Redegørelse i anledning af tre havarier med Dash-8 Q400

Statens Luftfartsvæsen
November 2007

Indhold

Indledning og resumé

Transport- og energiministeren anmodede den 14. september Statens Luftfartsvæsen om senest 1. november 2007 at udarbejde en redegørelse i anledning af to havarier med to DASH8 Q400 luftfartøjer tilhørende SAS i henholdsvis Aalborg og Vilnius den 9. og 12. september 2007.

I redegørelsen skal indgå en beskrivelse af det internationale system, som skal sikre det nødvendige tilsyn med luftfartøjer, herunder hvilken rolle de forskellige myndigheder og luftfartsselskaberne har. Videre skal der redegøres for organiseringen af flyvesikkerhedssystemet og tilsynet med luftfarten i Danmark, herunder SLV's og Havarikommissionens roller, samt behovet for ændringer i den fremtidige udøvelse af tilsynsvirksomheden.

For så vidt angår flytypen skal erfaringerne hermed og arbejdet med at afhjælpe tekniske problemer angives tillige med en beskrivelse af de to havarier.

På baggrund af et nyt havari med samme type luftfartøj den 27. oktober 2007 i Københavns Lufthavn meddelte Transport- og Energiministeriet, at der inden for den fastsatte tidsfrist alene skulle afgives en foreløbig redegørelse. Transport- og Energiministeriet meddelte videre, at den endelige redegørelse også skal omfatte det tredje havari, og at redegørelsen skal afgives senest to uger efter, at Havarikommissionen har afgivet sin foreløbige redegørelse vedrørende havariet i Københavns Lufthavn.

Den foreløbige redegørelse blev afgivet af SLV den 30. oktober 2007. Den endelige redegørelse er en videre udbygning heraf.

Redegørelsen indeholder i afsnit 1 en overordnet beskrivelse af reguleringen af luftfarten, der omfatter den internationale konvention – Chicago-konventionen. Denne fastsætter sammen med de ledsagende annekser minimumsregler for den internationale civile luftfart. Disse regler er gennemført i Danmark ved luftfartsloven og en række bekendtgørelser samt ved EU-forordninger, der dækker et stadig større område af luftfarten.
Afsnit 2 omhandler luftdygtighed af luftfartøjer, da det efter de foreløbige rapporter fra havarikommissionerne i Danmark og Litauen viser, at hovedårsagen til de to havarier er knyttet til selve luftfartøjet. Indholdet af EU-forordningerne på området belyses.

Afsnit 3 omhandler undersøgelse af flyvehavarier og flyvehændelser, hvoraf fremgår, at det er uafhængige havarikommissioner, der skal forestå sådanne undersøgelser.
Afsnit 4 beskriver overordnet SAS's luftfartsvirksomhed udført i SAS Konsortiet og indeholder også en beskrivelse af det tilsyn, der udføres af de skandinaviske luftfartsmyndigheder.
Afsnit 5 indeholder oplysninger om flytypen Dash8 Q400, herunder typecertificeringen heraf, samt oplysninger om de luftdygtighedsdirektiver, der er udstedt af luftfartsmyndighederne til afhjælpning af en række driftsproblemer, der er konstateret gennem de år den pågældende type af luftfartøj har været i drift.
Afsnit 6 indeholder nærmere oplysninger om de tre havarier og om den efterfølgende opfølgning.
Afsnit 7 indeholder en sammenfatning.

Bilag er dels indeholdt i selve redegørelsen dels i to separate bilagshæfter.

1. Reguleringen af luftfarten

Chicago-konventionen

Chicago-konventionen blev udarbejdet i 1944. Konventionen kan tiltrædes af lande, der er medlemmer af FN. Konventionen trådte i kraft i 1947, da den var ratificeret eller tiltrådt af det fastsatte antal lande, herunder de skandinaviske lande. I 2007 er der 190 kontraherede parter.

Ved Chicago-konventionen er oprettet en organisation "International Civil Aviation Organization" forkortet ICAO, der har hovedsæde i Montreal. Organisationen består af en generalforsamling, et råd og sådanne andre organer, som måtte være nødvendige. Generalforsamling mødes hvert tredje år, hvor rådets 36 medlemmer vælges. De nordiske lande har et samarbejde betegnet NORDICAO, og har herved gennem alle årene været repræsenteret i rådet ved en rotationsordning mellem landene.

Chicago-konventionen fastslår i artikel 37, at medlemsstaterne forpligter sig til at samarbejde med henblik på at opnå størst mulig ensartethed i forskrifter, normer, reglementer og organisation i forbindelse med luftfartøjer, personale, luftruter og hjælpetjeneste i alle forhold, hvor en sådan ensartethed kan lette og forbedre luftfarten. Med henblik på opfyldelse af artikel 37 skal ICAO udarbejde annekser til Chicago-konventionen indeholdende internationale standarder og rekommandationer – såkaldte SARP's (Standards and Recommended Practices). Annekserne skal omfatte følgende områder:

- Kommunikationssystemer og lufttrafikhjælpemidler
- Lufthavne og landingspladser
- Luftfartsregler og regler for lufttrafikkontrol
- Certificering af operativt personale
- Luftdygtighed
- Registrering og identifikation af luftfartøjer
- Indsamling og formidling af meteorologiske informationer
- Logbøger
- Flyvekort
- Told- og immigrationsprocedurer
- Luftfartøjer i nød og undersøgelse af havarier.

ICAO kan desuden fastsætte standarder og rekommandationer om ethvert andet spørgsmål, som til enhver tid skønnes relevant i forbindelse med luftfartens sikkerhed, regularitet og effektivitet.

Det er ICAO's råd, der fastsætter SARP's, hvilket normalt sker efter indstilling fra den permanente kommission, Air Navigation Commission (ANC), der består af 19 medlemmer udpeget af rådet. De nordiske lande har et medlem i ANC.

I forbindelse med behandlingen af forslag til ændringer i annekser gennemføres en høringsproces, der omfatter alle medlemsstater, hvorved disse får mulighed for at fremføre synspunkter, der således indgår i den endelige behandling. Der er for tiden udstedt 18 Annekser indeholdende standarder og rekommandationer. Antallet af SARP's er ca. 10.000.

Gennem fastsættelse af standarder er der således fastsat et minimum sikkerhedsniveau for den civile luftfart på global basis.

Det følger af Chicago-konventionens artikel 38, at enhver medlemsstat, der ikke anser det for muligt at opfylde en vedtagen standard, straks skal give ICAO underretning om forskellen mellem dens egen praksis og den vedtagne standard. ICAO underretter herefter de øvrige medlemsstater af organisationen herom. Hvis der ikke gives en sådan underretning forudsættes, at den internationale standard finder anvendelse. Rekommandationer er anbefalinger, som hvert medlemsland beslutter om det vil følge, og der er således ikke knyttet konsekvenser til, at en medlemsstat ikke følger en sådan. Anbefalinger følges imidlertid i betydeligt omfang af medlemsstaterne. I tilslutning til SARP's udarbejder ICAO manualer og vejledende retningslinier vedrørende de enkelte annekser.

ICAO har et omfattende auditeringsprogram, som indebærer, at medlemsstaterne med mellemrum gennemgås for at kunne konstatere i hvilket omfang de lever op til det internationale regelsæt, der er forudsætningen for at den internationale luftfart kan fastholde det høje sikkerhedsniveau. Som led i dette program vil Statens Luftfartsvæsen blive auditeret i efteråret 2008.

Luftfartsloven

De grundlæggende danske regler for den civile luftfart er indeholdt i luftfartsloven fra 1960 med senere ændringer jf. lovbekendtgørelse nr. 731 af 21. juni 2007. Luftfart inden for dansk område skal efter lovens § 1 finde sted i overensstemmelse med bestemmelserne i loven og de med hjemmel heri udfærdigede forskrifter, medmindre andet følger af EF-forordninger.

De detaljerede regler, herunder regler til gennemførelse af Danmarks internationale forpligtelser i medfør af Chicago-konventionen og EU-samarbejdet m.v. fastsættes med hjemmel i luftfartsloven, der er en rammelov, i form af bekendtgørelser og Bestemmelser for Civil Luftfart (BL). Ved bekendtgørelse nr. 795 af 3. september 2001 er det fastsat, hvilke opgaver i relation til luftfartsloven, der er henlagt til Statens Luftfartsvæsen.

EU-regler

Der fastsættes i disse år EU-bestemmelser i form af forordninger og direktiver om alle væsentlige forhold på luftfartens område, og der skabes derfor en sammenhængende og harmoniseret regulering af luftfarten i medlemsstaterne. Denne nye regulering indebærer ændringer i de nationale myndigheders tilrettelæggelse af deres tilsyns- og kontrolvirksomhed, herunder udstedelse af nye licenser eller validering af eksisterende, hvilket har medført et øget arbejde for disse myndigheder og luftfartserhvervet.

Denne regulering er i vidt omfang baseret på arbejdet i andre europæiske organisationer, som Joint Aviation Authorities (JAA), Den Europæiske Organisation for Luftfartens Sikkerhed (EUROCONTROL) samt Den Europæiske Civile Luftfartskonference (European Civil Aviation Conference – ECAC). Arbejdet i disse organisationer har været baseret på de af ICAO fastsatte regler, men der er på en række områder fastsat mere detaljerede regler.

Af særlig betydning er EU-bestemmelser om liberalisering af luftfarten, security, fælles europæisk luftrum og om luftfartssikkerhed. I EU er oprettet et agentur, Det Europæiske Luftfartssikkerhedsagentur (European Aviation Safety Agency – EASA), der har hovedsæde i Köln.

EASA er et ekspertorgan, der er uafhængigt med hensyn til tekniske spørgsmål, og som har retlig, administrativ og finansiel autonomi. Det udøver de opgaver, der er fastsat i forordninger og direktiver. Det bistår Kommissionen med forberedelse af lovgivning, og det bistår

medlemsstaterne og industrien med gennemførelsen heraf. EASA udsteder certificeringsspecifikationer og vejledende materiale inden for området luftdygtighed. Det bistår endvidere Kommissionen med at overvåge anvendelsen af de fastsatte bestemmelser i medlemsstaterne. De nationale luftfartsmyndigheder vil fortsat have tilsynsopgaver i relation til luftfarten i det pågældende land, men fremover baseret på den fastsatte EU-regler. EASA's udførende opgaver i relation til luftfartserhvervet er i dag begrænset til luftfartøjers luftdygtighed, og det er således EASA, der udsteder certifikat til typer af luftfartøjer (typecertifikat).

Der behandles for tiden forslag om at udvide EASA's arbejdsområde til at omfatte spørgsmål om certifikater til piloter, operation af luftfartøjer samt luftfartøjer fra tredjelande. På længere sigt vil EASA også blive tillagt opgaver i relation til lufthavne og lufttrafikstyring. Luftfartområdet vil således i løbet af en periode på 5-10 år være reguleret af EU-regler, der er baseret på ICAO's bestemmelser, men reguleringen vil være mere detaljeret og den vil være bindende for medlemsstaterne, idet kontrollen med de nationale myndigheders korrekte udførelse af deres tilsynsopgaver vil blive udført af EASA på vegne af Kommissionen.

2. Luftdygtighed

ICAO

Det fremgår af Chicago-konventionens artikel 31, at ethvert luftfartøj, der er indsat i international luftfart, skal være forsynet med et luftdygtighedsbevis, udstedt eller godkendt af den stat, i hvilket det er registreret.

Videre fremgår det af artikel 33, at luftdygtighedsbeviser, duelighedsbeviser og certifikater, der er udstedte eller godkendte af den stat, i hvilket luftfartøjet er registreret, skal anerkendes som gyldige af de øvrige kontraherende stater, forudsat de betingelser, på hvilke sådanne beviser eller certifikater er udstedte eller godkendte, svarer til eller ligger over de minimumsnormer, der til enhver tid er fastsat i overensstemmelse med konventionen.

Anneks 8 til Chicago-konventionen indeholder minimumsregler vedrørende luftdygtighed. Standarderne om luftdygtighed i anneks 8 beskriver i en vis udstrækning mere sigtet med bestemmelserne end hvorledes dette sigte skal realiseres. Standarderne er imidlertid tilstrækkelige til at opfylde konventionens artikel 37 om fastsættelse af standarder om luftdygtighed, ligesom de fastsætter de samlede internationale minimumsbestemmelser, der er nødvendige for at de rettigheder og forpligtelser, der følger af artikel 33, kan finde anvendelse. Anneks 8 indeholder såvel bestemmelser om udstedelse af typecertifikat som bestemmelser om udstedelse eller godkendelse af luftdygtighedsbeviser, hvortil kommer bestemmelser om vedvarende luftdygtighed.

I tilslutning hertil har ICAO udgivet vejledende materiale ”Airworthiness Technical Manual” (Doc 9760). Denne manual har til formål at vejlede staterne ved udviklingen af detaljerede og sammenfattende nationale koder, og manualen er således ikke bindende.

Registreringsstaten, der skal udstede eller godkende et luftdygtighedsbevis til et luftfartøj, er ofte ikke den samme stat, som har udstedt typecertifikat til serien af luftfartøjer (state of design). De standarder, der vedrører typecertificering af luftfartøjer skal derfor ikke anvendes af registreringsstaten, og disse standarder er således ikke en del af de minimums-bestemmelser, der vedrører udstedelser eller godkendelse af luftdygtighedsbeviser, og indebærer anerkendelse af deres gyldighed i henholdt til artikel 33. Part II til anneks 8 indeholder procedurerne for certificering og vedvarende luftdygtighed.

Typecertificering gives normalt til luftfartøjer, der skal i serieproduktion, når det er dokumenteret, at de særlige krav, der fastsættes til forskellige typer af luftfartøjer er opfyldt. Det godkendte design omfatter tegninger, specifikationer, rapporter, ligesom der indgår testflyvninger og inspektioner. Godkendelsen af et design er lettet i en række lande ved, at designorganisationen er godkendt. Der skal udstedes et typecertifikat, der definerer designet og godkender dette for luftfartstypen.

Det land, hvori produktionen af luftfartøjer finder sted skal sikre, at luftfartøjet, herunder dele produceret af underleverandører, er i overensstemmelse med det godkendte design. Det skal sikres, at produktionen finder sted på en kontrolleret måde under anvendelse af kvalitetssystemer, således at produktionen og samlingen af luftfartøjet er tilfredsstillende. Tilsynet med produktionen kan lettes ved, at selve produktorganisationen får en godkendelse. Luftdygtighedsbevis udstedes af registreringsstaten, når det er sandsynliggjort, at luftfartøjet er i overensstemmelse med designaspekterne i de behørige luftdygtighedskrav.

Såfremt det er første gang registreringsstaten udsteder luftdygtighedsbevis til et luftfartøj, skal det underrette designstaten om, at det har optaget et luftfartøj af den pågældende type på sit register. Herefter er designstaten forpligtet til at sende registreringsstaten alle oplysninger, der er af betydning for vedvarende luftdygtighed eller operation af luftfartøjet. Disse ”mandatory continuing airworthiness information”, herunder luftdygtighedsdirektiver, er registreringsstaten herefter forpligtet til at indføre direkte eller til at indføre andre hensigtsmæssige foranstaltninger.

Såfremt registreringsstaten selv indfører ”mandatory continuing airworthiness information” i relation til en type af luftfartøjer er den ligeledes forpligtet til at underrette designstaten herom, ligesom registreringsstaten er forpligtet til at sikre, at der er et system for større luftfartøjer, hvor informationer om fejl m.v. tilgår den organisation, der er ansvarlig for typedesignet af det pågældende luftfartøj.

Ligeledes skal designstaten sikre, at der er et system, der kan modtage disse oplysninger, som skal vurderes med henblik på, om og hvornår der er behov for foranstaltninger og at der i givet fald tages stilling til de nødvendige foranstaltninger. Der skal ske kundgørelse om disse foranstaltninger. Designstaten skal videre sørge for, at der er et ”continuing structural integrity programme”, der skal sikre opretholdelsen af luftfartøjets luftdygtighed. Dette program skal indeholde særlige specifikationer vedrørende forhindring af korrosion og kontrol.

EU – EASA

Der er i EU fastsat regler med udgangspunkt i ICAO-reglerne, der har til formål at sikre en fælles fortolkning og anvendelse heraf i medlemsstaterne. Europa-Parlamentets og Rådets forordning (EF) nr. 1592/2002 med senere ændringer om fælles regler for civil luftfart og om oprettelse af et europæisk luftfartssikkerhedsagentur har til formål at sikre europæiske borgere et ensartet højt sikkerhedsniveau inden for civil luftfart ved hjælp af fælles sikkerhedsbestemmelser. Luftfartøjsmateriel skal derfor certificeres for at sikre, at væsentlige luftdygtigheds- og miljøbeskyttelseskrav er opfyldt.

Videre understreges behovet for udviklingen af flydesign, som bedre beskytter passagerernes sikkerhed og sundhed, hvorfor det er nødvendigt at kunne reagere hurtigst muligt på resultatet af undersøgelser af flyulykker, specielt hvis de vedrører mangelfuldt flydesign eller driftsmæssige forhold.

Ved forordningen og de gennemførelsesbestemmelser, der er fastsat af Kommissionen, opfyldes medlemsstaternes forpligtelser efter Chicago-konventionen og anneks 8, herunder forpligtelser over for tredjelande. Behovet for et samarbejde med tredjelande er således vigtigt for at forordningens mål kan gennemføres, og det er forudsat, at der kan indgås aftaler med tredjelande. Selv om der ikke foreligger sådanne aftaler, er der under passende EF-kontrol mulighed for at anerkende de godkendelser, et tredjeland har givet vedrørende materiel, dele og apparatur samt organisationer og personale.

Det anføres i forordningen, at der på alle de områder, der er omfattet af forordningen anses at være behov for bedre ordninger, hvorfor nærmere fastlagte opgaver, der tidligere blev udført af Kommissionen eller medlemsstaterne, fremover skal udføres at et særligt ekspertorgan, luftfartssikkerhedsagenturet, EASA.

Videre præciseres det, at det af samfundshensyn er afgørende, at agenturet udelukkende bygger sit sikkerhedsrelaterede arbejde på uafhængig ekspertise. Alle agenturets sikkerhedsrelaterede afgørelser, skal derfor træffes af den administrerende direktør, som har stor frihed til at indhente rådgivning og tilrettelægge agenturets interne arbejdsgange. Certificeringen af luftfartøjer i EU foretages centralt og med bindende virkning for medlemsstaterne af EASA, hvilket også bidrager til at lette den fri bevægelighed for varer, personer og organisationer i det indre marked.

Forordningen finder anvendelse på luftfartøjer. Luftfartøjer, herunder alt installeret materiel, dele og apparatur, der er designet eller fremstillet af en organisation, som agenturet eller en medlemsstat fører tilsyn med, eller som er registreret i en medlemsstat, og som anvendes af en operatør, hvis operationer en medlemsstat fører tilsyn med, skal være i overensstemmelse med forordningen, medmindre forskriftsmæssigt sikkerhedstilsyn er blevet uddelegeret til et tredjeland, og de ikke anvendes af en EF-operatør.

Luftfartøjer skal opfylde en række væsentlige krav, der er angivet i et bilag til forordningen, og overensstemmelse med kravene godtgøres ved, at materiel skal ledsages af et typecertifikat, der udstedes af agenturet, når det dokumenteres, at materiellet svarer til typecertificeringsgrundlaget, der er udarbejdet for at garantere opfyldelsen af de væsentlige krav.

Organisationer, der er ansvarlige for design og fremstilling af materiel, dele og apparatur skal over for agenturet godtgøre, at de er kvalificeret og i stand til at varetage det ansvar, der er forbundet med deres særlige rettigheder. Agenturet har til opgave at sikre fortsat luftdygtighedsfunktion for materiel, dele og apparatur, det har certificeret, herunder hurtigt at gribe ind i tilfælde af sikkerhedsproblemer og udsende og formidle relevante obligatoriske oplysninger. Hvert luftfartøj skal forsynes med et individuelt luftdygtighedsbevis udstedt af en medlemsstat, der godtgør, at det er i overensstemmelse med den typemodel, der er godkendt i dets typecertifikat, og at relevant dokumentation, inspektion og test viser, at luftfartøjer er sikkert i drift.

Medlemsstaterne skal uden yderligere tekniske krav eller vurderinger godkende de certifikater, der er udstedt i overensstemmelse med forordningen. Kommissionen, agenturet og de nationale luftfartsmyndigheder udveksler de informationer, de har fået stillet til rådighed i forbindelse med anvendelsen af forordningen og gennemførelsesbestemmelserne hertil. De nationale havarikommissioner har ret til at få adgang til disse oplysninger.

De nationale luftfartsmyndigheder skal træffe de foranstaltninger, der er nødvendige for at sikre de oplysninger de modtager, en passende fortrolighedsgrad. Luftfartslovens § 89 b, giver adgang til at fastsætte regler om indberetning om driftsforstyrrelser og andre irregulære forhold af betydning for flyvesikkerheden, der ikke har medført er flyvehavari eller en flyvehændelse, og derfor skal undersøges af havarikommissionen. Der er tavshedspligt

omkring disse oplysninger for ansatte i den offentlige forvaltning. Overtrædelse heraf kan straffes efter straffelovens §§ 152 og 152a-e.

For at holde offentligheden underrettet om det generelle sikkerhedsniveau, skal agenturet hvert år udgive en sikkerhedsoversigt. Tilsvarende udgiver Statens Luftfartsvæsen en rapport om oplysninger, der er indberettet.

Gennemførelsesbestemmelser for luftdygtigheds- og miljøcertificering af luftfartøjer og hermed forbundet materiel, dele og apparatur og for certificering af konstruktions- og produktorganisationer er indeholdt i Kommissionens forordning (EF) nr. 1702/2003.
Denne forordning er trådt i kraft den 28. september 2003. Såfremt der er udstedt typecertifikat inden denne forordning trådte i kraft, skal materiellet alligevel anses for at have fået udstedt et typecertifikat i overensstemmelse med forordningen, når grundlaget for materiellets typecertifikat er det JAA-typecertificeringsgrundlag for materiel, der har fået udstedt et certifikat i henhold til JAA-procedurer som defineret i JAA's specifikationsblad for dette materiel. Et luftdygtighedsbevis, der er udstedt af en medlemsstat, og som bekræfter, at dette er i overensstemmelse med et sådan typecertifikat skal ligeledes anses for at være i overensstemmelse med forordningen.

Det fremgår videre, at de gældende luftdygtighedsdirektiver for dette materiel er dem, der er gældende i konstruktionslandet (designstaten). Agenturet skal inden 28. marts 2007 have fastlagt typecertifikatets specifikationsblad for støj for dette materiel.
Et typecertifikat har en ubegrænset varighed, men forudsætningen herfor er, at en række betingelser er opfyldt.

Typecertifikatet vil normalt omfatte typekonstruktionen, de operationelle begrænsninger, det gældende typecertificeringsgrundlag og de gældende miljøbeskyttelseskrav.
Indehaveren af et typecertifikat skal udarbejde, opretholde og ajourføre originaludgaver af alle håndbøger som kræves i henhold til de for produktet gældende typecertificeringsgrundlag og miljøbeskyttelseskrav.

Indehaveren af et typecertifikat skal for hver kendt ejer af et eller flere luftfartøjer af den pågældende type fremlægge mindst et fyldestgørende sæt instruktioner om vedvarende luftdygtighed, som omfatter beskrivende data og arbejdsbeskrivelser, der er udarbejdet i overensstemmelse med det gældende typecertificeringsgrundlag. Ændringer i instruktionerne

skal endvidere stilles til rådighed for disse. Indehaveren af et typecertifikat, som anses for at være blevet udstedt i henhold til forordningen, skal have et system for indsamling, undersøgelse og analyse af rapporter og information vedrørende svigt, mangler, fejl eller andre hændelser, der forårsager eller kan forårsage skadelige virkninger på den vedvarende luftdygtighed af det materiel, der er omfattet af typecertifikatet. Information om dette system skal gøres tilgængeligt for alle kendte brugere af materiellet.

Indehaveren af et typecertifikat som anses for at være omfattet af forordningen, skal til EASA indberette ethvert svigt, enhver mangel eller fejl eller andre hændelser, som vedkommende er bekendt med i forbindelse med materiellet, der er omfattet af et typecertifikat, og som har eller som kan medføre et usikkert forhold. Disse indberetninger skal udarbejdes i en form og på en måde, der er fastlagt af EASA, så hurtigt som praktisk muligt og skal under alle omstændigheder afgives ikke senere end 72 timer efter identifikation af det mulige usikre forhold, medmindre særlige forhold forhindrer dette.

Når en hændelse, der er indberettet til EASA, skyldes en mangel i konstruktionen eller en fabrikationsfejl, skal indehaveren af typecertifikatet, eller i givet fald producenten undersøge årsagen til manglen og til EASA indberette resultaterne af sin undersøgelse og enhver foranstaltning, som vedkommende har iværksat eller påtænker at iværksætte for at afhjælpe denne mangel.

Hvis EASA finder, at en foranstaltning er nødvendig med henblik på at afhjælpe en mangel, skal indehaveren af typecertifikatet eller i givet fald producenten indsende de relevante data til agenturet. EASA kan udstede luftdygtighedsdirektiver. Et luftdygtighedsdirektiv er et dokument, der udstedes eller vedtages af agenturet eller af et tredjeland, og som bemyndiger foranstaltninger, der skal gennemføres på et luftfartøj for at reetablere et acceptabelt sikkerhedsniveau, når der er bevis for, at luftfartøjets sikkerhedsniveau ellers vil blive kompromitteret.

EASA skal udstede et luftdygtighedsdirektiv, når agenturet har fastlagt, at der eksisterer et usikkert forhold på et luftfartøj som følge af en mangel i luftfartøjet eller en motor eller en propel, del eller et apparatur, der er installeret på dette luftfartøj, og at det er sandsynligt, at dette forhold findes eller kan udvikles i andre luftfartøjer. Når et luftdygtighedsdirektiv skal udstedes af EASA skal indehaveren af typecertifikatet fremsætte forslag om egnede afhjælpende foranstaltninger og/eller krævede inspektioner og forelægge agenturet de

nærmere enkeltheder i disse forslag med henblik på godkendelse. Efter EASA's godkendelse af disse forslag skal indehaveren af typecertifikatet gøre de relevante beskrivende data og arbejdsbeskrivelser tilgængelige for alle kendte brugere eller ejere af materiellet og, på anmodning, for enhver person, der skal overholde luftdygtighedsdirektivet.

Et luftdygtighedsdirektiv skal mindst indeholde følgende oplysninger; identifikation af det usikre forhold og det pågældende luftfartøj, den eller de nødvendige aktioner, terminer for udførelse af den eller de nødvendige aktioner samt ikrafttrædelsesdatoen.

Kommissionens forordning (EF) nr. 2042/2003 om vedvarende luftdygtighed af luftfartøjer og luftfartøjsmateriel, -dele og -apparatur og om godkendelse af organisationer og personale, der deltager i disse opgaver fastsætter de detaljerede regler, der finder anvendelse ved opretholdelsen af den vedvarende luftdygtighed efter at luftfartøjer er taget i brug af en luftfartvirksomhed. Vedvarende luftdygtighed omfatter alle de processer, der sikrer, at luftfartøjet på ethvert tidspunkt i sin funktionstid overholder de gældende luftdygtighedskrav og er i driftsikker stand.

Ved forordningen fastlægges fælles tekniske krav og administrative procedurer for at sikre vedvarende luftdygtighed af luftfartøjer, herunder enhver komponent til installation heri, som er registeret i en medlemsstat, eller som er registreret i et tredjeland, og som anvendes af et luftfartsforetagende, hvis operationer er underlagt agenturets eller en medlemsstats tilsyn. Forordningens bestemmelser om erhvervsmæssig lufttransport finder anvendelse på luftfartsselskaber, der har fået udstedt licens i henhold til fællesskabsretten eller hvis en medlemsstat har udstedt en operationel godkendelse for den pågældende aktivitet. I det følgende er det disse bestemmelser, der belyses.

Et luftfartsselskab, der driver erhvervsmæssig luftfart er ansvarligt for de luftfartøjer selskabet opererer, og skal sikre, at luftfartøjet er luftdygtigt, at påmonteret operationelt udstyr og nødudstyr er installeret korrekt og er funktionsdygtigt eller er tydeligt mærket som værende ikke-funktionsdygtigt, og at vedligeholdelsen af luftfartøjet sker i overensstemmelse med det godkendte vedligeholdelsesprogram.

Luftfartsselskabet skal have en særlig godkendelse som en organisation til sikring af vedvarende luftdygtighed (Del M, sektion A, subpart G). Vedligeholdelsen af luftfartøjer, der anvendes erhvervsmæssigt, og komponenter til sådanne luftfartøjer, skal udføres af en del

145 godkendt vedligeholdelsesorganisation. Luftfartsselskabet skal derfor udover godkendelsen som en organisation til sikring af vedvarende luftdygtighed have en særlig godkendelse i overensstemmelse med del 145 eller indgå kontrakt med en sådan organisation.

Ethvert luftfartøj skal vedligeholdes i overensstemmelse med et godkendt vedligeholdelsesprogram, der skal være i overensstemmelse med de instruktioner om vedvarende luftdygtighed, der er givet af indehaveren af typecertifikatet og supplerende typecertifikater og enhver anden organisation, der i overensstemmelse med del 21 offentliggør sådanne oplysninger, eller de instruktioner som vedkommende myndighed har givet, eller instruktioner fastlagt af luftfartsselskabet og godkendt af vedkommende myndighed. Vedligeholdelsesprogrammet skal indeholde nærmere oplysninger om al den vedligeholdelse, inklusive hyppighed, der kræves udført, herunder specifikke opgaver, der er forbundet med specifikke operationer. Programmet skal indeholde en dokumentationsplan (reliability programme), hvis vedligeholdelsen er baseret på vedligeholdesstyregruppens logik eller hovedsagelig tilstandsovervågning.

Ethvert gældende luftdygtighedsdirektiv skal gennemføres i overensstemmelse med kravene i det pågældende luftdygtighedsdirektiv, medmindre agenturet angiver andet.
Efter afslutning af enhver form for vedligeholdelse skal der udstedes et certifikat om frigivelse til tjeneste, og der skal føres rapporter og logbøger om det enkelte luftfartøj.
Enhver person eller organisation, der er ansvarlig for vedvarende luftdygtighed af luftfartøjer, skal indberette enhver konstateret omstændighed ved et luftfartøj eller en komponent, der kunne have alvorlig fare for flyvesikkerheden til registreringsstaten og den organisation, der er ansvarlig for typemodellen eller den supplerende typemodel. Tilsvarende skal enhver person i en del 145 organisation, der udfører selve vedligeholdelsen, indberette til den organisation, der er ansvarlig for sikring af vedvarende luftdygtighed.

Den organisation, der vedligeholder et luftfartøj skal have adgang til alle relevante vedligeholdelsesoplysninger, hvorved forstås alle relevante krav, procedurer, standarder eller oplysninger, der fastsættes af vedkommende myndighed, alle relevante luftdygtighedsdirektiver, gældende instruktioner om vedvarende luftdygtighed udstedt af indehavere af typecertifikater.

Alle former for vedligeholdelse skal foretages af kvalificeret personale ifølge fastlagte metoder, teknikker, standarder og instruktioner. For at sikre, at den organisation, der er godkendt til sikring af vedvarende luftdygtighed til stadighed opfylder de fastsatte krav, skal organisationen udarbejde et kvalitetssystem og udpege en kvalitetsansvarlig, der skal kontrollere overensstemmelse og tilstrækkeligheden af de procedurer, der er påkrævet for at sikre luftfartøjets luftdygtighed. For luftfartsselskaber, der udfører erhvervsmæssig lufttransport skal kvalitetssystemet indgå som en integreret del af luftfartsselskabets kvalitetssystem.

Den organisation, der skal udføre selve vedligeholdelsen (del 145 virksomheden) skal have en godkendelse, der angiver de klasser og rettigheder, som godkendelsen vedrører.
Klasser omfatter luftfartøjer, motorer, komponenter og specialiserede ydelser, mens rettigheder knytter sig til bestemte typer af luftfartøjer, motorer m.v., mens begrænsninger er knyttet til bestemte serier eller typer eller bestemte opgaver.

En kategori A-klasserettighed indebærer, at der udelukkende må udføres vedligeholdelse på luftfartøjet og en hvilken som helst komponent, når sådanne komponenter er monteret på luftfartøjet, bortset fra når disse komponenter midlertidigt kan afmonteres til vedligeholdelse, når en sådan afmontering er udtrykkeligt tilladt i luftfartøjsvedligeholdelseshåndbogen.
En A-klasserettighed er opdelt i ”grundlæggende” eller ”linjevedligeholdelse”, men en del 145-virksomhed kan godkendes til at udføre begge former for vedligehold.
De øvrige klasser B – D giver klasserettigheder, men i mere begrænset omfang end rettigheder efter klasse A.

Organisationen skal have et kvalitetssystem og skal indberette ethvert forhold, der har været eller kunne være til alvorlig fare for flyvesikkerheden, og skal gennem fastlagte procedurer afdække negative tendenser og afhjælpende foranstaltninger, der er truffet eller skal træffes af organisationen. I tilfælde af erhvervsmæssigt lufttransport skal organisationen underrette luftfartsselskabet om enhver tilstand, der påvirker luftfartsselskabets luftfartøj eller komponenter.

Forordningens del 66 vedrører krav i relation til uddannelse af personer, der skal have udstedt luftfartøjsvedligeholdelsescertikater, der giver adgang til og er en forudsætning for at kunne udføre nærmere angivne vedligeholdelsesarbejder på luftfartøjer.

Endelig indeholder del 147 detaljerede bestemmelser vedrørende godkendelse af de organisationer, der søger om tilladelse til at gennemføre uddannelse og eksaminere de personer, der er omfattet af del 66 i forordningen.

3. SAS og tilsynet hermed

SAS

Siden 1946 har de tre skandinaviske luftfartsselskaber, Det Danske Luftfartsselskab A/S (DDL), Det Norske Luftfartsselskab A/S (DNL) og Aktiebolaget Aerotransport (ABA) drevet luftfart i fællesskab og fra 1950 således, at et konsortium, SAS konsortiet, skulle overtage al luftfartsvirksomhed udført af de tre selskaber, Konsortiet skulle drives under ét og for fælles regning, således at rettigheder og forpligtelser, gevinst og tab skulle fordeles i forhold til deres ejerandele i SAS konsortiet. DDL 2/7, DNL 2/7 og ABA 3/7.

Moderselskaberne ejes med 50 procent af de respektive stater, mens de resterende 50 procent ejes af private. I Danmark varetages ejerrollen i henhold til kongelig resolution af 27. november 2001 af finansministeren, mens myndighedsopgaverne i relation til den civile luftfart henhører under transport – og energiministerens ressort.

Moderselskaberne skiftede i 1996 navne til SAS Danmark A/S, SAS Norge ASA og SAS Sverige AB. Samtidig blev der gennemført en harmonisering og omstrukturering af de tre selskaber, således at de tre selskabers virksomhed alene har bestået af administration af deres respektive ejerandele i SAS Konsortiet.

I 1999 blev der indledt overvejelser om at ændre den juridiske struktur af SAS med det formål at skabe én fælles aktie. Dette resulterede i oprettelsen af et nyt svensk selskab SAS AB, der afgav tilbud til aktionærerne i de tre moderselskaber om ombytning af samtlige aktier disse selskaber med samme antal nyemitterede aktier i det nye selskab, der skulle noteres på børserne i de tre hovedstæder.

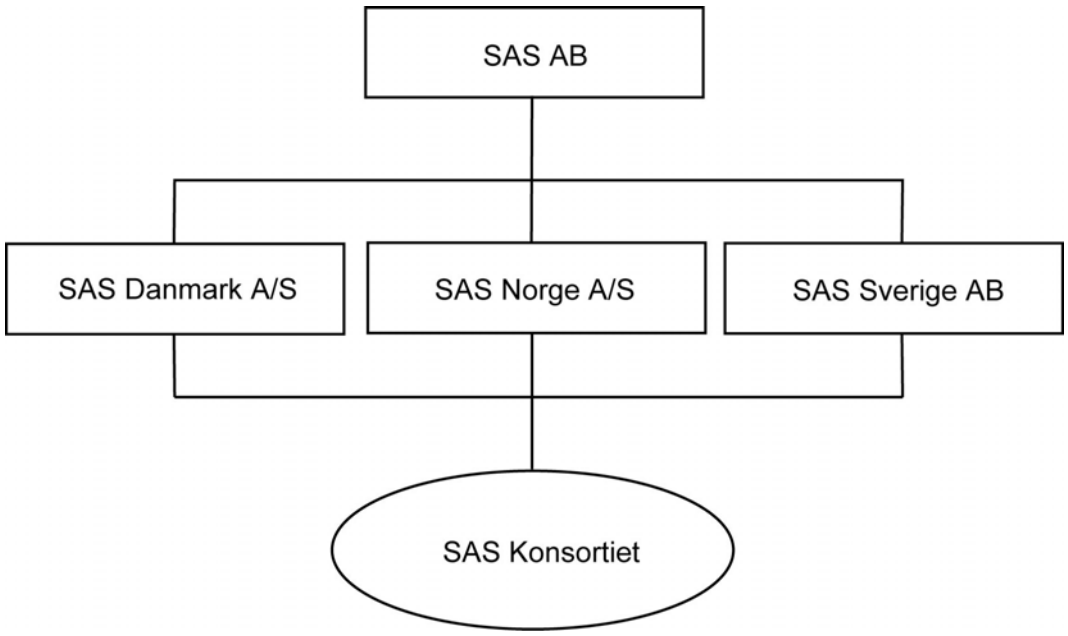
Baggrunden for denne ændring var, at SAS's struktur var kompliceret og havde en negativ effekt på SAS's kapitalfremskaffelse, ligesom visse investorgrupper anså SAS for en mindre interessant investering, hvorfor en aktie ville kunne medføre en højere likviditet og dermed en mere effektiv prisfastsættelse af aktien.

Videre ville en aktie give øgede muligheder for at deltage i strukturforandringer ved at anvende egne aktier som betalingsmiddel i forbindelse med eventuel overtagelse af andre selskaber, ligesom der ville blive bedre mulighed for at indføre incitamentsprogrammer.

Endelig ville den nye struktur medføre en mere effektiv beslutningsstruktur i forhold til tidligere, hvor moderselskaberne var selvstændige selskaber i forhold til hinanden, hvis opgave det var at varetage deres egne partsinteresser i SAS Konsortiet. Tre generalforsamlinger og tre bestyrelser for moderselskaberne samt et repræsentantskab og en bestyrelse for SAS Konsortiet ville blive afløst af en for alle aktionærer fælles generalforsamling og af én selskabsbestyrelse.

Ved de gennemførte ændringer blev det således bestyrelsen i SAS AB, der har den afgørende indflydelse i de tre moderselskaber og dermed i konsortiet og i helejede datterselskaber af SAS AB og SAS Konsortiet.

Efter dannelsen af holdingselskabet SAS AB var den overordnede struktur således.



Figur 1

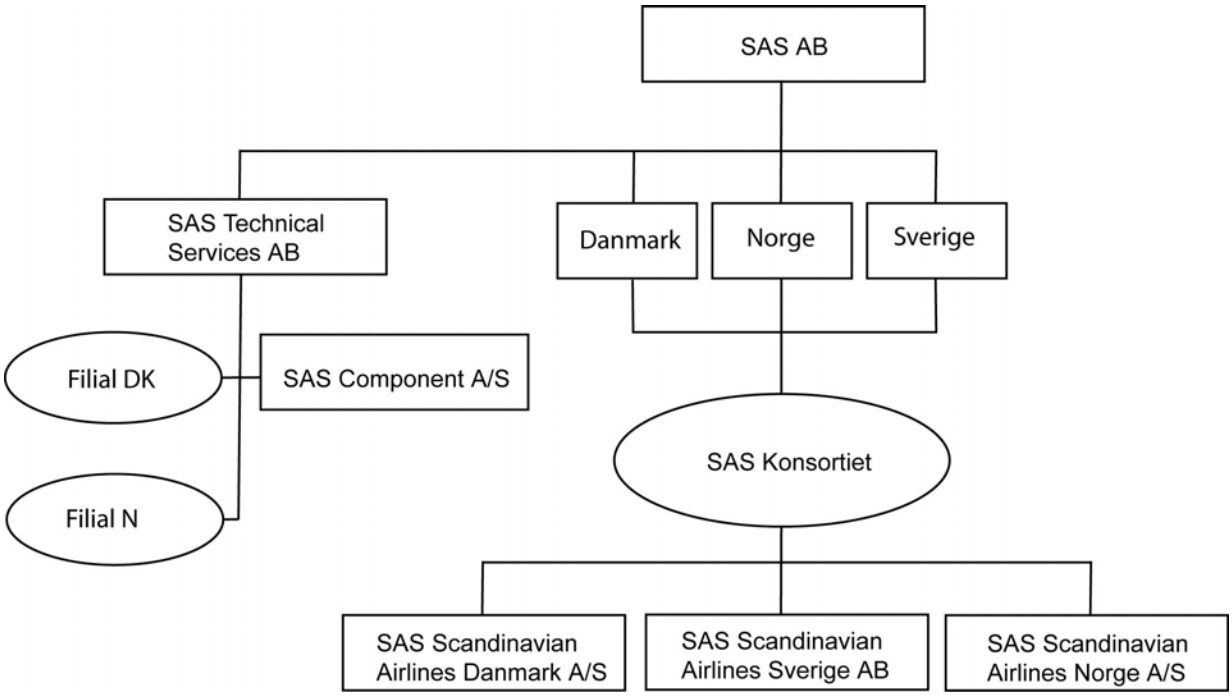
Der er efterfølgende oprettet et antal yderligere selskaber som datterselskaber af SAS-Konsortiet og af SAS AB.

Det er således oprettet tre selskaber SAS Scandinavian Danmark A/S, SAS Scandinavian Sverige AB og SAS Scandinavian Norge AS. Sidste selskab har af de norske myndigheder

fået udstedt licens, AOC, ligesom det har en godkendelse som del M subpart G organisation vedrørende varetagelse af opgaver vedrørende vedvarende luftdygtighed. De danske og svenske selskaber har ikke disse tilladelser og godkendelser. Det forventes, at der senere vil blive ansøgt om, at de danske og svenske selskaber bliver godkendt som egentlige luftfartsselskaber, hvorefter virksomheden i konsortiet vil blive reduceret.

Der er videre oprettet et helejet selskab SAS Technical Services AB som datterselskab af holdingselskabet, der sammen med datterselskabet SAS Component A/S, hvori SAS er mindretalsaktionær, har del-145 tilladelser til at udføre vedligeholdelse af luftfartøjer og komponenter hertil.

Organisationsstrukturen ser derfor i dag således ud, hvorved bemærkes, at der ikke er tale om en udtømmende beskrivelse af de under SAS-gruppen hørende selskaber.



Figur 2

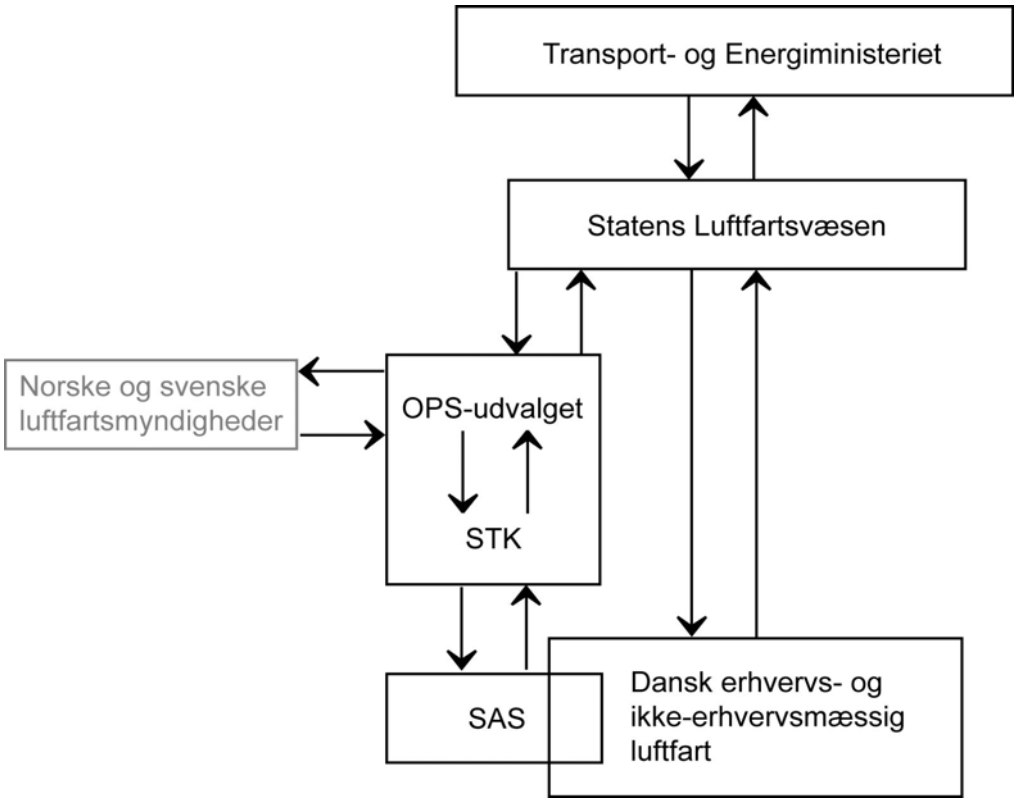
Tilsynet med SAS

De skandinaviske luftfartsmyndigheder samarbejder vedrørende tilsynet med SAS, og det sker gennem samarbejdsorganet, OPS-udvalget, der med en række underudvalg behandler og samordner tilsynet. Det praktiske tilsyn varetages af Skandinavisk Tilsynskontor (STK), der har til opgave at sikre, at de gældende skandinaviske krav overholdes.

SAS er som den øvrige erhvervsmæssige luftfart underlagt krav om egenkontrol, hvorfor det er SAS's ansvar at sikre, at selskabet til enhver tid lever op til reglerne om flyvesikkerhed.

STK's tilsyn med SAS er derfor primært rettet mod at sikre, at denne egenkontrol virker. Derfor fører STK et tilsyn med SAS der sikrer, at SAS's kontrol- og kvalitetssystemer fungerer.

Tilsynet med SAS kan skematisk fremstilles således:



Figur 3

Figuren viser, at det er transport- og energiministeriet, der har det overordnede ansvar for tilsynet med luftfarten i Danmark, der imidlertid med baggrund i luftartsloven har overladt en lang række beføjelser til SLV, der ligeledes efter luftfartsloven har hjemmel til delegation til en udenlandsk sagkyndig eller udenlandsk myndighed.

Det skandinaviske OPS-udvalg er sammensat af cheferne for de nationale luftfartstilsyn, og udvalget har instruktionsbeføjelse over for STK, som udfører det praktiske tilsyn med SAS.

Uanset delegationen er SLV dog fortsat ansvarlig for den uddelegerede virksomhed. SLV's ansvar er relateret til de objekter, der har en dansk tilladelse eller godkendelse, herunder de luftfartøjer, der er på dansk register og har et dansk luftdygtighedsbevis.

SAS er underlagt de samme flyvesikkerhedsregler som alle andre flyselskaber, der opererer i de tre lande. Det eneste, der adskiller SAS fra andre selskaber, er det forhold, at det af rent praktiske årsager har været hensigtsmæssigt at basere tilsynet på et fælles skandinavisk tilsynskontor (STK), som udfører det daglige tilsyn med SAS.

STK er ikke en selvstændig myndighed. I formel administrativ henseende er STK en del af Luftfartsstyrelsen i Sverige og anvender derfor de derværende administrative støtteprocesser.

STK's tilsyn skal være på samme niveau som de nationale myndigheders tilsyn med andre selskaber. Tilsynet er i øvrigt underlagt detaljerede internationale krav fra bl.a. EU for såvel operative som tekniske forhold og dermed også klare krav til selskabernes systemer.

Der er endvidere internationalt udarbejdet detaljerede retningslinjer for, hvorledes et tilsyn tilrettelægges og gennemføres. Disse regler er samtlige tilsynsmyndigheders fælles referenceramme i de forskellige lande. Det er på dette grundlag STK udfører sit tilsyn.

Statsrevisorerne afgav den 23. maj 2007 beretning nr. 12/06 om tilsynet med den civile luftfart. Den overordnede konklusion i beretningen var, at tilsynet med den civile luftfart i Danmark samlet set er tilfredsstillende.

SLV vil på baggrund af anbefalinger i beretningen sikre en bedre dokumentation for, at tilsynene lever op til nationale og internationale krav om tilsynsfrekvenser samt i videre

omfang anvende risikovurderinger. Der vil således i 2008 blive gennemført et projekt med sådanne vurderinger for udvalgte selskaber.

SLV er for tiden ved at udvikle et nyt IT-baseret tilsynssystem, hvilket vil give en forbedret overordnet dokumentation for, at tilsyn foretages med de foreskrevne frekvenser.

Det bemærkes videre, at SLV i oktober 2007 er blevet ISO certificeret af Det Norske Veritas. Certificeringen omfatter SLV's samlede virksomhed. SLV er ikke bekendt med at andre europæiske luftfartstilsyn har opnået en tilsvarende certificering.

Statsrevisorernes beretning omhandlede også spørgsmålet om SLV's tilsyn med STK er tilfredsstillende. Det anføres i beretningen, at SLV bør tilvejebringe et solidt dokumenteret overblik over, om STK fører et tilsyn, der mindst svarer til det tilsyn, som SLV fører med den øvrige luftfart i Danmark, og lever op til internationale og nationale krav.

SLV vil derfor inden for rammerne af det skandinaviske luftfartssamarbejde sikre, at dokumentationen af STK's tilsynsvirksomhed overfor SLV forbedres. Det bemærkes i den forbindelse, at de enkelte tilsyn der foretages af STK, er dokumenterede, hvorfor forbedringerne vil ske i relation til den samlede dokumentation for STK's tilsynsvirksomhed.

Beretningen omtaler en række ureglementerede flyvninger med SAS-fly som følge af, at et antal luftdygtighedsdirektiver ikke har været overholdt.

Årsagerne hertil har blandt andet været, at de datasystemer, som styrer hvornår de enkelte fly skal vedligeholdes, ikke har fungeret optimalt, hvortil der har været visse koordinationsproblemer mellem de to SAS-selskaber, som sammen varetager planlægning og udførelse af vedligeholdelsesprogrammerne.

Når der konstateres en overskridelse af et luftdygtighedsdirektiv bliver de pågældende foranstaltninger straks gennemført, og luftfartøjerne må ikke foretage flyvninger inden arbejdets udførelse uden særlig godkendelse.

De skandinaviske myndigheder ser med stor alvor på manglende overholdelse af luftdygtighedsdirektiver, og har gennem de seneste år besluttet en række tiltag i relation til SAS, hvilket bl.a. har medført, at der er anskaffet et nyt datasystem og foretaget en række

organisatoriske ændringer, der dog endnu ikke har haft den fulde virkning. Derfor har de skandinaviske luftfartsmyndigheder foreskrevet anvendelse af særlige compliance-lister i forbindelse med fornyelse af flyenes luftdygtighedsbeviser, hvorved myndighedernes arbejde med at konstatere overholdelse af samtlige gældende krav i relation til luftdygtighedsdirektiver er blevet forenklet. Fornyelse af luftdygtighedsbeviser vil således ikke blive foretaget, medmindre der foreligger korrekt udfyldte compliance-lister hvoraf det fremgår, at samtlige gældende luftdygtighedsdirektivkrav er overholdt.

Det skal bemærkes, at der ikke er sammenhæng mellem manglende overholdelse af luftdygtighedsdirektiver og de to havarier i september måned eller det senere havari i oktober måned.

På OPS-udvalgets møde den 25. oktober 2007 besluttede udvalget at intensivere arbejdet vedrørende tilrettelæggelsen af det fremtidige tilsyn med SAS set i lyset af de organisatoriske ændringer, der er gennemført i SAS-gruppen de senere år.

Det vil i den forbindelse blive vurderet, hvorvidt tilsynet mere hensigtsmæssigt helt eller delvist kan overgå til tilsyn af de nationale myndigheder isoleret eller i et direkte samarbejde mellem disse.

4. Undersøgelse af flyvehavarier og flyvehændelser

Undersøgelse af havarier og hændelser under civil luftfart er internationalt reguleret i ICAO's Anneks 13 til Chicago-konventionen og i Rådets Direktiv 94/56/EF af 21. november 1994 om fastlæggelse af de grundlæggende principper for undersøgelse af flyvehavarier og flyvehændelser inden for civil luftfart. Det følger af såvel ICAO-reglerne som EU-direktivet, at det skal være en uafhængig undersøgelse, og at undersøgelsesinstansen skal have fuld myndighed og kontrol over undersøgelsen.

Anneks 13 og direktivet er implementeret i dansk ret i luftfartslovens § § 134 – 144 b og i Trafikministeriets bekendtgørelse nr. 301 af 30. april 1997.

Danmark har i overensstemmelse med disse internationale regler etableret en uafhængig undersøgelsesenhed, Havarikommissionen for Civil Luftfart og Jernbane (HCLJ), der har til opgave at klarlægge årsagen til et havari eller en hændelse, men ikke at placere ansvaret herfor.

Oprindeligt blev undersøgelser af havarier og hændelser foretaget af Statens Luftfartsvæsen. Denne ordning kunne imidlertid kritiseres, idet luftfartsvæsenet enten som tilsynsmyndighed eller (dengang) som udøver af lufttrafiktjeneste kunne tænkes at være involveret i omstændigheder omkring et havari, som burde undersøges.

Ved en lovændring i 1978 blev Havarikommissionen etableret som en selvstændig institution under Transport – og Energiministeriet med virkning fra 1. januar 1979. Kommissionen blev etableret for at sikre fuldstændig uafhængighed af de nationale luftfartsmyndigheder og andre parter med eventuelle interessekonflikter i formålet med gennemførelsen af undersøgelser af havarier og hændelser. Havarikommissionen er som nævnt en institution under Transport- og Energiministeriet, men ministeren har ikke instruktionsbeføjelser med hensyn til kommissionens opklaringsarbejde, og kommissionens undersøgelsesresultater og konklusioner kan ikke redigeres ved forhåndsinstruks eller efterfølgende rettelser.

Et havari er i luftfartslovens § 135, stk. 1 defineret som "en begivenhed, der indtræffer i forbindelse med anvendelsen af et luftfartøj fra det tidspunkt, hvor nogen person går om bord i luftfartøjet i den hensigt at flyve, og indtil alle er gået fra borde og hvor:

nogen afgår ved døden eller kommer alvorligt til skade som følge af at være i eller på luftfartøjet eller ved direkte berøring med luftfartøjet eller noget, der hører til dette, eller luftfartøjet udsættes for skade eller strukturelle fejl, der nedsætter strukturens styrke eller luftfartøjets flyveegenskaber, og som normalt vil nødvendiggøre en større reparation eller udskiftning af de pågældende dele, eller flyet savnes eller er fuldstændigt utilgængeligt".

En hændelse er i luftfartslovens § 135, stk. 2 defineret som "en begivenhed, som ikke er et havari, men som indtræffer i forbindelse med anvendelsen af et luftfartøj, og som har indflydelse på eller ville kunne få indflydelse på sikkerheden, forbundet med luftfartøjers anvendelse".

Havarier og hændelser, der sker i forbindelse med flyvning i dansk område eller med danske luftfartøjer uden for dansk område, skal indberettes til Havarikommissionen. Efter de internationale regler er det normalt det land, hvor havariet eller hændelsen finder sted, der er ansvarlig for at udrede havariårsagen. Den danske havarikommission undersøger derfor normalt kun havarier og hændelser, der finder sted inden for dansk område.

Havarikommissionen bestemmer selv omfanget af de undersøgelser, der skal foretages, og kan herunder også beslutte, at der ikke skal foretages nogen undersøgelse. En sådan beslutning træffes under hensyn til havariets eller hændelsens omfang, undersøgelsens forventede flyvesikkerhedsmæssige værdi, opgavens betydning i forhold til andet arbejde, der aktuelt påhviler kommissionen, tilgængelige ressourcer og lignende, jf. luftfartslovens § 138. Kommissionen er tillagt en række beføjelser i forbindelse med undersøgelserne. Den har uden retskendelse adgang til luftfartøjet eller dets rester og kan kræve bøger og dokumenter af betydning for undersøgelsen fremlagt, ligesom den kan interviewe eller afhøre enhver person, som må formodes at kunne give oplysninger af betydning for undersøgelsen. Havarikommissionen kan endvidere kræve politiets bistand, i det omfang det skønnes fornødent.

Statens Luftfartsvæsen deltager ikke i undersøgelsesarbejdet, idet dette bl.a. også kan omfatte Statens Luftfartsvæsens rolle som tilsynsmyndighed for den civile luftfart.

Havarikommissionen skal mens undersøgelserne pågår løbende informere luftfartsvæsenet om forhold, som kan have væsentlig betydning for flyvesikkerheden, jf. luftfartslovens § 141, således at luftfartsvæsenet kan iværksætte eventuelle foranstaltninger, som måtte være

nødvendige. Det kunne f. eks være at udstede flyveforbud for luftfartøjer af samme type som et havareret luftfartøj, hvis der er formodning om, at der er en teknisk fejl på luftfartøjstypen.

Luftfartslovens § 134, stk. 3 indeholder nærmere regler om, hvem der udover Havarikommissionen kan deltage i undersøgelsen. For det første skal kommissionen udvides med repræsentanter for fremmede stater, hvis dette følger af en international forpligtelse, som Danmark har påtaget sig. En sådan forpligtelse findes i ICAO's Annex 13, hvorefter den stat, hvor luftfartøjet er registreret, den stat, hvor operatøren (luftfartsselskabet) er hjemmehørende og den stat, hvor fabrikanten er hjemmehørende hver især har ret til at udpege en repræsentant til at deltage i undersøgelsen. Herudover kan Havarikommissionen inddrage særlige sagkyndige i undersøgelsen, hvis den finder dette hensigtsmæssigt, herunder repræsentanter for luftfartsselskabet og producenten af luftfartøjet.

Havarikommissionens personale, tilkaldte sagkyndige og andre, der medvirker i undersøgelsen er pålagt tavshedspligt om, hvad de bliver vidende om i forbindelse med undersøgelsen, jf. luftfartslovens § 144 a. Tavshedspligten er bl.a. begrundet i, at det materiale, som benyttes under undersøgelsen, oftest er af meget teknisk kompliceret karakter, og at det af hensyn til forståelse af såvel enkeltoplysninger som den tekniske sammenhæng er ønskeligt, at materialet ikke gøres til genstand for drøftelse i offentligheden uden for den sammenhæng, som den endelige rapport repræsenterer. Det er endvidere af stor betydning, at Havarikommissionen får uhindret og ukompliceret adgang til alle relevante udsagn og oplysninger, uden at den, som skal udtale sig eller udlevere materialet, behøver at gøre sig overvejelser om, hvorvidt indholdet taler imod, at materialet bliver offentligt tilgængeligt.

Statens Luftfartsvæsen er på tilsvarende måde pålagt tavshedspligt med hensyn til de oplysninger af betydning for flyvesikkerheden, som luftfartsvæsenet løbende modtager fra Havarikommissionen.

Når undersøgelsen er afsluttet, udarbejder Havarikommissionen en rapport, medmindre kommissionen beslutter – i tilfælde hvor det findes hensigtsmæssigt med rapportering i kort form – at der i stedet for en rapport skal udarbejdes en redegørelse, jf. luftfartslovens § 142 og § 143. Hvis Havarikommissionen i undersøgelsen støder på forhold, der er eller kan være en trussel mod flyvesikkerheden, indeholder rapporten rekommandationer til Statens Luftfartsvæsen eller andre relevante instanser med henblik på iværksættelse af præventive tiltag. Rapporten eller redegørelsen sendes til luftfartsvæsenet og offentliggøres samtidig

hermed, medmindre afgørende hensyn taler imod en offentliggørelse. Herudover kan Havarikommissionen tidligt i forløbet udsende en kort foreløbig redegørelse om havariet.

5. Luftfartøjet Dash8 Q400

Luftfartøjet Dash8 Q400 er en videreudvikling af Dash7 – flyet. Flytypen er designet og produceret af den canadiske fabrikant Bombardier, hvorfor det er de canadiske myndigheder, der oprindeligt har typecertificeret luftfartøjet.

Det er også typecertificeret i Europa. Det er sket på baggrund af arbejde udført i Joint Aviation Authorities (JAA), hvor der blev foretaget en undersøgelse af luftfartøjet baseret på JAA's Joint Certification Procedures, som resulterede i udarbejdelse af JAA Data Sheet nr. JAA/25/99-22.

Efter oprettelse af Det Europæiske Luftfartssikkerhedsagentur (EASA) er typecertificeringsansvaret overført hertil jfr. Type-Certificate Data Sheet nr. EASA. IM.A.191, Issue 2, af 22. maj 2007, der angiver de betingelser og begrænsninger under hvilket luftfartøjet opfylder de fastsatte luftdygtighedskrav. Typecertifikatet er medtaget som bilag til redegørelsen.

Det er således EASA, der har overtaget ansvaret for administrationen af typecertifikatet vedrørende dette luftfartøj på vegne af alle medlemsstaterne i EU.

Det er derfor også EASA, der skal udstede eventuelle luftdygtighedsdirektiver for luftfartøjet, såfremt tekniske forhold tilsiger dette. Uanset et omfattende certificeringssystem, vil der ved idriftsættelse af nye flytyper forekomme en række driftsproblemer, der nødvendiggør udstedelse af sådanne direktiver.

I beslutning nr. 2/2003 truffet af EASA's Executive Director vedrørende gennemførelsen af luftdygtighedsdirektiver for materiel, dele og apparatur konstrueret i tredjelande er indeholdt følgende:
"Any airworthiness directive issued by a state of design for an aircraft imported from a third country, or for an engine, propeller, part or appliance imported from a third country and installed on an aircraft registered in an EU Member state, shall apply unless the Agency has issued a different Decision before the date of entry into force of that airworthiness directive."

De luftdygtighedsdirektiver, der udstedes af de canadiske myndigheder er derfor umiddelbart gældende for de luftfartøjer af den pågældende type, der er indregistreret i en medlemsstat.

Tilsvarende beslutning er truffet af EASA vedrørende hovedparten af canadiske typecertifikatindehaveres ændrings- og reparationsforskrifter til eksisterende typecertifikater. Ifølge EASA Decision no. 2004/02/CF er disse ændrings- og reparationsforskrifter godkendt uden videre foranstaltninger af EASA, under forudsætning af godkendelse fra de canadiske myndigheder Transport Canada.

Der har været driftsproblemer med Dash8 Q400, hvilket bl.a. skyldes anvendelse af nye konstruktionsmetoder.

Der kan således nævnes utætheder i pakninger ved døre, problemer med aircondition systemet samt fejl ved landingsstellet, hvor især indikeringssystemerne, låsning af stellet under flyvning og næsehjulssystemet har givet problemer. For en række af de problemområder der har været konstateret med Dash8 Q400 er der siden idriftsættelsen sket forbedringer på de områder, som fra starten har givet problemer. Det kan imidlertid også konstateres, at der for enkelte andre områder er problemer af teknisk karakter, som tilsyneladende har relation til flyenes alder, og som der er behov for i særlig grad at rette opmærksomheden på.

Til håndtering af problemer af ovennævnte karakter, er der etableret indberetningssystemer, hvis funktion der er redegjort for andetsteds i denne redegørelse. Det er et krav, at såvel operatøren som fabrikanten har indberetningssystemer, så problemerne indberettes, så der i givet fald kan iværksættes inspektioner og eventuelt ændring af konstruktionen.

Hovedparten af de ændringer som findes nødvendige at gennemføre, løses ved, at fabrikanten i de styresystemer, som er en del af fabrikantens myndighedsgodkendelse, udsteder dokumentation, som beskriver hvilke inspektioner, modifikationer eller ændrede vedligeholdelsesforskrifter der er behov for.

I tilfælde af problemer af større flyvesikkerhedsmæssig betydning, fastsættes ændringen af den certificerende myndighed, oftest med efterfølgende udstedelse af en såkaldt AD note (luftdygtighedsdirektiv).

Problemer af vedligeholdelsesmæssig karakter, der kan karakteriseres som generelle problemer i forhold til luftfartøjstypen, behandles i det såkaldte ”Maintenance Review Board” (MRB), der er en komite etableret imellem bl.a. fabrikanten, fabrikationslandets myndighed og

operatører i relevant omfang. MRB er en del af fabrikantens myndighedsgodkendelse, og komiteens arbejde udmønter sig normalt i udarbejdelse af ”Maintenance Planning Document” (MPD), som indeholder fabrikantens krav til vedligeholdelse af flyet. Dette dokument revideres løbende af MRB i takt med, at informationer indgår via indberetningssystemerne, således at dokumentet er opdateret i forhold til de aktuelle erfaringer som drages i forbindelse med drift og vedligeholdelse af luftfartøjet.
Ud over ovennævnte er der ligeledes via EU reglerne krav om, at flyet overholder alle krav anført i gældende luftdygtighedsdirektiver. For Dash8 Q400 er der hidtil udstedt 28 luftdygtighedsdirektiver som et resultat af de typecertificerende myndigheders arbejde med de hidtil konstaterede driftsproblemer. Nedenfor er luftdygtighedsdirektiver angivet. De er alle medtaget som bilag til redegørelsen.

- CF 2001 – 14 Fuel Tank Lightning Protection
- CF 2001 - 16R1 Main Landing Gear Prodecure
- CF 2001 - 23 Door Stops
- CF 2001 - 44 Spoiler Lift Dump Valves
- CF 2002 – 07 Forward Engine Mount Assembly
- CF 2002 - 13R2 Main Landing Gear Up-Lock Assembly
- CF 2002 - 15 Rudder Trim Switch Wiring
- CF 2002 - 25 Pitch Trim Control
- CF 2003 - 28 Fuselage Bottom Skin and Number 2 VHF Antenna
- CF 2004 - 07 Fuel and Hydraulic Tubes Chafing
- CF 2004 – 11 Outboard Flap Front Spar, Track nr 4 and 5 Fittings
- CF 2004 – 19 Airworthiness Limitation Items
- CF 2005 – 07 Horizon Stabilizer Attachment Fitting Bolt Torque Check
- CF 2005 – 08R1 Corrosion of Fuel Access Panel Attachm. Anchor Nut
- CF 2005 – 14R1 Inspection of Fire Bottle Connectors
- CF 2005 – 15 Pitot Static System Contamination
- CF 2005 – 37 Cracking of the Outer Wing Fuel Access Panel
- CF 2005 – 39 Incorrect Rivets Installed at Control Column Torque Tube
- CF 2006 – 05 Brake Control Cable Fouling on Camloc Fasteners
- CF 2006 – 06 Engine Exhaust Shroud V-Band Couplings
- CF 2006 – 08 Hydraulic System Power Transfer Unit Overspeed
- CF 2006 – 10 Airworthiness Limitation Items

- CF 2007 – 05 Translating Door Over-Centering Spring Bracket Fail.
- CF 2007 – 11 Flight Compartment – Utility and Observer Lights
- CF 2007 – 20R1 Main Landing Gear
- EASA 2007 – 0252E Main Landing Gear (erstattet af EASA 2007-0272)
- EASA 2007 – 0272 Main Landing Gear (erstatter EASA 2007-0252E og har forrang for CF 2007-20R1)

Listen anfører de luftdygtighedsdirektiver som er udstedt på selve luftfartøjet. Derudover kan der forekomme luftdygtighedsdirektiver udstedt direkte på motorer, propeller eller standard udstyr som er installeret i flyet, eksempelvis radio- eller navigationsudstyr.

Af de anførte luftdygtighedsdirektiver er der i alt 4 som omhandler landingsstelsystemet. Af disse har ingen relation til de problemer, som forårsagede havarierne i henholdsvis Aalborg, Vilnius eller København.

Ifølge Flight Safety Foundation har der siden 1. januar 2000 været 9 havarier med flytypen Dash8 Q400 inklusive de seneste 3 tilfælde med SAS fly. I ingen af disse tilfælde har der været omkomne.

6. Havarierne og opfølgning

Dette afsnit indeholder i afsnit A en kronologisk beskrivelse af hændelsesforløbet i relation til de indtrufne havarier i henholdsvis Aalborg med LN-RDK og Vilnius med LN-RDS. Videre omtales OPS-mødet den 25. oktober 2007.

I afsnit B er indeholdt en kronologisk beskrivelse af hændelsesforløbet vedrørende havariet den 27. oktober 2007 med LN-RDI i Københavns Lufthavn.

Bilagene til dette afsnit findes i to særskilte bilagshæfter.

Oplysningerne om årsagen til havarierne er baseret på de informationer som er tilgængelige på tidspunktet for udarbejdelsen af denne redegørelse, herunder de foreløbige rapporter fra havarikommissionerne i Danmark og Litauen. Havarikommissionernes undersøgelser fortsætter, hvorfor det er muligt, at der bliver afdækket yderligere forhold i relation til de tre havarier.

A. LN-RDK og LN-RDS

9. september 2007

SLV modtog telefonisk information om, at havari med LN-RDK, et norsk registreret Dash8 Q400 fly, opereret af SAS, var indtruffet kl. 14:10 UTC i Aalborg. Det blev oplyst, at havariet skyldtes kollaps af højre hovedlandingsstel umiddelbart efter, at flyet satte hjulene på landingsbanen.

Ifølge oplysninger fra luftfartøjschefen kom der i forbindelse med, at landingsstellene blev beordret udfældet, ikke indikation på, at højre hovedlandingsstel var korrekt udfældet og låst. Besætningen gjorde flere forsøg på at få etableret indikation for, at det højre hovedlandingsstel var låst, herunder anvendelse af alternativ udfældningsmetode dog uden held. Der var således ikke mulighed for at få korrekt indikation på låsning af højre hovedlandingsstel før landing.

På baggrund heraf valgte luftfartøjschefen at følge nødchecklisten, og lande med et landingsstel som ikke var låst. Ved landingen kollapsede højre hovedlandingsstel med det

resultat, at flyets højre vinge og bageste del af flykroppen kom i berøring med landingsbanen, hvilket bevirkede at flyet havarerede. Indberetning fra SAS er bilag 1.

10. september 2007

Der blev modtaget information fra SAS via STK om, at der var tæt kontakt til Bombardier, som havde sendt et team for af bistå havarikommissionen, således at en havariårsag kunne konstateres hurtigst muligt, og på den baggrund vurdere eventuelle tiltag i relation til flåden af Dash8 Q400 fly for at sikre fortsat luftdygtighed.

Der syntes imidlertid ikke at foreligge oplysninger, der gav sammenhæng mellem kendte tekniske problemer med flyene og havariet. Bombardier udsendte All Operator Message (AOM) nr. 235, hvor alle Dash8 Q400 operatører blev informeret om havariet, og hvori det blev betonet, at det er det første tilfælde, hvor et hovedlandingsstel er kollapset under landing. AOM 235 er bilag 2.

SLV erfarede sent samme dag via pressen, at SAS iværksatte et inspektionsprogram på Dash8 Q400 landingsstellene og anmodede STK om at tage kontakt til SAS herom.

11. september 2007

SLV anmodede STK om at få kopi af statuslisten for luftdygtighedsdirektiver på LN-RDK, hvilket umiddelbart fremsendtes. (Bilag 3).

HCLJ afholdt informationsmøde for pressen i Aalborg om det forestående undersøgelsesarbejde.

SLV modtog visse informationer fra STK vedrørende havariet inklusive de første krav fra Bombardier i form af instruks til inspektion på baggrund af hvad der på daværende tidspunkt var konstateret af skader på det havarerede fly. Der var mistanke om, at kollapset af hovedlandingsstellet skyldes brud i den mekanisme som låser landingsstellet i udfældet tilstand. Bombardier AOM 236A er bilag 4.

12. september 2007

Kort efter midnat havarerede LN-RDS, et norsk registreret SAS-fly af typen Dash-8 Q400 i Vilnius i Litauen. SLV modtog telefonisk meddelelse om havariet kort før klokken to om natten.

Ved telefonsamtalen blev det af SAS oplyst, at konsortiet havde standset al videre flyvning med Dash8 Q400.

Der blev af SLV under samtalen ligeledes fra myndighedernes side meddelt flyveforbud for alle fly af den pågældende type, hvorefter flyene ikke ville kunne anvendes uden tilladelse fra luftfartsmyndighederne.

Af indberetning fra SAS (bilag 5) fremgik det, at hændelsesforløbet ved havariet i Vilnius, stort set var identisk med hændelsesforløbet i Aalborg.

Det under samtalen af myndighederne telefonisk meddelte flyveforbud, blev fulgt op ved skriftlig meddelelse til SAS, hvor samtlige involverede luftfartøjers luftdygtighedsbeviser blev midlertidigt inddraget. OPS-udvalgets brev til SAS vedrørende flyveforbud for selskabets Dash8 Q400 fly er bilag 6.

Sideløbende orienterede SLV Det europæiske luftfartssikkerhedsagentur - EASA om de indtrufne havarier. SLVs brev til EASA med information om havarierne med LN-RDK og LN-RDS er bilag 7. STK fremsendte yderligere information fra SAS (bilag 8) vedrørende deres foreløbige analyse den 11. september af forholdene omkring havariet i Aalborg og luftfartøjet LN-RDK.

Om aftenen kl. ca. 19:30 modtog SLV telefonisk besked fra Havarikommissionen for Civil Luftfart og Jernbaner (HCLJ) om, at man anså at have konstateret den foreløbige årsag til havariet, idet der på det havarerede fly i Aalborg var konstateret fraktion af en gevindsamling imellem den hydrauliske actuator som anvendes ved udfældning og indfældning af landingsstellet, og den øjebolt, som er monteret i actuatorstemplet og fastgjort til landingsstellet. Fraktionen synes at være forårsaget af korrosion i et indvendigt gevind, som havde medført en alvorlig svækkelse af gevindet med brud til følge.

Transport Canada udsendte sent samme dag luftdygtighedsdirektiv nr. CF-2007-20 som krævede inspektion af alle Dash8 Q400 i forskelligt omfang, afhængig af antal foretagne landinger, før videre flyvning.

Der var således tale om et flyveforbud for alle fly. På daværende tidspunkt var der imidlertid allerede udstedt flyveforbud for den skandinaviske flåde af Dash8 Q400 opereret af SAS. De norske luftfartsmyndigheder havde fulgt samme fremgangsmåde for fly af tilsvarende type opereret af det norske selskab Widerøe.

Luftdygtighedsdirektiv CF-2007-20 er omhandlet i Bombardier AOM 237A (bilag 9) og underliggende dokumentation hertil er indeholdt i bilag 10A-10C.

13. september 2007

EASA udstedte luftdygtighedsdirektiv nr. EAD 2007-0252-E som med hensyn til inspektion var identisk med luftdygtighedsdirektiv CF-2007-20 udstedt af Transport Canada den 12. september 2007. EASA's luftdygtighedsdirektiv afveg dog fra Transport Canadas i forhold til de betingelser som er gældende for at foretage færgeflyvning af fly, som på udebaser var ramt af flyveforbudet, og som skulle flyves til baser, hvor inspektion og reparation kunne finde sted.

SAS anmodede om, og fik af OPS-udvalget tilladelse til, at foretage færgeflyvning i henhold til ovennævnte luftdygtighedsdirektiv. OPS-udvalgets tilladelse er bilag 11.

Havarikommissionen for Luftfart og Jernbane udsendte foreløbig redegørelse for havariet i Aalborg (bilag 12). Det fremgik, at landingsstellets actuator, øjebolt og låsemekanisme som led i arbejdet blev demonteret fra luftfartøjet for videre undersøgelse på et laboratorium. En undersøgelse af actuatorstemplets indre gevind blotlagde tilstedeværelsen af korrosion, som havde svækket materialet og ledte til separationen af øjebolten fra actuatorstemplet. Denne separation var hovedfaktoren, som ledte til understellets kollaps.

Havarikommissionen mente således gennem de foreløbige undersøgelser at have fastslået årsagen til det indtrufne havari, Havarikommissionens undersøgelser fortsættes med henblik på at afdække yderligere faktorer i forbindelse med havariet.

På baggrund af, at korrosionsskaden blev konstateret i et indvendigt ikke synligt gevind, kunne det ikke forventes, at skaden ville være konstateret ved udførelse af det krævede vedligeholdelsesprogram, på nuværende tidspunkt af flyenes driftstid.

Det bemærkes i den forbindelse, at der fra fabrikanten i "Maintenance Planning Document" er fastsat krav om visuel inspektion af landingsstellet og tilhørende systemer med regelmæssige intervaller, men actuatoren med det beskadigede indvendige gevind skal først udskiftes ved opnåelse af 22.400 landinger. Når det sker, vil actuatoren være genstand for et hovedeftersyn på et værksted, som er autoriseret til dette.

Flyet LN-RDK, som havarerede i Aalborg havde foretaget 14.795 landinger. LN-RDS som havarerede i Vilnius havde foretaget 14.224 landinger. For begge flys vedkommende var der således ca. 1/3 af tilladelige antal landinger tilbage, før demontering af actuatoren skulle foretages i henhold til vedligeholdelsesforskrifterne.

Det var derfor ikke efter de foreliggende oplysninger muligt at konstatere skaden ved de foreskrevne inspektioner.

14 -16. september 2007

SLV modtog supplerende informationer om havariet i Aalborg og afventede at Transport Canada muligvis ville supplere luftdygtighedsdirektiv af 12. september 2007.

En henvendelse til HCLJ viste, at der heller ikke her var modtaget informationer om mulig revision af det canadiske luftdygtighedsdirektiv.

SLV rettede herefter henvendelse til EASA med anmodning om et møde, for ad den vej at opnå informationer om eventuel ny dokumentation udsendt af Transport Canada samt sikre, at alle involverede parter var i besiddelse af relevante informationer.

EASA gav straks tilbagemelding med accept, og foreslog afholdt et møde tirsdag den 18. september 2007 hos EASA med relevante parter i sagen.

17. september 2007

Det viste sig vanskeligt, at få bekræftede informationer om årsagen til havariet med LN-RDS i Vilnius, hvilket blev forsøgt via HCLJ og EASA's koordinator i forhold til de europæiske havarikommissioner.

De informationer som blev modtaget var fra Bombardier, som havde et undersøgelseshold i Vilnius i lighed med Aalborg. Det blev oplyst, at årsagen til havariet synes at være tilsvarende havariet i Aalborg, og der fremkom enkelte billeder som viste skader på LN-RDS som var tilsvarende de skader der blev konstateret på LN-RDK i Aalborg.
Den foreløbige rapport fra de litauiske havarimyndigheder (bilag 12A) er senere modtaget.

18. september 2007

Der afholdtes møde hos EASA med deltagere fra EASA, STK og SLV. Derudover deltog Transport Canada og Bombardier via telefonkonference.

Mødet bragte klarhed, herunder for EASA, over hvilke instrukser, som var udsendt af Bombardier i forbindelse med Transport Canadas luftdygtighedsdirektiv.

SLV konstaterede, at revision af det canadiske luftdygtighedsdirektiv CF-2007-20 blev foretages ved at underliggende tilhørende dokumenter fra Bombardier revideres løbende ved udsendelse af nye ”All Operator Message” (AOM) og ikke ved udstedelse af AD-noter. Disse AOM var så godkendt af Transport Canada.

Informationerne var indeholdt i Bombardier AOM 238 (bilag 13), 239 (bilag 14), 240 (bilag 15), 241A (bilag 16), 242B (bilag 17) med relevant revision af inspektions- og reparationsinstrukser (bilag 18-23).

19. – 20. september 2007

Der blev foretaget koordination mellem de skandinaviske myndigheder vedrørende betingelserne for at sætte Dash8 Q400 flåden i drift igen.

Brevet fra OPS-udvalget til SAS af 20. september angav disse betingelser (bilag 24).

Kravene for på ny at operere Dash8 Q400 flåden var skærpet af OPS-udvalget i forhold til de krav som var stillet i luftdygtighedsdirektiverne.

Følgende skærpelser var foretaget:

- Det var et krav, at den enhed i actuatoren (stemplet), hvori det gevind, som fejlede, befinder sig, skulle udskiftes med en ny del, enten ved reparation af actuatoren, eller

ved en komplet udskiftning af denne. OPS-udvalget accepterede således ikke de godkendelseskriterier for korrosionsgrænser i de brugte dele som var anført i luftdygtighedsdirektiverne, eller at der blev foretaget de foreskrevne reparationsmuligheder af gevindet.

- Det var et krav, at den øjebolt, som er installeret i actuatorens stempel i det gevind som fejlede, skulle udskiftes med en ny øjebolt. OPS-udvalget accepterede således heller ikke her de godkendelseskriterier for brugte dele som var anført i luftdygtighedsdirektiverne.
- Det var et krav, at der uanset, at et defineret justeringsværktøj anvendes ved justering af den samlede længde af actuator og øjebolt, efterfølgende skulle foretages fuld funktionsprøve af landingsstellenes ud- og indfældning, både ved normal og alternativ udfældningsmetode.
- Opfyldelse af visse dokumentationsforhold særskilt i forhold til landingsstelinstallationen.

Disse skærpelser blev vurderet nødvendige på baggrund af to havarier med samme flytype med kort mellemrum samt på baggrund af de foreliggende oplysninger.
Bombardier udsendte i samme periode inspektionsprocedure for actuatorer (bilag 29) AOM 243 (bilag 30, 30A-30B), AOM 245 (bilag 31) og AOM 247 (bilag 32, 32A-32B) med underliggende inspektionsmateriale, som omhandlede mindre ændringer til inspektionsprocedurerne, krav til indberetning om fundne skader samt inspektion af andre dele af actuatoren til landingsstellet.

21.september 2007

Efterfølgende indtraf et havari med et tysk registreret Dash8 Q400 i München, som ikke kunne udfælde næsestellet, hvorfor flyet måtte lande uden dette udfældet.
Landingen skete efter omstændighederne uden dramatik, men med beskadigelse af den forreste del af flykroppen til følge.

Uheldet havde helt andre faktorer, end hvad der var gældende for havarierne i Aalborg og Vilnius med SAS flyene.

I den aktuelle situation med endnu et havari med Dash8 Q400 var det imidlertid OPS-udvalgets opfattelse, at der skulle være sikkerhed for, at der også blev taget højde for den

problematik der var årsag til dette havari. Derfor blev SAS pålagt at foretage den af fabrikanten foreskrevne inspektion med eventuel efterfølgende modifikation.

Bombardiers AOM 248 og 249B, der vedrørte dette emne er indeholdt i bilag 25 og 26 og tilhørende teknisk dokumentation i bilag 27A-27B.

OPS-udvalgets brev til SAS af 27. september 2007 vedrørende inspektion af næsestellet er bilag 28.

Oktober 2007

Dash8 Q400 blev gennemgået og repareret. De første fly som blev blevet inspiceret fik dokumentationen kontrolleret af STK, som ligeledes foretog fysisk besigtigelse af en række af de involverede fly. Flyene indsattes derefter løbende i drift, og medio oktober var samtlige Dash8 Q400 fly igen operative.

Bombardier udsendte den 1. oktober AOM 250 (bilag 33) med tilhørende instruktioner (bilag 33A-33B) med opdaterede inspektionskrav. De canadiske myndigheder Transport Canada udsendte den 11. oktober 2007 revision 1 til luftdygtighedsdirektiv CF-2007-20. Revisionen omhandlede indførelse af krav om repetetiv inspektion med fastsatte intervaller af de områder, hvor skaderne var konstateret, indtil en eventuel konstruktionsændring gør videre inspektion overflødig.

Det canadiske luftdygtighedsdirektiv blev den 19. oktober 2007 fulgt op af EASA ved udgivelse af et tilsvarende europæisk direktiv EASA AD 2007-0272 med krav tilsvarende det canadiske.

25. oktober 2007

OPS-udvalget afholdt møde i København den 25. oktober 2007. På mødet var der en grundig gennemgang ved SAS og en detaljeret drøftelse af de tiltag, som SAS har iværksat efter havarierne, indeholdt i et ” Confidence Restoration Program”.

Programmet skal generelt forbedre tilliden til Dash8 Q400, hvorfor SAS har fastsat et mål vedrørende reduktion af antallet af begivenheder til et niveau tilsvarende andre typer opereret

af SAS. Programmet skal ligeledes ses i lyset af, at SAS Dash8 Q400 flåden efterhånden har 7-8 års drift bag sig og indeholder følgende parametre:

Modifikationsprogram

Iværksættelse af et intensiveret modifikationsprogram (indførelse af konstruktionsmæssige forbedringer). Dette medfører primært, at implementering af en række planlagte ændringer er fremskyndet mest muligt. Der er i den forbindelse etableret særlige arbejdsgrupper som skal sikre, at relevante materialer, instruktioner og produktionskapacitet er til rådighed for gennemførelse af programmet.

Programmet indeholder i øjeblikket mere end 30 enkeltelementer, som ved indførelse skal medvirke til at forbedre flyenes pålidelighed. Der er etableret styringssystemer og tilført ressourcer til dette program fra såvel SAS som Bombardier.

Revision af programmet for visuel inspektion

Bombardier arbejder pt. med indførelse af et forbedret program vedrørende udførelse af visuelle inspektioner på flytypen. Dette program, som i øjeblikket ifølge det oplyste indeholder 18 områder hvor inspektionerne intensiveres, iværksættes parallelt med modifikationsprogrammet som en ekstra foranstaltning, ligeledes for at forbedre flyenes pålidelighed.

Vurdering af behov for konstruktionsændringer

Bombardier har igangsat en gennemgang af landingsstelkonstruktionen, for på baggrund heraf at vurdere, om der skal initieres nye ændringer af systemet.

Etablering af arbejdsgruppe til evaluering af indtrufne begivenheder

Der er etableret en særlig arbejdsgruppe af eksperter fra SAS og Bombardier, som når begivenheder indtræffer, vil undersøge disse, og på baggrund heraf vurdere, om de iværksatte korrektioner er fyldestgørende til at løse problemet.

Vedligeholdelsessystemet

Gennemgang af vedligeholdelsessystemet, specielt med fokus på landingsstelsystemet

Efter gennemførelse af den anførte gennemgang af landingsstelsystemet, vil der blive foretaget en vurdering af vedligeholdelsessystemet for på den baggrund at fastsætte eventuelle behov for ændringer.

Identifikation af "skjulte fejl"

Der er i fællesskab mellem SAS og Bombardier etableret et projekt, hvor systemerne gennemgås med henblik på at finde områder med mulighed for skjulte fejl i systemet (tilsvarende det ikke synlige gevind i landingsstellets actuator).

OPS-udvalget tog SAS's redegørelse til efterretning. Samtidig besluttede OPS-udvalget, at de skandinaviske myndigheder skal foretage en fornyet gennemgang af sagen med fokus på, om de typecertificerende myndigheder har modtaget relevante oplysninger om luftfartøjstypen til brug for deres vurderinger vedrørende udstedelse af luftdygtighedsdirektiver.

B. LN-RDI

I forbindelse med idriftsættelse af Dash8 Q400 flyene efter havarierne i Aalborg med LN-RDK den 9. september 2007 og i Vilnius med LN-RDS den 12. september 2007 blev der af OPS-udvalget fastsat krav til fornyet idriftsættelse af flyene jf. bilag 24.

Efter afslutning af ovennævnte arbejde, med efterfølgende fremsendelse af relevant dokumentation til STK, blev LN-RDI efter STK's gennemgang af dokumentationen godkendt til fornyet idriftsættelse den 12. oktober 2007.

27. oktober 2007

Om eftermiddagen kl. 16.45 modtog SLV meddelelse fra Naviair om, at et SAS opereret fly af typen Dash8 Q400 ved afslutningen af en flyvning imellem Bergen og København, ikke var i stand til at udfælde det højre hovedlandingsstel.

Besætningen havde forberedt en nødlanding i København, og havde i forbindelse hermed i en periode kredset for at bruge mest muligt brændstof før landing, således at risikoen for brand var nedsat. Samtidig havde besætningen arbejdet intenst for at få flyets højre landingsstel udfældet, både ved anvendelse af normal og alternativ udfældningsmetode.

Flyet landede kl. 16.53 med højre landingsstel delvist udfældet. Landingen blev af flybesætningen foretaget på venstre hovedlandingsstel og næselandingsstellet. Landingen gav mulighed for at afløbe en del af farten før flyets højre vinge og bageste del af flykroppen kom i berøring med landingsbanen, hvilket bevirkede at flyet havarerede.
På baggrund af havarierne med LN-RDK og LN-RDS i henholdsvis Aalborg og Vilnius den 9. og 12. september 2007, og det faktum, at ovennævnte hændelsesforløb i flere henseender mindede om forholdene ved disse havarier, meddelte OPS-udvalget umiddelbart telefonisk et flyveforbud for Dash8 Q400 opereret af SAS, hvilket SAS også selv havde indført.

Det telefonisk meddelte flyveforbud blev umiddelbart fulgt op af skriftlig meddelelse herom, ligesom EASA omgående blev informeret. Indberetning fra SAS er vedlagt som bilag 34.

Det bemærkes, at hændelsesforløbet i forbindelse med LN-RDI havariet var forskelligt fra de 2 øvrige havarier på det væsentlige punkt, at højre hovedlandingsstel ikke var fuldt udfældet ved det seneste havari. HCLJ's efterfølgende undersøgelse heraf bekræftede dette, ligesom årsagen til at landingsstellet ikke kunne udfældes efterfølgende blev identificeret.

28. oktober 2007

SLV blev kontaktet telefonisk af HCLJ som oplyste, at der ville blive udsendt en foreløbig redegørelse. Det fremgik, at fejlen på daværende tidspunkt vurderedes til at være en fejl ved landingsstellets hydrauliske actuator, idet denne tilsyneladende var blokeret, enten mekanisk eller hydraulisk.

En mekanisk blokering af actuatoren kan forårsages af en mekanisk fejl af enheder i actuatoren, som medfører en fysisk blokering af denne.
En hydraulisk blokering kan være forårsaget af en blokering af hydraulik-oliens mulighed for enten at få adgang til actuatoren, eller at undslippe denne.
Blokering vil derfor medføre, at actuatorstemplet ikke kan flytte sig, hvorfor det ikke er muligt at udfælde landingsstellet, hverken ved normal eller alternativ udfældningsmetode.

Samme dag meddelte SAS ved en pressekonference kl. 1500, at SAS havde besluttet ikke længere at anvende Dash8 Q400 flytypen.

29. oktober 2007

Det fremgår af HCLJ's foreløbige redegørelse af 29. oktober 2007 (bilag 35), at blokeringen var forårsaget af en blokering i en begrænser som er monteret på den side i actuatoren, hvor hydraulik-olien normalt ved udfældning af landingsstellet skal undslippe actuatoren.

Det fremgår ligeledes af HCLJ's foreløbige redegørelse, at de dele, som forårsagede havarierne med LN-RDK og LN-RDS, hvor højre landingsstel kollapsede, var intakte og at øjebolten var fastgjort i actuatorstemplet. Disse dele var på samtlige SAS fly udskiftet med nye dele, således som foreskrevet af OPS-udvalget jf. bilag 24.

EASA meddelte samme dag, at der den 30. oktober 2007 ville blive afholdt en telefonkonference imellem EASA, Transport Canada og Bombardier, hvor de skandinaviske myndigheder inviteredes til at deltage.

30. oktober 2007

HCLJ udsendte den anden foreløbige redegørelse om havariet (bilag 36).

Der blev heri redegjort for, at der på actuatoren, som blev demonteret fra LN-RDI's højre side, var fundet en O-ring i begrænseren på actuatorens udgangsside, og at dele af denne O-ring har blokeret den udgang i actuatorens begrænser, hvorigennem olien skal undvige, når landingsstellet udfældes.

Der redegjordes ligeledes for, at O-ringen ikke stammede fra actuatoren. Hvor O-ringen stammede fra, var på daværende tidspunkt ukendt.

Det fremgik videre af redegørelsen, at den utilsigtede tilstedeværelse af O-ringen og de deraf afledte konsekvenser, vurderes på det foreliggende grundlag til kun at vedrøre dette luftfartøj. EASA blev informeret om den foreløbige redegørelse.

Senere samme dag afholdtes den før omtalte telefonkonference arrangeret af EASA. Fra skandinavisk side deltog Danmark og Sverige.

Mødet var primært en generel udveksling af informationer mellem de berørte myndigheder og fabrikanten. På spørgsmål fra Bombardier bekræftede SLV, at de skandinaviske

luftfartsmyndigheder havde udstedt flyveforbud umiddelbart efter havariet den 27. oktober 2007.

EASA tilkendegav mod slutningen af mødet, at med 4 havarier med Dash8 Q400 i Europa inden for ganske kort tid, kunne en reaktion være nødvendig. EASA fremførte dog overfor Transport Canada, at der fra EASA's side ikke ville blive iværksat tiltag uden forudgående information herom.

Yderligere drøftelser blev henvist til et planlagt "Engineering Review" møde aftalt imellem parterne hos EASA i Köln den 7. november 2007.

1. november 2007

HCLJ afholdt pressemøde og orienterede efterfølgende SLV nærmere om forholdene omkring O-ringen, som blev fundet i actuatorens hydrauliske begrænser. Det fremgik af mødet mellem HCLJ og SLV, at actuatoren i højre side på LN-RDI siden idriftsættelsen efter de foregående havarier med LN-RDK og LN-RDS, var blevet udskiftet med en anden actuator. Hvorfra, og på hvilket tidspunkt O-ringen er introduceret i begrænseren var på det pågældende tidspunkt ukendt.

3. november 2007

HCLJ udsendte den tredje foreløbige redegørelse (bilag 37), hvoraf fremgik, at der var formodning om, at O-ringens oprindelse var identificeret.

O-ringens oprindelse menes at stamme fra en såkaldt Solenoid Sequence Valve (SSV) som er placeret i landingsstellets hydrauliksystem. Denne SSV, som ifølge det oplyste er den eneste komponent, som har en O-ring monteret af den pågældende type, blev udskiftet den 16. oktober 2007 i forbindelse med fejlretning på flyet grundet indberetning fra besætningen om, at højre sides landingsstel reagerede langsomt ved indfældning.

LN-RDI blev som anført ovenfor godkendt af STK til fornyet idriftsættelse den 12. oktober 2007. Den dokumentation som ligger til grund for STK's godkendelse af flyet er vedlagt som bilag 38.

Undersøgelse af den SSV, der var udskiftet den 16. oktober 2007, viste, at et filterelement og en O-ring manglede i komponenten. HCLJ er i forbindelse med undersøgelserne blevet bekendt med, at der har været tidligere hændelser, hvor filterelementet placeret sammen med O-ringen i SSV kollapsede og dermed kom ud i hovedunderstellets hydrauliksystem.

En systemfejl på flyet, hvor et trådfilter i ovennævnte ventil kan kollapse, vil kunne medføre, at den O-ring som er installeret i forbindelse med filteret, vil kunne føres ud i flyets hydrauliksystem. HCLJ har i redegørelsen konkluderet, at den fundne O-ring, der blokerede begrænseren, kom fra den SSV, som tidligere havde været monteret på luftfartøjet.

O-ringen kunne imidlertid ikke umiddelbart vandre fra SSV til den fundne position i begrænseren i det højre hovedunderstels actuator.

Efterfølgende fejlsøgning og fejlretning blev foretaget den 22. oktober 2007, hvor højre hovedunderstels Mechanical Sequence Valve (MSV) blev udskiftet. Den nye MSV, der var konfigureret for anvendelse i næseunderstelssystemet, blev af vedligeholdelsespersonalet ændret til anvendelse i hovedlandingsstellet. Det skete ved, at tilslutningsstudsene fra den demonterede ventil blev overført til den MSV, der skulle monteres på luftfartøjet.

Ved denne overflytning blev der mulighed for, at O-ringen kunne blive overflyttet fra den ene side til den anden side af MSV skjult i en tilslutningstuds, uden at dette ville komme til vedligeholdelsespersonalets kendskab. Efter den mulige overflytning ville O-ringen kunne fortsætte i hydrauliksystemet, og nå frem til begrænseren i hovedstellets hydrauliske actuator, og forårsage blokering af denne.

HCLJ's undersøgelser fortsætter imidlertid, hvorfor nye aspekter i sagen kan dukke op.

7. november 2007

SLV har løbende holdt EASA orienteret om forhold, som kunne være relevante i forbindelse med opklaring af årsagerne til havariet set i lyset af at EASA i dag er den typecertificerende myndighed i EU.

Som den højeste myndighed for så vidt angår luftdygtighed havde EASA således indkaldt til et møde, et såkaldt "Engineering Review" hos EASA den 7. november 2007.

Inden mødet startede afholdtes et kort formøde imellem EASA, Austrocontrol (den myndighed, hvortil EASA har udlagt arbejdet med typeansvaret for Dash8 Q400) og de skandinaviske myndigheder. På mødet tilkendegav EASA, at man gerne så en fælles EU holdning vedrørende spørgsmål om flytypens anvendelse og inspektion, hvor de skandinaviske myndigheder efter de to første havarier havde skærpet kravene i forhold til luftdygtighedsdirektiverne udstedt af Transport Canada og EASA.

De skandinaviske myndigheders oplyste, at de skærpede krav var fremsat på baggrund af de foreliggende oplysninger, herunder en ca. 20 år gammel dokumentation fra Bombardier (dengang DeHavilland) vedrørende et sammenligneligt problem på Dash7 samt indikation på slid (”fretting”) i gevindsamlingen imellem actuator og øjebolt. På den baggrund fastholdt de skandinaviske myndigheder beslutningen om de skærpede krav.

Efterfølgende gik ”Engineering Review” mødet i gang, hvori der deltog repræsentanter fra EASA, Transport Canada, Bombardier, Goodrich (fabrikanten af landingsstelkomponenterne), Austrocontrol, Luftfartsstyrelsen i Sverige, Luftfartstilsynet i Norge samt Statens Luftfartsvæsen (SLV).

På mødet gennemgik Bombardier i detaljer landingsstellets konstruktion og funktion samt redegjorde for høj pålidelighed i forhold til forsinkelser for Dash8 Q400 flåden i drift.
Fra skandinavisk side blev anført, at det ikke var det billede der var i Skandinavien, hvor der havde været en række tekniske forhold, der havde haft betydning for flytypens drift.

Bombardier redegjorde for deres indberetningssystem i forhold til de canadiske myndigheder samt informationskanalerne til de luftfartsselskaber, der anvender flytypen og dermed også skal indberette om tekniske forhold. Det blev oplyst, at SAS har haft en tilfredsstillende indberetningskultur, og at man således var bekendt med omfanget af de driftsforstyrrelser, der har været i relation til de skandinaviske fly. Bombardier har et opfølgningssystem, der har til formål at danne grundlag for iværksættelse af korrigerende aktioner. Endvidere blev redegjort om et program, der er iværksat for generelt at øge flytypens pålidelighed.

Transport Canada (TCCA) redegjorde for det gældende indberetningssystem i Canada, hvoraf det for begivenheder på fly uden for det nordamerikanske kontinent og Australien, er fabrikanten, Bombardier, som fastsætter hvad der videreformidles til myndighederne. I forhold til landingsstelsystemet på Dash8 Q400, var der ikke – bortset fra de seneste havarier -

indikationer på problemer i det canadiske indberetningssystem. Hvis det vurderes påkrævet udsteder TCCA luftdygtighedsdirektiver, men i relation til ”low risk items” indgår TCAA og Bombardier i en dialog om behovet herfor. TCCA oplyste videre, at der anvendes et system byggende på delegering i lighed med det system, der anvendes af de amerikanske luftfartsmyndigheder, hvilket indebærer, at et antal ansatte i Bombardier tillige er delegerede fra TCCA, således at de på vegne af TCCA er i stand til at godkende konstruktionsændringer mv.

Bombardier oplyste, at der nu er iværksat et omfattende ”Design Review” af bl.a. landingsstelsystemet på Dash8 Q400. Det hold som udfører Design Review er en sammensætning af konstruktører inden for relevante områder, som ikke tidligere har været involveret i konstruktion af Dash8 Q400. På den måde gives der mulighed for, at nye øjne uden påvirkning fra fortiden, forholder sig til det eksisterende design.

Der er allerede oplæg til konstruktion af en ny actuator til landingsstellet og det forventes, at denne actuator er til rådighed for operatørerne i løbet af ca. et år. Anvendelse af denne actuator forventes således at blive den korrektion som helt afslutter nuværende canadiske og europæiske luftdygtighedsdirektiver i forhold problemerne med korrosion i gevindene (Terminating Action), som forårsagede de to første havarier med henholdsvis LN-RDK og LN-RDS.

Tilsvarende er der konstateret en række generelle forhold i det eksisterende system til landingsstellet, som Bombardiers ekspertpanel anser for nødvendige at foretage ændringer til. Bombardier præsenterede overordnet hvilke områder dette omfatter, og tilkendegav, at opgaven med gennemgang af systemet i detaljer vil være tilendebragt primo 2008.

Generelt ved konstruktion af fly er det et krav, at en enkelt fejl ikke må medføre alvorlige følger for flyet. I tilfældet med de 3 havarier med SAS fly af typen Dash8 Q400, har en enkelt fejl imidlertid medført havari. Der blev derfor på mødet, af de skandinaviske myndigheder gjort opmærksom på disse tilfælde, hvor ”Single point of failure” havde medført et havari. Bombardier erkendte dette, men henviste i den forbindelse til det faktum, at der for alle fly er områder, hvor det er vanskeligt eller direkte umuligt, at have dublerede systemer.
For så vidt angår actuatoren til indfældning af landingsstellet oplyste Bombardier, at på grund af det vanskelige (nærmest umulige) i at konstruere denne som et redundant system, var actuatoren accepteret som en ”Safe Life Component”.

Dette medfører, at actuatoren reelt betragtes som en del af flyets struktur, hvilket bl.a. stiller helt specielle krav til vedligeholdelsesforskrifter for denne komponent, hvilket imidlertid ved en fejl ikke var implementeret.
Det må derfor forventes, at der i forbindelse med det igangværende revisionsarbejde hos Bombardier, vil blive fastsat mere restriktive krav til fremtidig vedligeholdelse af landingsstellets actuator.

For så vidt angår det tredje havari var det opfattelsen, at dette var forårsaget af en kombination af en teknisk fejl på flyet (filteret, der kollapsede) og efterfølgende fejlsøgning og fejlretning på baggrund af besætningens indberetning om for langsom funktion ved operation af landingsstellet.

Bombardier oplyste, at et nyt og stærkere filter til SSV vil være tilgængeligt i februar 2008.

EASA fandt, at ud fra en typeansvarsbetragtning var Dash8 Q400 luftdygtigt med de udstedte luftdygtighedsdirektiver, men at det var de skandinaviske luftfartsmyndigheder, der i relation til de enkelte luftfartøjer bestemte, hvornår flyveforbuddet kunne ophæves.

Samtidig blev det konkluderet, at mødet havde demonstreret, at det er vigtigt at forbedre informationsudvekslingen mellem myndighederne.

Efter mødet udsendte EASA en pressemeddelelse, hvori anføres, at havariet den 27. oktober 2007 ikke skyldtes en designfejl og at flytypens luftdygtighed er opretholdt. Som det fremgår af ovenstående er der imidlertid også konstateret systemfejl på flyet, idet filteret monteret i Solenoid Sequence Valve var kollapset.

HCLJ's undersøgelser fortsætter, og de årsager, der medførte havariet, vil blive nærmere belyst i den endelige redegørelse fra havarikommissionen.

Genaktivering af luftdygtighedsbeviser.

Som nævnt ovenfor, blev der umiddelbart efter havariet med LN-RDI i København den 27. oktober 2007 udstedt flyveforbud for samtlige Dash8 Q400 fly opereret af SAS, og flyenes luftdygtighedsbeviser blev midlertidigt inddraget.

Bombardier har i mellemtiden udgivet All Operator Message nr. 263, som fastsætter inspektionskrav såfremt der inden for en nærmere fastsat periode, er foretaget udskiftning af relevante komponenter i hydrauliksystemet tilhørende landingsstellet.

Denne instruks vil danne grundlag for OPS-udvalgets krav til SAS for genaktivering af luftdygtighedsbeviserne på de involverede fly. Der arbejdes i øjeblikket på at fastsætte de endelige detaljerede krav i relation til SAS-flyene.

7. Sammenfatning

- Det europæiske luftfartssikkerhedsagentur, (European Aviation Safety Agency – EASA), har siden september 2003 været den ansvarlige myndighed i EU for luftfartøjers luftdygtighed.

- EASA udsteder med bindende virkning for alle EU-medlemsstaterne typecertifikater til luftfartøjer, herunder luftfartøjer konstrueret i tredjelande.

- EASA skal udstede luftdygtighedsdirektiver vedrørende en luftfartøjstype, når der eksisterer et usikkert forhold på et luftfartøj som følge af en mangel på luftfartøjet og dette forhold findes eller kan udvikles i andre luftfartøjer af samme type.

- EASA har i vid udstrækning indgået aftaler med en række luftfartsmyndigheder i EU-medlemsstaterne om, at de for EASA forestår arbejdet i relation til luftfartøjers typecertificering og udstedelse af luftdygtighedsdirektiver.

- EU-medlemsstaterne fører tilsyn med luftfartøjer, der er indregistreret i det pågældende land – herunder tilsyn med disses vedvarende luftdygtighed.

- EASA's administrerende direktør har ved beslutning nr. 2/2003 fastsat, at alle luftdygtighedsdirektiver, der er udstedt af det tredjeland, der er designstat ("State of design") for pågældende flytype, skal være umiddelbart gældende i EU, medmindre andet besluttes af EASA inden det tidspunkt, hvor det pågældende luftdygtighedsdirektiv træder i kraft.

- EASA's administrerende direktør har videre ved beslutning nr. 2/2004 fastsat, at canadiske typecertifikatindehaveres ændrings- og reparationsforskrifter til eksisterende typecertifikater godkendes uden videre foranstaltninger af EASA, såfremt de er godkendt af de canadiske myndigheder. EASA har truffet tilsvarende beslutninger i relation til andre typecertifikatindehavere i andre tredjelande.

- Transport Canada (TCCA) anvender et system i lighed med det amerikanske system, hvorefter ansatte hos typecertifikatindehaveren er bemyndiget til på vegne af TCCA at godkende konstruktionsændringer m.v.

- De skandinaviske myndigheder indførte umiddelbart efter havariet den 12. september 2007 flyveforbud for alle SAS-fly af den pågældende type. De to havarier var relateret til actuatoren i hovedlandingsstellet.

- Såvel TCCA og EASA udstedte, da de to første havarier havde konstruktionsmæssige årsager, luftdygtighedsdirektiver, der ligeledes indebar et flyveforbud, idet videre flyvning var betinget af en visuel besigtigelse af luftfartøjets hovedlandingsstel, herunder af øjeboltens gevind (”rod-end”).

- De skandinaviske myndigheder fastsatte en række vilkår for ophævelsen af flyveforbuddet, der indebar en skærpelse i forhold til de i luftdygtighedsdirektiverne indeholdte.

- De skandinaviske luftfartsmyndigheders skærpede krav blev fremsat bl.a. på baggrund af de foreliggende oplysninger, herunder en ca. 20 år gammel dokumentation fra Bombardier (dengang DeHavilland) vedrørende et sammenligneligt problem på Dash7 samt indikation på slid (”fretting”) i gevindsamlingen imellem actuator og øjebolt.

- Havariet den 27. oktober 2007 havde andre årsager end de to første havarier. En O-ring blokerede udgangen i actuatorens begrænser, hvorigennem hydraulik-olien skal undvige, når landingsstellet udfældes. Et kollaps af et filter muliggjorde sammen med udført vedligeholdelsesarbejde efter luftfartøjets ibrugtagning efter det første havari antagelig havariet. Der er tidligere konstateret andre tilfælde af kollaps i dette filter.

- Efter SLV’s opfattelse er der således ikke, som anført fra canadisk side, alene tale om at vedligeholdelsesmæssige forhold i relation til luftfartøjet var årsagen til havariet.

- EASA har ikke bebudet udstedelse af et nyt luftdygtighedsdirektiv i relation til dette forhold, og anser således flytypen for luftdygtig med de nugældende luftdygtighedsdirektiver udført.

- Bombardier har iværksat et omfattende arbejde med ”Design Review” af den pågældende luftfartøjstype. Der er bl.a. oplæg til ny actuator til landingsstellet,

ligesom et nyt og stærkere filter til Solenoid Sequence Valve vil være tilgængeligt i begyndelsen af 2008.

- Havarikommissionernes undersøgelser fortsætter, og det kan derfor fremkomme nye forhold, der vil blive belyst i de endelige beretninger vedrørende de tre havarier.

- OPS-udvalget har efter de to første havarier besluttet at foretage en fornyet gennemgang af sagen med fokus på, om de typecertificerende myndigheder har modtaget relevante oplysninger om luftfartøjstypen til brug for deres vurderinger vedrørende udstedelse af luftdygtighedsdirektiver.

- På "Engineering Review"-mødet hos EASA den 7. november 2007 blev det konkluderet, at det er vigtigt, at forbedre informationsudvekslingen mellem myndighederne.

- OPS-udvalget har ligeledes besluttet at intensivere arbejdet vedrørende tilrettelæggelsen af det fremtidige tilsyn med SAS set i lyset af de organisatoriske ændringer, der er gennemført i SAS-gruppen de senere år.

- SAS har besluttet, at Dash8 Q400 ikke fremover skal indgå i flyflåden.

Bilag

- EASA TYPE-CERTIFICATE DATA SHEET DHC-8, TC Holder: Bombardier Inc.
- CF- 2001-14 – Subject: Bombardier DHC-8-400 - Fuel Tank Lightning Protection
- CF-2001-16R1 – Subject: Bombardier DHC-8-400 - Main Landing Gear Procedure
- CF-2001-23 – Subject: Bombardier DHC-8 Series 400 - Door Stops
- CF-2001-44 – Subject: Bombardier DHC-8- 400 - Spoiler Lift Dump Valves
- CF-2002-07 – Subject: Bombardier DHC-8 Series 400 - Fwd Engine Mount Assembly
- CF-2002-13R2 – Subject: Main Landing Gear Up-Lock Assembly
- CF-2002-15 – Subject: Bombardier DHC-8-400 – Rudder Trim Switch Wiring
- CF-2002-25 – Subject: Bombardier DHC-8 Series 400 – Pitch Trim Control
- CF-2003-28 – Subject: Bombardier DHC-8-400 Series – Fuselage Bottom Skin and Number 2 VHF Antenna Support Structure Inspection and Rework
- CF-2004-07 – Subject: Bombardier DHC-8 Series 400 - Fuel & Hydraulic Tubes
- CF-2004-11 – Subject: Bombardier DHC-8-400 Series - Outboard Flap Front Spar, Track Number 4 and Number 5 Fittings - Inspection and Modification
- CF-2004-19 – Subject: Bombardier DHC-8-400 – Airworthiness Limitation Items
- CF-2005-07 – Subject: Horizontal Stabilizer Attachment Fittings Bolt Torque Check, Shim Inspection and Modification
- CF-2005-08R1 – Subject: Corrosion of Fuel Access Panel Attachment Anchor Nut
- CF-2005-14R1 – Subject: Inspection of Fire Bottle Connectors
- CF-2005-15 – Subject: Pitot Static System Contamination
- CF-2005-37 – Subject: Cracking of the Outer Wing Fuel Access Panel
- CF-2005-39 – Subject: Incorrect Rivets Installed at Control Column Torque Tube
- CF-2006-05 – Subject: Brake Control Cable Fouling on Camloc Fasteners
- CF-2006-06 – Subject: Engine Exhaust Shroud V-Band Couplings
- CF-2006-08 – Subject: Hydraulic System Power Transfer Unit Overspeed
- CF-2006-10 – Subject: Airworthiness Limitation Items
- CF-2007-05 – Subject: Translating Door Over-Centering Spring Bracket Failure
- CF-2007-11 – Subject: Flight Compartment - Utility and Observer Lights
- CF-2007-20 – Subject: DHC-8-400 Main Landing Gear
- EASA EMERGENCY AIRWORTHINESS DIRECTIVE AD No : 2007-0252-E
- CF-2007-20 R1 – Subject: DHC-8-400 Main Landing Gear
- EASA AIRWORTHINESS DIRECTIVE AD No : 2007-0272

Bilag til kapitel 6 (se særskilte hæfter)

Bilag 01	Havarimeddelelse fra SAS LN-RDK
Bilag 02	AOM 235
Bilag 03	LN-RDK AD Compliance liste
Bilag 04	AOM 236A
Bilag 05	Havarimeddelelse fra SAS LN-RDS
Bilag 06	OPS-udv. Q400 LD bevis inddrages 120907
Bilag 07	EASA info vedr. MLG Collaps Q400 120907
Bilag 08	SAS preliminary engineering analysis LN-RDK
Bilag 09	AOM 237A
Bilag 10A	Bombardier RD84-32-059 Issue 1 120907
Bilag 10B	Goodrich SCR 086-07 rev NC 120907
Bilag 10C	Goodrich Steering Tool CG56806 120907
Bilag 11	OPS udv. till. til færgeflyvning 130907
Bilag 12	HCLJ foreløbig undersøgelse 130907
Bilag 12A	DHC-8-402 prelim report
Bilag 13	AOM 238
Bilag 14	AOM 239
Bilag 15	AOM 240
Bilag 16	AOM 241A
Bilag 17	AOM 242B
Bilag 18	Bombardier RD84-32-059 Issue 2 130907
Bilag 19	Bombardier RD84-32-059 Issue 3 130907
Bilag 20	Goodrich RD S2116 rev NC
Bilag 21	Goodrich RD S2117 rev NC
Bilag 22	Goodrich SCR 086-07 rev A 130907
Bilag 23	Goodrich SCR 086-07 rev B 130907
Bilag 24	OPS-udv. krav til genaktivering af LD bevis 200907
Bilag 25	AOM 248
Bilag 26	AOM 249B
Bilag 27	OPS-udv krav til næsestel 270907
Bilag 27A	RD 84-32-064
Bilag 27B	SCR 101-07

Bilag 28	OPS-udv krav om NLG insp 270907
Bilag 29	Bombardier RD84-32-059 Issue 5 200907
Bilag 30	AOM 243
Bilag 30A	Bombardier RD84-32-059 Issue 4 140907
Bilag 30B	Goodrich SCR 086-07 rev C 140907
Bilag 31	AOM 245
Bilag 32	AOM 247
Bilag 32A	AOM 247, RD84-32-063 Issue 1
Bilag 32B	AOM 247, Goodrich SCR 091-07 rev NC
Bilag 33	AOM 250
Bilag 33A	Bombardier RD84-32-059 Issue 5 200907
Bilag 33B	Goodrich SCR 086-07 rev D 200907
Bilag 34	SAS indberetning vedr. havari med LN-RDI SK2867 27.10.07
Bilag 34A	OPS-udvalget meddeler flyveforbud 27.10.07
Bilag 35	HCLJ redegørelse af 29.10.07 vedr. LN- RDI
Bilag 36	HCLJ redegørelse af 30.10.07 vedr. LN- RDI
Bilag 37	HCLJ redegørelse af 03.11.07 vedr. LN- RDI
Bilag 38	STK release doc. for LN-RDI
Bilag 39	AOM 263

European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET

DHC-8

Type Certificate Holder: Bombardier Inc.

123 Garratt Boulevard
Toronto, Ontario
CANADA M3K 1Y5

For models:	DHC-8-102	DHC-8-201	DHC-8-301	DHC-8-401
	DHC-8-103	DHC-8-202	DHC-8-311	DHC-8-402
	DHC-8-106		DHC-8-314	
			DHC-8-315	

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RESERVED

SECTION 1: GENERAL (ALL MODELS)

1. Data Sheet No: EASA.IM.A.191

2. Airworthiness Category: Large Aeroplanes

3. Performance Category: A

4. Certifying Authority: TCCA

5. Type Certificate Holder: **Bombardier Inc.**
123 Garratt Boulevard
Toronto, Ontario
Canada M3K 1Y5

SECTION 2: DHC-8 SERIES 100

I. General

1. Aeroplane: DHC-8 Series 100

II. Certification Basis

1. Reference Application Date for EASA Certification: February 7, 1986

2. TCCA Certification Date:

DHC-8-102	June 12, 1986
DHC-8-103	July 20, 1987
DHC-8-106	November 20, 1992

3. TCCA Certification Basis: Refer to TCCA Type Certificate Data Sheet No. A-142

4. EASA Certification Date:

DHC-8-102	January 27, 1988 (ACG, Austria)
DHC-8-103	January 27, 1988 (ACG, Austria)
DHC-8-106	February 23, 1995 (ACG, Austria and NCAA, Norway)

5. EASA Certification Basis:

FAR Part 25 dated February 1, 1965, including amendments 25-1 through 25-51; plus:
FAR 25.832, Amendment 25-56, Cabin Ozone Concentration.

Additional Airworthiness Requirements:

Flight Manual Policy ref. DOT letter 5010-10-366 (ABP/L) dated June 1, 1984.

AMA 525/1 Stalls, Compliance dated July 9, 1984. Airworthiness Manual 525.207(b) Stall Warning, initial issue dated 1986. Airworthiness Manual 525.201(d) Stall Demonstration, initial issue dated 1986.

Low Temperature Operations ref. AAR Review Document September 10, 1984.

Spoiler Policy ref. DOT letter 5010-10-366 (ABE/L), dated September 20, 1984.

Compliance with the following additional optional requirements has been established:

FAR 25.1419, Ice Protection.

Compliance with FAR 25.801 has been established when the safety equipment requirements of FAR 25.1411 and the ditching equipment requirements of FAR 25.1415 are satisfied.

6. Special Conditions:

Automatic take-off power control system (ATPCS) (ref. FAA Special Conditions No. 25-ANM-3; TC letter 5010-10-366 (ABP/A), dated February 24, 1984).

Steep Approach and Short Landing (ref. TC letter 5010-10-366 (ABP/L), dated June 7, 1985).

7. Exemptions:

FAR 25.571(e)(2)	Propeller Debris (ref. FAA Exemption No. NM-102; TC letter 5010-10-366 (ABP/A) dated February 10, 1984).
FAR 25.807(c)(1)	40 Passenger Configuration (ref. TC letter 5010-10-366, dated March 14, 1986).

8. Equivalent Safety Findings:

FAR 25.773(b)(2) Pilot compartment view.

9. Environmental Standards:

Environmental requirements for noise:

ICAO Annex 16 Volume 1 – Chapter 3

Environmental requirements for fuel venting and emissions:

SFAR 27 dated December 12, 1973, including Amendments 27-1 through 27-5.

III. Technical Characteristics and Operational Limitations

1. Type Design Definition: Current issue of AEROC 8.1.AC.1 - Definition of Certified Airplanes

2. Description: Detail Specification No. DS8-100

3. Equipment: Equipment Register

4. Dimensions:

Span	25.91 m (85 ft)
Length	22.25 m (73 ft)
Height	7.49 m (24 ft 7 in)

Wing Area 54.35 m^2

5. Engines: Two (2) Pratt and Whitney of Canada engines as follows:

DHC-8-102	PW120A or PW121
DHC-8-103	PW121
DHC-8-106	PW121

Refer to TCCA Engine Type Certificate Data Sheet E-19.

5.1 Engine Limits: For details refer to AFM – PSM 1-81-1A (Models 102, 103, 106)

6. Auxiliary Power Unit (APU): Options only. Refer to AFM - PSM 1-81-1A (Models 102, 103, 106)

6.1 APU Limits: For details refer to AFM – PSM 1-81-1A (Models 102, 103, 106)

7. Propellers: Hamilton Standard Model 14SF-7, 14SF-15 or 14SF-23

Refer to FAA Propeller Type Certificate Data Sheet P7NE.

7.1 Propeller Limits:

Blade	SFA13 ( )-OA	
Diameter	3.96 m (13 ft) nominal	
Pitch settings at 0.75 radius:		
Feather		77.5°
Flight fine		10.5°
Ground fine		-5.5°
Full reverse		-18.5°
Propeller (Np)	- Take off	1212 rpm
	- Max. continuous	1212 rpm

The following Hamilton Standard Propeller combinations are approved

14SF-7 & 14SF-7

Modification 8/2579 allows the following additional Hamilton Standard Propeller combinations.

14SF-15 & 14SF-15
14SF-15 & 14SF-7
14SF-15 & 14SF-23
14SF-23 & 14SF-23
14SF-23 & 14SF-7

8. Fluids (Fuel/Oil/Additives): For details refer to AFM – PSM 1-81-1A (Models 102, 103, 106)

8.1 Eligible Fuels

Kerosene	JET A, A-1, JP-5, JP-8
Wide Cut	JET B, JP-4

8.2 Eligible Oils Oils conforming to Specification MIL-L-23699

9. Fluid Capacities:

9.1 Fuel Capacity:

	Kg.	lbs.	Liters	Imp. Gals.
Usable	2575	5678	3160	695
Unusable	40	87	48	11
Total	2615	5765	3208	706

9.2 Oil Capacity per Engine:

	Liters	Imp. Gals.
Usable	3.8	0.83
Total	17.7	3.90

10. Air Speeds:

IAS		Knots
V_{MO} (Maximum Operating)	0 to 14000 ft	242
	15000 ft	239
	20000 ft	223
	25000 ft	207
V_{FE} (Flap extended)	Flap 5° & 15°	148
	Flap 35°	130
V_A (Maneuvering)		163
V_{LO} (Landing gear operation)		158
V_{LE} (Landing gear extended)		172

For other airspeeds refer to AFM – PSM 1-81-1A (Models 102, 103, 106)

11. Maximum Operating Altitude: 7,620 m (25,000 ft) (Pressure Altitude)

12. All Weather Capability: Cat II

13. Maximum Weights:

DHC-8-102

	Basic	Mod 8/1335	AFM Supplement 57	AFM Supplement 87
Taxi and ramp	15,740 kg (34,700 lb)	15,740 kg (34,700 lb)	15,740 kg (34,700 lb)	15,740 kg (34,700 lb)
Take-off	15,649 kg (34,500 lb)	15,649 kg (34,500 lb)	15,649 kg (34,500 lb)	15,649 kg (34,500 lb)
Landing	15,377 kg (33,900 lb)	15,377 kg (33,900 lb)	15,377 kg (33,900 lb)	15,377 kg (33,900 lb)
Zero fuel	14,061 kg (31,000 lb)	14,179 kg (31,300 lb)	14,243 kg (31,400 lb)	14,515 kg (32,000 lb)

DHC-8-103

	Basic	Mod 8/1335	MS8Q420649	AFM Supplement 57	AFM Supplement 87
Taxi and ramp	15,740 kg (34,700 lb)	15,740 kg (34,700 lb)	16,057 kg (35,400 lb)	15,740 kg (34,700 lb)	15,740 kg (34,700 lb)
Take-off	15,649 kg (34,500 lb)	15,649 kg (34,500 lb)	15,966 kg (35,200 lb)	15,649 kg (34,500 lb)	15,649 kg (34,500 lb)
Landing	15,377 kg (33,900 lb)	15,377 kg (33,900 lb)	15,377 kg (33,900 lb)	15,377 kg (33,900 lb)	15,377 kg (33,900 lb)
Zero fuel	14,061 kg (31,000 lb)	14,179 kg (31,300 lb)	14,515 kg (32,000 lb)	14,243 kg (31,400 lb)	14,515 kg (32,000 lb)

DHC-8-106

Taxi and ramp	16,556 kg (36,500 lb)
Take-off	16,466 kg (36,300 lb)
Landing	15,377 kg (33,900 lb)
Zero fuel	14,515 kg (32,000 lb)

14. Center of Gravity Range: For details refer to AFM – PSM 1-81-1A (Models 102, 103, 106)

15. Datum: Plate located on centerline at “Station 423.0 in” (1074.4 cm) on underside of fuselage.

16. Mean Aerodynamic Chord (MAC): 87.0 in

17. Leveling Means: Plumb bob and target in RH emergency exit opening.

18. Minimum Flight Crew: 2 (Pilot and Copilot)

19. Maximum Passenger Seating Capacity: 40 passengers (see Note 1)

20. Exits:

No.	Type	Size
1	I	0.762 m x 1.65 m (30 in x 65 in)
1	II	0.508 m x 1.37 m (20 in x 54 in)
2	III	0.508 m x 0.914 m (20 in x 36 in)

21. Baggage/Cargo Compartments:

	Class	Volume	Max. Allowable Load
Rear	B	8.48 m^3 (300 ft^3)	907 kg (2,000 lb)

Refer to Weight & Balance Manual PSM 1-8-8 for mixed passenger-cargo configurations.

22. Wheels and Tires: Tricycle landing gear, retractable, dual side by side wheel type.
Main wheel sized to accept 26.5 × 8.0−13 or 31.0 × 9.75−13 tubeless tires.
Nose gear sized to accept 18 × 5.50−8 tubeless tires or with S.O.O. 8009, 22.0 × 6.5−10 flotation type tire.

IV. Operating and Service Instructions

1. Airplane Flight Manual	PSM 1-81-1A (Models 102, 103, 106)
2. Airplane Maintenance Manual	PSM 1-8-2
3. Weight and Balance Manual	PSM 1-8-8
4. Maintenance Program Manual	
- Maintenance Review Board Report (MRB Report)	PSM 1-8-7, Part 1
5. Maintenance Program Manual	
– Airworthiness Limitations (AWL)	PSM 1-8-7, Part 2
6. Maintenance Task Cards Manual	PSM 1-8-7TC
7. Service Letters and Service Bulletins	Refer to Publications Index

V. Notes

1. Cabin Interior and Seating Configurations must be approved and are listed in AEROC 8.1.AC.1 Section 100 current issue.

SECTION 2: DHC-8 SERIES 200

I. General

1. Aeroplane: DHC-8 Series 200

II. Certification Basis

1. Reference Application Date for EASA Certification: August 1, 1997

2. TCCA Certification Date:

DHC-8-201	August 24, 1995
DHC-8-202	March 9, 1995

3. TCCA Certification Basis: Refer to TCCA Type Certificate Data Sheet No. A-142

4. EASA Certification Date:

DHC-8-201	February 17, 1998 (LBA, Germany)
DHC-8-202	February 17, 1998 (LBA, Germany)

5. EASA Certification Basis:

FAR Part 25 dated February 1, 1965, including amendments 25-1 through 25-66; plus:

FAR 25.963(e), Amendment 25-69,	Fuel Tank Access Covers
FAR 25.361, Amendment 25-72,	Engine Torque
FAR 25.729(e), Amendment 25-75,	Retraction Mechanism

With the following exceptions:
(The DHC-8 Series 200 was certificated as a derivative of the Series 100 aircraft. The applicable basis of certification is the same as the Series 100, but the manufacturer elected to demonstrate compliance with FAR Part 25, up to Amendment, 25-66, less the exceptions shown under Basis of Certification, Series 200.)

FAR 25.365(e), Amendment 25-54,	Pressurized Cabin Loads
FAR 25.561, Amendment 25-64,	Emergency Landing Conditions
FAR 25.562, Amendment 25-64,	Emergency Landing Dynamic Conditions
FAR 25.783, Amendment 25-54,	Doors
FAR 25.785, Amendment 25-64,	Seats, Berths, Safety Belts and Harnesses
FAR 25.904, Amendment 25-62,	Automatic Takeoff Thrust Control System (replaced by ATPCS Special Condition)
FAR 25.1091(e), Amendment 25-57,	Air Intakes

Additional Airworthiness Requirements

Flight Manual Policy ref. DOT letter 5010-10-366 (ABP/L) dated June 1, 1984.
AMA 525/1, Stalls, Compliance dated July 9, 1984. Airworthiness Manual 525.207(b) Stall Warning, initial issue dated 1986. Airworthiness Manual 525.201(d) Stall Demonstration, initial issue dated 1986.

Low Temperature Operations ref. AAR Review Document September 10, 1984.
Spoiler Policy ref. DOT letter 5010-10-366 (ABE/L), dated September 20, 1984.

Compliance with the following additional optional requirements has been established:

FAR 25.1419, Ice Protection
Compliance with FAR 25.801 has been established when the safety equipment requirements of FAR 25.1411 and the ditching equipment requirements of FAR 25.1415 are satisfied.

6. Special Conditions:

Automatic take-off power control system (ATPCS) (ref. FAA Special Conditions No. 25-ANM-3; TC letter 5010-10-366 (ABP/A), dated February 24, 1984).

Steep Approach and Short Landing – (ref. TC letter 5010-10-366 (ABP/L), dated June 7, 1985).

7. Equivalent Safety Findings:

FAR 25.773(b)(2), Pilot compartment view.

8. Environmental Standards:

Environmental requirements for noise:

ICAO Annex 16 Volume 1 – Chapter 3

Environmental requirements for fuel venting and emissions:

ICAO Annex 16, Second Edition, Volume II

9. Exemptions

FAR 25.571(e)(2),	Propeller Debris (ref. FAA Exemption No. NM-102; TC letter 5010-10-366 (ABP/A) dated February 10, 1984).
FAR 25.807(c)(1),	40 Passenger Configuration (ref. TC letter 5010-10-366, dated March 14, 1986

III. Technical Characteristics and Operational Limitations

1. Type Design Definition: Current issue of AEROC 8.1.AC–1 - Definition of Certified Airplanes

2. Description: Detail Specification No. DS8-200

3. Equipment: Equipment Register

4. Dimensions:

Span	25.89 m (85 ft)
Length	22.25 m (73 ft)
Height	7.49 m (24 ft 7 in)
Wing Area	54.35 m^2

5. Engines: 2 Pratt and Whitney of Canada engines as follows:

	Original	Optional
DHC-8-201	PW123C	PW123, PW123B, PW123D, PW1123E
DHC-8-202	PW123D	PW123, PW123B, PW1123E

Refer to TCCA Engine Type Certificate Data Sheet E-19.

Any combination of original engines and/or optional engines within each aircraft model is permitted. Optional engines must incorporate modification 8/2735.

5.1 Engine Limits: For details refer to AFM – PSM 1-82-1A (Models 201, 202)

6. Auxiliary Power Unit (APU): Options only. Refer to AFM - PSM 1-82-1A (Models 201, 202)

6.1 APU Limits: For details refer to AFM – PSM 1-82-1A (Models 201, 202)

7. Propellers: Hamilton Standard Model 14SF-23

Refer to FAA Propeller Type Certificate Data Sheet P7NE.

7.1 Propeller Limits:

Blade	SFA13 ( )-OA	
Diameter	3.96 m (13 ft) nominal	
Pitch settings at 0.75 radius:		
Feather		77.5°
Flight fine		10.5°
Ground fine		-5.5°
Full reverse		-18.5°
Propeller (Np)	- Take off	1212 rpm
	- Max. continuous	1212 rpm

The following Hamilton Standard Propeller combinations are approved — 14SF-23 & 14SF-23

Modification 8/2579 allows the following additional Hamilton Standard Propeller combinations. — 14SF-15 & 14SF-15; 14SF-15 & 14SF-23

8. Fluids (Fuel/Oil/Additives): For details refer to AFM – PSM 1-82-1A (Models 201, 202)

8.1 Eligible Fuels

Kerosene	JET A, A-1, JP-5, JP-8
Wide Cut	JET B, JP-4

8.2 Eligible Oils Oils conforming to Specification MIL-L-23699

9. Fluid Capacities:

9.1 Fuel Capacity:

	Kg.	lbs.	Liters	Imp. Gals.
Usable	2575	5678	3160	695
Unusable	40	87	48	11
Total	2615	5765	3208	706

9.2 Oil Capacity per Engine:

	Liters	Imp. Gals.
Usable	8.0	1.6
Total	19.3	4.57

10. Air Speeds:

			Knots
IAS	V_{MO} (Maximum Operating)	0 to 14000 ft	242
		15000 ft	239
		20000 ft	223
		25000 ft	207
	V_{FE} (Flap extended)	Flap 5°& 15°	148
		Flap 35°	130
	V_A (Maneuvering)		163
	V_{LO} (Landing gear operation)		158
	V_{LE} (Landing gear extended)		172

For other airspeeds refer to AFM – PSM 1-81-1A (Models 201, 202)

11. Maximum Operating Altitude: 7,620 m (25,000 ft) (Pressure Altitude)

12. All Weather Capability: Cat II

13. Maximum Weights:

DHC-8-201 & DHC-8-202

	Basic	AFM Supplement 57
Taxi and ramp	16,556 kg (36,500 lb)	16,556 kg (36,500 lb)
Take-off	16,466 kg (36,300 lb)	16,466 kg (36,300 lb)
Landing	15,650 kg (34,500 lb)	15,650 kg (34,500 lb)
Zero fuel	14,515 kg (32,000 lb)	14,696 kg (32,400 lb)

14. Center of Gravity Range: For details refer to AFM – PSM 1-82-1A (Models 201, 202)

15. Datum: Plate located on centerline at "Station 423.0 in" (1074.4 cm) on underside of fuselage.

16. Mean Aerodynamic Chord (MAC): 87.0 in

17. Leveling Means: Plumb bob and target in RH emergency exit opening.

18. Minimum Flight Crew: 2 (Pilot and Copilot)

19. Maximum Passenger Seating Capacity: 40 passengers (see Note 1)

20. Exits:

No.	Type	Size
1	I	0.762 m x 1.65 m (30 in x 65 in)
1	II	0.508 m x 1.37 m (20 in x 54 in)
2	III	0.508 m x 0.914 m (20 in x 36 in)

21. Baggage/Cargo Compartments:

	Class	Volume	Max. Allowable Load
Rear	B	8.48 m^3 (300 ft^3)	907 kg (2,000 lb)

Refer to Weight & Balance Manual PSM 1-82-8 for mixed passenger-cargo configurations.

22. Wheels and Tires: Tricycle landing gear, retractable, dual side by side wheel type.
Main wheel sized to accept 31.0 × 9.75−13 tubeless tires.
Nose gear sized to accept 18 × 5.50−8 tubeless tires or with S.O.O. 8009, 22.0 × 6.5−10 flotation type tire.

IV. Operating and Service Instructions

1. Airplane Flight Manual	PSM 1-82-1A (Models 201, 202)
2. Airplane Maintenance Manual	PSM 1-82-2
3. Weight and Balance Manual	PSM 1-82-8
4. Maintenance Program Manual	
- Maintenance Review Board Report (MRB Report)	PSM 1-82-7, Part 1
5. Maintenance Program Manual	
- Airworthiness Limitations (AWL)	PSM 1-82-7, Part 2
6. Maintenance Task Cards Manual	PSM 1-82-7TC
7. Service Letters and Service Bulletins	Refer to Publications Index

V. Notes

1. Cabin Interior and Seating Configurations must be approved and are listed in AEROC 8.1.AC.1 Section 200 current issue.

SECTION 4: DHC-8 SERIES 300

I. General

1. Aeroplane: DHC-8 Series 300

II. Certification Basis

1. Reference Application Date for EASA Certification: September 9, 1988

2. TCCA Certification Date:

DHC-8-301	February 14, 1989
DHC-8-311	July 31, 1990
DHC-8-314	February 20, 1992
DHC-8-315	June 2, 1995

3. TCCA Certification Basis: Refer to TCCA Type Certificate Data Sheet No. A-142

4. EASA Certification Date:

DHC-8-301	February 23, 1995 (NCAA, Norway)
DHC-8-311	August 15, 1990 (LBA, Germany)
DHC-8-314	May 3, 1993 (ACG, Austria)
DHC-8-315	March 22, 1996 (DGAC, Romania)

5. EASA Certification Basis:

FAR Part 25 dated February 1, 1965, including amendments 25-1 through 25-51; plus:

FAR 25.832,	Amendment 25-56 Cabin Ozone Concentration
FAR 25.812,	Amendment 25-58 Emergency Lighting
FAR 25.853,	Amendment 25-59 Compartment Interiors (Seat cushions)
FAR 25.853,	Amendment 25-66 Compartment Interiors (Materials) (Models 311, 314, and 315)

Additional Airworthiness Requirements

Flight Manual Policy ref. DOT letter 5010-10-366 (ABP/L), dated June 1, 1984.
AMA 525/1 Stalls, Compliance dated July 9, 1984. Airworthiness Manual 525.207(b) Stall Warning, initial issue dated 1986. Airworthiness Manual 525.201(d) Stall Demonstration, initial issue dated 1986.
Low Temperature Operations ref. AAR Review Document September 10, 1984.
Spoiler Policy ref. DOT letter 5010-10-366 (ABE/L) dated September 20, 1984.

Compliance with the following additional optional requirements has been established:

FAR 25.1419, Ice Protection
Compliance with FAR 25.801 has been established when the safety equipment requirements of FAR 25.1411 and the ditching equipment requirements of FAR 25.1415 are satisfied.

6. Special Conditions:

Automatic take-off power control system (ATPCS) (Ref. FAA Special Conditions No. 25-ANM-3; TC letter 5010-10-366 (ABP/A), dated February 24, 1984).
Steep Approach and Short Landing - (ref. TC letter 5010-10-366 (ABP/L), dated June 7, 1985).

7. Equivalent Safety Findings:

FAR 25.773(b)(2),	Pilot compartment view.
FAR 25.807(d)(2),	Ditching emergency exits for passengers (Applies to Models -311, 314, and 315 with Change Request CR803SO00001 or CR803SO00002 incorporated).

8. Environmental Standards:

Environmental requirements for noise:

ICAO Annex 16 Volume 1 – Chapter 3

Environmental requirements for fuel venting and emissions:

DHC-8-301 DHC-8-311 DHC-8-314	SFAR 27 dated December 12, 1973, including Amendments 27-1 through 27-5.
DHC-8-315	ICAO Annex 16, Second Edition, Volume II

9. Exemptions

FAR 25.571(e)(2),	Propeller Debris (ref. FAA Exemption No. NM-102; TC letter 5010-10-366 (ABP/A) dated February 10, 1984).
FAR 25.785(h),	Exemption No. 89-2, dated February 3, 1989, Flight Attendants Seats

III. Technical Characteristics and Operational Limitations

1. Type Design Definition: Current issue of AEROC 8.1.AC.1 – Definition of Certified Airplanes

2. Description: Detail Specification No. DS8-300

3. Equipment: Equipment Register

4. Dimensions:

Span	27.43 m (90 ft)
Length	25.68 m (84 ft 3 in)
Height	7.49 m (24 ft 7 in)
Wing Area	56.1 m^2

5. Engines: Two (2) Pratt and Whitney of Canada engines as follows:

	Original	Optional
DHC-8-301 & DHC-8-311	PW123	PW123B, PW1123E
DHC-8-314	PW123B	
DHC-8-315	PW123E	

Refer to TCCA Engine Type Certificate Data Sheet E-19.

Any combination of original engines and/or optional engines within each aircraft model is permitted. Optional engines must incorporate modification 8/2735.

5.1 Engine Limits: For details refer to AFM – PSM 1-83-1A (Models 301, 311, 314, 315)

6. Auxiliary Power Unit (APU): Options only. Refer to AFM – PSM 1-83-1A (Models 301, 311, 314, 315)

6.1 APU Limits: For details refer to AFM – PSM 1-83-1A (Models 301, 311, 314, 315)

7. Propellers:

DHC-8-301, DHC-8-311 & DHC-8-314 — Hamilton Standard Model 14SF-15

DHC-8-301, DHC-8-311, DHC-8-314 & DHC-8-315 — Hamilton Standard Model 14SF-23

Refer to FAA Propeller Type Certificate Data Sheet P7NE.

7.1 Propeller Limits:

Blade	SFA13 ( )-OA	
Diameter	3.96 m (13 ft) nominal	
Pitch settings at 0.75 radius:		
Feather		77.5°
Flight fine		11.5°
Ground fine		-7.5°
Full reverse		-18.5°
Propeller (Np)	- Take off	1212 rpm
	- Max. continuous	1212 rpm

The following Hamilton Standard Propeller combinations are approved:

DHC-8-301, DHC-8-311 & DHC-8-315	14SF-15 & 14SF-15
	14SF-23 & 14SF-23

Modification 8/2579 allows the following

additional Hamilton Standard Propeller combinations:

DHC-8-301, DHC-8-311 & DHC-8-315 — 14SF-15 & 14SF-23

8. Fluids (Fuel/Oil/Additives): for details refer to AFM – PSM 1-83-1A (Models 301, 311, 314, 315)

8.1 Eligible Fuels Kerosene JET A, A-1, JP-5, JP-8
Wide Cut JET B, JP-4

8.2 Eligible Oils Oils conforming to Specification MIL-L-23699

9. Fluid Capacities:

9.1 Fuel Capacity:

	Kg.	lbs.	Liters	Imp. Gals.
Usable	2575	5678	3160	695
Unusable	40	87	48	11
Total	2615	5765	3208	706

9.2 Oil Capacity per Engine:

	Liters	Imp. Gals.
Usable	8.0	1.6
Total	19.3	4.57

10. Air Speeds:

		Knots
IAS	V_{MO} (Maximum Operating) 0 to 17000 ft	243
	20000 ft	232
	25000 ft	214
	V_{FE} (Flap extended) Flap 5°	160
	Flap 10° & 15°	149
	Flap 35°	127
	V_A (Maneuvering)	176
	V_{LO} (Landing gear operation)	
	DHC-8-301	158
	DHC-8-311, DHC-8-314 & DHC-8-315	163
	V_{LE} (Landing gear extended)	172

For other airspeeds refer to AFM – PSM 1-83-1A (Models 301, 311, 314, 315)

11. Maximum Operating Altitude: 7,620 m (25,000 ft) (Pressure Altitude)

12. All Weather Capability: Cat II

13. Maximum Weights:

DHC-8-301, DHC-8-311, DHC-8-314, DHC-8-315

	Basic
Taxi and ramp	18,734 kg (41,300 lb)
Take-off	18,643 kg (41,100 lb)
Landing	18,144 kg (40,000 lb)
Zero fuel	16,874 kg (37,200 lb)

DHC-8-311, DHC-8-314, DHC-8-315

	CR 803SO00001	CR 803SO00002
Taxi and ramp	19,087 kg (42,080 lb)	19,595 kg (43,200 lb)
Take-off	18,997 kg (41,880 lb)	19,505 kg (43,000 lb)
Landing	18,597 kg (41,000 lb)	19,051 kg (42,000 lb)
Zero fuel	17,463 kg (38,500 lb)	17,917 kg (39,500 lb)

14. Center of Gravity Range: for details refer to AFM – PSM 1-83-1A (Models 301, 311, 314, 315)

15. Datum: Plate located on centerline at "Station 423.0 in" (1074.4 cm) on underside of fuselage.

16. Mean Aerodynamic Chord (MAC): 85.5 in

17. Leveling Means: Plumb bob and target in RH emergency exit opening.

18. Minimum Flight Crew: 2 (Pilot and Copilot)

19. Maximum Passenger Seating Capacity: 56 passengers (see Note 1)

20. Exits:

No.	Type	Size
1	I	0.762 m x 1.65 m (30 in x 65 in)
1	I	0.508 m x 1.37 m (20 in x 54 in)
2	III	0.508 m x 0.914 m (20 in x 36 in)

21. Baggage/Cargo Compartments:

	Class	Volume	Max. Allowable Load
Rear	B	9.1 m^3 (320 ft^3)	997 kg (2,200 lb)

Refer to Weight & Balance Manual PSM 1-83-8 for mixed passenger-cargo configurations.

22. Wheels and Tires: Tricycle landing gear, retractable, dual side by side wheel type.
Main wheel sized to accept 31.0 × 9.75−14 tubeless tires.
Nose gear sized to accept 18 × 5.50−8 or 22.0 × 6.5−10 tubeless tires.

IV. Operating and Service Instructions

1. Airplane Flight Manual	PSM 1-83-1A (Models 301, 311, 314, 315)
2. Airplane Maintenance Manual	PSM 1-83-2
3. Weight and Balance Manual	PSM 1-83-8
4. Maintenance Program Manual	
- Maintenance Review Board Report (MRB Report)	PSM 1-83-7, Part 1
5. Maintenance Program Manual	
– Airworthiness Limitations (AWL)	PSM 1-83-7, Part 2
6. Maintenance Task Cards Manual	PSM 1-83-7TC
7. Service Letters and Service Bulletins	Refer to Publications Index

V. Notes

1. Cabin Interior and Seating Configurations must be approved and are listed in AEROC 8.1.AC.1 Section 300 current issue.

SECTION 5: DHC-8 SERIES 400

I. General

1. Aeroplane: DHC-8 Series 400

II. Certification Basis

1. Reference Application Date for EASA Certification: 31 January 1995

2. EASA Certification Date

DHC-8-401	December 01, 1999	(CAA Denmark)
DHC-8-402	December 01, 1999	(CAA Denmark)

3. EASA Certification Basis:

JAR 25 Change 14
JAR 25 Amendment 25/96/01
JAR AWO Change 2
JAR 1 Definitions Change 4
JAR 21 Change 1

4. Special Conditions:

CRI C-01	Yawing Maneuvering Conditions INT/POL/25/8 Issue 1
CRI D-01	Worn Brakes INT/POL/25/6 Issue 1
CRI F-01	Protection from the Effects of HRIF INT/POL/25/2 Issue 1
CRI F-02	Protection from the Effects of Lightning Strike – Direct Effects INT/POL/25/3 Issue 1
CRI F-03	Protection from the Effects of Lightning Strike – Indirect Effects INT/POL/25/4 Issue 2
CRI G-07	Steep Approach Landing Capability (SAL)

5. Equivalent Safety Findings:

CRI B-04	Stall Warning and Stall Warning Speeds and Maneuver Capability (JAR 25.103, 107, 119, 125, 143 and 207)
CRI C-04	Flutter, Deformation and Failsafe Criteria (JAR 25.629)
CRI D-10	Nose-Wheel Steering System Protection {JAR 25x745(d)}
CRI D-02	Hydraulic System Proof Testing {JAR 25.1435(b)(1)}
CRI G-04	Accelerate Stop Distance INT/POL/25/5 Issue 1 (JAR 25.109)

6. Environmental Standards: for details refer to CRI A-03

Environmental requirements for noise:

ICAO Annex 16 Volume 1 – Chapter 3
For specific noise levels refer to AFM – PSM 1-84-1A (Models 401 or 402)

Environmental requirements for fuel venting and emissions:

ICAO Annex 16, Second Edition, Volume II

III. Technical Characteristics and Operational Limitations

1. Type Design Definition: Current issue of AEROC 8.1.AC.1 - Definition of Certified

Airplanes

2. Description: Detail Specification No. DS8-400

3. Equipment: Equipment Register

4. Dimensions:

Span	28.4 m (93 ft 3 in)
Length	32.8 m (107 ft 9 in)
Height	8.3 m (25 ft 5 in)
Wing Area	63.1 m^2 (679 ft^2)

5. Engines: Two (2) Pratt and Whitney of Canada engines Model PW150A

Refer to TCCA Engine Type Certificate Data Sheet No. E- 29.

5.1 Engine Limits: for details refer to AFM – PSM 1-84-1A (Models 401 or 402)

6. Auxiliary Power Unit (APU): One Hamilton Sundstrand Power System APS 1000 T-62T-46C12
TSO authorization, dated 23 July 1999
Note: Options only.

6.1 APU Limits: for details refer to AFM – PSM 1-84-1A (Models 401 or 402)

7. Propellers: Two (2) Dowty Aerospace Propellers
Model R408/6-123-F/17

Refer to EASA Type Certificate Data Sheet P.002 (previously covered under UK-CAA Propeller Type Certificate Data Sheet No. 117)

7.1 Propeller Limits:

Blade diameter		4.11 m (13.5 ft)
Pitch settings at 0.70 radius:		
Feather		84.5°
Flight fine (Electronic)		16.5°
Flight fine (Hydraulic)		16.0°
Ground fine		-3.5°
Full reverse		-19.0°
Propeller (Np)	- Take off	1020 rpm
	- Max. continuous	1020 rpm

8. Fluids (Fuel/Oil/Additives): for details refer to AFM – PSM 1-84-1A (Models 401 or 402)

8.1 Eligible Fuels	Kerosene	JET A, A-1, JP-5, JP-8
	Wide Cut	JET B, JP-4

8.2 Eligible Oils Oils conforming to Specification MIL-L-23699

9. Fluid Capacities:

9.1 Fuel Capacity:

	Kg.	lbs.	Liters	Imp. Gals.
Usable	5318	11724	6526	1436
Unusable	73	160	89	20
Total	5391	11884	6615	1456

9.2 Oil Capacity per Engine:

	Liters	Imp. Gals.
Usable	5.6	1.23
Total	24.9	5.48

10. Air Speeds:

			Knots
IAS	V_{MO} (Maximum Operating)	0 to 8,000 ft	245
		10,000 ft	282
		18,000 ft	286
		20,000 ft	275
		25,000 ft	248
	V_{FE} (Flap extended)	Flap 5°	200
		Flap 10°	181
		Flap 15°	172
		Flap 35°	158
	V_A (Maneuvering)		204
	V_{LO} (Landing gear operation)		200
	V_{LE} (Landing gear extended)		215

For other airspeeds refer to AFM – PSM 1-84-1A (Models 401 or 402)

11. Maximum Operating Altitude: 7,620 m (25,000 ft) (Pressure Altitude)

12. All Weather Capability: Cat II

13. Maximum Weights:

DHC-8-401 & DHC-8-402

	Basic Gross Weight MS 4-201539	Intermediate Gross Weight MS 4-308807	High Gross Weight MS 4-308907	Enhanced High Gross Weight MS 4-309238
Taxi and ramp	28,077 kg (61,900 lb)	29,089 kg (64,130 lb)	29,347 kg (64,700 lb)	29,665 kg (65,400 lb)
Take-off	27,987 kg (61,700 lb)	28,998 kg (63,930 lb)	29,257 kg (64,500 lb)	29,574 kg (65,200 lb)
Landing	27,442 kg (60,500 lb)	28,009 kg (61,750 lb)	28,009 kg (61,750 lb)	28,123 kg (62,000 lb)
Zero fuel	25,174 kg (55,500 lb)	25,855 kg (57,000 lb)	25,855 kg (57,000 lb)	26,308 kg (58,000 lb)
Zero fuel – Supplement 87	26,308 kg (58,000 lb)	26,308 kg (58,000 lb)	26,308 kg (58,000 lb)	N/A

14. Center of Gravity Range: For details refer to AFM – PSM 1-84-1A (Models 401 or 402)

15. Datum: Plate located on centerline at "Station 428.0 in" (1087.1 cm) on underside of fuselage.

16. Mean Aerodynamic Cord (MAC): 94.512 in.

17. Leveling Means: Plumb bob and target in RH emergency exit opening.

18. Minimum Flight Crew: 2 (Pilot and Copilot)

19. Maximum Passenger Seating Capacity:

DHC-8-401 70 passengers
DHC-8-402 78 passengers
(refer to Note 1)

20. Exits:

No.	Type	Size
1	II / III*)	0.508 m x 1.42 m (20 in x 56 in)
1	I	0.762 m x 1.65 m (30 in x 65 in)
1	I	0.610 m x 1.37 m (24 in x 54 in)
1	I	0.610 m x 1.65 m (24 in x 65 in)

*) Type III exit for showing compliance with JAR 25.801 only

21. Baggage/Cargo Compartments:

	Class	Volume	Max. Allowable Load
Front	C	2.58 m^3 (91 ft^3)	413 kg (910 lb)
Aft	C	11.64 m^3 (411 ft^3)	1,669 kg (3,680 lb)

Refer to Weight & Balance Manual PSM 1-84-8 for individual airplane configurations.

22. Wheels and Tires: Tricycle landing gear, retractable, dual side by side wheel type.
Main wheels sized to accept 32 × 8.8−16 or 34 x 8.8-16 tubeless tires.
Nose gear sized to accept 22 × 6.5−10 tubeless tires.

IV. Operating and Service Instructions

1. Airplane Flight Manual	PSM 1-84-1A (Models 401 or 402)
2. Airplane Operating Manual	PSM 1-84-1
3. Weight and Balance Manual	PSM 1-84-8
4. Master Minimum Equipment List	PSM 1-84-16A
5. Minimum Equipment List Procedures Manual	PSM 1-84-16
6. Airplane Maintenance Manual	PSM 1-84-2
7. Maintenance Requirements Manual	PSM 1-84-7
Part 1: MRB Report	
Part 2: Airworthiness Limitation Items (ALIs)	
a) Certification Maintenance Requirements	
b) Structural Maintenance Program	
c) System Safe Life Components	
8. Service Letters and Service Bulletins	Refer to Publications Index
9. Structural Repair Manual	PSM 1-84-3
10. Cargo Loading Manual	PSM 1-84-8A
11. Illustrated Parts Manual	PSM 1-84-4
12. Task Cards Manual	PSM 1-84-7TC

V. Notes

1. Cabin Interior and Seating Configurations must be approved and are listed in AEROC 8.1.AC.1 Section 400 current issue.

Transport Canada Transports Canada

TP 7245E

No. CF-2001-14 1/1

Issue Date 21 March 2001

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF- 2001-14**

Subject: **Bombardier DHC-8-400 - Fuel Tank Lightning Protection**

Effective: 4 May 2001.

Applicability: Bombardier Inc. DHC-8 Series 400, serial numbers 4005, 4006, 4008 through 4010, 4012 through 4015, and 4018 through 4040.

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Compliance: When indicated, unless already accomplished.

Background: Two potential problems have been identified with the wing fuel tanks which, if not corrected, could compromise the lightning protection of the aircraft. The first issue is the possible lack of clearance between the fuel tank vent line and rib structures at 20 wing stations (10 in each wing). The second issue is a potential fouling condition between #1, #2 and #5 fuel probes and the wing tank structure. The potential fouling problem with the probes was identified during initial production. Reworked probes, designed to provide a temporary solution, were installed at that time.

Corrective Actions:

Part A - Fuel tank vent line clearance

For aircraft serial numbers 4005, 4006, 4008 through 4010, 4012 through 4015, and 4018 through 4040, within 120 days after the effective date of this directive, incorporate ModSum 4-113299. Approved instructions for incorporating ModSum 4-113299 are detailed in the Accomplishment Instructions of Bombardier Alert Service Bulletin A84-28-02 dated 7 February 2001 or later revisions approved by the Director, Aircraft Certification, Transport Canada.

Part B - Replacement of fuel probes #1, #2 and #5

For aircraft serial numbers 4006, 4008, 4012 through 4015, and 4018 through 4027, before accumulating 4,000 hours air time after the effective date of this directive, incorporate ModSum 4-113192. Approved instructions for incorporating ModSum 4-113192, are detailed in the Accomplishment Instructions of Bombardier Service Bulletin 84-28-01 dated 19 December 2000 or later revisions approved by the Director, Aircraft Certification, Transport Canada.

Authorization: For Minister of Transport

for B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Ian McLellan, Continuing Airworthiness, Ottawa, telephone (613) 952-4362, facsimile (613) 996-9178 or e-mail mclelli@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2001-16R1 1/2

Issue Date 3 June 2002

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2001-16R1**

Subject: **Bombardier DHC-8-400 - Main Landing Gear Procedure**

Effective: 11 July 2002

Revision: Supersedes Airworthiness Directive CF-2001-16 issued 11 April 2001.

Applicability: Bombardier Inc. DHC-8 aircraft, Models 400, 401 and 402, serial number 4001 to 4055.

Compliance: As indicated, unless already accomplished.

Background: Due to manufacturing process problems combined with higher than qualified acceleration levels experienced by the main landing gear downlock proximity sensors, these sensors may fail concurrently on the same gear in the NEAR position. This failure could potentially inhibit the affected gear from extending. The indication to the flight crew from these failures is misleading.

To rectify this misleading indication, the original issue of this directive mandated an additional in-flight procedure to the approved Aircraft Flight Manual (AFM).

With improved main landing gear downlock proximity sensors being available, this directive is revised to require replacement of the sensors as a terminating action. This revised directive also updates the applicable aircraft serial numbers to account for aircraft that were fitted with improved sensors during production via Modsum 4-113330.

Corrective Actions:

A. Prior to 31 December 2002, replace the L/H and R/H main landing gear downlock proximity sensors with improved version by incorporating retrofit ModSum 4-113331. Bombardier Service Bulletin 84-32-09 dated 18 May 2001, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada provides approved instructions for incorporating ModSum 4-113331.

B. With either production Modsum 4-113330 or retrofit Modsum 4-113331 incorporated, the procedures previously added by Airworthiness Directive CF-2001-16, to Section 4.21 of the Aircraft Flight Manual, PSM 1-84-1A (Models 400, 401, & 402), are no longer required and are to be removed.

C. Inform all flight crews of this change to the AFM.

D. Accomplishment of paragraphs A, B, and C is considered terminating action to this directive.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Continuing Airworthiness, Ottawa, telephone (613) 952-4379, facsimile (613) 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2001-23 1/1
Issue Date 7 June 2001

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2001-23**

Subject: **Bombardier DHC-8 Series 400 - Door Stops**

Effective: 20 July 2001.

Applicability: Bombardier Inc. DHC-8 aircraft, Models 400, 401 and 402, serial numbers 4002 and subsequent.

Compliance: Within 30 days after the effective date of this directive.

Background: During the DHC-8-400 type certification fatigue test, fatigue failures of the door stops were discovered on the fuselage side and the door side of the aft passenger entry door and on the door side of the aft baggage door. Failure of the door stops, which have been identified as principal structural elements, could result in structural failure and consequent rapid decompression of the airplane during flight. Revisions have been made to the DHC-8-Q400 Maintenance Requirements Manual, Airworthiness Limitation Items, to ensure that fatigue failure of the door stops is detected and corrected.

Corrective Actions: Revise the Transport Canada approved maintenance schedule by incorporating the structural tasks 521004F101, 523004F101 and 532061F101 respectively as specified in Revision 2 of the DHC-8-Q400 Maintenance Requirements Manual, PSM 1-84-7, Part 2, Airworthiness Limitation Items.

Authorization: For Minister of Transport

Bohdan Goyaniuk

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Transport Canada, Continuing Airworthiness, Ottawa, telephone (613) 952-4379, facsimile (613) 996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2001-44 1/2

Issue Date 3 December 2001

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2001-44**

Subject: **Bombardier DHC-8- 400 - Spoiler Lift Dump Valves**

Effective: 28 December 2001

Applicability: Bombardier Inc. DHC-8 Models 400, 401 and 402, serial numbers 4005, 4006, 4008 through 4015 and 4018 through 4052.

Compliance: As indicated below, unless already accomplished.

Background: The manufacturer of the spoiler lift dump valves has determined that a venting slot was omitted during the manufacture of a batch lot of solenoid armatures. Although the affected spoiler lift dump valves passed acceptance test procedures and no problems have been observed with in-service aircraft, this defect has the potential to prevent the ground spoilers from deploying.

Corrective Actions:

1. Within 45 days after the effective date of this directive:

   A. Determine through a visual inspection of the aircraft, the serial number of the four spoiler lift dump valves (Part Number 395800-1005) installed in each aircraft.

   B. If the serial number of any spoiler lift dump valve is in the range from 5164 through 5264 or from 5267 through 5279 (below referred to as the suspect range), comply with one of the following options before further flight:

      (i) Replace the suspect spoiler lift dump valve with a spoiler lift dump valve that has a serial number that is outside the suspect range; or,

      (ii) Replace the suspect spoiler lift dump valve with a spoiler lift dump valve that has had the manufacturing defect corrected in accordance with Bombardier Service Bulletin 84-27-12 dated 07 September 2001 or later revisions approved by the Director, Aircraft Certification, Transport Canada. Valves which have had the defect corrected are identified with a serial number that includes the suffix ‘A’ (e.g. S/N 5164A); or,

      (iii) Advise flight crew of **Accelerate-Stop** and **Landing Distance** performance penalty below and incorporate this performance change in the aircraft flight manual (AFM). Incorporation in the AFM may be accomplished by including a copy of this directive in the AFM.

Performance Penalty for Suspect Lift Dump Valves

Accelerate-stop distance

Flap 5°	increase 2%	(Figures 5-5-4 and 5-5-5)
Flap 10°	increase 2%	(Figures 5-5-9 and 5-5-10)
Flap 15°	increase 3%	(Figures 5-5-14 and 5-5-15)

Landing Distance

Flap 10°	increase 3%	(Figures 5-11-1 and 5-11-4)
Flap 15°	increase 5%	(Figures 5-11-2 and 5-11-4)
Flap 35°	increase 11%	(Figures 5-11-3 and 5-11-4)

2. Within 6 months after the effective date of this directive, replace all spoiler lift dump valves that have a serial number in the range from 5164 through 5264 or from 5267 through 5279 that have not yet been replaced in accordance with paragraphs 1.B (i) or (ii) above. Concurrently, remove the amendment to the AFM that was inserted in accordance with paragraph 1.B (iii) of this directive.

3. As of the effective date of this directive, do not install spoiler lift dump valves with a serial number that is in the suspect range any aircraft unless the manufacturing defect has been corrected. These corrected valves are identified with a serial number that includes the suffix 'A' (e.g. S/N 5164A).

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Ian McLellan, Continuing Airworthiness, Ottawa, telephone (613) 952-4362, facsimile (613) 996-9178 or e-mail mclelli@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2002-07 1/2

Issue Date 21 January 2002

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2002-07**

Subject: **Bombardier DHC-8 Series 400 - Forward Engine Mount Assembly**

Effective: 4 March 2002

Applicability: Bombardier Inc. DHC-8 Model 400, 401, 402, serial numbers 4005, 4006, 4008 to 4016, 4018 to 4051 and 4053

Compliance: When indicated, unless already accomplished.

Background: The manufacturer of the forward engine mount assembly has identified that pre-production engine mount assembly, part number, 96042-07, had been installed as a production engine mount assembly, part number, 96042-09. This pre-production engine mount has a reduced fatigue life when compared to the production engine mount assembly. Based on vendor input, it is also possible that -07 assemblies may be incorrectly marked as –09 assemblies. Installation of the pre-production engine mount assemblies may result in premature failure of the forward engine mount that would degrade the integrity of the engine/nacelle installation.

Corrective Actions:

1. Within 100 flight cycles after the effective date of this directive, perform a visual inspection to determine the part number and the configuration for the four (4) forward engine mount assemblies in accordance with Bombardier Alert Service Bulletin, A84-71-06, Revision A, dated 5 December 2001, or later revisions approved by the Chief, Continuing Airworthiness, Aircraft Certification, Transport Canada.

For any of the engine mount assemblies identified to be the pre-production configuration (P/N 96042-07), comply with one of the following options:

(a) If only one pre-production engine mount assembly (P/N 96042-07) has been identified in a nacelle, accomplish the following:

(i) Perform a detailed visual inspection on the pre-production engine mount for cracks in accordance with the above mentioned Alert Service Bulletin prior to further flight.

(ii) At intervals not to exceed 250 flight cycles, repeat the inspection detailed in paragraph (a)(i).

(iii) Replace the 96042-07 assembly with a 96042-09 assembly at or before 1,100 flight cycles from the effective date of this directive.

(b) If both forward engine mounts installed in a nacelle have been identified as pre-production engine mount assemblies (P/N 96042-07), accomplish the following:

(i) Perform the inspection detailed in paragraph (a)(i) above prior to further flight.

(ii) If no cracks found on both the pre-production engine mount assemblies, replace at least one with the production engine mount assembly (P/N 96042-09) prior to further flight.

(iii) Repeat the detailed visual inspection in accordance with paragraph (a)(ii) and replace the remaining 96042-07 assembly with a 96042-09 assembly in accordance with paragraph (a)(iii).

2. Any engine mount assemblies found cracked are to be replaced with the production engine mount assemblies (P/N 96042-09) prior to further flight.

3. Installation of all four forward engine mounts with the production engine mount assemblies (P/N 96042-09) terminates the repetitive inspection requirements of this directive.

4. As of the effective date of this directive, pre-production engine mount assembly (P/N 96042-07) shall not be installed on any aircraft as replacement. Replacement of pre-production engine mount assembly may be achieved either by direct replacement with the -09 configuration or by the rework of the -7 assembly in accordance with Part B of the Accomplishment Instructions of the above-mentioned Alert Service Bulletin.

Authorization: For Minister of Transport

for B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Transport Canada, Continuing Airworthiness, Ottawa, telephone (613) 952-4410, facsimile (613) 996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2002-13R2 1/3

Issue Date 19 May 2005

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation* (CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2002-13R2**

Subject: **Main Landing Gear Up-Lock Assembly**

Effective: 17 June 2005

Applicability: Bombardier Inc. DHC-8, Models 400, 401 and 402, Serial Numbers 4001 and 4003 through 4087, equipped with main landing gear up-lock assembly Part Number 46500-3 or 46500-5.

Revision: This revision supersedes Airworthiness Directive CF-2002-13R1 issued 20 November 2002.

Compliance: When indicated, unless already accomplished.

Background: A DHC-8 Series 400 aircraft experienced difficulties in extending the right main landing gear. The cause is attributed to failure of the gear up-lock unit to disengage. Investigation of the up-lock hook revealed a groove in the lower jaw due to premature wear. In addition, it was found that the low friction liner was omitted on a batch lot of up-lock rollers, including the incident aircraft. These factors may result in the inability to extend the main landing gear.

A modified up-lock assembly, P/N 46500-5, has been introduced as a substitute for P/N 46500-3 which is no longer in production. However, the design of the modified up-lock assembly is very similar to P/N 46500-3 and could be subjected to the same failure. Therefore, Revision 1 of this directive is issued to mandate the repetitive replacement of this modified up-lock assembly, and also to allow it as a substitute for P/N 46500-3. This revision also clarifies the compliance time for Part II. A.

Revision 2 of this directive provides alternate inspection requirements for P/N 46500-5 up-lock assembly, in place of the life limit imposed in Revision 1 of this directive. In addition, a modified up-lock assembly, P/N 46500-7, has been introduced as a substitute for P/N 46500-3 or 46500-5 and is terminating action to this directive. The applicability section of this directive is also revised to reflect production aircraft that have incorporated the terminating action.

Corrective Actions:

Part I. Air Operator Action.

A. Within three calendar days after 4 February 2002 (the effective date of the original issue of this directive), amend all copies of the Aircraft Flight Manual (AFM), PSM 1-84-1A (Models 400, 401, 402) by adding the following procedure opposite to page 4-21-1. Advise all flight crews of these changes.

Note: The amendment required may be accomplished by inserting a copy of this directive into the affected section of the Airplane Flight Manual.

If ONE main landing gear fails to extend after performing landing gear extension per normal procedures given in paragraph 4.3.7 and alternate extension procedures per paragraph 4.21.1 of the AFM:

1. **Visually confirm that the affected gear has not extended and that the associated doors have opened.**

2. **Ensure No. 2 hydraulic system pressure and quantity are normal and the following landing gear advisory lights are illuminated: selector lever amber, gear green locked down (nose and non-affected main gear), red gear unlocked (affected main gear) and all amber doors open.**

3. **NOSE L/G RELEASE handle – Return to the stowed position.**

4. **LANDING GEAR ALTERNATE EXTENSION door – Close fully.**

5. **MAIN L/G RELEASE handle – Return to the stowed position.**

6. **LANDING GEAR ALTERNATE RELEASE door – Close fully.**

7. **LANDING GEAR lever – DN.**

8. **L/G DOWN SELECT INHIBIT SW – Normal and guarded. Check amber doors open advisory lights out (nose and non-affected main gear) and LDG GEAR INOP caution light out.**

9. **LANDING GEAR lever – UP Check all gear, door and LANDING GEAR lever advisory lights out.**

10. **With minimum delay, LANDING GEAR lever – DN. Check 3 green gear locked down advisory lights illuminate, all amber doors open, red gear unlocked and selector lever amber advisory lights out.**

11. **Items 9 and 10 may be repeated in an effort to achieve 3 gear down and locked.**

CAUTION

Should the LDG GEAR INOP caution light illuminate, or loss of no. 2 hydraulic system pressure or quantity, or any abnormality in landing gear system indication other than those associated with the affected main landing gear be experienced, see paragraph 4.21.1 ALTERNATE LANDING GEAR EXTENSION.

B. Upon replacing both left and right main landing gear up-lock assemblies with P/N 46500-7 up-lock assemblies, remove the procedures mandated in Part I, paragraph A above from the AFM. Advise all flight crews of this change.

Part II. Maintenance Action.

A. Replacement of P/N 46500-3 Up-lock Assemblies

1. Initially, by the later of either (a) or (b) below:

(a) Within 14 calendar days after 4 February 2002 (the effective date of the original issue of this directive),

(b) Before the up-lock assembly accumulating 2500 hours air time or 3000 flight cycles, whichever occurs first.

2. Thereafter at intervals not exceeding 2500 hours air time or 3000 flight cycles, whichever occurs first.

Replace main landing gear up-lock assemblies, P/N 46500-3, with new or overhauled P/N 46500-3, P/N 46500-5 or P/N 46500-7 up-lock assemblies, as per instructions given in Chapter 32-31-21 of the DHC-8 Series 400 Aircraft Maintenance Manual, PSM 1-84-2.

B. Inspection/Replacement of the Up-lock Roller

Within 30 calendar days from 4 February 2002 (the effective date of the original date of this directive:

1. Inspect the up-lock roller of the left and right main landing gear for the presence of an inner low friction liner, in accordance with the Accomplishment Instructions of Bombardier Alert Service Bulletin (ASB) A84-32-15, dated 04 February 2002, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

2. Replace up-lock rollers that do not have an inner low friction liner with new rollers, P/N 46575-1.

C. Inspection of P/N 46500-5 Up-lock Assemblies:

Prior to the up-lock assembly accumulating 2500 hours air time or 3000 flight cycles, whichever occurs first; and thereafter, at intervals not exceeding 400 hours air time or 480 flight cycles, whichever occurs first.

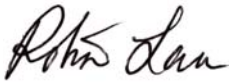
1. Inspect the surface of the up-lock latch lower jaw for the presence of a wear groove and measure the wear groove depth to a 0.001 inch accuracy in accordance with DHC-8 Series 400 Aircraft Maintenance Manual, PSM 1-84-2, Task 32-31-21-220-801. If the groove depth exceeds 0.007 inches, replace the up-lock assembly with a new or overhauled P/N 46500-7 up-lock assembly as per instructions given in Chapter 32-31-21 of the DHC-8 Series 400 Aircraft Maintenance Manual, PSM 1-84-2.

2. Inspect the up-lock roller, P/N 46575-1, to ensure that it rotates freely. If the up-lock roller does not rotate freely, replace the up-lock roller with a roller of the same part number, as per instructions given in Chapter 32-31-21 of the DHC-8 Series 400 Aircraft Maintenance Manual, PSM 1-84-2.

Part III. Terminating Action.

Replacement of both left and right up-lock assemblies with P/N 46500-7 up-lock assemblies terminates the Part I Air Operator Action and Part II Maintenance Action of this directive.

Authorization: For Minister of Transport



Robin Lau
Acting Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Continuing Airworthiness, Ottawa, telephone 613 952-4379, facsimile 613 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2002-15 1/1

Issue Date 20 February 2002

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2002-15**

Subject: **Bombardier DHC-8-400 – Rudder Trim Switch Wiring**

Effective: 15 March 2002

Applicability: Bombardier Inc. DHC-8 Models 401 and 402, serial numbers 4005, 4006, 4008 through 4016, 4018 through 4058.

Compliance: Within 90 days of the effective date of this directive.

Background: An investigation of an incident involving rudder trim runaway has revealed a discrepancy in the wiring of the rudder trim control switch on the aileron/rudder trim control panel. The wiring discrepancy in the rudder trim switch could potentially enable a single short circuit on the aileron/rudder trim control panel to cause a runaway condition of the rudder trim actuator.

Corrective Actions: In accordance with Accomplishment Instructions of Bombardier Alert Service Bulletin (ASB) A84-27-13 Revision B, dated 12 January 2002, or later revisions, approved by the Chief, Continuing Airworthiness, Transport Canada, accomplish the following:

A. Modify the wiring for the rudder trim switch (2722-S2) by incorporating Modsum 4-126256; and,

B. Visually inspect all wiring on the back of the aileron/rudder trim control panel (P/N 82410608-001, -003 or -005) for chafing. Replace any chafed wires before further flight.

Aircraft modified and inspected in accordance with the Accomplishment Instructions of ASB A84-27-13 Revision A, dated 9 January 2002, also satisfy the requirements of this directive.

Authorization: For Minister of Transport

for B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Ian McLellan, Continuing Airworthiness, Ottawa, telephone (613) 952-4362, facsimile (613) 996-9178 or e-mail mclelli@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2002-25 1/2

Issue Date 25 April 2002

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2002-25**

Subject: **Bombardier DHC-8 Series 400 – Pitch Trim Control**

Effective: 31 May 2002

Applicability: Bombardier Inc. DHC-8 Models 400, 401 and 402, serial numbers 4001 through 4065.

Compliance: As indicated below unless already accomplished.

Background: Two unrelated but recurring malfunctions have been identified with the pitch trim system. The first malfunction involves loss of the autopilot pitch trim, which then requires that the autopilot be disengaged and the aircraft flown manually. With the second malfunction, loss of manual pitch trim can occur due to the pitch trim system being disabled by the monitoring/modeling circuitry in the Flight Control Electronic Control Unit (FCECU). These pitch trim system malfunctions can, under adverse conditions, significantly increase flight crew workload.

Corrective Actions:

Part A – Auto Pilot Pitch Trim - Applicable to serial numbers 4001 through 4058

1. Prior to 31 July 2002, incorporate Modsum 4-113405 by replacing/reworking FGM1 and FGM 2 P/N C12429AA06 with/to FGM P/N C12429AA07 and perform a Return to Service Procedure. Bombardier Service Bulletin 84-22-04 Auto Pilot - Flight Guidance Module (FGM) – Introduction of Software V666 – Modsum 4-113405 dated 29 November 2001, or later revisions, approved by the Chief, Continuing Airworthiness, Transport Canada provides approved instructions for incorporating Modsum 4-113405.

2. As an interim procedure, until such time as Modsum 4-113405 is implemented, the procedure detailed in Bombardier Service Letter DH8-400-SL-22-001D dated 08 November 2001 can be used as an approved maintenance procedure to confirm that the AP pitch trim function is serviceable and to restore use of the auto pilot following an autopilot pitch trim failure. This autopilot pitch trim failure is characterized by an "AP PITCH TRIM FAIL" message on the PFD, followed by an "AUTO TRIM FAIL" message after the AP has been manually disengaged.

Part B – Manual Pitch Trim - Applicable to serial numbers 4001 through 4065

3. Prior to 31 January 2003, incorporate Modsum 4-113392 by removing Flight Control Electronic Control Units (FCECU) that have either Part Number (P/N) 398500-1001 or P/N 398500-1003 and replacing with FCECU P/N 398500-1005. Bombardier Service Bulletin 84-27-14 Flight Controls – Flight Control Electronic Control Unit Upgrade – Modsum 4-113392 dated 16 January 2002, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provides approved instructions for replacing the affected FCECUs.

4. As an interim procedure, until such time as Modsum 4-113392 is incorporated, the procedure detailed in Bombardier Service Letter DH8-400-SL-27-003 dated 22 May 2001 can be used as an approved maintenance procedure to confirm that the pitch trim system is serviceable following loss of manual pitch trim. This pitch trim failure is characterized by illumination of the “PITCH TRIM” Caution Light and concurrent loss of pitch trim function, during a manual pitch trim input by the flight crew.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Ian McLellan, Continuing Airworthiness, Ottawa, telephone (613) 952-4362, facsimile (613) 996-9178 or e-mail mclelli@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2003-28 1/3

Issue Date 28 November 2003

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2003-28**

Subject: **Bombardier DHC-8-400 Series – Fuselage Bottom Skin and Number 2 VHF Antenna Support Structure Inspection and Rework**

Effective: 9 January 2004

Applicability: Bombardier Inc. DHC-8 aircraft, Models 401 and 402, Serial Numbers 4003 through 4076 and 4078 through 4081.

Compliance: Compliance is required as indicated below, unless already accomplished.

Background: During an 'A' check, an aircraft was found to have an 8-inch crack on the fuselage skin in the vicinity of the forward Number 2 VHF antenna. Upon further investigation, it was found that four of eight cleats, P/N 85307891, attaching the internal antenna support plate had cracked as well. Since the original report, other aircraft were found to have cracked cleats. If undetected, cracking of the fuselage skin could result in rapid decompression of the aircraft.

Corrective Action:

1. Initially, in accordance with the following schedule:

Accumulated Air Time (Hours)	Initial Compliance Time
1,450 or less	Prior to exceeding 1,900 hours air time
Greater than 1,450 but less than or equal to 2,200	Within 300 hours air time after the effective date of this directive
Greater than 2,200 but less than or equal to 3,000	Within 150 hours air time after the effective date of this directive
Greater than 3,000	Within 50 hours air time after the effective date of this directive

Inspect the aircraft records to determine if any of the following has been incorporated:

(a) Bombardier Aerospace Repair Drawing RD8/4-53-317

(b) Bombardier Aerospace ModSum IS4Q5300001

2. If Bombardier Aerospace Repair Drawing RD8/4-53-317 or Bombardier Aerospace ModSum IS4Q5300001 has been incorporated, carry out terminating action in accordance with paragraph 4. of this directive at the times specified in that paragraph.

3. If neither Bombardier Aerospace Repair Drawing RD8/4-53-317 nor Bombardier Aerospace ModSum IS4Q5300001 has been incorporated, prior to further flight, accomplish the following:

(a) Carry out a detailed visual inspection of the external surface of the fuselage skin for cracking in the area around the Number 2 VHF antenna. The inspection is to be done using a 10X magnifying glass and appropriate lighting.

(i) If the fuselage skin is cracked, prior to further flight, incorporate repair in accordance with Bombardier Aerospace Repair Drawing RD8/4-53-317, Issue 2, or later approved revisions. Replace all eight support cleats, P/N 85307891, at stringer 32S and 33, between stations X71.8 and X94.8, in accordance with Bombardier Aerospace Repair Drawing RD8/4-53-328, Issue 1, or later approved revisions. Carry out terminating action in accordance with paragraph 4. of this directive at the times specified in that paragraph.

(ii) If the fuselage skin is not cracked, prior to further flight, inspect the Number 2 VHF antenna internal support structure in accordance with paragraph 3.(b) of this directive.

(b) Carry out a detailed visual inspection of the support cleats, P/N 85307891, at stringer 32S and 33, between stations X71.8 and X94.8, for cracking and deformation in the area of the bend radius and for broken rivets.

(i) If there is cracking or deformation of the cleats or broken rivet, remove the antenna and carry out a detailed visual inspection of the external surface of the fuselage skin underneath the antenna. The inspection is to be done using a 10X magnifying glass and appropriate lighting.

- If the fuselage skin is not cracked, prior to further flight, reinforce the fuselage skin around the Number 2 VHF antenna and replace all eight support cleats, P/N 85307891, at stringer 32S and 33, between stations X71.8 and X94.8, in accordance with Bombardier Aerospace ModSum IS4Q5300001, Revision A, or later approved revisions. Carry out terminating action in accordance with paragraph 4. of this directive at the times specified in that paragraph.

- If the fuselage skin is cracked, prior to further flight, incorporate repair in accordance with Bombardier Aerospace Repair Drawing RD8/4-53-317, issue 2, or later approved revisions, and replace all eight support cleats, P/N 85307891, at stringer 32S and 33, between stations X71.8 and X94.8 in accordance with Bombardier Aerospace Repair Drawing RD8/4-53-328, Issue 1, or later approved revisions. Carry out terminating action in accordance with paragraph 4. of this directive at the times specified in that paragraph.

(ii) If there is no cracking or deformation of the cleats and there is no broken rivet, repeat the inspections identified in paragraph 3.(a) through 3.(b) above at intervals specified in the table below, and carry out terminating action in accordance with paragraph 4. of this directive at the times specified in that paragraph.

Repeat Inspection Interval (Hours Air Time)	
Cleats not replaced per RD8/4-53-328	**Cleats Replaced per RD8/4-53-328**
200 (See note)	500

NOTE: If the inspection of the cleats reveals they are neither cracked nor deformed and there is no broken rivet , the option exists to replace all eight (8) cleats, P/N 85307891, in accordance with RD8/4-53-328 Issue 1, or later approved revisions, to increase the repeat inspection interval from 200 hours air time to 500 hours air time.

4. Within 4,000 hours air time after the effective date of this directive, accomplish the following:

   (a) Incorporate Bombardier Aerospace ModSum 4-113458 to reinforce the Number 2 VHF antenna support structure. Bombardier Aerospace Service Bulletin 84-53-32, Revision A, dated 7 July 2003, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provides approved instructions for incorporating Modsum 4-113458; and

   (b) If neither Bombardier Aerospace ModSum IS4Q5300001 nor Repair Drawing RD8/4-53-317 has been previously incorporated, reinforce the fuselage skin around the Number 2 VHF antenna by incorporating Bombardier Aerospace ModSum IS4Q5300001, Revision A, or later approved revisions.

   Accomplishment of paragraph 4.(a) and 4.(b) above provides terminating action to the inspection requirements of paragraph 3. of this directive.

Authorization: For Minister of Transport

Bohdan Goyaniuk

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Transport Canada, Continuing Airworthiness, Ottawa, telephone (613) 952-4379, facsimile (613) 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2004-07 1/2

Issue Date 14 April 2004

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2004-07**

Subject: **Bombardier DHC-8 Series 400 - Fuel and Hydraulic Tubes Chafing**

Effective: 28 May 2004

Applicability: Bombardier Inc. DHC-8 Series 400 aircraft serial numbers 4003 through 4089.

Compliance: Compliance is required as indicated, unless already accomplished.

Background: Service difficulty reports indicate there is a potential for chafing of fuel and hydraulic tubes with the fairlead plate where the tubes pass through the firewall. Titanium plates attached to the fairleads have close tolerance holes to provide isolation between fire zones. If the tubes are not centered in the fairlead plate, nacelle flexing can cause a fouling condition, which may cause chafing of the tubes.

Bombardier Inc. has issued System Drawings SYD 84-28-002 (for the fuel tubes), and SYD-84-29-006 (for the hydraulic tubes), to provide temporary rework instructions (to enlarge the tolerance holes) for the fairlead plates, in order to avoid chafing with the tubes which pass through the fairlead plates. Production rework Modsum 4-184079 (for the hydraulic tubes) and Modsum 4-184081 (for the fuel tubes) were issued to introduce the intent of SYDs 84-28-002 and 84-29-006 for production aircraft. In addition, Bombardier Inc. Service Bulletin (SB) 84-54-09 was issued to introduce modified fairlead plate assemblies to rectify the fuel and hydraulic tubes chafing problem.

Corrective Actions:

1. Within 500 hours air-time after the effective date of this directive:

   (a) For aircraft without Bombardier Systems Drawings SYD 84-28-002, Issue 1, or later approved revisions, and SYD 84-29-006, Issue 1, or later approved revisions incorporated; or

   (b) For aircraft without Modsum 4-184079 and Modsum 4-184081 incorporated:

   Install Bombardier Modsum 4-113438 (modified fairlead plate assemblies). Bombardier Service Bulletin (SB) 84-54-09, dated 23 January 2004, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provides approved instructions for incorporating Modsum 4-113438.

2. Within 4,000 hours air-time after the effective date of this directive:

   (a) For aircraft with Bombardier Systems Drawings SYD 84-28-002, Issue 1, or later approved revisions, and SYD 84-29-006, Issue 1, or later approved revisions incorporated; or

(b) For aircraft with Modsum 4-184079 and Modsum 4-184081 incorporated;

Install Bombardier Modsum 4-113438 (modified fairlead plate assemblies). Bombardier Service Bulletin (SB) 84-54-09, dated 23 January 2004, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provides approved instructions for incorporating Modsum 4-113438.

Authorization: For Minister of Transport Canada

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Robin Lau, Transport Canada, Continuing Airworthiness, Ottawa, telephone (613) 952-4461, facsimile (613) 996-9178 or e-mail laur@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2004-11 1/2

Issue Date 28 June 2004

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2004-11**

Subject: **Bombardier DHC-8-400 Series - Outboard Flap Front Spar, Track Number 4 and Number 5 Fittings - Inspection and Modification**

Effective: 13 August 2004

Applicability: Bombardier Inc. DHC-8, Models 400, 401 and 402, Serial Numbers 4001, and 4003 through 4093.

Compliance: Compliance is required as indicated unless already accomplished.

Background: During inspections and flap modifications, several aircraft have been discovered with loose flap front spar attachment fittings at the Number 4 and Number 5 flap track locations. Upon removal of the fittings, it was discovered that the fittings, and the flap front spar web to which they were mounted, had elongated attachment holes. In addition, the lugs of certain attachment fittings were found to be chafing with flap track Number 4. Looseness of the fittings may damage the flap front spar web and may result in the fitting becoming detached, thus affecting the controllability of the aircraft.

Corrective Action:

A. Initial Inspection of Flap Track Number 4 Attachment Fittings

1. Within 400 hours air time after the effective date of this directive, carry out an inspection of the flap track Number 4 front fittings on both the left and right outboard flap assemblies, in accordance with Part I of the Accomplishment Instructions of Bombardier Alert Service Bulletin (ASB) A84-57-06, Revision B, dated 9 March 2004, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Note: 1. At any flap track Number 4 front fitting location, prior incorporation of Bombardier Repair Drawing RD 8/4-57-228 in combination with either Repair Drawing RD 8/4-57-173 or RD 8/4-57-180 or RD 8/4-57-226 satisfies the requirements of paragraph A.1 of this directive for that fitting location.

Note: 2. Inspections performed in accordance with previous issues of ASB A84-57-06 satisfy the requirements of paragraph A.1 of this directive.

2. If any fitting lug is found to be damaged due to fouling with a flap track, prior to further flight, carry out repair in accordance with paragraph (2), Part I of the Accomplishment Instructions of the above-noted Bombardier ASB.

3. If any fitting is found to be loose or any blind fastener is found to be non-conforming in accordance with paragraph (4), Part I of the Accomplishment Instructions of the above-noted Bombardier ASB, prior to further flight, carry out repair of the discrepant fitting in accordance with the applicable paragraph (3) or (5), Part I of the Accomplishment Instructions of the above-noted Bombardier ASB.

B. Repeat Inspection of Flap Track Number 4 Attachment Fittings

1. At any flap track Number 4 front fitting location where Bombardier Repair Drawing RD 8/4-57-173, RD 8/4-57-180 or RD 8/4-57-226 has not been incorporated, repeat the inspection of Paragraphs A.1 to A.3 above, at intervals not to exceed 800 hours air time.

C. Initial Inspection of Flap Track Number 5 Attachment Fittings

1. Within 400 hours air time after the effective date of this directive, carry out an inspection of the flap track Number 5 front fittings on both the left and right outboard flap assemblies, in accordance with Part II of the Accomplishment Instructions of Bombardier ASB A84-57-06, Revision B, dated 9 March 2004, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Note: 1. At any flap track Number 5 front fitting location, prior incorporation of Bombardier ModSum IS4Q5750002 satisfies the requirements of paragraph C.1 of this directive for that fitting location.

Note: 2. Inspections performed in accordance with previous issues of ASB A84-57-06 satisfy the requirements of paragraph C.1 of this directive.

2. If any fitting is found to be loose or if the gap between any fitting and the front spar web exceeds 0.002 inches or any blind fastener is found to be non-conforming in accordance with paragraph (4), Part II of the Accomplishment Instructions of the above-noted ASB, prior to further flight, carry out repair in accordance with the applicable paragraph (2), (3) or (5), Part II of the Accomplishment Instructions of the above-noted ASB.

D. Repeat Inspection of Flap Track Number 5 Attachment Fittings

1. At any flap track Number 5 front fitting location where Bombardier ModSum IS4Q5750002 has not been incorporated, repeat the inspection of Paragraphs C.1 and C.2 above, at intervals not to exceed 800 hours air time.

E. Modification of Flap Track Number 4 and 5 Attachment Fittings

Within 4,000 hours air time after the effective date of this directive, carry out the following:

1. Modify the attachment of the flap track Number 4 front fittings on both the left and right hand outboard flap assemblies, in accordance with Bombardier Repair Drawing, RD 8/4-57-226, Issue 1, or later approved issues. Aircraft that have already incorporated RD 8/4-57-173 or RD 8/4-57-180 at flap track Number 4 fitting location, do not require the incorporation of RD 8/4-57-226 at those fitting locations.

2. Incorporate Bombardier ModSum IS4Q5750002 to modify the attachment of the flap track Number 5 front fittings on both the left and right outboard flap assemblies. Bombardier ModSum No. IS4Q5750002 provides approved instructions for incorporating the modification.

3. Accomplishment of paragraphs E.1 and E.2 above provide terminating action to the repeat inspections of paragraphs B.1 and D.1 of this directive respectively.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr.Philip Tang, Continuing Airworthiness, Ottawa, telephone (613) 952-4379, facsimile (613) 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2004-19 1/1

Issue Date 21 September 2004

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone (613) 952-4357.

Number: **CF-2004-19**

Subject: **Bombardier DHC-8-400 – Airworthiness Limitation Items**

Effective: 20 October 2004

Applicability: Bombardier Inc. DHC-8 Aircraft, Models 400, 401 and 402, serial numbers 4001, and 4003 through 4094

Compliance: When indicated, unless already accomplished.

Background: During DHC-8-400 type certification fatigue testing, fatigue failures were discovered at the engine isolator bracket and at the orifice support tube, upper bearing and piston plug in the main landing gear shock strut assembly. Failure of these components, which have been identified as principal structural elements, could adversely affect the structural integrity of the engine installation and of the main landing gear. Revisions have been made to the DHC-8-400 Maintenance Requirements Manual, Airworthiness Limitation Items, to ensure that fatigue failure of these components is detected and corrected.

Corrective Action: **Limitations Change**

Within 30 days after the effective date of this directive, amend the Transport Canada approved maintenance schedule by:

1. Incorporating the revised structural inspection tasks, 712001F102 and 712003F102 respectively as introduced by Temporary Revision, ALI-37 of Airworthiness Limitations Items (ALI) of the DHC-8-400 Maintenance Requirements Manual, PSM 1-84-7; and

2. Incorporating the revised safe life limits for the Orifice Support Tube, P/N 46117-1, Upper Bearing, P/N 46114-1, and Piston Plug, P/N 46137-1, as introduced by Temporary Revision, ALI -28 of Airworthiness Limitations Items (ALI) of the DHC-8-400 Maintenance Requirements Manual, PSM 1-84-7.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Transport Canada, Continuing Airworthiness, Ottawa, telephone (613) 952-4410, facsimile (613) 996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2005-07 1/2

Issue Date 21 March 2005

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2005-07**

Subject: **Horizontal Stabilizer Attachment Fittings Bolt Torque Check, Shim Inspection and Modification**

Effective: 8 April 2005

Applicability: Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001, and 4003 through 4081.

Compliance: Compliance is required as indicated unless already accomplished.

Background: On several aircraft it was discovered that laminated shims were delaminated and extruded from the interface of the horizontal stabilizer to vertical stabilizer forward attachment fittings. In addition, during removal of the horizontal stabilizer for replacing the laminated shims with solid shims, it was discovered that the torque values of some bolts at the six attachment locations (two each at the front spar, mid-spar and rear spar) on some aircraft were inconsistent with the aircraft maintenance manual requirements. If left uncorrected, shim extrusion and discrepancy in the bolt torque values could lead to a reduction in the fatigue life of the bolts, thus affecting the structural integrity of the horizontal stabilizer attachment.

Corrective Action:

A. Inspection of Laminated Shim and Breakaway Torque Check of Horizontal Stabilizer to Vertical Stabilizer Fitting Bolts

1. Within 4000 hours air time after the effective date of this directive, carry out an inspection of the laminated shims at the horizontal stabilizer to vertical stabilizer forward attachment fittings and perform a breakaway torque check of the six attachment bolts at the front spar, mid-spar and rear spar attachment fittings, in accordance with Part A of the Accomplishment Instructions of Bombardier Service Bulletin (SB) 84-55-02, Revision A, dated 12 January 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

2. If any laminated shim is cracked, damaged or extruded from the horizontal stabilizer to the vertical stabilizer forward attachment fitting interface, prior to further flight, replace the discrepant laminated shim with a solid shim, and replace both front spar attachment bolts, barrel nuts and retainers in accordance with Parts A and B of the Accomplishment Instructions of the above-mentioned Bombardier SB.

3. If any of the six attachment bolt breakaway torque value is outside the range specified in the above-mentioned Bombardier SB, prior to further flight, replace the attachment bolt and its corresponding barrel nut and retainer in accordance with Part A of the Accomplishment Instructions of the above-mentioned Bombardier SB.

Note 1
Prior accomplishment of the actions required by paragraphs A.1 to A.3 of this directive in accordance with the original issue of Bombardier SB 84-55-02 satisfy the requirements of those paragraphs.

Note 2
Prior incorporation of Bombardier Repair Drawings RD8/4-55-083, RD8/4-55-084, RD8/4-55-089, RD8/4-55-090, RD8/4-55-093, RD8/4-55-094, RD8/4-55-106, RD8/4-55-110 or RD8/4-55-138 satisfy the requirements of paragraph A.1o A.3 of this directive.

B. Replacement of Laminated Shim at the Horizontal Stabilizer to Vertical Stabilizer Forward Attachment Fittings

1. If not already accomplished as required in paragraph A.2 of this directive, within 8000 hours air time after the effective date of this directive, replace the laminated shims at both left and right of the horizontal stabilizer to vertical stabilizer forward attachment fittings with solid shims. Part B of the Accomplishment Instructions of Bombardier SB 84-55-02, Revision A, dated 12 January 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada provides approved instructions for replacing the shims.

   Note1
   Prior replacement of laminated shims in accordance with the original issue of Bombardier SB 84-55-02 satisfy the requirements of paragraph B.1 of this directive.

   Note 2
   Prior incorporation of Bombardier Repair Drawings RD 8/4-55-083, RD 8/4-55-084, RD 8/4-55-089, RD 8/4-55-090, RD 8/4-55-093, RD 8/4-55-094, RD 8/4-55-106, RD 8/4-55-110 or RD 8/4-55-138 satisfy the requirements of paragraph B.1 of this directive.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr.Philip Tang, Continuing Airworthiness, Ottawa, telephone 613 952-4379, facsimile 613 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2005-08R1 1/2

Issue Date 10 August 2005

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2005-08R1**

Subject: **Corrosion of Fuel Access Panel Attachment Anchor Nut**

Effective: 27 April 2005 (the effective date of the original issue of this directive)

Revision: This revision supersedes Airworthiness Directive CF-2005-08, issued 13 April 2005.

Applicability: Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001, 4003 through 4115.

Compliance: Compliance is required as indicated unless already accomplished.

Background: There have been a number of reported cases of corrosion of dome anchor nuts at the centre wing upper surface fuel access panel attachment locations during “2C” checks. In some cases, anchor nut domes were severely corroded and perforated. This condition, if not corrected, could result in arcing and ignition of fuel vapour in the centre wing fuel tank during a lightning strike and consequent fuel tank explosion.

Revision 1 of this directive is issued to revise the aircraft serial number applicability and to correct the Modsum number for installation of pre-cured sealant caps. This revision does not introduce additional mandatory action.

Corrective Action:

1. For aircraft that have incorporated Bombardier Modsum 4-113504 or 4-113509 during manufacture, replace all domed anchor nuts at all centre wing upper fuel access panel attachment locations in the wet bay area with corrosion resistant steel anchor nuts in accordance with Part C of this directive, prior to the aircraft reaching 48 months since new.

   Note: Modsum 4-113504 and 4-113509 consists of installation of pre-cured sealant domes.

2. For aircraft that have not incorporated Bombardier Modsum 4-113504 or 4-113509 during manufacture, perform Part A or Part B or Part C below, in accordance with the following schedule:

Aircraft time since new on the effective date of this directive	Corrective Action Selected	Compliance Time
Less than 15 months	Part A not allowed	Not applicable
	Part B	Within six (6) months after the effective date of this directive
	Part C	Prior to the aircraft reaching 24 months since new
15 months or more but less than 24 months	Part A	Within six (6) months after the effective date of this directive
	Part B	Within six (6) months after the effective date of this directive

	Part C	Within nine (9) months after the effective date of this directive or prior to the aircraft reaching 24 months since new, whichever is later
24 months or more	Part A	Within six (6) months after the effective date of this directive
	Part B	Within six (6) months after the effective date of this directive
	Part C	Within nine (9) months after the effective date of this directive

Part A – Inspection of Domed Anchor Nuts

a. Inspect all domed anchor nuts at all centre wing upper fuel access panel attachment locations in the wet bay area for signs of corrosion or perforation and replace all perforated or corroded anchor nuts with new anchor nuts of the same part number prior to further flight. Bombardier Service Bulletin (SB) 84-57-11, dated 25 February 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provides approved instructions for accomplishing the inspection and replacement of domed anchor nuts.

b. Within 24 months after accomplishing the requirements of Part A, paragraph a, replace all domed anchor nuts at all centre wing upper fuel access panel attachment locations in the wet bay area with corrosion resistant steel anchor nuts in accordance with Part C of this directive.

Part B – Installation of Pre-Cured Sealant Domes

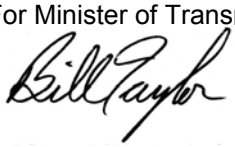
a. Inspect all domed anchor nuts at all centre wing upper fuel access panel attachment locations in the wet bay area for perforation. Replace all perforated anchor nuts with new anchor nuts of the same part number and install pre-cured sealant domes over all anchor nut domes. Bombardier SB 84-57-12, dated 11 March 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada provides approved instructions for accomplishing the inspection and replacement of domed anchor nuts and installation of sealant domes.

b. Within 48 months after accomplishing the requirements of Part B, paragraph a, replace all domed anchor nuts at all centre wing upper fuel access panel attachment locations in the wet bay area with corrosion resistant steel anchor nuts in accordance with Part C of this directive.

Part C – Replacement with Corrosion Resistant Steel Anchor Nuts

a. Replace all domed anchor nuts at all centre wing upper fuel access panel attachment locations in the wet bay area with corrosion resistant steel anchor nuts in accordance with Bombardier SB 84-57-10 Revision A, dated 14 March 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Authorization: For Minister of Transport



R. William Taylor
Acting Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Continuing Airworthiness, Ottawa, telephone 613 952-4379, facsimile 613 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2005-14R1 1/2

Issue Date 8 May 2006

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2005-14R1**

Subject: **Inspection of Fire Bottle Connectors**

Effective: 5 June 2006

Revision: Supersedes Airworthiness Directive CF-2005-14, issued 16 May 2005.

Applicability: Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001 through 4107.

Compliance: Compliance is required as indicated, unless already accomplished.

Background: Three reports have been received of crossed connection of the electrical connectors on the forward and aft baggage compartment fire bottles. An investigation has revealed that a similar unsafe condition could also potentially exist for the auxiliary power unit (APU) and engine nacelle fire bottles. Cross-connection of the fire bottle connectors could result in the inability to control a fire in the affected area.

Revision 1 of this directive is issued to add Part B to prevent the cross-connection of connectors for forward and aft baggage compartment, APU, and engine nacelle fire bottles. Part B mandates installation and modification of lanyards, mounts and clamps to restrict movement of fire bottle connectors when disconnected.

Note: The corrective action in the original issue of this directive becomes Part A. in this revision.

Corrective Actions:

Part A. Applicable to Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001 through 4105.

1. Within 14 days after 19 May 2005 (the effective date of the original issue of this directive), carry out an inspection of the electrical connectors on the forward and aft baggage compartment, APU and engine nacelle fire bottles, in accordance with the Accomplishment Instructions of Bombardier Service Bulletin (SB) A84-26-06, dated 12 May 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

2. Correct any deficiencies before the next flight.

Note: The Bombardier Aircraft Maintenance Manual PSM 1-84-2 has been amended to clarify the instructions for connection of fire bottle electrical connectors. Temporary Revisions (TR) 26-017 through 26-027 were issued accordingly.

Part B. Applicable to Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001 through 4107.

Within 5000 hours air time after the effective date of this revision, install/modify lanyards, mounts and clamps to the forward and aft baggage compartment, APU and engine nacelle fire extinguishing systems by incorporating Modsum 4-109941. Bombardier Service Bulletin 84-26-07, Revision A, dated 21 February 2006, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provides approved instructions for incorporating Modsum 4-109941.

Previous incorporation of Modsum 4-109941, in accordance with the Accomplishment Instructions in the original issue of Bombardier Service Bulletin 84-26-07, dated 15 June 2005, meets the requirements of this part (Part B of this directive).

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Richard Topham, Continuing Airworthiness, Ottawa, telephone 613 952-4428, facsimile 613 996-9178 or e-mail tophamr@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2005-15 1/2

Issue Date 18 May 2005

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2005-15**

Subject: **Pitot Static System Contamination**

Effective: 17 June 2005

Applicability: Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001, 4003 and subsequent.

Compliance: Compliance is required as indicated unless already accomplished.

Background: Incidents of airspeed mismatch between the pilot, co-pilot and standby airspeed indication have been reported. These events are believed to be caused by contamination within the pitot lines and/or blockage within the pitot static probes. Blockage of a probe's pitot drain may allow sufficient moisture to enter the probe's internal pitot line such that freezing may occur under certain conditions, causing a blockage to the pitot line. As an interim action, to avoid the potential for erroneous airspeed information, this directive mandates the periodic cleaning of the pitot static probe drain hole and the pitot lines.

Corrective Action:

A. Cleaning of Pitot Static Probe Drain Hole

1. Initially, within 30 days after the effective date of this directive and thereafter at intervals not to exceed 70 hours air time, clean the drain hole of all the pitot static probes in accordance with Dash 8 Q400 Aircraft Maintenance Manual, PSM 1-84-2, Task 20-00-40-170-801 and as follows:

   a. Clean the drain holes in accordance with paragraph 4.B., Procedure 2, sub-paragraph (1) to (3) of the above noted Aircraft Maintenance Manual task.

   b. After cleaning, examine the drain hole for blockage in accordance with Paragraph 4.A., Procedure 1 of the above noted Aircraft Maintenance Manual task.

   c. If the drain hole of any pitot static probe is blocked, repeat the cleaning and examination procedure of Paragraph A.1.a and A.1.b of this directive on the affected pitot static probe.

B. Cleaning of Pitot Lines

1. Initially, within 30 days after the effective date of this directive and thereafter at intervals not to exceed 600 hours air time, clean the pitot lines in accordance with Dash 8 Q400 Aircraft Maintenance Manual, PSM 1-84-2, Task 34-11-00-170-801.

Authorization: For Minister of Transport

Robin Lau
Acting Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Continuing Airworthiness, Ottawa, telephone 613 952-4379, facsimile 613 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2005-37 1/2

Issue Date 11 October 2005

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2005-37**

Subject: **Cracking of the Outer Wing Fuel Access Panel**

Effective: 31 October 2005

Applicability: Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402; serial numbers 4001, and 4003 through 4106.

Compliance: Compliance is required as indicated unless already accomplished.

Background: There have been a number of cases of cracks being reported on P/N 85714230-001, outer wing fuel access panels, during routine “A” and “C” checks. In some cases, cracks of up to four inches have been reported. Investigation revealed that certain fuel access panels were manufactured with seal grooves having sharp corner radii. Cracking of the fuel access panel, if not corrected, could result in arcing and ignition of fuel vapour in the outer wing fuel tank during a lightning strike.

Corrective Action:

A. Initial Inspection of Outer Wing Fuel Access Panels.

1. Within 400 hours air time after the effective date of this directive, carry out an ultrasonic inspection for cracks of the outer wing fuel access panels, P/N 85714230-001, on both left and right wing, in accordance with Accomplishment Instructions of Bombardier Service Bulletin 84-57-13, dated 17 August 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

2. If any access panel is cracked, perform one of the following prior to further flight:

   (a) Replace cracked panel with either panel, P/N 85714230-003 or 85714230- 005.

   (b) Incorporate temporary repair in accordance with Bombardier Repair Drawing, RD 8/4-57-451. Subsequently, replace the repaired panel within 1000 hours air time from time of incorporation of RD 8/4-57-451.

   (c) Replace the cracked panel with a new panel P/N 85714230-001. Ensure that the replacement panel has no crack, by carrying out an ultrasonic inspection for cracks in accordance with Accomplishment Instructions of the above-noted Bombardier Service Bulletin.

3. If the inspection required in paragraph A.1 of this directive reveals no crack, or if a cracked access panel is replaced in accordance with paragraph A.2.(c) of this directive; prior to further flight, conduct an ultrasonic inspection of the outer wing fuel access panels, P/N 85714230-001, to determine the presence of a radius in the seal groove, in accordance with Accomplishment Instructions of the above-noted Bombardier Service Bulletin.

B. Repeat Inspection for Cracks of Outer Wing Fuel Access Panels.

1. If no crack is found on P/N 85714230-001 outer wing fuel access panel, and a radius is present in the seal groove at all locations, carry out repetitive detailed visual inspections of the external surface of the panel for any sign of cracking, in accordance with accomplishment instructions of the above-noted Bombardier Service Bulletin; at intervals not exceeding 1200 hours air time.

2. If no crack is found on P/N 85714230-001 outer wing fuel access panel, and a radius is not present at any of the locations noted for inspection, repeat the ultrasonic inspection for cracks in accordance with paragraph A.1 and A.2 of this directive, at intervals not exceeding 1200 hours air time.

C. Terminating Action.

1. Within 6000 hours air time after the initial inspection required by this directive, replace the left and right outer wing fuel access panels, P/N 85714230-001, with either P/N 85714230-003 or 85714230-005 panel.

2. Replacement of both left and right outer wing fuel access panels, P/N 85714230- 001, with either P/N 85714230-003 or P/N 85714230-005 panel, constitutes terminating action for the initial and repeat inspections required by section A and B of this directive.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Continuing Airworthiness, Ottawa, telephone 613 952-4379, facsimile 613 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2005-39 1/2

Issue Date 21 November 2005

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2005-39**

Subject: **Incorrect Rivets Installed at Control Column Torque Tube**

Effective: 22 December 2005

Applicability: The following Bombardier Inc. Models:

1. DHC-8-102, DHC-8-103, DHC-8-106, DHC-8-201, DHC-8-202, DHC-8-301, DHC-8-311, DHC-8-314, DHC-8-315, Serial Numbers 528 through 602 and 606.

2. DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4003, 4004, 4006, 4008 through 4080 and 4082.

Compliance: Compliance is required as indicated unless already accomplished.

Background: It was discovered on several aircraft that incorrect rivets having lower than required strength were installed on the control column torque tube during production. This condition, if not corrected, could result in shear failure of control column torque tube rivets during a jam of the pitch control circuit, when the pilot of the non-jammed pitch control tries to free the control by applying a large force.

Although there has been no known incident of rivet failure, such failure could reduce the controllability of the aircraft due to unexpected decoupling of the elevators and large unwanted deflection of the free elevator.

Corrective Action:

1. Applicable to DHC-8-102, DHC-8-103, DHC-8-106, DHC-8-201, DHC-8-202, DHC-8-301, DHC-8-311, DHC-8-314, DHC-8-315, Serial Numbers 528 through 602, and 606.

(a) Within 5500 hours air time after the effective date of this directive, carry out an inspection of the left and right control column torque tube assemblies to determine the rivet types installed, in accordance with Part A of the Accomplishment Instructions of Bombardier Service Bulletin (SB) 8-27-104, dated 26 October 2004, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

(b) If any rivet is found to be of an incorrect type or the type cannot be identified, prior to further flight, rework the control column torque tube in accordance with Part B of the Accomplishment Instructions of the above noted SB 8-27-104.

2. Applicable to DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4003, 4004, 4006, 4008 through 4080 and 4082.

(a) Within 5500 hours air time after the effective date of this directive, carry out an inspection of the left and right control column torque tube assemblies to determine the rivet types installed, in accordance with Part A of the Accomplishment Instructions of Bombardier Service Bulletin (SB) 84-27-24, revision A, dated 28 September 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

(b) If any rivet is found to be of an incorrect type or the type cannot be identified, prior to further flight, rework the control column torque tube in accordance with Part B of the Accomplishment Instructions of the above noted SB 84-27-24.

Authorization: For Minister of Transport

for B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Continuing Airworthiness, Ottawa, telephone 613 952-4379, facsimile 613 996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2006-05 1/1

Issue Date 31 March 2006

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2006-05**

Subject: **Brake Control Cable Fouling on Camloc Fasteners**

Effective: 28 April 2006

Applicability: Bombardier Inc. DHC-8 Aircraft Models 400, 401 and 402, serial numbers 4003, 4004, 4006, 4008 through 4064, 4072 and 4073.

Compliance: Compliance is required as indicated unless already accomplished.

Background: A check of production aircraft has determined that the outboard brake control cable, P/N 83200551-001, can foul on two camloc fasteners on the pilot's bulkhead cover assembly, P/N 85314746. Although brake cable problems have not been reported on in-service aircraft, the possibility exists for brake cable wear to occur. If a brake cable were to separate while under tension, aircraft control problems could occur during take-off or landing.

Corrective Actions: Carry out the following in accordance with Bombardier Service Bulletin (SB) 84-53-37, Revision A, dated October 17, 2005, SB 84-53-37, Revision B, dated 24 November 2005, or SB 84-53-37, Revision C, dated 5 December 2005 or later revisions approved by Chief, Continuing Airworthiness, Aircraft Certification:

(a) Within 12 months of the effective date of this directive, perform a visual inspection of the outboard brake control cable, P/N 83200551-001, for fouling/damage.

(b) If damage to any cable is found, replace the brake control cable and rework the cable cover and, if applicable, manufacture/install the offset plate assembly. Complete the cable replacement and modifications before further flight.

(c) If no damage to the cable assembly is found during the visual inspection, rework the cable cover and, if applicable, manufacture/install the offset plate assembly, within 24 months of the date of the inspection.

Authorization: For Minister of Transport

Robin Lau
For B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr.Ian Mc Lellan, Continuing Airworthiness, Ottawa, telephone 613 952-4362, facsimile 613 996-9178 or e-mail mclelli@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2006-06 1/1
Issue Date 4 April 2006

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2006-06**

Subject: **Engine Exhaust Shroud V-Band Couplings**

Effective: 8 May 2006

Applicability: Bombardier Inc. Model DHC-8-400, DHC-8-401 and DHC-8-402 Serial Numbers 4001 through 4098 with engine exhaust shroud V-band clamps (part numbers VC1642A-1875-A or VC1642A-2030-A) that have manufacturer batch stamp dated earlier than 08-02 (August 2002).

Compliance: When indicated, unless already accomplished.

Background: There have been reports of a discrepancy on a V-band clamp located on the engine exhaust duct shroud during maintenance inspections. The clamp ends were found touching with the correct fastener torque applied, resulting in reduced clamp force on the flanges.

Investigation revealed that a batch of V-band clamps were not manufactured to the drawing specifications. If not corrected, this condition may cause vibration and fretting of the V-band clamp flanges, leading to flange cracking and local area overheating. This situation can trigger the fire warning system and result in an in-flight emergency such as the flight crew requiring to shut down the engine and activate the fire suppression system.

Bombardier Service Bulletin (SB) 84-78-01 was issued to introduce an inspection on the affected V-band clamps to ensure their integrity, and replacement of the affected clamps as required.

Corrective Action: Within 5000 flight hours after the effective date of this directive, carry out an inspection and replacement (as required) of the V-band clamps to ensure a proper gap, in accordance with Bombardier SB 84-78-01, Revision A, dated 15 September 2005, or its later revisions approved by the Chief, Continuing Airworthiness, Aircraft Certification Branch, Transport Canada.

NOTE: Prior inspection and replacement of the V-band clamps (before the effective date of this directive) in accordance with the original issue of SB 84-78-01, satisfies the requirements of this directive.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Robin Lau, Continuing Airworthiness, Ottawa, telephone 613 952-4461, facsimile 613 996-9178 or e-mail laur@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2006-08 1/1
Issue Date 26 April 2006

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2006-08**

Subject: **Hydraulic System Power Transfer Unit Overspeed**

Effective: 31 May 2006

Applicability: Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001, 4003 and subsequent.

Compliance: As indicated below, unless already incorporated.

Background: Several cases have been reported where a loss of fluid in the No.2 hydraulic system has caused the power transfer unit (PTU) to overspeed, resulting in pressure fluctuations and increased fluid flow within the No.1 hydraulic system. In one case, the hydraulic system control logic did not shut down the PTU and the overspeed condition persisted, resulting in the illumination of the No.1 HYD FLUID HOT caution light.

As an interim action to avoid possible loss of both the No.1 and No.2 hydraulic systems, the Airplane Flight Manual (AFM) has been revised to include pulling the HYD PWR XFER circuit breaker in the event of the loss of all hydraulic fluid in the No.2 hydraulic system.

Corrective Actions: Within 14 days after the effective date of this directive:

1. Amend the AFM, PSM 1-84-1A, by inserting Temporary Amendment (TA) No. 13, dated 14 July 2005, or later approved changes to this AFM temporary amendment.

2. Advise all flight crew of the changes introduced by the AFM temporary amendment.

Authorization: For Minister of Transport

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Richard Topham, Continuing Airworthiness, Ottawa, telephone 613 952-4428, facsimile 613 996-9178, e-mail tophamr@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2006-10 1/1
Issue Date 12 May 2006

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2006-10**

Subject: **Airworthiness Limitation Items**

Effective: 15 June 2006

Applicability: Bombardier Inc. DHC-8 Aircraft, Models 400, 401 and 402, serial numbers 4001, 4003, 4004, 4006, 4008 through 4126.

Compliance: When indicated, unless already accomplished.

Background: A revision has been made to the DHC-8-400 Maintenance Requirements Manual, Airworthiness Limitation Items (ALI). This revision incorporates additional inspection requirements for principal structural elements (PSEs) related to fuselage cutouts and revises an existing ALI task on the aft entry door with a lower threshold inspection.

The actions specified by this AD are to ensure that fatigue failure of these components will be detected and corrected since such fatigue cracking could adversely affect the structural integrity of the aircraft.

Corrective Actions: **Within sixty (60) days after the effective date of this directive, amend the Transport Canada-approved maintenance schedule by:**

1. Incorporating the additional structural inspection tasks, 532065F101, 532065F102, 532066F101, 532066F102 for Post Modsum 4-113458, 532066F103, 532067F101, 532067F102, 532067F103, 532068F101, 532068F102, 532069F101, 532069F102, 532069F103, 532070F101, 532070F102, 532071F101, 532072F101, 532072F102, 532073F101 and 532073F102 respectively as introduced by Temporary Revision, ALI-53 of Airworthiness Limitations Items (ALI) of the DHC-8-400 Maintenance Requirements Manual, PSM 1-84-7; and

2. Incorporating the revised structural task 521003F101 as introduced by Temporary Revision, ALI -54 of Airworthiness Limitations Items (ALI) of the DHC-8-400 Maintenance Requirements Manual, PSM 1-84-7.

Authorization: For Minister of Transport, Infrastructure and Communities

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Continuing Airworthiness, Ottawa, telephone 613-952-4410, facsimile 613-996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2007-05 1/2

Issue Date 10 April 2007

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation* (CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2007-05**

Subject: **Translating Door Over-Centering Spring Bracket Failure**

Effective: 24 April 2007

Applicability: Bombardier Inc. Models DHC-8-400, DHC-8-401 and DHC-8-402, Serial Numbers 4001, 4003 through 4102.

Compliance: Within 1000 flight hours after the effective date of this directive, unless already accomplished.

Background: There has been a reported case of failure of a bracket (P/N 85217732-108) of the over-centering spring assembly inside the translating door of the forward baggage compartment. This condition can exist on other translating doors on the aircraft. Investigation concluded that an insufficient gap between the bottom eyebolt and the barrel of the spring assembly caused an increase of tension load on the bracket and resulted in subsequent failure of the bracket. Failure of the bracket caused the eyebolt at the bottom of the spring assembly to become loose, resulted in damage of the support beam during normal door handle movement. Damage of the support beam, which is dormant, in combination with failure of a doorstop attached to any remaining undamaged support beam will degrade the structural integrity of the door, resulting in possible depressurization or loss of the door.

Corrective Actions:

1. Perform a one-time inspection for damages of the forward baggage door, aft service door and aft passenger door spring support bracket and support beams as applicable. Bombardier Service Bulletin 84-52-51, Revision A, dated 6 September 2006, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provides approved instructions for inspection and rectification. Damaged support bracket must be replaced according to the above-noted SB before further flight. Damaged support beams must be replaced or repaired as follows:

   a) If any support beam is damaged at one spring location and the damage is within the limits defined in Bombardier Repair Drawing RD 8/4-52-202, repair the support beam according to RD 8/4/52-202 within 5,000 hours air time. Aircraft without the incorporation of RD 8/4-52-202 may be returned to service for a maximum of 5,000 hours air time, provided that each door stops of the affected door be inspected for integrity according to the above-noted SB and subsequently at intervals not exceeding 400 hours air time.

   b) If any support beam is damaged at one or two spring locations and any damage exceeds the limits defined in RD 8/4-52-202, replace the damaged support beam with a new beam before further flight.

   c) If any support beam is damaged at two spring locations and the damage is within the limits defined in RD 8/4-52-202, repair the support beam in accordance with RD 8/4-52-202 prior to further flight.

2. Remove and discard the nuts and washers at the bottom of the over-centering spring assemblies of the forward baggage door, aft service door and aft passenger door by incorporating Modsum 4-155296. Bombardier Service Bulletin 84-52-51, Revision A, dated 6 September 2006, or later revision approved by the Chief, Continuing Airworthiness, Aircraft Certification, provides approved instructions for incorporating Modsum 4-155296.

Authorization: For Minister of Transport, Infrastructure and Communities

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Philip Tang, Continuing Airworthiness, Ottawa, telephone 613-952-4365, facsimile 613-996-9178 or e-mail tangp@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2007-11 1/1
Issue Date 09 August 2007

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: CF-2007-11

Subject: Flight Compartment - Utility and Observer Lights

Effective: 31 August 2007

Applicability: Bombardier Inc. DHC-8 Aircraft Models 102, 103, 106, 201, 202, 301, 311, 314 and 315, Serial Numbers 003 through 639.

Bombardier Inc. DHC-8 Aircraft Models 400, 401 and 402, Serial Numbers 4003, 4004, 4006 and 4008 through 4149.

Compliance: Within 18 months after the effective date of this directive, unless already accomplished.

Background: Several cases have been reported where the pilot, co-pilot or observer utility light system has failed, resulting in a burning smell within the cockpit. An investigation has revealed that, due to the orientation and location of the carbon molded potentiometers used to control the intensity of the light, the potentiometers can fail and overheat in such a way that burning of the ceiling panel and the associated insulation blanket could occur. This could lead to the presence of smoke in the cockpit, requiring that the pilots carry out the appropriate emergency procedure.

Corrective Actions:

A. Applicable to DHC-8 Aircraft Models 102, 103, 106, 201, 202, 301, 311, 314 and 315

1. Install Modsum 8Q101603 to replace the affected carbon molded resistive element potentiometers with wire-wound type potentiometers, for both the pilot and co-pilot utility lights. Bombardier Service Bulletin (SB) 8-33-53, original issue dated 1 December 2006, Revision A dated 14 March 2007, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provide instructions for incorporating Modsum 8Q101603.

B. Applicable to DHC-8 Aircraft Models 400, 401 and 402

1. Install Modsum 4-126381 to replace the affected carbon molded resistive element potentiometers with wire-wound type potentiometers, for the pilot, co-pilot and observer utility lights. Bombardier Service Bulletin (SB) 84-33-10, original issue dated 1 December 2006, Revision A dated 14 March 2007, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada, provide instructions for incorporating Modsum 4-126381.

Authorization: For Minister of Transport, Infrastructure and Communities

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Continuing Airworthiness, Ottawa, telephone (613) 952-4410, facsimile (613) 996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2007-20 1/2

Issue Date 12 September 2007

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

URGENT URGENT URGENT URGENT URGENT URGENT URGENT URGENT URGENT

TRANSPORT CANADA EMERGENCY AIRWORTHINESS DIRECTIVE
PLEASE FORWARD IMMEDIATELY TO THE PERSON RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF YOUR AIRCRAFT

Number: **CF-2007-20**

Subject: **DHC-8-400 Main Landing Gear**

Effective: Immediately upon received.

Applicability: Bombardier Inc. DHC-8 aircraft, Models 400, 401 and 402, serial numbers 4001, 4003 and subsequent.

Compliance: As indicated below.

Background: Two recent cases of main landing gear collapse have been reported. Main landing gear collapse may result in unsafe landing of the aircraft.

Corrective Actions:

A. General Visual Inspection of the Main Landing Gear System:

For all aircraft, before further flight, perform a general visual inspection of the left hand and right hand main landing gear system in accordance with Bombardier DHC-8 Series 400 Maintenance Requirements Manual (PSM 1-84-7), Part 1 (Maintenance Review Board Report), tasks Z700-03E (left hand) and Z700-04E (right hand). Rectify any discrepancy found prior to further flight.

B. General Visual Inspection of the Main Landing Gear Retract Actuator Jam Nut:

For all aircraft, before further flight, perform a general visual inspection of the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secured. If the wire lock is not in place or the jam nut is not secured, accomplish Bombardier Repair Drawing (RD) 8/4-32-059 prior to further flight.

C. Detailed Visual Inspection of the Main Landing Gear Retract Actuator:

1. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated 8,000 or more landings or in service for more than 4 years since new, whichever occurs first, perform detailed visual inspection in accordance with Bombardier RD 8/4-32-059 before further flight.

2. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated between 4,000 to 7,999 landings or in service between 2 to 4 years since new, whichever occurs first, perform detailed visual inspection in accordance with RD 8/4-32-059 within 500 flight hours after the effective date of this directive.

D. Reporting Requirement:

Within 7 days after each inspection, report any discrepancies found during any of the above inspections to Bombardier Technical Help Desk.

E. Ferry Flight:

To permit the ferry of an aircraft to a location where the inspection requirements of this directive can be accomplished, adhere to the following procedures and limitations:

Flight Crew Limitations and Procedures:

1. Ferry Flight with gear extended and pinned.
2. Landing to be conducted at a minimum descent rate.
3. Minimize braking on landing.
4. Flight to be conducted per Aircraft Operating Manual (AOM) Section 4.8.
5. Essential crew only on board.
6. Flight in known or forecast icing condition is prohibited.

Maintenance Procedures:

1. Inspect the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secure.
2. Perform the general visual inspections as defined in accordance with Bombardier All Operators Message No. 236 Rev A or later revisions.
3. If items 1 and 2 results are satisfactory, insert main landing gear ground lock pins and lockwire in place.
4. Ensure the nose landing gear ground lock is engaged.

Authorization: For Minister of Transport, Infrastructure and Communities

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Continuing Airworthiness, Ottawa, telephone 613-952-4410, facsimile 613-996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

EASA	EMERGENCY AIRWORTHINESS DIRECTIVE
	AD No : 2007-0252-E **Date: 13 September 2007**

No person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive unless otherwise agreed with the Authority of the State of Registry.

Type Approval Holder's Name :	**Type/Model designation(s) :**
Bombardier, Inc.	DHC-8-400 series aircraft

TCDS Number: EASA IM.A.191; Canada A-142

Foreign AD: Transport Canada Civil Aviation (TCCA) Emergency Airworthiness Directive (EAD) No. CF-2007-20, issued 12 September 2007.

Supersedure: For aircraft operated under EU regulations, the requirements of this EAD take precedence over those contained in TCCA EAD CF-2007-20.

ATA 32	**Landing Gear – Main Landing Gear System & Parts - Inspection**
Manufacturer(s):	Bombardier, Inc.
Applicability:	Model DHC-8-401 and DHC-8-402 aircraft, all serial numbers. **Note:** The TCCA EAD applies also to Model DHC-8-400 aircraft; as this Model has not been validated in Europe at this time, no aircraft operated under EU regulations and/or registered in EU Member States are affected. For that reason, this EAD cannot be applied to those aircraft.
Reason:	Two recent cases of main landing gear collapse on Bombardier Model DHC-8-400 series aircraft have been reported, occurring shortly after touchdown. Main landing Gear collapse during landing can result in loss of control of the aircraft. To address and correct the unsafe condition described above, Transport Canada Civil Aviation (TCCA), the responsible authority of the State of Design for the affected type design, has issued Emergency Airworthiness Directive (EAD) CF-2007-20 on 12 September 2007. That EAD requires, before further flight, general and detailed visual inspections to be accomplished on the Main Landing Gear (MLG) system, the MLG Retract Actuator Jam Nut and the MLG Retract Actuator and corrective actions, as necessary. In addition, that EAD requires, within 7 days after each inspection, to report any discrepancies found during any of the above inspections to Bombardier Technical Help Desk. This EASA EAD requires those same actions, but establishes a date for these required actions to become effective for all aircraft operated under EU regulations, and requires the initial inspection and corrective actions, as necessary, to be accomplished before next flight after that date. For ferry flights, reference is made to

	Airplane Flight Manual (AFM) Supplement No.94. The provisions in that document take precedence over points 4 (the reference to AOM Section 4.8), 5 and 6 of paragraph E “Flight Crew Limitations and Procedures”. In all other aspects, this EAD contains the same requirements as TCCA EAD CF-2007-20, which is attached to this directive.
Effective Date:	13 September 2007
Compliance:	(a) Before next flight after the effective date of this directive, accomplish the tasks described in paragraphs A, B and C.1 of TCCA EAD CF-2007-20 (attached to this EASA EAD); (b) Within the next 500 flight hours after the effective date of this directive, accomplish the tasks described in paragraph C.2 of TCCA EAD CF-2007-20. (c) In deviation from paragraph E “Flight Crew Limitations and Procedures” points 4, 5 and 6 of TCCA EAD CF-2007-20, ferry flights are permitted only in accordance with the instructions, procedures and limitations as specified in EASA-approved Supplement No.94 “Ferry Flight with Landing Gear Extended” to DHC-8 Series 400 (Q400) AFM Document No. PSM 1-84-1A (JAA). All other aspects and requirements of TCCA EAD CF-2007-20 remain unchanged and can be considered as ‘adopted’ in accordance with EASA ED Decision 2/2003.
Ref. Publications:	Bombardier Repair Drawing (RD) 8/4-32-059; and Bombardier DHC-8 Series 400 Maintenance Requirements Manual (PSM 1-84-7), Part 1 (Maintenance Review Board Report), tasks Z700-03E (left hand) and Z700-04E (right hand). Bombardier All Operator Message No. 236A also pertains to this subject.
Remarks :	1. If requested and appropriately substantiated, EASA can accept Alternative Methods of Compliance for this AD. 2. The safety assessment has requested not to implement the full consultation process and an immediate publication and notification. 3. Enquiries regarding this AD should be referred to the AD Focal Point - Certification Directorate, EASA. E-mail: ADs@easa.europa.eu . 4. For any question concerning the technical content of the requirements in this AD, please contact: Bombardier, Inc. 123 Garratt Boulevard, Toronto, Ontario M3K 1Y5 Canada; telephone +1-416-375 4000; facsimile +1-416375 4539; E-mail thd.qseries@aero.bombardier.com

Transport Canada Transports Canada

TP 7245E

No. CF-2007-20 1/2

Issue Date 12 September 2007

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

URGENT URGENT URGENT URGENT URGENT URGENT URGENT URGENT URGENT

TRANSPORT CANADA EMERGENCY AIRWORTHINESS DIRECTIVE
PLEASE FORWARD IMMEDIATELY TO THE PERSON RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF YOUR AIRCRAFT

Number: **CF--2007-20**

Subject: **DHC-8-400 Main Landing Gear**

Effective: Immediately upon received.

Applicability: Bombardier Inc. DHC-8 aircraft, Models 400, 401 and 402, serial numbers 003 and subsequent.

Compliance: As indicated below.

Background: Two recent cases of main landing gear collapse have been reported. Main landing gear collapse may result in unsafe landing of the aircraft.

Corrective Actions:

A. General Visual Inspection of the Main Landing Gear System:

For all aircraft, before further flight, perform a general visual inspection of the left hand and right hand main landing gear system in accordance with Bombardier DHC-8 Series 400 Maintenance Requirements Manual (PSM 1-84-7), Part 1 (Maintenance Review Board Report), tasks Z700-03E (left hand) and Z700-04E (right hand). Rectify any discrepancy found prior to further flight.

B. General Visual Inspection of the Main Landing Gear Retract Actuator Jam Nut:

For all aircraft, before further flight, perform a general visual inspection of the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secured. If the wire lock is not in place or the jam nut is not secured, accomplish Bombardier Repair Drawing (RD) 8/4-32-059 prior to further flight.

C. Detailed Visual Inspection of the Main Landing Gear Retract Actuator:

1. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated 8,000 or more landings or in service for more than 4 years

since new, whichever occurs first, perform detailed visual inspection in accordance with Bombardier RD 8/4-32-059 before further flight.

2. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated between 4,000 to 7,999 landings or in service between 2 to 4 years since new, whichever occurs first, perform detailed visual inspection in accordance with RD 8/4-32-059 within 500 flight hours after the effective date of this directive.

D. Reporting Requirement:

Within 7 days after each inspection, report any discrepancies found during any of the above inspections to Bombardier Technical Help Desk.

E. Ferry Flight:

To permit the ferry of an aircraft to a location where the inspection requirements of this directive can be accomplished, adhere to the following procedures and limitations:

Flight Crew Limitations and Procedures:

1. Ferry Flight with gear extended and pinned.
2. Landing to be conducted at a minimum descent rate.
3. Minimize braking on landing.
4. Flight to be conducted per Aircraft Operating Manual (AOM) Section 4.8.
5. Essential crew only on board.
6. Flight in known or forecast icing condition is prohibited.

Maintenance Procedures:

1. Inspect the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secure.
2. Perform the general visual inspections as defined in accordance with Bombardier All Operators Message No. 236 Rev A or later revisions.
3. If items 1 and 2 results are satisfactory, insert main landing gear ground lock pins and lockwire in place.
4. Ensure the nose landing gear ground lock is engaged.

Authorization: For Minister of Transport, Infrastructure and Communities

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Continuing Airworthiness, Ottawa, telephone 613-952-4410, facsimile 613-996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

Transport Canada Transports Canada

TP 7245E

No. CF-2007-20R1 1/3

Issue Date 11 October 2007

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2007-20 R1**

Subject: **DHC-8-400 Main Landing Gear**

Effective: 25 October 2007

Revision: Supersede Airworthiness Directive CF-2007-20 issued on 12 September 2007.

Applicability: Bombardier Inc. DHC-8 aircraft, Models 400, 401 and 402, serial numbers 4001, 4003 and subsequent.

Compliance: When indicated, unless already accomplished.

Background: Two recent cases of main landing gear collapse have been reported. Main landing gear collapse may result in unsafe landing of the aircraft.

This directive has been revised to amend the time compliance in paragraph C.2 (3 months in addition to 500 flight hours), to add new paragraph C.3 to cater for retract actuator which has accumulated less than 4,000 landings or 2 years since new and to add new paragraphs B.2 and C.4 to require that the respective inspections be repetitively performed until terminating action becomes available.

Corrective Actions:

A. General Visual Inspection of the Main Landing Gear System:

For all aircraft, before further flight after the effective date of the original issue of this directive (12 September 2007), perform a general visual inspection of the left hand and right hand main landing gear system in accordance with Bombardier DHC-8 Series 400 Maintenance Requirements Manual (PSM 1-84-7), Part 1 (Maintenance Review Board Report), tasks Z700-03E (left hand) and Z700-04E (right hand). Rectify any discrepancy found prior to further flight.

B. General Visual Inspection of the Main Landing Gear Retract Actuator Jam Nut:

1. For all aircraft, before further flight after the effective date of the original issue of this directive (12 September 2007), perform a general visual inspection of the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secured. If the wire lock is not in place or the jam nut is not secured, prior to further flight, accomplish Bombardier Repair Drawing (RD) 8/4-32-059, Issue 5, or later approved revision.
2. Subsequently, at intervals not to exceed 250 landings, or one month from the effective date of this directive, whichever occurs first, repeat the general visual inspection of the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secured. If the wire lock is not in place or the jam nut is not secured, prior to further flight, re-torque the jam nut and safety lockwire in accordance with Bombardier Repair Drawing (RD) 8/4-32-059, Issue 5, or later approved revision.

C. Detailed Visual Inspection of the Main Landing Gear Retract Actuator:

1. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated 8,000 or more landings, or more than 4 years in service since new, at the effective date of the original issue of this directive (12 September 2007), perform a detailed visual inspection and any required action(s) in accordance with Bombardier RD 8/4-32-059, Issue 5, or later approved revision, before further flight after the effective date of the original issue of this directive (12 September 2007).

2. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated between 4,000 to 7,999 landings, or between 2 to 4 years in service since new, at the effective date of the original issue of this directive (12 September 2007), perform a detailed visual inspection and any required action(s) in accordance with RD 8/4-32-059, Issue 5 or later approved revision within 500 flight hours, or 3 months, whichever occurs first, after the effective date of the original issue of this directive (12 September 2007).

3. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated less than 4,000 landings, or less than 2 years in service since new, at the effective date of the original issue of this directive (12 September 2007), prior to retract actuator reaching 4,500 landings or 27 months in service since new, whichever occurs first, perform a detailed visual inspection and any required action(s) in accordance with RD 8/4-32-059, Issue 5 or later approved revision.

4. Subsequently, at intervals not to exceed 2,000 landings, or one calendar year from the effective date of this directive, whichever occurs first, repeat the detailed visual inspection and any required action(s) in accordance with RD 8/4-32-059, Issue 5 or later approved revision.

Note: 1) Respective inspections performed in accordance with earlier issues of RD 8/4-32-059 satisfy the requirements of this directive, paragraphs B and C.

2) If the visual inspection of the piston (p/n 46570-1/-3) threads and thread relief area for evidence of corrosion in accordance with RD 8/4-32-059 Rev. NC was performed without using borescope or 10X magnification mirror, a one time deferral for up to 500 landings is permissible to complete the inspection of the piston using borescope or 10X magnification mirror.

D. Reporting Requirement:

Within 7 days after each inspection, report any discrepancies found during any of the above inspections to Bombardier Technical Help Desk.

E. Ferry Flight:

To permit the ferry of an aircraft to a location where the inspection requirements of this directive can be accomplished, adhere to the following procedures and limitations:

Flight Crew Limitations and Procedures:

1. Ferry Flight with gear extended and pinned.
2. Landing to be conducted at a minimum descent rate.
3. Minimize braking on landing.
4. Flight to be conducted per Aircraft Operating Manual (AOM) Section 4.8.
5. Essential crew only on board.
6. Flight in known or forecast icing condition is prohibited.

Maintenance Procedures:

1. Inspect the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secure.
2. Perform the general visual inspections as defined in accordance with Bombardier All Operators Message No. 236 Rev A or later revisions.
3. If items 1 and 2 results are satisfactory, insert main landing gear ground lock pins and lockwire in place.
4. Ensure the nose landing gear ground lock is engaged.

Authorization: For Minister of Transport, Infrastructure and Communities

B. Goyaniuk
Chief, Continuing Airworthiness

Contact: Mr. Anthony Wan, Continuing Airworthiness, Ottawa, telephone 613-952-4410, facsimile 613-996-9178 or e-mail wana@tc.gc.ca or any Transport Canada Centre.

EASA	AIRWORTHINESS DIRECTIVE
	AD No : 2007-0272 **Date: 16 October 2007**

No person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive unless otherwise agreed with the Authority of the State of Registry.

Type Approval Holder's Name :	**Type/Model designation(s) :**
Bombardier, Inc.	DHC-8-400 series aircraft

TCDS Number: EASA IM.A.191; Canada A-142

Foreign AD: Transport Canada Civil Aviation (TCCA) Airworthiness Directive (AD) No. CF-2007-20 R1, issued 11 October 2007.

Supersedure: This AD supersedes EASA Emergency AD 2007-0252-E, dated 13 September 2007.

NOTE: For aircraft operated under EU regulations, the requirements of this AD take precedence over those contained in TCCA AD CF-2007-20 R1.

ATA 32	**Landing Gear – Main Landing Gear System & Parts - Inspection**
Manufacturer(s):	Bombardier, Inc.
Applicability:	Model DHC-8-401 and DHC-8-402 aircraft, all serial numbers. **Note:** The TCCA AD applies also to Model DHC-8-400 aircraft; as this Model has not been validated in Europe at this time, no aircraft operated under EU regulations and/or registered in EU Member States are affected. For that reason, this AD cannot be applied to those aircraft.
Reason:	Two recent cases of main landing gear collapse on Bombardier Model DHC-8-400 series aircraft have been reported, occurring shortly after touchdown. Main landing Gear collapse during landing can result in loss of control of the aircraft. To address and correct the unsafe condition described above, Transport Canada Civil Aviation (TCCA), the responsible authority of the State of Design for the affected type design, issued Emergency Airworthiness Directive (EAD) CF-2007-20 on 12 September 2007. That directive has now been revised to amend the time compliance in paragraph C.2 (3 months in addition to 500 flight hours), to add new paragraph C.3 to cater for retract actuator which has accumulated less than 4 000 landings or 2 years since new and to add new paragraphs B.2 and C.4 to require that the respective inspections be repetitively performed until terminating action becomes available. This EASA AD requires those same actions, except for ferry flights, where reference is made to Airplane Flight Manual (AFM) Supplement No.94. The provisions in that

	document take precedence over points 4 (the reference to AOM Section 4.8), 5 and 6 of paragraph E “Flight Crew Limitations and Procedures”. In all other aspects, this AD contains the same requirements as TCCA AD CF-2007-20R1, which is attached to this directive.
Effective Date:	25 October 2007
Compliance:	Required as indicated, unless previously accomplished: In deviation from paragraph E “Flight Crew Limitations and Procedures” points 4, 5 and 6 of TCCA EAD CF-2007-20R1, ferry flights are permitted only in accordance with the instructions, procedures and limitations as specified in EASA-approved Supplement No.94 “Ferry Flight with Landing Gear Extended” to DHC-8 Series 400 (Q400) AFM Document No. PSM 1-84-1A (JAA). All other aspects and requirements of TCCA EAD CF-2007-20R1 remain unchanged and can be considered as ‘adopted’ in accordance with EASA ED Decision 2/2003. Note: Any actions already accomplished in accordance with EASA Emergency AD 2007-0252-E after 13 September 2007 can be considered in compliance with the corresponding tasks as required by TCCA AD CF-2007-20R1.
Ref. Publications:	Bombardier Repair Drawing (RD) 8/4-32-059 Issue 5; and Bombardier DHC-8 Series 400 Maintenance Requirements Manual (PSM 1-84-7), Part 1 (Maintenance Review Board Report), tasks Z700-03E (left hand) and Z700-04E (right hand). Bombardier All Operator Messages No. 235, 236A, 237, 238, 239, 240, 243, 245, 247 and 250 also pertain to this subject.
Remarks :	1. If requested and appropriately substantiated, EASA can accept Alternative Methods of Compliance for this AD. 2. Required actions and the risk assessment have warranted the immediate adoption of this Final AD with request for comments. 3. Enquiries regarding this AD should be referred to the AD Focal Point - Certification Directorate, EASA. E-mail: ADs@easa.europa.eu . 4. For any question concerning the technical content of the requirements in this AD, please contact: Bombardier, Inc. 123 Garratt Boulevard, Toronto, Ontario M3K 1Y5 Canada; telephone +1-416-375 4000; facsimile +1-416375 4539; E-mail thd.qseries@aero.bombardier.com

Transport Canada Transports Canada

TP 7245E

No. CF-2007-20R1 1/3

Issue Date 11 October 2007

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to ***Canadian Aviation Regulation*** **(CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: **CF-2007-20 R1**

Subject: **DHC-8-400 Main Landing Gear**

Effective: 25 October 2007

Revision: Supersede Airworthiness Directive CF-2007-20 issued on 12 September 2007.

Applicability: Bombardier Inc. DHC-8 aircraft, Models 400, 401 and 402, serial numbers 4001, 4003 and subsequent.

Compliance: When indicated, unless already accomplished.

Background: Two recent cases of main landing gear collapse have been reported. Main landing gear collapse may result in unsafe landing of the aircraft.

This directive has been revised to amend the time compliance in paragraph C.2 (3 months in addition to 500 flight hours), to add new paragraph C.3 to cater for retract actuator which has accumulated less than 4,000 landings or 2 years since new and to add new paragraphs B.2 and C.4 to require that the respective inspections be repetitively performed until terminating action becomes available.

Corrective Actions:

A. General Visual Inspection of the Main Landing Gear System:

For all aircraft, before further flight after the effective date of the original issue of this directive (12 September 2007), perform a general visual inspection of the left hand and right hand main landing gear system in accordance with Bombardier DHC-8 Series 400 Maintenance Requirements Manual (PSM 1-84-7), Part 1 (Maintenance Review Board Report), tasks Z700-03E (left hand) and Z700-04E (right hand). Rectify any discrepancy found prior to further flight.

B. General Visual Inspection of the Main Landing Gear Retract Actuator Jam Nut:

1. For all aircraft, before further flight after the effective date of the original issue of this directive (12 September 2007), perform a general visual inspection of the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secured. If the wire lock is not in place or the jam nut is not secured, prior to further flight, accomplish Bombardier Repair Drawing (RD) 8/4-32-059, Issue 5, or later approved revision.
2. Subsequently, at intervals not to exceed 250 landings, or one month from the effective date of this directive, whichever occurs first, repeat the general visual inspection of the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secured. If the wire lock is not in place or the jam nut is not secured, prior to further flight, re-torque the jam nut and safety lockwire in accordance with Bombardier Repair Drawing (RD) 8/4-32-059, Issue 5, or later approved revision.

C. Detailed Visual Inspection of the Main Landing Gear Retract Actuator:

1. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated 8,000 or more landings, or more than 4 years in service since new, at the effective date of the original issue of this directive (12 September 2007), perform a detailed visual inspection and any required action(s) in accordance with Bombardier RD 8/4-32-059, Issue 5, or later approved revision, before further flight after the effective date of the original issue of this directive (12 September 2007).

2. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated between 4,000 to 7,999 landings, or between 2 to 4 years in service since new, at the effective date of the original issue of this directive (12 September 2007), perform a detailed visual inspection and any required action(s) in accordance with RD 8/4-32-059, Issue 5 or later approved revision within 500 flight hours, or 3 months, whichever occurs first, after the effective date of the original issue of this directive (12 September 2007).

3. For aircraft main landing gear retract actuator (p/n 46550-7 or 46550-9) that have accumulated less than 4,000 landings, or less than 2 years in service since new, at the effective date of the original issue of this directive (12 September 2007), prior to retract actuator reaching 4,500 landings or 27 months in service since new, whichever occurs first, perform a detailed visual inspection and any required action(s) in accordance with RD 8/4-32-059, Issue 5 or later approved revision.

4. Subsequently, at intervals not to exceed 2,000 landings, or one calendar year from the effective date of this directive, whichever occurs first, repeat the detailed visual inspection and any required action(s) in accordance with RD 8/4-32-059, Issue 5 or later approved revision.

Note: 1) Respective inspections performed in accordance with earlier issues of RD 8/4-32-059 satisfy the requirements of this directive, paragraphs B and C.

2) If the visual inspection of the piston (p/n 46570-1/-3) threads and thread relief area for evidence of corrosion in accordance with RD 8/4-32-059 Rev. NC was performed without using borescope or 10X magnification mirror, a one time deferral for up to 500 landings is permissible to complete the inspection of the piston using borescope or 10X magnification mirror.

D. Reporting Requirement:

Within 7 days after each inspection, report any discrepancies found during any of the above inspections to Bombardier Technical Help Desk.

E. Ferry Flight:

To permit the ferry of an aircraft to a location where the inspection requirements of this directive can be accomplished, adhere to the following procedures and limitations:

Flight Crew Limitations and Procedures:

1. Ferry Flight with gear extended and pinned.
2. Landing to be conducted at a minimum descent rate.
3. Minimize braking on landing.
4. Flight to be conducted per Aircraft Operating Manual (AOM) Section 4.8.
5. Essential crew only on board.
6. Flight in known or forecast icing condition is prohibited.

Maintenance Procedures:

1. Inspect the left hand and right hand main landing gear retract actuator jam nut to ensure the wire lock is in place and the nut is secure.
2. Perform the general visual inspections as defined in accordance with Bombardier All Operators Message No. 236 Rev A or later revisions.
3. If items 1 and 2 results are satisfactory, insert main landing gear ground lock pins and lockwire in place.
4. Ensure the nose landing gear ground lock is engaged.

Authorization: For Minister of Transport, Infrastructure and Communities

B. Goyaniuk
Chief, Continuing Airworthiness

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