

DIRECTORATE GENERAL BORDER ROADS  
GENERAL MAINTENANCE INSTRUCTION NO- 192

ON

USE OF LIQUEFIED PETROLEUM GAS (LPG) IN THE GREF

GENERAL

1. The liquefied petroleum gas (LPG) and marketed in India is basically a mixture of butane and propane. LPG is colourless, odourless and it being highly inflammable, a malodourant is added to it to detect its leakage from the cylinder and other connected appliances. Although the cylinders are designed and tested for the requisite internal pressure, the gas in the cylinder can attain a pressure at excessive temperatures, which can result in its failure.

2. For safe handling of the LPG cylinder and appliances, BIS has published an Indian Standard "IS 12011: 1987 code of safety practice for domestic LPG installation". This standard covers general safety requirement to be observed during installation and operation of domestic appliance using LP Gas as fuel.

AIM

3. The aim of these instruction is to familiarize the users with LPG, caution them to take proper precautions in the correct use of gas and appliances, economise in its use and to avoid any serious accident.

4. In the overall national interest of preserving forest wealth of the country and maintaining the ecological balance. Government has accorded sanction for introduction of LPG in the GREF in a phased manner to replace the existing conventional cooking fuel such as firewood, coal, coke and kerosene. LPG, as a fuel for cooking purpose, has a large number of advantages over the existing conventional fuels. Some of the distinct advantages are as follows:-

4.1 It is always ready for use and gives out an instant heat output which can be varied over a wide range, rapidly and easily.

4.2 It leaves not dust, smoke, smell or soot, thus enabling the cooks and helpers to work in comfortable environments.

4.3 The gas is non-toxic and the burners of approved appliances do not produce carbon monoxide under normal working conditions. Since LPG is blended with a malodorant, leakages, if any, are easy to detect.

4.4 The appliances including burners, being sturdy and rebuts are long term investments which do not require frequent repairs/replacements.

## What is LPG

5. Liquefied Petroleum Gas (LPG) is filled under pressure in cylinders, stored and transported to the users place. When the cylinder valve of your gas installation is opened, reduction of pressure takes place inside the cylinder and the liquid automatically turns into gas. So, what you get out of the cylinder valve is LPG in gaseous form.
6. LPG in gaseous form is almost twice as heavy as air, it always settles down to floor level in case of leakage.
7. LPG is colourless and odourless. Therefore, a distinction foul occur is added before it is filled into cylinders, to enable easy detection in case of leakage.

## Know your gas installation

8. It consists of:
  - 8.1 Cylinder with valve.
  - 8.2 Pressure Regulator (attached to valve outlet).
  - 8.3 Appliance (Gas stove/Cooking Range).
  - 8.4 Flexible Rubber tubing (connecting the pressure regulator outlet to the appliance inlet).

## Every component needs your attention

9. The position of the cylinder should always be:
  - 9.1 Vertical
  - 9.2 Away from any source of heat/fire.
  - 9.3 On or above ground level, in order to prevent accumulation of gas in case of leakage.
  - 9.4 Convenient for:-
    - 9.4.1 Easy operation of cylinder valve.
    - 9.4.2 Removal in case of emergency.
    - 9.4.3 Easy access to connections and regulating devices.

**N.B** Do not change the colour of the cylinder.

10. The position of the gas stove should always be:
  - 10.1 About 2ft above floor level and against a wall to avoid the possibility of your clothes catching fire.

10.2 Away from curtains, if kept near the window. Windows should be closed and the use of fans avoided, during its operation. This will prevent blowing out of the flame and will not allow unburnt gas to escape.

10.3 Arranged in such a manner that there is no shelf or cabinet directly above or behind the stove. Your clothes can catch fire while trying to reach for the shelf.

**N.B.** Use an ISI approved appliance only. It should be duly tested by a mechanic before use.

11. The flexible tubing should be:-

11.1 Gas resistant and an approved one. Sub-standard tubing can cause disasters.

11.2 As short as possible, and not longer than a metre, so that the cylinder and the stove are in the same room.

11.3 Easily accessible for inspection, and not concealed in walls, cupboards, cabinets, etc., or covered by sheaths flexible conduits, etc.

11.4 Kept away from any source of heat.

11.5 Pushed over the full length of the nozzle.

11.6 Not subjected to external pressure or twisted or looped.

11.7 Cleaned, if necessary with water to ease the fitting of the tubing over the nozzle. Do not use soap, oil or grease for this purpose because the tube may slip out.

11.8 Checked regularly for cracks, holes, softness or porosity by visual inspection or with soap solution.

12. The pressure regulator:

12.1 It is connected to the outlet of the cylinder valve with a rubber washer at the joint. Its function is to lower the pressure of the gas in the cylinder and to maintain this low pressure irrespective of cylinder pressure.

### HOW TO USE THE GAS

13. First of all, make sure that the burner flame control knobs of the gas stove or appliance are in 'closed' position.

14. Next turn the hand wheel of the cylinder by half a turn only, in the anticlockwise direction. The cylinder valve is now open. Remember, never use tools to turn the hand wheel or the burner knobs.

15. Check for leakage of gas. If there is no foul smell, light a match stick in one hand and hold it near the burner ports (holes/slots).
16. Turn the gas knobs of the burner with the other hand. Generally, the gas flows when the knob is turned in the anticlockwise direction. In case it is of the "lock in off position type, press the knob and then open the tap. In case the match stick is extinguished before the gas is lit, use the burner control knob and repeat the procedure.
17. To shut off the burner, turn the knob in the clockwise directions.
18. As a precaution, keep the cylinder valve closed when not in use especially at night or when you leave the cook house. Do not, however, close the hand wheel too tightly as the valve could be damaged and this could lead to leakage.

#### Safety: A few Do's and Don'ts

19. Avoid the use of nylon garments, or clothing of a similar fabric, in the kitchen. Preferably, wear a cotton apron whilst working.
20. Keep persons who are not supposed to work in the cook house away from the stove even when it's in use or whilst the surfaces are still hot.
21. Use dry potholders when handling pans on the appliances and avoid the use of trailing moist towels, aprons, etc.
22. Never leave appliances unattended, when it is in operation. Cooking material may overflow on to the burners, extinguish the flame and above all, leakage of gas will occur. Accumulated gas could get ignited by the second burner in operation and this may result in fire.
23. Never try to repair, adjust or inspect any part of the gas installation or permit untrained persons to do so.
24. Be extremely careful when reaching for storage cabinets or shelves situated above a gas stove in operation.
25. If your appliance is near a window, do not use long curtains. They could blow over the burner and catch fire.
26. Always turn panhandles to the side or towards the back of the appliances to avoid knocking the pan off the stove.
27. Keep plastics away from those parts of the appliance which could become warm.
28. Important if you smell gas:-

28.1 "Follow your nose" to the source. Remember – It's possible that a pilot burner or simmer flame may have been put off, or a burner control gas tap may have been partially turned on something easily and safety corrected. But, if the source of gas cannot be located or if the foul odour persists:-

28.1.1 Close burner knobs and cylinder valves.

28.1.2 Extinguish any open flame.

28.1.3 Do not light a match or bring in any other ignited material.

28.1.4 Open windows for free ventilation.

28.1.5 Do not touch electrical switches.

28.1.6 Do not tamper with the installation.

28.1.7 Immediately contact your LPG Distributor.

### 10 ways to lower your gas consumption organised cooking

29. Cooking is much more enjoyable and less fuel consuming if your ingredients are prepared and ready for cooking, before you light the stove. Never keep the burner lighted unnecessarily. A matchstick for relighting the burner is much cheaper than the cost of the gas you waste by keeping the stove on.

### The pressure cooker the biggest fuel saver

30. Pressure cooking takes less time and consumes 30% less fuel as compared to ordinary cooking. But did you know that you can reduce the flame and completely switch off your stove whilst the food continues to cook inside the pressure cooker under pressure of the steam. You can save 5 to 8 minutes of cooking fuel each time this way. Plan your cooking so that you cook rice, dal and boil vegetables at the same time by making use of all the contents of your cooker.

### Eat the family way:

31. Eating together saves fuel. Avoid reheating food as much as possible by planning your meal when the family can eat together. Besides every time you reheat food you lose its nutritive value.

32. Avoid unnecessary vigorous boiling. Read Carefully:

32.1 Each burner is provided with a gas tap which controls the flow of gas to the burner. Three distinct positions are marked on the control knob – "OFF" "ON" and "SIMMER".

32.1.1 In the "ON" position flow of gas the burner is maximum.

32.1.2 In "SIMMER" the gas burns between 25% and 33% of the maximum capacity.

32.1.3 Remember: Light the burner when the control knob is in the "ON" position.

32.1.4 Always turn the knob to "SIMMER" once the vessel and its contents are heated to your requirement. Foods cook

just as quickly, whether they are boiled gently or vigorously in both cases, the temp of water is 100°C. A high boil destroys flavours and nutrients and causes unnecessary evaporation of moisture. Avoid vigorous boiling unless it is absolutely necessary, as in the case of drinking water and in a few cooking processes which need a high boil.

33. Try it out like this:

33.1 If you are boiling potatoes, or eggs once the water starts boiling turn the knob to 'SIMMER'. You will observe that the water continues to boil.

33.2 Similarly, while frying any material once the pan has acquired the heat level needed, turn the knob to 'SIMMER'.

34. Check the colour of the flame:

34.1 To get maximum heat out of the gas you burn, ensure that you always get greenish blue flame cones. If your burner boles are clogged, call you mechanic and get the burner cleaned. A yellow flame deposits soot on utensils, which indicate that gas is being wasted.

35. What height should the flame be?

35.1 The flame can be set at any height high, medium or low, by turning the knob to the position desired.

35.2 The optimum height of the flame depends on the size of the utensil the material you are cooking and whether you are cooking it with a liquid. Here are some rules.

35.2.1 The flame should never extend beyond the bottom of the pan.

35.2.2 Utensils which conduct heat slowly (stainless steel, cast iron, enamel glass and medium sized flame unless you are cooking with a liquid. The liquid helps to conduct heat and to keep the temp of the pan even in this case, you can use a higher flame, but never higher than the bottom of the pan. As a general rule for frying processes in pans which conduct heat slowly, adjust the burner to a low or medium flame. This takes a little longer but gives the best results.

36. The quantity of liquid you should use:

36.1 Food is cooked quicker, tastes better and is more nutritious. When cooked in as little water as possible even rice! Remember, surplus water consumes unnecessary fuel.

37. The ideal burner for the ideal vessel:

37.1 If your gas stove has 'small' and 'large' burners for small vessels use the small burner. The large burner consumes 15% more fuel. Besides, it is advisable to use wide and shallow vessels, they consume less gas.

38. Restrict the use of a pan-supporting ring:

38.1 Pan supports reduce heat transfer to the vessel and hence consume more fuel. Make use of small or round bottomed vessels for they limit the use of pan supporting rings.

39. About lids and covers:

39.1 A good fitting cover or lid for your utensil makes cooking easier and more economical. It keeps the temperature in the pan even. Conserves heat and retains steam and aroma. Thus, less gas is consumed.

#### General care and cleaning procedure

40. The body or main frame of the gas stove you are provided with could be of cast iron, or pressed steel with porcelain enamel with a finish of stoving enamel paint or polished metal (Chrome). All these materials require special cleaning treatment.

#### REMEMBER

41. Avoid harsh cleaners:

41.1 Do not use abrasive powders on the main frame of your gas stove. Highly acidic or alkaline cleaners should also be avoided.

41.2 Wait for surfaces to cool:

41.2.1 Do not wash or wipe any of the painted surfaces with a wet cloth whilst the unit is warm. Sudden temperature changes can cause the enamel or paint surface to crack.

41.3 Prevent acid stains:

41.3.1 Vinegar, turmeric with oil, sour milk, citrus fruits, tamarind marinades, tomato sauces contain acids which stain or discolour even the finest acid resistant materials. In case of over flow clean immediately with a dry cloth. When the surface becomes cool, wash with warm soapy water and dry.

41.4 Ordinary stains:

41.4.1 Remove them with washing soda or baking soda and a damp cloth. If the stain remains, use a mild cleanser so that the surface remain unscratched.

41.5 Treatment for chrome finishes:

41.5.1 Never use scouring or abrasive powders on bright metal or painted surfaces. Usually a damp cloth along can clean the chrome surface effectively. If the stain persists, any good chrome cleanser can be used.

41.6 Burner control knobs:

41.6.1 Do not use a scouring pad or scouring powder to clean them. The numerals and markings can be scratched off by the abrasive action.

### Important

42. Never deep the main frame/body of the stove in water. The grease in the gas taps may get washed away and this may result in continuous leakage.

43. The right way to clean the missing tube and burner head of your burner:-

43.1 Immerse the mixing tube assembly and the burner heads in a mixture of boiling water and washing soda. Soak for 20 min, ensuring that the solution completely covers the burner head caps and mixing tube. Remove and let the ports cool. Rins thoroughly, both internally as well as externally. The burners must be absolutely dry. Otherwise, corrosion may occur resulting in an uneven flame.

43.2 Clean the burner ports (Holes) with a soft wire and not with a wooden tooth pick. If necessary, clean the mixing tube with a stiff bottle cleaning brush.

44. Pan Supports:-

44.1 They are usually made of cast iron and can be cleaned in the same solution as used for the burner. After cleaning, these should be dried thoroughly to prevent.

45. When your LPG cylinder is being changed ensure the following:-

45.1 All naked flames should be extinguished or removed from the room. Beware of lighted stoves, sigris, wick lamps, agarbattis, choolas or angethis on fire or even covered with ash. These can ignite gas if a leakage occurred smoking should be strictly avoided.

- 45.2 If your electrical hot plates is in use, switch it off.
- 45.3 The burner control knob and the cylinder valve should be closed.
- 45.4 When opening the cylinder can make sure that the delivery does not use a hammer.
- 45.5 The valve of the new cylinder should be closed before the delivery boy unscrews the security nut.
- 45.6 The rubber washer in the pressure regulator should be replaced by the authorised rep each time.
- 45.7 The various joints and connections must be checked by the delivery boy for leakages with the help of soap solution after connecting the new cylinder.

Screening of film on LPG

46. Oil Industry is producing a film on LPG, which is educative and information. It will be arranged for screening.

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