

Civil Aviation Authority

MASTER MINIMUM EQUIPMENT LIST

PIPER PA31 / PA31-325 / PA31-350 / PA31P / PA31P-350

REVISION 5

8 MARCH 2010

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Civil Aviation Authority

MASTER MINIMUM EQUIPMENT LIST

PIPER PA31 / PA31-325 / PA31-350 / PA31P / PA31P-350

Revision 5
8 March 2010

Revision 5

This Master Minimum Equipment List (MMEL) is issued by the Civil Aviation Authority at the above revision and is approved as the basis for the preparation and approval of individual operators' Minimum Equipment Lists (MELs) for aircraft of this type.



H A Fowler

For and on behalf of the
Civil Aviation Authority

Correspondence concerning this document should be addressed to the office listed below:-

Civil Aviation Authority
Safety Regulation Group
Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

Attention: Aircraft Certification Department
Flight Manuals and MMEL Unit

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REVISION RECORD

REVISION No.	ISSUE DATE	INCORPORATED BY	DATE
Original	4 June 1990		
Revision 1	15 February 1991		
Revision 2	1 May 1994		
Revision 3	20 October 1995		
Revision 4	17 April 2003		
Revision 4a	9 July 2004		
Revision 5	8 March 2010		

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PREAMBLE

1. The CAA approved Master Minimum Equipment List (MMEL) provides owners/operators of United Kingdom registered aircraft, of the relevant type, with the basis for the preparation of their individual Minimum Equipment List (MELs). In the case of holders of Air Operator Certificates the MEL will be included in that Company's Operations Manual.
2. The approved MMEL represents a list of items of equipment which, under particular circumstances, can, to the satisfaction of the CAA, be unserviceable when the aircraft is dispatched, while still retaining the required level of safety.
3. The CAA recognises that in some respects the standard and scale of equipment provided in the aircraft may exceed the minimum required to satisfy airworthiness or Air Navigation Legislation requirements (**including EU-OPS**). Where necessary to achieve a satisfactory level of safety with an inoperative item, appropriate limitations are imposed or the function transferred to another component.
4. The MMEL does not include items such as wings, engines and landing gear that are always required, nor is reference made to equipment such as passenger convenience and entertainment items which, when inoperative, obviously do not affect airworthiness. It is important to note, therefore, that **ANY ITEM WHICH IS RELATED TO THE AIRWORTHINESS OF THE AIRCRAFT AND WHICH IS NOT INCLUDED IN THE MMEL IS ALWAYS REQUIRED TO BE OPERATIVE BEFORE A FLIGHT IS DISPATCHED. This also applies to** items required by Air Navigation Legislation. Additional Certification Requirements as appropriate, which are not listed, must be operative.
5. The MMEL may not waive a limitation or an emergency procedure which is given in the Flight Manual (FM) or override an Airworthiness Directive (AD) /Mandatory Inspection unless the FM/AD provides otherwise. Similarly, any Additional Certification Requirements, or other special provisions, as appropriate, which have been determined as necessary by the CAA shall not be waived unless otherwise agreed or varied by the CAA.
6. An Owner/Operators MEL must receive CAA approval which thereby conveys the permission, required by the UK Air Navigation Order, to the Commander, for operation of the aircraft with specified items of equipment unserviceable.
7. The MEL may not be less restrictive than the MMEL therefore the number of items required for dispatch shall not be less than the corresponding number in column 4 of the MMEL and any associated conditions shall be at least as severe as those specified in column 5.

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PREAMBLE (Cont.)

8. The MMEL does not anticipate the effects of combinations of apparently unrelated unserviceabilities or allow for situations where systems are made inoperative for special purposes such as demonstration, test or crew training. Other provisions may apply to positioning or ferrying flights but these may not necessarily be included in the MMEL.
9. The MEL should indicate that a decision to operate the aircraft with multiple unserviceabilities should only be made after due consideration of possible interrelated or additive effects and, if necessary, following consultation with appropriate engineering specialists.
10. It is not the purpose of the MMEL to allow defects of other than optional items to remain unrectified indefinitely. The operational flexibility provided under the MMEL policy is justified only within a framework of controlled and sound programmes of repairs, replacement and servicing. Defects should be rectified expeditiously thus retaining the intended overall level of safety and reducing the possibility of a subsequent failure necessitating the removal of the aircraft from service. Particular items in the MMEL may be subject to a limitation of flight hours, number of flights or consecutive calendar days, and these must be transferred into the MEL.

Operators with established routes shall specify in the MEL at which stations, in addition to the main maintenance base, repair facilities exist.

11. This MMEL is based upon UK legislation and some of the alleviations it provides may not therefore necessarily comply with foreign legislation.
12. The CAA MMELs and Supplements are produced in conjunction with a base document, generally either the MMEL issued/approved by a Foreign Airworthiness Authority or the aircraft manufacturer at a specific quoted revision number and date. There may be occasions whereby the CAA MMEL or Supplement has not been updated to consider later revisions of the base document. This could lead to instances where there are alleviations in the base MMEL which have either been revised or deleted and are now more restrictive than the corresponding CAA MMEL or Supplement entry. Operators are invited to review all new base document MMEL revisions and, where necessary, advise the CAA MMEL section of any significantly more restrictive alleviations introduced by the revision. The CAA will then expedite review of these variations and, where required, issue amendments to the CAA MMEL or Supplement.

New or amended alleviations given in later issues of the base document shall not be used until the CAA MMEL or Supplement has been updated to confirm that issue of the base document is acceptable.

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DEFINITIONS

1. In this list, the items of equipment are classified in systems according to the ATA 100 specification. Individual items within a given ATA classification are numbered sequentially.
2. "Item" (Column 1): The equipment, system, components or function as listed in Column 1.

NOTE: Items annotated in UPPER CASE letters indicates the precise flight deck legend used.

3. "Rectification Interval" (Column 2): Inoperative items or components, deferred in accordance with the MEL, must be rectified at or prior to the rectification intervals established by the following letter designators given in the "Rectification Interval" column (2) of the MMEL.

Category A

No standard interval is specified, however, items shall be rectified in accordance with the conditions stated in the Remarks column (5) of the MMEL.

Where a time period is specified it shall start at 00:01 on the calendar day following the day of discovery.

Category B

Items in this category shall be rectified within three (3) consecutive calendar days, excluding the day of discovery. For example, if it was recorded at 10 am on January 26th, the three day interval would begin at midnight on the 26th and end at midnight on the 29th.

Category C

Items in this category shall be rectified within (10) consecutive calendar days, excluding the day of discovery. For example, if it was recorded at 10 am on January 26th, the 10 day interval would begin at midnight on the 26th and end at midnight on February 5th.

Category D

Items in this category shall be rectified within one hundred and twenty (120) consecutive calendar days, excluding the day of discovery.

NOTE: Subject to the approval of the Authority, the operator may permit a one-time extension of the applicable rectification interval B, C or D for the same duration as that specified in the MEL.

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DEFINITIONS (Cont.)

4. **"Number Installed"** (Column 3): The number of the specified items normally installed in the aircraft. This number identifies the aircraft configuration considered in developing the MMEL.

NOTE: The operator's MEL should list the number installed in a particular aircraft.

5. **"Number Required for Dispatch"** (Column 4): The minimum number of the specified items required for operation provided the conditions defined in Column 5 are met.
6. **"Remarks or Exceptions"** (Column 5): This column includes a statement prohibiting operation or permitting operation with a specific number of items inoperative, provisos (conditions and limitations) for such operation and appropriate notes.

A note in column 5 indicates additional information and references for crew and/or maintenance personnel consideration; they are not part of the provisos.

Where references are stated in column 5 these are to identify certain interrelationships between subject item and other MMEL items, Flight Manual material etc. These references are intended to assist, but not relieve, an operator of the responsibility for determining such interrelationships as stated in the Preamble.

7. **Dash (-)**: This symbol indicates a variable quantity when used in Columns 3 or 4.

NOTE: The operator's MEL should list the numbers appropriate to his particular aircraft in Columns 3 and 4.

8. **"Placarding"**: Each inoperative item must be placarded to inform and remind the crew members and maintenance personnel of the equipment condition. To the extent practicable, placards should be located adjacent to the control or indicator for the item affected such that it is clear to the operating crew that it or its associated system is inoperative.

NOTE: The practice of specifying which items must be placarded, by means of an asterisk (*), has been discontinued.

9. **"Inoperative"**: A system or item of equipment is deemed inoperative if it malfunctions such that it does not accomplish its intended purpose and/or is not consistently functioning within its designed operating limit(s) or tolerance(s).

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DEFINITIONS (Cont.)

10. "(O)": The use of this symbol in Column 5 indicates that an appropriate operating procedure (or change to an existing procedure) must be established, published and utilised to maintain the required level of safety while operating under the terms of the (M)MEL.

Normally, these procedures are accomplished by the flight crew. However, other personnel may be qualified and authorised to perform certain functions.

11. "(M)": The use of this symbol in Column 5 indicates that an appropriate maintenance procedure must be established, published and utilised prior to the first flight undertaken following discovery of the defect and, if necessary, repeated at specified intervals during operation under the terms of the (M)MEL to maintain the required level of safety.

Normally, these procedures are accomplished by maintenance personnel. However, other personnel may be qualified and authorised to perform certain functions.

NOTE: Where an item is annotated (O)/(M), the "/" is defined as "and/or", which shows that there may be different options available in respect of the MEL procedures.

12. "As required by Air Navigation Legislation / Operating Requirements": The associated item must comply with legal provisions such as the Air Navigation Order or any other legislation (**EU-OPS**) in force during the flight.

Operators should refer to JAR-OPS 1 MEL Policy document (Temporary Guidance Leaflet number 26) for suitable alleviations based upon the required equipment identified within **EU-OPS**, subparts K and L (published in the JAA Administrative and Guidance **Material**, section four, Operations, part three).

13. "VMC" and "IMC": The definitions of these terms are those used in Section 2 of the Air Navigation Order - Rules of the air.

14. "Icing Conditions": An atmospheric condition that may cause ice to form on the aircraft or in the engines.

15. "Visible Moisture": An atmospheric environment containing water in any form that can be seen in natural or artificial light, i.e. clouds, fog, rain, sleet, hail, snow.

16. "Flight Hour": The time from the moment an aircraft leaves the surface of the earth until it touches it at the next point of landing.

NOTE: The definition differs from that given in the Air Navigation Order.

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DEFINITIONS (Cont.)

17. **"ETOPS"**: Refers to "extended range" operations which may be defined as "operation of a two-engined aeroplane over a route that contains a point farther than one hour flying time at the normal one-engined inoperative cruise speed (in still air) from an adequate airport".

In the MEL, for an operator who has received approval to extend maximum diversion time from 120 minutes to 138 minutes, unless otherwise stated, "120 minutes" may be interpreted as "138 minutes".

18. **"Flight day"**: A 24 hour period (from midnight to midnight) during which at least one flight is scheduled for the affected aircraft.
19. **"Authority"**: The competent regulatory authority according to the country of registry; for aircraft registered in the U.K. this is the Civil Aviation Authority.
20. **"Deleted"**: When applied to an item number, indicates that the item was previously listed but is now required to be operative.
21. **"Combustible (Material)"**: is defined as material which is capable of catching fire and burning.

When an MMEL item specifies the condition that only non-combustible materials are to be carried, it is the operator's responsibility to determine that all material (including containers, packing material and pallets etc) in the associated compartments is of a non-combustible nature.

If it cannot be determined whether any proposed cargo is non-combustible, it must not be loaded in compartments where combustible materials are prohibited.

22. **"System"**: System means the group of directly related components which together perform a specified function, for example 'RPM indication system' would include the RPM indicator, tachometer generator, circuit breaker and associated circuitry.
23. **"Extended Over-water Flight"**: Refers to an operation overwater at a horizontal distance of more than 50 nautical miles from the nearest shoreline.
24. **"Dispatch"**: The point at which an aircraft first moves under its own power for the purpose of commencing a flight.

NOTE: The definition above is in accordance with that given in **Article 256(1)(a)** of the ANO. The MMEL/MEL applies to all defects identified that occur up to the point of dispatch. They come into effect again when the aircraft next comes to rest at the end of its flight.

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DEFINITIONS (Cont.)

25. "It is not reasonably practical to repair or replace before the commencement of flight / It is not reasonably practicable for repairs or replacements to be made": These statements are intended to cover the situations whereby there is a lack of replacement part(s), inadequate engineering resources or manpower to enable the defect to be rectified.

Note: The intention of either of these statements in an MMEL is that the aircraft may be dispatched if there are inadequate available spares or if there are no qualified and authorised personnel on base to perform the task. The definition is not dependent on whether there is enough time available to complete the task before the next flight. If the aircraft is at a maintenance base or any other airport, but the spare(s) or manpower are not available, then the aircraft may be dispatched. As soon as the aircraft lands at an airport where the spares are available and there are qualified and authorised personnel on base, the defect must be rectified.

26. "The aircraft may depart on the flight or series of flights for the purpose of returning directly to a base where repairs or replacements can be made / The aircraft may continue the flight or series of flights but shall not depart an airport where repairs or replacements can be made": These statements are intended to allow the aircraft to be flown, using the most direct route, to the nearest maintenance base where arrangements for repairs or replacements can be made.

Note: Once the aircraft lands at the maintenance base, the aircraft shall not be dispatched until the defect has been rectified.

27. "Flight": For the purpose of a MEL, a flight is the period of time between the moment an aeroplane begins to move by its own means, for the purpose of preparing for take-off, until the moment the aeroplane comes to a complete stop on its parking area, after subsequent landing (and no subsequent take-off).

28. Base documents used for the preparation of this MMEL are:

- a) FAA Piper PA31, PA31-300, 325, 350, MMEL **Revision 10 dated 23 October 2009**.
- b) FAA Piper PA31P, PA31P-350 MMEL **Revision 6 dated 20 November 2009**.
- c) CAA policy, as at **8 March 2010**.
- d) CAA Piper PA31 series MMEL at **Revision 4a dated 9 July 2004**.

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HIGHLIGHTS OF REVISION 5

General Revised to align with FAA MMEL PA31/PA31-300/PA31-325/PA31-350 Revision 10 and FAA MMEL PA31P/PA31P-350 Revision 6.
Replaced references to "Air Navigation Legislation" with "Operating Requirements".

Preamble Item 3 – Added reference to EU-OPS.

Item 4 – Editorial correction.

Definitions Item 3 – Note re Rectification Intervals Extension revised in accordance with CAA Policy.

Item 12 – Revised to reflect introduction of EU-OPS.

Item 24 – Air Navigation Order reference updated.

Item 28 – Source documents amended.

ATA 21 AIR CONDITIONING

21-5 Heater Hour Meter Moved to item 31-4, in line with FAA MMEL.

ATA 21 AUTOPILOT

22-1 Autopilot Changed Rectification Interval to 'D' (both reliefs).

ATA 23 COMMUNICATIONS

23-5 Headsets Second relief - Number required for dispatch entered.

23-7 Ramp Hailer Number required for dispatch entered.

23-9 Recorded Passenger Briefing System Added "May be inoperative provided".

ATA 25 EQUIPMENT / FURNISHING

25-2 Passenger Seat Added relief for armrests, in accordance with JAA/EASA policy.

25-4 Flight Crew Seats Revised title and layout (no change to relief).

25-8 Emergency Locator Transmitter Revised to identify separate relief for Survival Type and Fixed Type ELTs.

ATA 30 ICE AND RAIN PROTECTION

30-8 Pitot Heat Indicating Systems New Item.

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HIGHLIGHTS OF REVISION 5 (Cont.)

ATA 31 INDICATING / RECORDING SYSTEMS

- | | | |
|------|-------------------|---------------------------------------|
| 31-1 | Clock | Revised in line with JAA/EASA policy. |
| 31-4 | Heater Hour Meter | Moved from Item 21-5 |

ATA 33 LIGHTS

- | | | |
|-------|---------------------------------|--|
| 33-1 | Anti-Collision Light System | Revised to read "As required by Operating Requirements". |
| 33-4 | Cockpit and Instrument Lighting | Revised item title. |
| 33-5 | Landing Lights | Revised second relief to delete unnecessary second proviso. |
| 33-8 | Passenger Notice System | Editorial changes only, no change to relief. |
| 33-11 | Cabin Interior Lights | Removed "As required by Air Navigation Legislation" (actual relief written in MMEL).
Proviso (a) amended from 'cabin crew' to 'crew'. |

ATA 34 NAVIGATION

- | | | |
|-------|---|--|
| 34-10 | ATC Transponder | Revised to read "As required by Operating Requirements". |
| 34-12 | Navigational Equipment | Omega/VLF and Doppler systems deleted from title (obsolete systems). |
| 34-13 | DME | Revised in line with JAA/EASA policy. |
| 34-15 | Altitude Alerting System | Revised title and revised relief in line with JAA/EASA policy (editorial change only). |
| 34-24 | Radio Magnetic Indicator | New item. |
| 34-25 | Area Navigation Equipment | New Item. |
| 34-26 | Flight Management System,
Navigation Databases | New Item. |
| 34-27 | Navigation Management System,
Navigation Databases | New Item. |

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HIGHLIGHTS OF REVISION 5 (Cont.)

34-28 ADS-B New item.

34-28 ADS-B New item.

ATA 38 WATER / WASTE

34-28 Portable Lavatory System New item.

ATA 61 PROPELLERS

61-1 Propeller Synchrophaser Added "If installed" to title.

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(1) System & Sequence Numbers Item		(2) Rectification Interval			
				(3) Number installed	
				(4) Number required for dispatch	
				(5) Remarks or Exceptions	
21	AIR CONDITIONING				
1.	Heater (excluding blower)	C	1	0	(M) May be inoperative provided OAT is +5°C or greater throughout the flight. <u>Note 1:</u> Consideration must be given to crew efficiency and passenger comfort. <u>Note 2:</u> If the de-mist function is not available, an alternative means of ensuring adequate visibility shall be provided.
2.	Air Conditioning System (If installed)	C	1	0	(M) May be inoperative.
3.	Aft Cabin Heater (If installed)	D	-	0	(M) May be inoperative.
4.	Cabin Ventilation Fan (PA31-350 Only)	C	2	0	May be inoperative.
5.	Heater Hour Meter				Moved to Item 31-4
6.	Ground Ventilation Fan (If installed)	D	-	0	May be inoperative.
7.	Cabin Heater Circulating Fan	C	1	0	May be inoperative provided: (a) Heater is not used on the ground, and (b) Heater is switched OFF prior to landing.
8.	Automatic Temperature Control (If installed)	C	1	0	May be inoperative.
9.	Cabin Altitude Controller (PA31P, PA31P-350)	C	1	0	May be inoperative for unpressurised flight.
10.	Cabin Altitude/Differential Pressure Indicator (PA31P, PA31P-350)	C	1	0	May be inoperative for unpressurised flight.
11.	Safety Valve (PA31P, PA31P-350)	C	1	0	(M) May be inoperative for unpressurised flight provided Safety Valve is blocked open.

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21	AIR CONDITIONING (Cont.)				
12.	Outflow Valve (PA31P, PA31P-350)	C	1	0	May be inoperative for unpressurised flight.
13.	Recirculation Fan (PA31P, PA31P-350)	C	1	0	May be inoperative.
14.	Cabin Rate of Change Indicator (PA31P, PA31P-350)	C	1	0	May be inoperative for unpressurised flight.

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		(3) Number installed	
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		(5) Remarks or Exceptions	
22	AUTOPILOT		
1.	Autopilot	D -	- May be wholly or partially inoperative for public transport operations provided the composition of the flight crew is in accordance with the appropriate Operating Requirements or arrangements approved by the Authority for aircraft of this type.
		D -	0 May be inoperative for aircraft flying for purposes other than public transport. <u>Note 1:</u> Any mode that functions normally may be used. <u>Note 2:</u> See Flight Manual Supplement for possible flap use restrictions.
2.	Autopilot Radio Coupler (If installed)	C -	0 May be inoperative provided operations are not dependent upon its use.
3.	Yaw Damper (If installed)	C -	0 May be inoperative provided yaw damper failure is independent of and unrelated to autopilot operation or the autopilot is not used – see 22-1. <u>Note:</u> See applicable Flight Manual Supplement for possible implications upon the autopilot.

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		(3) Number installed			
		(4) Number required for dispatch			
		(5) Remarks or Exceptions			
23	COMMUNICATIONS				
1.	Communications Equipment (VHF, HF, UHF)	-	-	-	As required by Operating Requirements.
2.	Passenger Address System				
	(1) Passenger configuration	B	-	0	(O) May be inoperative provided: (a) Alternate normal and emergency procedures and/or operating restrictions are established and used, and (b) Appropriate oral briefings are given to passengers.
	(2) Cargo configuration	D	-	0	
3.	Cockpit Speaker	C	1	0	May be inoperative provided an operative headset is available to each member of the flight crew, and a spare headset is available for single pilot operations.
4.	Flight Deck Intercommunications	D	1	0	May be inoperative for single pilot or non-public transport operations only.
5.	Headsets (Including Boom Microphones)	-	-	-	For public transport operations, one required for each crew member on flight deck duty.
		C	-	0	For non-public transport operation, may be inoperative provided hand held microphones are installed and operating normally.
6.	Hand Held Microphones	D	-	-	May be inoperative provided an operative headset is available to each member of the flight crew.
7.	Ramp Hailer (If installed)	D	1	0	(O) May be inoperative.
8.	Cockpit Voice Recorder (CVR)	-	-	-	As required by Operating Requirements.
9.	Recorded Passenger Briefing System	C	1	0	(O) May be inoperative provided alternate procedures are established and used.

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24	ELECTRICAL POWER				
1.	Digital Voltmeter (If installed)	C	-	0	May be inoperative provided the analogue voltmeter is operative.

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25 EQUIPMENT/FURNISHING			
1.	Crew Members Shoulder Harness Inertia Reel	A	- - May be inoperative provided: (a) The affected harness is adjusted and locked by an approved means to suit the requirements of the individual flight crew member, and (b) Repairs or replacements are carried out within three calendar days.
2.	Passenger Seat	D	- - (M) May be inoperative secured in the upright position.
		D	- 0 (M) One or more may be inoperative provided: (a) Affected seat does not block an emergency exit, (b) Does not restrict any passenger from access to the main aircraft aisle, and (c) Affected seat(s) is blocked and placarded "DO NOT OCCUPY". <u>Note 1:</u> A seat with an inoperative seat belt is considered inoperative. <u>Note 2:</u> A seat with an inoperative recline mechanism is considered inoperative if the seat cannot be secured upright.
	(1) Armrests	D	- - (M) One or more may be inoperative, damaged or missing provided: (a) The affected armrest does not block an emergency exit, (b) The affected armrest is not in a position such that it restricts any passengers from access to the aircraft aisle, and (Cont...)

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25	EQUIPMENT/FURNISHING (Cont.)			
2.	Passenger Seat (Cont.)			
	(1) Armrests (Cont.)			(c) For affected armrests with a seat recline mechanism, that the seat is secured in the upright position. <u>Note:</u> Any damage to passenger seats and components must not be detrimental to passenger safety.
3.	Flotation Equipment	-	-	-
				As required by Operating Requirements.
4.	Flight Crew Seats			
	(1) Vertical and Recline Adjustment	B	-	0
				May be inoperative provided the associated seat is secured or locked in a position acceptable to the flight crew member.
5.	Ashtrays	D	-	-
				May be inoperative provided the affected seat(s) is restricted to non-smoking passengers only.
6.	First Aid Kit	-	-	-
				As required by Operating Requirements.
7.	Torch	-	-	-
				As required by Operating Requirements.
8.	Emergency Locator Transmitter (If installed)			
	(1) Survival Type ELTs	D	-	-
				(M) Any in excess of the minimum required may be inoperative or missing provided the equipment is placarded inoperative, removed from the installed location and placed out of sight so that it cannot be mistaken for a functional unit.
	(2) Fixed ELTs	A	-	0
				May be inoperative provided repairs or replacements are made within 6 further flights or 25 flying hours, whichever occurs first.
		D	-	-
				Any in excess of those required by Operating Requirements may be inoperative.

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		(4) Number required for dispatch	
		(5) Remarks or Exceptions	
26	FIRE PROTECTION		
1.	Portable Fire Extinguishers	D	-
			-
			(M) Any in excess of those required may be inoperative or missing provided:
			(a) The inoperative fire extinguisher is placarded inoperative, removed from the installed location and placed out of sight so it cannot be mistaken for a functional unit, and
			(b) Required distribution is maintained.

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		(3) Number installed			
		(4) Number required for dispatch			
		(5) Remarks or Exceptions			
27	FLIGHT CONTROLS				
1.	Electric Elevator Trim System	C	1	0	(M) May be inoperative provided: (a) Manual trim system operates normally, and (b) Autopilot operation is unaffected or the autopilot is not used.
2.	Trim Tab Position Indicator	B	3	0	May be inoperative provided: (a) The affected tab(s) is/are verified to be operating normally prior to each departure, and (b) The affected tab(s) is/are positioned to neutral and verified by visual inspection prior to each departure.
3.	Stall Warning Light (If installed)	C	1	0	May be inoperative. <u>Note:</u> Stall warning HORN is essential and must operate normally.

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				(5) Remarks or Exceptions	
28	FUEL				
1.	Electric In-Line Low Pressure Boost Pump	C	2	0	(M)(O) May be inoperative provided flight is limited to a maximum of 15,000 feet AMSL. <u>Note:</u> This is not the in-line emergency electric boost pump.
2.	Fuel Quantity Indicators	C	2	1	(M)(O) One may be inoperative provided: (a) All fuel flow meters operate normally, (b) All fuel pressure gauges operate normally, and (c) Operations shall be conducted in accordance with one of the following: (i) Fuel tanks are visually checked to be full prior to departure, OR (ii) Fuel in affected tank is not included for the purposes of flight planning, OR (iii) An approved alternate procedure is used to refuel the aircraft with fuel reserves increased by 10%.
3.	Fuel Flow Gauge	C	1	0	(O) One or both indications may be inoperative provided: (a) All other associated engine indications operate normally, and (b) Fuel quantity indication system is operating normally.
4.	Fuel Totaliser	C	1	0	May be inoperative.

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				(3) Number installed	
				(4) Number required for dispatch	
				(5) Remarks or Exceptions	
30	ICE AND RAIN PROTECTION				
1.	Pitot Heater	B	2	0	One or more may be inoperative for day VMC only provided the aircraft is not operated in known or forecast icing conditions.
2.	Surface De-icing System (Wing, Vertical and Horizontal Stabilisers)	C	1	0	May be inoperative provided the aircraft is not operated in known or forecast icing conditions.
3.	Propeller De-icing System	C	2	1	(O) One may be inoperative provided: (a) The aircraft is not operated at any time in visible moisture or precipitation when OAT is +10°C or below, and (b) The aircraft is not operated in known or forecast icing conditions. <u>Note:</u> AFM limitations and procedures must be observed.
4.	Stall Warning Heater	C	1	0	(O) May be inoperative provided the aircraft is not operated in known or forecast icing conditions.
5.	Windshield Wiper System	C	1	0	(O) May be inoperative provided the aircraft is not operated in precipitation within arrival and departure areas.
6.	Windscreen De-mist System	C	1	0	(O) May be inoperative provided alternate procedures are established and utilised to maintain adequate forward vision when required.
7.	Windshield Heater	C	1	0	May be inoperative provided aircraft is not operated in known or forecast icing conditions.
8.	Pitot Heat Indicating Systems (Not required by certification or operating rules)	C	-	0	May be inoperative provided: (a) All other elements of the Pitot Heat System operate normally, and (b) The aeroplane is not operated in known or forecast icing conditions.

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		(3) Number installed		(4) Number required for dispatch	
		(5) Remarks or Exceptions			
31	INDICATING/RECORDING SYSTEMS				
1.	Clock	C	1	0	<p>May be inoperative provided an accurate timepiece is operative on the flight deck, indicating the time in hours, minutes and seconds.</p> <p><u>Note:</u> On the basis that the timepiece required does not need to be approved, an accurate pilot's wristwatch which indicates hours, minutes and seconds would be acceptable.</p>
2.	Flight Hour Recorder	C	1	0	(O) May be inoperative.
3.	Flight Data Recorder	-	-	-	As required by Operating Requirements.
4.	Heater Hour Meter	C	1	0	(O) May be inoperative.

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				(3) Number installed	
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				(5) Remarks or Exceptions	
32	LANDING GEAR				
1.	Wheel Brakes				
	(1) Right Hand Side (If installed)	C	-	0	(M) May be inoperative provided: (a) Left hand toe brakes operate normally, and (b) There is no evidence of fluid leakage from system when operative toe brakes are applied.
	(2) Left Hand Side	C	1	0	(O)(M) May be inoperative for two pilot operation only provided: (a) Right hand toe brakes are installed and operating normally, (b) There is no evidence of fluid leakage from system when operative toe brakes are applied.

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				(3) Number installed	
				(4) Number required for dispatch	
				(5) Remarks or Exceptions	
33	LIGHTS				
1.	Anti-Collision Light System	-	-	-	As required by Operating Requirements.
2.	Ground Recognition Beacon (Red)				Incorporated into Item 33-1.
3.	Navigation Lights	C	3	0	May be inoperative for daylight operations only.
4.	Cockpit and Instrument Lighting	C	-	0	May be inoperative for daylight operations only.
		C	-	-	Individual lights may be inoperative provided: (a) Sufficient lighting is operative to make each required instrument, control, and other device for which it is provided easily readable, (b) Sufficient flight deck emergency lighting is operative, and (c) Lighting configuration at dispatch is acceptable to the flight crew.
5.	Landing Light(s)	C	-	0	All may be inoperative for daylight operations only.
		B	-	1	One filament/lamp may be inoperative for night operations provided the taxi light is operative.
6.	Taxi Light	C	1	0	May be inoperative.
7.	Wing Ice Detection Light	D	1	0	May be inoperative for daylight operations.
		B	1	0	(O) May be inoperative for night operations provided an alternate means is operative and used to illuminate ice accretion on another outside surface visible from the flight deck.

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		(5) Remarks or Exceptions			
33	LIGHTS (Cont.)				
8.	Passenger Notice System ("NO SMOKING/FASTEN SEAT BELT") Signs	C	-	-	(M)(O) No passenger seat or cabin attendant seat may be occupied from which a "No Smoking/Fasten Seat Belt" sign is not readily legible or that seat must be blocked and placarded – "DO NOT OCCUPY"
		C	-	-	(O) No Smoking/Fasten Seat Belt Signs may be inoperative and the affected passenger seat(s) or cabin attendant seat(s) may be occupied provided: (a) An acceptable procedure is used to notify passengers when seat belts must be fastened, or smoking is prohibited. OR (b) Passengers are not carried.
9.	Baggage Compartment Light	D	1	0	May be inoperative.
10.	Logo Lights	D	-	-	May be inoperative.
11.	Cabin Interior Lights	C	-	-	Individual lights may be inoperative provided: (a) Lighting is adequate for the crew to perform their required duties, and (b) Cabin emergency lighting is operative. OR (c) Passengers are not carried. <u>Note:</u> Cabin emergency lighting does not include floor proximity lights.
12.	Recognition Lights	C	2	0	May be inoperative.
13.	Cabin Door Boarding Light (If installed)	D	1	0	May be inoperative.

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		(4) Number required for dispatch			
		(5) Remarks or Exceptions			
34	NAVIGATION				
1.	Altimeters				
	(1) Single Pilot Operations	B	-	1	Any in excess of one may be inoperative provided: (a) The operative altimeter is on the captain's side, and (b) Operations are confined to day VMC only.
	(2) Two Pilot Operations	C	-	2	Any in excess of two may be inoperative provided: (a) One altimeter is operative for each pilot, (b) The required altimeters operate independently, and (c) At least one of the above is a pneumatic, or servo pneumatic altimeter.
	(3) Servo Pneumatic Altimeter Mode (If installed)	C	-	0	May be inoperative provided the altimeter remains in the pneumatic mode and the transponder remains operative.
2.	Airspeed Indicator				
	(1) Single Pilot Operations	B	-	1	Any in excess of one may be inoperative provided the operative airspeed indicator is on the Captain's side.
	(2) Two Pilot Operations	C	-	2	Any in excess of two may be inoperative provided operative airspeed indicators are at each pilot's station.
3.	Gyroscopic Bank and Pitch Indicator System				
	(1) Single Pilot Operations	B	-	1	Any in excess of one may be inoperative provided the operative attitude indicator in on the Captain's side.
	(2) Two Pilot Operations	B	-	1	The co-pilot's indicator may be inoperative for day VMC only.

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				(5) Remarks or Exceptions	
34	NAVIGATION (Cont.)				
4.	Gyroscopic Directional Indicator System				
	(1) Single Pilot Operations	B	2	1	The right hand indicator may be inoperative provided the standby (magnetic) compass operates normally.
	(2) Two Pilot operations	B	2	1	One may be inoperative for day VMC only provided: (a) A stabilised heading indication is available on each pilot's panel, and (b) The standby (magnetic) compass operates normally.
5.	Gyroscopic Rate of Turn/Slip Skid Indicator	B	2	1	For single pilot operations, right hand indicator may be inoperative.
		B	2	1	(O) For two pilot operations, either indicator may be inoperative.
6.	Vertical Speed Indicator	C	2	1	For single pilot operations, right hand indicator may be inoperative.
		C	2	1	For two pilot operations, either indicator may be inoperative for day VMC.
7.	Flight Director	C	1	0	May be inoperative provided operational procedures do not require its use.
8.	Radio Altimeter	C	1	0	May be inoperative provided operational procedures do not require its use. <u>Note 1:</u> If the loss of the radio altimeter prohibits normal operation of the GPWS/TAWS, the dispatch deviation and rectification interval for an inoperative GPWS/TAWS must be observed. <u>Note 2:</u> If the loss of the radio altimeter prohibits normal operation of the ACAS, the dispatch deviation and rectification interval for an inoperative ACAS must be observed.

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34	NAVIGATION (Cont.)				
9.	Weather Radar	D	-	0	May be inoperative.
10.	ATC Transponder	-	-	-	As required by Operating Requirements.
11.	Marker Beacon	B	-	0	One or more may be inoperative for IFR operations, provided approach procedures do not require marker fixes.
		D	-	0	One or more may be inoperative for VFR operations.
12.	Navigational Equipment (VOR, ADF, ILS, Loran, INS)	D	-	-	Any installed equipment in excess of that required may be inoperative provided the equipment or combinations of equipment needed to satisfy the minimum navigation (or area navigation) performance requirement for the route or region of operation is available. <u>Note 1:</u> When preparing the MEL the operator should itemise the equipment / combinations of equipment needed for the particular operations for which the aircraft is approved. The effect of subsequent additional equipment failure should also be considered. <u>Note 2:</u> Items which are installed but not required may be inoperative provided there is no effect on workload, crew training, and procedures etc.
13.	DME	C	-	0	One or more may be inoperative provided navigation procedures for the routes to be flown are not dependent upon the use of the affected DME.
		B	-	0	(O) One or more may be inoperative provided alternate approved navigational equipment is operative and used. <u>Note:</u> Operators should consider whether the in-flight failure of any FMS sensor allows safe navigation with the remaining operative sensors and equipment.
		D	-	-	Any in excess of those required may be inoperative

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34	NAVIGATION (Cont.)				
14.	Altitude Encoder	D	-	-	Any in excess of that required for the route(s) being flown may be inoperative.
15.	Altitude Alerting System	B	1	0	The aircraft may continue the flight or series of flights but shall not depart an airport where it is reasonably practicable for repairs or replacements to be made.
16.	Standby (Magnetic) Compass	B	1	0	May be inoperative provided at least two independent stabilised compass systems are installed and operative.
17.	Stormscope (If installed)	C	1	0	May be inoperative.
18.	Outside Air Temperature Indicator	C	1	0	May be inoperative provided another air temperature indication is operative that is convertible to OAT.
19.	Remote Compass (If installed)	C	-	0	May be inoperative provided left direction indicator and standby compass are operating normally.
20.	Co-pilot's Instruments (other than those already specified in this MMEL)	D	-	-	Any or all may be inoperative provided the appropriate operating requirements are satisfied.
21.	Ground Proximity Warning System (GPWS) (including TAWS) (If installed)	-	-	-	As required by Operating Requirements.
22.	Airborne Collision and Avoidance System (ACAS II) (If installed)				
	(1) ACAS II System	A	-	0	(O)(M) May be inoperative provided the system is deactivated and secured, and: (a) It is not reasonably practicable for repairs or replacements to be made before the commencement of flight, and (b) Repairs or replacements must be carried out within 10 calendar days. (Cont...)

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		(5) Remarks or Exceptions			
34	NAVIGATION (Cont.)				
	Airborne Collision and Avoidance System (ACAS II) (If installed) (Cont.)				
	(2) Combined Traffic Alert (TA) and Resolution Advisory (RA) Dual Display	C	-	1	(O) May be inoperative on the non-flying pilot side provided TA and RA elements and audio functions are operative on flying pilot side.
	(3) Resolution Advisory (RA) Display Systems(s)	C	-	1	(O) One may be inoperative on non-flying pilot side.
		C	-	0	(O) May be inoperative provided: (a) All Traffic Alert (TA) display elements and voice command audio functions are operative, and (b) TA only mode is selected by the crew.
	(4) Traffic Alert (TA) Display System(s)	C	-	0	(O) May be inoperative provided all installed RA display and audio functions are operative.
23.	Flight Profile Advisory System (If installed)	C	1	0	May be inoperative.
24.	Radio Magnetic Indicator (RMI) (If installed)	C	1	0	May be inoperative.
25.	Area Navigation System (If installed)	D	-	-	(O) Any in excess of the number stated in the Aeronautical Information Publications (or their equivalent) as being required to satisfy operational requirements for airspace procedures, may be inoperative provided the limitations in the Flight Manual are observed.
		A	-	0	(O) One or more may be inoperative for one flight provided: (a) Routing is planned via ground based navigational aids taking account of promulgated range, and (b) Permission is obtained from the Air Navigation Service Provider(s) when required for the intended route.

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		(4) Number required for dispatch	
		(5) Remarks or Exceptions	
34	NAVIGATION (Cont.)		
26.	Flight Management System (FMS) (If installed)		
	(1) Navigation Databases	C	- 0
	<u>Note:</u> Databases which are out of date are considered to be inoperative.		
		C	- 1
		A	- 0
			(O) One or more may be inoperative for the intended route where conventional (non-RNAV) navigation is sufficient, provided:
			(a) Current aeronautical information (e.g. charts) is available for the entire route and for the aerodromes to be used, and
			(b) Navigation database information is disregarded.
			Any in excess of one may be inoperative provided:
			(a) The operative database is up to date for route, departure, arrival and approach procedures that require the use of Navigation Database for RNAV, and
			(b) This up to date database is readily available to the flight crew member(s) responsible for navigation.
			(O) One or more may be out of date for a maximum of 10 calendar days provided:
			(a) Area Navigation (RNAV) departure, arrival and approach procedures do not depend on the data amended in the current database cycle,
			(b) Before each flight, current aeronautical information is used to verify the database navigation fixes, the co-ordinates, frequencies, status (as applicable) and suitability of navigation facilities required for the intended route, and
			(Cont...)

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34	NAVIGATION (Cont.)		
26.	Flight Management System (FMS) (If installed) (Cont.)		
	(1) Navigation Databases (Cont.)		
		A - 0	<p>(c) Radio navigation aids, which are required to be flown for departure, arrival and approach procedures and which have been amended in the current database cycle, are manually tuned and identified.</p> <p>(O) One or more may be out of date for a maximum of 10 calendar days provided:</p> <p>(a) Conventional (non-RNAV) departure, arrival and approach procedures, when available, or ANSP assistance are used as an alternative to RNAV procedures which have been amended in the current database cycle.</p> <p>(b) Before each flight, current aeronautical information is used to verify the database navigation fixes, the co-ordinates, frequencies, status (as applicable) and suitability of navigation facilities required for the intended route, and</p> <p>(c) Radio navigation aids, which are required to be flown for departure, arrival and approach procedures and which have been amended in the current database cycle, are manually tuned and identified.</p>

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34	NAVIGATION (Cont.)		
27.	Navigation Management System (NMS) (If installed)		
	(1) Navigation Databases	C	- 0
	<u>Note:</u> Databases which are out of date are considered to be inoperative.		
		C	- 1
		A	- 0
			(O) One or more may be inoperative for the intended route where conventional (non-RNAV) navigation is sufficient, provided:
			(a) Current aeronautical information (e.g. charts) is available for the entire route and for the aerodromes to be used, and
			(b) Navigation database information is disregarded.
			Any in excess of one may be inoperative provided:
			(a) The operative database is up to date for routes, departures, arrival and approach procedures that require the use of Navigation Database for RNAV, and
			(b) This up to date database is readily available to the flight crew member(s) responsible for navigation.
			(O) One or more may be out of date for a maximum of 10 calendar days provided:
			(a) Area Navigation (RNAV) departure, arrival and approach procedures do not depend on the data amended in the current database cycle,
			(b) Before each flight, current aeronautical information is used to verify the database navigation fixes, the co-ordinates, frequencies, status (as applicable) and suitability of navigation facilities required for the intended route, and
			(Cont...)

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34	NAVIGATION (Cont.)		
27.	Navigation Management System (NMS) (If installed) (Cont.)		
	(1) Navigation Databases (Cont.)		
		A - 0	(c) Radio navigation aids, which are required to be flown for departure, arrival and approach procedures and which have been amended in the current database cycle, are manually tuned and identified.
			(O) One or more may be out of date for a maximum of 10 calendar days provided:
			(a) Conventional (non-RNAV) departure, arrival and approach procedures, when available, or ANSP assistance are used as an alternative to RNAV procedures which have been amended in the current database cycle.
			(b) Before each flight, current aeronautical information is used to verify the database navigation fixes, the co-ordinates, frequencies, status (as applicable) and suitability of navigation facilities required for the intended route, and
			(c) Radio navigation aids, which are required to be flown for departure, arrival and approach procedures and which have been amended in the current database cycle, are manually tuned and identified.
28.	Automatic Dependant Surveillance Broadcast (ADS-B) System (If installed)	D - -	Any in excess of those required may be inoperative.

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		(4) Number required for dispatch		
		(5) Remarks or Exceptions		
34	NAVIGATION (Cont.)			
29.	Standby Attitude Indicator (If installed)			
	(1) Single Pilot operations	B	-	0
	(2) Two Pilot operations	B	-	0
				One or more may be inoperative for day VMC only provided the captain's attitude indicator is operative.
				May be inoperative for day VMC only provided both attitude indicators are operative.

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35	OXYGEN			
1.	Passenger Oxygen	-	-	- As required by Operating Requirements.

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		(5) Remarks or Exceptions			
36	PNEUMATICS				
1.	Pneumatic Pump Functions (If installed)	A	2	1	<p>One may be inoperative for day VMC operations only provided:</p> <p>(a) The standby (magnetic) compass operates normally,</p> <p>(b) The aircraft must not be operated above the single engine service ceiling, see Flight Manual, and</p> <p>(c) The aircraft may continue the flight or series of flights not to exceed six sectors but shall not depart an airport where repairs or replacements can be made.</p> <p><u>Note:</u> Refer to item 37-1.</p>
2.	Gyro Pressure Gauge	C	1	0	<p>May be inoperative provided pneumatic indicator lights are installed and operating normally.</p>
3.	Pneumatic Indicator Lights	A	2	1	<p>(O) One may be inoperative provided gyro pressure gauge is operating normally.</p> <p>The aircraft may continue the flight or series of flights not to exceed six sectors but shall not depart an airport where repairs or replacements can be made.</p>

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		(5) Remarks or Exceptions			
37	VACUUM				
1.	Vacuum Pump Functions (If installed)	A	2	1	<p>One may be inoperative for day VMC operations only provided:</p> <p>(a) The standby (magnetic) compass operates normally,</p> <p>(b) The aircraft must not be operated above the single engine service ceiling, see Flight Manual, and</p> <p>(c) The aircraft may continue the flight or series of flights not to exceed six sectors but shall not depart an airport where repairs or replacements can be made.</p> <p><u>Note:</u> Refer to item 36-1.</p>
2.	Gyro Pressure Gauge	C	1	0	<p>May be inoperative provided vacuum indicator lights are installed and operating normally.</p>
3.	Vacuum Indicator Lights	A	2	1	<p>(O) One may be inoperative provided gyro vacuum gauge is operating normally.</p> <p>The aircraft may continue the flight or series of flights not to exceed six sectors but shall not depart an airport where repairs or replacements can be made.</p>

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		(5) Remarks or Exceptions		
38	WATER / WASTE			
1.	Portable Lavatory System (If installed)	C	-	0
				(M) May be inoperative provided: (a) Associated components are deactivated or isolated, (b) System components are verified not to have leaks, and (c) System is placarded "DO NOT USE".

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		(3) Number installed		(4) Number required for dispatch	
				(5) Remarks or Exceptions	
52	DOORS				
1.	Cabin Door Warning Lights				
	(1) Unpressurised variants	C	1	0	(O) May be inoperative provided: (a) A member of the flight crew confirms that the door is correctly latched and secured prior to each departure, and (b) Fasten seat belt sign remains on, or passengers are orally briefed to remain seated with their seat belts fastened.
	(2) Pressurised variants	C	1	0	(O) May be inoperative provided: (a) A member of the flight crew confirms that the door is correctly latched and secured prior to each departure, (b) The cabin remains unpressurised, and (c) Fasten seat belt sign remains on, or passengers are orally briefed to remain seated with their seat belts fastened.
2.	Nose Baggage Door Ajar Light (If installed)	C	1	0	(O) May be inoperative provided a member of the flight crew confirms that the door is correctly latched and secure prior to departure.

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		(5) Remarks or Exceptions		
56	WINDOWS			
1.	DV Windows	C	2	1
				For single pilot operations, the right hand window may be inoperative provided:
				(a) The affected window is secured closed, and
				(b) The left windshield wiper operates normally.
		C	2	1
				For two pilot operations, either may be inoperative provided:
				(a) The affected window is secured closed, and
				(b) The associated windshield wiper operates normally.

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		(5) Remarks or Exceptions			
61	PROPELLERS				
1.	Propeller Synchrophaser (If installed)	C	1	0	May be inoperative.

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		(3) Number installed		
		(4) Number required for dispatch		
		(5) Remarks or Exceptions		
71	POWERPLANT			
1.	Engine Automatic Alternate Air Control System	C	2	0
				(O) May be inoperative provided the associated manual alternate air control system(s) is/are verified to be operating normally prior to each departure.

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		(5) Remarks or Exceptions		
77	ENGINE INDICATING			
1.	EGT Gauge	C	2	1
				(O) One may be inoperative provided: (a) An approved procedure is established and utilised for mixture control, and (b) Fuel reserves for the flight are increased by 5%.

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		(3) Number installed			
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		(5) Remarks or Exceptions			
79	ENGINE OIL				
1.	Oil Temperature Gauges	B	2	1	One may be inoperative.

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