To: Distribution

Subject: Dash 8 Series 400, Airport Planning Manual, PSM 1–84–13

This is Revision 5 of the Dash 8 Series 400, Airport Planning Manual, PSM 1–84–13, dated Jan 05/2017.

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April 10, 1992
Technical Publications

Manual Change Request

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☐ I would like to receive notification of actions on this request.

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Publication Information

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*Description of Change Request:

Reason for change:

Reference data provided: ☐ Yes ☐ No Description:

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Oct 4/2013
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# AIRPORT PLANNING MANUAL

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## CHAPTER 8 DERIVATIVE AIRCRAFT

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## CHAPTER 9 SCALED DRAWINGS OF DASH–8 SERIES 400

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CHAPTER 1

PREFACE
1. **Purpose**
   
   A. This manual provides, in a standardized format, airport planning data for the Dash–8, Series 400 (Model 402). Because operational procedures are different for each airline and operator, the airport planner must coordinate specific data with the user airline before the design of facilities.

   B. The data contained in Chapter 3 (Aircraft Performance) is for reference only. Refer to the applicable Aircraft Flight Manual (AFM) for Model 402 operating data.

2. **Introduction**

   A. The content of this document conforms to NAS 3601, Revision 6 (15 Jul/94). NAS 3601 is the result of agreements between representatives of the organizations that follow:

      – Aerospace industries
      – Airport operators
      – Air Transport Association of America
      – International Air Transport Association.

   B. This manual provides Model 402 data for airport planners and operators, airlines, architectural and engineering consultant organizations (as well as other interested industry agencies). The content of this manual will change as options and aircraft changes occur. The data contained in this manual represents the typical Dash–8 Series 400 (Model 402) aircraft.

   C. For more information, contact:

   Director, Technical Publications
   Regional Aircraft Division
   Bombardier Aerospace
   Mail Stop N42–25
   123 Garratt Blvd., Downsview
   Ontario, Canada
   M3K 1Y5.

3. **A Brief Description of the Dash–8 Series 400 (Model 402) Aircraft**

   A. The Dash–8 Series 400 (Model 402) is a pressurized, commercial transport airplane that is designed to accommodate 50 to 86 passengers. This airplane establishes new standards in speed, comfort and efficiency. A new feature of the Dash–8 series is the Noise and Vibration Suppression (NVS) system, which dramatically reduces cabin noise in flight.
B. The aircraft is powered by two Pratt and Whitney PW150A turboprop engines. Large diameter, slow-turning, six-bladed Dowty R408 propellers provide high thrust efficiency and low noise levels.

C. The Dash–8 Series 400 is capable of economic operations over a broad range of applications. These are:

- Scheduled airline operations
- Resource and regional development work
- Corporate and military transport roles.

D. The aircraft is capable of operation in ambient temperatures of between –65 °F (–54 °C) and 122 °F and (50 °C), unless otherwise specified. Transfer from one climate to another can be done without penalties or extensive modifications or adjustment.

E. Significant features of interest to the airport planner include the items that follow:

- The engines are located high and on the wing
- The horizontal stabilizer is located on top of the fin
- The aircraft has a self-contained airstair entry–door at the forward end of the cabin
- Connections for single–point and overwing gravity refueling are provided
- All servicing can be accomplished with standard ground equipment
- High exhaust outlets produce modest pressure and temperature profiles.
CHAPTER 2

AIRCRAFT DESCRIPTION
General Information

1. **General**
   
   The Model 402 has a maximum take-off weight of up to 64,500 lb (29,257 kg). Other maximum weight parameters such as taxi weight (also known as ramp weight), landing weight and zero fuel weight are set accordingly.

2. **Contents of Chapter**
   
   This chapter contains the items that follow:
   
   A. General airplane characteristics and dimensions are shown in Figure 2–1 and Figure 2–2.
   
   B. Ground clearances are shown in Figure 2–3, Figure 2–4, Figure 2–5, Figure 2–6 and Figure 2–7.
   
   C. Interior configurations are shown in Figure 2–8, Figure 2–9, Figure 2–10, and Figure 2–11.
   
   D. A cross-section of the passenger compartment is shown in Figure 2–12.
   
   E. A floor loading diagram is shown in Figure 2–13.
   
   F. Dimensions of the forward and aft baggage compartments are shown in Figure 2–14, Figure 2–15, and Figure 2–16.
   
   G. Nets and tiedowns of the aft baggage compartment are shown in Figure 2–17 and Figure 2–18.
   
   H. Spider nets installed in the aft cargo compartment for the cargo combi configuration are shown in and Figure 2–19.
   
   I. Clearances for the passenger, the service, the baggage and the forward type I emergency exit doors are shown in Figure 2–20, Figure 2–21, Figure 2–22, Figure 2–23, and Figure 2–24.
   
   J. External handles of the various doors are shown in Figure 2–25.
   
   K. Horizontal clearances between the fuselage and nacelles are shown in Figure 2–26.
   
   L. Vertical dimensions of a typical aft baggage compartment is shown in Figure 2–27.
   
   M. Ground clearances of empennage and sill of aft baggage door is shown in Figure 2–28.

3. **Definitions**
   
   The definitions that follow are used throughout this manual (refer to Figure 2–1):
   
   A. **Maximum Design Taxi Weight (MTW)**
      
      This is the maximum weight at which an aircraft can move safely on the ground. It includes the fuel for those displacements and the takeoff run.
B. Maximum Design Landing Weight (MLW)
This is the maximum approved weight at which an aircraft can land.

C. Maximum Design Take–off Weight (MTOW)
This is the maximum approved weight at which an aircraft can start a take–off run.

D. Operational Weight Empty (OWE)
This is the weight of structure, power plant, furnishings, systems, unusable fuel and other items of equipment that are a necessary part of an aircraft configuration. The OWE also includes certain standard items, personnel, equipment and supplies required for full operations, but does not include usable fuel or payload.

E. Maximum Design Zero Fuel Weight (MZFW)
This is the maximum weight of an aircraft before the usable fuel is loaded on the aircraft.

F. Maximum Payload
This is the weight you get when you subtract the OWE from the MZFW.

G. Maximum Seating Capacity
This is the maximum number of passengers specifically certified or anticipated for certification.

H. Maximum Cargo Volume
This is the maximum space available for cargo.

I. Usable Fuel
This is the fuel available for the aircraft engines.
AIRPORT PLANNING MANUAL

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POWERPLANT

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<td>ENGINE (PWC 150 A, DRESSED, INCLUDING EXHAUST NOZZLE)</td>
<td>1925 lb (873.1 kg)</td>
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<td>EXHAUST ONLY (JET PIPE)</td>
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<td>PROPELLERS (DOWTY R408, SIX-BLADE, INCLUDES BETA TUBE UNIT AND SPINNER)</td>
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APU

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<td>APU WET</td>
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TANK CAPACITY – USABLE FUEL

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NOTE

1 BASED ON : 6.8 lb /U.S. GALLON (0.775 kg/l)

GENERAL AIRPLANE CHARACTERISTICS (Sheet 1 of 2)

Figure 2 – 1
## POWER PLANT WEIGHT BREAKDOWN DETAILS

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### NOTES

1. Power plant shipping crate dimensions are 46 in. W x 108 in. L x 54 in. (+ 7 in. Pallet=61 in.) H.
2. Assembly wheel weighs 248.48 lb per side (124.24 lb each).
3. Brake carbon weighs 138.4 lb per side (69.2 lb each set).

GENERAL AIRPLANE CHARACTERISTICS (Sheet 2 of 2)
NOTES

1. Refer to Ground Clearance Illustrations.

2. Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.

GROUND REFERENCE LINE

AIRCRAFT DIMENSIONS

Figure 2 – 2

Refer to Ground Clearance Illustrations.

Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.
Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.

NOTE

GROUND CLEARANCES – GENERAL ARRANGEMENT

Figure 2 – 3

Series: 400
## MAXIMUM GROUND CLEARANCE

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## MAXIMUM GROUND CLEARANCE

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### NOTES

1. Nose Wheel Tires 22 x 6.5 – 10, inflated to 89 psi (614 kPa) loaded.
2. Main Wheel Tires are 32 x 8.8 –16, inflated to 227 psi (1565 kPa) loaded.
3. Tire pressures shown are for calculation purposes only. Refer to AMM Ch. 12 for service pressures.

   - **Type II/III emergency exit door is de-activated for the extra capacity and the cargo combi configuration.**
   - **Forward type I emergency exit door is installed only on aircraft with extra capacity and the cargo combi configuration.**
   - **Forward baggage door is installed in lieu of the aft service door and de-activated for the cargo combi configuration.**
   - **Aft passenger door is de-activated for the cargo combi configuration.**

**MAXIMUM GROUND CLEARANCES–STANDARD MLG TIRES**

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**Figure 2 – 4**
**MINIMUM GROUND CLEARANCES**

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**NOTES**

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2. Main Wheel Tires are 32 x 8.8 – 16, inflated to 227 psi (1565 kPa) loaded.
3. Tire pressures shown are for calculation purposes only. Refer to AMM Ch. 12 for service pressures.

**MINIMUM GROUND CLEARANCES – STANDARD MLG TIRES**

Figure 2 – 5

Series: 400
## AIRPORT PLANNING MANUAL

### MAXIMUM GROUND CLEARANCE

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### NOTES

1. Nose Wheel Tires 22 x 6.5 – 10, inflated to 89 psi (614 kPa) loaded.
2. Main Wheel Tires are 34 x 10.75 – 16, inflated to 141 psi (972 kPa) loaded.
3. Tire pressures shown are for calculation purposes only. Refer to AMM Ch. 12 for service pressures.

4. Type II/III emergency exit door is de-activated for the extra capacity and the cargo combi configuration.
5. Forward type I emergency exit door is installed only on aircraft with extra capacity and the cargo combi configuration.
6. Forward baggage door is installed in lieu of the aft service door and de-activated for the cargo combi configuration.
7. Aft passenger door is de-activated for the cargo combi configuration.

MAXIMUM GROUND CLEARANCES–OPTIONAL MLG TIRES

Figure 2 – 6
## AIRPORT PLANNING MANUAL

### MINIMUM GROUND CLEARANCE

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### NOTES

1. Nose Wheel Tires 22 x 6.5 – 10, inflated to 89 psi (614 kPa) loaded.
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7. Aft passenger door is de–activated for the cargo combi configuration.

### MINIMUM GROUND CLEARANCES–OPTIONAL MLG TIRES

**Figure 2 – 7**
PASSENGER CABIN LENGTH
61 ft 8 in. (18.80 m)

11.00 ft. (3.35 m)

30.00 in. W x 65.00 in. H
(76.20 cm x 1.65 m)

24.00 in. W x 65.00 in. H
(60.96 cm x 1.65 m)

24.00 in. W x 54.00 in. H
(60.96 cm x 1.37 m)

AIRSTAIR/TYPE I EXIT
SERVICE DOOR/TYPE I EXIT

PAX DOOR/TYPE I EXIT

BAGGAGE DOOR

51.00 in. W x 59.00 in. H
(1.30 m x 1.50 m)

25 ft 5 in. (7.74 m)

5 ft 9 in. (1.75 m)

5 ft 9 in. (1.75 m)

13

45

6

23

24

5

1

3

4

5

6

NOTE
1. Forward baggage compartment
2. Rear baggage compartment
3. Lavatory.
4. Wardrobe.
5. Flight attendant.

SERIES 400 STANDARD INTERIOR CONFIGURATIONS (Sheet 1 of 2)

Figure 2 – 8

Series: 400

CHAPTER 2

Dec 05/2014
SERIES 400 (TYPE SPECIFICATION MODEL 401) INTERIOR CONFIGURATION
70 SEATS AT 33 INCH (83.82 cm) PITCH

NOTE
Standard configuration shown. Layout may vary with optional configurations.

LEGEND
1. Forward baggage compartment
   91.00 ft³ (2.58 m³).
2. Rear baggage compartment
   411.00 ft³ (11.64 m³).
3. Lavatory.
4. Wardrobe.
5. Flight attendant.
SERIES 400 (MODEL 402) STANDARD INTERIOR CONFIGURATION
74 SEATS AT 31 INCH PITCH (78.74 cm)

NOTE
Standard configuration shown. Layout may vary with optional configurations.
SERIES 400 (MODEL 402) INTERIOR CONFIGURATION
78 SEATS AT 30 INCH (76.2 cm) PITCH

PASSENGER CABIN LENGTH
61 ft 8 in. (18.80 m)

Note: Layout may vary with optional configurations.

BAGGAGE DOOR
24.00 in. W x 54.00 in. H
(60.96 cm x 1.37 m)

LEGEND
1. Forward baggage compartment
2. Rear baggage compartment
3. Lavatory
4. Wardrobe
5. Flight attendant
6. Galley

NOTE
Layout may vary with optional configurations.

Figure 2 – 10

Series: 400

CHAPTER 2
Jan 05/2017
SERIES 400 (MODEL 402) INTERIOR CONFIGURATION
72 SEATS AT 32 INCH (81.28 cm) PITCH

LEGEND
1. Forward Baggage Compartment
51.00 in. W x 59.00 in. H
(1.30 m x 1.50 m)
2. Rear baggage compartment
365.00 ft² (10.33 m²).
3. Lavatory.
4. Wardrobe.
5. Flight attendant Seat.
7. Cart storage.

NOTE
Layout may vary with optional configurations.
SERIES 400 (MODEL 402) INTERIOR CONFIGURATION

SERIES 400 OPTIONAL INTERIOR CONFIGURATIONS (Sheet 3 of 6)

Figure 2 – 10

NOTE
Layout may vary with optional configuration.

LEGEND
1. Forward baggage compartment
2. Rear baggage compartment
3. Lavatory
4. Wardrobe
5. Flight attendant
6. Galley
SERIES 400 (MODEL 402) THREE-ABREAST TRIPLE CLASS INTERIOR CONFIGURATION

7 SEATS AT 36 in. (91.44 cm) PITCH, 10 SEATS AT 34 in. (86.36 cm) PITCH AND 54 SEATS AT 30 in. (76.20 cm) PITCH

NOTE
Layout may vary with optional configuration.

LEGEND
1. Forward baggage compartment 91.00 ft³ (2.58 m³).
2. Rear baggage compartment 365.00 ft³ (10.33 m³).
3. Lavatory.
4. Wardrobe.
5. Flight attendant.
SERIES 400 (MODEL 402) EXTRA CAPACITY INTERIOR CONFIGURATION
86 SEATS AT 29 INCH (73.66 cm) PITCH

NOTE
Layout may vary with optional configurations.

LEGEND
1. Rear baggage compartment 365.00 ft³ (10.33 m³).
2. Lavatory.
3. Wardrobe.
5. Galley.

FORWARD TYPE I EMERGENCY EXIT DOOR
24.00 in. W x 54.00 in. H
(60.96 cm x 1.37 m)

SERVICE DOOR/TYPE I EXIT
24.00 in. W x 54.00 in. H
(60.96 cm x 1.37 m)

TYPE II/III EMERGENCY EXIT DE-ACTIVATED

PASSENGER CABIN LENGTH
61 ft 8 in. (18.80 m)

FORWARD PASSENGER AIRSTAIR DOOR
30.00 in. W x 65.00 in. H
(76.20 cm x 1.65 m)

PAX DOOR/TYPE I EXIT
24.00 in. W x 65.00 in. H
(60.96 cm x 1.65 m)

BAGGAGE DOOR
51.00 in. W x 59.00 in. H
(1.30 m x 1.50 m)
LEGEND
1. Aft cargo compartment
2. Lavatory
3. Wardrobe
4. Flight attendant Seat
5. C1A wardrobe
6. Galley

SERIES 400 (MODEL 925) CARGO COMBI INTERIOR CONFIGURATION
50 SEATS AT 35 INCH (88.90 cm) PITCH

SERIES 400 OPTIONAL INTERIOR CONFIGURATIONS (Sheet 6 of 6)

Figure 2 – 10
NOTE
Layout may vary with optional configurations.

LEGEND
1. Forward baggage compartment
   91.00 ft³ (2.58 m³).
2. Rear baggage compartment
   365.00 ft³ (10.33 m³).
3. Lavatory.
4. Wardrobe.
5. Flight attendant seat.
PASSENGER CABIN LENGTH
61 ft 8 in. (18.80 m)

SERIES 400 (MODEL 402) INTERIOR CONFIGURATION
76 SEATS AT 34, 30 & 29 INCH (86.36, 76.20 & 73.66 cm) PITCH

BAGGAGE DOOR
24.00 in. W x 54.00 in. H
(60.96 cm x 1.37 m)

5 ft 9 in.
(1.75 m)

TYPE II/III EXIT
20.20 in. W x 56.00 in. H
(51.31 cm x 1.42 m)

SERVICE DOOR/TYPE I EXIT
24.00 in. W x 54.00 in. H
(60.96 cm x 1.37 m)

PASSenger CABIN LENGTH
61 ft 8 in. (18.80 m)

AIRSTAIR/TyPE I EXIT
30.00 in. W x 65.00 in. H
(76.20 cm x 1.65 m)

PAX DOOR/TyPE I EXIT
24.00 in. W x 65.00 in. H
(60.96 cm x 1.65 m)

STA X−39.00

STA X701.00

11.00 ft.
(3.35 m)

51.00 in. W x 59.00 in. H
(1.30 m x 1.50 m)

NOTE
Layout may vary with optional configurations.

LEGEND
1. Forward baggage compartment
   91.00 ft³ (2.58 m³).
2. Rear baggage compartment
   365.00 ft³ (10.33 m³).
3. Lavatory.
4. Wardrobe.
5. Flight attendant seat.
NOTE

This dimension is approximate and will vary with aircraft configuration and loading conditions.

GROUND REFERENCE LINE

OVERHEAD STOWAGE BINS
(CAPACITY IS 1.67 ft³ (0.047 m³)/PAX.)

GROUND REFERENCE LINE

PASSENGER COMPARTMENT
(CLASSIC)

PASSENGER COMPARTMENT CROSS SECTION (Sheet 1 of 2)

Figure 2 – 12
OVERHEAD STOWAGE BINS
(CAPACITY IS 1.75 ft³ (0.049 m³)/PAX.)

GROUND REFERENCE LINE

106.0 in.
(2.69 m)

24.1 in.
(0.61 m)

20.4 in.
(0.52 m)

16.0 in.
(0.41 m)

11.1 in.
(0.28 m)

81.9 in.
(2.08 m)

100.1 in.
(2.56 m)

108.8 in.
(2.76 m)

11.37 in. (28.9 cm)

AT DOOR CENTER LINE

NOTE

This dimension is approximate and will vary with aircraft configuration and loading conditions.

PASSENGER COMPARTMENT
(NEXT GEN)

PASSENGER COMPARTMENT CROSS SECTION (Sheet 2 of 2)

Figure 2 – 12
Floor panels that can support a maximum floor loading of 37.5 lb/ft² (183 kg/m²).

Floor panels that can support a maximum floor loading of 75.0 lb/ft² (366 kg/m²).

Floor panels that can support a maximum floor loading of 125.0 lb/ft² (610 kg/m²).

LEGEND

Floor loading diagram (Sheet 1 of 3)

Figure 2 – 13

Chapter 2
Floor panels that can support a maximum floor loading of 37.5 lb/ft² (183 kg/m²).

Floor panels that can support a maximum floor loading of 75.0 lb/ft² (366 kg/m²).

Floor panels that can support a maximum floor loading of 125.0 lb/ft² (610 kg/m²).
AIRPORT PLANNING MANUAL

NOTES

1. The dimensions shown are measured at floor level.

2. Forward baggage compartment and forward baggage door is removed for the extra capacity and cargo combi configuration.

3. Type I emergency exit door is installed in forward RH side for the extra capacity and cargo combi configuration.

The dimensions shown are measured at floor level.

Forward baggage compartment and forward baggage door is removed for the extra capacity and cargo combi configuration.

Type I emergency exit door is installed in forward RH side for the extra capacity and cargo combi configuration.

NOTE

1. 
2. 

Figure 2 – 14

FWD BAGGAGE – COMPARTMENT DIMENSIONS (STANDARD INTERIOR CONFIGURATION)
NOTE
The dimensions shown are measured at floor level.

AFT BAGGAGE COMPARTMENT DIMENSIONS (STANDARD INTERIOR CONFIGURATION)

Figure 2 – 15

Series: 400
NOTE
The dimensions shown are measured at floor level.

AFT BAGGAGE COMPARTMENT DIMENSIONS (OPTIONAL INTERIOR CONFIGURATION)
(Sheet 1 of 2)
Figure 2 – 16
NOTE
The dimensions shown are measured at floor level.

CARGO COMBI CONFIGURATION
AFT BAGGAGE COMPARTMENT DIMENSIONS (OPTIONAL INTERIOR CONFIGURATION)
(Sheet 2 of 2)
Figure 2 – 16
FORWARD–FLOOR TIE–DOWN RINGS (4)
2000 lb (907 kg)

SIDEWALL (AND AFT BULKHEAD) TIE–DOWN RINGS (12)
2000 lb (907 kg)

VIEW LOOKING AFT (NETS AND POLES OMITTED FOR CLARITY)

NETS AND TIE–DOWNS (DETAIL SPEC. CONFIGURATION)

Figure 2 – 17
NETS AND TIE-DOWNS (G3 GALLEY) (Sheet 1 of 3)

Figure 2 – 18

Series: 400
CARGO COMBI CONFIGURATION

VIEW LOOKING DOWN ON AFT BAGGAGE COMPARTMENT
NETS AND TIE-DOWNS (G3 GALLEY) (Sheet 2 of 3)

Figure 2 – 18
NETS AND TIE–DOWNS (G3 GALLEY) (Sheet 3 of 3)
AFT CARGO COMPARTMENT – SPIDER NET ASSEMBLY

Figure 2 – 19
Door Clearances

1. General
   The door clearance sheets provide the door size and location of the passenger, service and baggage compartment doors.

2. The forward passenger (airstair) door opens outwards and downwards and is manually controlled from inside or outside the aircraft.

3. The aft passenger door/Type 1 exit opens inward and upwards, then moves outward and forward.

4. The aft service door/Type 1 exit opens inwards and upwards, then moves outwards and forward.

5. The forward baggage–compartment door opens inward and upward, then moves outwards and forward.

6. The aft baggage–compartment door opens outwards and upwards.

7. For the cargo combi configuration, type III emergency exit doors are installed at station X479.70 on both the sides of the aircraft. The doors are plug type which have to be removed completely for opening. The door is unlocked by the operation of the internal or external handle.
FORWARD PASSENGER – DOOR CLEARANCES

Figure 2 – 20

1. Refer to Ground Clearance illustrations.
2. Dimensions are approximate and will vary with aircraft configuration and loading conditions.
AFT PASSENGER DOOR (OPEN POSITION)

NOTES
1 Refer to Ground Clearance illustrations.
2 Aft passenger door is de-activated for the cargo combi configuration.

AFT PASSENGER – DOOR CLEARANCES (Sheet 1 of 2)

Figure 2 – 21
Aft passenger door is de-activated for the cargo combi configuration.
Refer to Ground Clearance illustrations.

Forward baggage door is installed in lieu of the aft service door and deactivated for the cargo combi configuration.

AFT SERVICE – DOOR CLEARANCES (Sheet 1 of 2)
Forward baggage door is installed in lieu of the aft service door and de-activated for the cargo combi configuration.
Refer to Ground Clearance illustrations.

1. Forward baggage compartment and forward baggage door is removed for the extra capacity and the cargo combi configuration.

2. Forward type I emergency exit door is installed in lieu of forward baggage compartment door for the extra capacity and the cargo combi configuration.

FORWARD BAGGAGE COMPARTMENT/FORWARD TYPE 1 EMERGENCY EXIT – DOOR CLEARANCES (Sheet 1 of 2)

Figure 2 – 23
Forward baggage compartment and forward baggage door is removed for the extra capacity and the cargo combi configuration.

Forward type I emergency exit door is installed in lieu of forward baggage compartment door for the extra capacity and the cargo combi configuration.
AFT BAGGAGE–COMPARTMENT – DOOR CLEARANCES (Sheet 1 of 2)

Figure 2 – 24
NOTE

Refer to Ground Clearance illustrations.

AFT BAGGAGE–COMPARTMENT – DOOR CLEARANCES (Sheet 2 of 2)

Figure 2 – 24
HANDLE IN OPEN POSITION

PUSH TO RELEASE

PULL HANDLE AND TURN TO OPEN

WARNING
KEEP CLEAR OF DOOR
PULL HANDLE OUT AND DOWN TO OPEN SUPPORT DOOR WHILE LOWERING

PULL HANDLE AND TURN TO OPEN

HANDLE IN OPEN POSITION (TYPICAL)

PULL HANDLE AND TURN TO OPEN

Aft passenger door is de-activated for the cargo combi configuration.

EXTERIOR HANDLES (Sheet 1 of 3)

Figure 2 – 25
EXTERIOR FORWARD BAGGAGE DOOR/ EXTERIOR FORWARD TYPE I EMERGENCY EXIT DOOR

PULL HANDLE AND TURN TO OPEN

PULL HANDLE AND TURN TO OPEN

PUSH TO RELEASE

HANDLE IN OPEN POSITION

31.0 in. (78.7 cm)

TURN HANDLE DOWN AND PUSH HATCH IN

NOTES

\[\text{Forward type I emergency exit door is installed only on aircraft with extra capacity and the cargo combi configuration.}\]

\[\text{Type II/III emergency exit door is de-activated for the extra capacity and the cargo combi configuration.}\]

EXTERIOR HANDLES (Sheet 2 of 3)

Figure 2 – 25
EXTERIOR OF AFT SERVICE DOOR

NOTES

4 Forward baggage door is installed in lieu of the aft service door and de-activated for the cargo combi configuration.

5 Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.

EXTERIOR HANDLES (Sheet 3 of 3)

Figure 2 – 25
NOTES

1. Right side of aircraft is shown, left side is identical.

2. Drain mast on left side of each nacelle (viewed from behind the aircraft) protrudes approx. 4 in. (10.2 cm).

3. The minimum clearance between the nacelle (aft MLG doors) and the fuselage is 96 in. (2.44 m). Right side of the aircraft is shown, left side is identical.

4. Aft MLG doors protrude approx. 6 in. (15.2 cm) from both sides of the nacelles.

MINIMUM CLEARANCE BETWEEN NACELLES AND FUSELAGE

Figure 2 – 26
AFT BAGGAGE COMPARTMENT VERTICAL DIMENSIONS (TYPICAL CONFIGURATION)
(Sheet 1 of 2)
Figure 2 – 27
CARGO COMBI CONFIGURATION

AFT BAGGAGE COMPARTMENT VERTICAL DIMENSIONS (TYPICAL CONFIGURATION)
(Sheet 2 of 2)
Figure 2 – 27
### AIRCRAFT DIMENSIONS (Sheet 1 of 3)

**Figure 2 – 28**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>HEIGHT</th>
<th>FEET (ft)</th>
<th>METERS (m)</th>
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<td>VERTICAL STABILIZER (OFF JACKS)</td>
<td>26.7 – 27.2</td>
<td>8.13 – 8.30</td>
</tr>
<tr>
<td>JJ</td>
<td>VERTICAL STABILIZER (ON JACKS)</td>
<td>27.2</td>
<td>8.30</td>
</tr>
<tr>
<td>K</td>
<td>HORIZONTAL STABILIZER (OFF JACKS)</td>
<td>25 – 26</td>
<td>7.62 – 7.92</td>
</tr>
<tr>
<td>KK</td>
<td>HORIZONTAL STABILIZER (ON JACKS)</td>
<td>26.7</td>
<td>8.13</td>
</tr>
<tr>
<td>A</td>
<td>TAIL (OFF JACKS)</td>
<td>11.8</td>
<td>3.60</td>
</tr>
<tr>
<td>AA</td>
<td>TAIL (ON JACKS)</td>
<td>13 – 13.9</td>
<td>3.96 – 4.24</td>
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<tr>
<td>G</td>
<td>SILL OF AFT BAGGAGE DOOR (OFF JACKS)</td>
<td>5.06</td>
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<tr>
<td>GG</td>
<td>SILL OF AFT BAGGAGE DOOR (ON JACKS)</td>
<td>5.7</td>
<td>1.74</td>
</tr>
</tbody>
</table>

**NOTES**

1. K and KK values are through C/L of horizontal stabilizer.

2. Dimensions are approximate and will vary with aircraft configuration and loading conditions.
Dimensions are approximate and will vary with A/C configuration and loading conditions.

**AIRCRAFT EMPENNAGE – PLATFORM WORKING HEIGHTS**

**NOTE**

AIRCRAFT DIMENSIONS (Sheet 2 of 3)

Figure 2 – 28
EMERGENCY EXIT LOCATIONS AND ELEVATIONS

AIRCRAFT DIMENSIONS (Sheet 3 of 3)

Figure 2 – 28

<table>
<thead>
<tr>
<th>ITEM</th>
<th>FEET (ft)</th>
<th>METERS (m)</th>
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</thead>
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<td>B</td>
<td>12.83</td>
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<tr>
<td>C</td>
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<td>D</td>
<td>3.61</td>
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<td>4.11</td>
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<td>8.33</td>
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<td>5.07</td>
<td>1.55</td>
</tr>
<tr>
<td>H</td>
<td>5.07</td>
<td>1.55</td>
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<td>J</td>
<td>4.08</td>
<td>1.24</td>
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<tr>
<td>K</td>
<td>3.82</td>
<td>1.16</td>
</tr>
<tr>
<td>L</td>
<td>10.75</td>
<td>3.28</td>
</tr>
</tbody>
</table>
CHAPTER 3

AIRCRAFT PERFORMANCE
1. General

This chapter contains the performance data of the Dash–8 Series 400 (Model 402) aircraft as required for airport planning purposes. This data reflects the performance levels of the Dash–8 Series 400, Performance Data (July 1999).

2. The various definitions used in this Chapter are as follows:

A. Maximum Structural Weights

As found in the July 1999 Performance Data, the maximum structural take–off weight is 63,750 lbs (28,916 kg), and the maximum landing weight is 61,250 lbs (27,782 kg).

B. WAT Limits

The maximum permissible take–off weight (refer to Figure 3–2, Figure 3–3 and Figure 3–4) and landing weight (refer to Figure 3–8, Figure 3–9 and Figure 3–10) are based on the climb requirements of FAR 25 (one engine inoperative).

C. Take–off Runway Length

The take–off runway length shown in Figure 3–5, Figure 3–6 and Figure 3–7 is the longest of:

– The accelerate–stop distance
– The take–off distance to 35 feet altitude with one engine inoperative at V1
– 1.15 times the all engine–operating take–off distance to 35 feet altitude.

D. Landing Runway Length

The landing runway length required in Figure 3–14 is the unfactored landing distance (refer to Figure 3–11, Figure 3–12 and Figure 3–13) multiplied by an operational factor of 1.67 (or 1/0.6) or 1.43 (or 1/0.7). The unfactored landing distance is based on an approach speed of 1.3 Vs and a screen height of 50 feet.

E. Retardation Devices

The retardation devices that follow are used:

(1) Accelerate–Stop

(a) Maximum main–wheel anti–skid braking.
(b) One propeller in the DISC position, the other one is feathered.
(c) Roll spoilers are extended.

(2) Landing
(a) Maximum main-wheel anti-skid braking.
(b) One propeller in the DISC position, the other one is feathered.
(c) Roll spoilers are extended.

F. Standard Day Temperatures

The table that follows shows the standard day temperatures that are used in this Chapter.

<table>
<thead>
<tr>
<th>STANDARD DAY TEMPERATURES</th>
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<td>ELEVATION</td>
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<td>0</td>
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<tr>
<td>2000</td>
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<td>4000</td>
</tr>
<tr>
<td>6000</td>
</tr>
<tr>
<td>8000</td>
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<tr>
<td>10,000</td>
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</table>
Figure 3 – 1

PAYLOAD/RANGE AT MAXIMUM CRUISE RATING AND LONG RANGE CRUISE
AIRPORT PLANNING MANUAL

MAXIMUM PERMISSIBLE TAKE-OFF WEIGHT (WAT LIMIT) – FLAPS 5 DEGREES

Figure 3 – 2
MAXIMUM PERMISSIBLE TAKE-OFF WEIGHT (WAT LIMIT) – FLAPS 10 DEGREES

Figure 3 – 3
MAXIMUM PERMISSIBLE TAKE-OFF WEIGHT (WAT LIMIT) – FLAPS 15 DEGREES

Figure 3 – 4
TAKE-OFF FIELD LENGTH – FLAP 5°

ASSOCIATED CONDITIONS
1. DRY, HARD, LEVEL RUNWAY SURFACE, ZERO WIND.
2. BOTH ENGINES AT NORMAL TAKEOFF POWER TO VEF, THEREAFTER MAX TAKEOFF POWER ON OPERATING ENGINE.
3. RETARDATION IN ACC.STOP: MAXIMUM MAIN WHEEL ANTI-SKID BRAKING, PROPELLERS AT DISC, ROLL SPOILERS EXTENDED.

OUTSIDE AIR TEMPERATURE – °C

WEIGHT – 1000 LB

TAKE-OFF RUNWAY LENGTH REQUIREMENTS – FLAPS 5 DEGREES

Figure 3 – 5
TAKE-OFF FIELD LENGTH – FLAP 10°

ASSOCIATED CONDITIONS
1. DRY, HARD, LEVEL RUNWAY SURFACE, ZERO WIND.
2. BOTH ENGINES AT NORMAL TAKEOFF POWER TO VEF,
   THEREAFTER MAX TAKEOFF POWER ON OPERATING ENGINE.
3. RETARDATION IN ACC.STOP: MAXIMUM MAIN WHEEL ANTI-
   SKID BRAKING, PROPELLERS AT DISC,
   ROLL SPOILERS EXTENDED.

TAKE-OFF RUNWAY LENGTH REQUIREMENTS – FLAPS 10 DEGREES

Figure 3 – 6
TAKE-OFF FIELD LENGTH – FLAP 15°

ASSOCIATED CONDITIONS
1. DRY, HARD, LEVEL RUNWAY SURFACE, ZERO WIND.
2. BOTH ENGINES AT NORMAL TAKEOFF POWER TO VFE. THEREAFTER MAX TAKEOFF POWER ON OPERATING ENGINE.
3. RETARDATION IN ACC.STOP: MAXIMUM MAIN WHEEL ANTI-SKID BRAKING, PROPELLERS AT DISC, ROLL SPOILERS EXTENDED.

TAKE-OFF RUNWAY LENGTH REQUIREMENTS – FLAPS 15 DEGREES

Figure 3 – 7
MAX. LANDING WEIGHT – LANDING FLAPS 10° AND APPROACH FLAPS 5° DEGREES

Figure 3 – 8
MAX. LANDING WEIGHT – LANDING FLAPS 15° AND APPROACH FLAPS 10 DEGREES

Figure 3 – 9
MAX. LANDING WEIGHT – LANDING FLAPS 35° AND APPROACH FLAPS 15 DEGREES

Figure 3 – 10
UNFACTORED LANDING DISTANCE

FLAP 10°

UNFACTORED LANDING DISTANCE - FLAPS 10 DEGREES

Figure 3 - 11

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AIRPORT PLANNING MANUAL

UNFACTORED LANDING DISTANCE

FLAP 15°

UNFACTORED LANDING DISTANCE – FLAPS 15 DEGREES

Figure 3 - 12
AIRPORT PLANNING MANUAL

UNFACTORED LANDING DISTANCE

FLAP 35°

Figure 3 – 13

UNFACTORED LANDING DISTANCE – FLAPS 35 DEGREES

Series: 400

CHAPTER 3

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May 28/2001
General Information

1. This Chapter supplies data on the items that follow:
   - Aircraft turning capability (refer to Figure 4–1, Figure 4–2 and Figure 4–3)
   - Visibility from cockpit (Note, this information is not available at this time)
   - Maneuvering characteristics (refer to Figure 4–4, Figure 4–5, Figure 4–6 and Figure 4–7)
   - Mooring data (refer to Figure 4–8).

2. This data has been determined from the theoretical limits imposed by the geometry of the aircraft and includes normal allowance for tire slippage (as indicated). The purpose of this Chapter is to show the turning capability of the aircraft in favorable operating conditions (without the use of reverse thrust or differential braking). Use this data only as a guideline.

3. It is possible that each airline will use more conservative turning procedures to avoid excessive tire wear and possible maintenance problems. The operating techniques of each airline will be different and may be modified because of these physical factors within the maneuvering area:
   - Adverse grades
   - Limited area
   - High risk of jet engine exhaust or propeller slipstream damage.

4. Because of these reasons the airport planner must coordinate the ground maneuvering data with the user airline for airport layout plan.
TURNING CENTER FOR NOSE–GEAR TURNING ANGLE. (TYPICAL)

NOSE–GEAR AXLE PROJECTION–LINE. (TYPICAL)

R–1 (Inner).
R–2 (Outer Gear).
R–3 (Nose Gear).
R–4 (Wing Tip).
R–5 (Nose).
R–6 (Tail).

Dimension "C" Typical. Refer to table for distance of individual points from aircraft center line.

TURNING RADI (NO SLIP ANGLE)

Figure 4 – 1
## TURNING RADIUS DATA (NO SLIP ANGLE)

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<th>STEERING ANGLE (DEGREES)</th>
<th>R-1 INNER GEAR</th>
<th>R-2 OUTER GEAR</th>
<th>R-3 NOSE GEAR</th>
<th>R-4 WING TIP</th>
<th>R-5 NOSE</th>
<th>R-6 TAIL</th>
<th>DIMENSION &quot;C&quot;</th>
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<td>m</td>
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<td>85</td>
<td>-144.29</td>
<td>-12.90</td>
<td>202.34</td>
<td>-13.50</td>
<td>218.25</td>
<td>-13.50</td>
<td>250.50</td>
</tr>
</tbody>
</table>

**NOTE**

The actual operating data will be greater than the values shown because tire slippage is not considered.

The airport planner must consult with the user airline for specific operating procedures.
NOTES

1. Dimensions noted are for dry, hard, level surfaces at these tire pressures:
   227 psi (loaded), 32 x 8.8–16 standard main–wheel tires, and 89 psi (loaded)
   for 22 x 6.50–10 standard nose–wheel tires.
2. Nose gear steering limit is approximately 70° left and right.
3. Slip angle of 2° is approximate only and may vary with
   aircraft configuration, loading and tire wear.
4. Dimensions given for maneuvering clearance and turning
   radii are minimum recommended limits.
5. Tire pressures shown are for calculation purposes only.
   Refer to AMM Ch. 12 for service pressures.

TURNING RADIUS AT MINIMUM POWER

Figure 4 – 3
The airport planner must consult with the user airline for specific operating procedures.
NOTE
The airport planner must consult with the user airline for specific operating procedures.

90 DEGREE TURN – RUNWAY TO TAXIWAY WITH NOSE GEAR AND COCKPIT TRACKS

Figure 4 – 5
NOTE
The airport planner must consult with the user airline for specific operating procedures.

Figure 4 – 6
90 DEGREE TURN – TAXIWAY TO TAXIWAY WITH NOSE GEAR AND COCKPIT TRACKS
Figure 4 – 7

- **Holding Apron**
  - 20 ft (6.10 m) MIN.
  - 100 ft (30.48 m) RADIUS
  - 38 ft (11.58 m) MINIMUM CLEARANCE OF MOVING AIRCRAFT
  - MAIN GEAR CENTER LINE TRACKS (PORT & STARBOARD)
  - 23 ft (7.01 m) MIN.
  - 75 ft (22.86 m) TAXIWAY WIDTH
  - 150 ft (45.72 m) RUNWAY WIDTH

**Scale**

<table>
<thead>
<tr>
<th>Scale</th>
<th>0</th>
<th>25</th>
<th>50</th>
<th>75</th>
<th>100 ft</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>m</td>
</tr>
</tbody>
</table>

**Runway Holding Bay (Apron)**

- **Series: 400**
- **Page 8**

**CHAPTER 4**

May 28/2001
1. Left MLG similar.
2. Protect gear with foam rubber or clean cotton cloths, etc.

NOTES

1. Protective spool.
2. Rope.
3. Attachments rings.

LEGEND

1. Protective spool.
2. Rope.
3. Attachments rings.

AIRCRAFT TIE DOWN PROVISIONS (Sheet 1 of 2)

Figure 4 – 8
Figure 4 – 8

AIRCRAFT TIE DOWN PROVISIONS (Sheet 2 of 2)

TOW SPOOLS

BUNGEE CORD

APPROX. 3 ft (1 m)

APPROX. 3 ft (1 m)
CHAPTER 5

TERMINAL SERVICING
General Information

1. This chapter supplies ground service information for the Dash–8 Series 400.
   A. A typical servicing arrangement (no APU) is shown in Figure 5–1.
   B. Terminal operations are shown in Figure 5–2 and Figure 5–3.
   C. Locations of ground servicing points are shown in Figure 5–4.
   D. Data about the ground service connections is shown in Figure 5–5.
   E. The ground–power electrical requirements for engine starting are shown in Figure 5–6.
   F. Ground towing requirements are shown in Figure 5–7.
   G. Ground air conditioning requirements for pre conditioned airplane are shown in Figure 5–8.
LEGEND
1. Fuel truck.
2. Cabin and buffet service vehicle.
3. Ground air-conditioning unit
   (not required, if optional APU is installed).
4. Tractor with baggage carts.
5. Portable stairway.
6. DC electrical–power unit.
7. Towing tractor (if required).
8. Toilet service vehicle.
9. AC electrical–power unit.
   (if required, for maintenance activities).

NOTES

1. Zone around fuel vents – keep clear during refuelling.
2. For option 824CH00114, 824SO90105.

AIRCRAFT SERVICING ARRANGEMENT (STANDARD CONFIGURATION)

Figure 5 – 1
LEGEND
1. Fuel truck.
2. Cabin and buffet service vehicle.
3. Ground air-conditioning unit
   (not required, if optional APU is installed).
4. Tractor with baggage carts.
5. Portable stairway.
6. DC electrical–power unit.
7. Towing tractor (if required).
8. Toilet service vehicle.
9. AC electrical–power unit.
   (if required, for maintenance activities).

NOTES
1. Zone around fuel vents – keep clear during refuelling.
2. For option 824CH00114, 824SO90105.

AIRCRAFT SERVICING ARRANGEMENT (EXTRA CAPACITY CONFIGURATION)
AIRCRAFT SERVICING ARRANGEMENT (TYPICAL – NO APU) (Sheet 2 of 4)

Figure 5 – 1
LEGEND
1. Fuel truck.
2. Cabin and buffet service vehicle.
3. Ground air–conditioning unit
   (not required, if optional APU is installed).
4. DC electrical–power unit.
5. Towing tractor (if required).
6. Toilet service vehicle.
7. AC electrical–power unit.
   (if required, for maintenance activities).
8. Tractor with baggage carts.

NOTES
1. Zone around fuel vents – keep clear during refuelling.
2. For option 824CH00114, 824SO90105.

AIRCRAFT SERVICING ARRANGEMENT (CARGO COMBI CONFIGURATION)
AIRCRAFT SERVICING ARRANGEMENT (TYPICAL – NO APU) (Sheet 3 of 4)

Figure 5 – 1
### SYSTEM | ADAPTER
--- | ---
PRESSURE REFUELING | MS 24484–2
DC ELECTRICAL POWER | MS 3506–1 (AIRCRAFT CONNECTOR); MS 25488 (MATING GROUND CONNECTOR)
AC ELECTRICAL POWER | CANNON CE9310–10 (AIRCRAFT CONNECTOR) CE9183 (MATING GROUND CONNECTOR)
GROUND AIR CONDITIONING | MS 33562 8.00 in. (20.32 cm); RECEPTACLE (OPTIONAL INSTALLATION)
TOILET SERVICING | MS 2651–133 ROYLYN ‘Y’ DRAIN COUPLING PLUS STANDARD 1.00 in. (2.54 cm) FILLPORT
GROUND CREW INTERPHONE | 300 OHM IMPEDANCE THROAT MICROPHONE WITH SWITCH – AIRCRAFT CONNECTOR 72340012–001 (SWITCHCRAFT C–55B); MATING GROUND CONNECTOR PF051B (NATO 4–WAY JACK PLUG)

### HYDRAULIC SYSTEM

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SIZE</th>
<th>EQUIPMENT INTERFACE DETAILS</th>
<th>AIRCRAFT INTERFACE DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRAULIC POWER UNIT (PRESSURE)</td>
<td>8</td>
<td>AE99111H</td>
<td>AE81618H AE9110H AE81617H</td>
</tr>
<tr>
<td>HYDRAULIC POWER UNIT (RETURN)</td>
<td>10</td>
<td>AE99140J</td>
<td>AE80660J AE99139J AE81724J</td>
</tr>
<tr>
<td>HYDRAULIC SERVICING/REPLENISHING DISPENSER</td>
<td>4</td>
<td>AE99140E</td>
<td>AE80660E AE99149E AE81724E</td>
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**AIRCRAFT SERVICING ARRANGEMENT (TYPICAL – NO APU)** (Sheet 4 of 4)

Figure 5 – 1
### ACTIVITY

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<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park on ramp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Passengers deplane (fwd door)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(aft door)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unload baggage (aft compt.)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td>Service toilet</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load baggage (aft compt.)</td>
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<tr>
<td>(fwd compt.)</td>
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<td></td>
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</tr>
<tr>
<td>Passengers enplane (fwd door)</td>
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### DEFINITION

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<td>Unload baggage</td>
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<td>Service toilet</td>
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<tr>
<td>Load baggage</td>
</tr>
<tr>
<td>Passenger enplane</td>
</tr>
<tr>
<td>Clear ramp</td>
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</tbody>
</table>

### NOTE

Forward baggage compartment and forward baggage door are removed for the extra capacity and cargo combi configuration.

**RAPID TURNAROUND USING FORWARD AND AFT DOORS**

Figure 5 – 2
Forward baggage compartment and forward baggage door are removed for the extra capacity and cargo combi configuration.

Rapid Turnaround Using Forward Door Only

Figure 5 – 3
LEGEND

1. Forward passenger door.
2. Aft baggage door.
3. Forward baggage door.
4. Type II/III emergency exit.
5. Aft passenger door.
6. Flight compartment emergency exit.
7. Interphone connectors (3).
8. Lavatory service/optional wash water service.
9. Galley service door/type I emergency exit.
10. Optional auxiliary power unit (APU).
11. Optional conditioned air connection.
12. Electrical DC power receptacle.
13. Electrical AC power receptacle (optional installation on right nose fuselage).
14. Pressure refueling panel and ground point.
15. Ground point (over wing–both sides).
16. Aircraft ground point (on undercarriage–both sides).
17. Gravity fuel filler (over wing–both sides).
18. Magnastick (fuel quantity–under wing–both sides).
19. Engine oil filler panel.
20. No.1 Hydraulic system.
21. No.2 Hydraulic system.
22. No.3 Hydraulic system.
23. Brake accumulator and hydraulic hand pump.
24. Emergency landing gear hydraulic reservoir and hand pump.
25. Nose landing gear shock strut charging point.
26. Main landing gear shock strut charging point (under nacelle–both sides).
27. Nose jacking point.
28. Wing jacking point (under wing–both sides).
29. Nose landing gear jacking point.
30. Main landing gear jacking point (both sides).
31. Crew oxygen supply.
32. Avionics bay.
33. Wardrobe.
34. Optional galley water service.

GROUND SERVICING POINT LOCATIONS (STANDARD CONFIGURATION)
GROUND SERVICING POINT LOCATIONS (Sheet 2 of 6)

Figure 5 – 4
GROUND SERVICING POINT LOCATIONS (EXTRA CAPACITY CONFIGURATION)

Figure 5 – 4
1. Forward passenger door.
2. Aft baggage door.
3. Forward type I emergency exit door.
4. Aft passenger door.
5. Flight compartment emergency exit.
6. Interphone connectors (3).
7. Lavatory service/optional wash water service.
8. Galley service door/type I emergency exit.
9. Optional auxiliary power unit (APU).
10. Optional conditioned air connection.
11. Electrical DC power receptacle.
12. Electrical AC power receptacle (optional installation on right nose fuselage).
13. Pressure refueling panel and ground point.
14. Ground point (overwing–both sides).
15. Aircraft ground point (on undercarriage–both sides).
17. Magnastick (fuel quantity–underwing–both sides).
18. Engine oil filler panel.
19. No.1 Hydraulic system.
20. No.2 Hydraulic system.
21. No.3 Hydraulic system.
22. Brake accumulator and hydraulic hand pump.
23. Emergency landing gear hydraulic reservoir and hand pump.
24. Nose landing gear shock strut charging point.
25. Main landing gear shock strut charging point (under nacelle–both sides).
27. Wing jacking point (underwing–both sides).
28. Nose landing gear jacking point.
29. Main landing gear jacking point (both sides).
30. Crew oxygen supply.
31. Avionics bay.
32. Wardrobe.
33. Optional galley water service.
GROUND SERVICING POINT LOCATIONS (CARGO COMBI CONFIGURATION)

GROUND SERVICING POINT LOCATIONS (Sheet 5 of 6)

Figure 5 – 4

Series: 400
1. Forward passenger door.
2. Aft baggage door.
3. Forward type I emergency exit door.
4. Aft passenger door.
5. Flight compartment emergency exit.
6. Interphone connectors (3).
7. Lavatory service/optional wash water service.
8. Type I exit/aft service door.
9. Optional auxiliary power unit (APU).
10. Optional conditioned air connection.
11. Electrical DC power receptacle.
12. Electrical AC power receptacle (optional installation on right nose fuselage).
13. Pressure refueling panel and ground point.
14. Ground point (overwing–both sides).
15. Aircraft ground point (on undercarriage–both sides).
17. Magnastick (fuel quantity–underwing–both sides).
18. Engine oil filler panel.
19. No.1 Hydraulic system.
20. No.2 Hydraulic system.
21. No.3 Hydraulic system.
22. Brake accumulator and hydraulic hand pump.
23. Emergency landing gear hydraulic reservoir and hand pump.
24. Nose landing gear shock strut charging point.
25. Main landing gear shock strut charging point (under nacelle–both sides).
27. Wing jacking point (underwing–both sides).
28. Nose landing gear jacking point.
29. Main landing gear jacking point (both sides).
30. Crew oxygen supply.
31. Avionics bay.
32. Wardrobe.
33. Type III emergency exit door.
34. C1A Wardrobe.
35. Type II/III emergency exit door.
36. Optional galley water service.

NOTES

1. Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.
2. The aft passenger door is de–activated for the cargo combi configuration.
3. Forward baggage door is installed in lieu of aft service door and de–activated for the cargo combi configuration.
4. Type II/III emergency exit door is de–activated for the cargo combi configuration.
<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>DISTANCE AFT OF NOSE</th>
<th>DISTANCE FROM AIRCRAFT CENTER LINE</th>
<th>HEIGHT FROM GROUND</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>FT</td>
<td>M</td>
<td>FT</td>
</tr>
<tr>
<td><strong>LEFT SIDE</strong></td>
<td><strong>RIGHT SIDE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic System (Phosphate–Ester Based Hydraulic–Fluid)</td>
<td></td>
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</tr>
<tr>
<td>3 Service Points</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Access door on inboard L/H nacelle for No. 1 Hyd. System (reservoir capacity is 8 U.S. quarts, (7.57 L)</td>
<td>52 ft 2 in.</td>
<td>15.9 m</td>
<td>12 ft 11 in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Access door on inboard R/H nacelle for No. 2 Hyd. System (reservoir capacity is 12 U.S. quarts, (11.35 L)</td>
<td>52 ft 2 in.</td>
<td>15.9 m</td>
<td>15 ft 11 in.</td>
</tr>
<tr>
<td>– No. 3 Hyd. System reservoir (located in aft fuselage, 2 U.S. quarts, 1.89 L)</td>
<td>90 ft 8 in.</td>
<td>27.6 m</td>
<td>1 ft 8 in.</td>
</tr>
<tr>
<td>Electrical System</td>
<td></td>
<td></td>
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<tr>
<td>2 Service Connections</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– 28 volt DC External Power Receptacle (capacity is 550 A continuous, 2000 A peak)</td>
<td>4 ft 11 in.</td>
<td>1.51 m</td>
<td>2 ft 6 in.</td>
</tr>
<tr>
<td>Nacelle Location</td>
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<td></td>
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</tr>
<tr>
<td>– 115/200 volt A/C External Power Receptacle (capacity is 20 KVA MIN.,3–PH.,400Hz)</td>
<td>51 ft 11 in.</td>
<td>15.8 m</td>
<td>12 ft 11 in.</td>
</tr>
<tr>
<td>Nose Fuselage Location</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>– 115/200 volt A/C External Power Receptacle (capacity is 20 KVA MIN.,3–PH.,400Hz)</td>
<td>4 ft 11 in.</td>
<td>1.51 m</td>
<td>2 ft 6 in.</td>
</tr>
<tr>
<td>Oxygen System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Service Connection</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Charging valve for one 39.8 ft³ (1100 L) Capacity Crew Supply (in nose compartment)</td>
<td>4 ft 6 in.</td>
<td>1.37 m</td>
<td>1 ft 7 in.</td>
</tr>
<tr>
<td>Three 11.0 ft³ (311L) portable passenger cylinders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One 11.0 ft³ (311L) first–aid portable cylinder (optional)</td>
<td></td>
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</tr>
</tbody>
</table>

**NOTES**

1. These measurements are approximate.

2. These measurements are approximate and will vary with aircraft configuration and loading conditions.

3. For option 824CH00114 and 824SO90105.

GROUND SERVICE CONNECTIONS DATA (Sheet 1 of 3)

Figure 5 – 5
<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>DISTANCE AFT OF NOSE</th>
<th>DISTANCE FROM AIRCRAFT CENTER LINE</th>
<th>HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FT</td>
<td>M</td>
<td>FT</td>
</tr>
<tr>
<td>Fuel System</td>
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<td></td>
</tr>
<tr>
<td>3 Service Points</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–One Single–Point Refuel/Defuel Adapter (on Refuel/Defuel Panel)</td>
<td>58 ft 7 in.</td>
<td>17.8 m</td>
<td>14 ft 5 in.</td>
</tr>
<tr>
<td>–Two over–wing Gravity Filling–Points (one on each wing)</td>
<td>49 ft 0 in.</td>
<td>14.9 m</td>
<td>34 ft 8 in.</td>
</tr>
<tr>
<td>–2 pairs of Fuel Vents (one pair under each wing)</td>
<td>49 ft 0 in.</td>
<td>14.9 m</td>
<td>34 ft 8 in.</td>
</tr>
<tr>
<td>Landing Gear System</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3 Servicing Points (Nitrogen)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–One Shock–Strut Valve on each Main Gear</td>
<td>51 ft 9 in.</td>
<td>15.8 m</td>
<td>14 ft 5 in.</td>
</tr>
<tr>
<td>–One Shock–Strut Valve on Nose Gear</td>
<td>6 ft 2 in.</td>
<td>1.88 m</td>
<td>3 ft 11 in.</td>
</tr>
<tr>
<td>–Charging Valve for Parking Brake Accumulator (behind access panel on R/H fuselage at wing root).</td>
<td>52 ft 4 in.</td>
<td>15.9 m</td>
<td>3 ft 11 in.</td>
</tr>
<tr>
<td>1 Servicing Point (Phosphate–Ester Based Hydraulic–Fluid).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–Filling Point for reservoir of Alternate Landing–Gear Extension–System (in nose compartment) (1 U.S. quarts, 0.95 L)</td>
<td>4 ft 6 in.</td>
<td>1.37 m</td>
<td>2 ft 4 in.</td>
</tr>
</tbody>
</table>

These measurements are approximate.

These measurements are approximate and will vary with aircraft configuration and loading conditions.
<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>DISTANCE AFT OF NOSE</th>
<th>DISTANCE FROM AIRCRAFT CENTER LINE</th>
<th>HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LEFT SIDE</td>
<td>RIGHT SIDE</td>
<td>LEFT SIDE</td>
</tr>
<tr>
<td>Air Conditioning System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Air Conditioning ground connection (optional)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- One 8 inch (20.3 cm) receptacle (on R/H side of aft fuselage)</td>
<td>86 ft 4 in.</td>
<td>26.3 m</td>
<td></td>
</tr>
<tr>
<td>Toilet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Service Point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1 Service connection on Lavatory Service Panel (capacity of toilet flush reservoir is 3.3 U.S. gallons (13 L))</td>
<td>14 ft 1 in.</td>
<td>4.29 m</td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Servicing Points</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Oil Filter behind access door on L/H side of each nacelle (tank capacity is 5.9 U.S. gallons (22.3 L))</td>
<td>40 ft 11 in.</td>
<td>12.5 m</td>
<td>15 ft 11 in.</td>
</tr>
</tbody>
</table>

1 These measurements are approximate.
2 These measurements are approximate and will vary with aircraft configuration and loading conditions.
LEGEND
1. External DC power receptacle.
2. Battery installation.
3. DC contactor box (includes start control relays).
4. Overhead console panel.
5. Ignition box.

<table>
<thead>
<tr>
<th>NOMINAL STARTING VOLTAGE (VDC)</th>
<th>ENGINE START CURRENT REQUIRED FROM GROUND DC POWER CART (AMPS)</th>
<th>CORRESPONDING DURATION OF CRANKING (SECONDS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>1200–1400</td>
<td>2–3</td>
</tr>
<tr>
<td></td>
<td>600–800</td>
<td>5</td>
</tr>
<tr>
<td>400</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

NOTE: SET THE GROUND DC POWER CART LIMIT TO 1500 AMPS MINIMUM.

ELECTRICAL REQUIREMENTS FOR ENGINE STARTING

Figure 5 – 6
**EXAMPLE:**

At an aircraft gross weight of 50,000 lb (22,676 kg), an uphill slope of 2% and with a wet concrete surface, the corresponding draw bar pull or push required is 3,000 lb (1,360 kg) and the total traction wheel load is 5,250 lb (2,381 kg).
NOTE
Acceptable limits within shaded area.

GROUND AIR CONDITIONING REQUIREMENTS – PRE CONDITIONED AIR

Figure 5 – 8

Series: 400

CHAPTER 5
Jan 05/2017
AIRPORT PLANNING MANUAL

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CHAPTER 6

OPERATING CONDITIONS
AND NOISE DATA
General Information

1. Aircraft operating conditions and noise are important to airport and community planners. While an airport is a major element in an community transportation system and is vital to its growth, it must be a good neighbor. This can only be accomplished with proper planning. Because aircraft noise extends beyond the boundaries of the airport, it is vital to consider the impact on surrounding communities.

2. The Dash−8, Series 400 aircraft is designed with advanced, quiet, turboprop technology. Its noise impact is minimal compared to most aircraft, larger and smaller, currently being operated in a typical airport.

3. To help the airport planner to estimate the impact of the Dash−8 Series 400 on airport operations, the following material is provided:

   A. Engine Exhaust Temperature Contours

      (1) Data on the exhaust temperature contours at ground idle, flight idle and take−off power settings are shown in Figure 6−1, Figure 6−2, Figure 6−3, Figure 6−4, Figure 6−5 and Figure 6−6.

   B. Airport and Community Noise Data for Powerplants

      (1) Data on the takeoff and landing noise footprints for the PW150A powerplants are shown in Figure 6−7 and Figure 6−8.

      (2) The Dash−8, Series 400 complies with the Stage 3 noise−level limits under the trade−off clause specified in FAR 36, Section C36.5b and also under AWM 516 and JAR 36 standards. A summary of the certified noise levels, measured and corrected to these standards, is shown in the table that follows:

<table>
<thead>
<tr>
<th></th>
<th>FAR 36 Stage 3 Noise Limit (EPNdB)</th>
<th>Dash−8 Series 400 Noise Level (EPNdB)</th>
<th>Margin (EPNdB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take−off</td>
<td>89</td>
<td>78.3</td>
<td>+10.7</td>
</tr>
<tr>
<td>Lateral</td>
<td>94</td>
<td>84.2</td>
<td>+9.8</td>
</tr>
<tr>
<td>Approach</td>
<td>98</td>
<td>94.9</td>
<td>+3.1</td>
</tr>
</tbody>
</table>

   C. Community Noise Data for Optional APU

      (1) The results of ramp noise tests for the optional APU are shown in Figure 6−9.

      NOTE: Exhaust temperature contours for the optional APU are not available at this time.

   D. Propeller/Engine Slipstream Velocity Contours

      (1) Data on the Propeller/Engine slipstream velocity contours as on ground (18% and 43% torque) and at maximum takeoff power settings are shown in Figure 6−10, and Figure 6−11.
Figure 6 – 1

ENGINE EXHAUST TEMP. CONTOURS AT GROUND IDLE – TOP VIEW

ASSOCIATED CONDITIONS:
1. ALL TEMPERATURES IN °C.
2. SEA LEVEL, ZERO WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

AIRCRAFT SYMMETRY PLANE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

TOP VIEW – GROUND IDLE

DISTANCE DOWNSTREAM FROM NOZZLES (ft)

EXHAUST NOZZLES (ft)

ENGINE SYMMETRY PLANE

ASSOCIATED CONDITIONS:
1. WEEKEND, HOLIDAY
2. SEA LEVEL, WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.
ASSOCIATED CONDITIONS:
1. ALL TEMPERATURES IN °C.
2. SEA LEVEL, ZERO WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

ENGINE EXHAUST TEMP. CONTOURS AT GROUND IDLE – SIDE VIEW

Figure 6 – 2
ASSOCIATED CONDITIONS:

1. ALL TEMPERATURES IN °C.
2. SEA LEVEL, ZERO WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.
ASSOCIATED CONDITIONS:
1. ALL TEMPERATURES IN °C.
2. SEA LEVEL, ZERO WIND, ISA DAY.
3. 660 RPM NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

ENGINE EXHAUST TEMP. CONTOURS AT FLIGHT IDLE – SIDE VIEW

Figure 6 – 4
ASSOCIATED CONDITIONS:
1. ALL TEMPERATURES IN °C.
2. SEA LEVEL, ZERO WIND, ISA DAY.
3. 100 % NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

ENGINE EXHAUST TEMP. CONTOURS AT MAX. T.O. POWER – TOP VIEW

Figure 6 – 5
ASSOCIATED CONDITIONS:
1. ALL TEMPERATURES IN °C.
2. SEA LEVEL, ZERO WIND, ISA DAY.
3. 100 % NP.
4. ZERO PROPELLER PRESSURE RISE ASSUMED.

ENGINE EXHAUST TEMP. CONTOURS AT MAX. T.O. POWER – SIDE VIEW

Figure 6 – 6

Series: 400
ASSOCIATED CONDITIONS: 1. SEA LEVEL, ISA + 10°C, ZERO WIND.
   2. TAKEOFF WT. − 63,250 lb (28,750 kg).
   3. LANDING WT. − 61,250 lb (27,841 kg).

1 in. = 6000 ft.

SCALE:

DISTANCE FROM RUNWAY THRESHOLD − 1000 FT

9.2 % CLIMB GRADIENT AT MAX. CLIMB POWER

15.81 % TAKEOFF GRADIENT AT 11020 RPM

CUTBACK ALTITUDE 1000 ft

3 DEGREES APPROACH

AT 850 RPM

35 DEG. FLAPS

1000 m

AREA ENCLOSED

(SQ. MILES)

2.677
1.262
0.575
0.271

(SQ. KM)

6.933
3.269
1.490
0.702

TAKEOFF AND LANDING NOISE FOOTPRINT − 3 DEGREE APPROACH

Figure 6 – 7
ASSOCIATED CONDITIONS:
1. SEA LEVEL. ISA + 10°C, ZERO WIND.
2. TAKEOFF WT. - 63,250 lb (28,750 kg).
3. LANDING WT. - 61,250 lb (27,841 kg).

1 in. = 6000 ft.

SCALE:
(SQ. KM) 0.652 1.369 2.975 6.166
(SQ. MILES) 0.252 0.529 1.149 2.381

Figure 6 – 8

TAKEOFF AND LANDING NOISE FOOTPRINT – 4 DEGREES APPROACH
AIRPORT PLANNING MANUAL

APU / ECS NOISE READINGS

<table>
<thead>
<tr>
<th>POSITION</th>
<th>dB(A)</th>
<th>POSITION</th>
<th>dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70</td>
<td>16</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>84</td>
<td>17</td>
<td>78</td>
</tr>
<tr>
<td>3</td>
<td>79</td>
<td>18</td>
<td>76</td>
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<tr>
<td>4</td>
<td>82</td>
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<td>6</td>
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<td>8</td>
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<td>24</td>
<td>67</td>
</tr>
<tr>
<td>10</td>
<td>85</td>
<td>25</td>
<td>69</td>
</tr>
<tr>
<td>11</td>
<td>84</td>
<td>26</td>
<td>72</td>
</tr>
<tr>
<td>12</td>
<td>83</td>
<td>27</td>
<td>75</td>
</tr>
<tr>
<td>13</td>
<td>82</td>
<td>28</td>
<td>77</td>
</tr>
<tr>
<td>14</td>
<td>83</td>
<td>29</td>
<td>73</td>
</tr>
<tr>
<td>15</td>
<td>82</td>
<td>30</td>
<td>78</td>
</tr>
</tbody>
</table>

OPERATING CONDITIONS
- Air conditioning packs operating : 2
- APU shaft speed : 100% or 64,154 RPM
- APU normal rated speed : 64,154 RPM
- APU shaft load : 65% or 260 Amps (100% = 400 Amps)
- Pneumatic load : 36.3 kg/min
- APU exhaust gas temperature : 1,173 °C
- ACM operating mode : maximum cooling
- Recirculation fan : on

NOTES
1. Forward type I emergency exit door is installed only on aircraft with extra capacity and cargo combi configuration.
2. Forward baggage door is installed in lieu of the aft service door and de-activated for the cargo combi configuration.
3. Aft passenger door is de-activated for the cargo combi configuration.

RAMP NOISE TEST RESULTS FOR OPTIONAL APU

Figure 6 – 9
PROPELLER/ENGINE SLIPSTREAM VELOCITY CONTOURS
(MAXIMUM TAKEOFF POWER)

DISTANCE FROM AIRCRAFT CENTERLINE (FT)

DISTANCE DOWNSTREAM PROPELLER PLANE (FT)

PROPELLER / ENGINE SLIPSTREAM VELOCITY CONTOUR AT MAXIMUM TAKEOFF POWER

Figure 6 – 10

Series: 400
AIRPORT PLANNING MANUAL

PROPELLER/ENGINE SLIPSTREAM VELOCITY CONTOURS (~18% TORQUE) (STATIONARY ON GROUND)

DISTANCE FROM AIRCRAFT CENTERLINE (FT)

DISTANCE DOWNSTREAM PROPELLER PLANE (FT)

PROPELLER/ENGINE SLIPSTREAM VELOCITY CONTOURS (~43% TORQUE) (STATIONARY ON GROUND)

DISTANCE FROM AIRCRAFT CENTERLINE (FT)

DISTANCE DOWNSTREAM PROPELLER PLANE (FT)

PROPELLER / ENGINE SLIPSTREAM VELOCITY CONTOUR AS ON GROUND

Figure 6 – 11
CHAPTER 7

PAVEMENT DATA
General Information

1. The pavement requirements for commercial aircraft are customarily derived from the static analysis loads imposed on the main landing–gear wheels and tires through the shock struts.
   A. Basic data on the landing–gear footprint configuration, maximum–design taxi loads, and tire sizes and pressures are shown in Figure 7–1.
   B. Maximum pavement loads for certain critical conditions at the tire–ground interfaces are shown in Figure 7–2.
   C. Landing–gear loading on pavement at various aircraft weights is shown in Figure 7–3.
   D. The California Bearing Ratio (CBR) for unlimited commercial use at all aircraft weights is shown in Figure 7–4 and Figure 7–5.
   E. The minimum Load Classification Number (LCN) for flexible and rigid pavement are shown in Figure 7–6, Figure 7–7, Figure 7–8 and Figure 7–9.
   F. The minimum Aircraft Classification Number (ACN) for flexible and rigid pavement are shown in Figure 7–10, Figure 7–11, Figure 7–12 and Figure 7–13.

2. Make sure that all runways or pavements to be used meet these minimum CBR, LCN and ACN requirements.
### Maximum Design Taxi Weight

<table>
<thead>
<tr>
<th></th>
<th>64,700 lb (29,347 kg)</th>
</tr>
</thead>
</table>

### Percentage Weight on Main Gear

(Refer to landing gear loading on pavement illustration)

<table>
<thead>
<tr>
<th>Gear Type</th>
<th>Size</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nose</td>
<td>22 x 6.50–10</td>
<td></td>
</tr>
<tr>
<td>Main</td>
<td>32 x 8.8–16 Standard</td>
<td>218 PSI (1503 kPa) Unloaded, 227 PSI (1565 kPa) Loaded</td>
</tr>
<tr>
<td></td>
<td>34 x 10.75–16 Optional</td>
<td>135 PSI (931 kPa) Unloaded, 141 PSI (972 kPa) Loaded</td>
</tr>
</tbody>
</table>

### Notes

Tire pressures shown are for calculation purposes only. Refer to AMM Ch. 12 for service pressure.

**Diagram:**

- **Nose Gear Footprint:**
  - **Size:** 15.0 in. (38.1 cm)
  - **Pressure:** 19.54 in. (49.63 cm) Optional

- **Main Gear Footprint:**
  - **Size:** 21.0 in. (53.34 cm) Standard
  - **Pressure:** 28 ft 10 in. (8.8 m)
  - **Size:** 45 ft 9 in. (13.94 m)

**Figure 7-1**

---

Series: 400

**CHAPTER 7**

Page 2

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**NOTES:**

All loads calculated using aircraft Maximum Design Taxi Weight.

- $V_{NG}$ = Maximum Vertical Nose–Gear Ground Load at Most Forward C.G..
- $V_{MG}$ = Maximum Vertical Main–Gear Ground Load at Most Aft C.G..
- $H$ = Maximum Horizontal Ground Load from Braking.

- Upper C.G. limit is approximately 12.77 ft (3.89 m) above ground line.
- Instantaneous braking applied during a steady braking run.

**MAXIMUM PAVEMENT LOADS**

*Figure 7 – 2*
PERCENT MAC

PERCENT OF WEIGHT ON MAIN GEAR

NOTE
Unshaded area represents operational limits.

LANDING GEAR LOADING ON PAVEMENT

Figure 7 – 3
1. Tires are 32 x 8.8−16 (21.0 in. centers), inflated to 227 psi (1565 kPa), loaded.
2. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
3. Max. Aft C.G. (36% MAC at approx. 94% of weight on MLG).
4. U.S. Army Corps of Engineers design method (S−77−1) and FAA design method used.

FLEXIBLE PAVEMENT REQUIREMENTS – CBR (32X8.8−16 TIRES)

Figure 7 – 4

NOTES
NOTES
1. Tires are 34 x 10.75−16 (19.5 in. centers), inflated to 141 psi (972 kPa), loaded.
2. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
3. Max. Aft C.G. (36% MAC at approx. 94% of weight on MLG).
4. U.S. Army Corps of Engineers design method (S−77−1) and FAA design method used.

FLEXIBLE PAVEMENT REQUIREMENTS – CBR (34X10.75−16 TIRES)

Figure 7 – 5
NOTES
1. Tires are 32 x 8.8 – 16 (21.0 in. centers).
2. 227 psi (1565 kPa) inflation pressure (loaded).
3. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
4. Max. All C.G. (96% at approx. 94% of weight on MLG).

Figure 7 – 6
NOTES
1. Tires are 34 x 10.75−16 (19.5 in. centers).
2. 141 psi (972 kPa) inflation pressure (loaded).
3. Tire pressure is for calculation purposes only; refer to AMM Ch 12 for service pressures.
4. Max. At C.G. (36% MAC at approx. 94% of weight on MLG).

FLEXIBLE PAVEMENT REQUIREMENTS – LCN CONVERSION (34X10.75−16 TIRES)

Figure 7 – 7
AIRPORT PLANNING MANUAL

RIGID PAVEMENT REQUIREMENTS – LCN CONVERSION (32X8.8–16 TIRES)

Figure 7–8

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RIGID PAVEMENT REQUIREMENTS – LCN CONVERSION (34X10.75–16 TIRES)

Figure 7 – 9

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NOTES
1. Tires are 34 x 10.75–16 (19.5 in. centers).
2. 141 psi (972 kPa) inflation pressure (loaded).
3. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
4. Max. Alt. C.G. (36% MAC at approx. 94% of weight on MLG).

AIRPORT PLANNING MANUAL

LOAD CLASSIFICATION NUMBER (LCN)

RADIUS OF RELATIVE STIFFNESS (L)

EQUIVALENT SINGLE WHEEL LOAD (ESWL) (X 1000 LB)

AIRCRAFT WEIGHT

A – 63,450 LB
B – 55,000 LB
C – 45,000 LB
D – 35,312 LB

30 20 10

10 20 30 40
NOTES
1. Tires are 32 x 8.8−16 (21.0 in. centers).
2. 227 psi (1565 kPa) inflation pressure (loaded).
3. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
4. Max. Aft C.G. (36% MAC at approx. 94% of weight on MLG).

AIRCRAFT CLASSIFICATION NUMBER – FLEXIBLE PAVEMENT (32X8.8−16 TIRES)

Figure 7 – 10
NOTES
1. Tires are 34 x 10.75–16 (19.5 in. centers).
2. 141 psi (972 kPa) inflation pressure (loaded).
3. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
4. Max. Aft C.G. (36% MAC at approx. 94% of weight on MLG).

AIRPORT PLANNING MANUAL

AIRCRAFT CLASSIFICATION NUMBER – FLEXIBLE PAVEMENT (34X10.75–16 TIRES)

Figure 7 – 11
NOTES
1. Tires are 32 x 8.8–16 (21.0 in. centers).
2. 227 psi (1565 kPa) inflation pressure (loaded).
3. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
4. Max. Aft C.G. (36% MAC at approx. 94% of weight on MLG).
NOTES
1. Tires are 34 x 10.75–16 (19.5 in. centers).
2. 141 psi (972 kPa) inflation pressure (loaded).
3. Tire pressure is for calculation purposes only, refer to AMM Ch 12 for service pressures.
4. Max. Aft C.G. (36% MAC at approx. 94% of weight on MLG).

AIRPORT PLANNING MANUAL
CHAPTER 8

DERIVATIVE AIRCRAFT
General Information

1. There are no plans to develop any derivative aircraft at this time.
CHAPTER 9

SCALED DRAWINGS OF DASH-8 SERIES 400
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General Information

1. The scaled drawings that follow can be used to plan/verify runway, ramp and maintenance facility layouts.
   
   A. The 1 in. = 32 ft. (1:384) scaled drawing is shown in Figure 9–1.
   
   B. The 1 in. = 50 ft (1:600) and 1 in. = 100 ft (1:1200) scaled drawings are shown in Figure 9–2.
   
   C. The 1:500 and 1:1000 (Metric) scaled drawings are shown in Figure 9–3.
Forward type I emergency exit door is installed only on aircraft with extra capacity and cargo combi configuration.

Type II/III emergency exit door is de-activated for the extra capacity and the cargo combi configuration.

Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.

Forward baggage door is installed in lieu of the aft service door and de-activated for the cargo combi configuration.

Aft passenger door is de-activated for the cargo combi configuration.

Turning radius points: 70°, 60°, 50°, 40°, 30°, 25°, 20°.

Type III emergency exit door.
Air conditioning.

- Ground air–conditioning connection (if no APU is installed).
- Electrical connection (DC).
- Electrical connection (AC).
- Pressure refueling point.
- Lavatory.
- Main landing gear.
- Nose landing gear.
- Fuel vent (on both wings).
- Forward passenger airstair door.
- Type II/III emergency exit.
- Aft passenger door.
- Aft service door.

Turning radius points: 70°, 60°, 50°, 40°, 30°, 25°, 20°.

Type I emergency exit door is installed only on aircraft with extra capacity and cargo combi configuration.

Type II/III emergency exit door is deactivated for the extra capacity and the cargo combi configuration.

Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.

Forward baggage door is installed in lieu of the aft service door and deactivated for the cargo combi configuration.

Aft passenger door is deactivated for the cargo combi configuration.

Notes: 1 IN = 50 FT (1:600), 1 IN. = 100 FT (1:1200)

Figure 9 – 2
NOTES

1. Forward type I emergency exit door is installed only on aircraft with extra capacity and cargo combi configuration.

2. Type II/III emergency exit door is de-activated for the extra capacity and the cargo combi configuration.

3. Type III emergency exit doors are installed at the station X479.70 on both the sides of the aircraft with the cargo combi configuration.

4. Forward baggage door is installed in lieu of the aft service door and de-activated for the cargo combi configuration.

5. Aft passenger door is de-activated for the cargo combi configuration.

SCALE DASH 8, SERIES 400 (MODEL 402) DRAWING – 1:500 AND 1:1000 (METRIC)

Figure 9 – 3