

CHAPTER 3

YARD MAINTENANCE

The efficient working of freight stock is closely linked to the standard of yard maintenance. Several factors are responsible for good and quality examination/repairs in the yard. The method of examination is described in the succeeding paragraphs.

301. PATTERN OF FREIGHT TRAIN EXAMINATION:

Comprehensive instructions regarding the pattern of freight train examination and issue of Brake Power Certificate have been issued by Railway Board in the form of Joint Procedure Order vide letter No.94/M(N)/951/57 dated 28.2.2000 (Para 314)

302. NOTIFICATION OF EXAMINATION POINTS:

- A) All goods trains must invariably be given Intensive Examination for repairs.
- B) Railways should notify nodal points authorise to issue intensive brake power certificates for running of air brake trains on End-to-End basis and in Close Circuits. These nodal points should have adequate facilities like cemented pathways, welding points, proper lighting etc. for proper examination of air brake trains.
- C) Intensive BPC for vacuum brake stock to be issued from nodal examination points only.
- D) As a special case, a Safe-to -Run certificate may be issued from examination points other than the nodal points for empty journey of air brake stock after unloading up to the first/nominated nodal point in the direction of movement as mentioned in para 314.

303. FREQUENCY OF INTENSIVE EXAMINATION FOR DIFFERENT STOCK:

- A) All freight trains should be subjected to intensive examination in empty condition at originating stations.
- B) In exceptional cases the back loaded freight trains can be examined as per instructions mentioned in para 314 item 1 (v).
- C) All freight trains shall be re-examined if stabled for more than 24 hours by JE (C&V) in yard and by guard and driver in non C&V station up to next C&V point in the direction of movement for examination, as per Railway Board's Joint Procedure Order placed at para 314.

- D) All conventional (plain bearing) stock should be offered for examination after having travelled 800 km on BG and 600 km on MG from its last intensive examination.
- E) Vacuum brake stock other than conventional stock shall run on end-to-end pattern as per instructions mentioned in para 314. The intensive BPC shall remain valid provided:
- i. the empty examined rake reaches the loading point within **4 days** of the issue of BPC.
 - ii. the **destination is mentioned** on the BPC of the loaded train.
 - iii. the composition of the rake is not changed by **10 or more Four-Wheeler Units**.
 - iv. the rake is **not stabled** for more than **24 hours**.
- F) Air brake stock shall run on end-to-end pattern as mentioned in para 314. The intensive BPC shall remain valid provided:
- i. the **destination is mentioned** on the BPC of the loaded train.
 - ii. the composition of the rake is not changed by **4 or more wagons**
 - iii. the rake is **not stabled** for more than **24 hours**.
- G) Air brake stock shall run on nominated Close Circuit for 4500 KMs as mentioned in para 314. The intensive BPC issued at the nodal point shall remain valid provided:
- i. the kilometrage have been logged in correctly and continuously, if not, BPC will be deemed to be valid for 15 days only from the date of issue of BPC.
 - ii. the rake integrity is not changed and only the listed wagons are included.
 - iii. the rake is **not stabled** for more than **24 hours**.
 - iv. the rake is running in the predefined circuit as mentioned on the BPC.
(Breaking the rake into parts and reforming the same parts, will not be deemed to have broken the rake integrity)
- H) No intermediate examination of the Close Circuit rake is required. It would be the responsibility of the Driver and Guard to check the unloaded CC rake at the unloading point and ensure brake continuity before starting.
- I) All close circuit freight trains will be given intensive examination during day light hours.
- J) BPC issued after intensive examination in empty condition must be revalidated after loading. Revalidation includes conducting brake continuity test, ensuring completeness/securing of brake gears only and endorsing on intensive BPC . No detachments unless safety is affected.

304. STEPS OF INTENSIVE EXAMINATION

- A) Rolling-in -examination including axle box feeling.
- B) Intensive examination of originating trains including repairs, detachment of damaged/sick wagons, brake testing etc.
- C) Issue of Intensive Brake Power Certificate after ensuring brake continuity of the formed load.

For loads requiring sorting and/or having different terminating and originating yards/locations, the steps for issuing intensive BPC will be as follows:

- i. Rolling-in -examination including axle box feeling (same as para 305 A).
- ii. Terminating examination including detachment of damaged/sick wagons (given in para 305 D).
- iii. Intensive examination of originating trains including repairs, brake testing etc. (Same as para 305 B).
- iv. Issue of Intensive Brake Power Certificate after ensuring brake continuity of the formed load (same as Para 305 C).

305. DETAILS OF INTENSIVE EXAMINATION:

305A. ROLLING-IN-EXAMINATION INCLUDING AXLE BOX FEELING -

All terminating trains should be given rolling in examination while entering a station/yard with a train examination depot. To carry out this examination the Train Examiner and his staff should take up positions on both sides of the lines short of the normal halting place on which the train is to be received. The following inspection should be carried out during the rolling in examination:

- i. In motion inspection and observation of under gear of wagons for any loose or dangling components and flat places on tyres/wheels.
- ii. Immediately after the train has come to a halt, all axle boxes should be felt within 20 minutes of the train arrival and those, which are found running at high temperature, should be marked for opening/checking at the time of examination and attention if necessary.
- iii. Examination of any abnormal behaviour of any of the vehicles or any other observation which may relate to unsafe working condition.
- iv. The rolling in examination must be conducted to detect any skidded wheel. Defect in the brake system or faulty manipulation by the driver may cause skidding of wheels.
- v. Incoming BPC should be collected by yard C&W staff.

305B. INTENSIVE EXAMINATION AND REPAIRS -

Once, the train has been offered for examination by Traffic Department, the rake should be protected at both the ends before undertaking the following examination and repair activities:

- i. Inspection and repairs of running gear fittings.
- ii. Inspection and repairs of brake gear and spring gears.
- iii. Inspection and repairs of draw and buffing gear.
- iv. Checking and making good the deficiency of safety fittings, safety brackets, safety loops, etc.
- v. Replacement of brake blocks:
 - Brake blocks should be replaced on reaching condemning thickness as given in para 307 A.
 - Cast iron brake blocks as per RDSO drawing No. WA/BG-6158 with latest alteration or composite brake blocks should be used.
 - Worn out composite brake blocks should be replaced with composite brake blocks.
 - To ensure correct fitment of brake blocks, only spring steel key as per RDSO Drg. No. W/BG-6150 should only be used.
 - After fitment of brake block and key on brake head fitment of split pin should be ensured.
- vi. Correct fitment of washers, bulb cotters and all brake gear pins to be ensured.
- vii. Correct functioning and positioning of empty load device.
- viii. Identified Plain bearing worn axle box should be opened for examination and attention, if any. Roller bearing stock found running at high temperature may be taken in sick lines for further attention
- ix. Checking and proper securing of doors of covered wagons.
- x. Look for abnormal and /or unequal buffer heights/CBC height, wear plate knuckle, etc. to the extent it is possible to detect by visual examination. In case of doubt, the buffer height/CBC height should be measured.
- xi. Meticulous check of brake cylinders, distributor valves, auxiliary reservoir control chambers and other pipe points should be carried out to ensure that these are in proper working order. Isolating cocks and angle cocks to be checked for proper position. Brake cylinder should be released and checked for piston stroke as per para 307 B for empty and loaded position.

- xii. After brakes are released, the wheel profile should be examined visually. If any defect is noticed, it should be checked with tyre defect gauge and wagon to be marked sick for wheel changing, if required. If bent axle is suspected wheel gauging must be done.
- xiii. The bogies, complete side frames and bolsters to be visually examined for cracks and missing parts. bolster springs, snubbers, spigots, centre pivots fastening, roller side bearer in case of CASNUB 22 bogie to be checked for defects, if any.
- xiv. Examine brake rigging components with special attention to brake beam deformation and wear on integral brake shoe bracket. Check intactness of the pull and push rods with pins, washers, split pins and cotters, etc. Hand brakes must be checked for smooth and effective operation.
- xv. Visual examination of under frame members, body, door mechanism, CBC wear or deficiency of parts to be marked and their operation to be checked.
- xvi. Brake power should be tested as per rule E-5 of Appendix E of the IRCA Rules Part III for vacuum brake stock and as per rake testing procedure stated herewith at Para 306.
- xvii. At certain nominated yards, vacuum braked trains moving over falling gradients in ghat sections shall be subjected to Balanced Vacuum Test. The detailed procedure for carrying out this test is given in IRCA Part III, 2000-Appendix E.
- xviii. Examination of loaded stock should be done as per IRCA part-III.
- xix. Examination of tank wagons should be done as per IRCA Part-III.
- xx. **Where a rejectable defect can not be attended to on the train in the yard, the wagon shall be damaged labelled for attention in the sick line.**

C. ISSUE OF INTENSIVE BRAKE POWER CERTIFICATE –

- i) All freight trains after being subjected to intensive examination will be given a Brake Power Certificate.
- ii) The standard format for Brake Power Certificate for vacuum brake stock, air brake stock and close circuit rakes is enclosed at Annexure-I, Annexure-II and Annexure-III respectively.
- iii) To distinguish the brake power certificates, the colour of **vacuum brake and air brake stock** will be **Pink and Green** respectively.

- iv) On originating BG and MG vacuum goods trains, there shall be **85%** and **80 %** effective brake power respectively, subject to observance of **any higher limit** prescribed by the Railways for particular Ghat/other sections.
- v) The **minimum originating brake power** for air braked goods trains, running on end-to-end pattern of examination, shall be **85%** except wherever local instructions have specified higher level of brake power to meet specific requirement. Exception shall only be made after prior approval of Chief Rolling Stock Engineer has been obtained for each individual case.(Reference RB's letter No.94/M(N)/951/57 dated 29.9.95)
- vi) The **originating brake power** for air braked goods trains, running in **close circuits shall be 100 %** with adequate brake block thickness for the extended run of 4500 KMs.
- vii) As far as possible, the close circuit air brake rakes should be formed by off-ROH and off -FOH wagons for better monitoring.
- viii) No fresh Brake Power Certificate shall be issued during revalidation.
- ix) No Safe-to-Run BPC shall be issued from nodal points.
- x) No Safe-to-Run BPC shall be issued for vacuum brake stock either in empty or in loaded condition.
- xi) Brake pipe pressure required in the air braked train with locomotive should be as follows:

<u>No. of wagons</u>	<u>On Locomotive</u>	<u>On last wagon</u>
Up to 56	5.0 Kg/Cm ²	4.8 Kg/Cm ²
Beyond 56	5.0 Kg/Cm ²	4.7 Kg/Cm ²

- xii) The minimum level of vacuum should be 46 cm in engine and 38 cm in the brake van. The level of the vacuum on the engine and the brake van along with the percentage of effective brake cylinders must be recorded on the vacuum certificate and countersigned by the Driver and the Guard. (RB's letter No.83/M(N)/951/34 dated 26.5.99)
- xiii) The following procedure should be followed to issue the BPC after attachment of the locomotive:
 - All BP hoses/ hose pipes on the train should be coupled up. The angle cocks in case of air brake stock at both ends of the wagon in brake pipe should be open. The angle cock at the end of air brake van must be in closed position. In case of vacuum stock, hose pipe of the rear most vehicle should be kept on dummy carrier.
 - Attach front wagon BP hose/ hose pipe to BP hose/ hose pipe of the locomotive.

- Ensure firmness and tightness of hoses with palm ends/universal coupling and clips.
- Ensure that all the cut of angle cocks on brake pipes are in open position in case of air brake stock.
- Attend to all leaks by replacing MU washer/IR washer, leaky hoses and angle cock assembly, if requisite BP pressure is not coming in the last vehicle.
- Inoperative or defective brake cylinders should be isolated by putting the isolating cock handle in close position.

305D. TERMINATING EXAMINATION OF STOCK REQUIRING SORTING AND/OR HAVING DIFFERENT TERMINATING AND ORIGINATING YARDS/LOCATIONS :

Examination of terminating load should be carried out as soon as the train has come to a halt. The examination would consist of the following: -

- i) All under gear fittings including brake gear, draw and buffing gear and spring gear, air brake, underframe, body, door mechanism, bogies, wheels, axle, etc. should be examined for being in sound condition and with all fittings intact.
- ii) The tyre profiles should be checked to ensure that rejectable defects have not arisen. In doubtful cases, use of the tyre defect gauge should be made for this purpose.
- iii) Vacuum brake cylinders should be tested in accordance with Rule E-5 of Appendix E of the IRCA Rules Part III. All vacuum brake cylinders should be released.
- iv) Ensure functioning and position of load/empty device.
- v) Identified plain bearing warm axle box Plain should be opened for examination and attention, if any. Roller bearing stock found running at high temperature may be taken in sick lines for further attention.
- vi) Other items to be checked in case of air brake stock are as follows:
 - Meticulous check of brake cylinders, distributor valves, auxiliary reservoir control chambers and other pipe points should be carried out to ensure that these are in proper working order. Isolating cocks and angle cocks to be checked for proper position. Brake cylinder should be released and checked for piston stroke as per para 307 B for empty and loaded position.
 - During terminating examination, special care should be exercised for any deficiencies, damages, leaky components, malfunctioning of distributor valves, brake cylinders, control and auxiliary reservoirs, angle cocks, BP hoses so that necessary replacement and repairs can be executed to minimise attention during outgoing examination.
- vii) In case of terminating loading trains to be subjected to tippler for unloading, the Brake power available on train should be recorded deficiencies noticed should be chalk marked so that after unloading/Tippler operation, deficiencies can be identified and replaced during outgoing examination.

- viii) Where a rejectable defect is not expected to be attended to on the train during the subsequent outgoing examination in the yard, the wagon shall be sick marked/ damaged-labelled for attention in the sick line.

306. AIR BRAKE TESTING :

A rake consisting of air brake wagons should be tested with rake test rig. This rig may be used for testing the train in yard before attaching the engine. The rake test rig has compressed air supply and a mobile test rig. The mobile test rig has a cubical structure and is mounted on wheels.

- i) Attach the locomotive/compressor through the test rig to the train & couple brake pipes. Ensure correct coupling with pipes so that there is no leakage of air from coupled joints
- ii) The coupling should be done with angle cocks in closed position.
- iii) Open the angle cocks of loco after coupling brake pipe.
- iv) Open the angle cock of the brake pipe on all the wagons., Check for continuity of brake pipe by reducing and rebuilding brake pipe pressure. The verification should invariably be carried out through the pressure gauge provided in Guard's Brake Van.
- v) After the brake pipe pressure has stabilised in the locomotive and rearmost vehicle to the level indicated below. Move the driver's automatic brake valve handle towards application position to reduce the brake pipe pressure from 5 kg/cm² to 4 kg/cm²

TABLE 3.1 Brake pipe pressure required in the train

S. No.	No. of wagons	On Locomotive	On last wagon
1.	Up to 56 wagons	5.0 Kg/Cm ²	4.8 Kg/Cm ²
2.	More than 56 wagons	5.0 Kg/Cm ²	4.7 Kg/Cm ²

- vi) After the brake pipe pressure has been stabilised, close the brake pipe isolating cocks provided between additional C2 relay valve and brake pipe of the locomotive.
- vii) Wait for 60 seconds for temperature and gauge settlement. Then note the drop in pressure in the brake pipe gauge in the locomotive for five minutes.
- viii) The drop in brake pipe pressure gauge shall not be more than 0.25 kg/cm² per minute.
- ix) Examine for leaky components, malfunctioning of distributor valves, brake cylinders, control and auxiliary reservoirs, angle cocks, BP hoses.
- x) If the leakage rate is more than the value indicated in para viii, check for excessive leakage on individual wagon as indicated below:

- A hissing sound would be audible at points where leakage is heavy.
 - Once the hissing sound is heard from a particular area, pin point the location of leakage by applying soap water solution
 - Use of permitted material viz. Teflon tape for arresting the leakage at threaded joints.
- xi) In case leakage is heavy and cannot be arrested, the wagon may have to be isolated/detached
- xii) In case where leakage can be arrested temporarily by tape and the nature of leakage is such that it requires attention at primary depot, clear marking on the wagon must be made to draw attention of primary depot for adequate attention.
- xiii) In case the leakage is from the distributor valve and cannot be arrested, close the distributor valve isolating cock. In such a condition, clear marking should be provided on the wagon to indicate this defect to primary depot. Do not close brake pipe angle cocks under any circumstances either for isolation of wagons or for any other purpose whatsoever except for carrying out shunting operation after which the angle cocks should again be opened to ensure continuity of brake pipe.

307. IMPORTANT PARAMETERS TO BE ENSURED DURING INTENSIVE EXAMINATION:

307 A. BRAKE GEAR LIMIT AND CLEARANCES:

Description	Limit
Brake block condemning limits	10 mm
Yard leaving thickness of brake block except BOY wagons	20 mm
'A' dimension of slack adjuster BOX/UIC bogie wagons	50 mm +2 - 0
'A' dimension of air brake stock fitted with CASNUB bogie except BOBRN wagon	70 mm +2 - 0
'A' dimension of BOBRN wagons	27 mm +2 - 0

307B. PISTON STROKE:

Type of wagon	Piston Stroke	
	Empty	Loaded
BOXN, BCN/BCNA, BRN, BTFGLN	85 mm +/- 10	130 mm +/- 10
BTPN	87 mm +/- 10	117 mm +/- 10
BOY	90 mm +/- 10	135 mm +/- 10
BVZC	70 mm +/- 10	
BOX, BOI & BCX	130 mm	180 mm
BOBRN/BOBR	100+/- 10	110+/- 10

307 C. BUFFER HEIGHT :

Description	Limit
Buffer height from Rail level	Max. 1105 mm (Empty)
	Min. 1030 mm (Loaded)

308. IMPORTANT PARAMETERS TO BE ENSURED DURING SICK LINE/ DEPOT ATTENTION**308A. CLEARANCES OF SCREW COUPLING**

S. No	Description	Clearances
1	Draw bar & Screw coupling (BG) Roof of hook near point of a) Contact with screw coupling shackle b) Shackle pin hole c) Underside of sq. position of shank d) Cotton hole e) Trunion pin (nut) f) Shackle pin	Max. permissible wear 12.7 mm 6.35 mm 12.7 mm 12.7 mm 3.17 mm 3.17 mm
2	Variation in camber between any two Springs on a bogie under load should not exceed	12 mm
3	Min. clearance between eye end & top surface	2 mm
4	Maximum variation in effective inside length	2 mm
5	Maximum permissible wear of the shackle at the places of contact with stone	2 mm
6	Clearance between U/F side bearer and bogie side bearer of UIC	4 mm

308 B. SPRING GEAR CLEARANCES FOR VACUUM BRAKE STOCK :

S. No	Description	Clearances
1	Max. Clearance between shackle pin dia and shackle plate	3 mm
2	Clearance along the length of shackle pin assembly with shackle plate, scroll iron, spring eye and cotter.	Max.1.5 mm
3	Shackle pin diameter and shackle plate hole	Max. 1.00 mm
4	Eye end is clear of top surface	Min. 2 mm

308 C. NOMINAL CLEARANCES OF CASNUB BOGIES

Description	22W 22W(RETRO)	22V(M)	22NL NLB	22HS
Lateral clearance between side frame and bolster	18 mm	18mm	18 mm	25 mm
Lateral clearance between side frame and axle box/adopter	25 mm	25 mm	16 mm	16 mm
Longitudinal clearance between side frames and axle box/adopter	2 mm	10 mm	9mm	9 mm
Longitudinal clearance between side frame and bolster	6 mm	6 mm	6 mm	6 mm
Clearance between anti rotation lug and bolster	4 mm	4 mm	4 mm	4 mm

308 D. WEAR LIMITS :

Adapter Thrust shoulder	0.7 mm
Adapter Crown lugs	4.0 mm
Adapter crown seat	3.5 mm
Adapter side lugs	3.0 mm
Adapter sides	3.0 mm
Side frame column friction plate	4.0 mm
Side frame column sides	5.0 mm
Side frame anti rotation lug	3.0 mm
Pedestal crown roof	5.0 mm
Pedestal crown sides	4.0 mm
Pedestal sides	2.0 mm
Pedestal jaw	4.0 mm
Bolster liner wear limit	5.0 mm
Bolster land surface	3.0 mm
Bolster column sides – Inner/Outer	5.0 mm

308 E. LOAD/SNUBBER SPRINGS OF CASNUB

Type of Bogie	Location	Free Height (Nominal mm)	Recommended free condemning height (mm)
All version except CASNUB 22 HS	Outer	260	245
	Inner	262	247
	Snubber	294	279
CASNUB 22 HS	Outer	260	245
	Inner	243	228
	Snubber	293	278

308 F. WEAR LIMIT FOR FRICTION WEDGE BLOCK

Vertical Surface	7 mm
Slope Surface	3 mm

308 G. CENTRE PIVOT DIMENSIONS

	CASNUB 22(W)	OTHERS
Seat	5.5 mm	4.0 mm
Vertical sides	4.0 mm	4.0 mm

308 H. RUBBER BONDED METAL PAD

Description	Nominal dimension	Dimension after permanent set (condemning size)
Elastomeric Pad	46 mm	42 mm
Side bearer rubber Pad	114 mm	109 mm

Note : The parameters given above are as per IRCA Pt.III, 2000- Rejections.

308 I. WHEEL & AXLE

Description	Limit	
	New	Condemn.
Wheel dia used on BOX/UIC bogie)	1000 mm	860 mm
Wheel dia used on BOX/CASNUB bogie)	1000 mm	906 mm
Lateral clearance between axle box lug and horn cheek (for BOX/UIC wagons)	20 mm	25 mm
Lateral clearance available between spring buckle and horn gap stiffener for UIC	25 mm	
Lateral clearance for CRT wagons	12 mm	
Buffer height from Rail level	Max. 1105 mm (Empty)	Min. 1030 mm (Loaded)

309. COMMON PROBLEMS IN BRAKE SYSTEM AND REMEDIES**309A. JAMMED BRAKES**

Taking the following precautions can prevent jamming of brakes:

- a) Both the vacuum and hand brakes on a loaded wagon should be fully released before commencement of unloading.
- b) Adjustment of brake regulator and empty tie rod should not be tampered with.
- c) Empty load box lever handle should be brought to empty position before unloading by the commercial staff or by station staff while placing the wagon in goods shed line.

Despite the above precaution, if the brakes jam, the following steps should be taken:-

- i. Try to rotate brake regulator barrel by hand or with spanner on the hexagon flat or with a Tommy bar in the slot provided at the end. **DO NOT HAMMER OR USE EXCESSIVE FORCE.**
- ii. If this fails, then apply and release the brakes fully two or three times either with vacuum or hand brake. When using the hand brake, make sure of full application and full release. If jamming is not severe, this will make brake regulator operate automatically to create enough slack, by paying out, to release the brakes.
- iii. If this also fails, then it means the brakes are severely jammed, also jamming the brake regulator. In this case knock out the shaft crank pin but not the pin securing the brake regulator in any case. Then rotate brake regulator barrel until pull rod pinholes align and the pin can be replaced easily. Always replace the pin, which had been withdrawn to release brakes, with its washer and split pin, and tack weld the washer with pin.

309B. PISTON STROKE TOO SHORT

If the piston strokes are not within the limits the brake equipment should be thoroughly examined. Probable causes for too short piston strokes are given below:-

- i. Vacuum too low i.e. less than 460 mm.
- ii. Free lift too small i.e. much less than 13 mm.
- iii. One brake cylinder out of action, or one or both cylinders defective.
- iv. Brake shaft or piston jammed/seized.
- v. Brake rigging jammed e.g. pull rod pin or hanger partly out of its hole and fouling vertical levers in the bogie brake rigging or end of bogie pull rod striking transverse trimmer. In both cases there may be no application of brakes at the outer wheels.
- vi. Adjustment of pin holes in bogie brake rigging not corresponding to wheel diameter.
- vii. Some parts of the brake rigging distorted or non-standard.
- viii. New brake blocks just fitted and brakes not applied and released at least twice before checking piston strokes.
- ix. Hand brakes partly "ON".

- x. Brake regulator or empty load box maladjusted or damaged causing either insufficient "slack" or empty braking at all times (This is a serious defect and should be attended to immediately)
- xi. Fully loaded wagon just emptied but brakes not applied and released at least twice before checking piston strokes.

Note: If slightly short piston strokes are not caused by any of the defects mentioned above, they are not harmful.

309C. PISTON STROKE TOO LONG

If the piston strokes exceed the maximum limits prescribed, examine the equipment thoroughly. Probable causes for too long piston strokes are given below.

- i. Vacuum high, i.e. over 510 mm
- ii. Free lift too large, i.e. more than 13 mm
- iii. Parts of brake gear defective, broken, worn out, missing or non-standard e.g. pull rod pins missing or under sized pin fitted.
- iv. Wearing parts beyond condemning size i.e. wheels, brake blocks and pin/hole joints.
- v. New brake blocks just fitted and brakes not applied and released at least twice before checking piston strokes.
- vi. Empty wagon just loaded and brakes not applied and released at least twice before checking piston strokes.
- vii. Adjustment of pin/holes in the brake rigging not corresponding to wheel diameter
- viii. Brake regulator or empty load box maladjusted or damaged causing either excessive slack or load braking at all times.
- ix. Brake regulator control rod assembly damaged, detached or missing. (This is a serious defect and should be attended to immediately)

310. INFRASTRUCTURE & FACILITIES REQUIRED IN THE YARD

- i. Adequate centre to centre distance between tracks for nominated lines for conducting intensive examination. There should be enough space of at least 2.5 metre for jacking, to change springs etc.
- ii. Concrete pathways with monorails/material handling equipment to facilitate movement of man and material smoothly from one end to another.
- iii. Proper illumination specially covering bogies and brake gear locations so that the wagons needing attention can be easily detected.
- iv. Welding grid on the entire length of train of nominated line with return lead arrangement so that welding can be carried out without marking the wagon sick.
- v. Enough outlets for tapping vacuum/air pressure for testing of the stock.
- vi. Duty room for Junior Engineer (C&M), staff room, air compressor/vacuum exhaustor room, store room for stocking material, tool room, oil grease room, welding machine room, battery charging room etc.
- vii. VHF sets for closes monitoring and communication between supervisors, staff and yard foreman.

311. MACHINERY & PLANT ITEMS

The following machinery and plant are essential for train examination during yard maintenance:

- Diesel Screw Compressor
- Vacuum exhauster
- Welding plant
- Rake Test rig
- Hydraulic jacks of various capacities.
- Lister truck for carrying material such as brake blocks etc.

312. TOOLS

All fitters should carry the following tools in their bags at all times for examination:

- Tool Bag
- Hammer
- Chisel
- Punch (Flat & Round End)
- Inspection lamp
- Spanner
- Wheel tyre defect gauge
- Vaidhyanathan gauge
- Oil Syringe
- Oil can
- Measuring foot rule
- Ultrasonic leak detector
- Electronic device for detecting warm box (Non contact hot axle detector)
- Cord for measuring spring camber
- Gauge for measuring "A" dimension
- Test plate
- Wheel gauge
- CBC "GO NO GO" gauge

To be made available in Section Engineer/Junior Engineer (C&W) office

- All types of jacks
- Banner flag/Tail lamp
- Tools for attending warm box
- Buffer height gauge
- Vacuum/Air pressure gauge
- Wire chisel
- Wire punch
- Sledge hammer
- Brass tools (hammer, chisel, spanner)

313. MAN HOURS FOR VARIOUS TYPE OF EXAMINATIONS

The man-hours for examination of various types of stock are given below as a guideline. Zonal railways may however permit variation based on local conditions, typical characteristics prevailing at site and availability of infrastructural facilities.

TABLE 3.2 Man-hours for examination of various types of stock

Stock	Type of Examination		
	Terminating (wherever applicable as per para 305 D)	Intensive (As per para 304 B)	Originating (As per para 304 C)
Vacuum Brake (End-to-End running)	6	40 (for 70 FVUs)	10
Air Brake (End-to-End running)	6	56	10
Air Brake (Close Circuit)	6	100	10

The standard gang for conducting intensive examination should consist of two Junior Engineers, 10 Fitters & 10 Khalasis. They will complete one intensive examination in 2 hours. However, wherever the density of train examination is less, local conditions will prevail for formation of the gangs.

The distribution of intensive staff gang wise with tools and material is given in Table 3.3.

**314. JOINT PROCEDURE ORDER FOR GOODS TRAINS EXAMINATION
(Railway Board's letter No.94/M(N)/951/57 dated 28.2.2000)**

At present, practices for the issue of BPC to freight trains vary considerably between various Zonal railways. The matter has been considered in the Railway Board and the following comprehensive instructions are issued.

ITEM 1: END TO END RUNNING OF UIC/CRT RAKES

UIC/CRT stock will be permitted to run on end-to-end pattern with following conditions:

- i) The rake should normally be intensively examined in empty condition except when back loading of rake has to be done at stations/sidings. After such intensive examination, the empty rake should be moved to the loading station as per the requirement of traffic.
- ii) The BPC of empty rake may have no destination mentioned. But, after loading the empty rake, the operating staff (commercial staff, if not operating staff is posted at that station) will ensure that the destination of the loaded train is clearly mentioned on the BPC and the same BPC will then become valid upto such destination.

- iii) No driver should move the loaded train from the loading point unless the destination is clearly mentioned on the BPC. BPC of the loaded train without destination will be considered as invalid.
- iv) The empty rake must reach the loading point within 4 days of the issue of BPC including the day of issue, for the loaded rake to move on the same BPC, otherwise the rake (empty or loaded) will have to be offered for examination for issue of fresh BPC at a suitable examination point in the direction of movement.
- v) At the destination after unloading, the rake must be examined once again in the empty condition and the above cycle repeats. In the absence of freight train examination facilities at the unloading point, the empty rake/back loaded rake must be examined at the first freight train examination point in the direction of movement. The movement of empty rake/back loaded rake from the unloading point to the first freight train examination point will be permitted on Driver and Guard's certificate for which the following instructions should be followed:
 - a) Driver and Guard will ensure vacuum/air pressure continuity before starting.
 - b) Guard and the Driver will ensure that there are no loose or missing fittings in the under gear (such as brake blocks, safety brackets, draw gear pins, brake gear pins etc.) which may endanger the safe running of the train.
 - c) Driver and Guard can then prepare the memo jointly on a plain sheet in triplicate and both Driver and Guard will sign it. One copy each will be retained by the Driver and Guard and third copy will be handed over to Station Master.

ITEM 2: END TO END RUNNING OF AIR BRAKE STOCK

Condition (I) to (V) mentioned under item 1 shall apply for end-to-end running of Air Brake stock also except item (iv) i.e. the 4 day limit will not apply to air brake stock. However, since these rakes are likely to run for extended periods on each loading cycle, the examination should be thorough and intensive to take care of such long runs.

In case empty rakes are moving on Safe to run examination BPC, the rake will be dropped for intensive examination at nominated point before being taken for loading.

ITEM 3: BACK LOADING OF TRAINS

When back loading is done at a station where freight train examination facilities exists, the loaded rake should be examined at that station only and BPC issued. In cases where back loading is done at a non-TXR station, such trains can be:

- a) Either checked by flying squad, if operationally feasible.
- b) or, if that is not possible, permitted to run on a driver & Guard's memo for which the instructions given under item 1 (v) should be followed.

Running of trains on Driver and Guard's memo will be permitted only up to the first freight train examination point in the direction of train movement.

ITEM 4: VALIDITY OF BRAKE POWER CERTIFICATE FOR CLOSE CIRCUIT AIR BRAKE RAKES

A per instructions issued vide Board's letter No. 87/M(N)/951/31 dt. 22.8.1994, BPC of air brake stock running in close circuit shall remain valid for 4500 kms. In case it is seen that the record of the distance covered by the rake is discontinuous or not mentioned properly, the BPC will be deemed to be valid for only 15 days from the date of issue. It is the responsibility of the crew to check that entries regarding distance are clearly and continuously recorded.

ITEM 5: STANDARDISATION OF BRAKE POWER CERTIFICATE FOR AIR BRAKE CLOSE CIRCUIT RAKES

Since the existing BPC format was having certain discrepancies, the same has been modified. A copy of the modified format is enclosed. Zonal railways must ensure that in future, BPCs for CC rakes are issued as per the modified format only.

Zonal Railways may issue detailed joint instructions for C&W examination of freight trains on the above guidelines. In terms of Board's letter No. 78/M(W) 848 Vol. II dtd. 1.10.80 and 91/M(N)951/31 dtd. 24.3.95, this exercise should be done jointly by Operating and Mechanical departments every year in line with the changes in traffic pattern.

(R.N. Verma)
EDIT(S)
25.2.2000

(V.K. Manglik)
EDME(Fr.)
25.2.2000

(Format – I)**ब्रेक पावर प्रमाण - पत्र वायु ब्रेक (मालगाड़ी) पूर्व नियोजित चक्र यात्रा के लिये
BRAKE POWER CERTIFICATE FOR AIR BRAKE (GOODS) CLOSE CIRCUIT RAKES**

जारी किया : (परीक्षण स्थल/मण्डल/रेलवे)	
ISSUED BY : (Exam. Point/Divn./Railway)	
पूर्व निश्चित सर्किट	
Nominated Close Circuits	
दिनांक	प्रमाण पत्र सं.
Date	BPC No.

निर्देश INSTRUCTIONS

ए. गार्ड एवं ड्राइवर

GUARDS AND DRIVERS:

1. गाड़ी को चलाने से पहले गार्ड एवं ड्राइवर सुनिश्चित करें :

Before starting the train, guard and driver should ensure:

i) प्रथम वैगन से अन्तिम वैगन तक वायु दबाव की निरंतरता .

Continuity of air pressure from first to last vehicle of the train.

ii) ब्रेक पावर प्रमाण पत्र की वैधता । यदि प्रमाण पत्र अवैध है तो सेक्शन कंट्रोलर को सूचित करें व सी.डी.एम.ई. कैरेज कंट्रोलर से उचित निर्देश प्राप्त करें.

Validity of BPC. If found invalid. inform the control office immediately and take necessary instructions from carriage control/Sr. DME.

2. ड्राइवर व गार्ड अर्जित किलोमीटर को ठीक व साफ ढंग से लिखें।

Driver and guard should correctly log the kilometers earned

बी. स्टेशन स्टाफ

STATION STAFF

1. गाड़ी के साथ अनाधिकृत छेड़छाड़ व चोरी के प्रति सतर्क रहें। इस प्रकार की किसी भी घटना की सूचना तत्काल सेक्शन कैरेज कंट्रोलर को दें व इसे दिये गये स्थान पर भरें।

They should be vigilant for averting any theft or tempering with this rake. Any incident of theft tempering to be reported to TXR Control and entry made in the space provided.

यह प्रमाण पत्र 4500 किलोमीटर वैध है :

1. यदि अर्जित किलोमीटर की लगातार व ठीक ढंग से लिया गया हो । अगर नहीं तो ब्रेक पावर प्रमाण पत्र की वैधता जारी की गई दिनांक से केवल 15 दिन होगी ।
2. यदि मार्ग में गाड़ी की अभिन्नता भंग न की गई हो और गाड़ी में केवल लिखित डब्बे ही हों।
3. यदि गाड़ी को 24 घंटे से अधिक स्टेबल नहीं किया गया हो ।
4. यदि गाड़ी पूर्व निश्चित सर्किट पर ही चल रही हो ।

THIS CERTIFICATE IS VALID FOR 4500 Kms.

- i. *Provided the kilometrage have been logged in correctly and continuously, if not, BPC will be deemed to be valid for 15 days only from the date of issue of BPC.*
- ii. *Provided the rake integrity is not changed and only listed wagons are included.*
- iii. *Provided the rake is not stabled for more than 24 hours.*
- iv. *Provided the rake is running in pre-defined close circuit as mentioned above.*

सी. परीक्षण स्थल पर गाड़ी परीक्षक कृपया भरें :

TO BE FILLED AT THE ORGINATING EXAMINATION POINT BY TRAIN EXAMINING STAFF.

3. ट्रेन नं. Train No.
4. इंजन नं. Loco No.
5. भार एवं स्टॉक Load & stock
6. कुल ब्रेक सिलेण्डर Total No. Bk. Cyls.
7. कार्यरत ब्रेक सिलेण्डर No. of Operating Cyls.
8. ब्रेक पावर प्रतिशत Brake Power %
9. वायु दबाव प्रस्थान पर : इंजन में किग्रा/सेमी² ब्रेक वान पर किग्रा/सेमी²
Air pressure on dep. : On loco KG/CM² On Bk. Van KG/CM²
10. गाड़ी पर इंजन लगाने का समय Engine on train
11. वायु दबाव तैयार होने का समय Air pressure ready at

वैगनों की क्रमबद्धता

LIST OF WAGONS IN ORDER

क्रमांक S.No.	वैगन नं. WAGON No.	क्रमांक S.No.	वैगन नं. WAGON No.	क्रमांक S.No.	वैगन नं. WAGON No.
1		21		41	
2		22		42	
3		23		43	
4		24		44	
5		25		45	
6		26		46	
7		27		47	
8		28		48	
9		29		49	
19		30		50	
11		31		51	
12		32		52	
13		33		53	
14		34		54	
15		35		55	
16		36		56	
17		37		57	
18		38		58	
19		39		59	
20		40		60	

ड्राइवर का नाम व हस्ताक्षर DRIVER'S NAME & SIGN	गाई का नाम व हस्ताक्षर GUARDS'S NAME & SIGN	JE/SE का नाम व हस्ताक्षर JE/SE (C&W) NAME & SIGN

(Format – II)

सघन ब्रेक पावर प्रमाण पत्र वायु ब्रेक (मालगाड़ी) छोरे से छोरे यात्रा के लिये

INTENSIVE BRAKE POWER CERTIFICATE FOR AIR BRAKE (GOODS)**(END TO END RUN)**

जारी किया : (नामांकित गहन परीक्षण स्थल /मंडल/रेलवे)	<input type="text"/>		
ISSUED BY : (Nominated Intensive Exam. Point/Div./Rly)	<input type="text"/>		
गन्तव्य स्थान	<input type="text"/>		
Destination	<input type="text"/>		
दिनांक	<input type="text"/>	प्रमाण पत्र सं.	<input type="text"/>
Date	<input type="text"/>	BPC No.	<input type="text"/>
ट्रेन नं.	<input type="text"/>	इंजन नं.	<input type="text"/>
Train No.	<input type="text"/>	Loco No.	<input type="text"/>
भार एवं स्टॉक	<input type="text"/>	कुल ब्रेक सिलेण्डर	<input type="text"/>
Load & Stock	<input type="text"/>	Total No. OF Bk. CyLS.	<input type="text"/>
कार्यरत ब्रेक सिलेण्डर	<input type="text"/>	ब्रेक पावर प्रतिशत	<input type="text"/>
No. of Operating Cylinders	<input type="text"/>	Brake Power %	<input type="text"/>
वायु दबाव प्रस्थान पर : इंजन मे	<input type="text"/>	किग्रा/सेमी ²	ब्रेक वान पर <input type="text"/> किग्रा/सेमी ²
Air pressure on dep.: On Loco	<input type="text"/>	KG/CM ²	On Bk. van <input type="text"/> KG/CM ²

निर्देश INSTRUCTIONS

ए. गार्ड एवं ड्राइवर

GUARDS AND DRIVERS:

गाड़ी को चलाने से पहले गार्ड एवं ड्राइवर सुनिश्चित करें :

Before starting the train, guard and driver should ensure:

- जब तक भरी हुई मालगाड़ी के ब्रेक पावर प्रमाण पत्र पर गन्तव्य स्थान न लिखा हो, गाड़ी न चलायें।
No driver should move the loaded train from the loading point unless the destination is clearly mentioned on the brake power Certificate.
- प्रथम वैगन से अंतिम वैगन तक वायु दबाव की निरंतरता।
Continuity of air pressure from first to last vehicle of the train.
- यदि ब्रेक पावर प्रमाण पत्र अवैध है तो सेक्शन कंट्रोलर को सूचित करें व कॅरेज कंट्रोलर से उचित निर्देश प्राप्त करें।
If IBP is invalid, inform the Control Office and take necessary instructions from C&W controller.

यह प्रमाण पत्र वैध है :

- यदि भरी हुई मालगाड़ी के ब्रेक पावर प्रमाण पत्र पर गन्तव्य स्थान लिखा हो।
- यदि मार्ग मे 4 या अधिक वैगन न गाड़ी मे जोड़े या काटे नहीं गये हों।
- यदि मालगाड़ी को 24 घंटे से अधिक स्टेबल नहीं किया गया हो।

THIS CERTIFICATE IS VALID:

- Provided the destination is mentioned on the BPC of the loaded train.
- Provided the composition of the rake is not changed by 4 or more wagons.
- Provided the rake is not stabled for more than 24 hours.

ब. वैगनों की क्रमबद्धता / LIST OF WAGON IN ORDER:

क्रमांक Sr. No.	वैगन नं. WAGON No.	क्रमांक Sr. No.	वैगन नं. WAGON No.	क्रमांक Sr. No.	वैगन नं. WAGON No.	क्रमांक Sr. No.	वैगन नं. WAGON No.
1		16		31		46	
2		17		32		47	
3		18		33		48	
4		19		34		49	
5		20		35		50	
6		21		36		51	
7		22		37		52	
8		23		38		53	
9		24		39		54	
19		25		40		55	
11		26		41		56	
12		27		42		57	
13		28		43		58	
14		29		44		59	
15		30		45			

सी. लोडिंग के बाद ब्रेक निरंतरता / वैधता की जाँच, लोडिंग स्थल या निकटतम परीक्षण प्वाइंट पर गाड़ी, परीक्षक द्वारा
BRAKE CONTINUITY / REVALIDATION AFTER LOADING AT LOADING POINT OR THE NEAREST
EXAMINATION POINT BY TRAIN EXAMINATION STAFF:

क्रमांक S.No.	स्टेशन STATION	रेलवे RAILWAY	दिनांक DATE	लोको नं. LOCO No.	वायु दबाव तैयार समय PR. READY AT	पाई गई विषमता ABNORMALITY OBSERVED	हस्ताक्षर SIGN

डी. मार्ग में पाई गई कठिनाईयों एवं निवारण

ENROUTE PROBLEMS NOTICED & ATTENTION GIVEN

दिनांक DATE	लोको नं. LOCO No.	ड्राइवर का नाम/ हे. क्वा. DRS NAME & HQ	कठिनाईयों निवारण PROBLEMS & ACTION TAKEN		ड्राइवर व स्टेशन स्टाफ के हस्ताक्षर SIGN OF DR / STN. STAFF
			स्टेशन STN	प्रकार NATURE	

ई. सूचनायें/ NOTES:

- आने वाला ड्राइवर प्रमाण पत्र कार्य मुक्त करने वाले ड्राइवर को सौंप देगा। यदि वह बिना एवजी (रिलीफ) के गाड़ी छोड़ता है तो वह इसे नामित अधिकारी के नाम जमा कर देगा जो कि इसे जाने वाले ड्राइवर को देगा।
The incoming driver shall handover the brake power certificate to relieving driver. If he is leaving the train without relief, it shall be deposited with the nominated authority, who will give it to the outgoing driver.
- जाने वाला ड्राइवर और गार्ड दिये गये वैगनों के नंबर के बारे में अपने आप को संतुष्ट कर लेंगे कि प्रमाण पत्र गाड़ी से संबंधित है।
The outgoing driver and guard will satisfy themselves from the listed wagon numbers that the Brake Power Certificate pertains to their train

ड्राइवर का नाम व हस्ताक्षर DRIVER 'S NAME & SIGN	गार्ड का नाम व हस्ताक्षर GUARD' S NAME & SIGN	TXR का नाम व हस्ताक्षर JE/SE (C&W) NAME & SIGN

(Format – III)
सघन ब्रेक पावर प्रमाण पत्र वैक्यूम ब्रेक (मालगाड़ी) छोर से छोर यात्रा के लिये
INTENSIVE BRAKE POWER CERTIFICATE FOR VAC BRAKE (GOODS)
(END TO END RUN)

जारी किया : (सघन परीक्षण स्थल /मंडल/रेलवे)			
ISSUED BY : (Intensive Exam. Point/Div./Rly)			
गन्तव्य स्थान			
Destination			
दिनांक		प्रमाण पत्र सं.	
Date		BPC No.	
ट्रेन नं.		इंजन नं.	
Train No.		Loco No.	
भार एवं स्टॉक		कुल ब्रेक सिलेण्डर	
Load & Stock		Total No. of Bk. CyLS.	
कार्यरत ब्रेक सिलेण्डर		ब्रेक पावर प्रतिशत	
No. Of Operating Cylinders		Brake Power %	
वैक्यूम प्रस्थान पर : इंजन मे		सेमी	
Vacuum on dep.: On Loco		CM	
		ब्रेक वान पर	
		सेमी	
		CM	

निर्देश INSTRUCTIONS

ए. गार्ड एवं ड्राइवर

GUARDS AND DRIVERS:

गाड़ी को चलाने से पहले गार्ड एवं ड्राइवर सुनिश्चित करें:

Before starting the train, guard and driver should ensure:

- i) जब तक भरी हुई मालगाड़ी के ब्रेक पावर प्रमाण पत्र पर गन्तव्य स्थान न लिखा हो, गाड़ी न चलायें।
No driver should move the loaded train from the loading point unless the destination is clearly mentioned on the brake power Certificate.
- ii) प्रथम वैगन से अंतिम वैगन तक वैक्यूम की निरंतरता।
Continuity of Vacuum from first to last vehicle of the train.
- iii) यदि ब्रेक पावर प्रमाण पत्र अवैध है तो सेक्शन कंट्रोलर को सूचित करें व कैंरेज कंट्रोलर से उचित निर्देश प्राप्त करें।
If IBP is invalid, inform the Control Office and take necessary instructions from C&W controller.

यह प्रमाण पत्र वैध है :

1. यदि खाली मालगाड़ी ब्रेक पावर प्रमाण पत्र जारी किये जाने के 4 दिन के अन्दर ही लोडिंग प्वाइंट पर पहुँचती है ।
2. यदि भरी हुई मालगाड़ी के ब्रेक पावर प्रमाण पर गन्तव्य स्थान लिखा हो।
3. यदि मार्ग में 10 (FW) यूनिट या अधिक वैगन गाड़ी में जोड़े या काटे नहीं गये हों ।
4. यदि गाड़ी को 24 घंटे से अधिक स्टेबल नहीं किया गया हो ।

THIS CERTIFICATE IS VALID:

1. Provided the empty examined rake reaches the loading point within 4 days of the issue of BPC.
2. Provided the destination is mentioned on the BPC of the loaded train.
3. Provided the composition of the rake is not changed by 10 or more Four Wheeler Units.
4. Provided the rake is not stabled for more than 24 hours.

ब. वैगनों की क्रमबद्धता / LIST OF WAGONS IN ORDER:

क्रमांक Sr. No.	वैगन नं. WAGON No.	क्रमांक Sr. No.	वैगन नं. WAGON No.	क्रमांक Sr. No.	वैगन नं. WAGON No.	क्रमांक Sr. No.	वैगन नं. WAGON No.
1		19		37		55	
2		20		38		56	
3		21		39		57	
4		22		40		58	
5		23		41		59	
6		24		42		60	
7		25		43		61	
8		26		44		62	
9		27		45		63	
19		28		46		64	
11		29		47		65	
12		30		48		66	
13		31		49		67	
14		32		50		68	
15		33		51		69	
16		34		52		70	
17		35		53		71	
18		36		54		72	

सी. मार्ग में पाई गई कठिनाईयों एवं निवारण / ENROUTE PROBLEMS NOTICED & ATTENTION GIVEN

दिनांक DATE	लोको नं. LOCO No.	ड्राइवर का नाम/ हे. क्वा. DRS NAME & HQ	कठिनाईयों निवारण PROBLEMS & ACTION TAKEN	ड्राइवर के हस्ताक्षर SIGN OF DR

ई. सूचनायें / NOTES:

- आने वाला ड्राइवर प्रमाण पत्र कार्य मुक्त करने वाले ड्राइवर को सौंप देगा। यदि वह बिना एवजी (रिलीफ) के गाड़ी छोड़ता है तो वह इसे नामित अधिकारी के नाम जमा कर देगा जो कि इसे जाने वाले ड्राइवर को देगा।
The incoming driver shall handover the brake power certificate to relieving driver. If he is leaving the train without relief, it shall be deposited with the nominated authority, who will give it to the outgoing driver.
- जाने वाला ड्राइवर और गार्ड दिये गये वैगनों के नंबर के बारे में अपने आप को संतुष्ट कर लेंगे कि प्रमाण पत्र गाड़ी से संबंधित है।
The outgoing driver and guard will satisfy themselves from the listed wagon numbers that the Brake Power Certificate pertains to their train

ड्राइवर का नाम व हस्ताक्षर DRIVER 'S NAME & SIGN	गार्ड का नाम व हस्ताक्षर GUARD 'S NAME & SIGN	TXR का नाम व हस्ताक्षर JE/SE (C&W) NAME & SIGN

TABLE 3.3

DISTRIBUTION OF INTENSIVE STAFF GANG WISE WITH TOOLS AND MATERIAL TO CARRY

S. No.	Gang	Tools	Material to carry	Items to be examined/Repaired (Vacuum Brake)	Items to be examined/Repaired (Air Brake)
1	"A" having 2 Sk +2U/Sk	Hammer 2 Chisel 1 Spanner 2 (3/8"X 7/16" & 2"X 1/2")Monkey spanner	IR washer/MU washer as per load, Hose pipe/BP hose-2, MS bolts 2X1/2, Knuckle pin-4, Dummy plug-2 (spare)	CBC & its components, setting of CBC lock piece with toggle, knuckle pin, Hose pipe with clip, Draw bar, IR washer, train pipe and swan neck.	CBC & its components, setting of CBC lock piece with toggle, knuckle pin, Brake pipe & BP air hose, MU washer, angle cock, Isolating cock.
2	"B" having 3Sk+ 3U/Sk	Hammer 3 Chisel 2 Round Punch 2 Spanner 2 (3/8"X 7/16"	Brake block (As per load and type) , Brake gear pins, Brake gear cotter No.5,6&7. Split pins 2 -1/2"X1/4", 3 -1/2"X5/16" 4"X3/8". Brake shoe key, washers (Plain & spring) , other type of split pins	Brake blocks, split pin, washer, cotter, brake shoe key, safety fittings, APD, Brake beam safety bracket , safety loops, bolts, SAB safety bracket, Pull rod safety bracket, hanger pin, cotter, tyre defect gauge	Brake blocks, brake shoe key, split pin, washer, cotter and brake shoe key safety fittings, APD, Brake beam safety bracket, safety loops, bolts, SAB safety bracket, Pull rod safety bracket, tyre defect gauge
3	"C" having 1Sk+ 2U/Sk	Hand Hammer 1 Chisel 1 Spanners 1/2"X 3/8" 5/8"X 3/4" 3/8"X 7/16" 1/4"X 5/16"	Syphon pipe, clips complete tested release valve, neck ring, diaphragms, piston cotters, pin no. 12, release valve lever, guard van valve with diaphragm.	Vac. Cylinders, trunion bracket bolt, release valve, piston stroke , free lift, hand brake	Distributor valve, piston stroke, Brake power by testing the rake with air compressor and testing rig.

S. No.	Gang	Tools	Material to carry	Items to be examined/Repaired (Vacuum Brake)	Items to be examined/Repaired (Air Brake)
4.	'D' having 3Sk +3U/Sk	Hand Hammer 3 Chisel 3 Punch (Round)- 3 Punch cotter -3 Ring spanner 2 Plain spanner -2 1/2X5/8" and 3/4X7/8"	Buffer bolts 3 - 1/2X3/4", spring washer, shackle pin, side stone, shackle Plate.	Spring gear, LB springs, shackle, shackle plate, shackle link stone, retainer, split pins, ELB device, empty tie rod with sleeve nut, Buffers, control rod, SAB pins, door/body, side bearer top and bottom, pivot top and centre pivot pin	EM pad, bolster spring, snubber spring, adopter, side frame key, side bearer, Centre pivot top, Centre pivot pin.
5.	'E' having 1Sk +2U/Sk	Hand Hammer 2 Spanner 1/2X3/8 -1 Oil syringe Vaidyanathan gauge	Axle oil with tin	Axle boxes, face cover, Rolling - in examination, monthly oiling, work with "C" gang	Axle boxes, Rolling in examination, work with "C" gang for Testing brake power and other Misc. work.

