



U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

**ORDER**  
**5300.7**

Effective Date:  
October 6, 2005

**SUBJ:** Standard Naming Convention for Aircraft Landing Gear Configurations

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- 1. Purpose of This Order.** This Order establishes a standard convention for naming and characterizing aircraft landing gear configurations. Although this order is primarily directed at fixed wing airplanes, it is applicable to any aircraft using wheels for landing purposes.
- 2. Who This Order Affects.** This Order impacts divisions in the Offices of Planning and Programming, Airport Safety and Standards, Air Traffic, Airway Facilities, and Flight Standards Services; the regional Airports, Air Traffic, Airway Facilities, and Flight Standards Divisions; and Airport District and Field Offices. It will also affect organizations and individuals external to the Federal Aviation Administration (FAA). A standardized naming convention will allow uniformity and consistency among Federal agencies and external entities when naming aircraft gear configurations. Pilots and airport operators will no longer need to learn multiple naming systems and will be able to use common aircraft landing gear names at all military and commercial facilities.
- 3. Background of This Order.** Landing gear configuration and aircraft gross weight are an integral part of airfield pavement design and are often used to characterize pavement strength. Historically, most aircraft used relatively simple gear geometries such as a single wheel per strut or two wheels side by side on a landing strut. As aircraft became larger and heavier, they required additional wheels to prevent individual wheel loads from introducing excessively high stresses into the pavement structure. For economy and efficiency reasons, aircraft manufacturers added more wheels per landing strut whenever possible. This often led to groups of wheels placed side-by-side and in tandem configurations.
  - a. Typical Gear Configurations.** Up until the late 1980s, the majority of civilian and military aircraft used three basic gear configurations: the “single wheel” (one wheel per strut), the “dual wheel” (two wheels side by side on a strut), and the “dual tandem” (two wheels side by side followed by two additional side-by-side wheels). As aircraft continued to increase in gross weight, manufacturers attempted to limit the damage imparted to pavements by increasing the total number of wheels. This was typically done by adding additional landing struts to the aircraft. For example, McDonnell Douglas originally manufactured the DC-10 with two landing struts using the dual tandem gear configuration. When the company produced the heavier DC-10-30 variation of the aircraft, it added an additional landing strut, using a dual wheel configuration, to the center of the aircraft. Another example is the Boeing 747 aircraft. To reduce the impact to airfield pavements, Boeing used four landing struts with dual tandem configurations on the B-747.
  - b. Complex Gear Configurations.** The increasingly complex gear arrangements quickly outgrew the simple single, dual, and dual tandem descriptions. Additionally, other aircraft were developed with gear configurations that used numerous wheels in arrangements that could not be

described by the three simple gear configurations. As the number and complexity of gear arrangements increased and with no coordinated effort to provide a uniform naming convention, the FAA, U.S. Air Force, and U.S. Navy developed different naming systems that were not easily cross-referenced.

#### 4. Definitions Used in This Order.

**a. Main Gear.** “Main gear” means the primary landing gear that is symmetrical on either side of an aircraft. When multiple landing gears are present and are not in line with each other, the outer most gear pair is considered the main gear. Multiples of the main gear exist when a gear is in line with other gears along the longitudinal axis of the aircraft.

**b. Body/Belly Gear.** “Body/belly gear” refers to an additional landing gear or gears in the center portion of the aircraft between the main gears. Body/belly gears may be of a different type than the main gear and may be nonsymmetrical.

**5. Intended areas of use.** The naming convention shown in Figure 1 is intended for use in all civilian and military applications. All FAA pavement design guidance and FAA databases and database publications, e.g. 5010 Master Record, Airport/Facilities Directory, etc., will hereafter use the described aircraft gear naming convention. The Air Force and Navy will also adopt this system in their pavement guidance and facilities databases.

#### 6. Aircraft Gear Geometry Naming Convention.

**a. Basic Name for Aircraft Gear Geometry.** Under the naming convention, abbreviated aircraft gear designations may include up to three variables: the main gear configuration, the body/belly gear configuration if body/belly gears are present, and an optional tire pressure code described below. Figure 1 illustrates the two primary variables.

**b. Basic Gear Type.** Gear type for an individual landing strut is determined by the number of wheels across a given axle (or axle line) and whether wheels are repeated in tandem. There may exist, however, instances in which multiple struts are in close proximity and are best treated as a single gear, e.g. Antonov AN-124 (see Figure 14). If body/belly gears are not present, the second portion of the name is omitted. For aircraft with multiple gears, such as the B-747 and the A380, the outer gear pair is treated as the main gear.

**c. Basic Gear Codes.** This naming convention uses the following codes for gear designation purposes (see Figure 2):

S	Single
D	Dual
T	Triple
Q	Quadruple

**d. Use of Historical Tandem Designation.** Although the verbal description continues to use the term “tandem” to describe tandem gear configurations, the tandem designation “T” no longer appears in the gear name. “T” now indicates triple wheels.

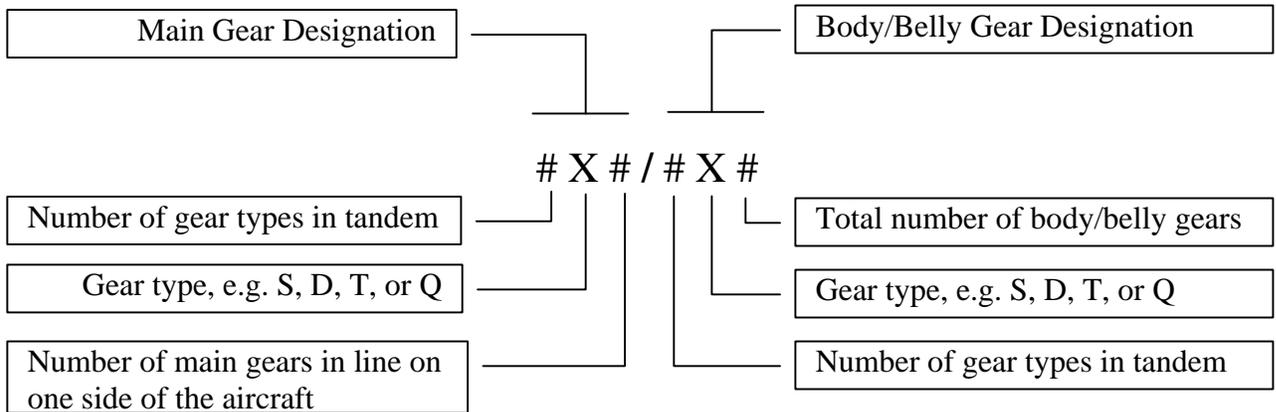


Figure 1. Aircraft Gear Naming Convention

**e. Main Gear Portion of Gear Designation.** The first portion of the aircraft gear name comprises the main gear designation. This portion may consist of up to three characters. The first character indicates the number of tandem sets or wheels in tandem, e.g. 3D = three dual gears in tandem. (If a tandem configuration is not present, the leading value of “1” is omitted.) Typical names are S = Single, 2D = two dual wheels in Tandem, 5D = five dual wheels in tandem, and 2T = two triple wheels in tandem.

(1) The second character of the gear designation indicates the gear code, e.g. S, D, T, or Q.

(2) The third character of the gear designation is a numeric value that indicates multiples of gears. For the main gear, the gear designation assumes that the gear is present on both sides (symmetrical) of the aircraft and that the reported value indicates the number of gears on one side of the aircraft. A value of 1 is used for aircraft with one gear on each side of the airplane. For simplicity, a value of 1 is assumed and is omitted from the main gear designation. Aircraft with more than one main gear on each side of the aircraft and where the gears are in line will use a value indicating the number of gears in line. For example, the Ilyushin IL-76 has two gears containing quadruple wheels on each side of the aircraft and is designated as a Q2 (see Figure 20).

**f. Body/Belly Gear Portion of Gear Designation.** The second portion of the aircraft gear name is used when body/belly gears are present. If body/belly gears are present, the main gear designation is followed by a forward slash (/), then the body/belly gear designation. For example, the B-747 aircraft has a two dual wheels in tandem main gear and two dual wheels in tandem body/belly gears. The full gear designation for this aircraft is 2D/2D2. The body/belly gear designation is similar to the main gear designation except that the trailing numeric value denotes the total number of body/belly gears present, e.g. 2D1 = one dual tandem body/belly gear; 2D2 = two dual tandem body/belly gears. Because body/belly gear arrangement may not be symmetrical, the gear code must identify the total number of gears present, and a value of 1 is not omitted if only one gear exists.

**g. Extension of Naming Convention.** Future aircraft might require additional body/belly gears that are nonsymmetrical and/or nonuniform. In these instances, the body/belly gear

designation will contain a hyphen to indicate the nonuniform gear geometry. For demonstration purposes, consider adding one dual wheel body/belly gear to the existing 2D/2D2 gear configuration. The resulting gear name would be 2D/2D2-D.

**h. Unique Gear Configurations.** The Lockheed C-5 Galaxy has a unique gear type and is difficult to name using the proposed method. This aircraft will not be classified using the new naming convention and will continue to be referred to directly as the C5. Gear configurations such as those on the Boeing C-17, Antonov AN-124, and Ilusyin IL-76 might also cause some confusion; see Figures 8, 14, and 20, respectively. In these cases, it is important to observe the number of landing struts and the proximity of the struts. In the case of the AN-124, it is more advantageous to address the multiple landing struts as one gear, i.e. 5D or five duals in tandem, rather than use D5 or dual wheel gears with five sets per side of the aircraft. Due to wheel proximity, the C-17 gear is more appropriately called a 2T as it appears to have triple wheels in tandem. In contrast, the IL-76 has considerable spacing between the struts and should be designated as a Q2.

**i. Examples of Gear Geometry Naming Convention.** Figure 2 provides examples of generic gear types in individual and multiple tandem configurations. Figures 3 through 20 provide examples of known gear configurations.

**j. Comparison of Naming Convention to Historical Procedures.** Table 3 demonstrates the proposed naming convention and references the historic FAA, U.S. Air Force, and U.S. Navy methods. The historic Air Force methodology also addresses the configuration of the aircraft nose gear. Due to the insignificance of the pavement load imposed by the nose gear, the proposed method does not address nose gear configuration.

**k. Inclusion of Tire Pressure Information.** In addition to specifying gear geometry, the aircraft gear designation can also indicate the tire pressures at which the aircraft operates. Although tire pressure effects on airfield pavements are secondary to aircraft load and wheel spacing, they can have a significant impact on the ability of the pavement to accommodate a specific aircraft.

(1) The Aircraft Classification Number (ACN) and the Pavement Classification Number (PCN) system created by the International Civil Aviation Organization (ICAO) has defined and categorized aircraft tire pressures into four groups for reporting purposes. Table 1 lists these groups and their assigned codes.

Table 1. Standard Tire Pressure Categories

Category	Range		Code Designation
	psi	MPa	
High	No limit	No Limit	W
Medium	146 - 217	1.01 - 1.5	X
Low	74 - 145	0.51 - 1.0	Y
Very Low	0 - 73	0.0 - 0.5	Z

(2) To allow for the reporting of tire pressure, the gear naming convention includes a third variable. Using the codes identified by the International Civil Aviation Organization (ICAO), the tire pressure can be included in parentheses after the standard gear nomenclature. Table 2 provides sample gear names with and without the additional tire pressure code.

Table 2. Sample Gear Names With and Without Tire Pressure Codes

Gear Name Without Tire Pressure	Gear Name With Tire Pressure
S	S(W)
2S	2S(X)
2D/2D1	2D/2D1(Z)
Q2	Q2(Y)
2D/3D2	2D/3D2(Z)

Table 3. Proposed Naming Convention with Historical FAA, U.S. Air Force, and U.S. Navy Nomenclatures

PROPOSED NOMENCLATURE	Reference Figure	Historic FAA Designations					U.S. Air Force Designations				U.S. NAVY Designations			Typical Aircraft
		FAA Name	Main Gear	Belly Gear	# Belly Gear	Total # Wheels, Excluding Nose	Air Force Designation	Air Force Types	Air Force Name	NOSE GEAR	Navy Name	Navy Designation	DOD Flight Information	
S	3	Single Wheel	SW			2	S	A	Single, Tricycle	Single Wheel	Single Tricycle	ST	S	F-14, F15
S	4	Single Wheel	SW			2	S	B	Single, Tricycle	Dual wheel				
D	5	Dual wheel	DW			4	T	C	Twin, Tricycle	Single Wheel				Beech 1900
D	6	Dual wheel	DW			4	T	D	Twin, Tricycle	Dual wheel	Dual Tricycle	DT	T	B-737, P3 (C-9)
2S	7	Single Tandem				4	S-TA	E	Single, Tandem Tricycle	Dual wheel	Single Tandem Tricycle	STT	ST	C-130
2T	8					12	TR-TA	L	Twin-Tandem, Tricycle	Dual wheel	Triple Tandem	TRT	TRT	C-17
2D	9	Dual Tandem	DT			8	T-TA	F	Twin-Tandem, Tricycle	Dual wheel	Dual Tandem Tricycle	DTT	TT	B757, KC135, C141
2D/D1	10	Dual tandem	DT	DW	1	10	T-TA	H	Twin-Tandem, Tricycle	Dual wheel	Single Belly Twin Tandem	SBTT	SBTT	L1011, DC-10
2D/2D1	11	Dual Tandem	DT	DT	1	12				Dual wheel				A340-600
2D/2D2	12	Double Dual Tandem	DT	DT	2	16	T-TA	J	Twin-Tandem, Tricycle	Dual wheel	Double Dual Tandem	DDT	DDT	B-747, (E-4)
3D	13	Triple dual Tandem	TDT			12				Dual wheel				B-777
5D	14					20				4 across				An-124
7D	15					28				4 across				An-225
2D/3D2	16		DT	TDT	2	20				Dual wheel				A380
C5	17					24	T-D-TA	K	Twin-Delta-Tandem, Tricycle	4 across	Twin Delta Tandem	TDT	TDT	C-5
D2	18					8	T-T	G	Twin-Twin, Bicycle	No Nose Gear - single outrigger	Twin Twin Tricycle	TT	TT	B-52
Q	19					8								HS-121 Trident
Q2	20					16								IL-76

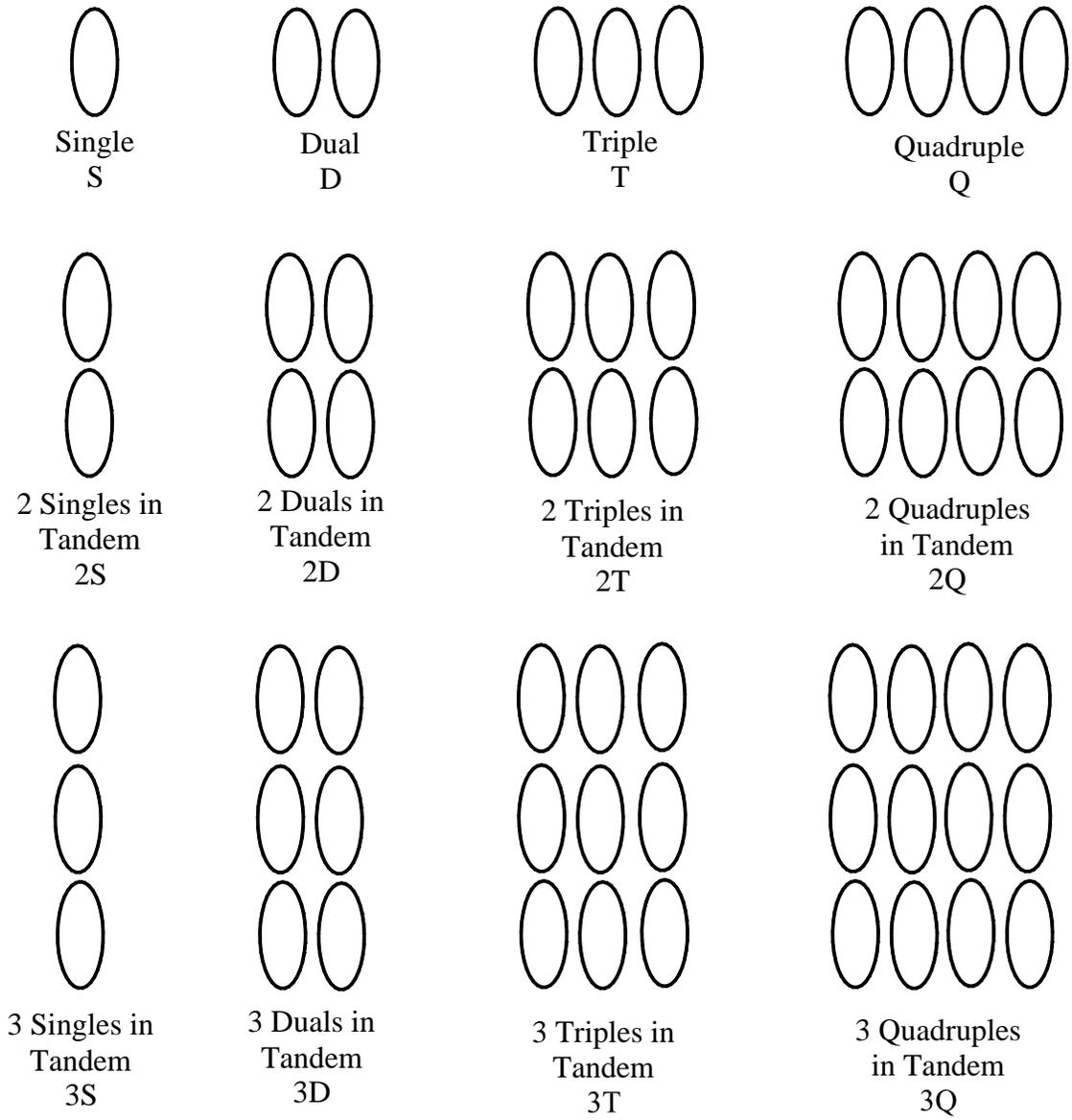


Figure 2. Generic Gear Configurations. Increase numeric value for additional tandem axles.

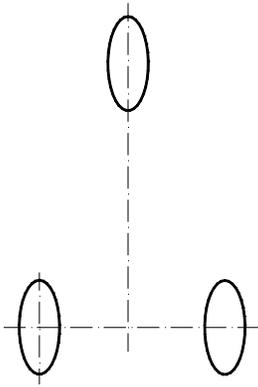


Figure 3. S - Single Wheel Main Gear with Single Wheel Nose Gear

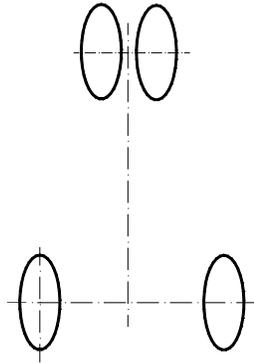


Figure 4. S - Single Wheel Main Gear with Dual Wheel Nose Gear

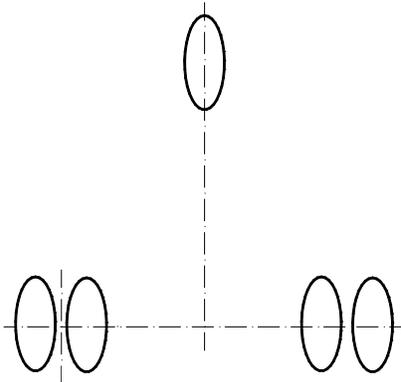


Figure 5. D - Dual Wheel Main Gear with Single Wheel Nose Gear

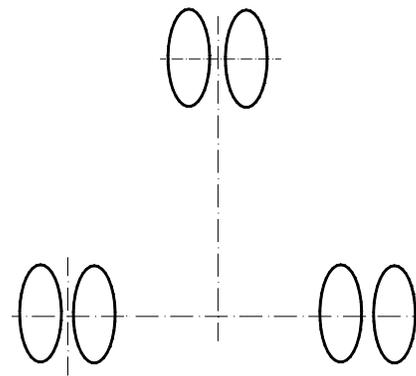


Figure 6. D - Dual Wheel Main Gear with Dual Wheel Nose Gear

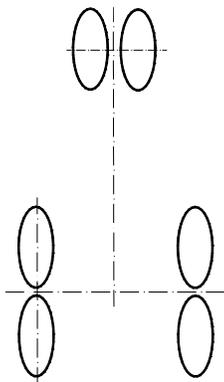


Figure 7. 2S - Two Single Wheels in Tandem Main Gear with Dual Wheel Nose Gear, Lockheed C-130

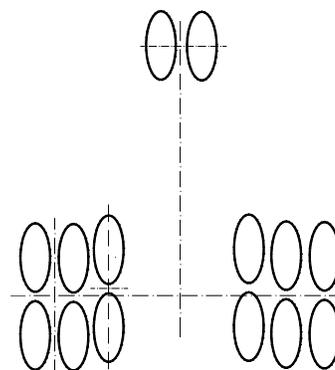


Figure 8. 2T - Two Triple wheels in Tandem Main Gear with Dual Wheel Nose Gear, Boeing C-17

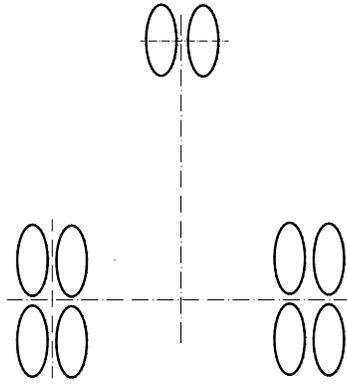


Figure 9. 2D - Two Dual Wheels in Tandem Main Gear with Dual Wheel Nose Gear

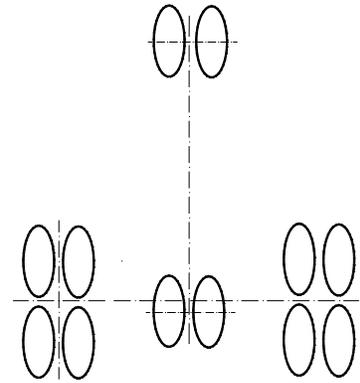


Figure 10. 2D/D1 - Two Dual Wheels in Tandem Main Gear/Dual Wheel Body Gear with Dual Wheel Nose Gear, McDonnell Douglas DC-10, Lockheed L-1011

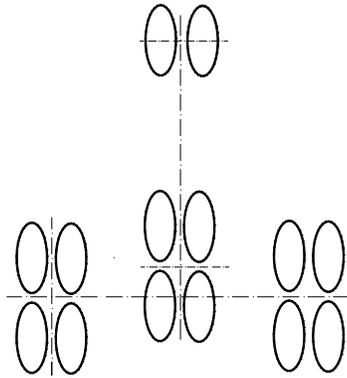


Figure 11. 2D/2D1 Two Dual Wheels in Tandem Main Gear/Two Dual Wheels in Tandem Body Gear with Dual Wheel Nose Gear, Airbus A340-600

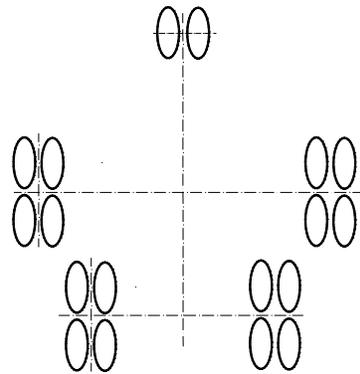


Figure 12. 2D/2D2 - Two Dual Wheels in Tandem Main Gear/Two Dual Wheels in Tandem Body Gear with Dual Wheel Nose Gear, Boeing B-747

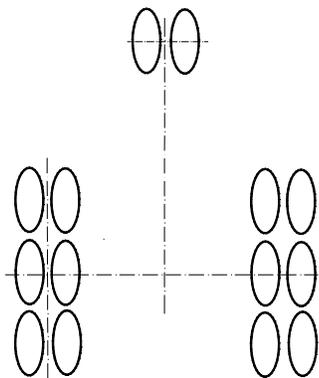


Figure 13. 3D - Three Dual Wheels in Tandem Main Gear with Dual Wheel Nose Gear, Boeing B-777

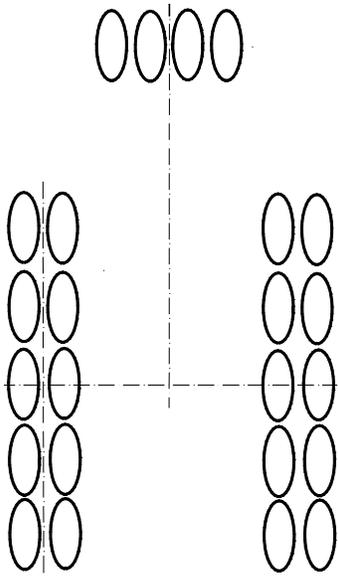


Figure 14. 5D - Five Dual Wheels in Tandem Main Gear with Quadruple Nose Gear, Antonov AN-124

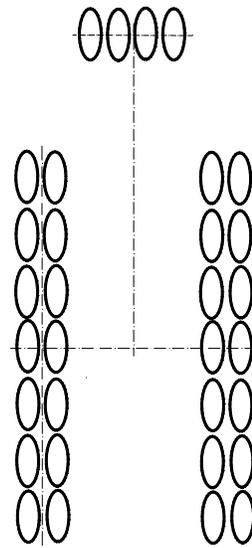


Figure 15. 7D - Seven Dual Wheels in Tandem Main Gear with Quadruple Nose Gear, Antonov AN-225

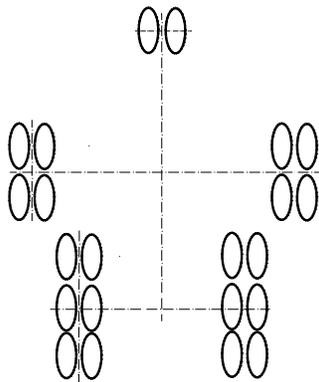


Figure 16. 2D/3D2 - Two Dual Wheels in Tandem Main Gear/Three Dual Wheels in Tandem Body Gear with Dual wheel Nose Gear, Airbus A380

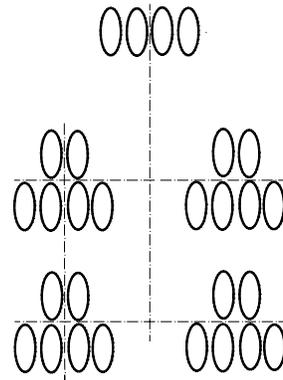


Figure 17. C5 - Complex Gear Comprised of Dual Wheel and Quadruple Wheel Combination with Quadruple Wheel Nose Gear, Lockheed C5 Galaxy

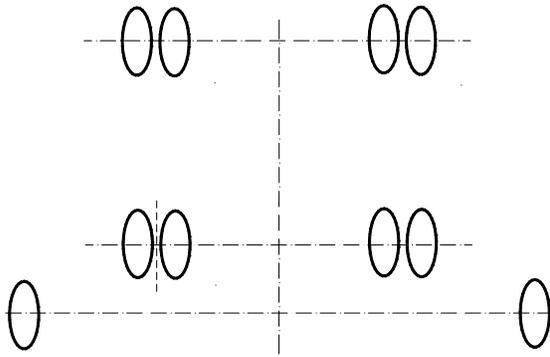


Figure 18. D2 - Dual Wheel Gear Two Struts per Side Main Gear with No Separate Nose Gear (note that single wheel outriggers are ignored), Boeing B-52 Bomber

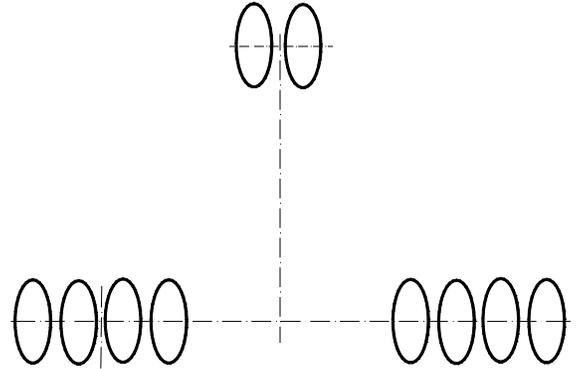


Figure 19. Q - Quadruple Wheel Main Gear with Dual Wheel Nose Gear, Hawker Siddeley HS-121 Trident

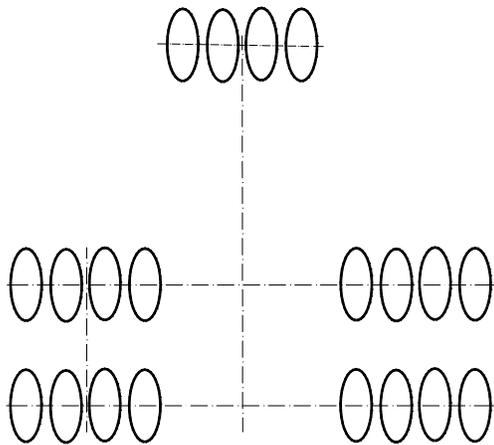


Figure 20. Q2 - Quadruple Wheels Two Struts per Side with Quadruple Nose Gear, Ilyushin IL-76

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