

INTRODUCTION

1. Scope

The Time Limits/Maintenance Checks (TL/MC) manual shows tasks that are Airworthiness Limitations (life limited components, airworthiness limitation items and certification maintenance requirements) and tasks approved by the Maintenance Review Board (MRB) for the Bombardier Challenger 300® Business Jet. These tasks are required to make sure of the continued airworthiness of the aircraft. The Airworthiness Limitation section and MRB section are approved by Transport Canada (TC).

The MRB Report and the Airworthiness Limitations form the basis of the Manufacturer's recommended inspection/maintenance program.

The MRB Report contains the initial minimum maintenance/inspection requirements in compliance with Instructions for Continued Airworthiness. It does not include the Mandatory Airworthiness Inspection tasks that follow:

- Life Limited Components
- Airworthiness Limitation Items (ALI)
- Certification Maintenance Requirements (CMR).

2. Manual Organization

The TL/MC manual includes the front matter that follows:

- Title Page
- Record of Revisions
- Record of Temporary Revisions
- List of Effective Pages
- List of Effective Temporary Revisions
- Table of Contents

The TL/MC manual is divided into the sections that follow:

- PART 1 – 5-00-00 General
- PART 2 – 5-10-00 Airworthiness Limitations
- PART 3 – 5-20-00 Maintenance Review Board (MRB) Report.

For extension tolerances to the inspection intervals, refer to section 1, paragraph 2.A. of the Maintenance Planning Document (MPD).

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3. Complementary Information

The manual has references to the manuals that follow:

- Aircraft Maintenance Manual (AMM)
- Structural Repair Manual
- Component Maintenance Manual
- Non-Destructive Test Manual.

Aircraft stations and zones data can be found in the AMM, Chapter 6.

Engine Inspection procedures can be found on the Honeywell CD-ROM, AS907-1-1A, Light Maintenance Manual, Report No. 72-05-12 and Heavy Maintenance Manual, Report No. 72-05-13.

The AS907 engine is operated under the Task Oriented Maintenance Program and has no mandatory scheduled overhaul or hot section inspection maintenance. This program lists borescope inspections of internal and external components and other tasks that can be done without the removal of the engine from the airframe.

Data from the Trend Monitoring Program is intended to compliment the Task Oriented Maintenance Program of the MRB report.

4. Program Glossary and Definitions

A. Accidental Damage

Physical deterioration of an item caused by contact or impact with an object or influence which is not a part of the aircraft, or by human error during manufacturing, operation of the aircraft, or maintenance practices.

B. Age Exploration

A systematic evaluation of an item based on analysis of collected information from in-service experience. It verifies the item's resistance to a deterioration process with respect to increasing age.

C. Airworthiness Limitations Section

A section of the Instructions for Continued Airworthiness that contains each mandatory replacement time, inspection interval, and related inspection procedure for structural items (ALIs) and for systems items (CMRs). This section also includes mandatory replacement times, inspection intervals and related inspection procedures resulting from custom installations and/or repairs on Principal Structural Elements (PSEs). The information contained in the Airworthiness Limitations section may be changed to reflect service and/or test experience of new analysis methods but only with the approval of Transport Canada.

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D. Airworthiness Limitations Items

Mandatory structural inspections for the basic aircraft.

E. Certification Maintenance Requirements

A required periodic task, established during the design certification of the airplane as an operating limitation of the type certificate.

F. Corrosion

The gradual deterioration of a metal or alloy as a result of chemical interaction with its environment.

G. Corrosion – Level 1

Corrosion damage that does not require structural reinforcement or replacement OR corrosion occurring between successive inspections which exceeds allowable limits, but is local and can be attributed to an event not typical of operator usage of other aircraft in the same fleet (e.g. mercury spill).

H. Corrosion Prevention and Control Program (CPCP)

A comprehensive and systematic approach to controlling corrosion such that the load carrying capability of an airplane structure is not degraded below a level necessary to maintain airworthiness. It contains the basic corrosion inspection tasks, definition of corrosion levels, implementation threshold, and repeat interval for task accomplishment in each area or zone.

I. Damage Tolerant

A qualification standard for aircraft structure. An item is judged to be damage tolerant if it can sustain damage and the remaining structure can withstand reasonable loads without structural failure or excessive structural deformation until the damage is detected.

J. Direct Adverse Effect on Operating Safety

Direct – To be direct, the functional failure or resulting secondary damage must achieve its effect by itself, not in combination with other functional failures (no redundancy exists and it is a primary dispatch item)

Adverse Effect on Safety – This implies that the consequences are extremely serious or possibly catastrophic and might cause the loss of aircraft or injury to occupants.

Operating – This is defined as the time interval during which passengers and crew are on board for the purpose of flight.

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K. Discard

The removal from service of an item at a specified time limit.

L. Economic Effects

Failure effects which do not prevent aircraft operation, but are economically undesirable due to added labor and material cost for aircraft or shop repair.

M. Engine Hours

See Flight Hours

N. Environmental Deterioration

Physical deterioration of an item's strength or resistance to failure as a result of chemical interaction with its climate or environment.

O. Failure

The inability of an item to perform within previously specified limits.

P. Failure Cause

Why the functional failure occurs.

Q. Failure Effect

What is the result of a functional failure.

R. Fatigue Damage

The initiation of a crack or cracks due to cyclic loading and subsequent propagation.

S. Fleet Leader Concept

The concentration of sample inspections on the pieces of equipment which have the highest operating ages to identify the first evidence of changes in their condition with increasing age.

T. Flight Hours

Accumulated time interval between wheels-off to wheels-on

U. Function

The normal characteristic actions of an item.

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V. Functional Test

A quantitative check to determine if one or more functions of an item performs within specified limits.

W. Functional Failure

How an item failed to perform its function.

X. Hidden Function

A function which is normally active and whose cessation will not be evident to the operating crew during performances of normal duties OR a function which is normally inactive and whose readiness to perform, prior to it being needed, will not be evident to the operating crew during performance of normal duties.

Y. Inherent Level of Reliability and Safety

That level which is built into the unit and, therefore, inherent in its design. This is the highest level of reliability and safety that can be expected from a unit, system or aircraft if it receives effective maintenance. To achieve higher levels of reliability generally requires modification or redesign.

Z. Inspection

An examination of an item against a specific standard.

AA. Inspection – Detailed

An intensive visual examination of a specific structural area, system installation or assembly, to detect damage, failure or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate by the inspector. Inspection aids such as mirrors, hand lens, etc., surface cleaning and elaborate access procedures may be required.

AB. Inspection – General Visual

A visual examination of an interior or exterior area, installation or assembly, to detect obvious damage, failure or irregularity. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight or drop-light and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked. General Visual Inspection cannot be a candidate for transfer to Zonal Working Group if originated from route 5 or 8.

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AC. Inspection – Special Detailed

An intensive examination of a specific item(s), installation or assembly to detect damage, failure or irregularity. The examination is likely to make extensive use of specialized inspection techniques and/or equipment. Intricate cleaning and substantial access or disassembly procedure may be required.

AD. Item

Any level of hardware assembly (i.e. system, sub-system, module, accessory, component, unit, part etc.).

AE. Landing

A sequence covering the approach and touchdown phases. Each touch-and-go operation is considered a landing.

AF. Life-Limited Items

An item which must be removed from service and discarded before a specified time is achieved.

AG. Lubrication and Servicing

Any act of lubricating or servicing for the purpose of maintaining inherent design capabilities.

AH. Maintenance Significant Item

Items identified by the manufacturer whose failure:

- (1) could affect safety (on ground and/or in flight), and/or
- (2) is undetectable during operations, and/or
- (3) could have significant operational impact, and/or
- (4) could have significant economic impact.

AI. Multiple Site Fatigue Damage

The presence of a number of adjacent small cracks that might coalesce to form a single long crack.

AJ. Operating Crew Normal Duties

Operating Crew – Qualified cockpit and cabin attendant personnel who are on duty.

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Normal Duties – Those duties associated with the routine operation of the aircraft, on a daily basis, to include the following:

- (1) Procedures and checks performed during aircraft operation
- (2) Recognition of abnormalities or failures by the operating crew through the use of normal physical senses (e.g. odor, noise, vibration, temperature, visual observation of damage or failure, changes in physical input force requirements, etc.).

AK. Operational Effects

Failure effects which interfere with the completion of the aircraft mission. These failures cause delays, cancellations, ground or flight interruptions, high drag coefficients, altitude restrictions, etc.

AL. Operational Test

An operational test is a task to determine that an item is fulfilling its intended purpose. Does not require quantitative tolerances. This is a failure finding task.

AM. Other Structure

Structure which is judged not to be a Structural Significant Item. "Other Structure" is defined both externally and internally within zonal boundaries.

AN. Principal Structural Element (PSE)

Elements of Primary Structure which contribute significantly to carrying flight, ground, pressurization or control loads, and whose failure could result in catastrophic failure of the airplane. PSEs are a subset of SSIs (every PSE is an SSI or contained within an SSI).

AO. Residual Strength

The strength of a damaged structure.

AP. Restoration

That work necessary to return an item to a specific standard. Restoration may vary from cleaning or replacement of single parts up to a complete overhaul.

AQ. Safe Life Limit

Time at which safe-life component must be removed from service.

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AR. Safe Life Structure

Structure which can withstand the repeated loads of variable magnitude expected during its service life without detectable cracks.

AS. Scheduled Maintenance Check

Any of the maintenance opportunities which are prepackaged and are accomplished on a regular basis.

AT. Structural Assembly

One or more structural elements which together provide a basic structural function.

AU. Structural Detail

The lowest structural level in an aircraft structure. A discrete region or area of a structural element, or a boundary intersection of two or more elements.

AV. Structural Element

Two or more structural details which together form an identified manufacturer's assembly part.

AW. Structural Function

The mode of action of aircraft structure. It includes acceptance and transfer of specific loads in items (details/elements/assemblies) and provides consistently adequate aircraft response and flight characteristics.

AX. Structural Significant Item

Any detail, element or assembly which contributes significantly to carrying flight, ground, pressure or control loads and whose failure could affect the structural integrity necessary for the safety of the aircraft.

AY. Tasks – Maintenance

An action or set of actions required to achieve a desired outcome which restores an item to, or maintains an item in serviceable condition, including inspection and determination of condition.

AZ. Threshold

The initial accomplishment of a specific maintenance task expressed in flight cycle, flight hours, and/or calendar time.

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BA. Visual Check

A visual check is an observation to determine that an item is fulfilling its intended purpose. Does not require quantitative tolerances. This is a failure finding task.

5. List of Abbreviations and Acronyms

AC	Advisory Circular
ACO	Aircraft Certification Office
AD	Accidental Damage
AEG	Aircraft Evaluation Group
AFCS	Automatic Flight Control System
ALI	Airworthiness Limitation Item
AMA	Airworthiness Manual Advisory
AMM	Aircraft Maintenance Manual
ADF	Automatic Direction Finder
AMTOSS	Aircraft Maintenance Task Oriented Support System
APU	Auxiliary Power Unit
ATA	Airline Transport Association of America
BBA	Bombardier Business Aircraft
BL	Buttock Line
CFR	Code of Federal Regulations
CIC	Corrosion Inhibiting Compound
CMM	Component Maintenance Manual
CMR	Certification Maintenance Requirement
CPCP	Corrosion Prevention and Control Program
CRES	Corrosion Resistant Steel
DI	Detailed Inspection
DME	Distance Measuring Equipment
DOT	Department of Transportation
DTR	Damage Tolerance Rating
ED	Environmental Deterioration

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EFIS	Electronic Flight Instrument System
EICAS	Engine Indicating and Crew Alerting System
ELT	Emergency Locator Transmitter
FAA	Federal Aviation Administration (USA)
FAR	Federal Aviation Regulation
FC	Flight Cycles
FD	Fatigue Damage
FMEA	Failure Mode and Effects Analysis
FMQGC	Fuel Management and Quantity Gauging Computer
FMS	Flight Management System
FOD	Foreign Object Damage
FS	Fuselage Station
GVI	General Visual Inspection
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
H	Hours
HF	High Frequency
ICA	Instructions for Continued Airworthiness
IRS	Inertial Reference System
ISC	Industry Steering Committee
IWG	Industry Working Group
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
L	Landings
L/HIRF	Lightning/High Intensity Radiated Field
LBL	Left Buttock Line
LEP	List of Effective Pages
LRU	Line Replaceable Unit
M	Months
ME	Maintenance Engineering

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MEL	Minimum Equipment List
MMEL	Master Minimum Equipment List
MLG	Main Landing Gear
MPD	Maintenance Planning Document
MPE	Maintenance Planning Engineering
MPP	Maintenance Program Proposal
MPS	Material Process Specification
MRB	Maintenance Review Board
MRBR	Maintenance Review Board Report
MSG-3	Maintenance Steering Group – 3rd Task Force
MSI	Maintenance Significant Item
MTBF	Mean Time Between Failure
MTBUR	Mean Time Between Unscheduled Removal
NDI	Nondestructive Inspection
NDT	Nondestructive Test
NLG	Nose Landing Gear
P/N	Part Number
PPH	Policy and Procedures Handbook
PSE	Primary Structural Element
R	Repeat
RBL	Right Buttock Line
REF	Reference
REO	Repair Engineering Order
REV	Revision
SACD	Structural Airworthiness Control Document
SATCOM	Satellite Communication System
SB	Service Bulletin
SDI	Special Detailed Inspection
SELCAL	Selective Calling System
SID	Supplemental Inspection Document

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SIP	Structural Inspection Program
SRM	Structural Repair Manual
SRT	Safety Related Task
SSA	System Safety Analysis
SSI	Structural Significant Item
SWG	Structure Working Group
T	Threshold
TBD	To Be Determined
TC	Transport Canada
TCAS	Traffic Alert and Collision Avoidance System
TLMC	Time Limits/Maintenance Checks
TR	Temporary Revision
TSOP	Technical Support Operating Procedure
VHS	Very High Frequency
VS	Vertical Stabilizer
WG	Working Group
WL	Water Line
WS	Wing Station
ZIN	Zonal Identification Number
ZL	Zonal
ZWG	Zonal Working Group

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