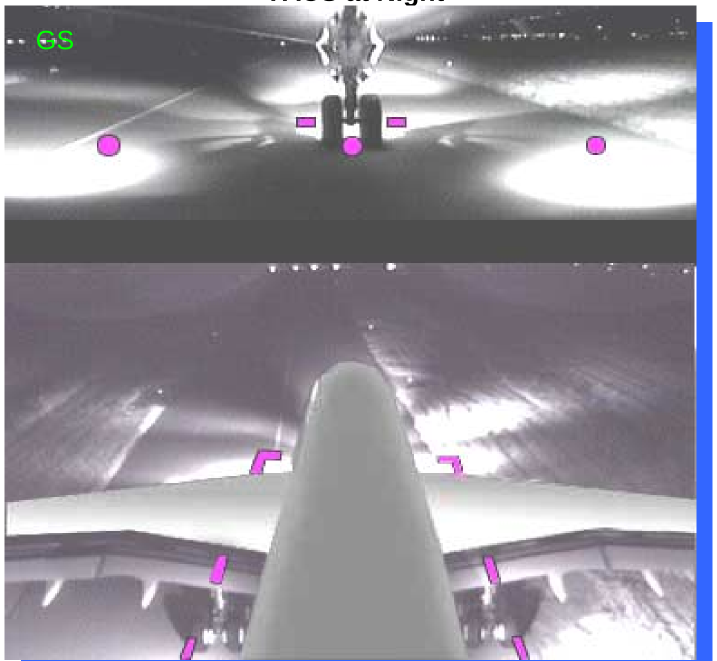
TAXI AID CAMERA SYSTEM (TACS)

The wheel track of the **A340-500/600** is unchanged from the **200/300**, but the wheelbase is significantly increased in the case of the **A340–600** (from 25m to 33m). The **A340-600** should be able to operate easily at any airport, but taxi-way turns of over 45 degrees will require an "oversteering" technique, i.e. maintaining the nosewheel to the outside of the centerline during the initial part of the turn. This technique is already standard practice on most large aircraft, but to help pilots become accustomed to the **A340–600**, and to give confidence on narrow taxiways, the **A340–600** will have a Taxi Aid Camera System (TACS).

The TACS consists of two externally-mounted video cameras, one on the fin looking forward along the fuselage, and the other under the belly looking forward towards the nosewheel. These will provide a composite display, which will be available by selection on either the PFD or SD cockpit screens. Symbology will be added to the displays to assist maneuvering, and external lights provided to ensure the system is usable at night. The TACS will be standard equipment on the **A340–600**, and optional on the **A340–500.** It is intended as an aid to pilots and is a "go item".

TACS in Daylight

TACS at Night



Taxi Aid Camera Control Panel

The electrical system on the **A340-500/600** is nearly identical to that on the **A340-200/300**, with the same architecture and operating procedures in both normal and failure cases. Integrated Drive Generator (IDG) values have, however, increased from 75kVA to 90kVA and a new feature has been added to the **A340-600** in the form of the Electrical Load Management System (ELMS).

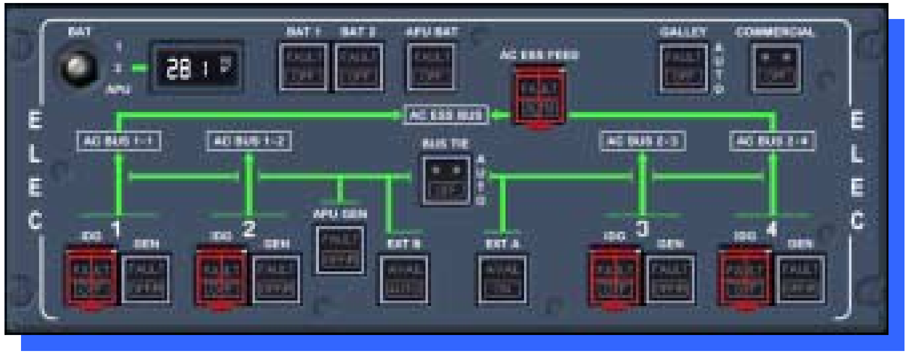
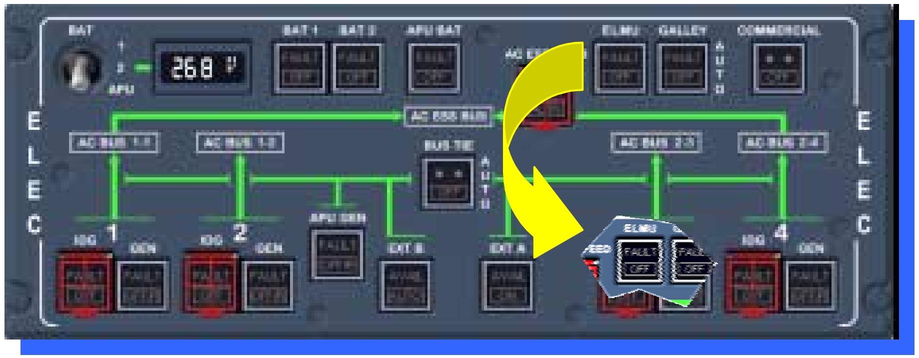
The ELMS system:

- gives better availability of cabin electrical loads when not enough electrical power is available
- ensures optimum use of electrical power sources in case of overload
- automatically reconnects electrical loads when electrical power has been restored

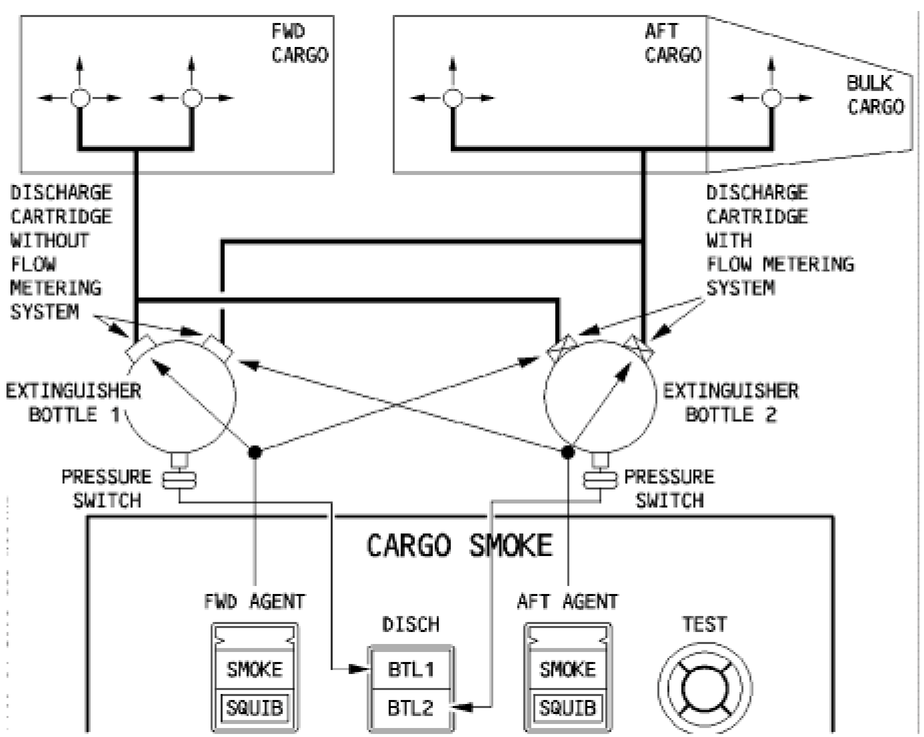
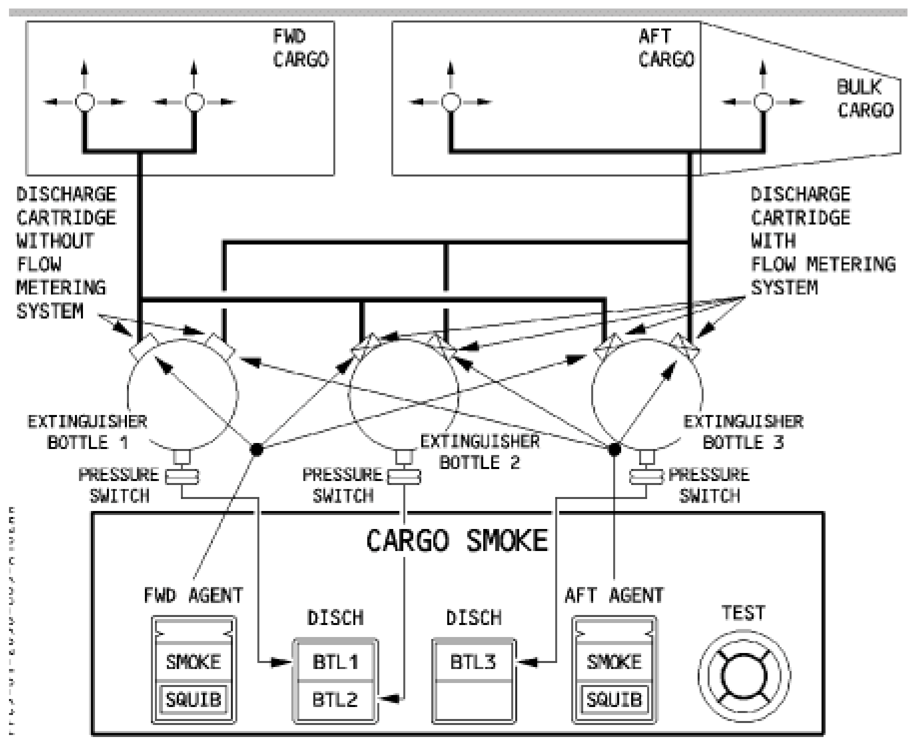
The ELMS carries operational software and a database, which may be customized by airlines. It defines:

– 3 priority levels of loads affecting passenger comfort and cabin crew workload.
– Internal priority orders for some systems (In Flight entertainment, airflow management system…) used to switch off/reconnect some systems in predefined order.

Overhead Panel

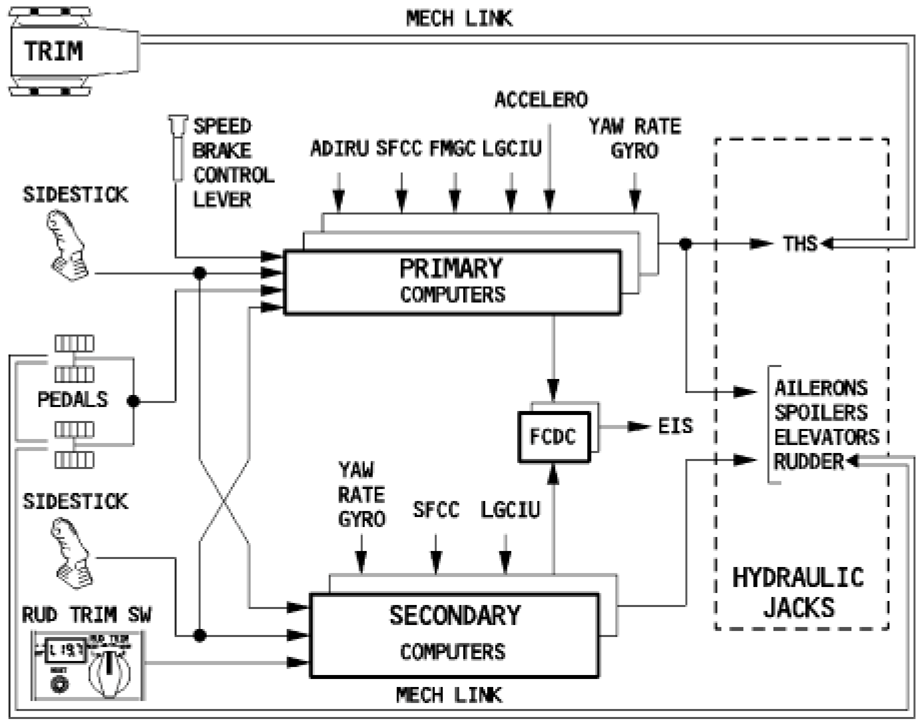
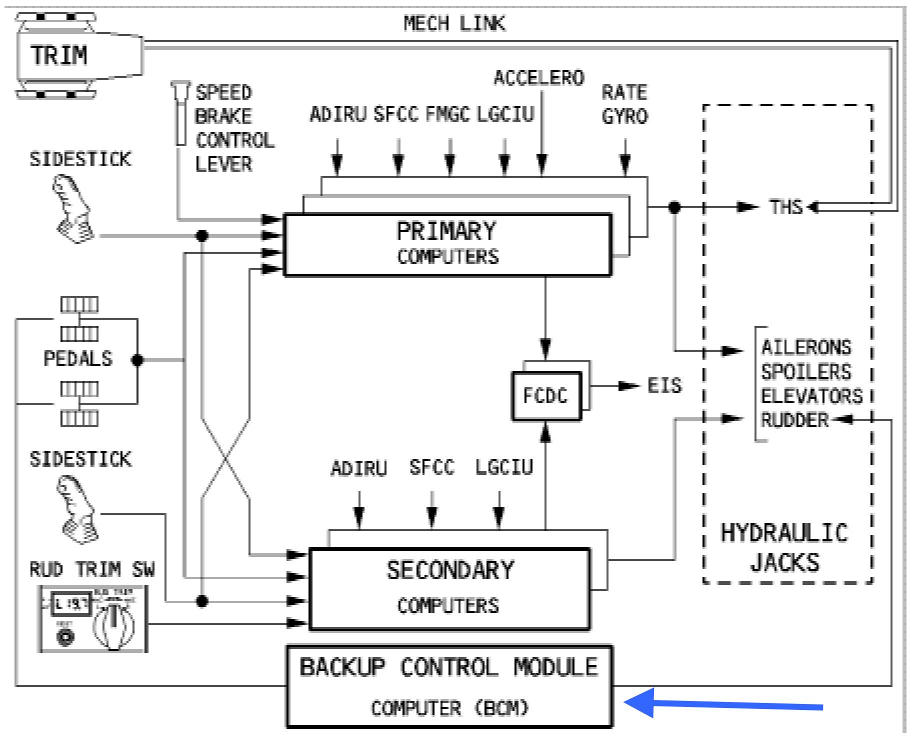
A340-200/300	A340-500/600
	

Chapter 4 – ATA 26 Fire Protection

A340-200/300/500	A340-600
	

There are two continuous loops for fire detection in the main landing gear bay on board **A340-600**, which are not present on **A340-200/300/500**. Each fire detection loop comprises two fire detectors connected in parallel. The fire detectors are installed by pair (loop A/loop B).There are no significant changes to the overhead control panel.

Chapter 5 – ATA 27 Flight Controls

A340-200/300	A340-500/600
	

In the **A340-200/300**, the pilot's rudder commands are transmitted through mechanical linkages to the hydraulically-actuated rudder. The rudder is also used to provide roll control, in the event of a total flight control computer failure (mechanical back up mode).
The **A340-500/600** will have an "electric rudder", meaning that the mechanical links between the pedals and hydraulic actuators are replaced by electrical signalling of pilot yaw commands. However, the rudder will still be hydraulically-actuated as for the **A340-200/300**. This modification produces many benefits, including the removal of several mechanical components such as the Yaw Damper, the Back up Yaw Damper (BYDU), the Rudder Travel Limiter (RTLU), and the Pedal Travel Limiter (PTLU). It will also allow easier and more effective incorporation of the rudder into the turbulence damping modes of the flight control system. Although electrically-signalled, the rudder will retain its function as a back up flight control by virtue of a back up electrical power supply (powered by either the blue or yellow hydraulic system), and an autonomous back up control module, independent of the flight control computers.

Handling Qualities/ General

	A340-300	A340-500	A340-600
MTOW MLW PAX (3-class)	271t 186t 295 seats	372t 240t 313 seats	365t 254t 380 seats
Wing load	735 daN/m2	834 daN/m2	819 daN/m2
Powerplant	CFM56-5C4 (34,000lbs)	Trent 553 (53,000lbs)	Trent 556 (56,000lbs)
Nominal Range	7150 NM	8500NM	7500NM
MMO/VMO MD Cruise MN Approach speed MLW V2 conf3 SL MTOW	0.86/330 0.93 0.82 136 157	0.86/330 0.93 0.83 146 179	0.86/330 0.93 0.83 151 179
CG Range CG	<17%-43%> 26%	<19%-44%> 25%	<12%-45%> 30%

	A340-300 /34k	A340-500 /53k	A340-600 /56k
VMCA	124	128.5	130.5
VMCL	125	130	132
VMCG	126.5	140	136
VMCL-2	157	154	157

Handling Qualities/ Characteristic speeds

Higher wingload and longer fuselage on the **A340-500/600** than on the **A340-200/300** necessitates:
- Higher operational speeds (about 15kts increase on Vapp, VFE, Flaps Auto Retraction Speed)
- More "VMU limited" at takeoff
- Approach speed could potentially be "geometrically limited" at landing
- Higher TO/LDG speeds than on the **A340-200/300.**

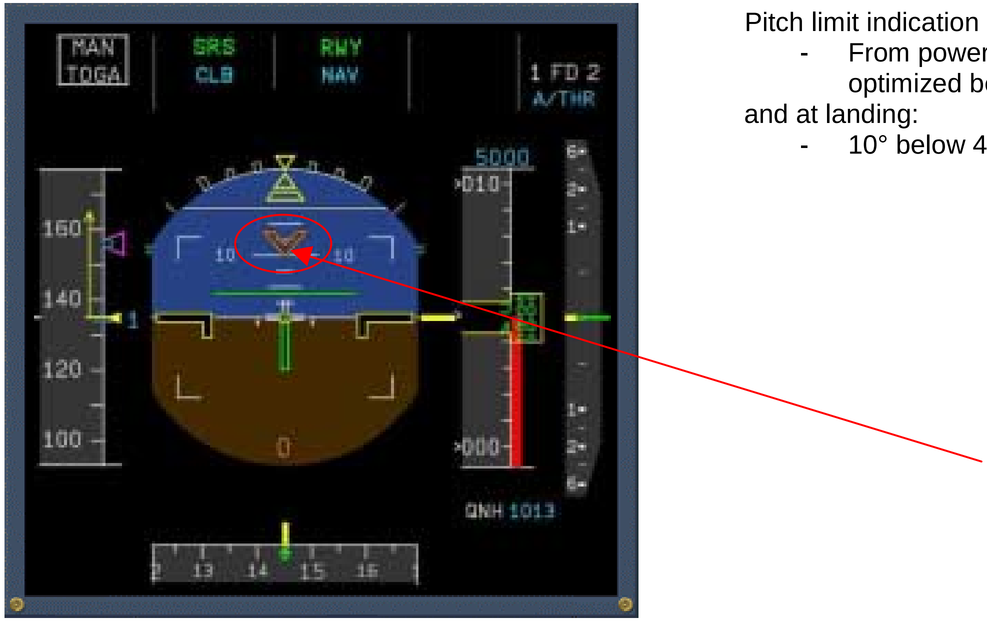
When in de-icing conditions, the same handling qualities and performance are targeted on the **A340-600** as on **A340-300**. To achieve this, Slats 3 & 4 are de-iced (slats 4,5,6,7 de-iced on the **A340-300**)

Tail strike Prevention

Tail Strike prevention on the A340-500/600 is aided by:

- **Pitch Limit indication** at T/O and landing (below 400 ft RA).
- **Pitch trim disagree if the** ECAM message in comparison to the:
  - MCDU PERF T/O value
  - Aircraft-calculated value
  - Actual T/O trim setting

- **Tail Strike Sensor** triggering an ECAM warning, if tail strike is detected.



Pitch limit indication is provided at Takeoff:

- From power application to 3 sec after take off where maximum pitch attitude is optimized between 9.5° and 14°

and at landing:

- 10° below 400 feet/AGL

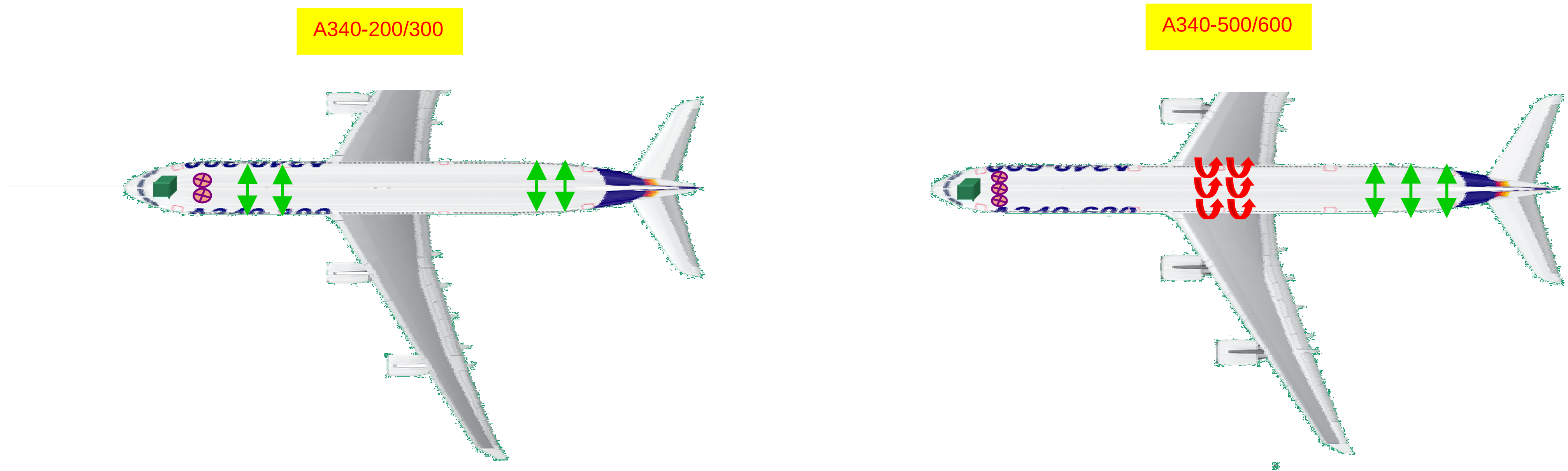
Additional evolutions have resulted in the following to the A340-500/600:

– Ailerons:
- Ailerons have a centering mode, which has improved behavior characteristics in failure instances.
- Uses of ailerons as lift dampers at landing or rejected take off.

– Improved interface with Flight Guidance:
- Inner loop with the Flight Control Primary Computer (FCPC) improves synchronization.
- Autopilot disconnects with rudder pedals inputs.
- Autopilot available with rudder trim failure.

Turbulence and Structural Mode Damping

The increased length of the **A340-600** means that the structural mode oscillation frequencies will be lower than on the **A340-200/300** and, therefore, closer to the handling mode frequencies. The flight control laws have been redesigned on the **A340-500/600** to damp out structural oscillations and to improve turbulence damping. This has been, in part, helped by a change to the flight control system architecture, such that the autopilot inner loop computations are now carried out by the Primary Flight Control Computers (PRIMs), rather than the Flight Management and Guidance Computers (FMGCs). Previously, the IRSs were used as sensors for the handling functions and separate accelerometers used for comfort functions. Now all sensors, including some additional gyrometers, will be used for both handling and comfort functions.



Accelerometers used for comfort functions.

All sensors used for handling **and** comfort functions.

Nz accelerometers Gyrometers Ny accelerometers Inertial Reference System

Chapter 6 – ATA 28 Fuel System

The fuel system of the **A340-500/600** aircraft differs significantly from the **A340-200/300**. The principal reason for the difference is the change of the wing design, resulting in an increase in the wing sweep. The effect of this is to change the trajectory of any debris from an uncontained engine rotor failure, preventing the use of similar tank boundaries similar to those on **A340-200/300**. The increase in Fuel Volume (approx. +30%) has led to additional changes to the system architecture, to fulfill the requirement for increased refueling flow rates (400,000 liters/hour). The new engines mean that there will be an increase in engine burn rates associated with the new aircraft.

FUEL TANK ARRANGEMENT

The fuel tanks on **A340-500/600** now comprise an:

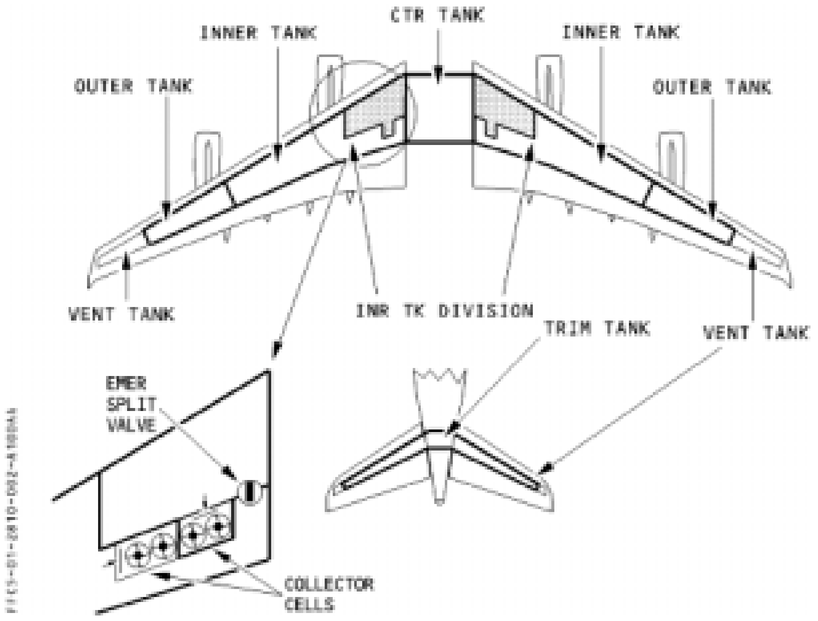
- Outer Engine Feed Tank (Inner tanks 1 & 4 to 27 tons)
- Inner Engine Feed tank (Inner tanks 2 & 3 to 20 tons)
- Outer tank (5 tons).

The extra tank has led to extra pipe work: Valves for refueling and Vent systems to that tank.

- Center tank, increased to 43 tons.
- A rear center tank (16 tons) #
- New all composite Trim Tank to 6.5 tons

A340-500 only

A340-200/300



Depending on the specific aircraft in question, the maximum usable fuel quantities on board **A340-200/300** may be one of two possible values. With regards to fuel quantities, care must be advised in checking the values given below to a given aircraft MSN. The fuel on the **A340-200/300** is stored in the following tanks:

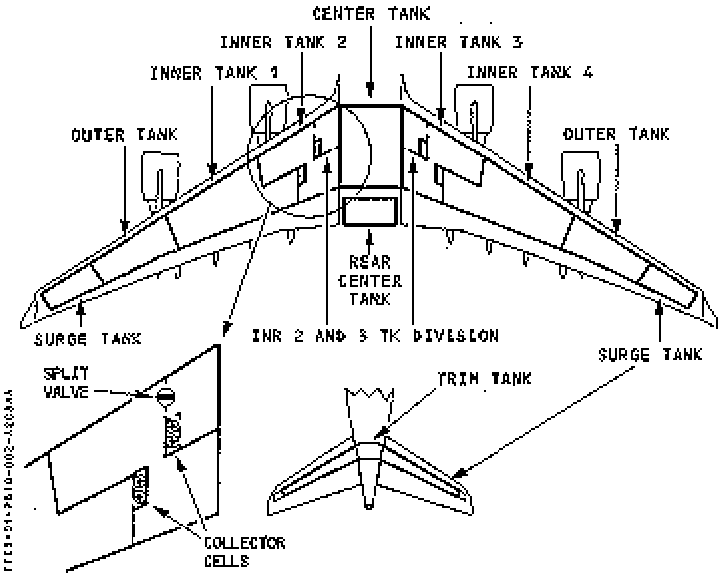
- In both wings : An outer tank
  An inner tank
- A center Tank
- A trim Tank

Vent tanks are located next to the outer and trim tanks, to allow for an overflow from the other tanks and provide gaseous ventilation.

USABLE FUEL						
		OUTER TANKS (each)	**INNER TANKS (each)**	**CENTER TANK**	**TRIM TANK**	**TOTAL**
VOLUME	(liters)	(3688 / 3650)	(42194 / 42775)	41720 / 42420	6121 / 6230	139605 / 141500
	(US gallons)	(975 / 964)	(11147 / 11301)	11022 / 11207	1617 / 1646	36883 / 37383
WEIGHT*	(KG)	(2895 / 2865)	(33122 / 33578)	32750 / 33300	4805 / 4890	109589 / 111078
	(LB)	(6387 / 6315)	(73024 / 74033)	72205 / 73417	10593 / 10782	241620 / 244896

* fuel specific gravity: 0.785kg/l or 6.551lbs/US Gal

A340-500



The addition of a rear center tank to the **A340-500 substantially** increases the aircraft's gross fuel weight, the quantity of which is dictated by specific MSN number. The tank is located in front of the aft Cargo Compartment and to the rear of the main landing gear. The fuel on the **A340-500** is stored in the following tanks:

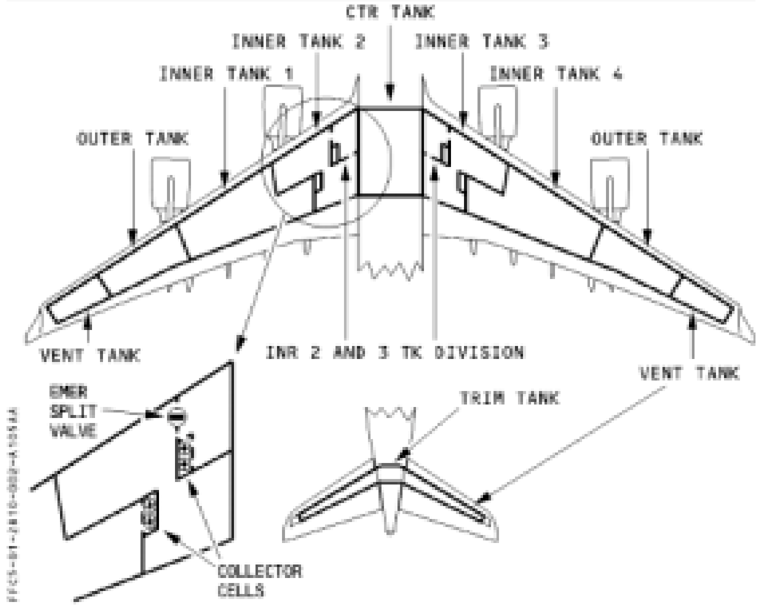
- In both wings: Two inner tanks
  An outer tank
- A center tank
- A trim tank
- A rear center tank

Surge tanks are located next to the outer tanks and trim tanks to allow for overflow and gaseous ventilation. The modification of the two inner tanks has also led to a change in the collector cell arrangement, which may be seen in the opposite diagram.

USABLE FUEL								
		OUTER TANKS (each)	INNER TANKS 1 and 4 (each)	INNER TANKS 2 and 3 (each)	CENTER TANK	REAR CENTER TANK	TRIM TANK	TOTAL
VOLUME	(liters)	6145	24501	34757	54969	20042	8361	214178
	(US gallons)	1624	6473	9183	14523	5295	2209	56586
WEIGHT*	(KG)	4824	19233	27284	43151	15733	6563	168130
	(LB)	10636	42406	60157	95139	34688	14471	370694

* fuel specific gravity: 0.785kg/l or 6.551lbs/US Gal

A340-600



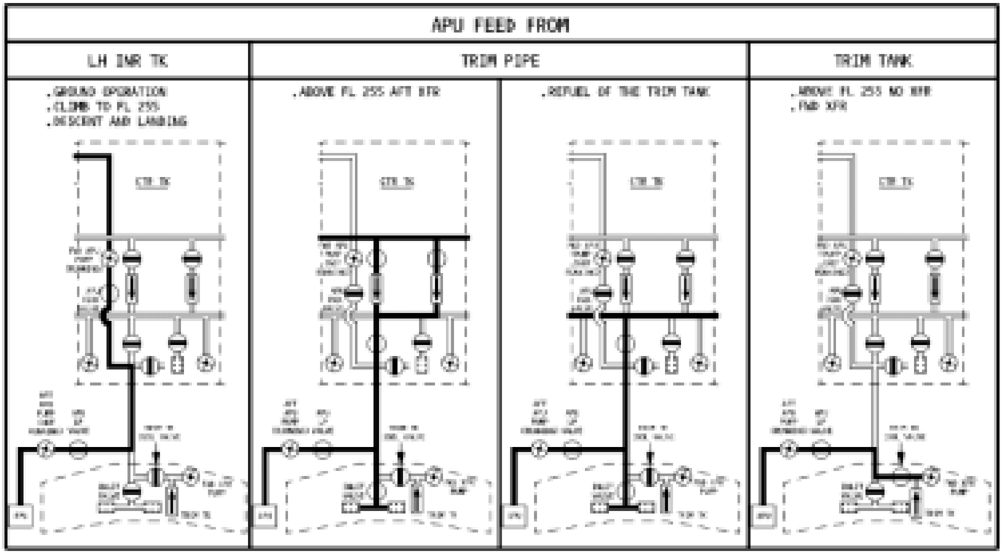
Despite the lack of a rear center tank, the **A340-600's** larger wing means that significantly more fuel may be stored than on the **A340-200/300**. All tank quantities have, therefore, increased on the **A340-600,** resulting in an aircraft whose fuel volume has increased by 30%.The fuel on the **A340-600** is stored in the following tanks:

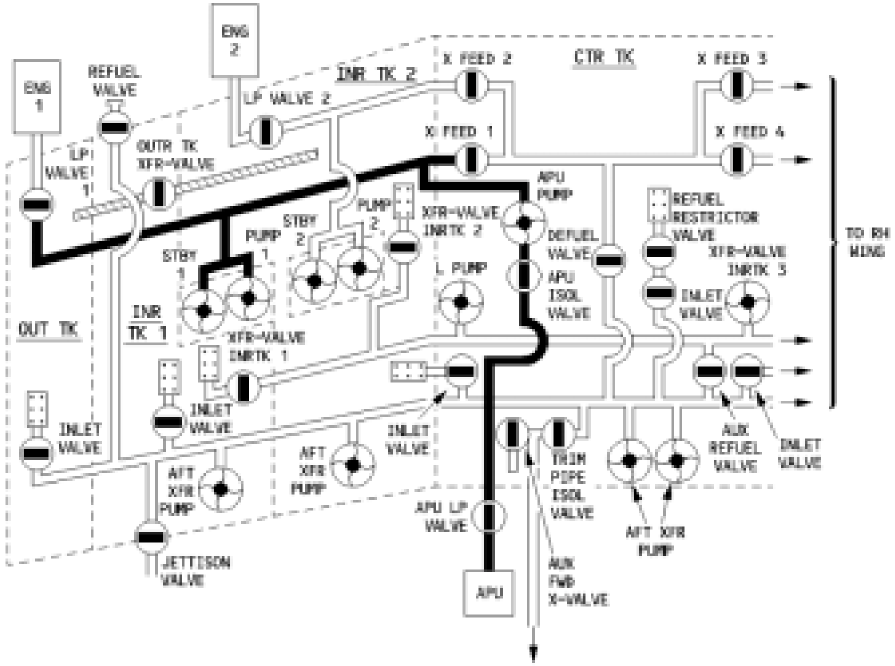
- In both wings: Two inner tanks
  An outer tank
- A center tank
- A trim tank

USABLE FUEL							
		OUTER TANKS (each)	**INNER TANKS 1 AND 4 (each)**	**INNER TANKS 2 AND 3 (each)**	**CENTER TANK**	**TRIM TANK**	**TOTAL**
VOLUME	(liters)	6145	24105	34757	54969	8361	194136
	(US gallons)	1623	6472	9182	14521	2209	51285
WEIGHT*	(KG)	4824	19233	27284	43151	6563	152397
	(LB)	10635	42402	60151	95131	14470	335977

* fuel specific gravity: 0.785kg/l or 6.551lbs/US Gal

APU FEED

<table>
<tr><th>A340-200/300</th><th>A340-500/600</th></tr>
<tr><td>


</td><td>


</td></tr>
<tr><td colspan="2">On the A340-200/300 aircraft, the APU is fed from the trim tank transfer line and is independent of the FCMC. There are two identical feed pumps: The forward pump, situated the wing's center station, draws fuel directly from the left wing collector cell. The pump outlet is connected to the trim tank line via an isolation valve. The rear pump is situated close to the APU, downstream of the APU low-pressure isolation valve. Pump control is automatic and depends on trim tank transfer line's status at the time of operation.
On the A340-500/600, the APU is fed via a dedicated line from a tapping of the number one engine's fuel feed line. The number one engine's booster pumps normally supply the fuel pressure. However, if these pumps are not selected, then a dedicated APU pump is installed in the line to supply the fuel pressure. The new system removes the Fuel/Air separator, and associated water drainage system.</td></tr>
</table>

Fuel Transfers

Aft Fuel Transfer

A340-200/300:
Aft fuel transfer towards to trim tank comes:
- from the center tank by means of two pumps, when the center tank is not empty
- from the inner tanks by means of main 2/3 and standby 2/3 pumps, when the center tank is empty

A340-500/600:
Introduction of six Aft Transfer/ Jettison pumps:
- Enables Aft Transfer and Jettison to be independent of the engine feed system.
- Allows Engine Feed pumps to remain common.
- Improves jettison rate.

Aft fuel transfer towards to trim tank comes:
- from the center tank by means of its two aft transfer pumps, when the center tank quantity is above 17000 kg (37500lbs)
- from the inner tanks, by means their aft transfer pumps, when the center tank quantity is below 17000 kg (37500lbs)

Transfers from the Center to Inner Tanks

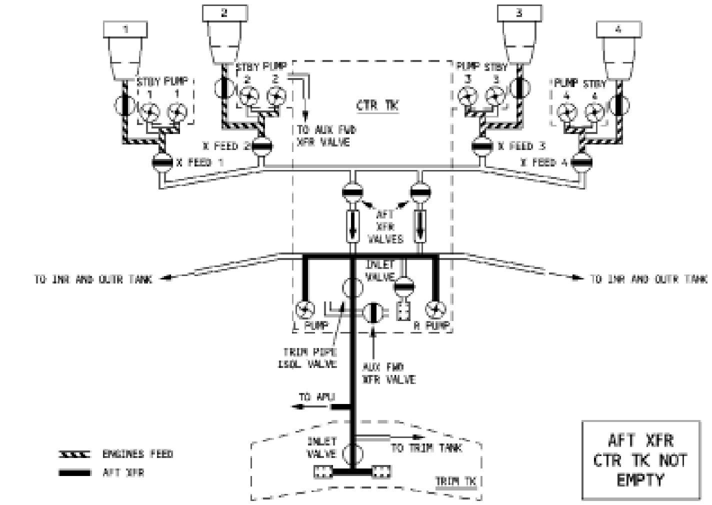
A340-200/300:
Transfers from the center to inner tanks are by means of two pumps, located in the center tank which a connected to the refueling gallery. Inner wing tank inlet valves are independently cycled open/closed, such that the inner wing tanks remain full until the center tank is depleted.
A340-500/600
Transfers from the center to inner tanks are normally by means of two pumps, located in the center tank which are connected to a specific center to inner transfer line, and independently controlled inner tank transfer valves
Center to Inner tanks 1 – 4 are independent from:
- Aft Transfers
- Jettison

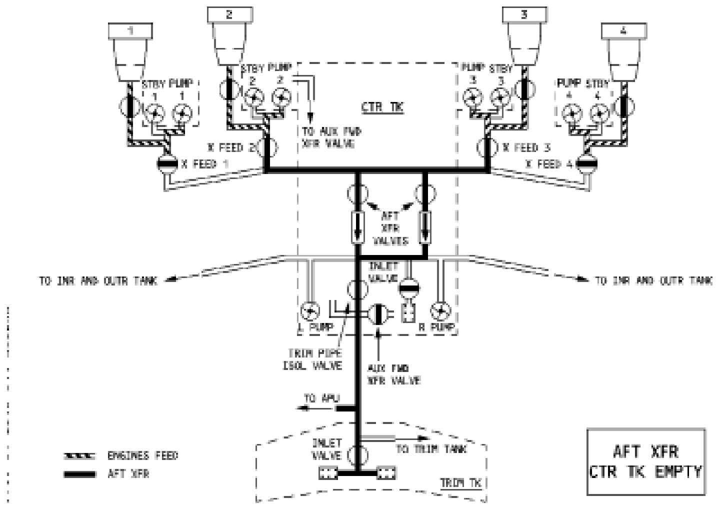
Transfers from the RCT to the Center tank (A340-500 only):

Transfers from the RCT to the Center tank are by means of two pumps, located in the RCT, and two valves, one valve situated at each end of the RCT's refuel/transfer line.

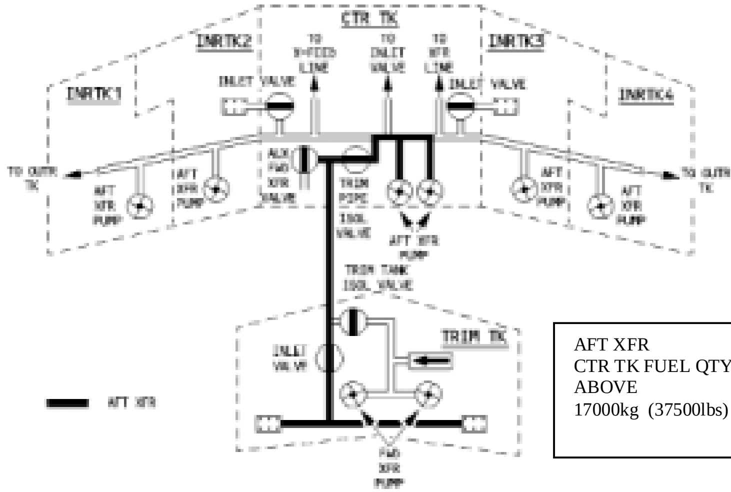
Aft Fuel Transfer

A340-200/300

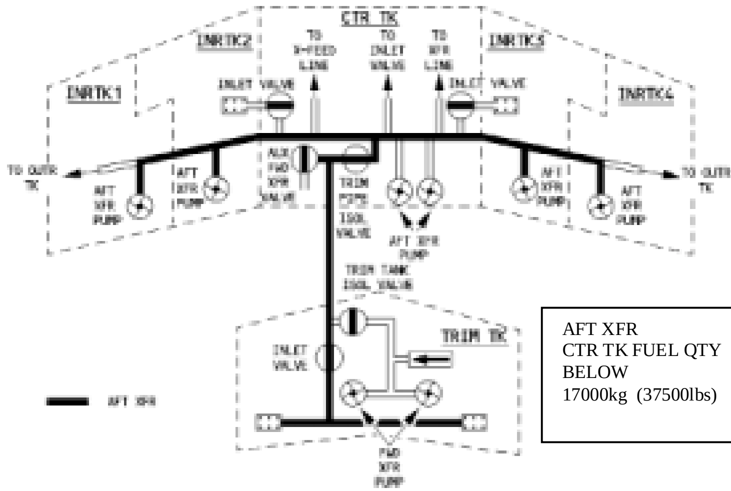




A340-500/600

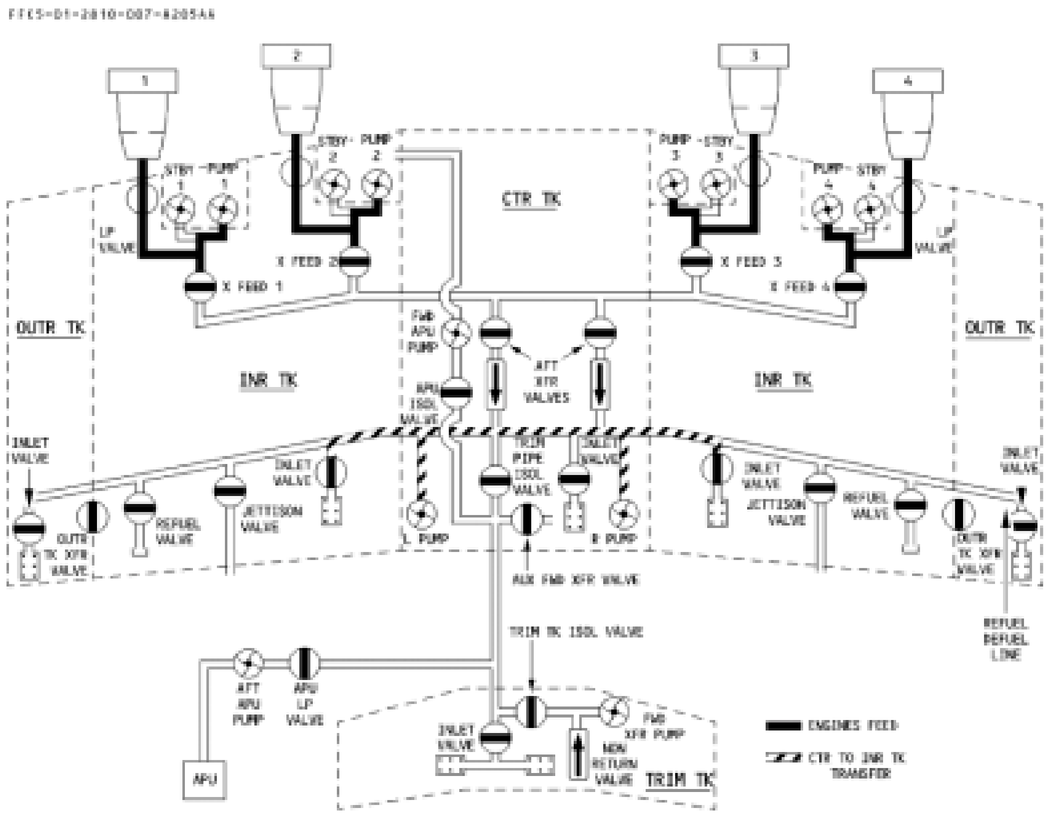


AFT XFR
CTR TK FUEL QTY
ABOVE
17000kg (37500lbs)

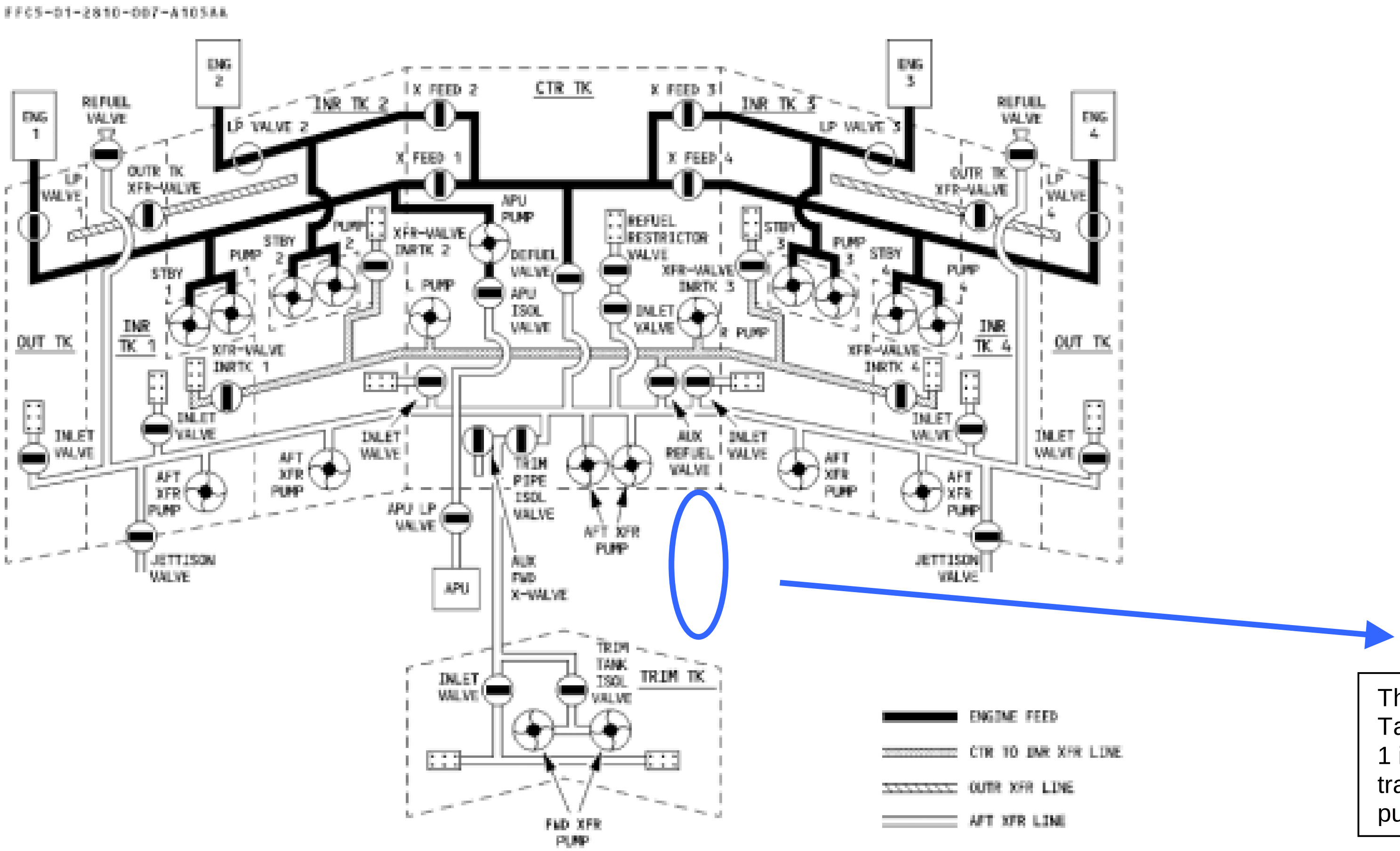


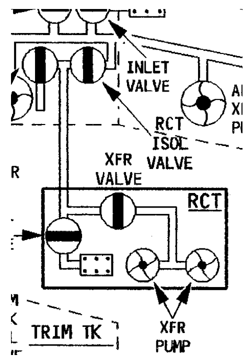
AFT XFR
CTR TK FUEL QTY
BELOW
17000kg (37500lbs)

Engine Feed
A340-200/300



A340-600





The addition of the rear Center Tank on **A340-500** also requires 1 inlet valve, one isol valve, one transfer valve, and two transfer pumps

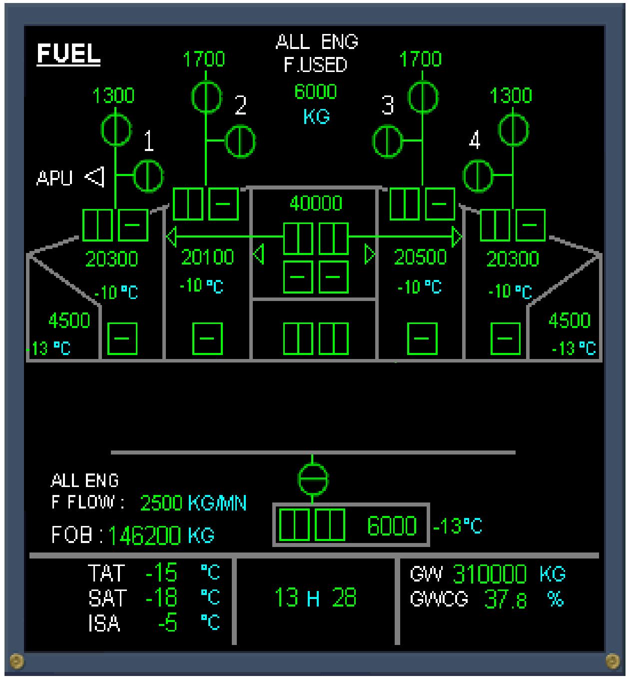
Jettison

Fuel may be jettisoned from the:

- **A340-200/300** – Inner tanks and center tank
- **A340-500** – Trim tank, inner tanks, Rear Center Tank and Center tank
- **A340-600** – Trim tank, inner tanks, and Center tank

Fuel may be jettisoned at a rate of:
A340-200/300 – 1000kg (2200lbs) / min
A340-500/600 – 1600kg (3520lbs) / min

ECAM Indication

<table>
<tr><th>A340-200/300</th><th>A340-500</th><th>A340-600</th></tr>
<tr>
<td>
</td>
<td>
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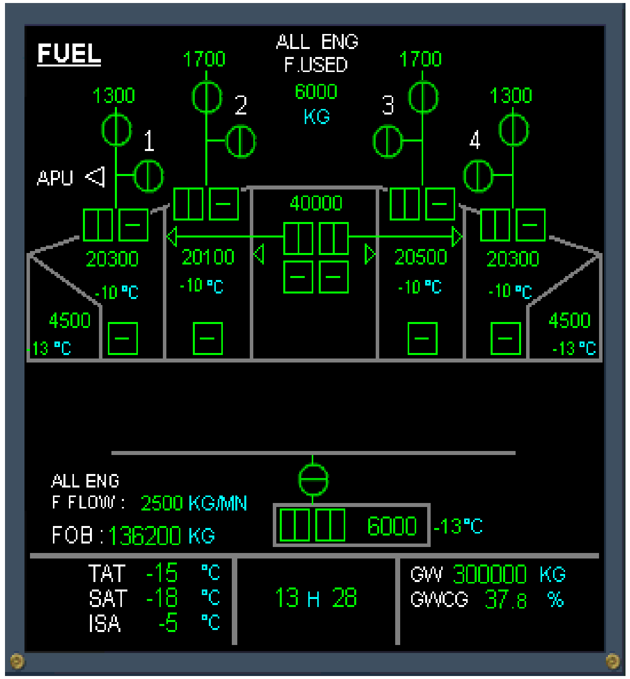
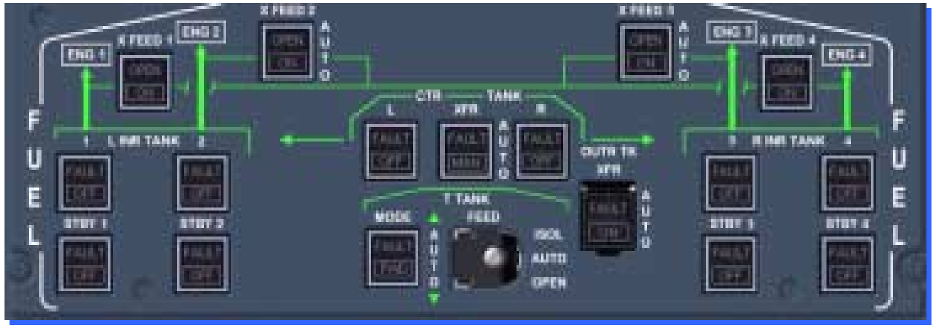
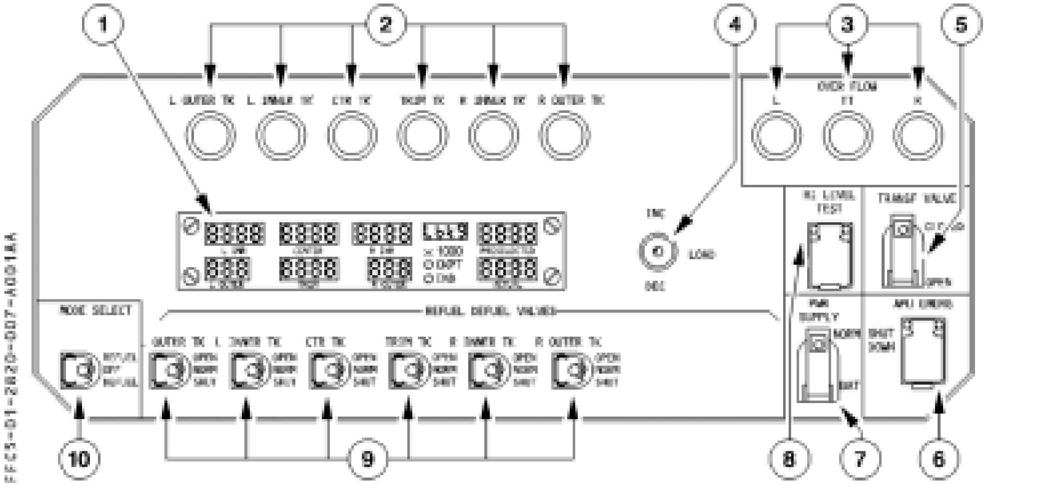
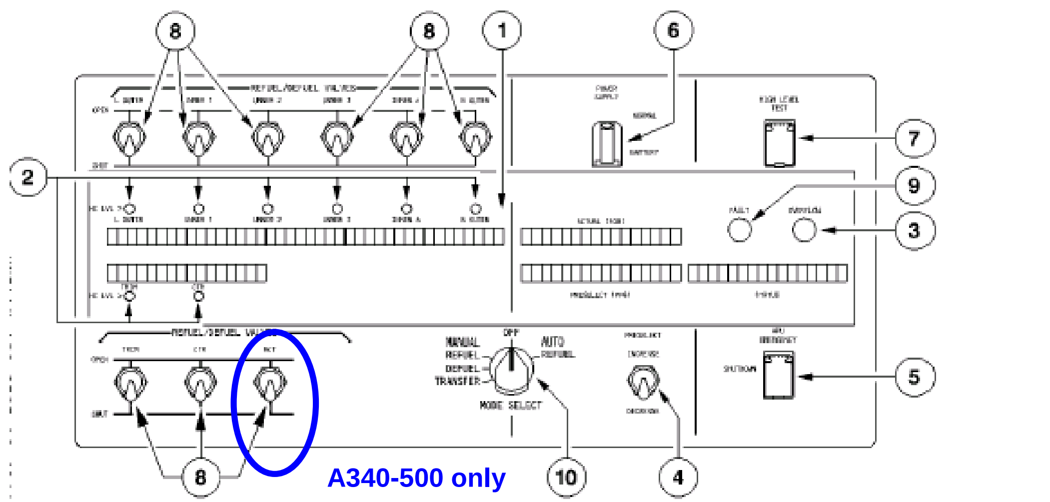
<td>
</td>
</tr>
<tr><td colspan="3">The new ECAM pages take into account the rear center tank on the A340-500, and the differing tank layout on the A340-500/600.</td></tr>
</table>

A340-200/300	
	Due to the differences in the fuel system architecture, the fuel system control panel and ECAM system page differ between the **A340-200/300** and **A340-500/600** aircraft.
A340-600	**A340-500 modification**
	On the **A340-500,** three pushbuttons are added to control the rear center tank. 

A340-200/300



A340-500/600



	A340-200/300	A340-500/600
1.	Fuel Quantity Indicator	Fuel Quantity Indicator
2.	HI LVL light	HI LVL light
3.	OVERFLOW light	OVERFLOW light
4.	INCREASE/DECREASE preselector rocker switch	INCREASE/DECREASE preselector rocker switch
5.	TRANSF VALVE switch (guarded in CLOSED)	APU EMER pushbutton
6.	APU EMER pushbutton (guarded)	POWER SUPPLY switch (guarded in NORM)
7.	POWER SUPPLY switch (guarded in NORM)	HIGH LEVEL TEST switch (guarded)
8.	HI LEVEL TEST switch (guarded)	REFUEL / DEFUEL VALVES sel
9.	REFUEL / DEFUEL VALVES sel	FAULT light
10	MODE SELECT switch (guarded at off)	MODE SELECT sel

Control of the refuel function is via two FCMCs and two FDCs. The operator interface is either through the standard refuel panel, fitted in the lower surface of the fuselage just aft of the undercarriage bay, or through the optional refuel panel and MCDU in the cockpit.

Refuel – Defuel

<table>
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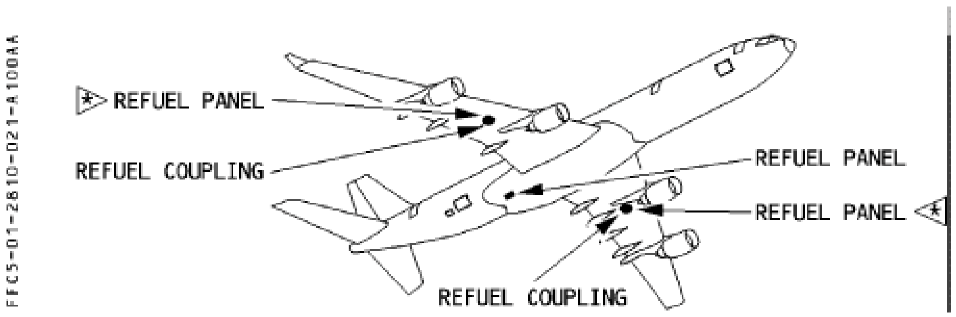
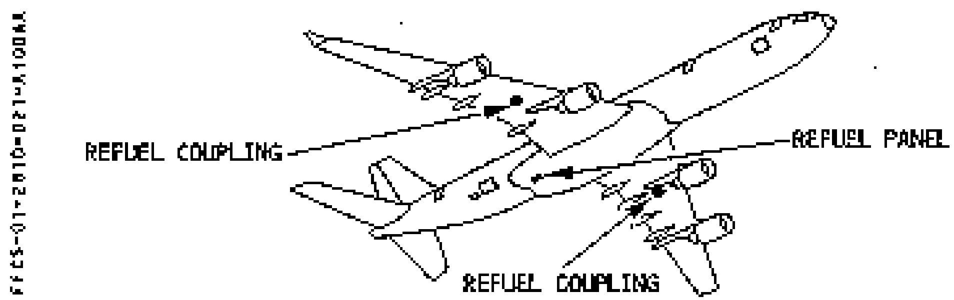
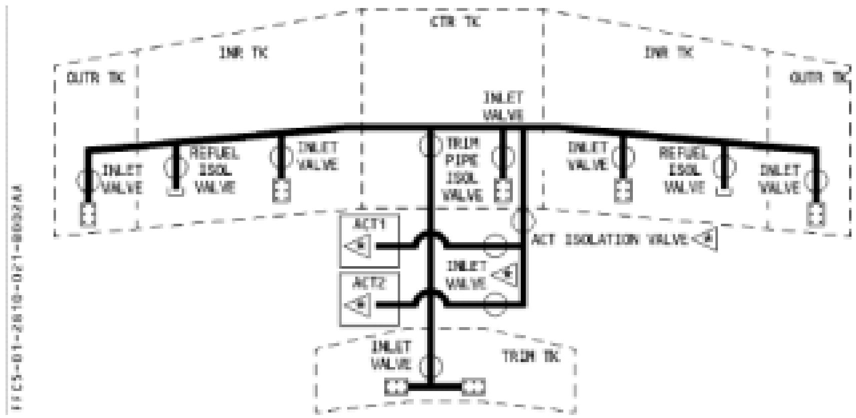
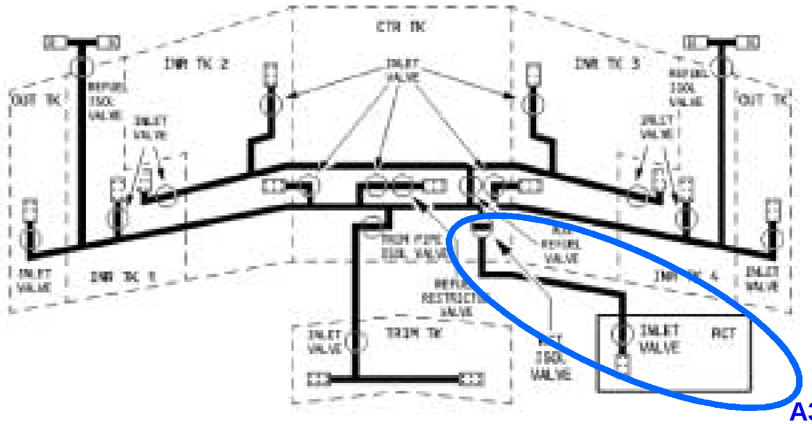
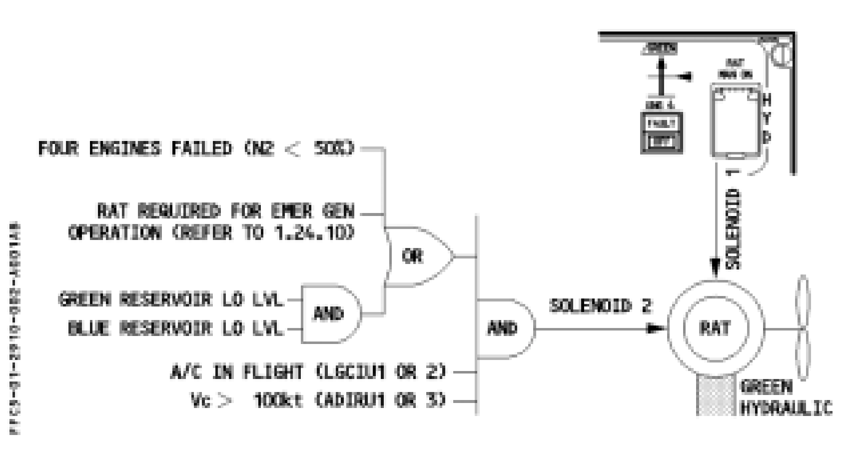
<tr><td></td><td></td></tr>
<tr><th>A340-200/300</th><th>A340-500/600</th></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="2">A different fuel tanks arrangement has also led to a different refuel architecture on the A340-500/600.</td></tr>
</table>

Chapter 7- ATA 29 Hydraulic

Ram Air Turbine Logic

<table>
<tr><th>A340-200/300</th><th>A340-500/600</th></tr>
<tr><td>


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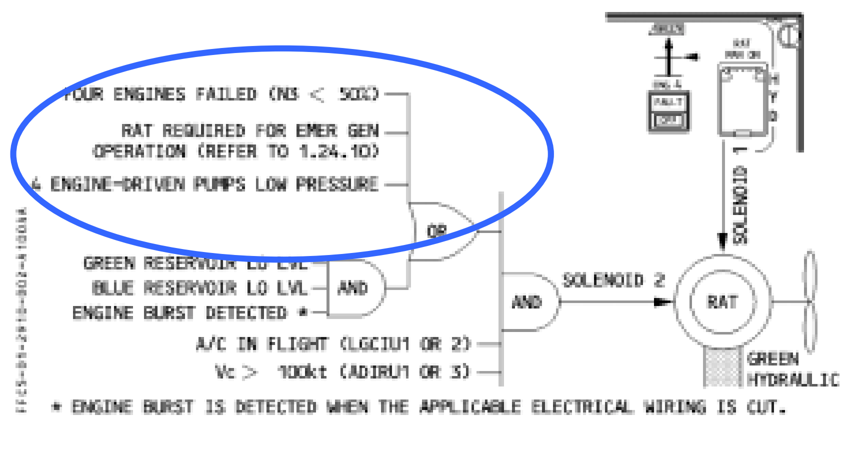

</td></tr>
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Overhead Panel

<table>
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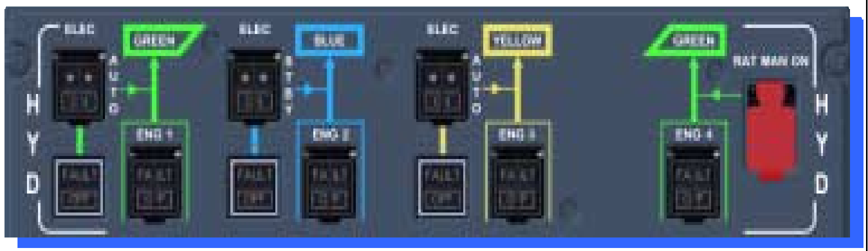
<tr><td>


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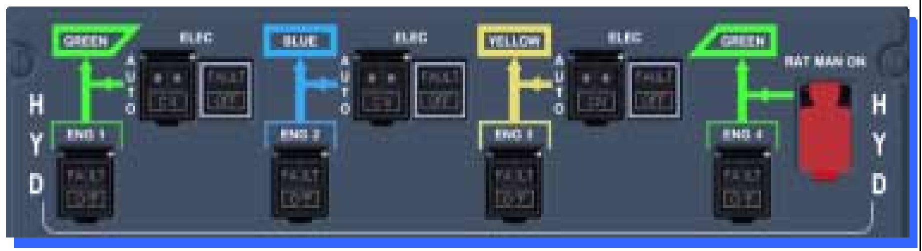
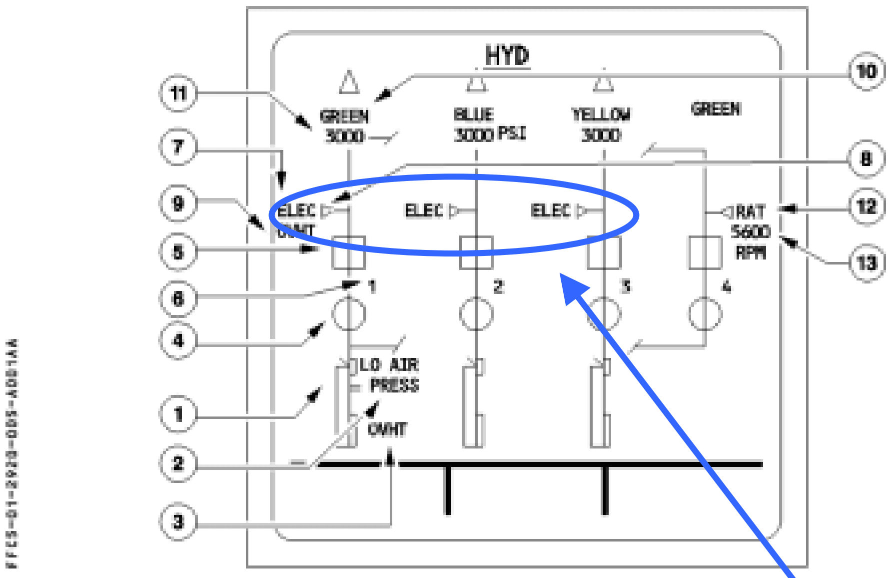
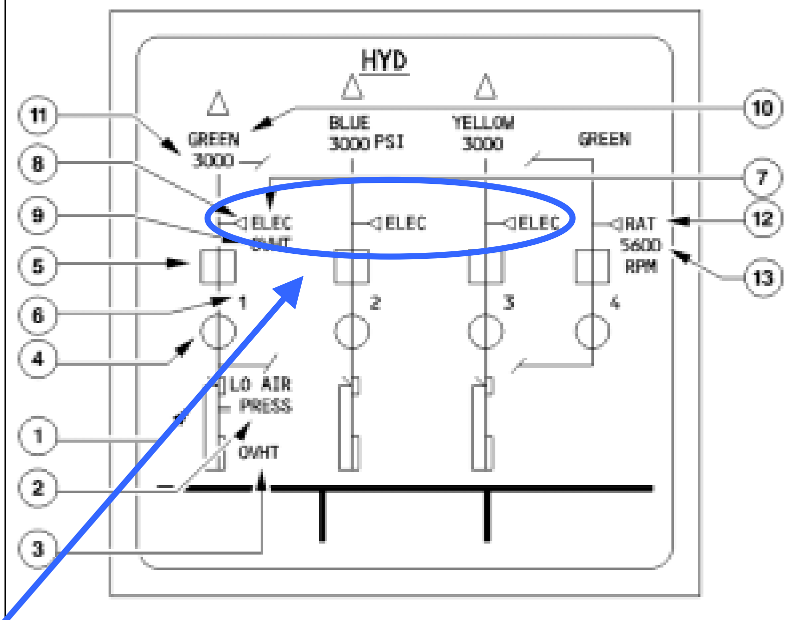


</td></tr>
</table>

ECAM Indication

A340-200/300	A340-500/600
	
New ECAM display to reflect changes in overhead panel's layout	

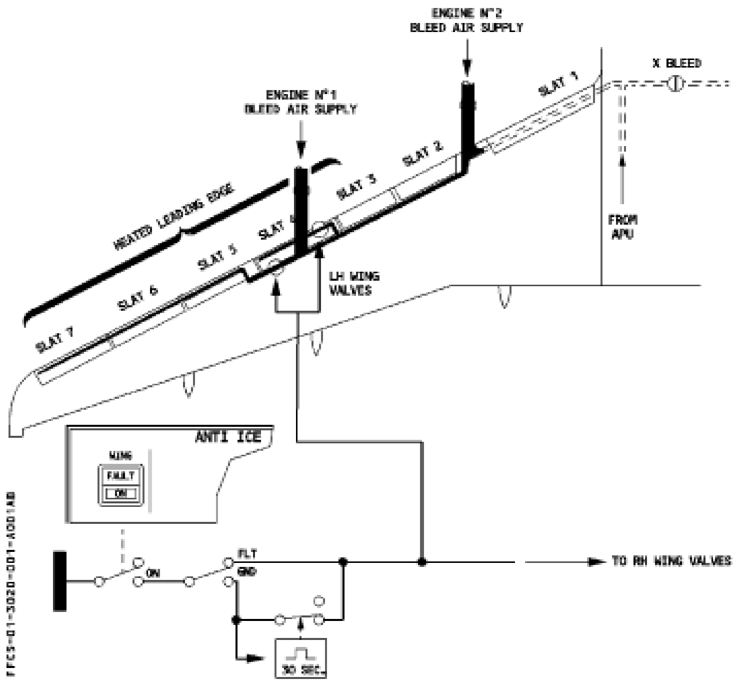
Chapter 8- ATA 30 Ice and Rain

On the **A340-500/600**, anti-ice protection is provided to Slats 3 and 4 by means of one wing anti-ice valve on each wing. Bleed air is supplied to the inboard end of Slat 4 through the inboard telescopic tube, and then directed to Slats 3 and 4 piccolo tubes. Bleed air pressure and flow rates are similar to that of the **A340-200/300** aircraft.

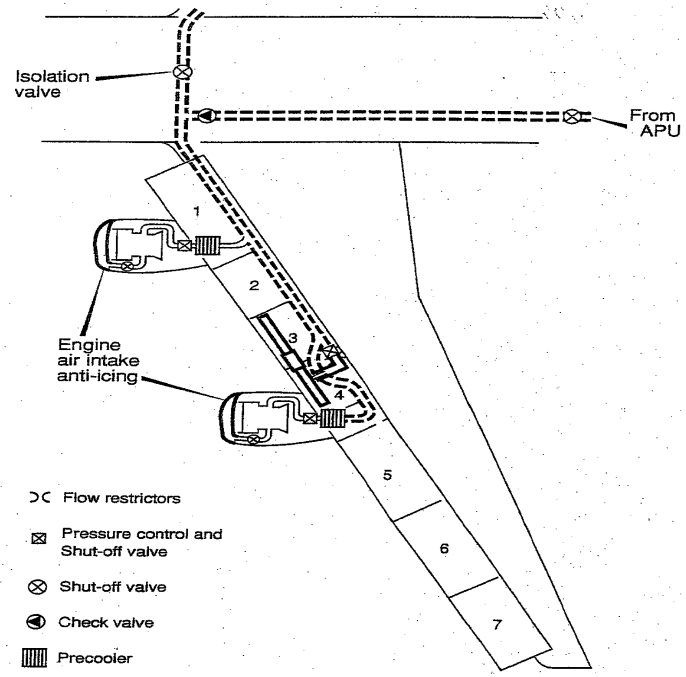
Warnings and Cautions on the ECAM page

The **A340-200/300** ECAM Warning Display:
"A.ICE L (R) OUTR WING OPEN**"**
"A.ICE L (R) INR WING OPEN**"**
is replaced on **the A340-500/600** by **"**A.ICE L (R) WING OPEN**"**

A340-200/300



A340-500/600



Chapter 9- ATA 31 Indicating and Recording

The major operating differences between the **A340-200/300** and the **A340-500/600** regarding indicating and recording equipment arise as a result of the new evolution Electronic Instrument System (EIS 2).

The advantages of EIS 2

- **LCD Technology:** Current Cathode Ray Tube (CRT) displays have an intrinsically limited contrast in sunny conditions: a constant source of irritation among flight crew. Liquid Crystal Technology (LCD) offers a much-enhanced contrast in these conditions and is a much lighter system – up to thirty-five kilos less.
- **Flexibility –** With the advent of new cockpit technology (TCAS, EGPWS…), the previous EIS system had reached its limits with regard to display capacity, development potential and computational ability. In a fast changing aeronautical environment, EIS 2 flexibility will allow new applications to come on-stream such as electronic Jeppesen cards, forecasted weather at destination or diversion airports and 3D images etc.
- **Commonality –** The goal of the new system is to have full interchangeability between all the AIRBUS family of fly-by-wire aircraft. Harmonization will result in a unique pool of equipment that may be developed progressively through advancing technology and in service experience. A common Single Aisle/Long Range spare pool will considerably help the airlines having AIRBUS fly-by-wire mixed fleets.
- **Cost** – Airbus has estimated that compared to the previous technology, the implementation of the EIS 2 program will considerably decrease the maintenance cost for airlines.

Pilot Interface Improvements

- The screen size

  Even if the outside dimensions of each display unit panel are unchanged, the size of the usable surface of the screen has increased in area from 177.8cm² to 252 cm². Firstly this has impacted the readability of the information with more space between each zone of information and secondly, the new screen size has also freed some additional space for future new line or column implementation

- Display unit sun readability

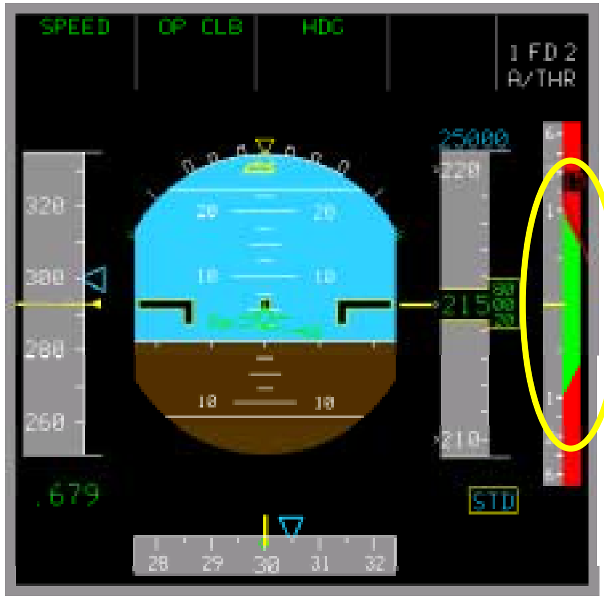
  CRT technology had an intrinsically limited contrast under sunny conditions. LCD technology offers a far better contrast in these conditions and a contrast, which is stable all along its guaranteed lifetime.

What has changed?

- **On the primary flight display, the** V/S scale and its associated TCAS Information has greatly increased in clarity. The length and the width of the scale have been increased, the range reaches now 6000 ft/min, and intermediate scale graduations have been included. The readability and the alertness in case of preventive or corrective TCAS advisory have also evolved with EIS 2.

EIS 1

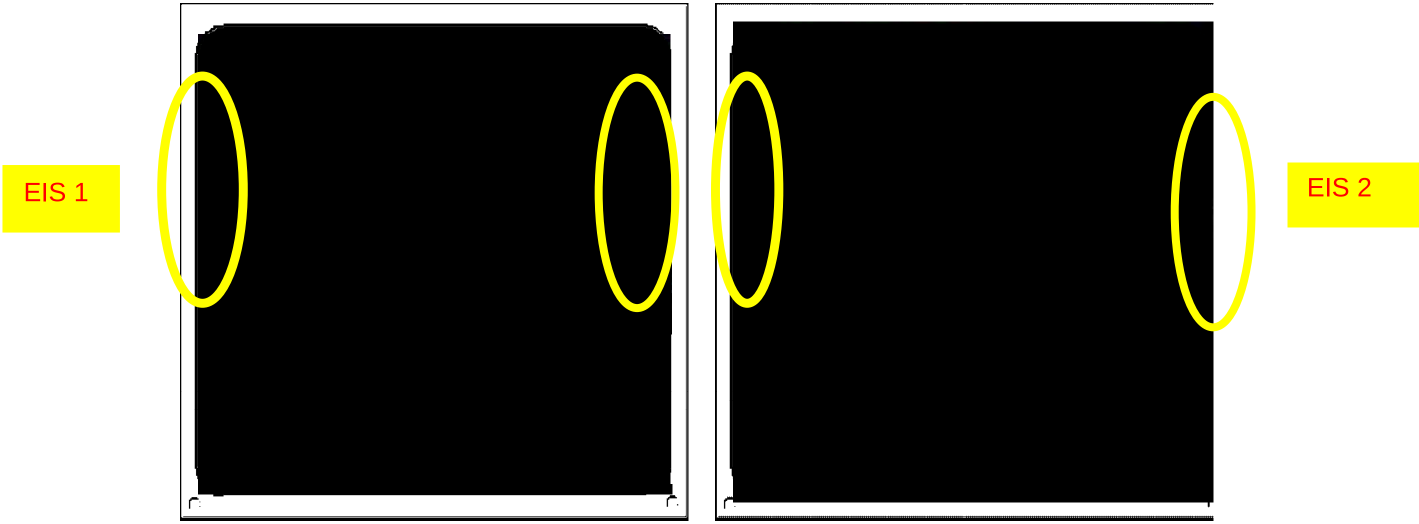
EIS 2



– **On upper ECAM,** for the display of warnings and cautions, 3 characters may be added. 2 characters may be added for a memo.

Display readability inside the Attitude zone (windshear, W/S ahead, CHECK ATT) and Flight Director (FD) bars symbology have been reworked. Concerning the FMA, there is now the space provision for an additional character by column and for an additional line of message text.

On the ND, in ARC mode, an extra +/- 5-degree angle for the heading scale has been implemented



- **On the lower ECAM,** lines are also longer on the STATUS page, and can admit up to 3 supplementary characters

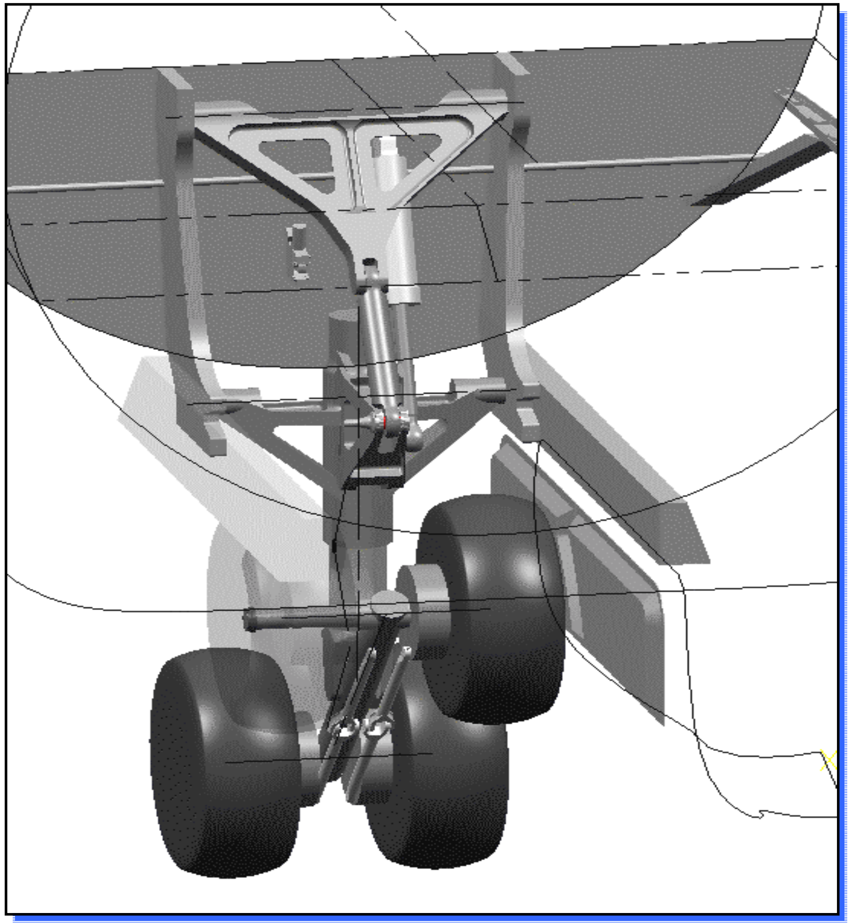
Chapter 10- ATA 32 Landing Gear Systems

ATA32 LANDING GEAR SYSTEMS

Several modifications have been introduced to **A340-500/600's landing gear** that have to date not been present on the **A340-200/300.**

Landing Gear- Nose – (500/600 only):

- General strengthening of structural components due to increased loads
- Larger retraction actuator
- New drag stay arrangement, from a single beam to an A320 panel type
- Down lock assembly revised
- Longer shock absorber stroke
- Larger steering actuators
- New larger diameter wheel and tire: **A340-300** 16" wheel & 40.5" tire
  A340-500/600 17" wheel & 45.0" tire



Landing Gear- Main Landing Gear- (500/600 only):

- General strengthening of structural components due to increased loads
- Minor geometry changes due to wing tilt
- Main fitting and shock absorber diameter increased
- Shock absorber stroke now 33mm shorter and spring curve revised
- Minor revision to hydraulic & electrical interfaces at top of leg
- Increased axle length for improved CAN

Landing Gears – Centerline Landing Gear- (500/600 only):

- Completely new design, 4 wheel bogie Centerline landing gear
- CLG now shares the load approx. equally with each MLG
- Landing loads now also absorbed by CLG
- New drag stay arrangement attaches to rear wall of landing gear bay
- New CLG pitch trimmer positions the 4 wheel bogie for retraction
- Shock absorber is "2 stage" design-same principle to A340-300
- Each wheel is now braked
- CLG uses the same wheels, tires and brakes as the MLG

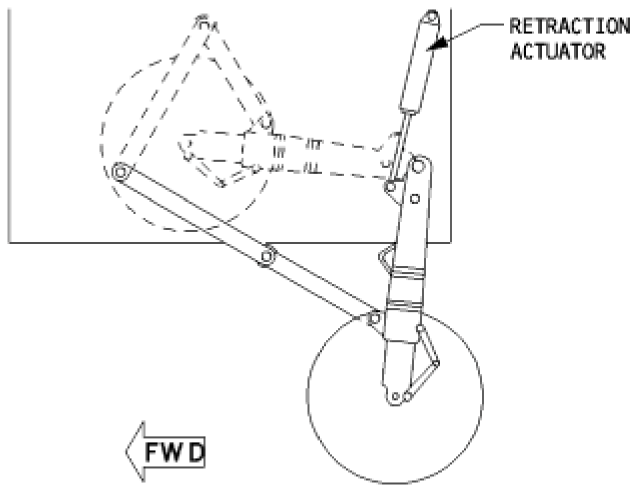
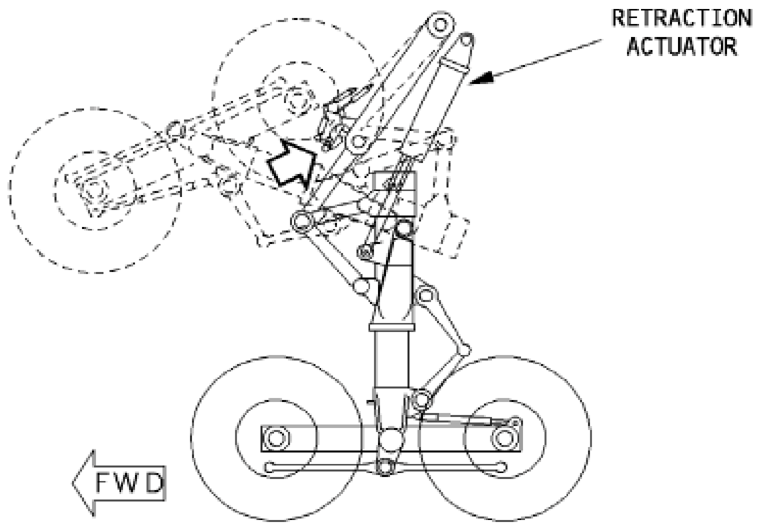
Extension/Retraction System – Timing
The extension and retraction times of the A340-500/600 landing gear are longer than those of the A340-300 This is due to:

- Heavier, strengthened landing gear and equipment
- Larger actuators, resulting in larger flow demands
- Extra sequence of the CLG bogie ‘dip’ and ‘trail’ positioning,
- Higher hydraulic demand from flight controls.

Extension/Retraction System – Freefall System

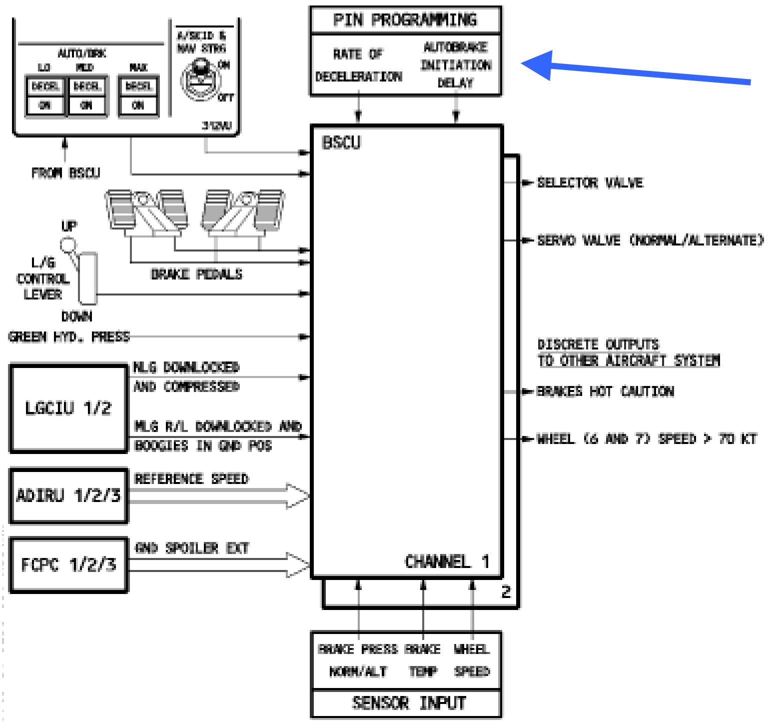
- CLG now included for gravity extension
- New CLG freefall system added to the A340-500/600 landing gear bay
- New CLG door and gear uplocks with freefall release mechanism
- CLG downlock indicated in the cockpit after gravity extension

Center Landing Gear

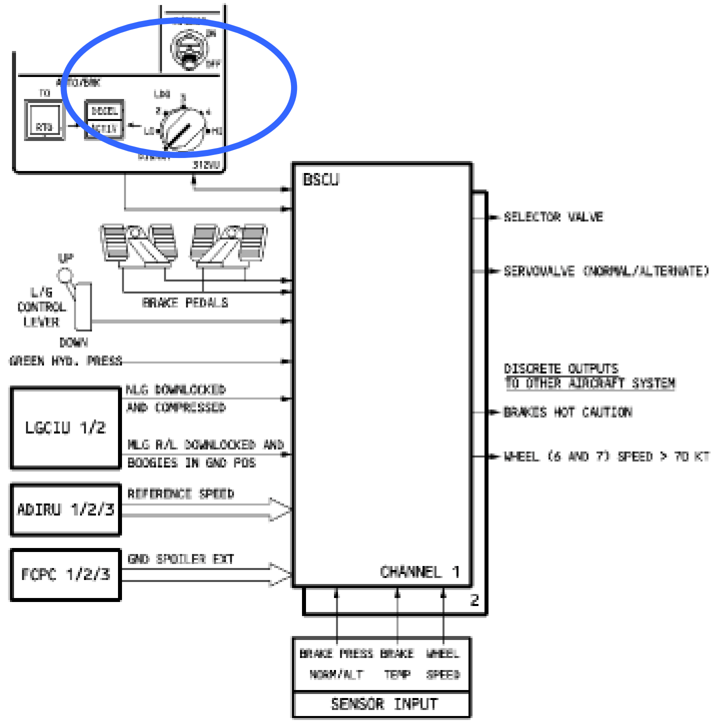
A340-200/300	A340-500/600
	

Brakes and Anti Skid

<table>
<tr><th>A340-200/300</th><th>A340-500/600</th></tr>
<tr><td>



</td><td>



</td></tr>
<tr><td colspan="2">On the A340-500/600, the left pedal controls the left main landing gear brakes, and the forward wheel brakes of the center landing gear. The right pedal controls the right main landing gear brakes, and the rear wheel brakes of the center landing gear</td></tr>
</table>

Autobrake

The autobrake is still comprised of three modes on the **A340-200/300** family, but has been extended to six modes on the **A340-500/600**.

On the **A340-200/300** aircraft, autobrake control is achieved via a deceleration target, based on a target speed / aircraft speed comparison. It is, therefore, dependent on tachometer wheel speed acquisition.
A simpler control is used for the new autobrake system on the **A340-500/600,** It works exactly as the pilot would, by modulating brake pressure according to the desired deceleration. This enhanced autobrake function provides improved accuracy in achieving the selected deceleration rate, while maintaining a perfect level of comfort: No deceleration overshoot, no nose landing gear slammed on the ground. It also enables exactly the same pressure to be applied on all the brakes, thereby achieving more homogeneous temperatures in all the brakes.

A340-500/600 Autobrake

Airline feedback has been instrumental in defining the autobrake mode. The LOW and MED modes were sometimes, respectively, found to be a little too low or too high. Therefore, to avoid airlines having to request different deceleration rates, three additional landing modes have been set: LO-2-3-4 and HI modes are available for landing. In addition, an RTO autobrake mode will be set for takeoff, in the event of a rejected takeoff.

DECEL light

With the current design on **A340-200/300** aircraft, misinterpretation of the DECEL light may unduly incite disconnection of the autobrake. The DECEL light comes on when 80 % of the appropriate deceleration rate is achieved. Thus, the light may not illuminate on contaminated runways, even if the autobrake is functioning normally.
As a result, on **A340-500/600** aircraft, the autobrake panel now includes an “ACTIV” light to indicate to the pilot whether the autobrake is operating properly when the runway condition is such that the selected deceleration cannot be achieved (but is at its optimum).

Antiskid function

Thanks to a new antiskid system, improved braking performance is expected on the **A340-500/600.** Antiskid will also be available after gravity extension and nosewheel steering shall no longer be linked to the antiskid function.

On current **A340-200/300** aircraft, the wheel-slip threshold that activates the brake release, if wheels are skidding, is the same for all the wheels, and is constant. This means that braking cannot be at its optimum for all wheels, if they are not on the same runway conditions (i.e. wet patches on the runway). Moreover, the wheel-slip threshold is unique for any runway condition and, therefore, cannot be at its exact optimum for both dry and wet runways. It is a compromise selected by safety for slippery runways.

A new antiskid concept has been defined for the **A340-500/600** aircraft. It takes into account the individual behavior of each wheel, which varies depending on the runway's surface condition. Even on wet patches, the braking of each wheel will be at its optimum. Braking now takes into account sudden wheel speed deceleration or acceleration in order to adapt the wheel-slip threshold, used to release or reactivate braking. This new antiskid function, reducing antiskid cycling, provides a smoother braking response. It is expected to improve braking performance, particularly on non-uniform contaminated runways.
It bears noting that antiskid improvements are also applicable to alternate braking with antiskid.

New ECAM warnings
On **A340-500/600, the following ECAM warnings were added in an attempt** to simplify existing ECAM warnings. For instance, the AUTOBRAKE FAULT warning currently announces a loss in normal braking. The "NORM BRK FAULT" has replaced this.

BRAKES NORM BRK FAULT
Loss of NORMAL brake mode

BRAKES ALTN BRK FAULT
Complete loss of alternate brake mode

BRAKES NORM + ALTN BRK FAULT
Loss of all means of braking from pedals (park brake available)

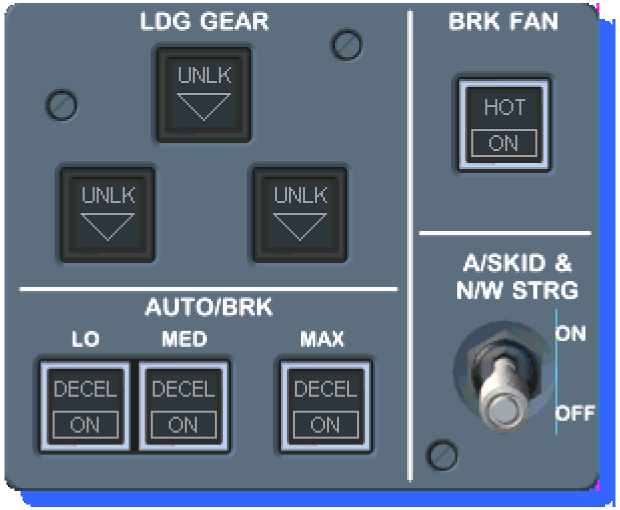
BRAKES BRK B ACCU LO PR
Indicates low brake accumulator pressure. The warning is available even when BSCU is not powered.

BRAKES / NWS MINOR FAULT
Regroups minor failures, which are GO, GO IF

BRAKES EBCU FAULT
Loss of EBCU equipment (ALTN available via BSCU)

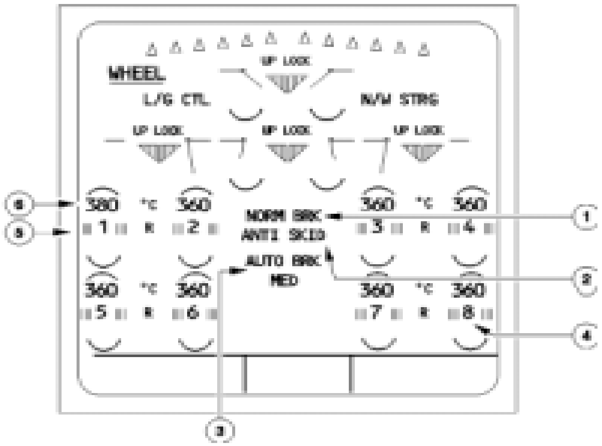
Landing Gear Overhead Control Panel

A340-200/300

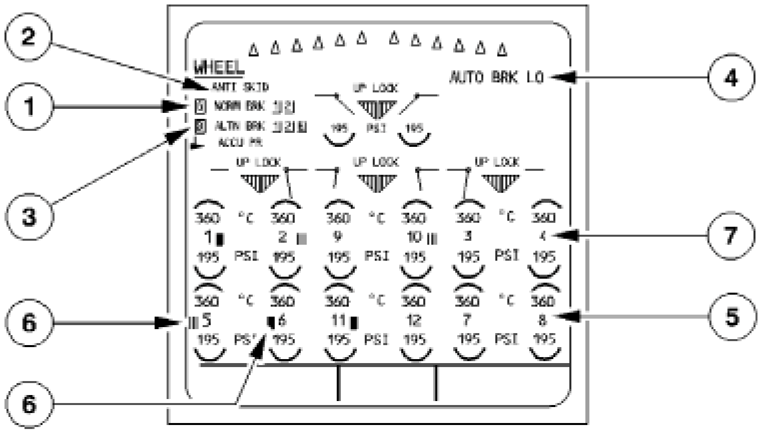


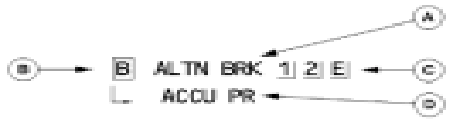
A340-500/600

A340-200/300



A340-500/600

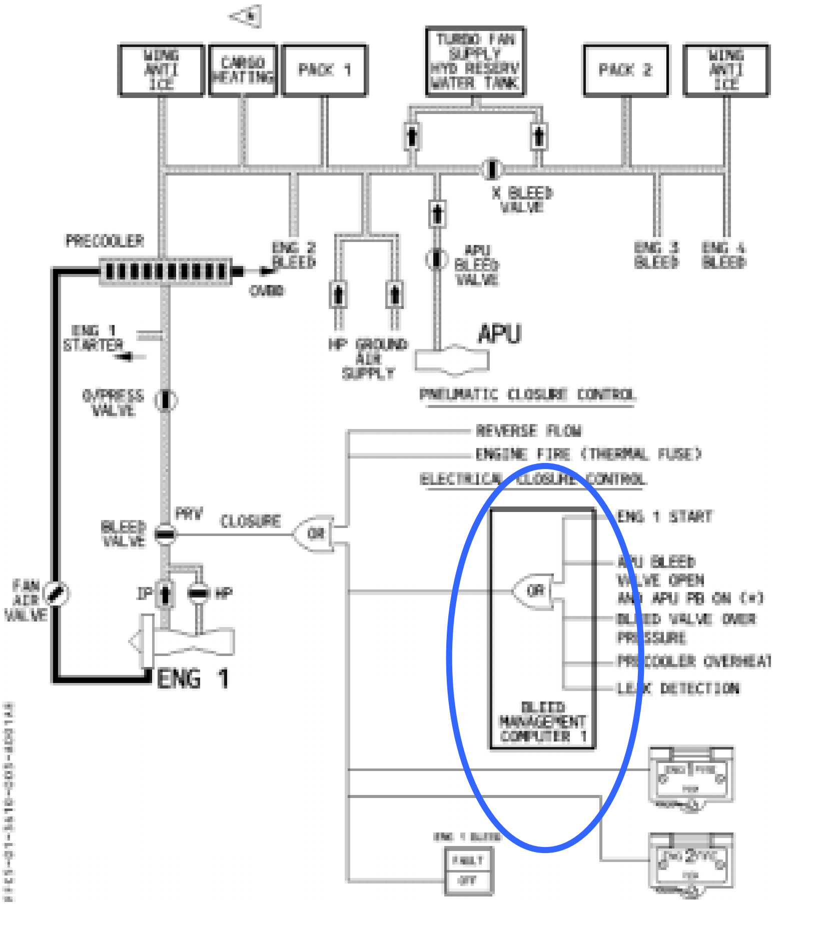


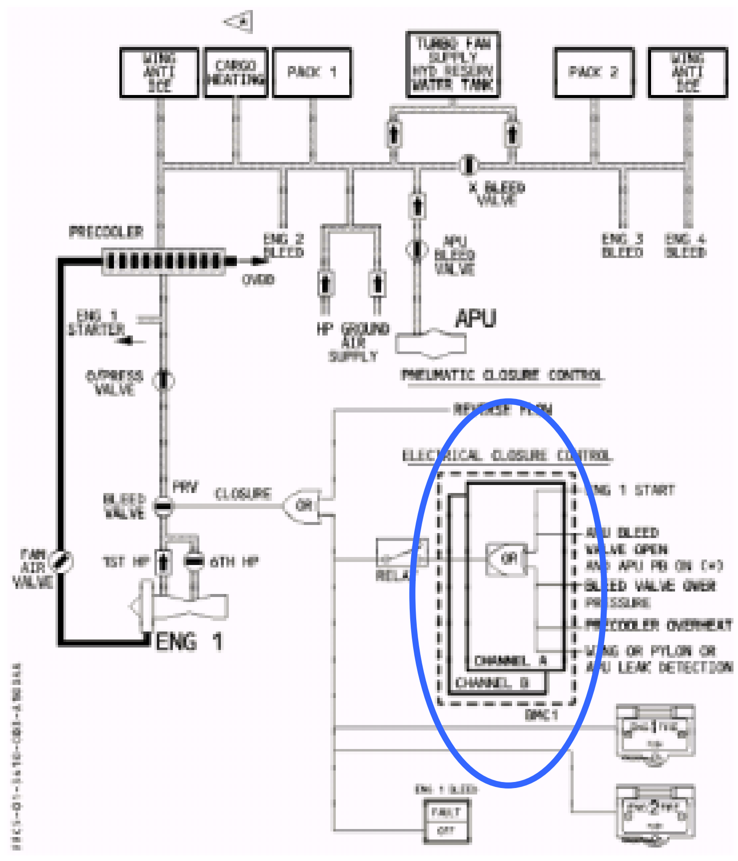
	A340-200/300	A340-500/600
1.	NORM BRK indication	NORM BRK indication  A.NORM BRK label B. NORM BRK hydraulic supply indication C. BSCU channels indication
2.	ANTISKID indications	ANTISKID indications
3.	AUTO BRK indication	ALTRN BRK indication  A. ALTN BRK label B. ALTN BRK hydraulic supply indication C. BSCU and EBCU channels indication D. ACCU indications
4.	Wheel number identification	AUTO BRK indication
5.	III indications	Wheel number identification
6.	Brake temperature indications	Release indications
7.	-	Brake temperature indication

Chapter 11- ATA 36 Pneumatic

The main operational differences pertaining to the pneumatic system arise as a result of electro-pneumatic control

Control and Monitoring
A340-200/300 The 4 BMC's (1 per engine bleed system) only achieve system monitoring and automatic closure control
A340-500/600 The 2 BMC's achieve system control and monitoring

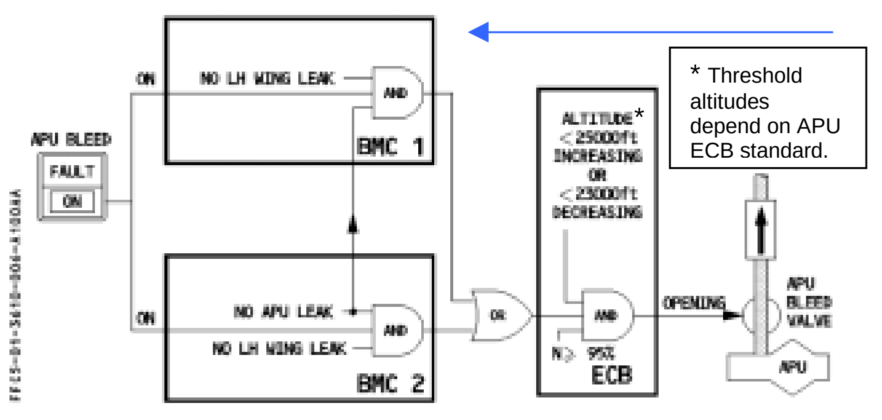
<table>
<tr><th>A340-200/300</th><th>A340-500/600</th></tr>
<tr><td>


</td><td>


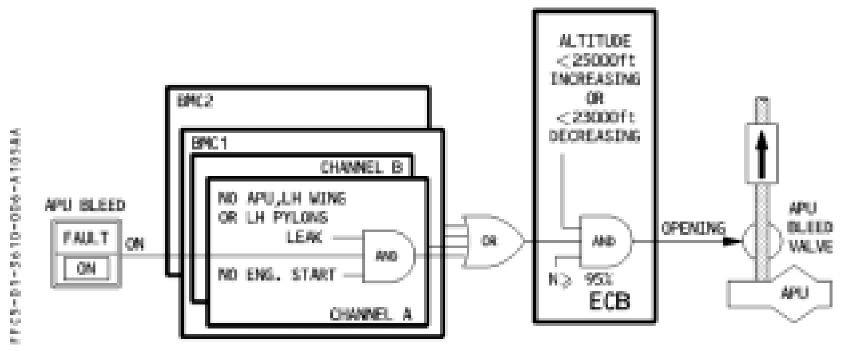
</td></tr>
</table>

APU Bleed Valve Opening Logic

A340-200/300

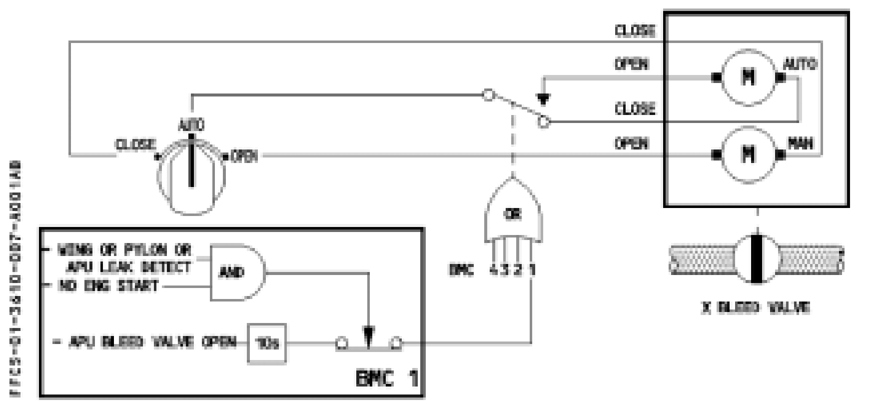


A340-500/600

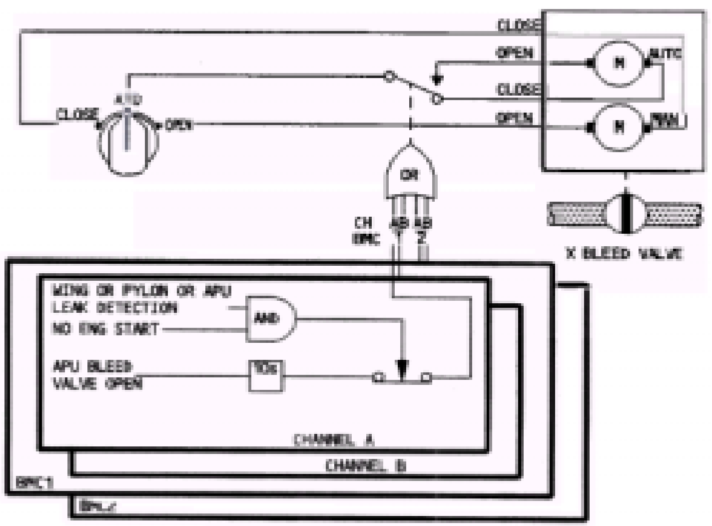


X- Bleed Valve Control Logic

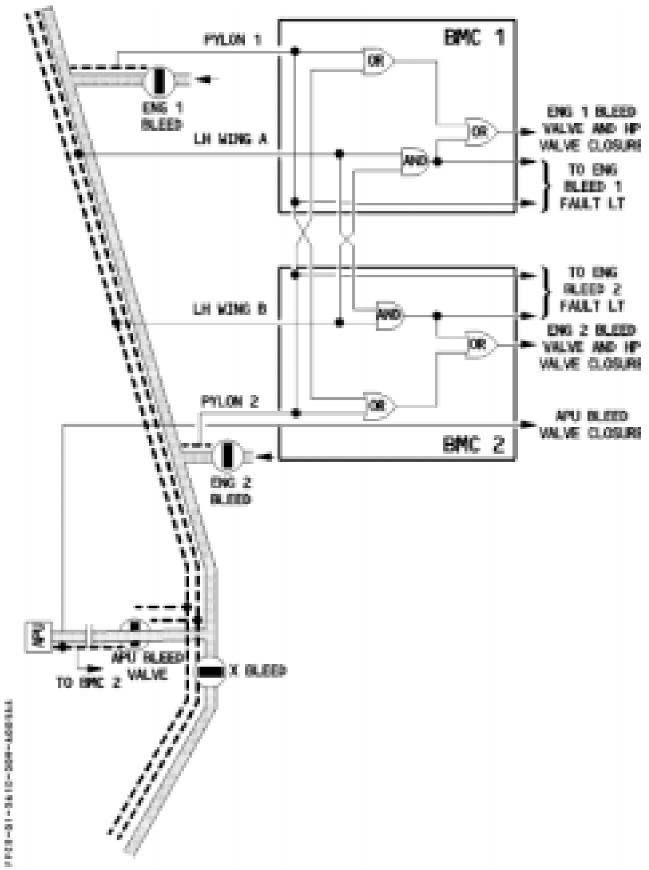
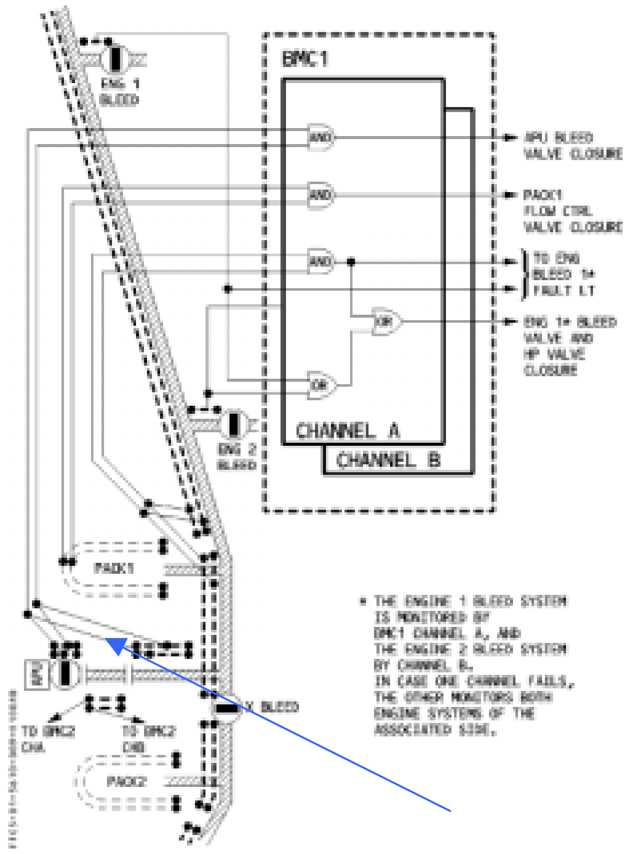
A340-200/300



A340-500/600



Leak Detection

A340-200/300	A340-500/600
	

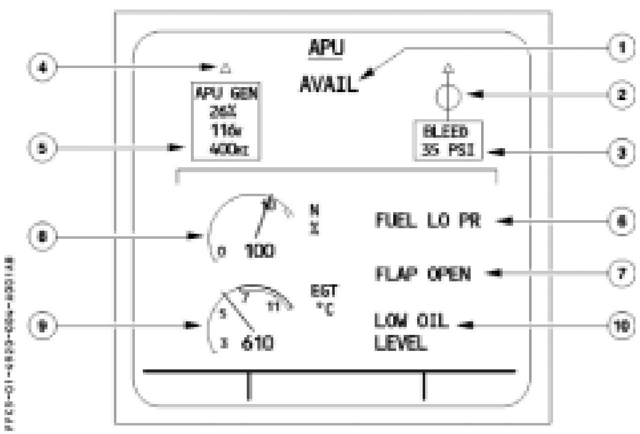
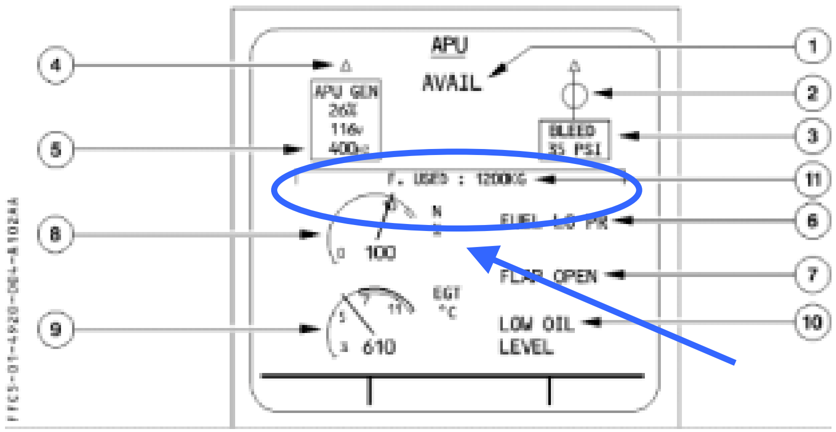
The air leakage detection loops detect any ambient overheat in the vicinity of the hot air ducts in the fuselage, pylons and wings. This has been augmented on **A340-500/600** to include an APU leak detection loop. Resulting from this change, there are now further ECAM warnings associated with the pneumatic system.

Chapter 12- ATA 49 APU

The main operational differences between **A340-200/300/500/600** with respect to the APU, arise in relation to Automatic shutdown, Failure warnings and the changes in the corresponding ECAM pages. With reference to automatic shutdowns on ground and in flight, in addition to shutdowns caused by Overspeed, Emergency, ECB Failure which are prevalent on all A340 aircraft, on **A340-500/600,** the APU shall also shut down due to APU Generator High Oil Temperature and Clogged Oil Filters.

ECAM APU PAGE

The ECAM fuel page differs very slightly between types. On the **A340-500/600,** there is, however, a 'Fuel Used Indication'. Fuel used by the APU is calculated by the ECB. It is normally green. If no data is computed, the last computed data is crossed out by two amber dashes. Units may be in KG or LB, depending on the DMC pin program.

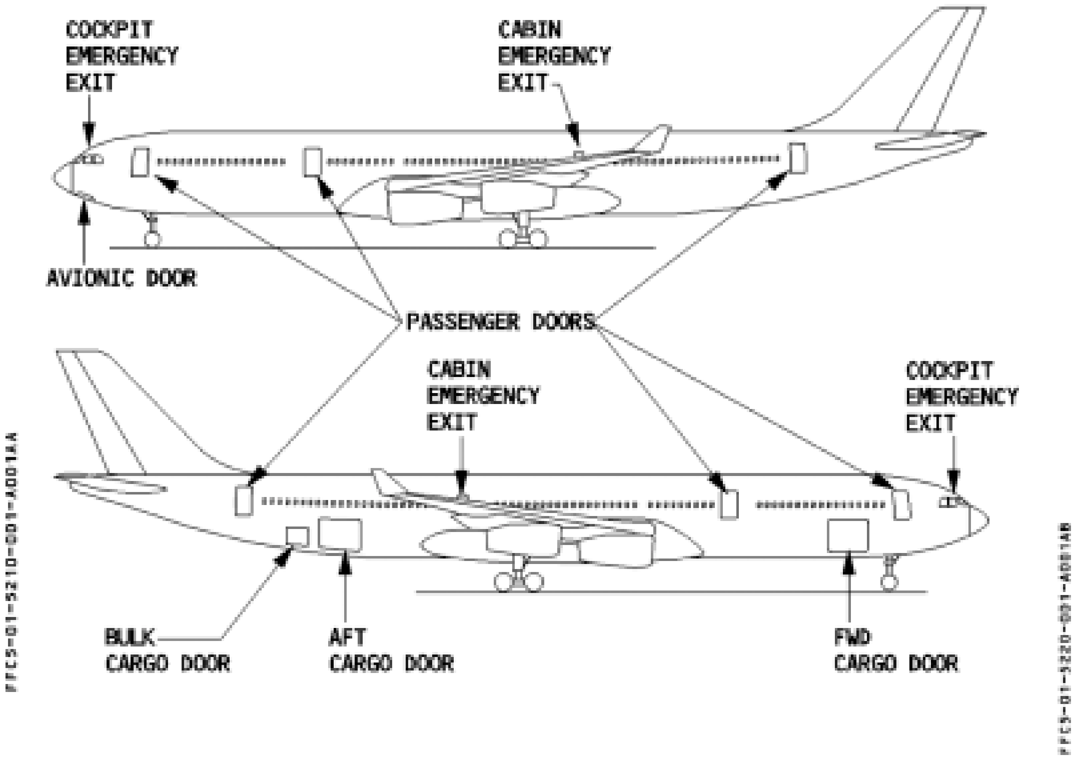
A340-200/300	A340-500/600
	

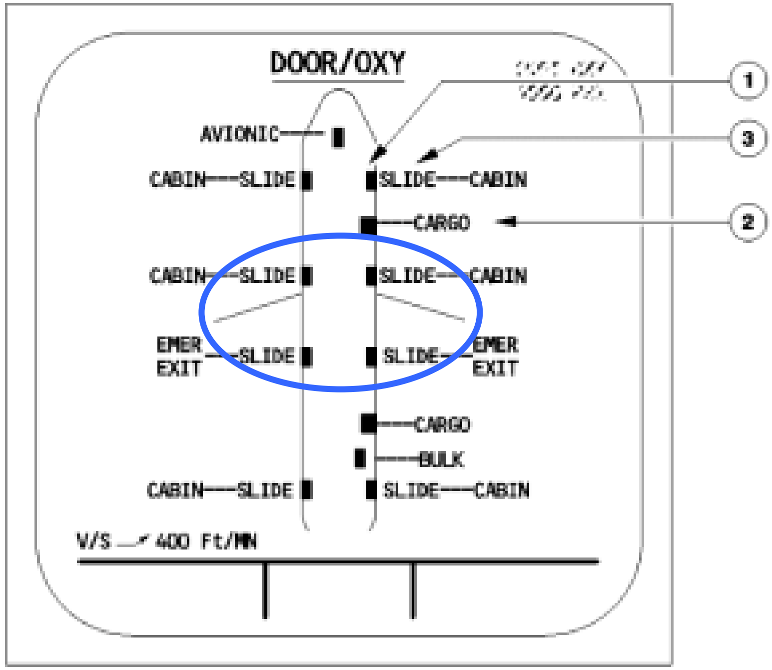
1. Avail Indication
2. APU Bleed
3. APU bleed air pressure
4. APU GEN line contactor indication
5. APU GEN
6. FUEL LO PR
7. FLAP OPEN
8. APU ON
9. APU EGT
10. LOW OIL LEVEL
11. Fuel used indication

Chapter 13- ATA 52 Doors

Door Arrangement and Corresponding ECAM Page

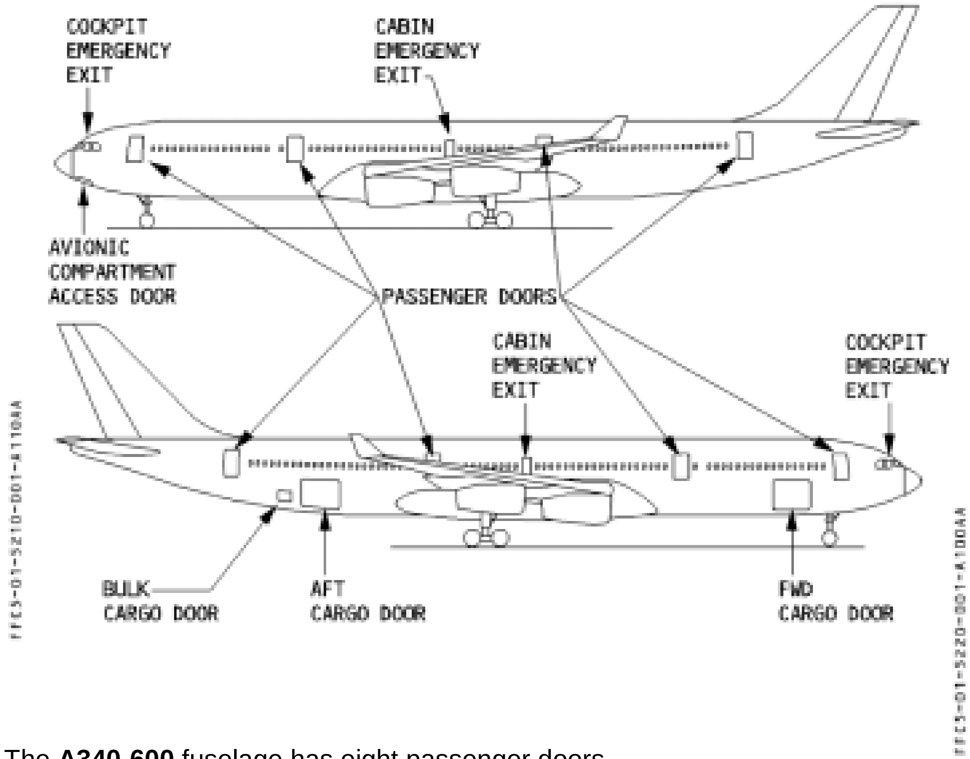
A340-200/300/500

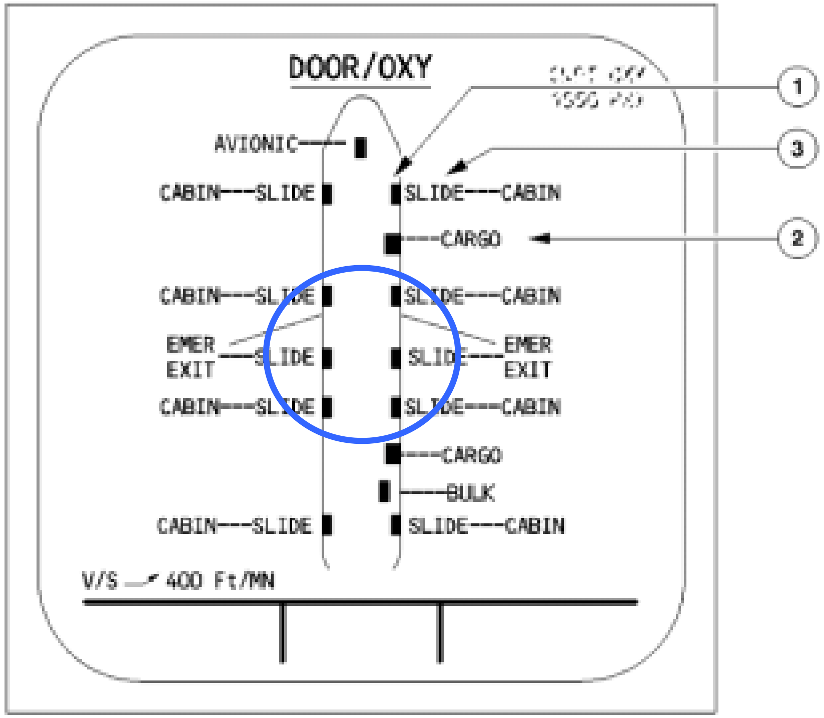




The of the **A340-200/300/500** fuselage have six passenger doors.

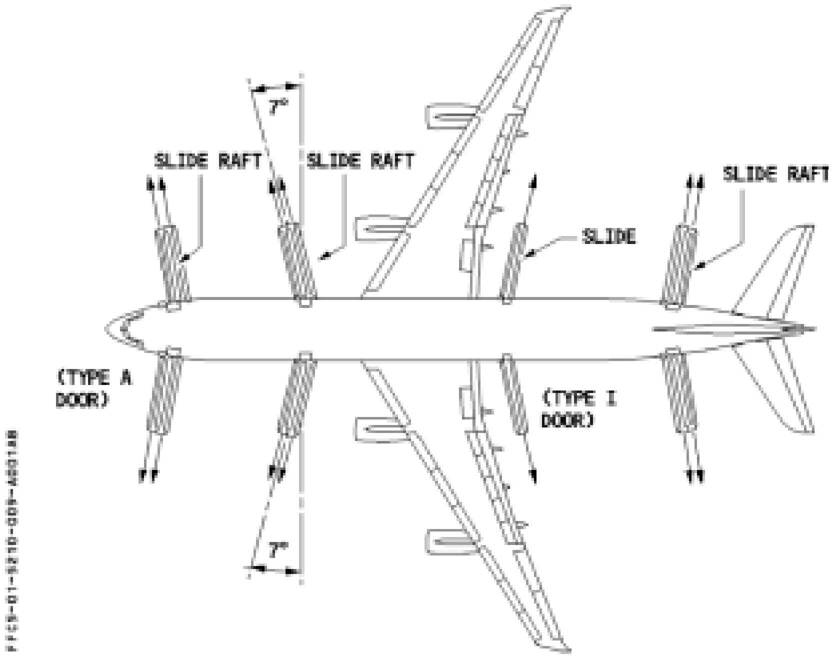
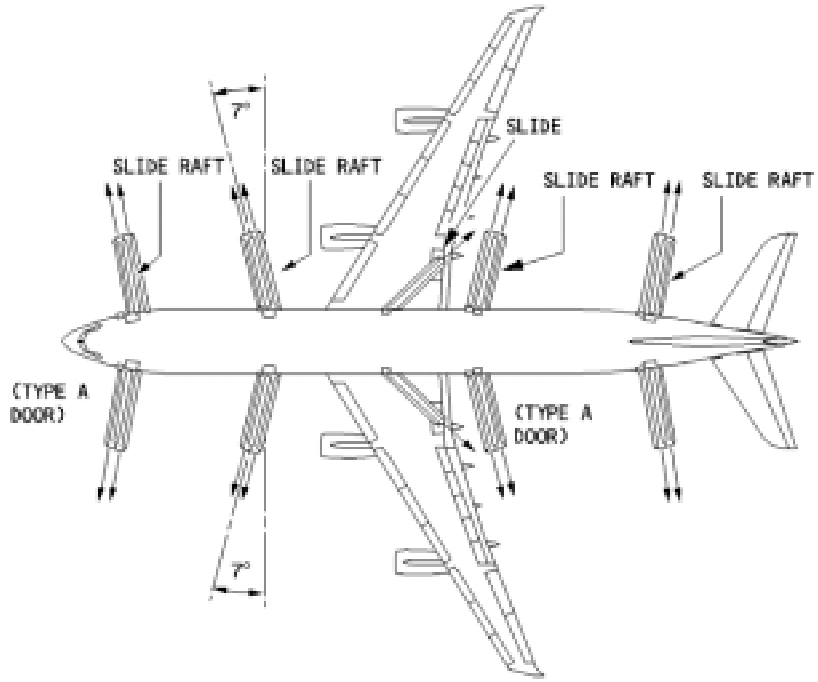
A340-600 Door Layout and corresponding ECAM Page





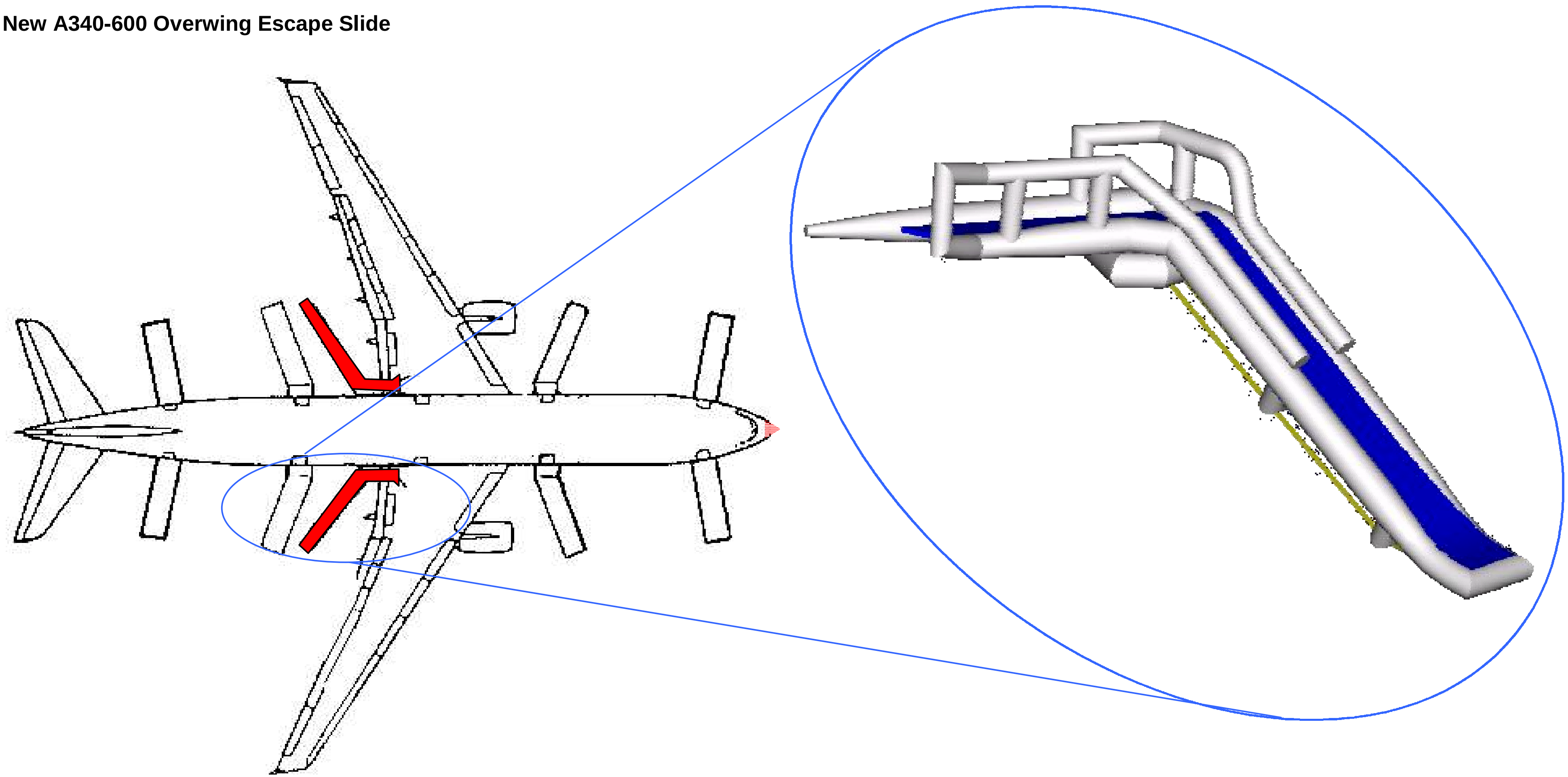
The **A340-600** fuselage has eight passenger doors.

Escape Slide Arrangement

<table>
<tr><th>A340-200/300/500</th><th>A340-600</th></tr>
<tr><td>
</td><td>
</td></tr>
</table>

The number of slide rafts has increased to eight on the **A340-600,** with the addition of a new type A slide and a new overwing escape slide.

New A340-600 Overwing Escape Slide

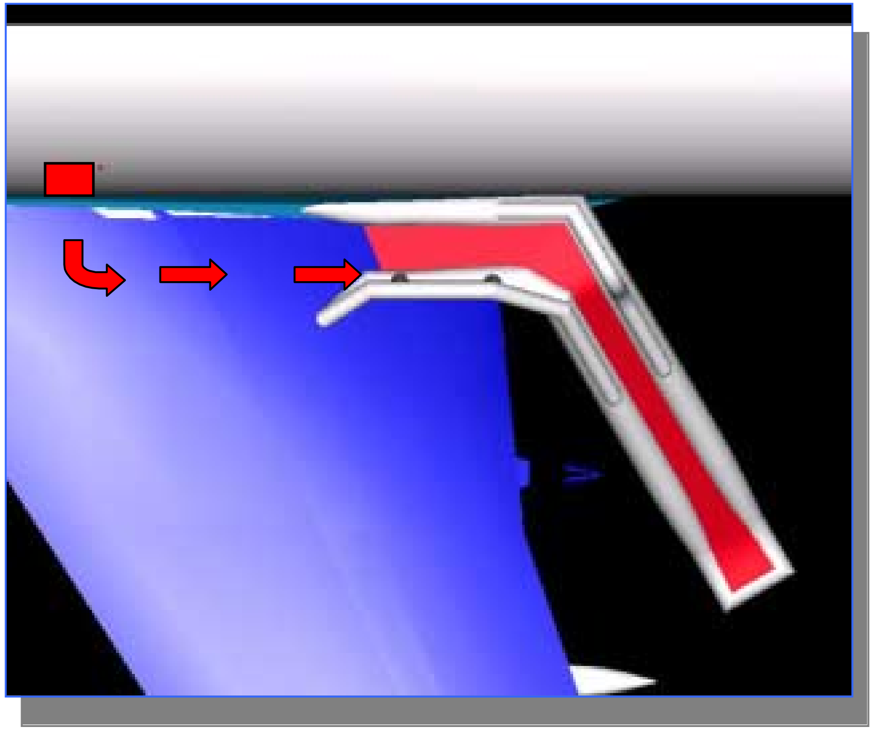


The offwing evacuation system consists of a single lane, inflatable ramp/slide construction and an associated reservoir assembly in the belly fairing aft of the wing's trailing edge. The reservoir assembly is remote from the slide compartment and mounted outside the pressurized cabin to the fuselage adjacent to the slide enclosure.

The regulator valve assembly is activated electrically (aircraft powered by a dedicated power supply unit. The inflatable slide portion of the unit is canted out, away from the fuselage such that neither interferes with parts of the aircraft (e.g. flaps, flap-track fairings etc) nor with the slide raft installed at door 3 (type “A”) will affect deployment or evacuation performance.

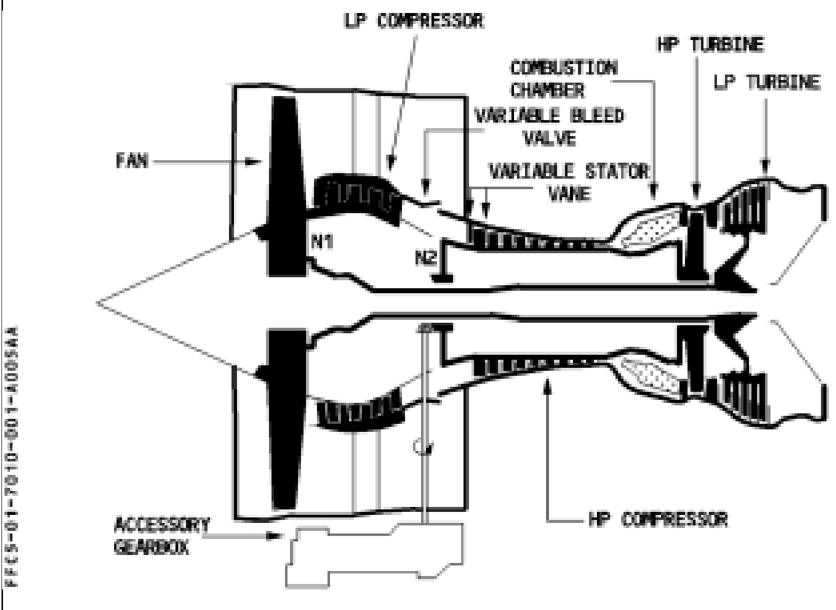
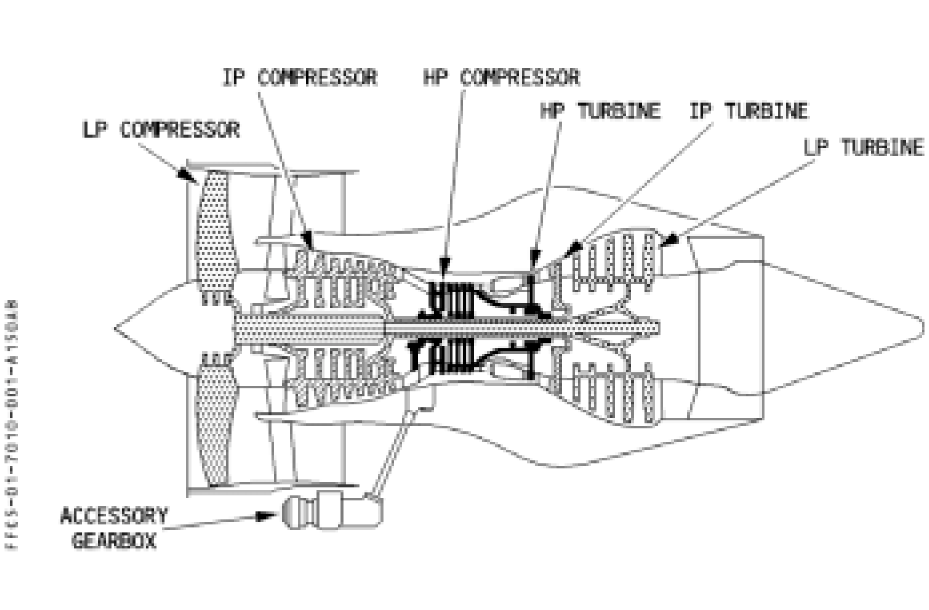
Function- Automatically controlled actions (in “armed mode”)

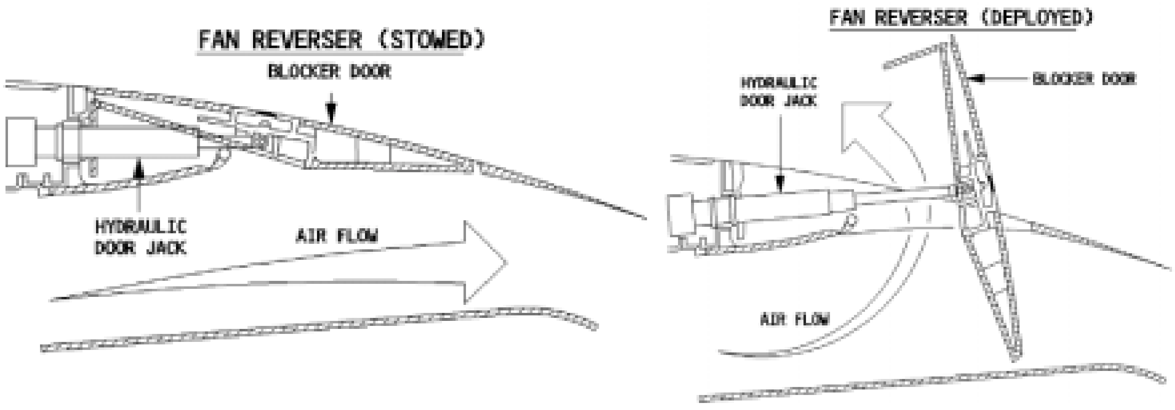
- Door motion activates the “Electrical Escape Slide Release System”
- Slide Release Power Supply Unit (SRPSU) provides the ignition current to the pressure cartridge
- Regulator valve of reservoir assembly opens
- Gas pressure activates blow outpanel release device
- Inflatable starts to inflate caused by gas pressure of inflation system
- Slide stowage door (blow outpanel) ejects
- Ramp/slide inflates to operating pressure in useable configuration
- Illumination harness receives power from aircraft

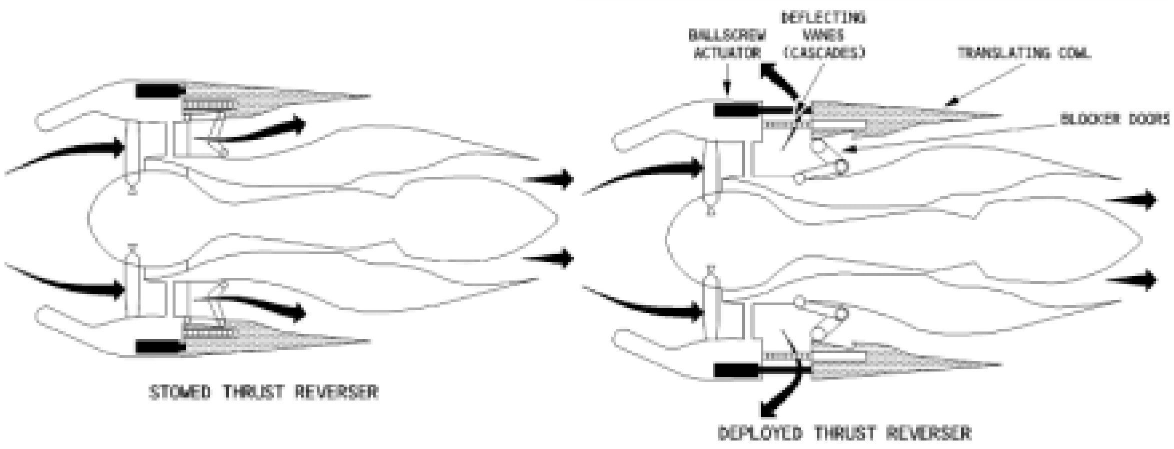


- **Single Lane Slide**
- **Ramp over flaps**
- **Angled 60° to avoid door 3 slide**

Chapter 14- ATA 70 Powerplant

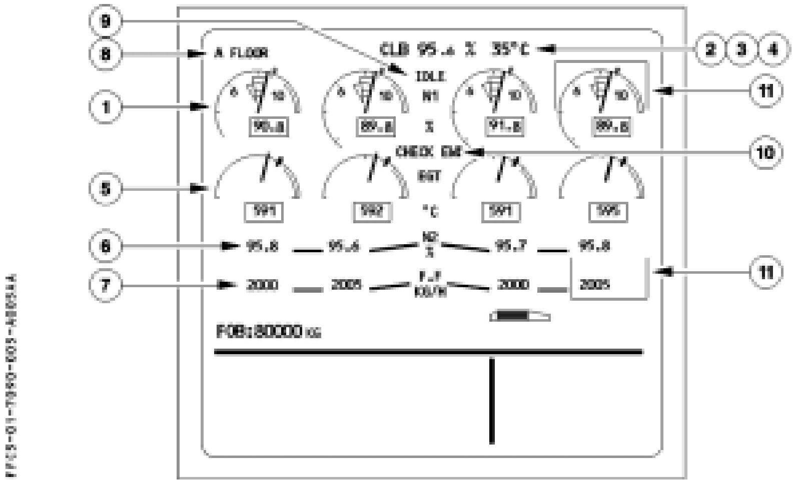
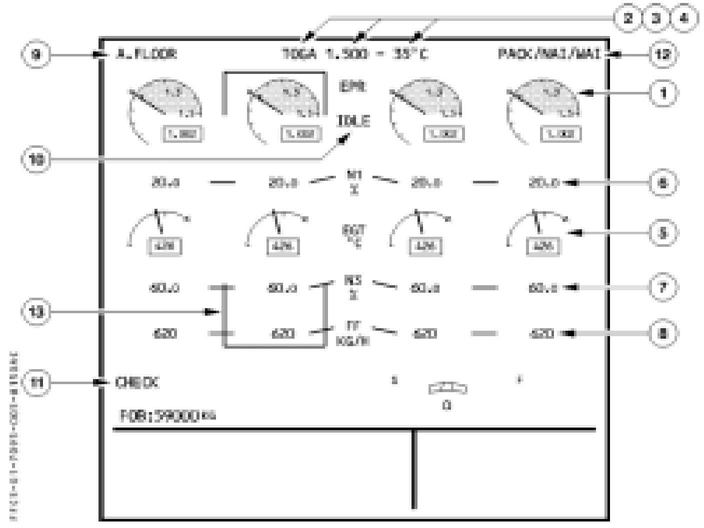
<table>
<tr><th>CFM 56-5C A340-200/300</th><th>RR TRENT 500 A340-500/600</th></tr>
<tr><td>
</td><td>
</td></tr>
<tr><td>Thrust:-
• Controlled in N1
• SLS ideal thrust range 31,200 lbs to 34,000lbs
• High Bypass ratio: 6.4/1</td><td>Thrust:-
• Controlled in EPR, with N1 back-up mode
• SLS ideal thrust range 53,000 lbs to 60,000lbs
• High Bypass ratio: 7.5/1</td></tr>
</table>

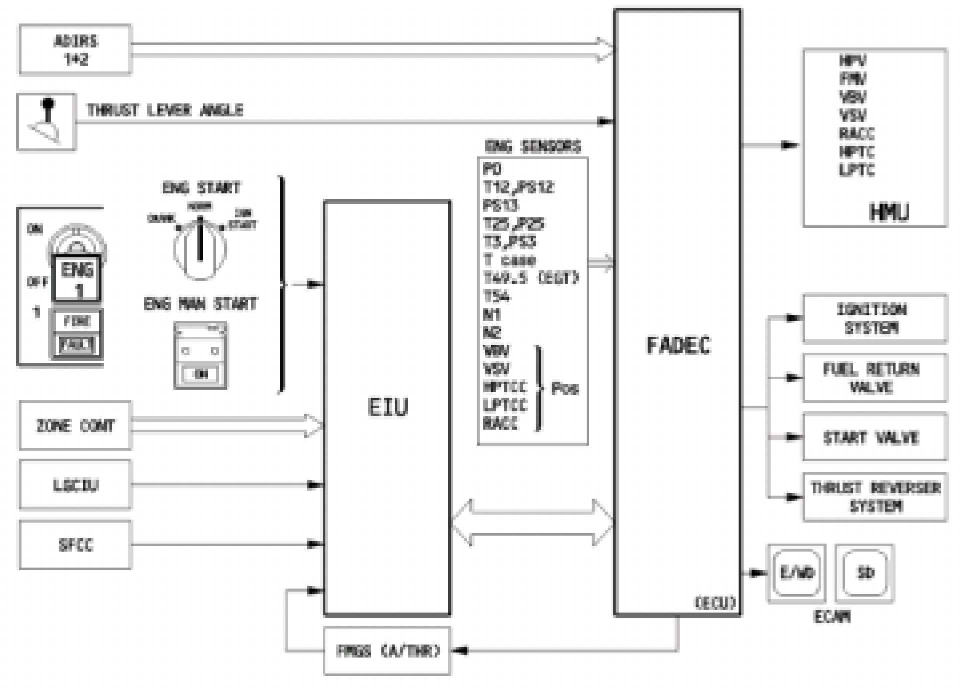
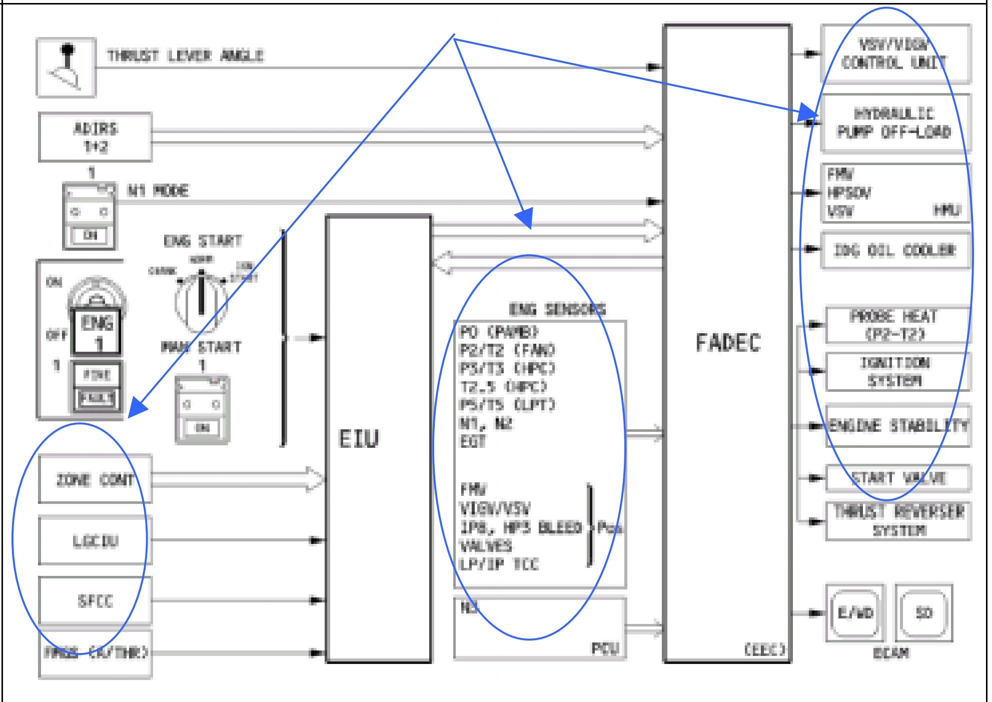
<table>
<tr><td>CFM 56-5C</td><td></td></tr>
<tr><td>
</td><td>Reverse thrust is obtained by using four pivoting blocker doors on each engine to deflect the fan airstream. The system includes the following:

4 actuators
4 latches
A shut-off valve, which allows the hydraulic pressure to the HCU
Door position switches
</td></tr>
<tr><td>RR Trent 500</td><td></td></tr>
<tr><td>
</td><td>Reverse thrust is obtained by using 2 translating cowls to enable the pivoting blocker doors to divert the fan flow forward through the cascades. The system includes the following:

2 translating cowls each activated by three hydraulic actuators
An hydraulic isolation valve controlled by the FADEC
2 Linear Variable Differential Transformers (1 per cowl), which monitor the position of the translating cowls.
4 Primary locks (2 per cowl)
2 Tertiary Lock Systems (1 per cowl)
</td></tr>
</table>

ECAM Indication

	A340-200/300	A340-500/600
		
1.	LP rotor speed	Engine Pressure Ratio (EPR)
2.	Thrust limit mode	-
3.	N1 rating limit	EPR rating limit
4.	FLEX temperature	-
5.	EGT indicator	-
6.	HP rotor speed N2	LP rotor speed N1
7.	Fuel Flow	HP rotor speed N3
8.	A FLOOR messsage	Fuel Flow
9.	IDLE message	A FLOOR messsage
10.	Check EWD message	IDLE message
11.	White box	CHECK message
12.	-	Bleed configuration
13.	-	Attention getting box

A340-200/300	A340-200/300
	

FADEC : Highlight of differences relative to A340-200/300

- **Overthrust protection: 1**. Above 50% of MTO on ground when throttle = Idle or in REV **2.** Automatic engine shut-down initiated by the EEC when Overthrust detected and A/C input discrete set (FCPC signal when on ground and throttle at idle or in REV and at least one other throttle at idle or in REV.
- **Fire and Overheat Protection**: Automatic engine shutdown, initiated by the EC when detection of fire or overheat, the philosophy being to avoid failure of EEC components which could lead to hazardous effect to the A/C.
- Starting function, Windmilling restart performance: Linear line between (30,000 ft, 200 kts) and (5000ft, 230kts) In flight, automatic hydraulic pump offload by the ECC to improve the engine restart capability
- Bleed Decrements: Bleed decrements logic is based upon Engine bleed Push Button only, a bleed valve failure during the T/O roll can not impact the thrust
- Emergency Electrical Conficuration: Chanel A only supplied in emergency electrical configuration but either Igniter A or B can be selected