



AEROSPACE INFORMATION REPORT

AIR5631™**REV. A**

Issued 2009-02
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Superseding AIR5631

(R) Catalog of Landing Gear Systems and Suppliers

RATIONALE

The initial release of the document included commercial aircraft only, with a place holder to add the military aircraft at some future date. We have updated the document now with the military data.

1. SCOPE

The purpose of this document is to provide a listing for current commercial and military aircraft landing gear systems and their types and manufacturers. Data has been provided for the following commercial aircraft types; wide body jet airliners, narrow body jet airliners, and turboprop/commuter aircraft and the following military aircraft types; fighter, bomber, cargo, attack, surveillance, tanker and helicopter categories. The aircraft that have been included in this document are in operational service either with airlines, business, cargo or military operators. No information is presented for aircraft that are currently being developed or that are not in extensive usage. This document will provide an informational reference for landing gear engineers to access when evaluating other gear and aircraft systems. Future revisions of this document will add aircraft as they enter into service.

1.1 General Information

The initial release of the document contained information for only the commercial aircraft. Revision A includes similar information for military aircraft. The goal would be to update the document as required to include new aircraft. The following information is provided for each aircraft:

- A simplified iso-metric sketch of the landing gear.
- The braking system description
- The steering system description
- Tire size information
- A table listing of landing gear information including the name of equipment suppliers

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Documents

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NOTES:

1. For some aircraft, the data is incomplete. This is due to difficulties in obtaining the data (particularly for the older aircraft presented in this report).
2. On some aircraft, the wheels, brakes, and tires may not be those as stated in this document. The reason for this is because there may be more than one vendor for a specific aircraft application, especially where a configuration is developed later than the aircraft delivery. This document has attempted to list alternative suppliers where multiple suppliers are on the aircraft and the information is known.
3. The diagrams for each aircraft landing gear have been simplified for clarity and ease of understanding.
4. The aircraft gross weights shown are as listed in Aviation Week, 13 January 2003 or information available from other online sources such as Wikipedia and air frame websites.

2. REFERENCES

2.1 There are no referenced publications specified herein.

2.2 Abbreviations

ABSC	Aircraft Braking Systems Corporation (now Meggitt)
BBW	Brake-By-Wire
BS	Bridgestone
Conv.	Conventional
Deg.	Degree
DL	Dunlop
ELEB	or ELEB Equipment Ltd is a company Brazilian aeronautical industry, controlled by Embraer. Embraer-Liebherr Equipamentos Brasil.
GY	Goodyear
Hyd	Hydraulic
kg	kilograms
Meggitt	Meggitt Aircraft Braking Systems (MABS). Since January 2008, Meggitt Aircraft Braking Systems has been the trade name of the two Meggitt businesses supplying aircraft wheels and brakes, Aircraft Braking Systems Corporation (ABSC) and Dunlop Aerospace Braking Systems (DABS).
Mech	Mechanical
M	Michelin
MBD	Messier-Bugatti-Dowty was formed by combining the Messier-Dowty and Messier-Bugatti companies
m	meters
MLG	Main Landing Gear
mph	miles per hour
NLG	Nose Landing Gear
PR	Ply Rating
Syst.	System
TBD	To Be Determined
TL	Tubeless
TT	Tube Tire
UTC Aerospace Systems	UTC Aerospace Systems, a unit of United Technologies Corp. (NYSE: UTX) was formed by combining Hamilton Sundstrand and Goodrich (Goodrich was formed by combining Menasco and Cleveland Pneumatic) (Menasco had previously acquired Bendix LG)
UTC Aerospace Systems and MBD JV-	Goodrich and Messier joint venture

3. AIRCRAFT LISTING

A listing of the aircraft included in this AIR is shown in Table 1 and 2. The aircraft are grouped in categories for commercial and military applications.

The commercial aircraft are grouped generally by narrow body, by wide body and by regional/business aircraft categories.

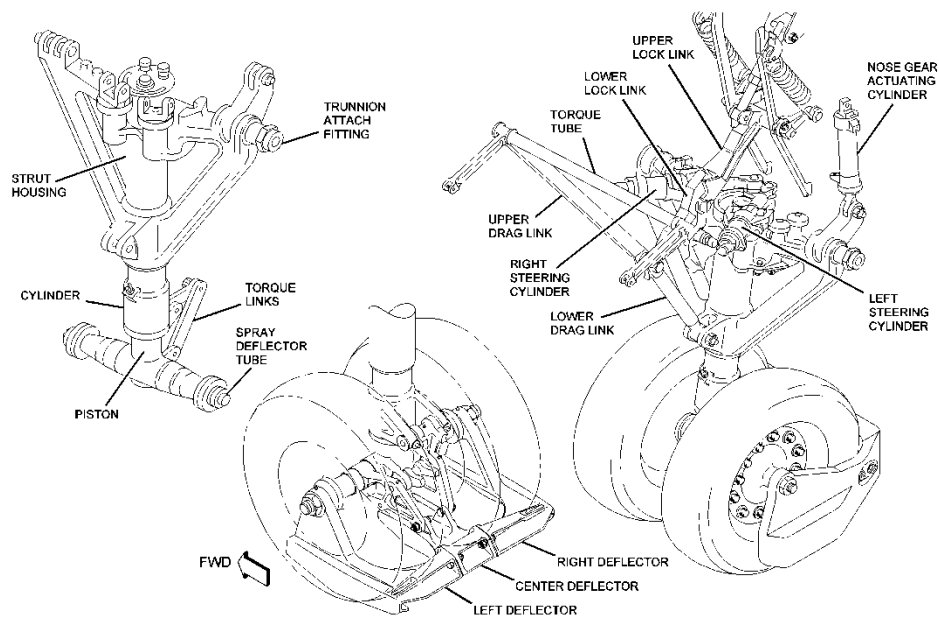
The military aircraft are grouped by fighter, bomber, cargo, attack, surveillance, tanker and helicopter categories and are shown in Table 2. This is not a completely correct grouping, since several of the aircraft are multi-role aircraft and are not listed more than once. Table 2 is located following the commercial section.

Table 1 - Commercial aircraft listing

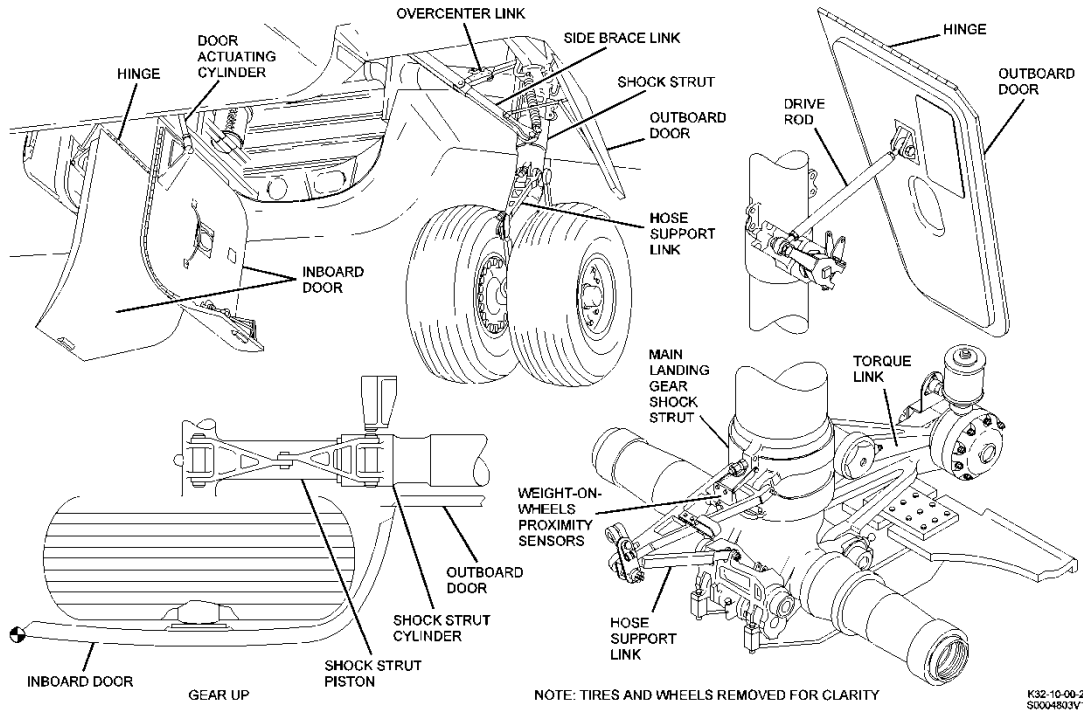
<u>CATEGORY</u>	<u>DESIGNATION</u>	<u>POPULAR NAME</u>	<u>MANUFACTURER</u>	<u>PAGE</u>
Commercial - Narrow Body	717/MD80		Boeing	4 - 6
	A320		AIRBUS	7 - 8
	737 Classic/Next Gen		Boeing	9 - 11
	757		Boeing	12 - 13
Commercial - Wide Body	A300		AIRBUS	14 - 15
	A310		AIRBUS	16 - 17
	A330/340		AIRBUS	18 - 19
	747		Boeing	20 - 21
	767		Boeing	22 - 23
	777		Boeing	24 - 25
	MD-11		Boeing	26 - 27
Commercial - Regional	CRJ100/200/440		Bombardier	28 - 29
	CRJ700/900		Bombardier	30 - 31
	Dash 8 Q Series		Bombardier	32 - 34
	ATR 42		Avions de Transport Regional	35 - 36
	ATR 72		Avions de Transport Regional	37 - 38
	C 235		EADS (CASA)	39 - 40
	C-295		EADS (CASA)	41 - 42
	F100		Fokker	43 - 44
	EMB 170		Embraer	45 - 46
	EMB 190		Embraer	47 - 48
	Citation Sovereign		Cessna	49 - 50
	Gulfstream G-V		Gulfstream	51 - 52

Boeing 717

Nose Landing Gear:



Main Landing Gear:



K32-10-08-2
50004803V1

717 Technical Information: Gross Weight = 121,000 pounds (54,886 kg)

Braking System Cable and hydraulically controlled system, digital anti-skid system individually controlled for each MLG-wheel, Carbon brakes

Steering System

Steering angle Normal operating angle ± 82 degrees
Aircraft towing, steering angle ± 90 degrees

Actuation system Hydraulically powered steering actuators

Turning radius 65.8 feet (20.1 m)

Tire Sizes

NLG 26x6.6R14

MLG H41x15.0-19

Suppliers:

Item	No. per Aircraft	Type	Manufacturer
Nose Landing Gear	1	Telescopic	Israeli Aircraft Industry - SHL division
Main Landing Gear	2	Telescopic	Israeli Aircraft Industry - SHL division
MLG Wheels & Brakes	4	Steel brakes	Honeywell
NLG Wheels	2		ABSC
Pilot Metering Valve	1	Hydraulic	Sterer
Brake Control System (Anti-skid & Autobrake)	1	Digital	Crane Aerospace Hydro-Aire
Steering Control System	2 (cylinders)	Steering cylinders with cable position feedback	Israeli Aircraft Industry - SHL division
MLG Tires	4	Bias or radial	Multiple suppliers
NLG Tires	2	Radial	Goodyear
Brake Temperature Monitoring System	1		MBD
Tire Pressure Monitoring System	(N/A)	None	(N/A)

MD-80 Technical Information: Gross Weight = 183,000 pounds

Braking System

Mechanical cable-control, hydraulic actuation, dual brake system, analog anti-skid system, individual wheel control, autobrake mode (three deceleration levels), steel brakes

Steering System

Steering angle Normal operating angle ± 15 degrees
 Taxi steering angle ± 82 degrees
 Aircraft towing, steering angle ± 90 degrees
 Actuation system Cable-controlled, hydraulic actuated cylinders

Tire Sizes

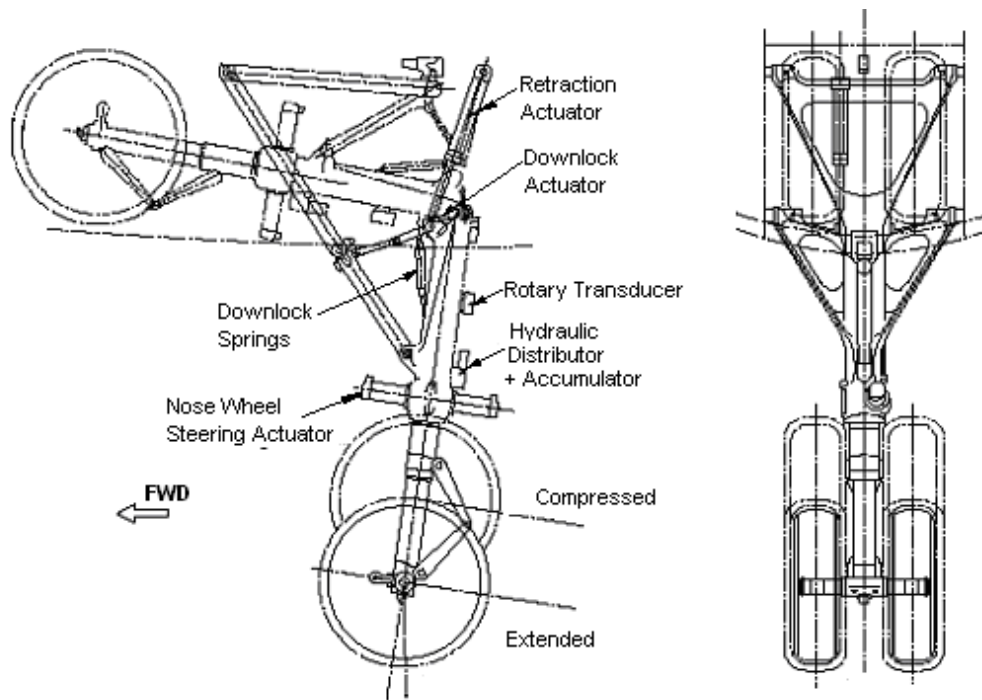
NLG 26x6.6
 MLG H44.5x16.5-20

Suppliers:

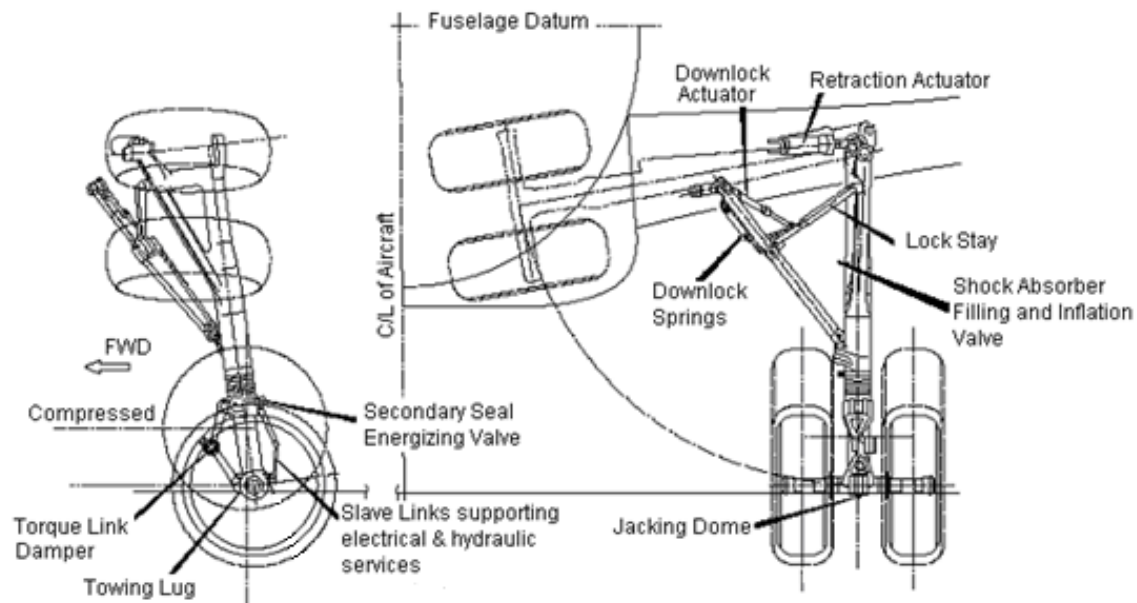
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	4	Steel	ABSC	Optional
MLG Wheels & Brakes	4	Steel	Honeywell	Optional
NLG Wheels	2		ABSC	
AutoBrake Control System	1		Crane Aerospace Hydro-Aire	Optional
Skid Control System	1		Crane Aerospace Hydro-Aire	
Steering Control Syst.	1			
MLG Tires	4	Bias	Goodyear	
NLG Tires	2	Bias	Goodyear	
Brake Temperature Monitoring System	1		ABSC, Messier	Optional

Airbus A320

Nose Landing Gear:



Main Landing Gear:



A320 Technical Information: Gross Weight = 169,800 pounds (77,000 kg)

Braking System Full digital brake-by-wire system, digital anti-skid system individually controlled for each MLG-wheel, autobrake mode (three deceleration levels), carbon brakes

Steering System Full digital steering by wire system

Steering angle Normal operating angle ± 75 degrees
Aircraft towing, steering angle ± 95 degrees
Actuation system Hydraulically powered Rack & Pinion
Turning radius 72.1 feet (21.99 m)

Tire Sizes

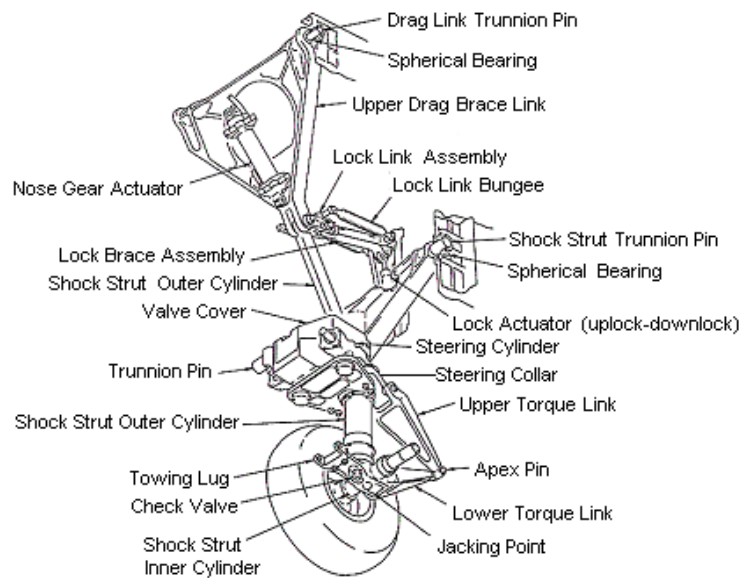
NLG 30 x 8.8 R15, 30 x 8.8 - 15
MLG 46 x 17.0 R20, 46 x 16, 49 x 17, 49x19.0-20, 1270x455R22

Suppliers:

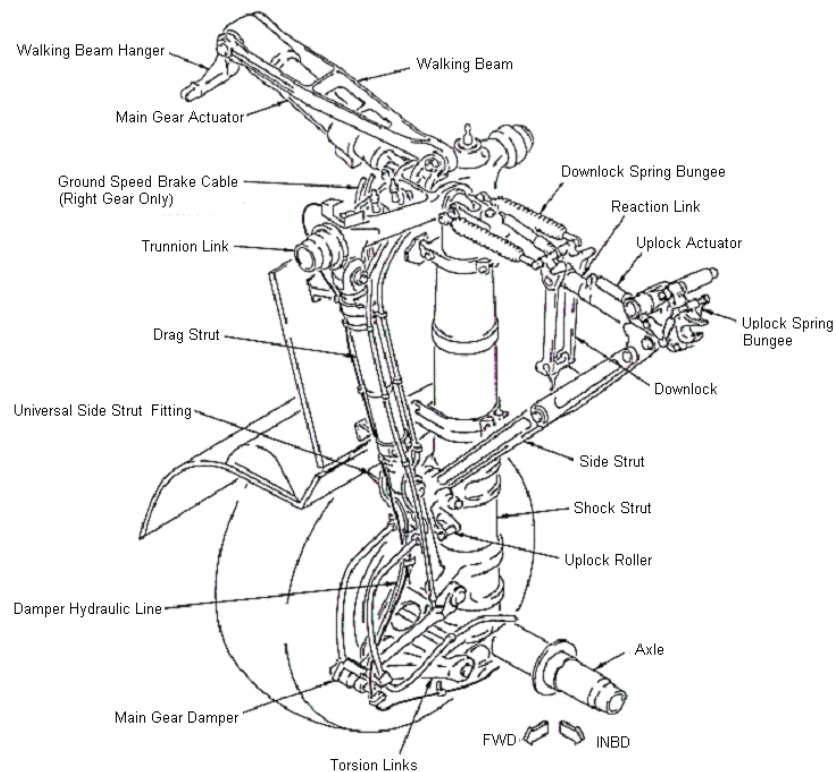
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	MBD	
Main Landing Gear	2	Telescopic	MBD	
MLG Wheels & Brakes	4	Carbon	MBD or UTC Aerospace Systems or Meggitt	Meggitt (A321 only)
Brake cooling fan	4		Technofan	Optional
NLG Wheels	2		UTC Aerospace Systems	
Brake Control System	1	BBW	MBD	
Skid Control System	1	Digital	MBD	
Steering Control Syst.	1	SBW-Digital	MBD	
Autobrake	1	Digital	MBD	
MLG Tires	4	Radial	Michelin, Bridgestone, Goodyear	
MLG Tires	4	Bias	Goodyear, Bridgestone, Michelin, Dunlop	
NLG Tires	2	Radial	Michelin, Bridgestone, Goodyear	
NLG Tires	2	Bias	Goodyear, Michelin, Bridgestone, Dunlop	
Tire Pressure Monitoring System	1		MBD	Optional
Brake Temperature Monitoring System	1		Thales	Standard

Boeing 737 Classic

Nose Landing Gear:



Main Landing Gear:



737 Classic Technical Information: Gross Weight = 174,700 pounds (79,234 kg)

Braking System

Cable controlled and hydraulically powered dual system, digital anti-skid system with individual control of each brake, optional autobrake system (3 deceleration levels for landings), and carbon brakes.

Steering System

Steering angle	Normal operating angle ± 78 degrees Aircraft towing, steering angle ± 78 degrees
Actuation system	Cable controlled, hydraulically powered
Turning radius	-300 64.7 feet (19.7 m) -400 72.4 feet (22.1 m) -500 59 feet (18 m)

Tire Sizes

NLG	24x7.7, 27x7.75-15, 27x7.75R15
MLG	40x14, H40x14.5-19, H42x16.0-19

Suppliers:

Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	4	Steel	UTC Aerospace Systems, Honeywell	Standard
	4	Carbon	UTC Aerospace Systems, MBD	From 2008
NLG Wheels	2		UTC Aerospace Systems, Honeywell	
Brake Control System	1	Hydraulic	Boeing	
Skid Control System	1	Digital	Crane Aerospace Hydro-Aire	
Autobrake System	1	Digital	Crane Aerospace Hydro-Aire	Optional
Steering Control Syst.	1	Hydraulic	Boeing	
MLG Tires	4	Bias	BS, DL, GY, M	Standard
NLG Tires	2	Radial	BS, GY, M	Optional
NLG Tires	2	Bias	BS, DL, GY, M	Standard
Brake Temperature Monitoring System	1		UTC Aerospace Systems	Optional

737 Next Generation Tech. Information: Gross Weight (-900) = 174,000 pounds (78,926 kg)

Braking System

Cable controlled and hydraulically powered dual system, digital anti-skid system with individual control of each brake, optional autobrake system (4 deceleration levels for landings), and carbon brakes.

Steering System

Steering angle	Normal operating angle ± 78 degrees
	Aircraft towing, steering angle ± 78 degrees
Actuation system	Cable controlled, hydraulically powered
Turning radius	-600 60.8 feet (18.5 m)
	-700 66.4 feet (20.2 m)
	-800 79.1 feet (24.1 m)
	-900 85.4 feet (26 m)

Tire Sizes

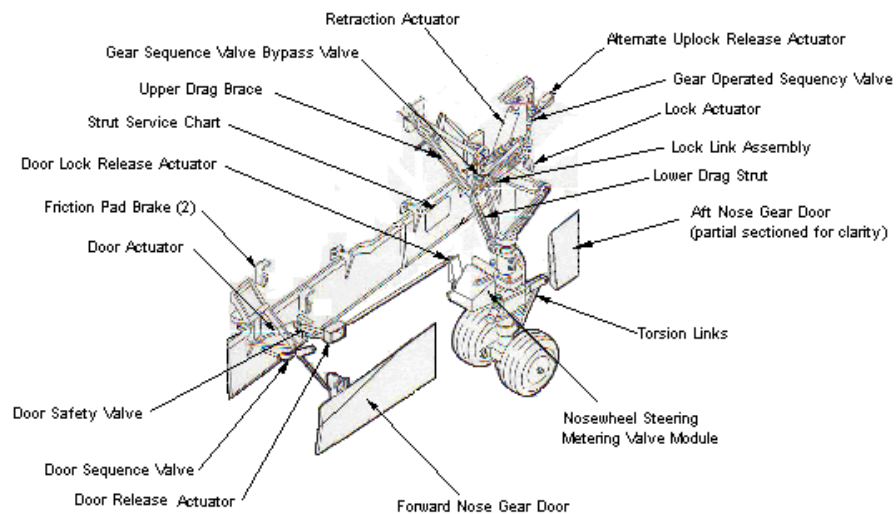
NLG	27x7.75-15, 27x7.75R15
MLG	H43.5x16.0-21, H44.5x16.5-21

Suppliers:

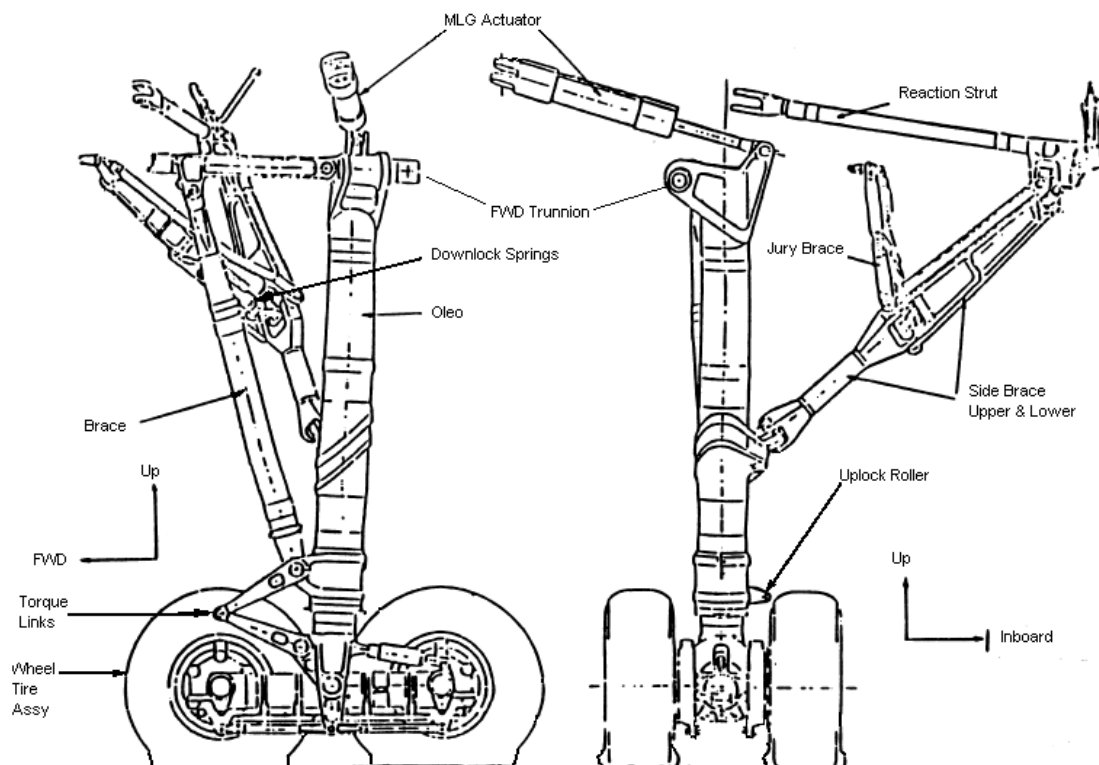
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	4	Steel	UTC Aerospace Systems, Honeywell	Standard
	4	Carbon	UTC Aerospace Systems, MBD	From 2008
NLG Wheels	2		UTC Aerospace Systems, Honeywell	
Brake Control System	1	Hydraulic	Boeing	
Skid Control System	1	Digital	Crane Aerospace Hydro-Aire	
Autobrake System	1	Digital	Crane Aerospace Hydro-Aire	Optional
Steering Control Syst.	1	Hydraulic	Boeing	
MLG Tires	4	Bias	BS, DL, GY, M	Standard
NLG Tires	2	Radial	BS, GY, M	Optional
NLG Tires	2	Bias	BS, DL, GY, M	Optional
Brake Temperature Monitoring System	1		UTC Aerospace Systems	Optional

Boeing 757

Nose Landing Gear:



Main Landing Gear:



757 Technical Information: Gross Weight = 273,000 pounds (123,833 kg)

Braking System

Cable controlled and hydraulically powered dual system, digital anti-skid system with individual control of each brake, optional autobrake system (5 deceleration levels for landings), and carbon brakes

Steering System

Steering angle Normal operating angle ± 65 degrees
 Aircraft towing, steering angle ± 65 degrees
 Actuation system Cable controlled, hydraulically powered
 Turning radius -200 120 feet (36.6 m)
 -300 141 feet (43 m)

Tire Sizes

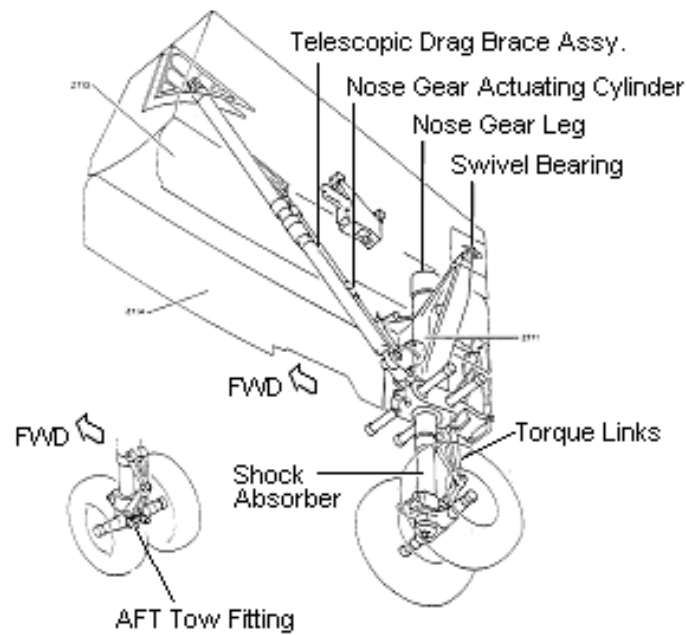
NLG H31x13.0-12
 MLG H40x14.5-19

Suppliers:

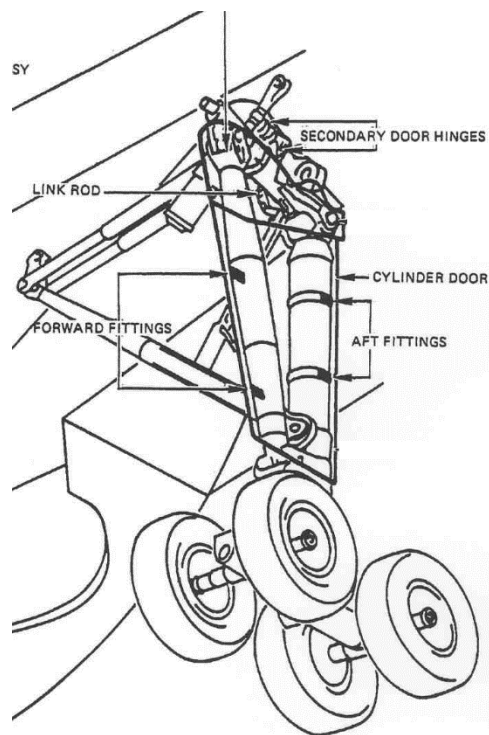
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	8	Carbon	UTC Aerospace Systems, Dunlop	Optional
		Steel	UTC Aerospace Systems	Optional
		Carbon	UTC Aerospace Systems, Dunlop	-300 model
NLG Wheels	2		UTC Aerospace Systems, Dunlop	
Brake Control System	1	Hydraulic	Boeing	
Skid Control System	1	Digital	Crane Aerospace Hydro-Aire	
Autobrake System	1	Digital	Crane Aerospace Hydro-Aire	Optional
Steering Control Syst.	1	Hydraulic	Boeing	
MLG Tires	8	Bias	Numerous	Standard
NLG Tires	2	Bias	Numerous	Standard
Brake Temperature Monitor System	1		UTC Aerospace Systems	Optional

Airbus A300

Nose Landing Gear:



Main Landing Gear:



A300 Technical Information: Gross Weight = 378,500 pounds (171,700 kg)

Braking System Brake-by-wire system, analog anti-skid system individually controlled for each MLG-wheel, autobrake mode (three deceleration levels), (digital autobrake on A300-600), Carbon brakes

Steering System

Steering angle Normal operating angle ± 65 degrees
Aircraft towing, steering angle ± 95 degrees

Actuation system Hydraulically powered Rack & Pinion - Cable feedback

Min. width for U-turn: 126.12 feet (38.44 m)

Tire Sizes

NLG 40 x 14.0 R16, 40 x 14

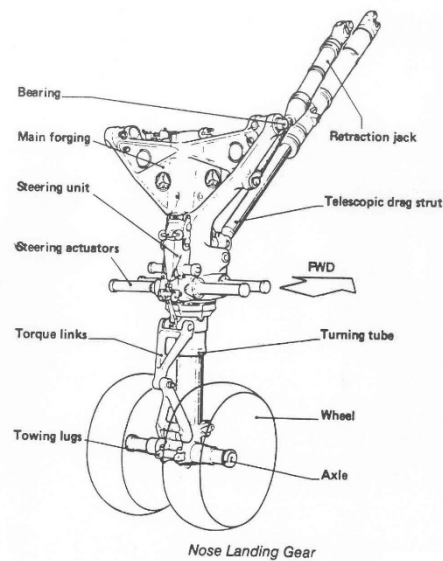
MLG 49 x 17, 46x17.0 R20, 49 x 19.0 -20 300, 46x16

Suppliers:

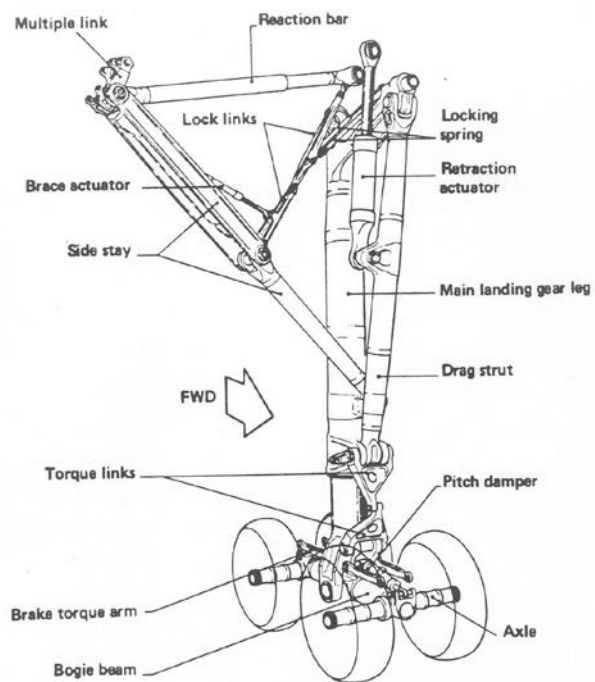
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	MBD	
Main Landing Gear	2	Telescopic	MBD	
MLG Wheels & Brakes	8	Carbon	MBD	
Brake cooling fan	8		Technofan	optional
NLG Wheels	2		MBD	
Brake Control System	1	BBW-Analog	MBD	
Skid Control System	1	BBW-Analog	MBD	
Steering Control Syst.	1	HydroMech	MBD	
Autobrake	1	Hydraulic Analog	MBD	
MLG Tires	8	Radial	Michelin, Bridgestone, Goodyear	
MLG Tires	8	Bias	Goodyear, Michelin, Bridgestone, Dunlop	
NLG Tires	2	Radial	Michelin	
NLG Tires	2	Bias	Goodyear, Michelin, Bridgestone, Dunlop	
Tire Pressure Monitoring System	1		MBD	Optional
Brake Temperature Monitoring System	1		Thales	Standard

Airbus A310

Nose Landing Gear: (Same as A300)



Main Landing Gear:



A310 Technical Information: Gross Weight = 361,600 pounds (164,000 kg)

Braking System

Brake-by-wire system, analog anti-skid system individually controlled for each MLG-wheel, digital autobrake mode (three deceleration levels), carbon brakes

Steering System

Steering angle Normal operating angle ± 65 degrees
 Aircraft towing, steering angle ± 95 degrees
 Actuation system Hydraulically powered Rack & Pinion - Cable feedback
 Min. width for U-turn: 113.69 feet (34.65 m)

Tire Sizes

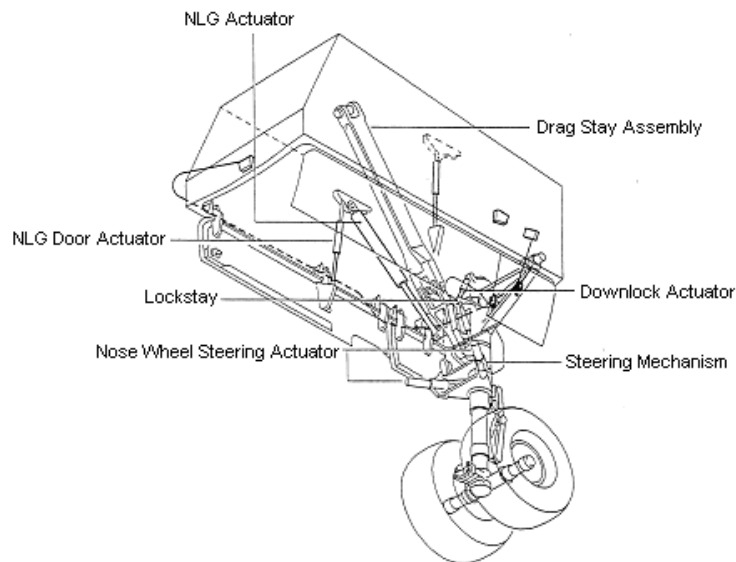
NLG 40 x 14.0R16, 40 x 14
 MLG 46 x 17.0 R20, 46 x 16, 49 x 17

Suppliers:

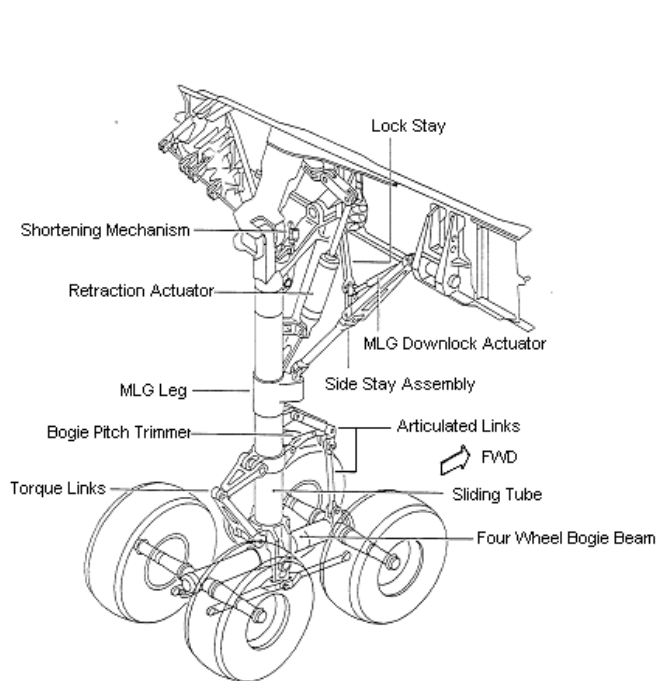
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	MBD	
Main Landing Gear	2	Telescopic	MBD	
MLG Wheels & Brakes	8	Carbon	MBD or ABSC	
MLG Wheels & Brakes	8	Steel	Honeywell	
Brake cooling fan	8		Technofan	optional
NLG Wheels	2		UTC Aerospace Systems, MBD	
Brake Control System	1	Analog-Hydr	MBD	
Skid Control System	1	Analog	MBD	
Steering Control Syst.	1	Analog-Hydr	MBD	
Autobrake	1	Analog	MBD	
MLG Tires	8	Radial	Michelin, Bridgestone, Goodyear	
MLG Tires	8	Bias	Michelin, Bridgestone, Goodyear, Dunlop	
NLG Tires	2	Radial	Michelin	
NLG Tires	2	Bias	Goodyear, Michelin, Bridgestone, Dunlop	
Tire Pressure Monitoring System	1		MBD	Optional
Brake Temperature Monitoring System	1		Thales	Standard

Airbus A330/A340

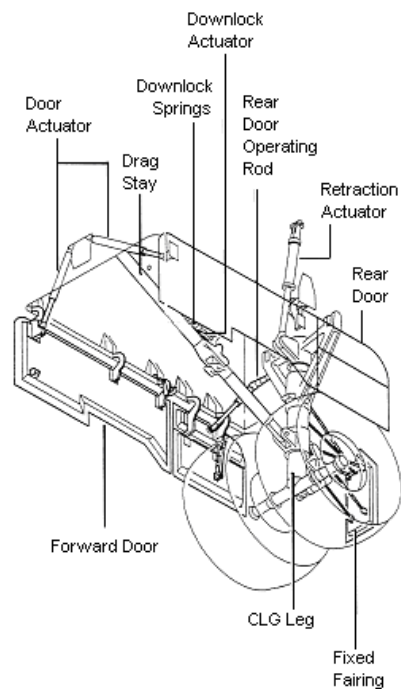
Nose Landing Gear:



Main Landing Gear:



Center Landing Gear (on A340 only):



A330/A340 Technical Information: A-330 Gross Weight = 534,000 pounds (242,000 kg) and A-340 Gross Weight = 840,000 pounds (380,000 kg)

Braking System Digital Brake-by-wire system, digital anti-skid system individually controlled for each MLG-wheel, autobrake mode (three deceleration levels), carbon brakes

Steering System Full digital steering by wire system
 Steering angle: Normal operating angle ± 78 degrees
 Actuation system: Hydraulically powered Push-Pull
 Turning radius: 154.70 feet (47.10 m)

Tire Sizes

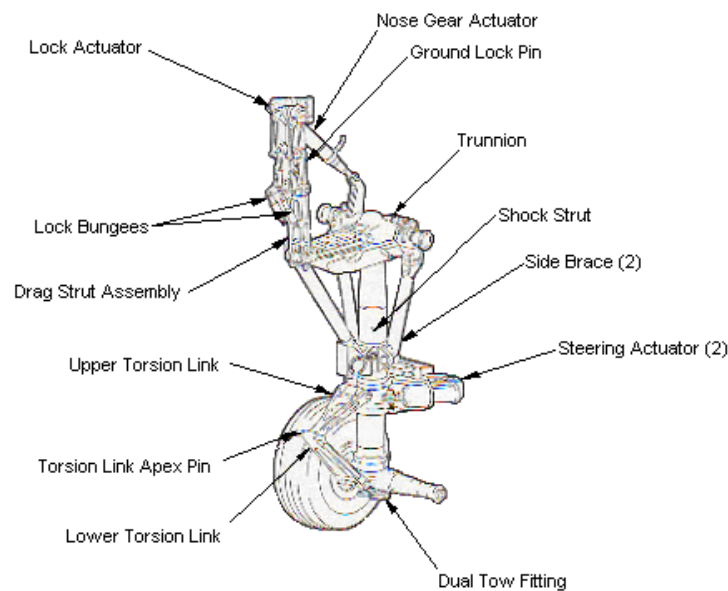
NLG 1050 x 395 R16
 MLG 1400 x 530 R23 or 54 x 21.0 - 23

Suppliers:

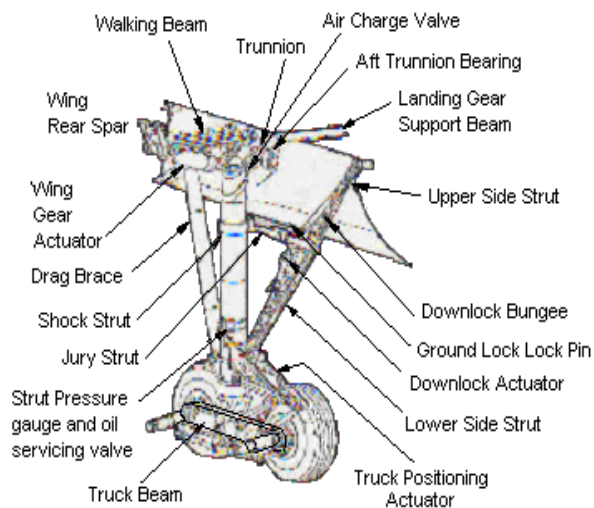
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	MBD	
Main Landing Gear	2	Telescopic	MBD	
Center Landing Gear	1	Telescopic	MBD	not on A330
MLG Wheels & Brakes	8/10	Carbon	UTC Aerospace Systems and MBD JV or Honeywell	Standard/
Brake cooling fan	8		Snecma (Technofan)	Optional
NLG Wheels	2		UTC Aerospace Systems and MBD JV or Honeywell or ABSC	
Brake Control System	1	BBW	MBD	
Skid Control System	1	Digital	MBD	
Steering Control Syst.	1	Digital	MBD	
Autobrake	1	Digital	MBD	
MLG Tires	8/10	Radial	Michelin, Bridgestone	
MLG Tires	8/10	Bias	Bridgestone, Goodyear	
NLG Tires	2	Radial	Michelin, Bridgestone, Goodyear	
Tire Pressure Indicating System	1		MBD	Optional
Brake Temperature Monitoring System	1		MBD or Thales	Standard

Boeing 747

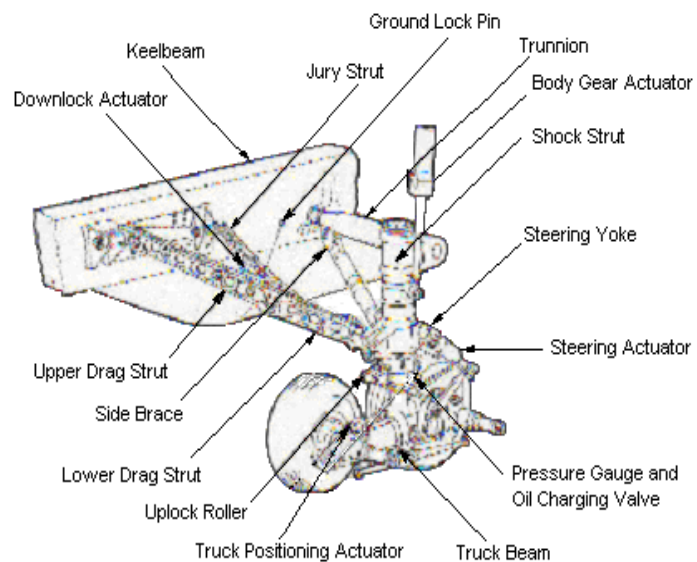
Nose Landing Gear:



Wing & Body Landing Gear:



Wing Gear



Body Gear

747 Technical Information: Gross Weight (-400) = 910,000 pounds (412,776 kg)

Braking System

Cable controlled and hydraulically powered dual system, digital anti-skid system with individual control of each brake, optional autobrake system (5 deceleration levels for landings), and carbon brakes

Steering System

Steering angle	Normal operating angle ± 70 degrees		
	Aircraft towing, steering angle ± 70 degrees		
Actuation system	Cable controlled, hydraulically powered		
Turning radius	-100/-200/-300	109 feet (33.2 m)	w/o BLG steering
		102 feet (31.1 m)	w/ BLG steering
	-400	156 feet (47.5 m)	w/o BLG steering
		152 feet (46.3 m)	w/ BLG steering

Tire Sizes

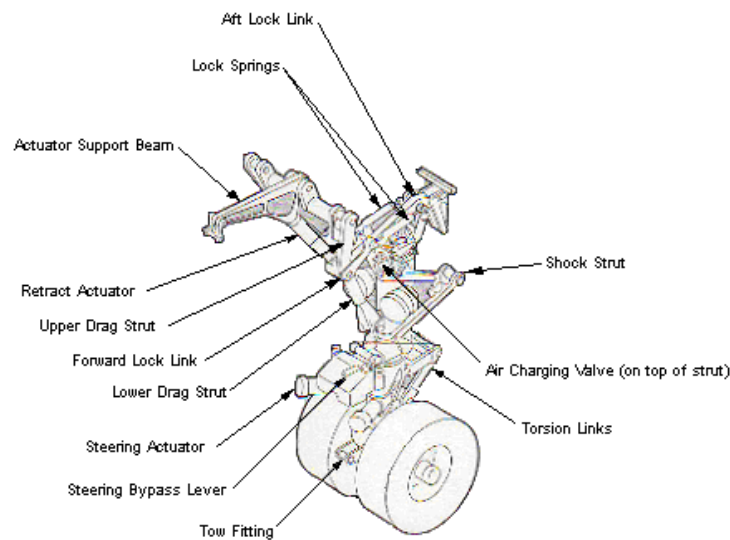
NLG	46x16, 49x17, 49x19.0-20, H49x19.0-22, 50x20.0R22
MLG	46x16, 49x17, 49x19.0-20, H49x19.0-22, 52x21.0R22

Suppliers:

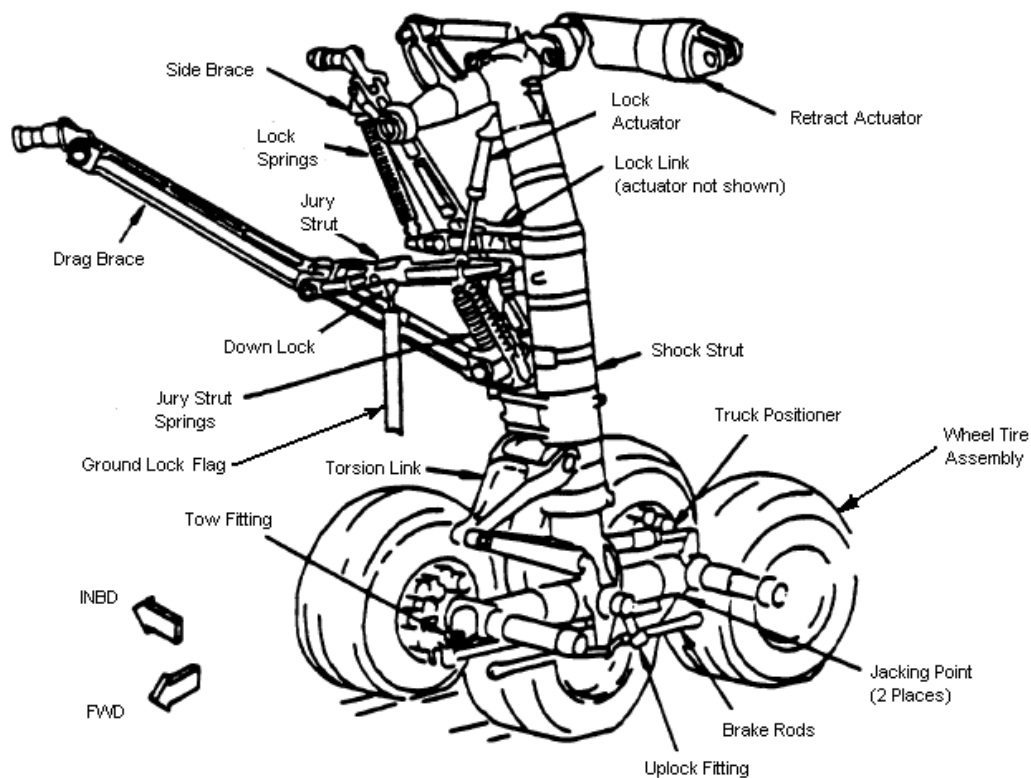
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	4	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	16	Carbon	UTC Aerospace Systems, Honeywell (747-400)	Standard
MLG Wheels & Brakes	16	Steel	Honeywell (Classics 100/200/300)	
NLG Wheels	2			
Brake Control System	1	Hydraulic	Boeing	
Skid Control System	1	Digital	Crane Aerospace Hydro-Aire	
Autobrake System	1	Digital	Crane Aerospace Hydro-Aire	Optional
Steering Control Syst.	1	Hydraulic	Boeing	
MLG Tires	16	Bias	Goodyear	Optional
	16	Radial	Goodyear	Optional
NLG Tires	2	Radial	Goodyear	Optional
	2	Bias	Goodyear	Optional
Tire Pressure Monitoring System	1		MBD	Optional
Brake Temperature Monitor System	1		Thales	Standard

Boeing 767

Nose Landing Gear:



Main Landing Gear:



767 Technical Information: Gross Weight = 450,000 pounds (204,120 kg)

Braking System

Cable controlled and hydraulically powered dual system, digital anti-skid system with individual control of each brake, optional autobrake system (5 deceleration levels for landings), and carbon brakes

Steering System

Steering angle Normal operating angle ± 65 degrees
 Aircraft towing, steering angle ± 65 degrees
 Actuation system Cable controlled, hydraulically powered
 Turning radius -200 129 feet (39.3 m)
 -300 146.3 feet (44.6 m)
 -400 165.3 feet (50.4 m)

Tire Sizes

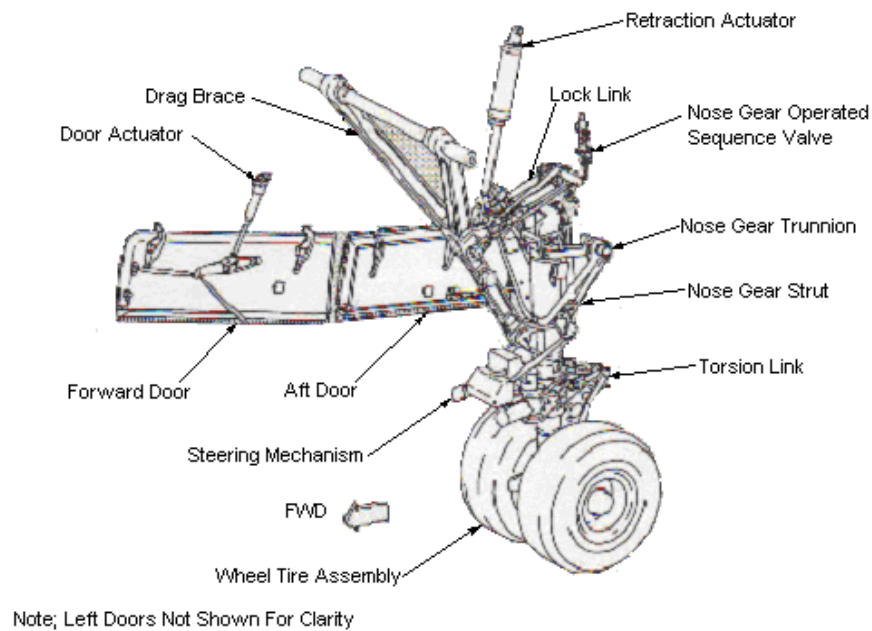
NLG H37x14.0-15
 MLG H45x17.0-20, H46x18.0-20, 50x20.0R22

Suppliers:

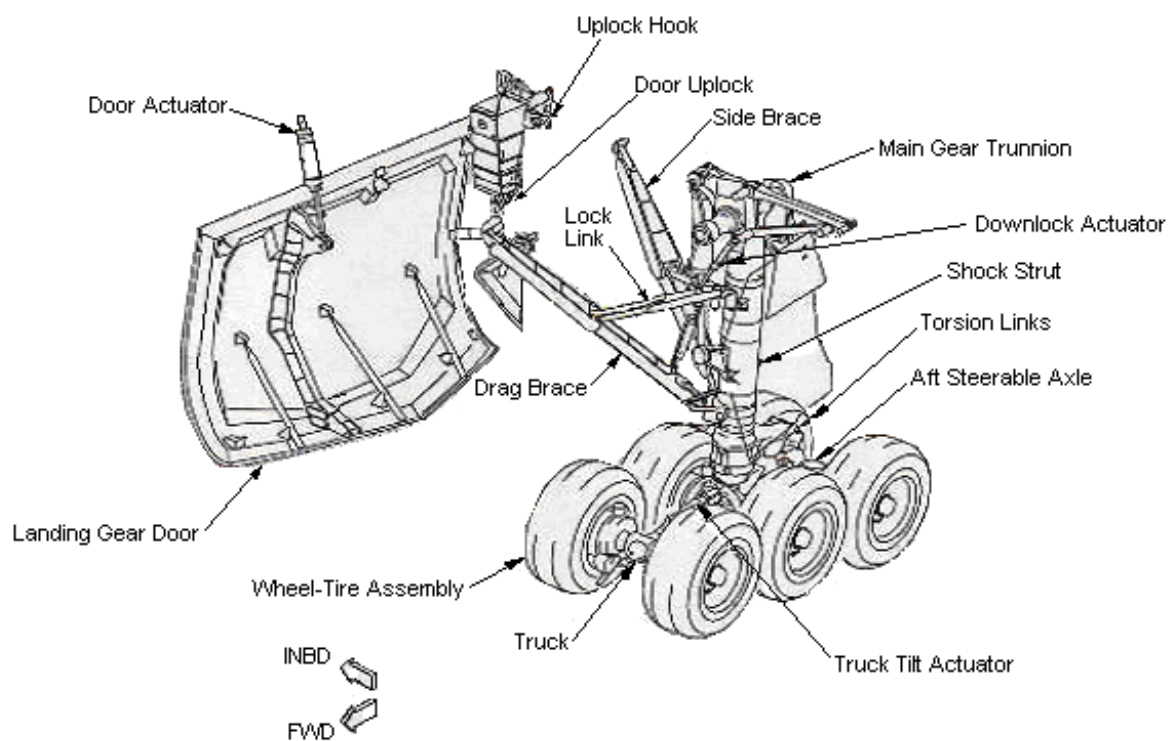
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	8	Carbon	Honeywell, MBD, UTAS	Optional
NLG Wheels	2			
Brake Control System	1	Hydraulic	Boeing	
Skid Control System	1	Digital	Crane Aerospace Hydro-Aire	
Autobrake System	1	Digital	Crane Aerospace Hydro-Aire	Optional
Steering Control Syst.	1	Hydraulic	Boeing	
MLG Tires	8	Bias	Goodyear	Standard
	8	Radial	Goodyear	Optional -400
NLG Tires	2	Bias	Goodyear	Standard
Tire Pressure Monitoring System	1		MBD	Optional
Brake Temperature Monitor System	1		UTC Aerospace Systems	Optional

Boeing 777

Nose Landing Gear:



Main Landing Gear:



777 Technical Information: Gross Weight = 750,000 pounds (340,200 kg)

Braking System

Cable controlled and hydraulically powered dual system, digital anti-skid system with individual control of each brake, optional autobrake system (5 deceleration levels for landings), and carbon brakes

Steering System

Steering angle	Normal operating angle ± 70 degrees Aircraft towing, steering angle ± 70 degrees
Actuation system	Cable controlled, hydraulically powered
Turning radius	-200/-200LR 156 feet (47.5 m) -300/-300ER 190 feet (57.9 m)

Tire Sizes

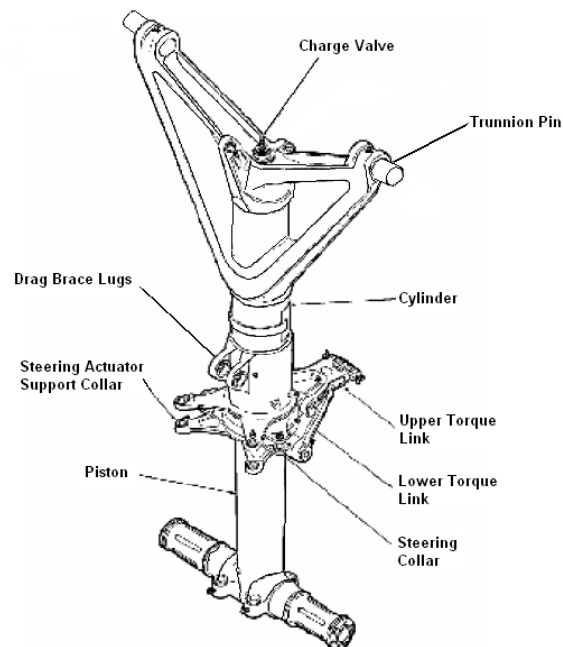
NLG	42x17.0R18, 43x17.0R17
MLG	50x20.0R22, 52x21.0R22

Suppliers:

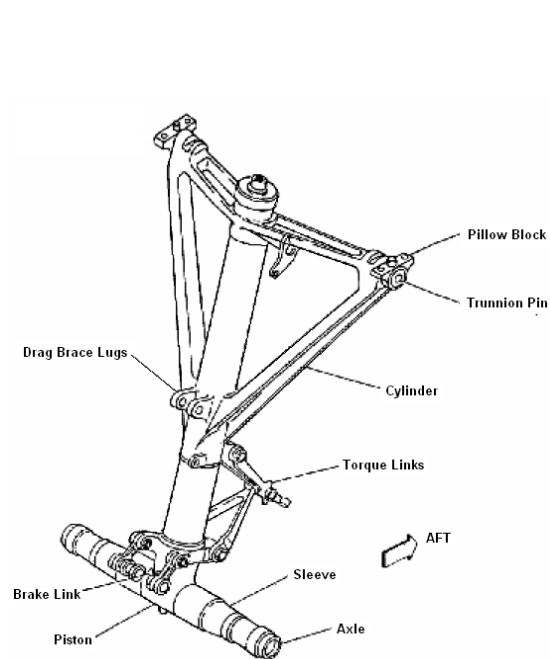
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	12	Carbon	UTC Aerospace Systems, Honeywell, MBD	Standard
NLG Wheels	2			
Brake Control System	1	Hydraulic	Boeing	
Skid Control System	1	Digital	Crane Aerospace Hydro-Aire	
Autobrake System	1	Digital	Crane Aerospace Hydro-Aire	Optional
Steering Control Syst.	1	Hydraulic	Boeing	
MLG Tires	12	Radial	Goodyear, Michelin and Bridgestone	Standard
NLG Tires	2	Radial	Goodyear, Michelin and Bridgestone	Standard
Tire Pressure Monitoring System	1		MBD	Standard
Brake Temperature Monitor System	1		MBD	Standard

McDonnell-Douglas MD-11

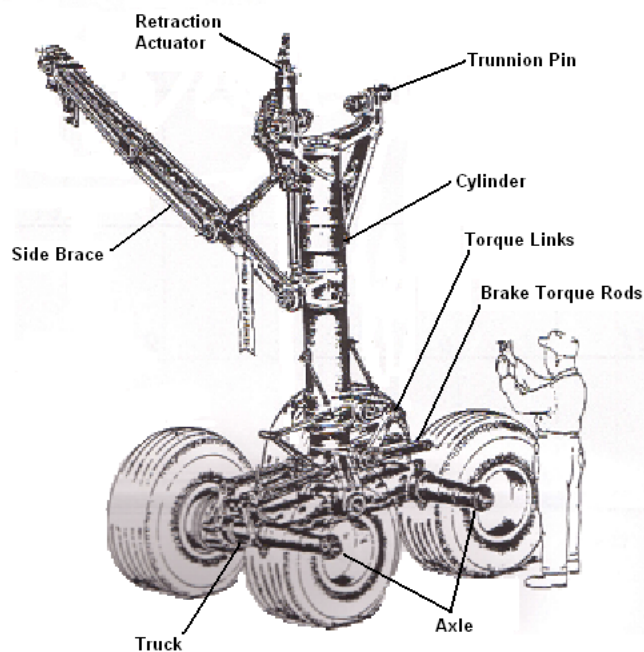
Nose Landing Gear:



Center and Main Landing Gear:



Center Landing Gear



Main Landing Gear

MD-11 Technical Information: Gross Weight = 630,500 pounds (285,995 kg)

Braking System Mechanical cable-control, hydraulic actuation, dual brake system, digital anti-skid system individual wheel control, autobrake mode (three deceleration levels), carbon brakes

Steering System

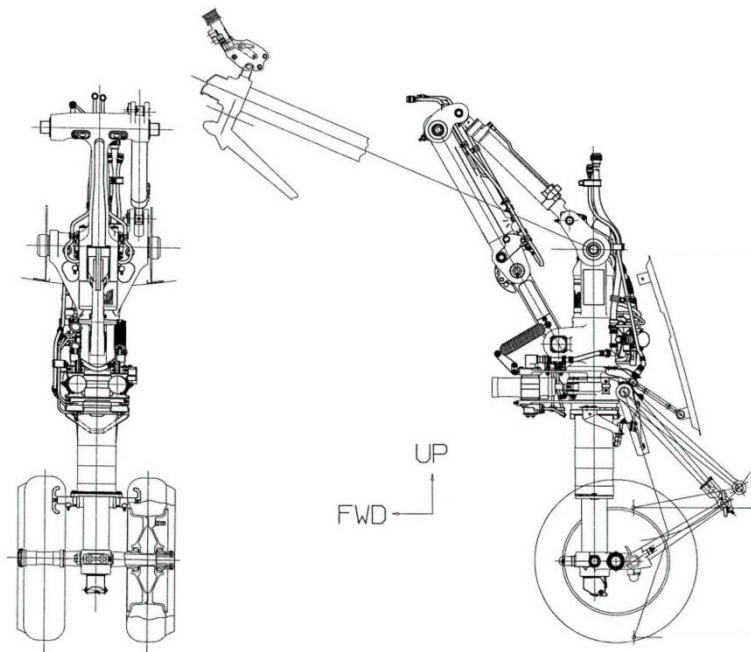
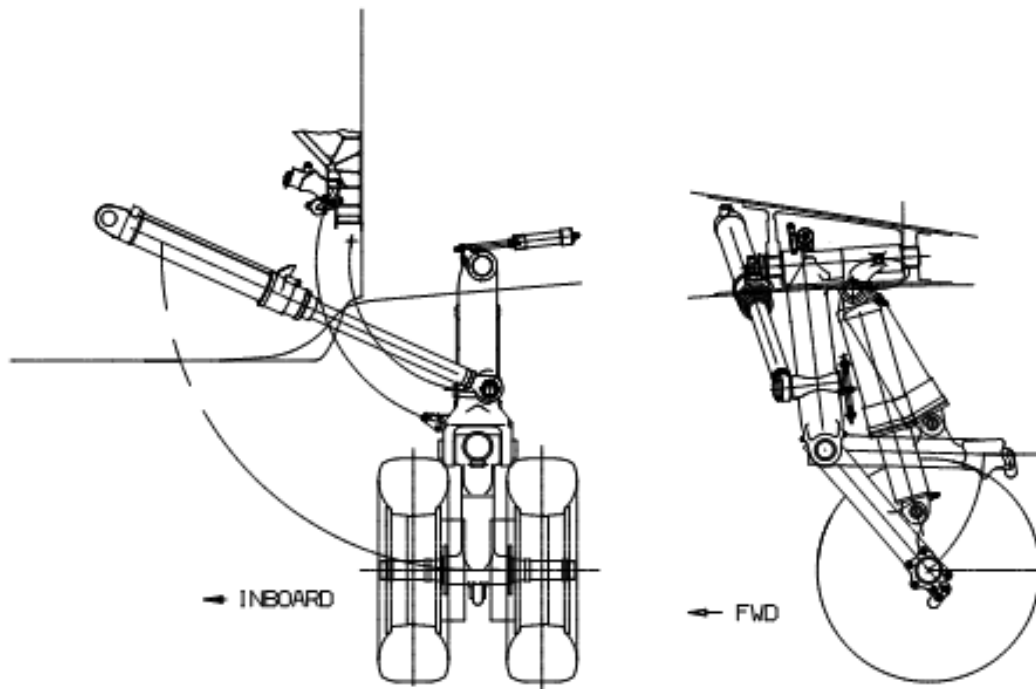
Steering angle Normal operating angle ± 14 degrees
Taxi steering angle ± 70 degrees
Aircraft towing, steering angle ± 90 degrees
Actuation system Cable-controlled, hydraulic actuated cylinders

Tire Sizes

NLG 40x15.5-16
MLG H54x21.0-24

Suppliers:

Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
Center Landing Gear	1		UTC Aerospace Systems	
MLG Wheels & Brakes	10	Carbon	Honeywell	Standard
NLG Wheels	2		ABSC	
AutoBrake Control System	1		Crane Aerospace Hydro-Aire	Standard
Skid Control System	1		ABSC	
Steering Control Syst.	1			
MLG Tires	10	Bias	Goodyear	
NLG Tires	2	Bias	Goodyear	
Brake Temperature Monitoring System	1		MBD	Standard
Tire Pressure Monitoring System	1		MBD	Standard

Bombardier - CRJ100/200/440**Nose Landing Gear:****Main Landing Gear:**

CRJ100/200/440 Technical Information: Gross Weight = 51,000 pounds (23,134 kg)

Gear Actuation

Electro-hydraulic normal extend retract system
Cable operated mech. emergency system with hydraulic assist

Braking System

Hydro-mechanical braking system with individual anti-skid protection and brake temp. monitoring to all 4 main wheels

Steering System

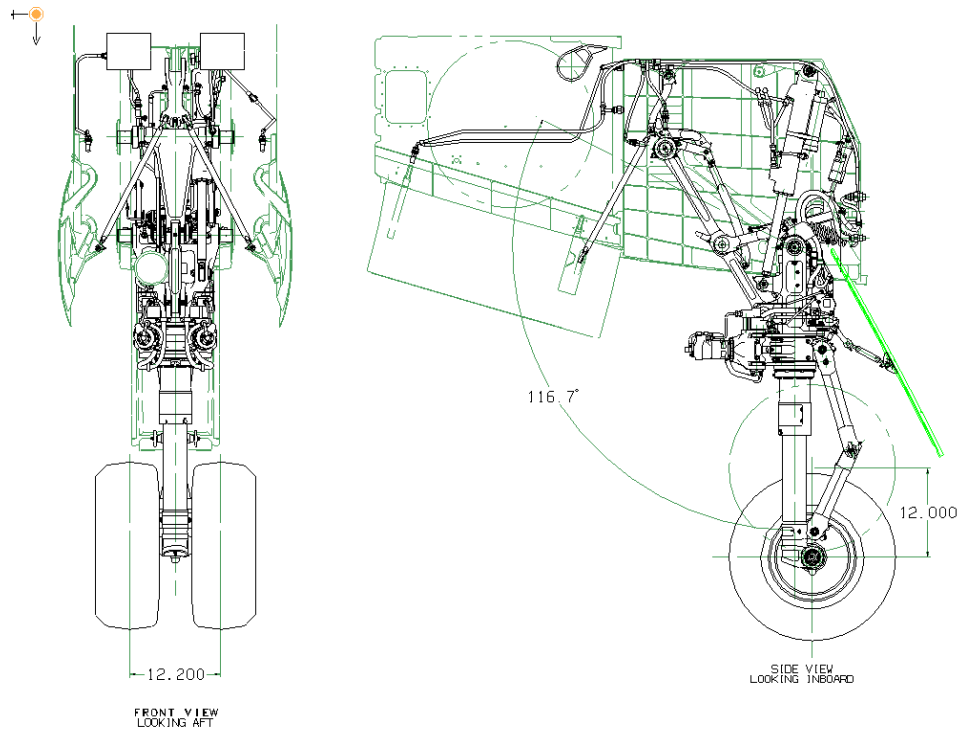
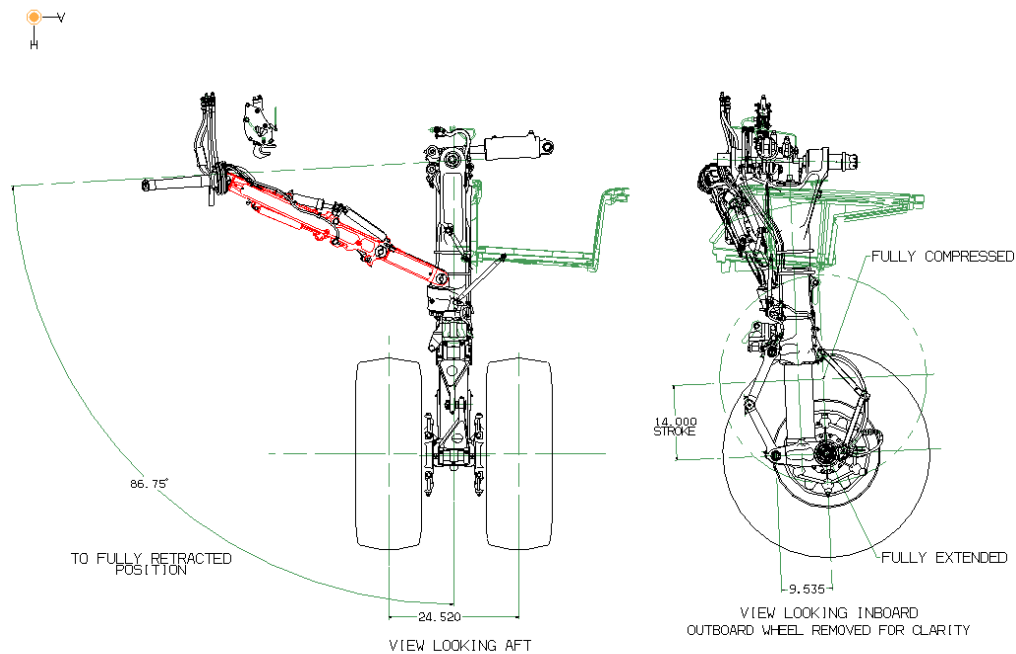
Steering Angle Powered steering range: ± 70 degrees
Towing Angle Torque links disconnected: unlimited
Torque links connected: ± 70 degrees
Actuation System Hydraulically powered dual push pull actuators
Turning Radius 41.25 feet (12.6 m)

Tire Sizes

NLG 18 x 4.4
MLG H29 x 9.0-15, 16pr

Suppliers:

Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Cantilever	MBD	Fwd Retract
Main Landing Gear	2	Trailing Arm	MBD	Inbd Retract
Gear Actuation	1	Electro-Hyd	Bombardier Architecture with ELDEC Control Unit	Proximity Sensing
Brake Control System	1	Hydro-Mech	Bombardier Architecture - Various Suppliers	
Skid Control System	1	Electro-Hyd	Crane Aerospace , Hydro-Aire	Analog
Steering Control Sys	1	Electro-Hyd	MBD	Digital/Analog
Brake Temperature Monitoring	4	Electric	Thales	Digital/Analog
MLG Wheels	4	Ring Retained Flange	ABSC	
MLG Brakes	4	Steel	ABSC	4 pair
NLG Wheels	2	Split Wheel	ABSC	
MLG Tires	4	H Bias	Goodyear	Standard
MLG Tires	4	H Bias	Michelin	Option
NLG Tires	2	Type VII Bias, Single chine	Goodyear	Standard
NLG Tires	2	Type VII Bias, Single chine	Michelin	Option

Bombardier - CRJ700/CRJ900**Nose Landing Gear:****Main Landing Gear:**

CRJ700/CRJ900 Technical Information: Gross Weight = 72,750/80,500 pounds (33,000/36,500 kg)

Gear Actuation

Electro-hydraulic normal extend/retract system
Cable operated mechanical emergency system with hydraulic assist

Braking System

Hydro-mechanical braking system with individual anti-skid protection and brake temperature monitoring to all four main wheels

Steering System

Steering Angle Powered steering range: ± 80 degrees
Towing Angle Torque links disconnected: unlimited
Torque links connected: ± 70 degrees
Actuation System Hydraulically powered dual push pull actuators
Turning Radius CRJ700: 49.6 feet (14.5 m)
CRJ900: 59.1 feet (18 m)

Tire Sizes

NLG 20.5 x 6.75-10, 12 ply bias
MLG H36 x 12.0-18, 18 ply bias

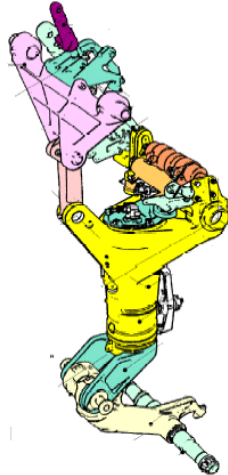
Suppliers:

Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Cantilever	UTC Aerospace Systems	Fwd Retract
Main Landing Gear	2	Cantilever	UTC Aerospace Systems	Inbd Retract
Gear Actuation	1	Electro-Hyd	UTC Aerospace Systems Architecture with ELDEC Control Unit	Proximity Sensing
Brake Control System	1	Hydro-Mech	ABSC	
Skid Control System	1	Electro-Hyd	ABSC	Digital
Steering Control Sys	1	Electro-Hyd	UTC Aerospace Systems	Digital
Brake Temperature Monitoring	4	Digital	ABSC	
MLG Wheels	4	Bolted Flange	ABSC	CRJ700
MLG Wheels	4	Ring Retained Flange	ABSC	CRJ900
MLG Brakes	4	Steel	ABSC	4 pair (CRJ700) 5 pair (CRJ900)
NLG Wheels	2	Split Wheel	ABSC	
MLG Tires	4	H Bias	Goodyear	Standard
NLG Tires	2	Bias	Goodyear	

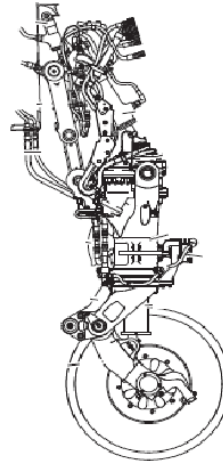
Bombardier Dash 8 Q Series

Nose Landing Gear:

SERIES 100/300A

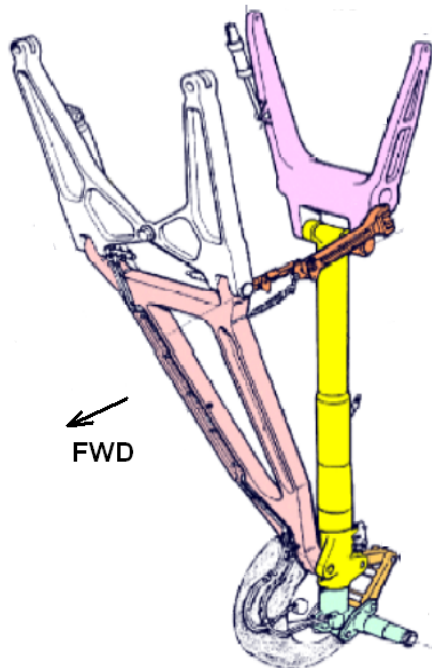


SERIES 400

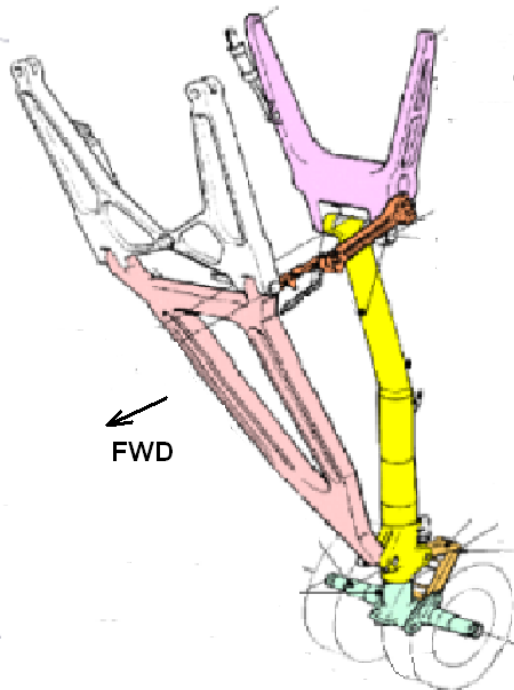


Main Landing Gear:

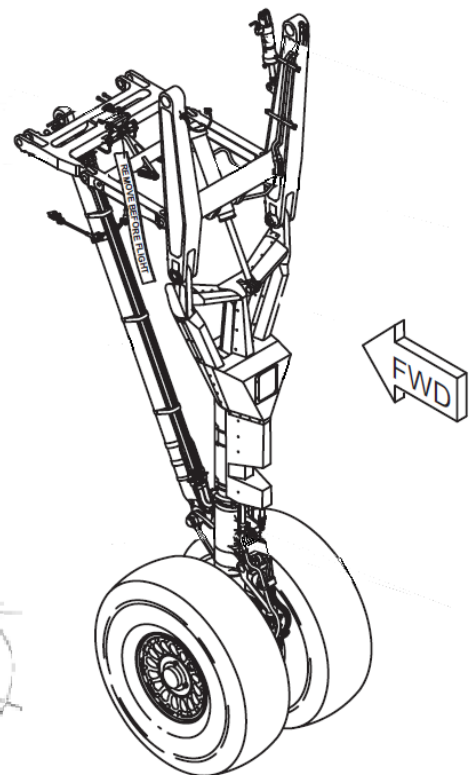
SERIES 100



SERIES 300A



SERIES 400



Dash 8 - 100,200,300 Series Technical Information: Gross Weight = -100/200, 36,300 pounds (16,450 kg), -300, 43,000 pounds (19,500 kg)

Braking System

Cable and hydraulically controlled system, digital anti-skid system individually controlled for each MLG-wheel, Steel brakes

Steering System

Steering angle Normal operating angle ± 60 degrees
 Aircraft towing, steering angle ± 120 degrees
 Actuation system hydraulically powered actuator and links pushing
 on inner cylinder spigot
 Turning radius 100/200 - 60 feet (18.28 m), 300 - 74 feet (22.56 m)
 Minimum pavement width for 180 degree turn

Tire Sizes

NLG 100/200/300 - 18x5.5, 300 - optional 22x6.5-10
 MLG 100 - 26.5 x 8.0-13, optional H31 x 9.75-13
 200 - H31 x 9.75-13
 300 - 31 x 9.75 - 14

Suppliers:

Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Semi-Articulated	MBD	
Main Landing Gear	2	Telescopic	MBD	
MLG Wheels & Brakes	4	Steel	UTC Aerospace Systems	
NLG Wheels	2		UTC Aerospace Systems	
Brake Control System	1	Hydraulic		
Skid Control System	1		Crane Aerospace Hydro-Aire	Analog
Steering Control Syst.	1	By Wire	MBD	Analog
MLG Tires	4	Bias	Dunlop, Goodyear	Standard
NLG Tires	2	Bias	Dunlop, Goodyear	Standard

Dash 8 - 400 Series Technical Information: Gross Weight = -400, 64,500 pounds (29,260 kg)

Braking System

Cable and hydraulically controlled system, digital anti-skid system individually controlled for each MLG-wheel, Carbon brakes

Steering System

Steering angle Normal operating angle ± 70 degrees
 Aircraft towing, steering angle ± 120 degrees
 Actuation system hydraulically powered motor and gear box
 Turning radius 84 feet 5 inches (25.7 m) minimum pavement width for 180 degree turn

Tire Sizes

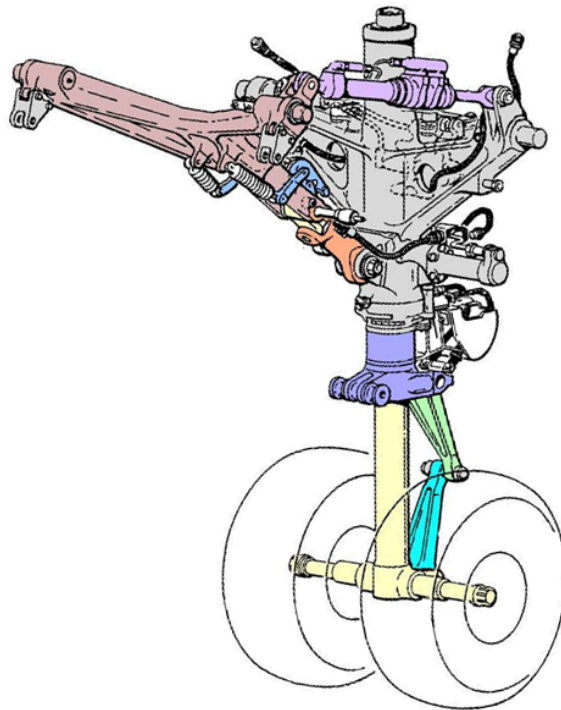
NLG 22x6.50-10
 MLG 32x8.8, optional 34x10.75-16

Suppliers:

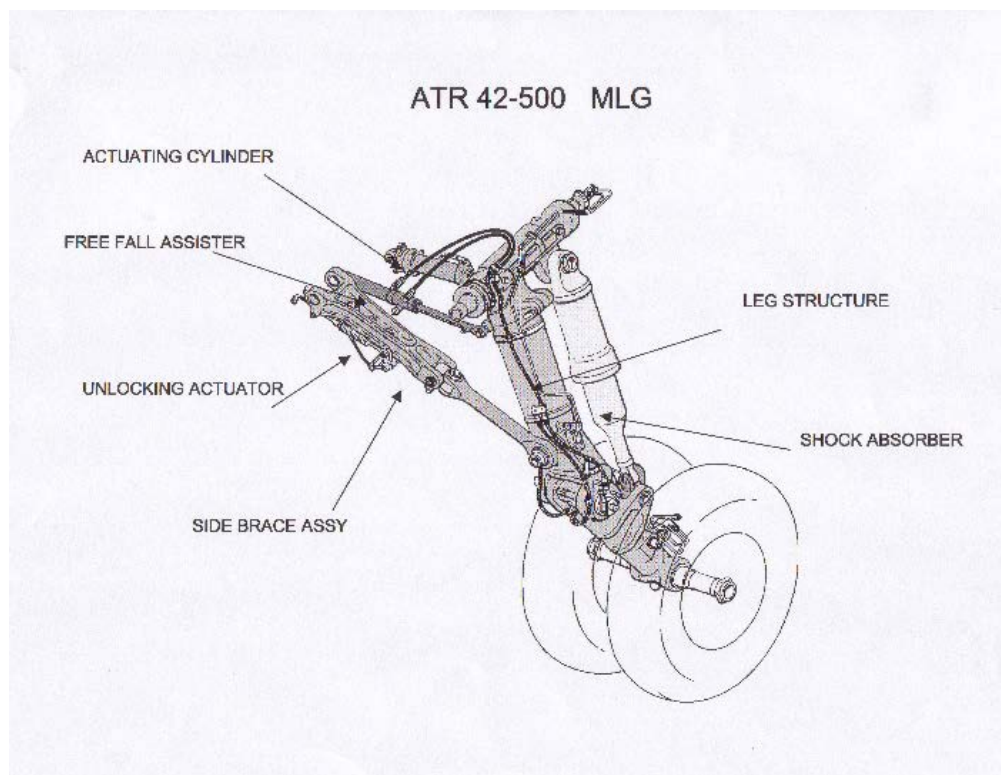
Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Semi-Articulated	UTC Aerospace Systems	
Main Landing Gear	2	Telescopic	UTC Aerospace Systems	
MLG Wheels & Brakes	4	Carbon	UTC Aerospace Systems	
NLG Wheels	2		UTC Aerospace Systems	
Brake Control System	1	Hydraulic		
Skid Control System	1		ABSC	Digital
Steering Control Syst.	1	By Wire	UTC Aerospace Systems/BAE	Analog
MLG Tires	4	Bias	Dunlop	Standard
NLG Tires	2	Bias	Dunlop	Standard

Avions de Transport Regional ATR 42

Nose Landing Gear:



Main Landing Gear:



ATR 42 Technical Information: Gross Weight = 41,005 pounds (18 600 kg)

Braking System Hydro-mechanical braking system with individual control and anti-skid protection on each wheel - Steel brakes

Steering System

Steering angle Normal operating angle ± 60 degrees
 Aircraft towing, steering angle ± 91 degrees
 Actuation system Hydraulically powered Rack & Pinion

Tire Sizes

NLG 450x190-5, 435x190R5
 MLG H34x10.0R16 or 32x8.8R16

Suppliers:

Item	No. per Aircraft	Type	Manufacturer	Remark
Nose Landing Gear	1	Telescopic	MBD	
Main Landing Gear	2	Lever	MBD	
MLG Wheels & Brakes	4	Steel, Carbon	Dunlop or ABSC	Standard
Brake cooling fan	No			
NLG Wheels	2		Dunlop or ABSC	
Brake Control System	1	Hydromech	Crane Aerospace Hydro-Aire	
Skid Control System	1	Analog	Crane Aerospace Hydro-Aire	
Steering Control Syst.	1	Hydromech	MBD	
MLG Tires	4	Radial	Michelin or Goodyear	Standard
NLG Tires	2	Bias	Michelin or Goodyear	Standard
Brake Temperature Monitoring System	1		MBD	Optional