

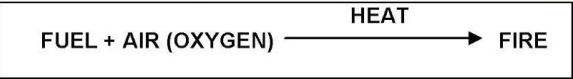
INTRODUCTION

The fire incidences in trains are among the most serious disasters to human lives and the property of Indian Railways. Thus the prevention of train fire has become a serious concern for Railways.

A train fire is different from a fire in other places in the manner in which it breaks out, grows and spreads, and in the method of fighting it. Fire in a coach on running train is very dangerous because it spreads very quickly to other coaches due to fanning effect.

CHARACTERISTICS OF FIRE

The **fire triangle** illustrates the three elements a fire needs to ignite: heat, fuel, and an oxidizing agent (usually oxygen). **By eliminating any one of the element, fire can be extinguished.**



CLASSIFICATION OF FIRES

Fires are classified according to the type of fuel that is burning. If wrong type of fire extinguisher is used for extinguishing the fire, it might make matters worse. The four different fire (fuel) classification are as under:

- i. Class A: Wood, paper, cloth, trash, plastics - solids that are not metals.
- ii. Class B: Flammable liquids—gasoline, oil, grease, acetone. Includes flammable gases.
- iii. Class C: Electrical—energized electrical equipment (as long as it's “plugged in” or supply ON)
- iv. Class D: Metals—potassium, sodium, aluminum, magnesium. Requires Metal-X, foam, and other special extinguishing agents.



PROBABLE CAUSES OF FIRE IN RAILWAY COACHES

There are varieties of reasons which may be a source of initialization of fire, some of them are mentioned below-

- 1. Carrying Inflammable goods like stove, gas cylinder, kerosene oil, petrol, fireworks etc. in passenger coaches.



- 2. Making fire/ using fire near paper, wood, petrol or such other inflammable articles.
- 3. Throwing waste material out side the dust bin near door.



- 4. Malpractices like smoking and carelessly thrown lighted match sticks, cigarette/ Bidi butts etc.



- 5. Leakages/ Blasts of Pantry Gas Cylinders.
- 6. Careless storage of inflammable materials like news papers, edible oil etc. in pantry cars.
- 7. Insertion of cigarette butts, Bidi butts, Gutakha wrapper etc. in fan base, fuse distribution board, roof openings etc.
- 8. Sabotage / Discrepancy.
- 9. Mishandling/ careless use of pantry equipment by pantry car staff.
- 10. Panic has also been noticed to have been caused among the passengers due to smoke emission in case of brake binding/ hot axle.

FIRE PREVENTIVE MEASURES

FIRE FIGHTING ARRANGEMENT

Guard-cum-Brake Van, AC coaches and Pantry Cars in all trains are provided with portable fire extinguishers to cater for emergencies due to fire accidents.

- Fire extinguishers shall be in working order.
- Shall be located on the brackets at easily visible and accessible place.
- They shall not be placed in locked cupboards/compartment.
- Shall carry an instruction plate for operating instruction in English & Hindi and any other regional language.
- Last checking, refilling date and due date shall be displayed on it.
- Adequate **fire fighting training** is to be given to the running and other train staff.



FIRE EXTINGUISHERS

The fire extinguishers used in railway coaches are of Dry Chemical powder (DCP) type. Dry chemical extinguishers put out fire by coating the fuel with a thin layer of dust. This separates the fuel from the oxygen in the air. This is available in two variants:



i. Stored Pressure Type



ii. Generated Pressure type

STEPS TO USE A STORED PRESSURE TYPE DCP FIRE EXTINGUISHER

1. Break the seal and pull the pin.



2. Hold hose in hand and aim the extinguisher or nozzle at the base of the fire.



3. Squeeze the handle and release the extinguishing agent.



4. Sweep the extinguisher from side to side across the base of the fire until it appears to be out.



STEPS TO USE A GENERATED PRESSURE (CARTRIDGE) TYPE DCP FIRE EXTINGUISHER

1. Remove the safety clip of fire extinguisher.



2. Tilt the extinguisher at 60 degree to avoid injury to user.

3. Break the cartridge by hitting the plunger with palm duly holding the pipe.



4. Direct the jet towards the near edge of the fire with a rapid sweeping motion.

INSTRUCTIONS FOR AC COACH MECHANIC

1. Do not bypass protection system (MCB/FUSE etc.).



2. Use proper rating of MCBs / fuses.



3. Check condition of cables for damage and overheating marks, discoloration of lugs.

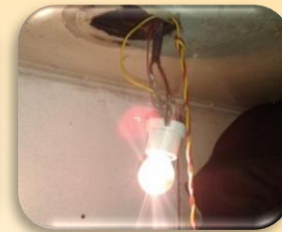


4. Check the connections, switches, fuses with the help of Infrared temperature gun to detect any over heating.



5. Ensure proper locking arrangement of doors and covers of panels to prevent unauthorized access.

6. Do not allow loose or temporary connection, hanging wires/ exposed joints etc.



INSTANT ACTION TEAM AGAINST FIRE

- ❖ In case of fire on train, typical time available for rescue is 2-3 minutes before smoke fills up and passengers start getting disoriented.
- ❖ Smoke (toxic/non-toxic) can cause suffocation and loss of consciousness in two minutes.
- ❖ Fire in personal clothing causes loss of consciousness in 10-15 seconds and death or incapacitation (followed by death) can happen in five minutes.
- ❖ A fire in train destroys the train carriage(s) completely in a few minutes before relief reaches.
- ❖ Under such situation, role of on-board Railway servants becomes vital and they should plunge into action to save the precious lives on priority.



It is desired that an Instant Action Team comprising the following available on the train is to be formed and their role is to be communicated through various training programs.

- Train crew (Loco pilots, Guard, TTEs)
- AC Coach staff, TXR staff
- RPF/ GRP staff
- Pantry car and On-board Housekeeping Staff (railway and / or contractor)
- On board Railway employees either on duty or on leave traveling as passengers
- Doctors traveling by the train
- Passengers traveling on the train who volunteer for rescue and relief work
- Railway staff working at site or available near the site of the fire incident

ROLE OF INSTANT ACTION TEAM

1. Don't panic.
2. Pull the Alarm Chain and stop the train immediately.
3. Evacuate the passengers to the adjacent coaches which are away from the fire through the vestibules; if the fire is not extinguished. After complete evacuation the rolling shutters of coaches on fire to be closed to contain the spread of fire.
4. More people expire due to suffocation from smoke rather than due to actual burning. **Advice passengers to take a cloth, wet it in their drinking water and cover their nostrils. This reduces the smoke inhalation & subsequently its bad effects.**
5. Insist that passengers should save themselves first and not to bother about their luggage which can be retrieved later on. **Open Emergency Windows/ break glasses** for Evacuation of the passengers.
6. Isolate the affected coaches from other coaches by decoupling both Mechanical & Electric couplers.
7. Locate the fire extinguishing substances viz, fire extinguishers, water bucket with water/sand, etc. **Use water available in the coaches.**
8. Try and put out the very source of the fire before it becomes a big blaze.
9. Turn off Electrical Appliances. In case of fire from electricity switch off the source.
10. Report it to the nearest station/control/fire station. (fire services: 101, it can be dialed by mobile also).
11. Provide anti rolling arrangement on the isolated coaches and train as well.
12. Arrange the stretcher and first-aid box for the injured passengers.
13. Render first aid to injured passengers and transport the injured to the hospital by taking the help of Ambulance service, means available.

When a person is on fire

- Approach him holding the nearest available wrap in front of you.
- Wrap it round him.
- Lay him flat and smother the flames.
- He may roll on the floor, smothering the flames.
- On no account should he rush into the open air.
- Call for assistance.

Handling of injured passengers

- Building up confidence of injured passengers by suitable advice is of great importance.
- First aid should be rendered to the injured passengers.
- Ordinarily give nothing ORALLY to injured one, but if medical treatment is delayed more than 4 hours, give ORS drinks **preferably bio-carbonated soda.**
- In serious case, remove the patient quickly to hospital as the injured may require an anesthetic, medical soothing.

DO's AND DON'Ts for FIRE PREVENTION

- Keep the fire extinguishers in clean condition. There should be no sharp bend in hose pipe.



- Emergency window position should be displayed properly and on board staff shall be conversant.



- Pantry staff should keep the pantry stove platform clean and no foreign material shall be left on it.



- Pantry car corridor shall be clear. Do not stack material in it.



- Vestibules area shall be free. Do not keep bed rolls, etc. in this area.



- Do not allow smoking in the train.



- Do not throw waste material out side dustbin.



- Do not allow any un-authorised vendor in train or at platforms.



- Ensure availability of fire extinguishers at easily visible and accessible places. They shall not be placed in **locked cupboards**.



- Do not keep inflammable material like edible oil tin/ can etc. near gas burner/stove.



- Ensure the isolating cock of LPG line is in **OFF** condition when not in use in pantry car.

- Do not plug extra load/ loose wire on socket provided in pantry car or in mobile charging socket.



- Do not fix hammer as shown, it will take time and require screw driver to remove in case of any emergency.



- Ensure availability of hammer in hammer box provided for breaking window glass. The glass cover shall be of slide type for easy removal.

Disclaimer:

It is clarified that this pamphlet does not supersede any existing provisions laid down by RDSO, Railway Board or Zonal Railways. The pamphlet is for guidance only and it is not a statutory document.

If you have any suggestion or comment, please write to:

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भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय MINISTRY OF RAILWAYS

PAMPHLET
on

Fire Causes and Preventive Measures in Railway Coaches

End User : Technicians and Train Escorting Staff

CAMTECH/E/2015-16/Fire-Causes-Prevention/1.0

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