

TYPES OF WAGON STOCK



INTRODUCTION

- ❖ Rolling stock used exclusively for transport of goods is termed as freight stock
- ❖ In order to transport goods, the wagons are required
- ❖ The earliest types of wagons were in the form of four sided wooden boxes, either open or closed at top
- ❖ Earlier wagons were four wheeler type
- ❖ Gradually, the design of the wagon has gone under considerable changes and modifications
- ❖ Indian railways transports all types of goods such as building materials, coal, sugarcane, animals, chemicals, cloths, food-grains, oils, petrol, explosives, automobiles, medicines, perishable goods, milk, finished products of high and low values, paper etc.
- ❖ In order to meet the requirements of each type of goods, the wagons of different designs are employed

CLASSIFICATION OF WAGON

Freight Stock are broadly classified either according to their under gear or according to utility

According to:

1. Under gear
2. Utility

ACCORDING TO UNDER GEAR

1. Four wheeler wagon

- Conventional Wagons
- Modified Wagons
- Tank Wagons

At present only Brake van is in service

2. Bogie wagons

- Diamond frame bogie
- Cast steel Bogie
- UIC fabricated bogie
- CASNUB Bogie

At present only CASNUB bogie wagon is in service

ACCORDING TO UTILITY

- Open wagons
- Covered wagons
- Flat wagons
- Well wagons
- Hopper wagons
- Container wagons
- Tank wagons
- Brake vans

TRANSPORTATION CODES USED FOR WAGONS

- HS : High Speed
- HA : Higher Axle Load
- LW : Light weight
- HL : Higher Pay Load
- B : (prefix) Bogie wagon
- BV : Brake van
- V : Brake/parcel van
- O : Open wagon (gondola)
- C : Covered wagon
- F : Flat car
- FK : Flat car for container
- LA : Low flat car with standard buffer height
- LB : Low flat car with low buffer height
- LAB : Low flat car, one end with low buffers, the other with high buffers
- R : Rail-carrying wagon
- B : Hopper wagon
- E : Explosive wagon
- T : Tanker

TRANSPORTATION CODES USED FOR WAGONS

- U : Well wagon
- W : Well wagon
- M : (suffix) Military
- MR : Horse/Cattle
- C : Centre discharge
- S : Side discharge
- X : Centre & side discharge
- R : Rapid bottom discharge
- X : (also) High sided
- Y: Low (medium) side walls
- L : Low sided

- H : Heavy load
- N : Air-braked
- EL : Enhanced loading

Type of Coupling

C : Centre buffer coupler
(CBC)

Usually not written as all
stock are fitted with CBC

- R = Screw coupling only
- T = Transition coupler
(CBC with additional side
buffers and screw coupling)

NOMENCLATURE OF WAGONS

- BOY - Bogie open low sided wagon
- BOYEL - Bogie open low sided wagon for enhanced loading
- BOXN - Bogie open wagon fitted with air brakes
- BOXNCR - Bogie open wagon fitted with air brakes and stainless steel body
- BOXNHA - Bogie open wagon with IRF-108 HS bogies, air brake
- BOXNLW - Bogie open light weighted wagon fitted with air brake
- BOXNHS - Bogie open wagon with CASNUB 22HS bogies, air brake

NOMENCLATURE OF WAGONS

- **BOXNAL** - Bogie open Aluminium wagon with CASNUB 22HS bogies fitted with air brake
- **BOXNHL** - Bogie open stainless steel wagon with CASNUB 22HS bogies (modified for 22.9 t axle load), air brake
- **BOXNEL** - Bogie open wagon fitted with air brakes and high axle load
- **BOXNR** - Bogie open wagon fitted with air brakes (Rehabilitated)
- **BOST** - Bogie open wagon with CASNUB HS bogies, air brake for loading steel sections

NOMENCLATURE OF WAGONS

- BCN - Bogie covered wagon fitted with air brakes
- BCCN - Bogie covered wagon fitted with & air brakes for loading Auto cars
- BCNA - Bogie covered wagon fitted with air brakes. All welded Broad gauge covered wagon
- BCNAHS - Bogie Covered wagon with CASNUB 22 HS bogies & air brakes
- BCNHL - Bogie Covered wagon with CASNUB 22HS bogies (modified for 22.9t axle load), air brake
- BCNEL - Bogie Covered wagon fitted with air brakes and high axle load

NOMENCLATURE OF WAGONS

- BRN / BRNA - Bogie Rail Truck with Air Brake
- BFNS - Bogie Flat wagon with Casnub bogies & air brake
- BRSTN - Bogie Rail Wagon for heavy vehicles
- BWTB - Well wagon for Battle Tank (well height 1055 mm)
- BOBYN - Hopper with top and 4 row controlled bottom discharge with Casnub bogies fitted with air brake
- BOBR - Hopper wagon with casnub bogies bottom automatic discharge system wagon
- BOBRN - Hopper wagon with casnub bogies automatic rapid bottom discharge wagon, air bk.
- BOBRNEL - Hopper wagon with casnub bogies, high axle load and automatic discharge system wagon
- BCBFG - Bogie covered Hopper Wagon for Food Grain

NOMENCLATURE OF WAGONS

- **BLCA/BLCB/BLLA/BLLB/BLCAM/BLCBM** - Bogie Low platform container flat wagon (A Car & B Car) with LCCF 20 (C) type Cast Steel Bogies with Air Brake system with LSD
- **BFKN** - Container flat wagon with standard floor height
- **BCACM** - Bogie covered auto car modified wagon
- **BCACBM** - Bogie covered auto car carrier wagon
- **BOMN** - Bogie open Military wagons for defence Equipments
- **BRSTN** - Bogie Rail Wagon for heavy vehicles

NOMENCLATURE OF WAGONS

- BTPN - Bogie Tank wagon for petroleum product
- BTPGLN - Bogie tank wagon for LPG/petroleum product fitted with air brake
- BTFLN - Bogie Frameless Tank wagon for Petroleum product with air brake
- BTAP - Bogie Tank wagon for Alumina Powder
- BTCS - Bogie Tank wagon for Caustic Soda
- BTALN - Bogie Tank wagon Ammonia Liquefied with Air Bk.
- BTALNM - Bogie Tank wagon for Ammonia fitted with air bk.
- BVZC - Brake van, Conventional with air brake
- BVZI - Covered Brake Van with ICF bogie and air bk.

TERMINOLOGY USED

- **Tare weight** – Wt. of wagon in empty condition
- **Pay load** – Wt. of commodity loaded on wagon
- **Gross load/weight** – Tare weight + Pay load
- **Axle load** – Gross load/No. of axle
- **Pay to tare ratio** – Ratio of Pay load to Tare wt.
- **Carrying Capacity (CC)** – Gross load/weight that can be carried by the axles of the wagon

OPEN WAGONS

- Used for transportation of coal, ore, limestone's etc.
- For commodities do not require protection from rain
- Provided with flap doors for ease of loading/ unloading of consignment

Type:

BOY, BOYEL, BOXN, BOXNHA, BOXNM1, BOXNHS, BOXNCR, BOXNHSM1, BOXNLW, BOXNLWM1, BOXNHL, BOXNAL, BOXNEL, BOXNR, BOXNS, BOST, BOSTM1, BOSTHS, BOSTHSM1, BOSTHSM2

BOXN →

- Designed in 1980 for coal
- Axle Load - 20.32t
- Bogie - CASNUB Bogie
- Speed - 75/80 Kmph



BOXN M1

- Introduced in 2005
- Increasing the CC up to CC+8+2t
- Bogie side frame is also painted with Golden Yellow band
- Speed 70/80 Kmph for CC+6+2t & 60/80 Kmph for CC+8+2t

BOXN HS



- Variant of BOXN with Casnub 22HS bogie
- Differentiated from BOXN by a Golden Yellow band
- Lower than BOXNHA and higher than BOXN
- Length and width are same as BOXN
- Designed for coal loading
- Estimated tare – 23.2 t- more
- Speed -100/100 Kmph

BOXN CR

- Designed in 1999
- Material of body of BOXN (IS 2062 or IRSM -41) changed to stainless steel (IRSM 44)
- Crib angles side is manufactured from IRSM-44 steel instead of IS 2062
- Sole bar is manufactured from IRSM-41 instead of IS 2062 steel
- Other parameters are same as BOXN
- Other features like overall dimensions, CBC, brake gear, brake system are same as BOXN

BOXNHA



- Designed in 1998 and manufactured in 2001 for transportation of coal
- Use of IRSM - 41
- Length & width – same as BOXN
- Height - 3450 mm – 225 mm higher than BOXN
- Axle load of 22.1 t
- Bogie - IRF 108HS
- Speed - 75/80 Kmph

BOXN LW

- Designed in 1988 to meet the requirement of higher pay to tare ratio
- Axle Load - 20.32 t
- Casnub 22 HS bogie
- Width 50 mm more than BOXN
- Stainless steel (IRS: M 44) & Corton Steel (IRS: M41) used in body & under frame
- Cold Rolled Formed (CRF) section used in design to reduce the tare weight of the wagon
- Manufacturing of this wagon started in 2005
- Speed -100/100 Kmph.

BOST



- Designed in 2000 for long steel products
- Axle Load - 20.32 t
- Bogie - CASNUB 22HS
- Speed 75/80 Kmph



BOST M1

- In 2006 for operation up to CC+6+2t
- Modified by providing additional springs
- Differentiated from BOST by a caption “Fitted with additional springs for Axle Load 22.32t” in centre of the wagon in Golden Yellow
- Speed - 60/65 Kmph

BOST HS



- Designed in 2004
- Variant of BOST with Casnub 22HS (Mod-1) bogie
- Differentiated from BOST by a Golden Yellow Band
- Speed 100/100 Kmph

COVERED WAGONS

- Used for transportation of bagged commodity i.e consignments which require to be protected from rain etc.
- Generally carry food grains, cement, fertilizers, fruits & vegetables etc.

Type :

BCN, BCNA, BCNM1, BCNAM1, BCNAHS,
BCNAHSM1, BCNHL, BCCN

BCN →

- Designed in 1984
- Axle Load - 20.32t
- Speed - 75/80 Kmph
- Bogie - Mostly with CASNUB 22NLB

BCN A

- Designed in 1990 by reducing the length of BCN wagon and increasing height
- Resulting increases the number of wagons in a rake to 44
- Axle Load - 20.32t
- Bogie- CASNUB 22NLB
- Speed - 80/80 Kmph



BCNA HS



- Designed in 2001
- Variant of BCNA
- Bogie - CASNUB 22HS
- Differentiated from BCNA by a Golden yellow band
- Speed -100/100 Km/h.

BCN M 1

- Introduced in 2006 for operation up to CC+8+2t
- Differentiated from BCN by a caption “Fitted with additional springs for Axle Load 22.82t” in centre of the wagon in Golden yellow
- Golden Yellow Band is provided on bogie side frame also
- Speed - 75/80 Kmph for CC+6+2t and 65/80 Kmph for CC+8+2t

FLAT WAGONS

- Without side walls
- Generally used for carrying steel coils, billets, rail, rails sleepers etc.
- **Type:**
BRN, BRNA, BRNAHS, BFNS, BRHNEHS,
BRN22.9

BRN →



- Designed 1992 for transportation of rails and heavy steel products
- Axle Load - 20.32t
- Bogie - CASNUB 22 NLB
- Speed - 75/80 Kmph

BRNA



- Designed in 1994
- Improved version of BRN
- The design is riveted cum welded construction
- Higher pay to tare ratio, compared to BRN
- Speed - 75/80 Kmph



BRNAHS

- Designed in 2001
- Variant of BRNA
- Bogie – CASNUB 22HS
- Speed - 100/100 Kmph

WELL WAGONS



- Having well shaped under frame
- Used to carry the bulky articles of excessive height
- Used for larger consignments like military tanks, heavy equipments etc.
- Provided with lashing chains and couplings and the folding ramps on either end of the head stock of the wagon to facilitate loading of motor vehicle

Type: BFU, BWTB

HOPPER WAGON

- Special wagons designed for Rapid discharge from either bottom or side or both
- Wagon has a hopper shape
- Used for transporting minerals, coal and ballast
- Provided with electro-pneumatically operated door operating mechanism

Type:

BOBR, BOBRM1, BOBRN, BOBRNM1, BOBRNHSM1, BOBRNEL, BOBSN, BOBSNM1, BOBYN, BCBFG

BOBSN



- Designed in 1994 for transportation of iron ore
- Axle Load - 22.9t
- Provided with modified CASNUB 22NLB bogie
- Side discharge
- Speed -75/75 Kmph

BOBR

- Designed in 1986 for transportation of Coal
- Provided with bottom discharge
- Axle Load 20.32t
- Bogie - CASNUB 22NLB
- Speed - 80/80 Kmph.

BOBRM1

- Introduced in 2006 for operation up to CC+6+2t
- Differentiated form BOBR by caption “Fitted with additional springs for A/L 22.32t” in centre of wagon in Golden Yellow
- Golden Yellow Band is provided on bogie side frame also
- Speed - 70/75 Kmph.

CONTAINER WAGONS

- Special flat wagons designed for handling containers
- **Type** : BFKN, BLCA/BLCB, BLLA/BLLB



BFKN



- Bogie Container Flat Wagon
- Modified version of BFKI wagons
- Speed - 75 kmph
- Pay Load - 61t
- Fitted with indigenous designed Retractable Anchorage Locks (patented) to secure containers

TANK WAGON

- Designed to carry liquid consignment like petroleum products, corrosive liquids, milk, edible oils etc.
- Wagon underframes fitted with bulky barrels
- Barrel consists manholes and covers on their tops for filling liquids
- Delivery valves at the bottom of the barrel centre for discharging
- Baffle plates have been provided inside the barrel to control other liquids coming on any one side under dynamic condition and on gradient

Type:

BTPN, BTFLN, BTPGLN, BTAL, BTALN, BTCS, BTAP

BTPN →



- Bogie Tank Wagon
- Designed in 1986
- Used for transportation of petroleum products
- Axle Load - 20.32t
- Bogie - CASNUB 22 NLB
- Speed - 80/80 Kmph

BTFLN →



- Improved version of BTPN
- Designed to increase the pay load
- This tank is without complete under frame
- Hence tare weight is reduced from 27t to 23.53t
- Pay load is increased from 54.28t to 57.75t
- Volume also increased from 70.4 m³ to 76 m³
- Brake system is also modified to BMBS

BTPGLN



- Designed for transportation of LPG
- Provided with Air brake
- Bogie - CASNUB 22NLB
- Axle Load - 20.32t
- Speed - 75/80 Kmph

BTALN →



- Bogie Liquid Ammonia Tank Wagon
- Designed in 1984 for transportation of anhydrous liquid ammonia
- Provided with CASNUB 22 NLB Bogie
- Axle Load - 20.32t
- Speed - 65/65 Kmph

BTCS →



- Bogie Caustic Soda Tank Wagon
- Designed in 1980 for transportation of Caustic soda
- Bogie - CASNUB 22W
- Axle Load - 20.32t
- Speed - 65/65 Kmph

BTAP →



- Designed in 1982 for transportation of Alumina powder
- Gravity loaded and has provision of fluidizing for evacuation
- Fitted with CASNUB 22NLB bogie
- Axle Load - 20.32t
- Speed - 65/65 Kmph

BRAKE VANS

- Guards van used with freight trains as last vehicle

Type :

BVZC, BVZI,
BVCM



BVZC →



- 4-wheeled brake van
- Fitted with 9 plated laminated springs
- Wheel base is 5400 mm
- Fitted with cylindrical roller bearing wheels
- Auxiliary reservoir capacity is 75 ltrs
- Brake cylinder diameter - 304mm/12 inches
- Speed potential -100 kmph

BVZI →



- 8-wheeled brake van
- Designed in 2004
- Fitted with ICF bogie to achieve comfort level (Ride Index) for goods guard
- Capable of running at 100 Km/h
- 5 meter longer than BVZC brake van

SOME OTHER WAGON

Cattle wagon

- Used to transport cattle
- Troughs of suitable sizes are provided for feeding and drinking the cattle during the journey
- Arrangements for proper ventilation and disposal of waste matters

Powder wagon

- Used to transport chemicals and explosives
- A heavy timber lining is provided to check the transmission of heat
- All the metallic fittings such as hinge, clips, brackets etc. are made of gun-metal to minimize the risk of sparking by metallic contact with the explosives

CODAL LIFE OF WAGON STOCK

S.No.	Type of wagon stock	Codal life
01	All open wagons & variants [BOX-N etc.]	30 Years
02	All covered wagons & variants [BCN etc.]	35 Years
03	Tank wagons & variants [BTPN etc.]	40 Years
04	All Flat wagons & variants [BRN, BLC etc.]	30 Years
05	BOBRN, BOBS wagons & variants	30 Years
06	BOBY & BOBY-N	30 Years
07	Brake Vans [BVZC & BVZI]	30 Years

WAGON NUMBERING SYSTEM

Wagon numbering system is being done as per Railway board's instruction issued vide letter No. 2000/M (N)/60/2/wagon census dated 4th July 2003

- The wagon number shall consist of 11 digits
- First two digits will indicate types of wagon
- Next two digits will indicate owning railway
- Next two digits will indicate year of manufacture
- Next four digits will indicate individual wagon number
- The last digit will be a check digit

WAGON NUMBERING SYSTEM



C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
Type of wagon	Owning Railway	Year of manufacturing				Individual Wagon Number				Check Digit

TYPES OF WAGON (C1,C2) (ACCORDING TO BODY TYPE)

OPEN WAGON - code allotted 10 to 29

BOXN	10	BOXNB	15	BOXNAL	20
BOXNHA	11	BOXNF	16	BOSTHS	21
BOXNHS	12	BOXNG	17	BOXNHL	22
BOXNCR	13	BOY	18	BOXNS	24
BOXNLW	14	BOST	19		

COVERED WAGON - code allotted 30 to 39

BCNA	30	BCCNR	32
BCNAHS	31	BCNHL	33

TANK WAGON - code allotted 40 to 54

BTPN	40	BTALN	43	BTAP	46
BTPNHS	41	BTCS	44	BTFLN	47
BTPGLN	42	BTPH	45		

FLAT WAGON - code allotted 55 to 69

BRNA	55	BFAT	60	BRS	65
BRNAHS	56	BLCA	61	BFU	66
BFNS	57	BLCB	62	BRHNEHS	67
BOMN	58	BLLA	63	BCL	68
BRSTH	59	BLLB	64	BCLA	69

HOPPER WAGON - code allotted 70 to 79

BOBYN	70	BOBRN	72	BOBRAL	74
BOBYNHS	71	BOBRNHS	73	BOBSN	75

Well wagon - code allotted 80 to 84

BWTB	80	DBKM	82
MBWT	81	MBWZ	83

Brake van - code allotted 85 to 89

BVZC	85
BVZI	86
BVCM	87

OWNERSHIP (RAILWAYS') CODE (C3,C4)

Sl No.	Name of the Railways	Numerical Codes
1	Central Railway	01
2	Eastern Railway	02
3	Northern Railway	03
4	North East Railway	04
5	Northeast Frontier Railway	05
6	Southern Railway	06
7	South Eastern Railway	07
8	Western Railway	08
9	South Central Railway	09

OWNERSHIP (RAILWAYS') CODE (C3,C4)

10	East Central Railway	10
11	North Western Railway	11
12	East Coast Railway	12
13	North Central Railway	13
14	South East Central Railway	14
15	South Western Railway	15
16	West Central Railway	16
17	Wagon owned by Defense	24
18	Wagon owned by CONCOR	25
19	Wagon owned by other private parties	26

YEAR OF MANUFACTURE CODE (C5, C6)

- Consists of last two digits of the year of manufacture
- For example, wagon manufacture in 2016 will have code 16

INDIVIDUAL WAGON No. (C7, C8, C9, C10)

- This will be running serial number from 0001 to 9999
- 0001 to 0999 will be departmental stock, after completing upto 0999, the number will begin from 0001
- 1000 to 9999 will be for other (traffic) stock, after completing upto 9999, the number will begin from 1000
- The series will not change with type of wagon
- For example on ECR if 1001 is BOXNHS, next wagon which may be BCNHS will be 1002

CHECK DIGIT: Method of calculation

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
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Step-1: Add all the characters in the even number

$$S1 = C2+C4+C6+C8+C10$$

Step-2: Multiply S1 by 3 =3 S1

Step-3: Add all the character in the odd number

$$S2 = C1+C3+C5+C7+C9 \text{ (Except check digit)}$$

Step-4: Add the sum of step 2 to the sum of step 3; $S4=3S1+S2$

Step-5: Round this total up to the next multiple of 10

Step-6: The check digit is the number required to be added to round up to the next multiple of 10.

If the total in S4 is already a multiple of 10, then the check digit will be Zero (0).

EXAMPLE

Northern Railway owned BOXNHS wagon number 4567 manufactured in 2003 would be stenciled as 1203034567. Calculate the check digit and write down the wagon number which will be stenciled on wagon body.

Check digit calculation

Type of wagon		Railway Code		Year of manufacturing		Individual Wagon Number				Check Digit
1	2	0	3	0	3	4	5	6	7	?
BOXNHS		N. Rly.		2003						

Step-1: Add all the characters in the even number

$$S1 = C2 + C4 + C6 + C8 + C10 = 2 + 3 + 3 + 5 + 7 = 20$$

Check digit calculation continued...

Step-2: Multiply S1 by 3 =3 S1 = 3X20 = 60

Step-3: Add all the character in the odd number

$$S2 = C1+C3+C5+C7+C9 = 1+0+0+4+6 = 11$$

Step-4: Add the sum of step 2 to the sum of step 3;

$$S4=3S1+S2=60+11=71$$

Step-5: Round this total up to the next multiple of 10.

$$71+9=80$$

Step-6: The check digit is the number required to be added to round up to the next multiple of 10.

Check digit is 9

Therefore, the wagon number will be stenciled as : **BOXNHS**

12030345679

EXERCISE

1. East Central Railway owned a BCNAHS wagon having number 9521, manufactured in 2016 would be stenciled as **3110169521**. Calculate the check digit and write down the wagon number which will be stenciled on wagon body.
2. Eastern Railway owned a BLLA wagon having number 6557, manufactured in 2020 would be stenciled as **6302206557**. Calculate the check digit and write down the wagon number which will be stenciled on wagon body.