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Participant Handbook

Sector
Hydrocarbon

Sub-Sector
Downstream (Oil Refining and Marketing)

Occupation
LPG Installation & Complaint Handling

Reference ID: **HYC/Q3401, Version 4.0**
NSQF Level 3

LPG Mechanic

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> Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi
Prime Minister of India

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COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

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HYDROCARBON SECTOR SKILL COUNCIL

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **'LPG_Mechanic'** QP No. **'HYC/Q 3401 NSQF Level 4'**

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*Valid up to the next review date of the Qualification Pack or the 'Valid up to' date mentioned above (whichever is earlier)

Authorised Signatory
(Hydrocarbon Sector Skill Council)

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About this book

This Participant Handbook is designed for providing skill training and/ or upgrading the knowledge and basic skills to take up the job of an 'LPG Mechanic' in the hydrocarbon sector.

This Participant Handbook is designed based on the Qualification Pack (QP) under the National Skill Qualification Framework (NSQF) and it comprises of the following National Occupational Standards (NOS)/ topics.

- HYC/N 3401 Carry Out Installation of LPG Cylinders at Customer Premises with Adherence to Safety
- HYC/N 3402 Attending Complaints of LPG Leakage, Allied LPG Equipment's and Non-functioning of Equipment
- HYC/N 3403 Carry Out Mandatory Inspection of Consumer Premises Once in Every Two Years
- HYC/N 3103 Maintain Health and Hygiene Habits

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https://www.skillindiadigital.gov.in/content/list

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1. Introduction

Unit 1.1 - Introduction to the Training Programme

Unit 1.2 - Introduction to Hydrocarbon Sector

Unit 1.3 - Introduction to Downstream Segment

Unit 1.4 - Role of an LPG Mechanic

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Explain the purpose of the training programme
2. State the benefits of the training programme
3. Discuss the qualification pack and National Occupation Standards
4. Explain about the hydrocarbon sector
5. Explain the meaning of hydrocarbons
6. List the different types of hydrocarbons
7. Describe the refining process for crude oil
8. Describe the distillation process
9. State the different types of fuels
10. List the three major segments in the hydrocarbon sector
11. State the functions of the downstream segment
12. List the roles and responsibilities of LPG Mechanic
13. State the personal attributes of LPG Mechanic

UNIT 1.1: Introduction to the Training Programme

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the purpose of the training programme
2. State the benefits of the training programme
3. Discuss the qualification pack and National Occupation Standards

1.1.1 Introduction to the Training Programme

This training programme is developed to impart specific skills to individuals who wish to work as an LPG Mechanic.

The training programme is based upon the National Occupational Standards for LPG Mechanic and installation of LPG cylinders for the new connection at customer premises. The National Occupational Standards have been described in the following sub-section of this session.

The training programme will enable an individual to:

- Perform specialised work such as LPG pre-installation, installation and post-installation activities at customer premises (domestic)
- Follow safety guidelines while setting up a cylinder
- Create customer awareness regarding LPG use and safety
- Attend customer complaints and resolve them in a timely manner
- Achieve customer satisfaction by providing excellent service
- Fulfilled customer requirement by resolving all types of complaints
- Carry out mandatory inspection for all customers under the gas agencies
- Maintain personal health and hygiene habits and follow environment protocol

1.1.2 Benefits of the Training Programme

After successful completion of the training programme, trainees will undergo an assessment which will have a theory and a practical test

- On successfully passing the assessment, a certificate will be awarded by the Hydrocarbon Sector Skill Council
- This will help you in getting employed as an LPG Mechanic in downstream companies or in working independently

1.1.3 Introduction to QP and NOS

This training programme is intended to impart basic skill and knowledge relevant to an LPG Mechanic and LPG cylinders installation activities required to be performed at the customer premises. This programme is based on the qualification pack called LPG Mechanic. The Qualification Pack Code for LPG Mechanic is HYC/Q 3401. This is also called a QP. A QP consists of a set of National Occupational Standards (NOS). NOS specify the standardised level of competency a worker should possess in order to perform the enlisted function at the workplace. Under the LPG Mechanic QP, there are four numbers of NOS which detail the functions to be performed at the work site by the LPG Mechanic.

NOS Code	Major Function/Task
HYC/N 3401	Carry out Installation of LPG Cylinders at Customer Premises with Adherence to Safety
HYC/N 3402	Attending Complaints of LPG Leakage, Allied LPG Equipment's Non-Functioning Complaints
HYC/N 3403	Carry out Mandatory Inspection of Customer Premises Once in Every Two Years
HYC/N 3103	Maintaining Health and Hygiene Habits

UNIT 1.2: Introduction to the Hydrocarbon Sector

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the hydrocarbon sector
2. Explain what hydrocarbons are and describe the different types of hydrocarbons
3. Describe the refining process for crude oil
4. State the different types of fuels

1.2.1 About the Hydrocarbon Sector

The hydrocarbon sector is one of the six-core industries in India and therefore has an impact on all the other sectors, industries, and segments in the country. Since India is a developing nation, there is an ever-increasing demand for energy and this demand further influences the growth of this sector. Today, 57 per cent of India's domestic crude oil production comes from Oil and Natural Gas Corporation (ONGC). India is also the fourth-largest importer of Liquefied Natural Gas (LNG) in the world.

One of the reasons why this sector is projected to flourish is government initiatives. State-run oil firms are working towards improving the Liquefied Petroleum Gas (LPG) infrastructure in Uttar Pradesh, which will also help create clean energy and generate employment. The Government of India (GOI) has introduced various policies in order to promote the use of biofuels for transport. Additionally GOI is also planning to build refineries in Rajasthan and Maharashtra, increase the use of LNG, and auction off oil and gas fields. GOI is also planning to create an integrated oil major that will compete in the global market.

The hydrocarbon sector has played a vital role in the economic growth of the country.

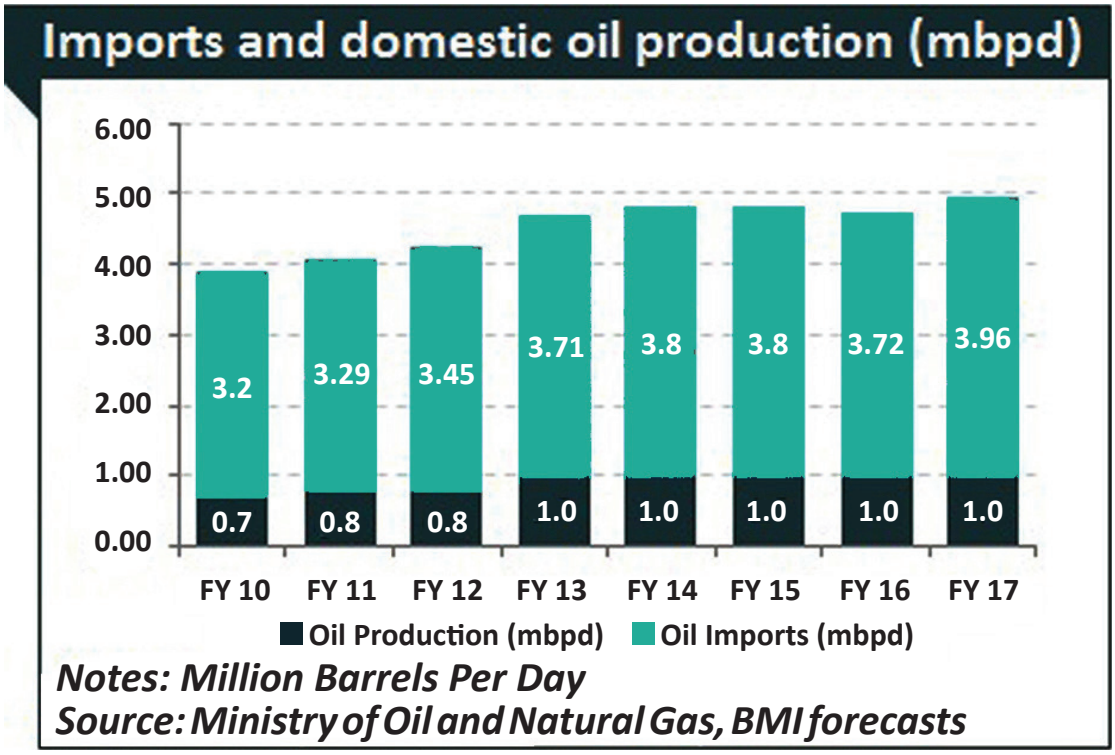

Fig. 1.2.1. Economic growth

The oil and gas (hydrocarbon) sector has seen significant growth over the past few years. India's energy consumption has almost doubled since 2000 and the potential for further rapid growth is enormous.

According to data[1] released by the Department of Industrial Policy and Promotion (DIPP), the petroleum and natural gas sector attracted FDI worth US$ 6.86 billion between April 2000 and September 2017.

The Ministry of Petroleum and Natural Gas (MOP and NG) is a Ministry of the Government of India responsible for the exploration, production, refining, distribution, marketing, import, export, and conservation of petroleum, natural gas, petroleum products, and liquefied natural gas in India. They are the apex body for laying down the guidelines and rules for the petroleum and natural gas segment.

The Hydrocarbon Sector Skill Council (HSSC) plays a crucial role in the skill development ecosystem in India. Their job is to ensure that the training is relevant to industry needs and is aligned with the national skill development policy. As autonomous bodies, they front-end various activities and take measures to identify and close the skill gaps under the hydrocarbon segment.

1.2.2 About Hydrocarbons

Hydrocarbons are organic compounds which are made up of hydrogen and carbon atoms.

Hydrocarbons	
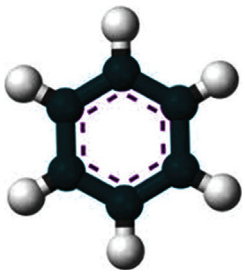	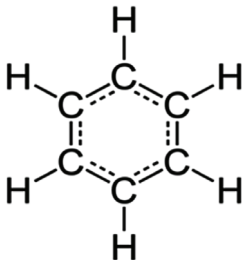
Fig. 1.2.2. Hydrocarbon	*Fig. 1.2.3. Structure of the hyrdrocarbon*

Types of Hydrocarbons:

There are four basic types of hydrocarbons:

- The common usages of alkanes are in natural gas and petroleum fuels.
- Alkenes are used in the syntheses of alcohols, plastics, lacquers, detergents, and fuels.
- Acetylene is used to cut and weld steel.
- Many aromatic compounds are used as solvents to remove or thin out oil or grease-based compounds. Toluene, for example, is an ingredient in paint thinners.

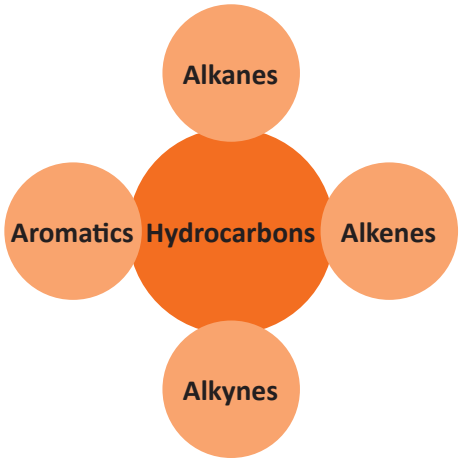

Fig. 1.2.4. Types of hydrocarbons

1- https://www.ibef.org/industry/oil-gas-india.aspx

Many of the fuels which we use are hydrocarbons. The majority of the hydrocarbons found naturally are present in crude oil. Crude oil is a mixture of hydrocarbons that exists as a liquid found underground or underwater. Hydrocarbons in crude oil can generally be divided into four categories:

Hydrocarbons in Crude Oil	Weight
Paraffins	15 to 60%
Napthenes	30 to 60%
Aromatics	3 to 30%
Asphaltics	6%

What is Petroleum?

Petroleum is a naturally occurring, yellow-to-black liquid found beneath the Earth's surface. It is a general term for crude oil and natural gas.

1.2.3 Refining of Crude Oil

Refining of crude oil refers to the process of converting crude oil into useful products. The process is divided into three basic steps: separation, conversion, and treatment.

1. **Separation or Distillation process**

   Separation refers to the process of distillation. Crude oil is heated in a furnace so that hydrocarbons can be separated according to their weight and boiling point.

2. **Conversion**

   Conversion is simply the process of changing one kind of hydrocarbon into another.

3. **Treatment**

   Treatment is the final process of refining. One common example of treatment is the removal of sulphur from diesel fuel, which is necessary for it to meet clean air guidelines.

Distillation Process

This process is based on the principle that different substances boil at different temperatures. In the distillation process, crude oil is heated and fed into a tall steel tower called a distillation column and then separated into its components according to their boiling points. As the temperature of the crude oil in the distillation column rises, the crude oil separates itself into different components. Each component corresponds to a different type of petroleum product, depending on its boiling temperature.

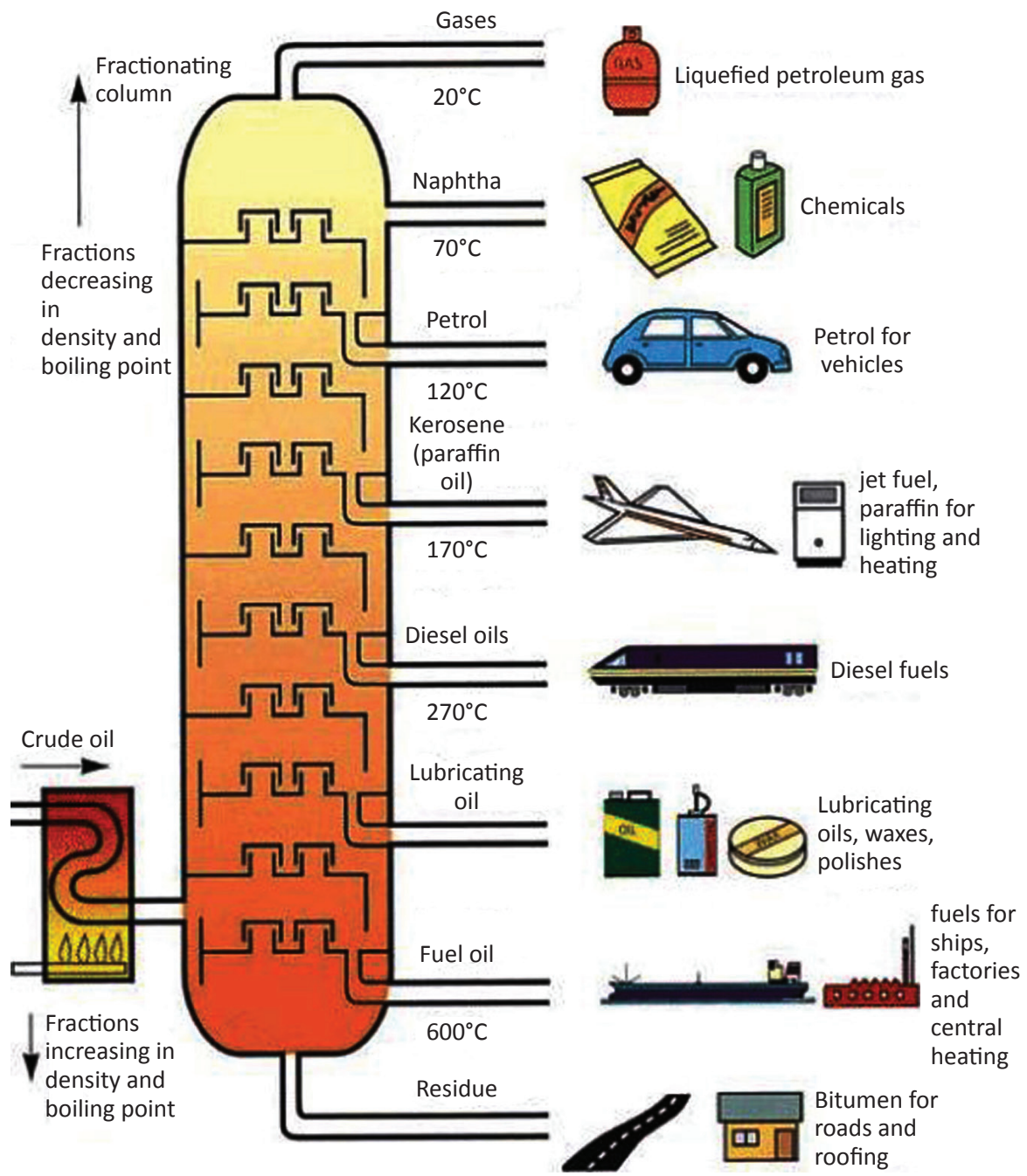

Fig. 1.2.5. Distillation process

1.2.4 Types of Fuel

There are three main types of fuels – solid fuels, liquid fuels and gaseous fuels.

Fuel Types and Examples

Solid fuels

Fig. 1.2.6. Wood

Fig. 1.2.7. Coal

Fig. 1.2.8. Cow Dung

Some more examples are coke, charcoal, etc.

Liquid fuels

Fig. 1.2.9. Diesel, Petrol

Fig. 1.2.10. Kerosene

Fig. 1.2.11. Coal Tar

Some more examples are petrol, naphtha, ethanol, etc.

Gaseous fuels

Fig. 1.2.12. CNG

Fig. 1.2.13. LPG

Fig. 1.2.14. Biogas

UNIT 1.3: Introduction to the Downstream Segment

Unit Objectives

At the end of this unit, you will be able to:

1. List the three major segments in the hydrocarbon sector
2. State the functions of the downstream segment

1.3.1 Different Segments of Hydrocarbon Sector (Petroleum Industry)

The petroleum industry is divided into three major segments: Upstream, Midstream, and Downstream.

Upstream

- Searching for potential underground or underwater crude oil or natural gas fields
- Drilling exploratory wells
- Bringing the crude oil and natural gas to the surface

Midstream

- Transportation and Storage of oil and natural gas
- Shipping
- Pipelines
- Liquefied Natural Gas (LNG) Terminals

Downstream

- Refining of petroleum crude oil
- Processing and purifying of raw natural gas
- Marketing and distribution of products derived from crude oil and natural gas

Fig. 1.3.1. Different segments of hydrocarbon sector

Processes involved in different segments of the petroleum industry:

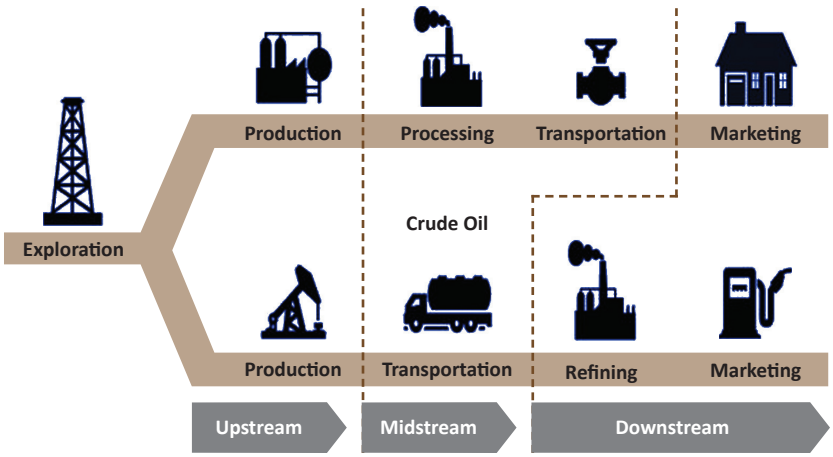

Fig. 1.3.2. Processes involved in different segments of the petroleum industry

1.3.2 About the Downstream Segment

The downstream segment involves the refining of petroleum crude oil and the processing and purifying of raw natural gas, as well as the marketing and distribution of products derived from crude oil and natural gas. The downstream segment reaches consumers through products such as petrol, kerosene, jet fuel, diesel oil, fuel oils, lubricants, waxes, asphalt, natural gas, and Liquefied Petroleum Gas (LPG), etc.

About the Downstream Segment in India

Fig. 1.3.3. Downstream segment

The downstream segment is also known as the oil and gas industry. The oil and gas industry is among the six core industries in India. It plays a major role in influencing the decision-making for all the other important sections of the economy. India's downstream segment has 19 refineries in the public sector and three in the private sector. Private companies such as Reliance Industries Ltd. and Essar Oil are the major refiners. In the year 2016, public sector refineries accounted for 54.42% of total refinery crude throughput and the private sector refineries' total crude throughput grew at a CAGR of 9.28%, reaching 88.7 million metric tonnes (MMT).

In the year 2016, total consumption of petroleum products by companies stood at around 183.5 MMT, higher by 11.2% in comparison with the previous fiscal year. The total number of retail outlets increased to 56,190 (including private) in April 2016 (provisional) from 53,419 in April 2015.

UNIT 1.4: Role of an LPG Mechanic

Unit Objectives

At the end of this unit, you will be able to:

1. List the roles and responsibilities of an LPG Mechanic
2. State the personal attributes of an an LPG Mechanic

1.4.1 Who is LPG Mechanic?

The LPG Mechanic is responsible for new LPG connection and mandatory checking or emergency handling at the customer premises. He should be able to use proper tools and equipment while on visit to customer for new connection. He should have the technical knowledge to solve the customer complaints regarding LPG and its allied products. He must educate the customer on safe usage of LPG and allied equipment. He should provide good customer service and should be courteous and respectful towards the customer.

Fig. 1.4.1. LPG Mechanic

1.4.2 Role and Responsibility of LPG Mechanic

This job role involves the following:

- Visit the LPG distributor showroom and collect the new customer details as per the schedule and plan of installation
- Carry the tools, equipment and required documents for domestic LPG cylinder installation
- Execute pre- Installation, installation and post-installation activities of LPG cylinders at customer premises
- Demonstrate the safety usage of as well as safe handling of LPG appliances

- Achieve customer satisfaction by providing excellent service
- Attend all types of customer complaints related to LPG leakage and functioning of LPG cylinders, stoves, etc.
- Fulfil customer requirement by resolving all complaints within 48 hours
- Carry out mandatory inspection as per the mandatory inspection format for domestic installation
- Plan and organise tasks in order to meet expected outcomes
- Apply different kinds of problem-solving strategies to resolve customer issues

As part of his job role, he also needs to:

- Conduct pre-checking before installation activities such as; visit the showroom, collect the customer details as per the day's schedule and plan accordingly
- Check if the tool-kit is ready with all essential tools and replenish the required consumables
- Wear proper uniform and carry ID cards provided by distributors at all times while visiting customer premises
- Greet the customer in a polite manner
- Educate customers on the properties of LPG and safe usage of LPG equipment
- Ensure that there are no other inflammable items in the kitchen during the setting up of the LPG cylinder.
- Ensure cylinders are installed at places free from obstruction / prone to damage or vulnerable to unsafe conditions.
- If any unsafe practices are observed, they should be politely communicated to the customer.
- Follow dos and don'ts during LPG cylinder installation and emergency complaint handling.
- Get the customer feedback, record the same and convey the same to the showroom staff.
- Understand customer's need for service quality requirements.
- Understand the importance of mandatory inspection
- Operate within the appropriate health, hygiene and safety regulations ensuring the working environment, property are safe and secure at all times

Career Path of LPG Mechanic

An individual may progress from LPG Mechanic to the Supervisor level.

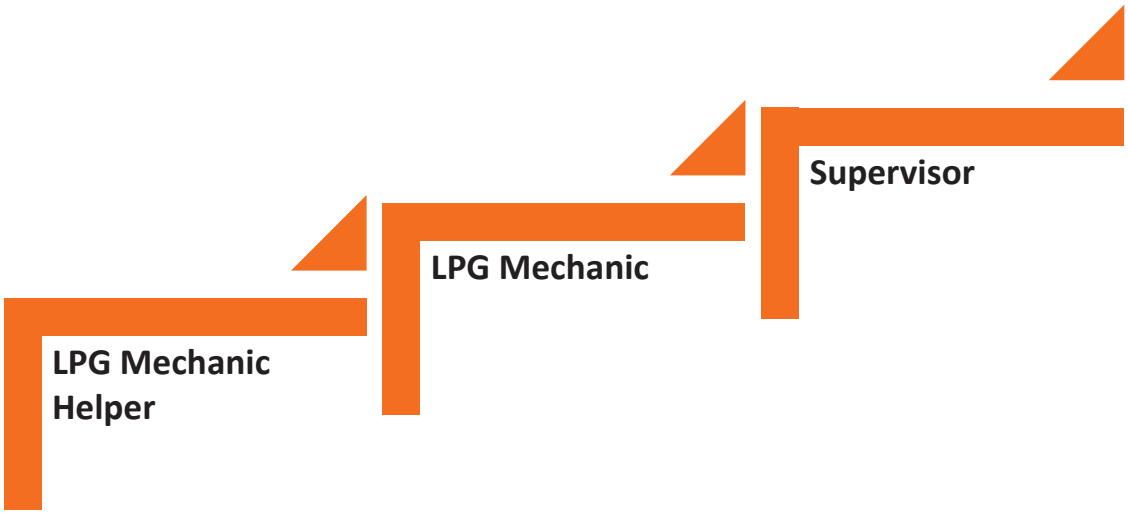

Fig. 1.4.2. Career path for LPG mechanic

1.4.3 Personal Attributes of LPG Mechanic

In addition to the above, LPG Mechanic should:

- be honest, reliable and responsible
- be well-organised and plan assigned tasks
- be courteous while communicating with customers
- maintain mental and physical fitness to perform at work
- have an eye for detail
- be able to read and write
- be a good listener
- maintain personal health and hygiene
- stay alert and observant to notice potential hazards in and around the storage area and customer premises
- solve problems with an analytical mind-set
- always wear proper uniform and carry ID card while visiting the customer

Exercise

Read the questions carefully and answer them.

1. What are your expectations from this training programme?

2. What are the three main sections of the hydrocarbon sector?

3. List the roles and responsibilities of an LPG Mechanic.

Hands-on practice sessions will be conducted at the LPG Showroom/Distributors/Godown.

Tips

- Hydrocarbons are organic compounds which are made up of hydrogen and carbon atoms.
- The four basic types of hydrocarbons are – Alkanes, Alkenes, Alkynes and Aromatics.
- Fuels are divided into three main types – Solid fuels, Liquid fuels and Gaseous fuels.
- The three major segments of Hydrocarbon Sector are: Upstream, Midstream, and Downstream.

Notes

Notes

Notes

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=RtURL0FW3KI

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2. Carry Out Installation of LPG Cylinders at Customer Premises with Adherence to Safety

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HYC/N 3401

Key Learning Outcomes

At the end of this unit, you will be able to:

1. State the properties of LPG
2. List the characteristics of LPG
3. Describe how LPG is filled in cylinders
4. Explain the use of LPG
5. Describe the pre-installation activities at the distributor's showroom/godown
6. Describe the pre-installation activities at the customer premises
7. Identify the required tools and equipment required for LPG installation
8. Describe the LPG installation activities at the customer premises
9. Explain the procedure for a new domestic LPG connection
10. Describe the post-installation activities performed at the customer premises
11. State the procedure for billing
12. List the hazards that occur when dealing with LPG
13. Explain safety measures while dealing with LPG
14. Describe the safety practices regarding LPG cylinder usage
15. State the Fire Triangle
16. List the different types of fire
17. State the different types of fire extinguishers and their uses
18. Describe the DCP type fire extinguisher and its uses
19. Explain the procedure to use fire extinguisher

UNIT 2.1: About LPG Cylinders

Unit Objectives

At the end of this unit, you will be able to:

1. State the properties of LPG
2. List the characteristics of LPG
3. Describe how LPG is filled in cylinders
4. Explain the use of LPG

2.1.1 What is LPG?

Liquefied Petroleum Gas (LPG) is a combination of hydrocarbon gases such as propane and butane. Though LPG is in gaseous state at normal temperature, it becomes a liquid with the application of higher pressure. This property allows for its use as a fuel.

LPG is sold in India as per the specifications of IS 4576, which is a standard specified by the Indian Government. LPG is produced at refineries during processing of crude or is extracted from natural gas.

LPG is the most convenient form of fuel in comparison to similar category of gaseous fuel like Compressed Natural Gas (CNG), Liquefied Natural Gas (LNG) due to its basic inherent properties. LPG is used as a domestic fuel in kitchens. It is also gaining popularity in industries for a wide variety of its uses. LPG is a pure and clean source of energy.

LPG provides even and controllable heat, and is an ideal source of heat and power for several industrial uses. As LPG is a colourless and odourless gas, it cannot be detected. Therefore, Ethyl Mercaptan is a liquid chemical added to LPG to provide odour for detection during LPG leakage.

2.1.2 Characteristics and Properties of LPG

LPG mainly consists of one or more of the following hydrocarbons:

Propane (C_3H_8)

Propylene (C_3H_6)

n-butane (C_4H_{10})

Iso-butane (C_4H_{10})

Butylene (C_4H_8)

Small quantities of one or more of the following hydrocarbons may also be present:

Ethane (C_2H_6)

Ethylene (C_2H_6)

Pentane (C_5H_{12})

Pentene (C_5H_{10})

The required specifications and composition of the hydrocarbons for LPG sold in India is specified in Indian Standards IS 4576 - Liquefied Petroleum Gases. This standard prescribes the requirements and methods of sampling and test for all types of LPG commercially marked for household, commercial, industrial applications and pipeline transmission excluding automotive use.

2.1.2.1 Properties of LPG

Flammable

LPG forms a flammable mixture with air in the range of 2% to 10%.

It can, therefore, lead to a fire or an explosion hazard if stored or used incorrectly.

High Density

LPG is approximately twice as heavy as air when in gas form.

It normally settles down at ground level or low lying places.

Colourless

LPG is colourless, both in liquid and vapour phase.

Rapid Vapourisation

LPG, in liquid form, when released from a container or a cylinder vapourises immediately and expands 270 times which can lead to an explosion.

Hence a vapour space of approximately 15% is left in the LPG cylinder.

Odourless

LPG in general is odourless and cannot be detected by human senses.

Hence an odourising substance - Ethyl Mercaptan is added to LPG to provide odour for detection during leaks.

Fig. 2.1.1. Properties of LPG

Boiling Point:

The temperature at which the vapour pressure of a liquid becomes equal to the external pressure is called boiling point. The normal boiling point is the temperature at which the vapour pressure reaches 760 mm of mercury or 1 atmosphere.

Hydrocarbon Gas	Boiling Point
Propane	– 42^{0}C
Butane	– 20^{0}C
LPG	sub-zero

2.1.3 How is LPG Filled in Cylinders?

LPG cylinders are produced as per Bureau of Indian Standards (BIS) 3196 by manufacturers approved by the Chief Controller of Explosives, Nagpur (CCOE). These manufacturers have a BIS license. Every new LPG cylinder is checked at various manufacturing stages and marked by BIS after various tests carried out as per the BIS codes and Gas Cylinder Rules, 2004. Thereafter, each LPG cylinder is checked at the LPG bottling Plants. Only the LPG cylinders which meet the standards, as specified in the Gas Cylinder Rules, are filled, checked and sent to the distributors for delivery to the customers.

Procedure of filling LPG in cylinders:

1. Empty cylinders received in the bottling plant for filling are initially checked for any damage or repair.
2. Once the cylinder passes this stage, cylinders are washed and dried to remove dirt and loose particles. Washing is done in capped condition to avoid damage to valves.
3. The dried cylinders are then sent for purging. Purging removes unwanted gas or liquid from the cylinder.

4. Purging is done for new cylinders, hot repaired cylinders and retested cylinders. Air is removed from the cylinders up to 0.35 kg/cm^2 of vacuum.
5. Cylinders are then transferred to a carousel for filling after punching the tare weight and cylinder type.
6. The filling process is automated. On filling up the desired weight, the filling gun gets disconnected.
7. Filled Cylinders undergo a weight check to ensure the cylinders are filled with the correct quantity.

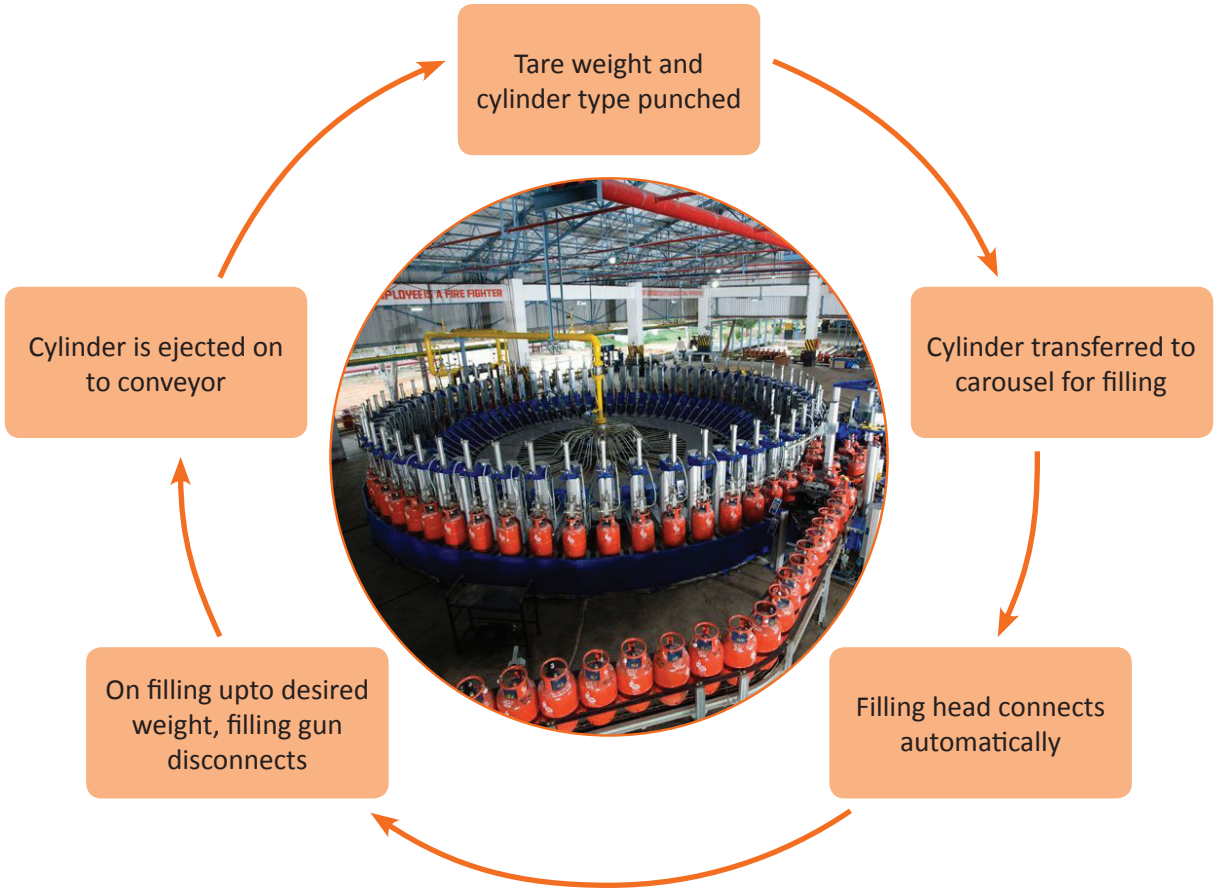


Fig. 2.1.2. Procedure of filling LPG in cylinders

2.1.4 Uses of LPG

The uses of LPG as a fuel are as follows:

Household

It is used for cooking and heating water at home.

Fig. 2.1.3. LPG use at home for cooking

Vehicles

It can be used to power vehicles such as cars, vans, etc.

Fig. 2.1.4. LPG use in vehicle

Industrial

It is used for heat treatment in industries such as metal cutting and forging, etc. Other areas of application include construction, textile, paper, ceramics, etc.

Fig. 2.1.5. LPG use at construction site

Commercial

It is used for cooking in commercial spaces such as hotels and restaurants. It is also used for heating water, lighting, and air conditioning. Other areas of application include agriculture, horticulture, etc.

Fig. 2.1.6. LPG use in restaurants

2.1.5 Types of LPG Cylinders

LPG cylinders are sold and used in India in various sizes and capacities.

Fig. 2.1.7. LPG cylinders sizes and capacities

There are two types of material used to produce cylinders. They are as follows:

Steel Cylinders

Steel cylinders are considered traditional as steel has been used since the inception of LPG storage. They are prone to corrosion.

Fig. 2.1.8. Steel Cylinder

Composite Cylinders

Composite cylinders are a new generation of cylinders and have come into use in recent times. They are lightweight, non-explosive, and non-corrosive. Composites are costlier than steel.

Fig. 2.1.9. Composite Cylinder

2.1.5.1 Parts of a Cylinder

The body of LPG cylinder can be divided in to three main parts, namely the neck portion called collar shroud, the main body (pressure part) and the foot ring.

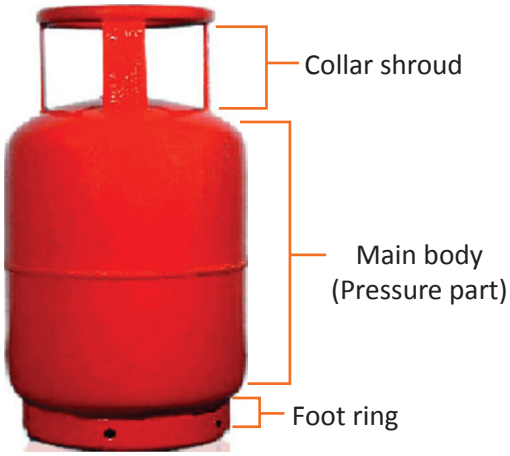


Fig. 2.1.10. Parts of a cylinder

2.1.6 LPG Supply Chain

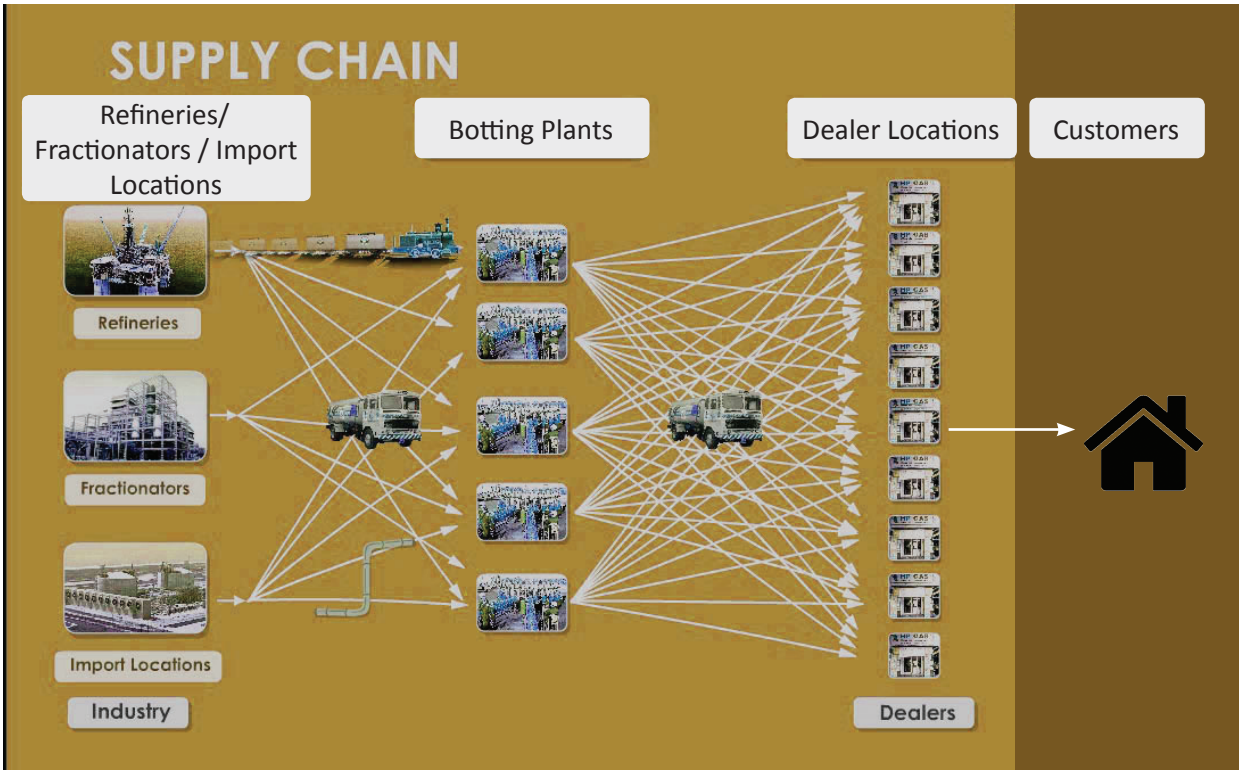


Fig. 2.1.11. LPG supply chain

LPG Distributors:

LPG distributorships are appointed by Public Sector Oil Marketing Companies (OMCs) and are governed by the terms and conditions of the agreement entered into between the OMCs and the Distributors. The LPG distributors are responsible to sell a product of the correct quality and quantity and provide excellent customer service.

Domestic Customer:

The customers who used LPG at home.

Organisation chart:

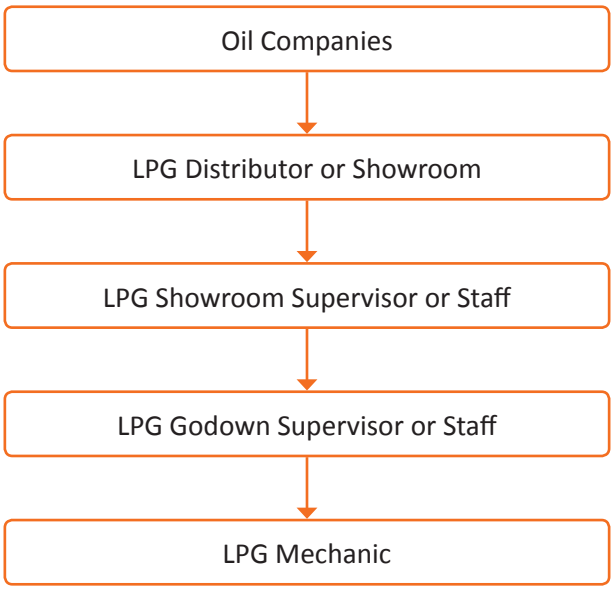


Fig. 2.1.12. Organisation chart

2.1.6.1 Standard LPG Cylinder Equipment

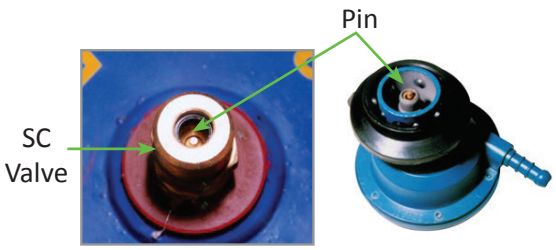


Fig. 2.1.13. Cylinder valve

Self-closing valve

- A device that regulates, directs or controls the flow of gas by opening, closing or partially obstructing various passageways
- Ensures that the cylinder with a self-closing valve should always meet BIS standard

Pressure regulator

- It helps to regulate the pressure of LPG in cylinders.
- Uses a pressure regulator of appropriate type, which matches the cylinder self-closing valve
- It should always meet ISI standard.

Fig. 2.1.14. Pressure regulator

Fig. 2.1.15. 'O' ring

'O' ring

- It is designed to be seated in a groove
- It is compressed during assembly between two or more parts, creating a seal at the interface.

Safety cap

- It helps to prevent dust from getting inside the valve.
- It is used to prevent damage to the valve.
- It also helps in preventing the spread of gas in case of a pin-leak.

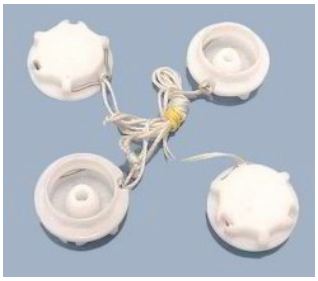


Fig. 2.1.16. Safety cap

Fig. 2.1.17. Suraksha LPG hose

Suraksha LPG hose

- This leak-proof tube is a connector between the cylinder and the gas stove.
- It helps to supply LPG from the cylinder to the gas stove.
- Always use ISI marked suraksha hose.
- The Suraksha LPG hose is produced by manufacturers who are approved by LERC and BIS, according to IS - 9573: 1998 Type

Features of Suraksha LPG Hose

The hose is manufactured with strict quality control standards that cover raw materials, processing and the finished product. The key features are as follows:

- The hose is built using three layers, with the inner and outer layer made of high quality rubber. The middle layer is made using interwoven copper or brass coated high carbon steel wire mesh that cuts down any deficit in the rubber tube.
- The hose is crack-proof and cannot be harmed by rodents on account of the interwoven steel wire mesh.
- The outer layer of the hose can withstand damage from fire, weather and abrasion.
- Each hose contains details such as batch number, month/year of manufacture, and expiry date (month/year).
- The hoses are packed and sold in pouches which carry details such as manufacturer, MRP, length, instruction card and safety tips.

Gas Stove

- Today, gas stoves use two basic types of ignition sources i.e. standing pilot and electric.
- A stove with a standing pilot has a small, continuously burning gas flame under the cooktop.
- Green Label LPG stoves save fuel and possess a thermal efficiency of 68% and above. Other LPG stoves possess a thermal efficiency of 64%. Other advantages are as follows:
  - They are manufactured with strict quality control checks.
  - Authorities at BIS certify each stove and provide a serial number for each unit.
  - Consumers will receive a BIS certificate along with the stove, which will be packaged according to specifications.

Fig. 2.1.18. Gas stove

UNIT 2.2: Pre-installation Activities

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the pre-installation activities at the distributor's showroom/godown
2. Describe the pre-installation activities at the customer premises
3. Identify the required tools and equipment required for LPG installation

2.2.1 Pre-Installation Activities

The LPG Mechanic is responsible for installing new LPG cylinders at customer premises. He is also responsible for pre-installing checks at the LPG distributor showroom. While installing the new filled LPG cylinder at the customer premises, the LPG Mechanic needs to perform the following pre-installation activities.

- He must first visit the LPG distributor showroom to collect the basic documents as per the day's schedule and plan of installation. The documents include:
  - new customer details with address and contact number.
- He needs to wear complete uniform and carry an ID card provided by LPG distributor during working hours.
- He should carry a complete set of tools (preferably in a bag).
- He needs to also carry the printed documents with digital payment devices (if any).
  - The digital payment devices may include point of sale (POS) machines or mobile devices.
- If the house is found locked, the tear-off slip is to be stuck or displayed with 'house locked' intimation at the main door of the customer.
- Before the installation, the LPG Mechanic should inspect the place or kitchen where the LPG cylinder is installed as follows:
  - Ensure that the walls and roof of the kitchen are not made up of any flammable material.
  - Ensure that the kitchen or room should have at least one window and one door.
  - Ensure that the appliance is installed in well-ventilated area so that the leakage of gas is removed away by natural draft.
  - Ensure that there are no other flammable items (kerosene stove, open fire chullas, and heaters) in the kitchen other than the gas cylinder.
  - Ensure that the hotplate has a proper ISI mark.
  - Check the kitchen platform; ensure that it has a proper space for the cylinder which will be kept in a vertical position.
- Before the installation, the LPG Mechanic should inspect the appliance where the LPG cylinder is installed as follows:
  - Ensure that the appliance should be placed on the platform approximately 75 cm high from the floor level
  - If there is no cooking platform at customer premises, ensure that the customer is using 'extension piece', which is used as an appliance inlet connection for connecting the flexible suraksha hose
  - Ensure that the gas stoves or hot plates are installed above the cylinder level

2.2.2 Tools and Equipment Used in Installation of LPG Cylinders

The LPG Mechanic needs the following tools and equipment for installing or replacing LPG equipment at the customer premises. The tool kit should comprise of:

1. 'O'- ring remover/inserter

   This tool is used to replace 'o'-ring from self-closing valve of LPG cylinder.

Fig. 2.2.1. 'O'- ring remover/inserter

2. Magnetic type slot screw driver and fastener

   The Screw drivers are used to:

   - Tighten screws
   - Loosen screws (open screws)

   Screwdrivers tips come in many different shapes and sizes. The tips can be fixed to the metal blade and used as per the cuts on screw heads.

Fig. 2.2.2. Screw driver and fastener

3. Needle Nose pliers

   Used to hold wires in place

   - Help to grip nuts
   - Used to loosen and tighten terminals while fixing wires

Fig. 2.2.3. Needle Nose pliers

4. Hack Saw

   The hack saw is a type of saw with a long blade and is a very useful tool. It comes in various lengths. It is used to cut:

   - Metal
   - Plastic
   - PVC

Fig. 2.2.4. Hack Saw

5. Combination Plier
   - Used to cut and twist wires
   - Also called as join pliers

Fig. 2.2.5. Combination Plier

6. Spanners

   Spanners are used to tighten and loosen bolts, screws and nuts, etc. They come in various sizes depending on the type of work. E.g. Ring spanner, double-ended spanner, torque wrenches, slide wrenches, etc.

Fig. 2.2.6. Spanners

7. 'O' ring

It is installed in the cylinder. It is used to protect the self-closing valve pin.

Fig. 2.2.7. 'O' ring

8. Leak detectors

They are used to detect leakage of gas.

Fig. 2.2.8. Leak detectors

9. Gas knob

The flame or hot gases released from the gas burners can be regulated using the ON/OFF knob installed on the gas stove.

Fig. 2.2.9. Gas knob

10. Gas burner

A gas burners mounted on Gas stove

Fig. 2.2.10. Gas burner

Maintenance of Tools

To keep the tools and equipment in work condition for a long time, taking care of maintenance of tools and equipment is necessary. Few maintenance tips are:

- Check tools handles for splinters, breaks and cracks. Also, make sure that metal parts show no signs of corrosion or rust. Repair or replace any tools that show signs of damage.
- If the metal head separates from the handle while in use, this could result in a dangerous projectile. To prevent this hazard, just grind off the metal edges with a powered grinder on a regular basis.
- Periodically check the tools and equipment calibration and report any errors to the maintenance teams for rectification.
- Prepare periodic log sheets of equipment maintenance dates, maintenance schedules and maintenance activity
- Tools which are used during the LPG installation activities should be placed in safe and clean conditions on completion of work so that they can be easily accessed and used by an authorized person whenever required.
- This also prevents tool from being cut or damaged by insects/animals and also from rusting.

UNIT 2.3: Installation Activities

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the LPG installation activities at the customer premises
2. Explain the procedure for a new domestic LPG connection
3. Describe the post-installation activities performed at the customer premises

2.3.1 Replace LPG Cylinder at Customer Premises

LPG Mechanic must perform the following pre-installation checks before replacing the cylinders in the customer's kitchen:

- Greet the customer
- Ask the customer to check the seal on the cylinder
- Open the seal and remove the safety cap in the presence of the customer

Fig 2.3.1 Intact seal of the cylinder

Fig 2.3.2 Open the safety cap

- Before fixing the pressure regulator, check if there is any leakage in the valve using the leak detector.
- In case of any leakage, do not connect or install the cylinder. Mark the cylinder as faulty and send it back to the showroom or godown.
- In case of faulty O-ring replace it with the help of 'O'-ring remover tool.

Connect a filled LPG Cylinder

An LPG Mechanic is responsible to educate the customer on safe LPG installation. He has to provide following safety tips to the customers while connecting the filled LPG cylinder

- Ensure that there are no other flammable items (kerosene stove, open fire chullas, lamp and heaters) in the kitchen.

Fig 2.3.3 Kerosene stove and lamp

- Switch OFF the knob of the gas stove or hotplate.
- Switch OFF the pressure regulator of the used cylinder.
- Disconnect the used cylinder.
- Remove the safety cap by pulling the cord and lifting the cap off the valve.
- Hold the regulator and pull the bush up.
- Mount the regulator vertically on the valve, press it down gently and rotate.
- Release the bush. You will hear a click sound if the regulator is fixed properly. The pressure regulator is in the locked position.
- Now, turn ON the switch knob of the pressure regulator in the anti-clockwise direction. This will open the valve of the LPG cylinder and allow the gas to pass through the suraksha hose to the gas stove.
- Demonstrate the soundness of the cylinder by testing the connection.

Fig 2.3.4 Switch ON the pressure regulator

Fig 2.3.5 Check the cylinder connection

2.3.2 Installation Procedure for a New Connection

It is the responsibility of the LPG Mechanic to install LPG cylinders for new connections. The customer must not install or connect the new connection on their own.

The new connection or installation of the cylinders is similar to replacing refilled cylinders. The LPG Mechanic needs to follow the standard operating procedure (SOP) for the installation of a new connection.

- During installation of new connection, he should ensure that there are no naked flames from kerosene stoves, heaters or any potential heat sources existing in the kitchen.
- He should perform the pre-delivery checks as follows:
  - Remove the safety cap by pulling the cord and lifting the cap off the valve.
  - Using a leak detector to check if there is any leakage of gas from the valve or 'O' ring.
  - In case the cylinder is faulty, put the safety cap on the cylinder valve and keep the cylinder aside.
- Install the gas stove or hot plate if the new connection comes along with the option.
  - Check the ISI mark on the gas stove or hot plate.
  - Open the new gas stove or hot plate packaging in the presence of the customer.
  - Check for any visual damages before assembling the gas stove or hot plate.
  - Show the warranty certificate to the customer.
  - Check if the customer requires to change the position of the nozzle inlet and accordingly reverse the fittings.
  - Assemble the gas stove or the hot plate by fixing the knob, leg stands and other items.
  - Once the gas stove is assembled, check for any loose fittings and tighten them properly.

Fig 2.3.6. ISI mark

- Inform the customer that the hot plate should always be placed on a platform (made of nonflammable
- material) above the cylinder level.
- Check the suraksha hose and show the validity and other markings of the suraksha hose to the customer. Record the validity of the hose in the Domestic Gas Consumer Card (DGCC) book.
- Attach one end of the suraksha hose to the gas stove or hotplate and the other end to the pressure regulator.
- Ensure that the suraksha hose does not get damaged, turned or twisted while fixing.
- The LPG cylinder should be placed in an upright/vertical position at the ground level.
- Ensure that the LPG cylinder should be placed in a well-ventilated area.

Fig 2.3.7 Ideal installation

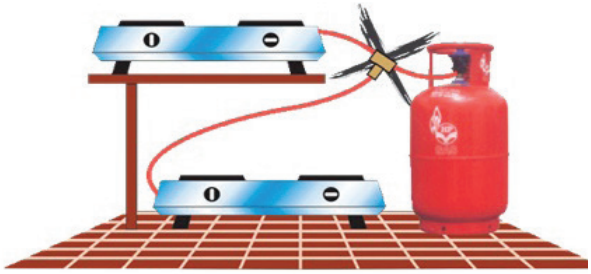


Fig 2.3.8 In-correct installation

Connect the pressure regulator to the self-closing valve of the cylinder

- Ensure the knob of the regulator is in the 'OFF' position while connecting.
- Hold the regulator and pull the bush up.
- Place the regulator vertically on the valve, press it down gently and rotate.
- Release the bush. You will hear a click sound if the regulator is fixed properly. The pressure regulator is in the locked position.
- Now, turn ON the switch knob of the pressure regulator in the anti-clockwise direction. This will open the valve of the LPG cylinder and allow the gas to pass through the suraksha hose to the gas stove.

Fig. 2.3.9. Fit the pressure regulator on cylinder valve

- Demonstrate the soundness of the cylinder by testing the connection. Hold a lighted matchstick near the gas stove burner head. Turn the knob of the gas stove burner to ON position. The flame from the burner is ignited.
- Educate the customer regarding safety precautions while connecting or disconnecting the cylinder for the next use.
- Ask the customer to use emergency contact numbers in case of any LPG leakages emergency.

Fig. 2.3.10. Emergency helpline number

UNIT 2.4: Post-Installation Activities

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the post-installation activities performed at the customer premises
2. State the procedure for billing

2.4.1 Post-Installation Activities

After installing or refilling the LPG cylinder at the customer premises, an LPG Mechanic must perform the following post-delivery activities:

Billing Procedure

Ask the customer about the mode of transaction and present the cash memo to the customer.

- Cash Transaction
  - Collect the exact amount from the customer
  - Update the serial number and date of installation in the customer's DGCC book
  - Obtain the signature on the counter foil
  - Return the counter foil at the distributor's showroom

Fig 2.4.1 Cash Transaction

- Online Transaction
  - Use the mobile application for online payment.
  - Check for the authenticity of the transaction with the OTP (one time password).
  - Record the customer's payment in the mobile application.
  - Advise the customer to use the online mode for booking a cylinder

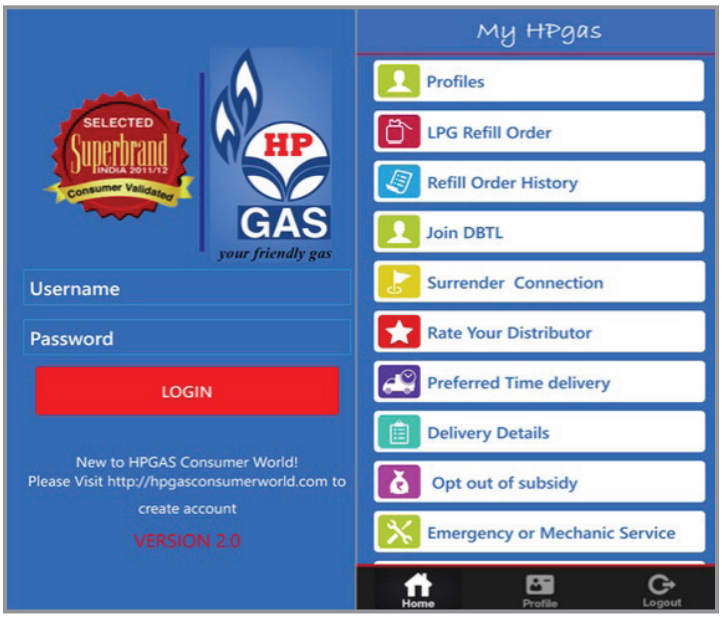


Fig 2.4.2 e - Transaction

LPG Schemes

- Advise the customer for mandatory inspection of LPG installation once in 2 years by authorised personnel only.
- Inform the customer about the prevalent schemes, such as 'Ujwala', 'Give-it-Up'.
- In case the customer is using single cylinder, suggest the customer to apply for a second cylinder as a backup.
- Inform the customer about the use of the surksha hose which is safe and has a five year warranty.

Fig 2.4.3 Ujwala scheme

Educate the customer regarding safety precautions

- In case of LPG leakage, advise the customer to switch OFF the regulator and open the windows and doors immediately.
- In case of LPG leakage, advise the customer not to switch ON/OFF any electrical equipment or appliances as it may cause a spark.
- Ask the customer to keep the regulator switch in the OFF position when the cylinder is not in use.
- Ask the customer to always cover the valve of the cylinder with the safety cap for the used cylinder.

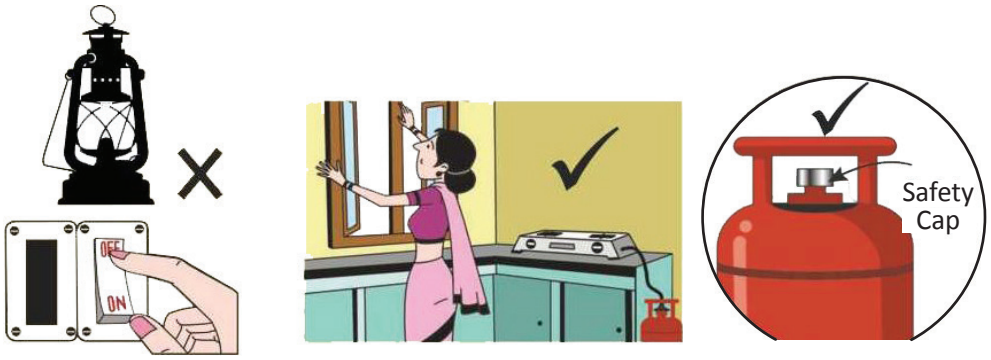


Fig 2.4.4 Safety measures

- Advise the customer to not hand over the empty or faulty cylinder to any unauthorised personnel.

Customer feedback

- Ask for a feedback from the customer, which has to be promptly conveyed to the showroom staff.

Educate the Customer regarding Conservation of Fuel

The Indian government is promoting the conservation of LPG (cooking fuel). LPG is a clean fuel and its use will improve the lifestyle of poor households. However, the country is importing large amounts of the fuel to meet the requirements of its citizens. This is where fuel conservation plays a crucial role. The following initiative outlines the need for fuel conservation:

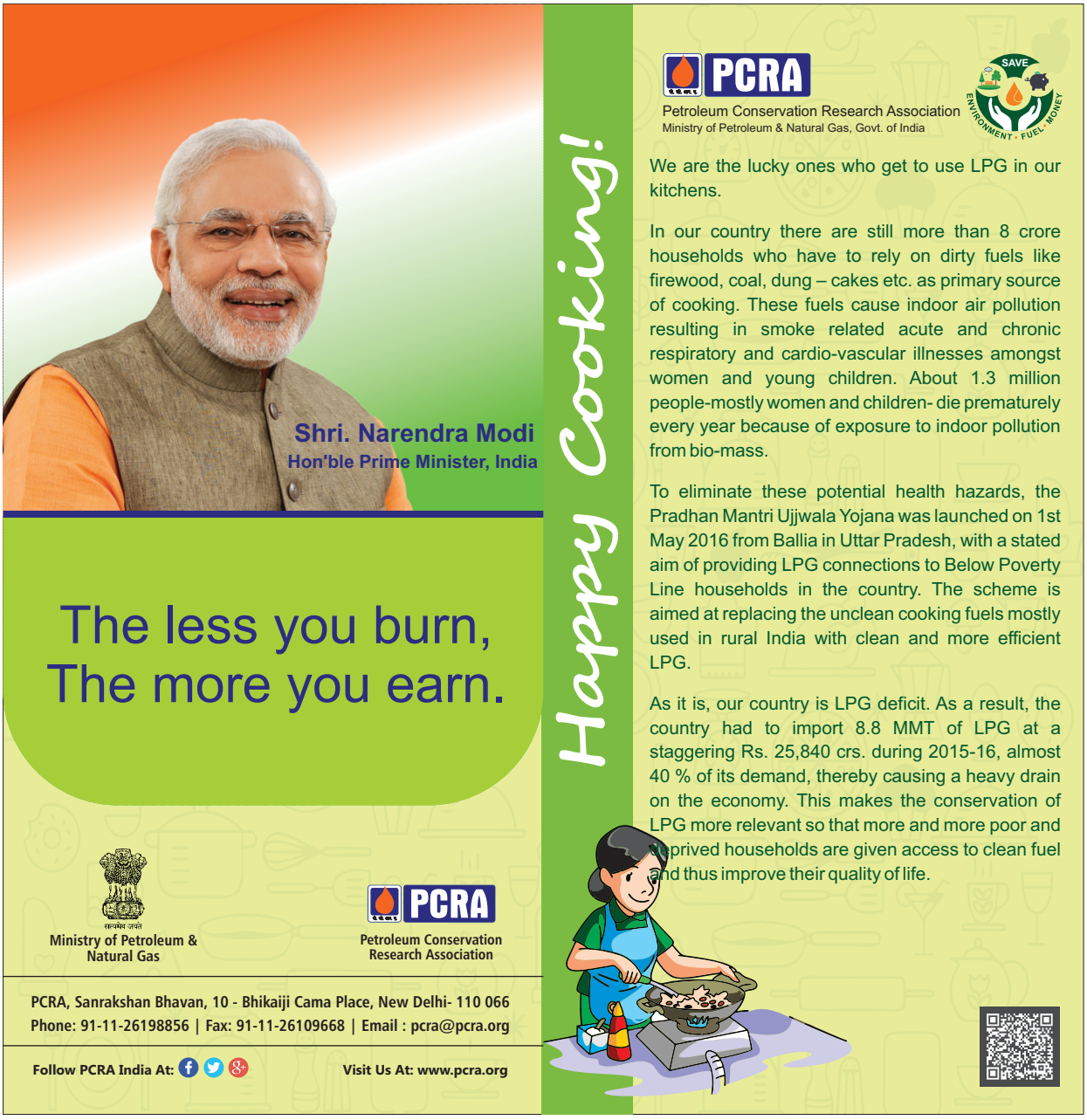


Fig 2.4.5 PCRA initiative for conservation of LPG

As an LPG Mechanic, you can educate the customer on fuel conservation. The following tips have to be communicated to the customer:

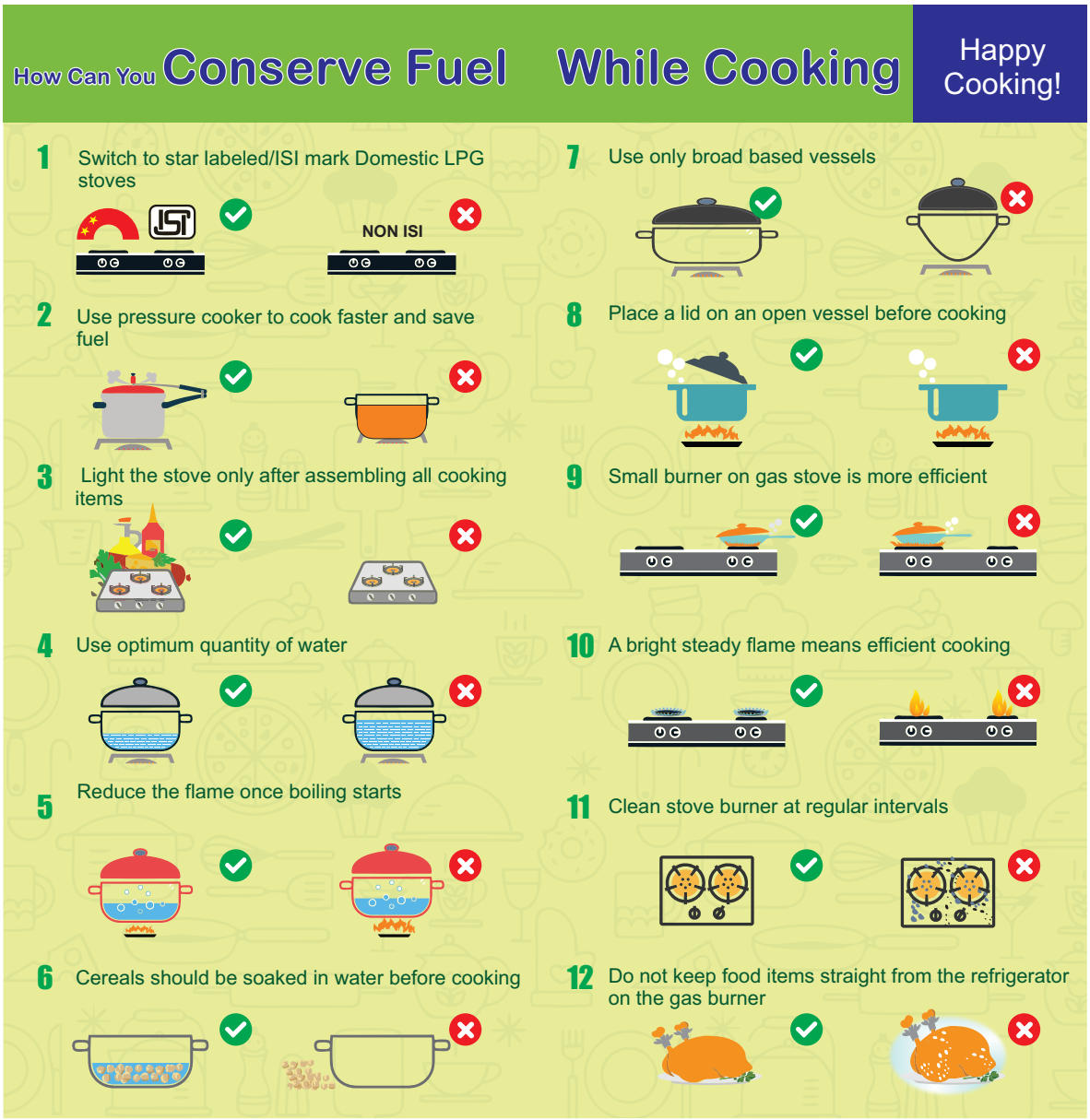


Fig 2.4.6 PCRA initiative for conservation of LPG

UNIT 2.5: Creating Customer Awareness on Safe Usage of LPG

Unit Objectives

At the end of this unit, you will be able to:

1. List the hazards that occur when dealing with LPG
2. Explain safety measures while dealing with LPG
3. Describe the safety practices regarding LPG cylinder usage

2.5.1 Hazards While Dealing with LPG

We have learned that LPG has wide domestic use. It is one of the most cost-effective and environment-friendly fuel. However, it may prove dangerous if not handled properly. Incorrect use and improper handling of LPG can result in explosions, fires, loss of property and most importantly, loss of lives.

Following are the causes that can lead to a physical and chemical hazard if the LPG cylinders are not handled properly:

- Fire or explosion from the uncontrolled release of LPG near ignition source
- LPG leakage from the LPG cylinder valve
- LPG cylinder falls on the ground
- Improper stacking of LPG cylinders in the vehicle
- Tampering the LPG equipment and attempting to clean it with a steel pin
- Replacing or installing cylinders by an unauthorised person
- LPG cylinder is placed in an unventilated area
- Use of oil or similar lubricant on the valves or other fittings of the cylinder
- By soaking the cooking appliance body in water, the grease/lubricant in the gas knob may get washed away, which might cause a gas leak.

Fig. 2.5.1. LPG hazards

2.5.2 Safety Measures While Dealing with LPG

LPG is commonly used in many households and industries as it is economical and eco-friendly in nature. However, improper use and handling of LPG can result in blasts, fire hazards, property damage and most vitally, fatal injuries or death. Therefore, LPG has to be used in accordance with certain safety measures.

2.5.2.1 Safety Measures for LPG Installation

The following measures cover general safety requirements to be observed during installation and operation of domestic appliances that use LPG in cylinders as a fuel:

- Check the weight of the cylinder and ensure it is at an optimum level.
- Check the contents on the other equipment such as pressure regulator, accurate self-closing valve, flexible suraksha hose, safety cap along with nylon thread, etc.
- Check the next due date of re-testing on the LPG cylinder. If it is past its due date, do not accept the cylinder.

Fig. 2.5.2. Cylinder inspection

- The LPG cylinder must always be installed or placed in an upright or vertical position and at the floor level.
- The LPG cylinder should be installed or placed in well-ventilated area so that a gas leak, if any, will be swept away by natural draft.
- Ensure that the LPG cylinder is placed or kept on its foot ring, which is welded at the bottom. Do not use any other kind of stand for the cylinder.

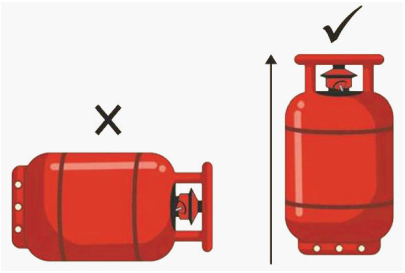


Fig. 2.5.3. Install in upright position

Fig. 2.5.4. Install cylinder in ventilated area

- The LPG cylinder contains highly flammable gases. Therefore, it should not be stored or placed near sources of ignition.
- Avoid using oil or grease while installing the LPG cylinder at the customer's premises.
- The LPG cylinder should be installed carefully so that the suraksha hose is not disturbed due to the movement of the operator.

Fig. 2.5.5. Warning symbol of highly flammable LPG

Fig. 2.5.6. Kerosene stove and lamp

- Cylinders should not be installed under conditions that will cause them to corrode.
- After installing the new connection or replacing the empty gas cylinder, check the joint between the suraksha hose and pressure regulator with soap solution against LPG leakage.

Fig. 2.5.7. Check LPG leakage with soap solution

2.5.2.2 Safety Measures for LPG Leakage, Emergency or Fire

The following safety measures can be followed to prevent a fire hazard that occurs due to LPG leakage:

- If you smell an LPG leak in the premises, switch OFF the gas stove or hot plate knob and turn off the regulator.
- Do not check the leakage with naked fire or lighted matchstick.
- Ensure that all flames are extinguished in case of a leak. Do not switch ON or OFF any electrical equipment to avoid any electric spark or other sources of fire or ignition.
- Open the door(s) and window(s) for ventilation.
- Do not attempt to repair or tamper with the cylinder's self-closing valve, pressure regulator, suraksha hose or burner.
- In case of an uncontrolled LPG leakage, safely detach the pressure regulator from the cylinder immediately. Fit the safety cap on the SC valve of the cylinder.
- Inform the LPG supplier for handling the emergency using the LPG toll free helpline number.

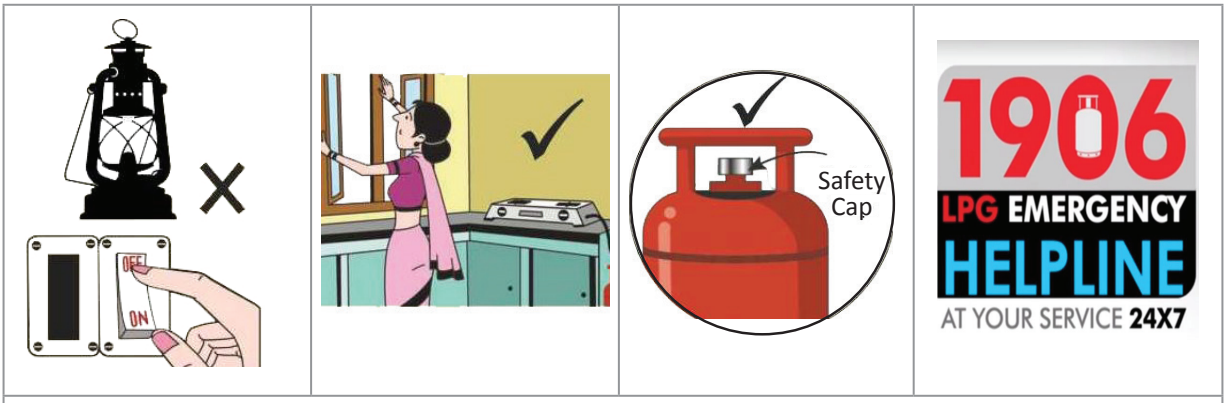


Fig. 2.5.8. Safety measures for LPG leakage

In case of LPG-induced fire:

- Use a wet cloth for extinguishing small fire.
- Turn off the regulator.
- Carry a portable fire extinguisher.

2.5.3 Safety Practices Regarding LPG Cylinder Usage

At the distributor's showroom or godown

The LPG Mechanic needs to know the following safety practices that can be used at the distributor's showroom or godown:

- Always check the next due date of testing before delivering the LPG cylinder.
- Ensure that the cylinder does not have any defects.
- Use proper Personal Protective Equipment (PPE) when lifting the filled LPG cylinder. This may include safety shoes, etc.

Fig. 2.5.9. Safety shoes

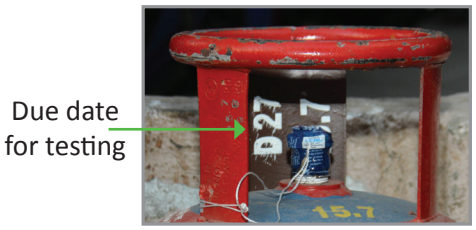


Fig. 2.5.10. Due date for testing

- Do not roll the cylinder on the ground. Use proper handling device such as a cylinder trolley.
- Ensure that the cylinder is at its optimum weight by using a weighing machine.
- The cylinder should be stacked in an upright or vertical position in the LPG vehicle.
- Ensure that the LPG vehicle has at least one fire extinguisher for fire safety.

Fig. 2.5.11. LPG delivery vehicle

Fig. 2.5.12. Fire extinguisher

At the customer's premises

The LPG Mechanic should be able to inform the customer about the following safety practices to be followed:

Safety Tips for Changing Cylinder

- Extinguish all the flames or sources of fire in the kitchen.
- Avoid switching ON or OFF any electric appliance.
- Keep the door(s) and window(s) open.
- Switch OFF the pressure regulator knob.

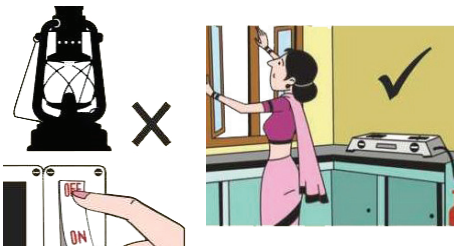


Fig. 2.5.13. Safety tips for changing cylinder

- Ensure you hear a click sound when you fix the regulator.

Fig. 2.5.14. Fit the pressure regulator on cylinder valve

Safety Tips to Light the LPG Burner

- Do not apply unnecessary force to turn the gas stove knob ON.
- Always light the matchstick before turning on the gas stove.
- Always turn OFF the stove knob when not in use.

Cleaning the Appliance

In addition to the other safety practices, an LPG Mechanic should be able to inform the consumer on the following safety practices for cleaning the appliance:

- Switch the appliance taps and pressure regulator knob OFF and wait till the surface of the appliance is cool.
- Do not attempt to clean a hot surface with a wet cloth; the surface finish may crack.
- Clean the surface of the appliance with a dry cloth.
- Clean the surface with a moist cloth to remove stains from cooking.
- To clean the burner head of the stove or hot plate, remove it and dip it in a warm solution of soap and water and use a toothpick to clean the burner ports.
- Do not tamper with the gas equipment or attempt to clean it with a steel pin.
- Never soak the appliance body in water as the grease or lubricant in the gas tap may be washed away resulting in the possibility of gas leakage.

Safety Check for Suraksha Hose

- Ensure that there are no cracks on the suraksha hose.

2.5.3.1 Safety Tips While Dealing with Cylinders

- Keep the gas stove above the cylinder on a stable surface.
- Do not keep the gas stove on the floor for cooking purposes. The area used for cooking has to be elevated at a level above the cylinder.
- Always be present near the stove while it is ON.

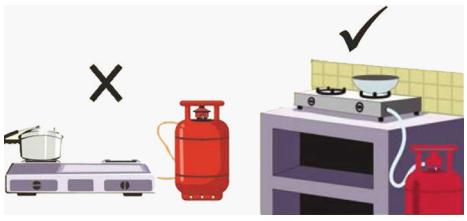


Fig. 2.5.15. Safety tips for LPG cylinder

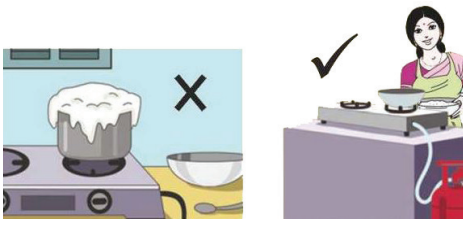


Fig. 2.5.16. Safety tips for LPG cylinder

- Keep the regulator switched OFF when the cylinder is not in use.

- Do not place the gas stove where the wind is strong.
- Always store the cylinder in a vertical position at a stable level in a ventilated area.
- Never keep the LPG cylinder in a closed cabinet.
- Never keep the LPG cylinder near source of ignition such as an induction cooker, lit lamp, etc.
- Turn the regulator knob OFF once you are done with cooking.
- Store the empty cylinders in a cool and airy spot.
- Ensure that the safety cap is placed on the valve of the cylinder.

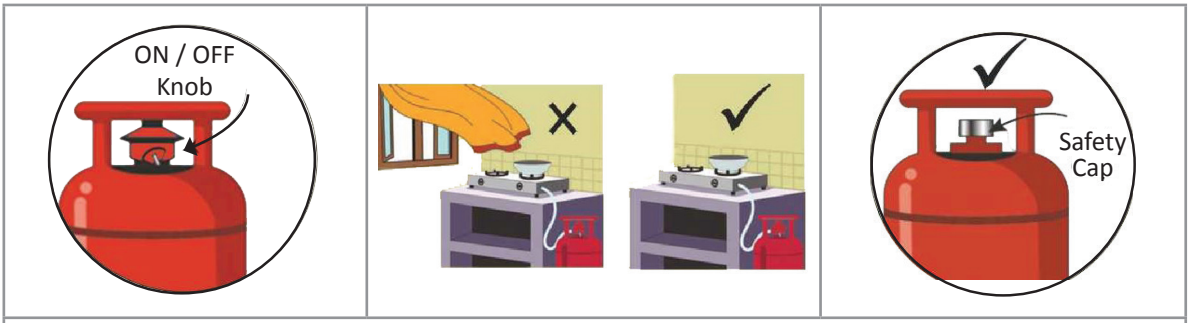


Fig. 2.5.17. Safety tips

- Keep the match stick lit/ lighter ready and then turn the knob ON.
- Change the suraksha hose after five years.
- Do not smoke near the cylinder or in the kitchen.
- Install an exhaust fan above the gas stove to dispense gas leaks.

UNIT 2.6: Emergency Procedures in Case of a Fire

Unit Objectives

At the end of this unit, you will be able to:

1. State the Fire Triangle
2. List the different types of fire
3. State the different types of fire extinguishers and their uses
4. Describe the DCP type fire extinguisher and its uses
5. Explain the procedure to use fire extinguisher

2.6.1. Fire Triangle

LPG is a highly flammable gas. Improper use and handling of LPG can cause a blast or any fire hazard that could harm both you and the customer.

To ensure you are prepared for any fires that may arise, always keep a fire extinguisher handy. Schedule routine fire extinguisher inspections to verify that they function properly.

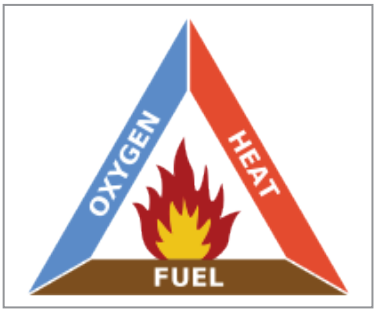


Fig. 2.6.1. Fire triangle

The Fire Triangle is a diagram used most often to explain the components needed to start a fire. The sides of the triangle show the necessary ingredients for a fire: heat, fuel and oxygen.

- Heat: The burning source
- Fuel: Solid, liquid, or gas that burns
- Oxygen: It supports the chemical process where fuel reacts with oxygen to produce fire.

If we take any one of these components away, the fire will get extinguished.

2.6.2. Types of Fire

Based on the materials involved, fires have been classified into 4 different types:

Fire Class Type	Description
Class A	Solids that are not metals – wood, paper, cloth, trash, plastics
Class B	Flammable liquids – petrol, oil, kerosene, alcohol, grease, acetone, solvents and paint
Class C	Flammable gas and Live Electrical Equipment— LPG, Natural Gas, Methane, etc. and Electrical Equipment – overloaded switchboards, faulty equipment and damaged wires
Class D	Metals—potassium, sodium, aluminium, magnesium

Note: Class B and C fire types are vital information for LPG Mechanic, as they can happen at LPG godown, LPG showroom and customer premises.

Choosing the right extinguisher:

Choosing the right extinguisher can prevent property damage and save lives				
Types of Fire Extinguishers → / Types of Fire ↓	Water	Foam	CO_2	Dry Chemical
A — Class A: Paper, Wood, Plastic Fabric, Rubber, Trash	✓	✓	✗	✓
B — Class B: Oil, Petrol, Some Paints and Solvents	✗	✓	✓	✓
C — Class C: Electrical Equipment, Appliances, Computers	✗	✗	✓	✓

Fig. 2.6.2. Types of fire and fire extinguisher

2.6.3 Types of Fire Extinguishers and their Uses

Different types of fire extinguishers are designed to fight different classes of fire. Each type has a label telling which type of fire it can extinguish. The five most common types of fire extinguishers are:

1. Sand Buckets
2. Water Spray
3. Mechanical Foam Type
4. Carbon dioxide (CO_2)
5. Dry Chemical Powder (DCP)

Types of Fire Extinguishers	Uses
	• These are used to extinguish Class B fires. • Sand is thrown on the fire. • Sand absorbs the fuel generating fire.

Fig. 2.6.3. Sand buckets

Types of Fire Extinguishers	Uses
 *Fig. 2.6.4. Water spray extinguisher*	• These are used to extinguish Class A fires. • The heat of vaporisation of water is much higher. • It reduces the volume of oxygen in the fire.
 *Fig. 2.6.5. Mechanical foam type*	• These are used to fight Class A and B fires. • Due to its fast spreading coverage action that takes over the fuel surface, it results in fast extinguishment.
 *Fig. 2.6.6. Carbon dioxide*	• These are used to fight Class B and C fires. • Carbon dioxide is a non-flammable gas that takes away the oxygen element of the fire. • Carbon dioxide is very cold as it comes out of the extinguisher, so it cools the fuel as well. • It is useful for offices and electrical fire.
 *Fig. 2.6.7. Dry Chemical Powder*	• These are designed for extinguishing Class A, B and C fires. • Dry chemical extinguishers put out fire by coating the fuel with a thin layer of dust. • It separates the fuel from the oxygen in the air.

Procedure to Use Fire Extinguisher

It is easy to remember how to use a fire extinguisher if you remember the **PASS** technique.

P - Pull	A - Aim	S - Squeeze	S – Sweep

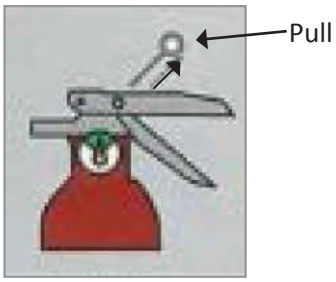
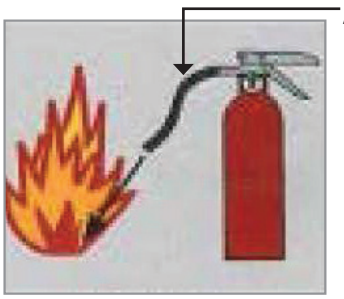
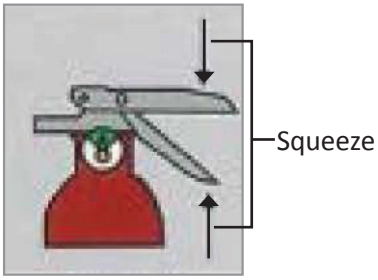
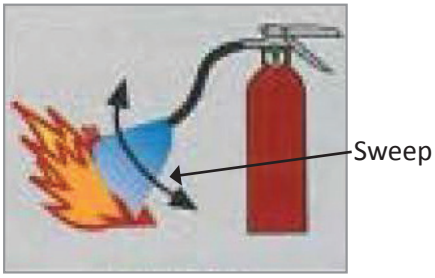
Step 1 – Pull: Pull the pin located at the top of the fire extinguisher. This will break the seal and unlock the fire extinguisher.	
	**Step 2 – Aim:** Aim low, pointing at the base of the fire. Do not aim in the opposite direction of air. Instead, aim from the direction of air. If this is not followed, there is a chance that person using the fire extinguisher can get hurt.
Step 3 – Squeeze: Squeeze the handle to release the extinguishing substance to put out the fire.	
	**Step 4 – Sweep:** Start using the extinguisher from a safe distance away, and then slowly move forward. Using a sweeping motion, sweep the extinguisher from one side to another at the base of the fire until the fire is completely out. Once the fire is out, keep an eye on the area. If the fire re-ignites, repeat the steps 2, 3 and 4.

Fig. 2.6.8. Procedure to use fire extinguishers

Note:

- Maintain a safe distance (approximately 6 to 8 feet) while using a fire extinguisher.
- Ensure that you are standing in the same direction as the air flowing (if you stand in the opposite direction you might end up as the victim of fire).
- While aiming, point to the base of fire or root of fire ignited, because when you squeeze the extinguisher, it creates an foam surface on the fire, and stops one of the factors causing the fire.

Exercise

Read the questions and tick the correct option.

1. The two types of material used to produce cylinders are _____.
   a. Steel and Composite
   b. Steel and Iron
   c. Composite and Non-Composite
   d. Composite and Iron

2. LPG is a combination of hydrocarbon gases, such as _____.
   a. methane and ethane
   b. propane and butane
   c. propane and ethane
   d. butane and methane

3. Which of the following chemical liquid is added to LPG to provide odour for detecting leakage?
   a. Ethyl Mercaptan
   b. Methyl Mercaptan
   c. Sulphuric acid
   d. Methane

4. Before fixing the LPG cylinder to the gas stove, it has to be tested using _____.
   a. leak detectors
   b. pressure regulators
   c. wrenches
   d. match stick or lighter

5. This is a printed invoice which includes the customer's address and other details.
   a. Customer's pass book
   b. Cash memo
   c. Domestic Gas Customer Card
   d. Customer register

6. The cylinder should be covered with the _____ when it is not in use.
   a. Safety cap
   b. Surkasha hose
   c. 'O' ring
   d. Pressure regulator

7. The cylinders needs to be stacked in _____ in the LPG vehicle.
   a. vertical position
   b. horizontal position
   c. diagonal position
   d. inverted position

8. Install or place the cylinder in proper a/an _____ area.
   a. unventilated
   b. ventilated
   c. enclosed
   d. airless

9. Pull the regulator in a _____ direction and place the safety cap on the cylinder.
   a. downward
   b. upward
   c. left
   d. right

10. Install a cylinder carefully so that the _____ is not disturbed due to the movement of the operator.
    a. suraksha hose
    b. pressure regulator
    c. safety cap
    d. self-closing valve

11. The LPG cylinder is always placed on its _____ which is welded at the bottom.

    a. shroud ring
    b. foot ring
    c. valve protected ring
    d. top ring

12. Select the correct safety measures that need to be followed when you smell LPG in air:

    a. Switch ON/OFF any electrical equipment
    b. Switch OFF the pressure regulator and open the windows and doors
    c. Repair or tamper with the cylinder
    d. Extinguish all flames or sources of fire
    e. Do not check the leakage with naked fire or lighted matchstick
    f. Safely detach the pressure regulator from the cylinder
    g. Never use a fire extinguisher in the kitchen
    h. Check the the connection of suraksha hose and pressure regulator with soap solution
    i. Use a LPG toll free emergency number and inform the LPG supplier

13. Match the column

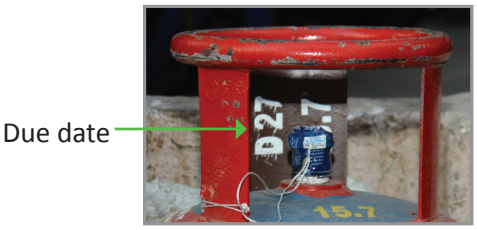
Column A	Column B
a. Class A	i. Metals- potassium, sodium, aluminium, magnesium
b. Class B	ii. Flammable gas- LPG, Natural Gas, Methane
c. Class C	iii. Flammable liquids- petrol, oil, kerosene, acetone etc.
d. Class D	iv. Solids- wood, paper, cloth, trash

Hands-on practice sessions will be conducted at the LPG Showroom/Distributors/Godown.

Tips

- What is due date for testing?

  The date on the cylinder mentions when the cylinder is due for testing. The due date is mentioned as an alphabet for indicating the quarter, followed by a two digit number for the year. For example: The date 'D 27' on the cylinder is the due date for testing during the period October to December of the year 2027.



Due date for Testing	
A	January, February, March
B	April, May, June
C	July, August, September
D	October, November, December

- Advise the customer to not use a T-joint for connecting two burners. (The T-connection is when a cylinder is supplying LPG to more than one gas stove.) This increases the chances of leakage.
- In case the gas stove or hot plate is brought by the customer, advise the customer to check the ISI mark on the gas stove.
- There are four types of Fire: 'Class A','Class B', 'Class C' and 'Class D'.
- Different types of fire extinguishers are designed to fight different classes of fire.

Notes

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=YYZZjNeTNRU

What is LPG | How LPG cylinder works

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=sqR-ls5OVNA

Pre Delivery Checks

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https://www.youtube.com/watch?v=vPMyeUeDnpg

Installation procedure of LPG gas

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How to change regulator on an Indane LPG cylinder

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https://www.youtube.com/watch?v=S8LO-95Pjg8

Important safetytips for LPG cylinders at home

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https://www.youtube.com/watch?v=HvPy9RaFJ7I

LPG Safety

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Precautions for using LPG

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LPG cylinder blast and kitchen fire- fire fighting technique

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Transforming the skill landscape

3. Attending Complaints of LPG Leakage, Allied LPG Equipment's Non-Functioning Complaints

HSSC
HYDROCARBON SECTOR
SKILL COUNCIL

Unit 3.1 - Addressing Complaints in Timely Manner

Unit 3.2 - Customer Centricity

HYC/N 3402

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Describe the process of handling complaints
2. Explain how to fulfil customer requirements
3. Explain how to achieve customer satisfaction

UNIT 3.1: Addressing Complaint in Timely Manner

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the process of handling customer complaints

3.1.1 What is a Complaint?

A customer complaint highlights a problem with the product or service. These problems or complaints need to be investigated so that the services can be improved. Attempts should be made to resolve or address each complaint in a timely manner.

Fig. 3.1.1. LPG Mechanic at customer's Residence

It is the responsibility of every LPG Mechanic to take feedback from the customer after the service. This direct feedback from the customer will always help in in improving the quality of the products or services.

3.1.2 Types of Complaints

Some of the frequent types of complaints are as follows:

- Constant smell of LPG
- Cylinder getting over faster
- Leak related complaints
- Stove burner not burning

Many of these complaints can be resolved by educating the customer over the call. This could also prevent accidents. After resolving the complaints over the call, you may visit the customer's premises to check the LPG installation.

Type of Complaints	Your Response
1. Constant Smell of LPG	a. Shut the burner taps and pressure regulator knob, to 'OFF position' b. Open the door and windows for free ventilation c. Extinguish all flames. Do not switch 'ON' or 'OFF' any electrical equipment to avoid any electric spark or such other sources of fire/ignition d. Light the burners only after the smell disappear e. Check for the source of any possible leakage in the stove, regulator, burner, etc

Type of Complaints	Your Response
2. Cylinder getting over faster	a. This depends on customer usage; check the customer's monthly usage and consumption habits. b. Suggests conservation of LPG, and educate about conservation methods
3. Leak related complaints	a. Shut the burner taps and pressure regulator knob, to 'OFF position'. b. Open the door and windows for free ventilation. c. Extinguish all flames. Do not switch 'ON' or 'OFF' any electrical equipment to avoid any electric spark or such other sources of fire/ignition. d. Light the burners only after the smell disappear. e. In case of persistent/heavy leakage, detach the pressure regulator from the cylinder valve; fit the 'Safety Cap' on the valve outlet, and remove the cylinder (without tilting it) to balcony or open space where it is least dangerous to life and property and away from any source of ignition. Keep away to avoid starvation of Oxygen due to breathing the gas concentrated air.
4. Stove burner not burning	a. Check if the burners are switched OFF and allow the stove to cool down completely before cleaning. b. Check for any possible damages in the stove burner. Replace if necessary. c. Clean the burner using a toothpick and light burner to check the flame.

3.1.3 Domestic Gas Stove for use with LPG:

What is a Gas Stove?

A gas stove is an assembly of one or more burners forming a separate unit. The gas stoves consist of a main chassis made of CRC sheet nickel chromium plated/painted, cast iron, vitreous enamelled or stainless steel sheets etc. The various components are mounted on the chassis. The flame or hot gases released from the gas burners can be regulated using the ON/OFF knob installed on the gas stove.

Gas stoves contain one of two types of ignition systems: a pilot light or an electronic ignition system. A pilot light is a constantly burning blue flame near the burner. Because it's always on, a pilot light uses a lot more gas than an electronic ignition system. An electronic ignition system creates a spark (you'll hear this as a clicking noise) only when you turn the burner on..

Types of gas burners for domestic use are:

With changing times customers prefer of modular kitchen, kitchen hobs are in uses which are fitted on the working platform of the kitchen with operational knobs on top or side or in front of the body. The principle of working remains the same.

Types of gas burners for domestic use are:

		
Double Burner Gas Stove	Triple Burner Gas Stove	Four Burner Gas Stove

Fig. 3.1.2. Types of gas burners

Cleaning of the Appliance

In addition to the other safety practices, LPG Mechanic should be able to inform the customer on the following safety practices for cleaning the appliance:

- Switch the appliance taps and pressure regulator knob OFF and wait till the surface of the appliance is cool.
- Clean the surface of the appliance with a dry cloth.
- Do not attempt to clean a hot surface with a wet cloth; the surface finish may crack.
- A moist cloth can be used to remove stains from cooking when the surface has become cool.
- To clean the burner head of the stove or hot plate, remove it and dip it in a warm solution of soap, and water and use a toothpick to clean the burner ports.
- Do not tamper with the gas equipment or attempt to clean it with a steel pin.
- Never soak the appliance body in water as the grease or lubricant in the gas tap may be washed away resulting in the possibility of gas leakage.

3.1.4 Dos and don'ts during LPG Cylinder Emergency Complaint Handling:

Following are the dos and don'ts during the cylinder emergency complaint handling for LPG Mechanic:

Dos	Don'ts
When customer calls, receive the complaint and acknowledge the complaint.	NEVER delay after receiving the complaint call from the customer.
Listen to the customer attentively and respond to them politely.	Avoid interrupting the customer during the call or during the visit.
Update the date and time of the receipt of telephonic and SMS complaints.	Never miss out of the date and time when the complaint was received.
Note down the details of the complaint and customer's address and contact number.	Never forget to note details of the complaint, and customer address and contact number. It helps in keeping records of frequency of complaints and number of complaints received from the same customer as this may need attention.

Dos	Don'ts
In case of leakage complaints, instruct the customer to switch off the regulator. If the problem persists, ask the customer to disconnect the regulator and put the safety cap on the valve. Educate the customers not to switch on any electric buttons, light diya, etc. during a leakage.	Never miss out on informing the customer about immediate precautionary steps that customer should take during emergency
Ensure the leakage complaints are attended within 30 minutes.	Try not to cross the set out time of 30 minutes, after receiving leakage complaints as it may be an emergency.
Ensure the complaints on stoves or burners are attended within 24 hours.	Try not to cross the set time of 24 hours, after receiving complaints on stoves or burners.

Note: After fixing customer's problem, inform the customer about the ways they can report a complaint in future –

a. In case of emergency, they can call on 1906 (round the clock emergency helpline across India) and
b. Alternatively, they can register a complaint online with the service providers.

Tools and equipment that need to be carried for handling emergency complaints

Always remember to carry the tools and equipment that the LPG Mechanic should carry in his toolkit:

- 'O'-ring
- Safety cap with nylon thread
- Portable fire extinguisher
- Leak detectors
- 'O'-ring inserter
- 'O'-remover suraksha hose
- Gas knob
- Pressure regulator parts

UNIT 3.2: Customer Satisfaction

Unit Objectives

At the end of this unit, you will be able to:

1. Explain how to fulfill customer requirements
2. Explain how to achieve customer satisfaction

3.2.1 Fulfilling Customer Requirements

A customer requirement is a set of characteristics present in a product or service that motivates a customer to select it. Every customer expects that his or her requirements of purchasing the product are fulfilled. An LPG Mechanic needs to ensure that he provides best service and meets the customer's requirements.

For fulfilling customer's requirements, LPG Mechanic must:

- Understand the customer's needs for service requirements.
- Resolve all complaints within 48 hours and convey it to the concerned authority.
- Maintain a record of all customer complaints and the time frame for resolution.
- Ensure that complaints from District Authorities, Tehsildar, Police, Collector, etc. are attended and resolved on priority.
- Carry out root-cause analysis of repetitive complaints to avoid their recurrence.

3.2.2 Qualities and Skills needed to Handle Complaints

Handling complaint is very important for retaining consumers. If the complaint is handled in the right manner, it is an opportunity for enhancement of service. However, handling complaints can be stressful, that is why the following set of qualities and skills are essential for a LPG Mechanic should to possess:

Confidence is one of the most important components of delivering great service to your customers. If you are confident about your work it reflects in your behaviour.

Customer service requires a lot of **patience**. Sometimes, your customers will be angry with you, and there are going to be situations where your customers will need extra attention to understand things. So, always be patient with your customer.

Being polite means being aware of feelings of the customers, and respecting those feelings. Customer may not always notice **politeness** but they usually notice rudeness or inconsiderate behaviour. So, always be polite in your conduct and behaviour.

Resilience is the capacity to recover quickly from difficulties, in customer centric job you need to build resilience in handling difficult customers.

Empathy is the ability to share or understand the feelings of others. It's an essential element of everyday relationships and can be equally powerful when it comes to company-customer relationships. Be empathetic towards your customer.

3.2.3 Achieving Customer Satisfaction

Achieving customer satisfaction is the ultimate goal of every company. The LPG Mechanic represents his company and the reputation of the company depends on the kind of service he offers to the customers.

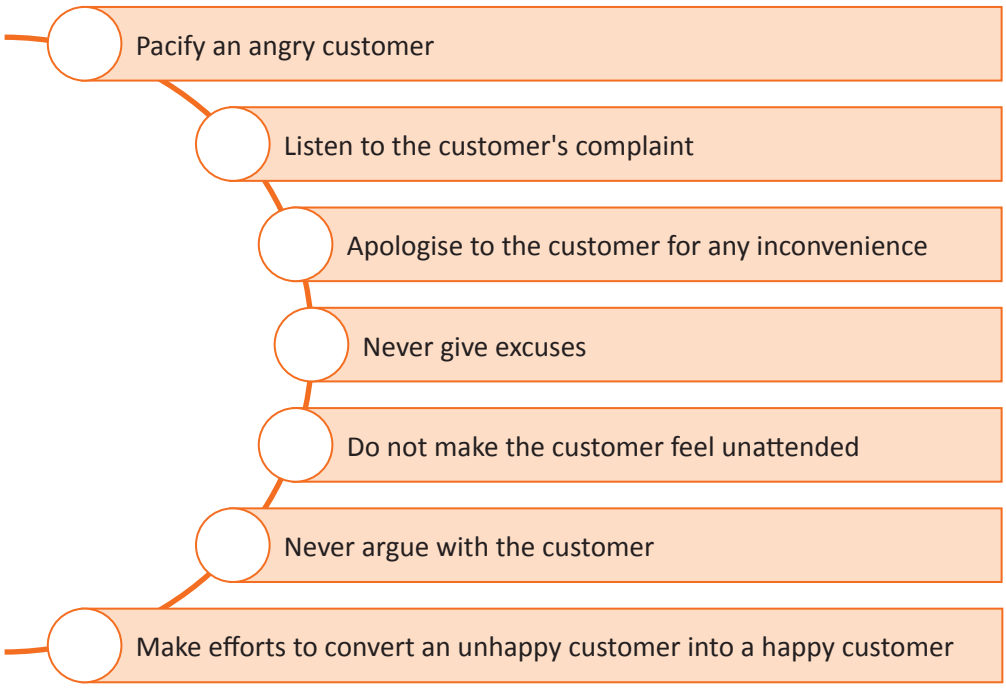
The LPG Mechanic can help his company to achieve high customer satisfaction by providing top quality service to the customers.

To achieve customer satisfaction, LPG Mechanic must:

- Provide excellent service to the customers.
- Build a good rapport with the customer by discussing with them about general likes and dislikes in the market, latest trends, etc. Relating to LPG.
- Create awareness on various schemes and benefits for customers by informing about the latest company offers on gas stoves.
- Increase the brand value of the LPG agency
- Assure the customer that their feedback (especially, negative ones) will be conveyed to the concerned authority
- Take regular feedback from the customers on current service, complaints and improvements.

3.2.3.1 Tips to Handle Complaints

Following are a few tips to Handle Complaints:



Exercise

Read the questions and tick the correct option.

1. The two types of ignition systems used in gas stove are
   a. pilot light or an electronic ignition system
   b. mechanical or electronic ignition system
   c. distributorless or mechanical ignition system
   d. electronic or Distributorless ignition system

2. Which one of the following which is important step, while addressing the customer complaint?
   a. Addressing the complaint during the day time
   b. Addressing the complaint in time
   c. Addressing the complaint along with documents
   d. Addressing the complaint along with LPG cylinder

3. Shut the burner taps and pressure regulator knob, to 'OFF position, and open the door and windows for free ventilation - are immediate steps that should be taken during which type of complaint
   a. Burner stove not working at customer's residence
   b. When children are in the kitchen
   c. Leak related complaints at customer's residence
   d. LPG cylinder delivered late at customer residence

4. Leak related complaints should be addressed within _____ minutes.
   a. 48
   b. 30
   c. 60
   d. 45

Hands-on practice sessions will be conducted at the LPG Showroom/Distributors/Godown.

Tips

- When customer calls, receive the complaint and acknowledge the complaint.
- Listen to the customer attentively and respond to them politely.
- Update the date and time of the receipt of telephonic and SMS complaints.
- Note down the details of the complaint and customer's address and contact number.
- In case of leakage complaints, instruct the customer to switch off the regulator. If the problem persists, disconnect the regulator and put the safety cap on the valve.
- Educate the customers not to switch on any electric buttons, light diya, etc. during a leakage.
- Ensure the leakage complaints are attended within 30 minutes.
- Ensure the complaints on stoves or burners are attended within 24 hours.
- It is of utmost importance that the LPG Mechanic carries all the necessary tools and equipment in his tool kit when he goes to customer's house for handling emergency complaints.

Notes

Notes

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=MPYukhSgXxM

LPG Emergency Number

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=8p0N1Tn8FE4

Things to do in case of LPG leakage

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सत्यमेव जयते
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MINISTRY OF SKILL DEVELOPMENT
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N·S·D·C
National
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4. Carry Out Mandatory Inspection of Customer Premises Once in Every Two Years

Unit 4.1 - Carry Out Mandatory Inspection at Customer Premises

HYC/N 3103

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Explain the procedure of the mandatory inspection

UNIT 4.1: Carry Out Mandatory Inspection at Customer Premises

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the procedure of the mandatory inspection

4.1.1 What is the Mandatory Inspection?

A Mandatory Inspection of LPG Installation is done once in two years by a authorised LPG Mechanic. This service is available on payment of the requisite charges approved by the Oil Company. This will help in safe up keep of the domestic LPG installation and it is a legal requirement.

The main purpose of this inspection is to primarily prevent LPG leakage which may lead to accidents.

Fig. 4.1.1. Mandatory inspection

4.1.2 What is the Procedure for Mandatory Inspection?

The LPG Mechanic is responsible to carry out mandatory inspection for all the customers as per the "Mandatory Inspection Format for Domestic Gas Installation".

The LPG Mechanic needs to follow the standard procedure in order to achieve the desired result of the inspection.

- Before going for the mandatory inspection, the LPG Mechanic must inform the customer about the mandatory inspection visit
- The LPG Mechanic needs to wear proper uniform with identity card provided by respected LPG agency.
- The LPG Mechanic needs to carry Mandatory Inspection checklist.
- The LPG Mechanic needs to carry a tool-kit along with essential LPG equipment, leak detectors etc.
- The LPG Mechanic needs to carry the mobile device which will have mobile application for Mandatory Inspection

At the customer premises

- Greet the customer and show the ID card

Fig. 4.1.2. Mandatory Inspection visit at customer premises

- Educate the customer about the need and importance of Mandatory Inspection
  - Advise the customer to get Mandatory Inspection of LPG installation once in every two years by authorised personnel
  - Advise the customer to always check the seal on the refill cylinder and weight of the cylinder
  - Advise the customer to use emergency contact numbers in case of any LPG leakages
  - Inform the customer that the gas stove or hot plate should always be placed on a platform (made of non-flammable material) above the cylinder level
  - Inform the customer to check the suraksha hose validity and other markings of the suraksha hose. Ensure that the LPG cylinder should be placed in an upright/vertical position at the ground level
  - Ensure that the LPG cylinder should be placed in a well-ventilated area

Unsafe practices observed at the customer's kitchen

- As a part of the Mandatory Inspection, the LPG Mechanic needs to take the photographs of the following in case he observed any unsafe practices
  - Position of the LPG cylinder in the kitchen
  - Kitchen platform
  - Validity of suraksha hose
  - ISI mark on suraksha hose
  - Weight of the LPG cylinder
  - ISI mark on pressure regulator

Fig. 4.1.3. Photographs taken on mandatory inspection

- Record the inspection details in the checklist as per the prescribed format
  - Record the validity of the suraksha hose in the DGCC book
  - Upload the photographs of LPG installation or LPG Equipment on the inspection portal or record in the hardcopy of the Mandatory Inspection checklist

Fig. 4.1.4. Mobile application for mandatory inspection

4.1.3 Checklist for Mandatory Inspection

The purpose of the Mandatory Inspection is to determine whether all safety measures are being implemented. The LPG Mechanic checks for signs of leakage and other potential problems which may lead to accidents. This inspection also gives the opportunity to check for illegal connections.

Here is a sample checklist to carry out Mandatory Inspection:

☐	Is the cylinder kept in vertical position, with valve on top?
☐	Is the cylinder kept in hot water?
☐	Where the cylinder is kept? Whether floor level ventilation is provided?
☐	Any utensils / clothes have been kept on cylinder?
☐	Additional cylinder (empty or full) is kept with safety cap on?
☐	Is the customer aware of correct procedure of fitting regulator?
☐	Has the pressure regulator, being procured from the gas agency?
☐	'O'-Ring is in proper condition without any damages?
☐	Is the pressure regulator having an ISI Mark?
☐	Is the specified type of suraksha hose is being used?
☐	Is the suraksha hose having an ISI Mark?
☐	Is the connecting hose properly fitted with the regulator and the stove nozzle?
☐	Is the validity period of the connecting suraksha hose within limits?
☐	Is the suraksha hose concealed?
☐	Is the length of suraksha hose adequate?
☐	Are the suraksha hose and the gas stove placed in the same room and within the specified distance?
☐	Does the hose have any damages?
☐	Is the position of the gas stove is above level of LPG cylinder?
☐	Has the customer connected 2 stoves with T-connection?
☐	Is the customer using high thermal efficiency and ISI mark gas stove?
☐	Is the burner giving blue flame?
☐	Is the customer having more than one gas connections in the same Kitchen?
☐	Is the customer using Kerosene or other fuels at the same time in kitchen?
☐	Is the refrigerator kept in the kitchen?
☐	Is there any other open flame in the kitchen?

Exercise

List down at least five points that fall under the Mandatory Inspection checklist.

Hands-on practice sessions will be conducted at the LPG Showroom/Distributors/Godown.

Tips

- Advise the customer to not use a T-joint for connecting two burners. (The T-connection is when a cylinder is supplying LPG to more than one gas stove.) This increases the chances of leakage.
- Advise the customer to get Mandatory Inspection of LPG installation once in every two years by authorised personnel.

Notes

Notes

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=Nclikkiw8ZE

HP Mandatory Inspection

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=6SbHUHwQcGY

HP Mandatory Inspection

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5. Maintain Health & Hygiene

Unit 5.1 - Personal Hygiene Practices

HYC/N 3103

Key Learning Outcomes

At the end of this unit, you will be able to:

1. State the habits to maintain personal health and hygiene
2. Explain the correct techniques of lifting and carrying a cylinder
3. Describe how to maintain dental hygiene
4. List the precautionary health measures

UNIT 5.1: Personal Hygiene Practices

Unit Objectives

At the end of this unit, you will be able to:

1. State the habits to maintain personal health and hygiene
2. Explain the correct techniques of lifting and carrying a cylinder
3. Describe how to maintain dental hygiene
4. List the precautionary health measures

5.1.1 Ways to Maintain Good Health

Very often, your performance and behaviour both at work and home depends on your health. An unhealthy person can easily fall ill due to improper diet, lack of hygiene and bad habits like smoking and drinking alcohol. It is, therefore, important to stay healthy. Following are the ways to maintain good health:

1. Maintain personal hygiene (cleanliness) at all times
2. Wash your hands or clean them using a hand wash or a sanitiser (a chemical gel that kills the germs present on the skin)
3. Have a balanced and healthy meal
4. Avoid junk food
5. Have a sound sleep of 6 to 8 hours daily
6. Exercise regularly to keep yourself fit
7. While on the job, do some jaw, shoulder, neck and back exercises to prevent any injuries
8. Stay away from pan masala, gutka, cigarettes, alcohol, etc. that will affect your health

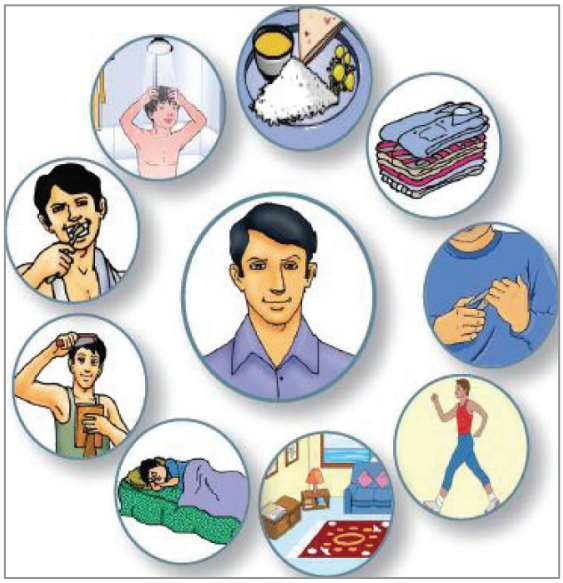


Fig. 5.1.1. Personal Hygiene

Physical Fitness

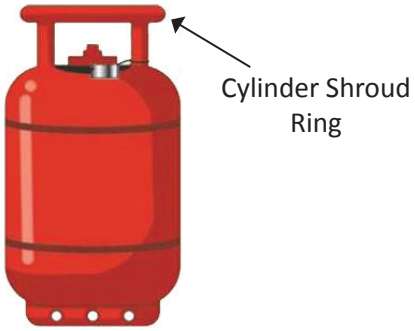
You have to be physically fit and strong to perform your daily activities at work. Following are the tips that can help you maintain physical fitness:

1. Eat well before leaving for work.
2. Do not skip any meals and eat at regular intervals.
3. Have a glass of milk daily.
4. Do regular physical exercises to make your body strong.
5. Do stretching exercises of hands, neck and shoulders before lifting any heavy objects.

5.1.2 Recommended Techniques for Lifting and Carrying Cylinders

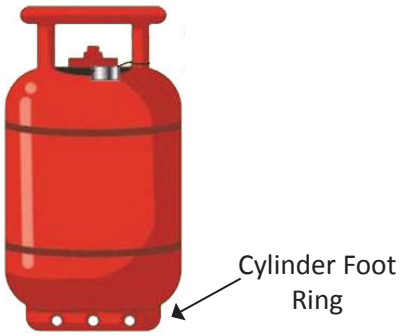
Lifting and carrying heavy cylinders with incorrect body posture can cause injuries such as back injury, shoulder injury, neck injury and hands and toes injury. Correct body posture and the right techniques can help prevent such injuries. Below are some recommended techniques to follow while performing these actions:

1. Stretching of hands, neck and back increases flexibility. So do the stretching exercises before lifting or carrying any heavy objects like gas cylinder.
2. Grip the object firmly before lifting it. Hold and grip the cylinder shroud ring and add the support of your forearms to lift it.
3. Do not keep your feet close to each other; keep a little distance between them while lifting the cylinder.
4. Bend your back and knees forward to lift the cylinder.



To carry the cylinder on your shoulder,

1. Push the cylinder sideways to an extent so that some portion of the base of cylinder foot ring is visible.
2. Grip the cylinder in such a way that your one hand is gripping the cylinder shroud and the other gripping the cylinder foot ring.
3. Lift the cylinder and place it slowly on your shoulder.



5.1.3 Personal Hygiene Practices

Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases. Hygiene is of utmost importance for everyone who wishes to be healthy. You have to maintain high standards of hygiene at all times. Remember, as LPG Mechanic, you are representing your company and your personality will reflect the image of your company.

You must follow the following practices to maintain personal hygiene:

1. Bathe daily and shampoo your hair as often as necessary.
2. Do not spit at public places
3. Cover your nose and mouth while sneezing or coughing. Also, wash your hands immediately after sneezing.
4. Never dig your nose in public.
5. Trim your nails and keep them clean.
6. Wash your hands with soap and water before beginning work.
7. Wipe your hands with clean towel; never wipe your hands on your uniform.
8. Keep your uniform neat and tidy.
9. Wash your hands before and after meals.
10. Wash your hands with soap and water after visiting toilet.
11. When you are unwell, consult a doctor; avoid going to work if there are chances that your sickness may increase or the disease may spread.

12. Cover your wounds with a band-aid.

Personal Hygiene at a Glance

Body	**Avoid body odour**	• Take a bath daily. • Use a deodorant.	
Mouth	**Avoid bad breath**	• Brush your teeth twice a day. • Do not smoke or drink alcohol or chew tobacco/gutka. • Use a mouth freshener.	

Fig. 5.1.2. Personal Hygiene

5.1.4 Ways to Maintain Dental Hygiene

Good oral and dental hygiene can help prevent bad breath, tooth decay and gum disease and keep your teeth strong. Here are the ways to maintain dental hygiene:

Fig. 5.1.3. Mouth freshner

1. Brush your teeth twice a day i.e. in the morning and at night.
2. Rinse your mouth well after each meal.
3. Do not drink alcohol and smoke cigarettes; do not chew tobacco or gutka.
4. Use a mouth freshener to prevent bad breath.
5. Visit a dentist in case of any dental related problems like cavities, gum diseases, bad breath, etc.

5.1.5 Grooming

Wearing clean and tidy clothes and looking presentable is called grooming. Being well-groomed makes you feel confident. It not only helps to create a positive image of yourself but also of your company. Unclean or untidy people are not liked by anyone. Therefore, for a good impression, grooming is necessary.

What would customers think when they see you are well dressed and well-groomed?

- They will respect you
- They will perceive you are confident
- They will be comfortable to talk or interact with you
- They will be impressed by your overall appearance

To be well-groomed, an LPG Mechanic needs to follow the practises listed below:

1. Always wear clean and well-ironed uniforms.
2. Wear your identity card at all times.
3. Keep hair short and well-combed.
4. Shave regularly.
5. Trim your nails and keep them clean.
6. Avoid wearing too many accessories and jewellery.
7. Wear proper footwear, shoes as part of inform.

5.1.6 Precautionary Health Measures

You need to be healthy and physically fit to perform various tasks at work place. Precautionary health measures need to be taken to prevent various diseases, injuries or any health related issues. There are certain precautionary health measures you need to follow while at work:

You must follow the following practices to maintain personal hygiene:

1. Inform and report on personal health issues related to injury and infectious diseases.
2. Use a tissue or a hand kerchief to cover your mouth while sneezing or coughing.
3. Turn away from people and food items while sneezing or coughing.
4. Wash or wipe your hands immediately after sneezing o coughing.
5. Undergo preventive health check-ups at regular intervals.
6. Take proper treatment from the doctor in case of illness and injuries.
7. Do stretching exercises involving your hands, neck and shoulders before lifting any heavy objects.
8. Have a general sense of hygiene and appreciation for cleanliness.

Exercise

Read the questions and tick the correct option

1. Which one of these is a balanced and healthy meal?
   a. Bread, sandwich, samosa, etc.
   b. Falooda, ice-creams, pastries etc
   c. Dal-rice with pickles
   d. Dal, rice, chapatti (roti), along with vegetables.

2. To maintain dental hygiene, you should not chew tobacco or _____
   a. chewing gum
   b. pan masala
   c. lollipops and cotton candies
   d. gutka

3. Wearing clean and tidy clothes and looking presentable is called _____
   a. hygiene
   b. organised
   c. well mannered
   d. grooming

4. Why is there a need to take precautionary health measures?
   a. To prevent diseases and accidents
   b. To prevent absenteeism and loss of job
   c. To increase sales of the business
   d. To prevent various diseases, injuries and health related issues

5. When you are suffering from a contagious disease, you should not go to work because
   a. There are chances that your sickness may increase or the disease may spread.
   b. There are chances that your boss will be happy and offer you better pay.
   c. There are chances that your colleagues will take care of you when you are at work.
   d. There are chances that you will get cured at work.

6. For maintaining a healthy life style, you should _____
   a. Not skip any meals and eat at regular intervals.
   b. Practice regular physical exercises to make your body strong.
   c. Not drink a glass of milk daily.
   d. Not sleep for 6-8 hours a day.

7. Which of the following is the correct way of lifting a cylinder?
   a. While lifting a cylinder, you should take your hands forward and lift the cylinder.
   b. While lifting a cylinder, you should bend your back and knees forward to lift the cylinder.
   c. While lifting a cylinder, you should take your hands to lift the cylinder and place it on your head.
   d. While lifting a cylinder, you should bend your back and roll the cylinder to the place, instead of carrying it.

Hands-on practice sessions will be conducted at the LPG Showroom/Distributors/Godown.

Tips

- Maintain clean and dry floor area.
- Avoid messy work area.
- Use disinfectants to clean your hands.
- Using proper waste disposal methods helps you ensure cleanliness around the workplace.
- Personal hygiene practices help in keeping yourself healthy.
- When you are unwell, consult a doctor; avoid going to work if there are chances that your sickness may increase or the disease may spread.
- Being well-groomed makes you feel confident. It not only helps to create a positive image of yourself but also of your company. Unclean or untidy people are not liked by anyone.

Notes

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Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=WfPw5KAsuXE

High Precision Gas Cylinder Cleaning

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6. Core Generic Skills

Unit 6.1 - Reading and Writing Skills

Unit 6.2 - Communication Skills

Unit 6.3 - Plan and Organise Work

Unit 6.4 - Problem Solving Skills

Key Learning Outcomes

At the end of this unit, you will be able to:

1. State the importance of reading and writing skills for the job
2. State the scenarios where you need to apply your reading and writing skills
3. State the definition of oral communication
4. Explain the importance of oral communication in your job
5. Describe how to develop listening and speaking skills
6. Describe how to plan and organise
7. State the benefits of planning
8. State the benefits of organising
9. Explain what is problem solving
10. Solve your problems efficiently

UNIT 6.1: Reading and Writing Skills

Unit Objectives

At the end of this unit, you will be able to:

1. State the importance of reading and writing skills for the job
2. State the scenarios where you need to apply your reading and writing skills

6.1.1 Reading and Writing Skills

Safety at a LPG distributor showroom or godown is of utmost importance. Safety symbols and cautionary instructions should be displayed at various places at a LPG distributor showroom or godown. Additionally, helpline numbers like that of the ambulance, fire brigade, police, nearest hospital should be provided to the LPG Mechanic; he can use these in case of emergencies.

Fig. 6.1.1. Reading Skills

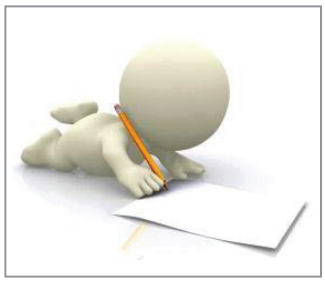


Fig. 6.1.2. Writing Skills

With the help of reading and writing skills, a LPG Mechanic will be able to:

- read cash memos or bills.
- read safety instruction, signs and charts.
- accept digital payment modes i.e. net banking, credit and debit cards payment made by the customers.

UNIT 6.2: Communication Skills

Unit Objectives

At the end of this unit, you will be able to:

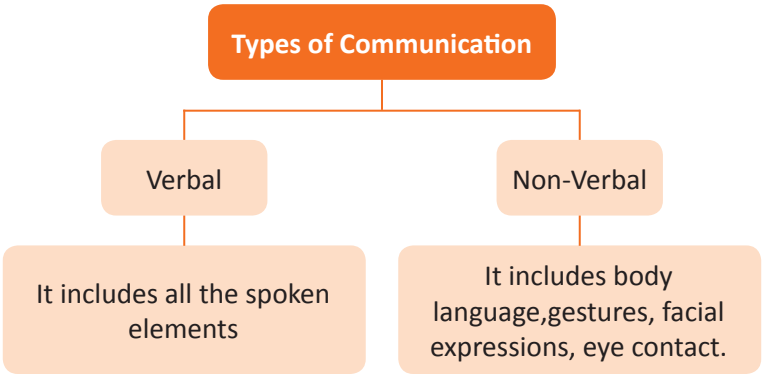
1. State the definition of oral communication
2. Explain the importance of oral communication in your job
3. Describe how to develop listening and speaking skills

6.2.1 Communication Skills

Oral Communication is clearly stating your thoughts or messages to others. It can be verbal and non-verbal. For this, you should speak, listen, observe, question, analyse and evaluate. You must convey your thoughts properly to a consumer. This will enable you to develop a good rapport with the consumer.

Good oral communication will enable you to:

- inform the customer about the safety tips and the latest schemes.
- inform the customers about the emergency number, complaint number and the booking number printed on the cash memo, etc.
- ask for customer's feedback.
- apologise (when necessary) and thank the customer.



6.2.2 Listening and Speaking Skills

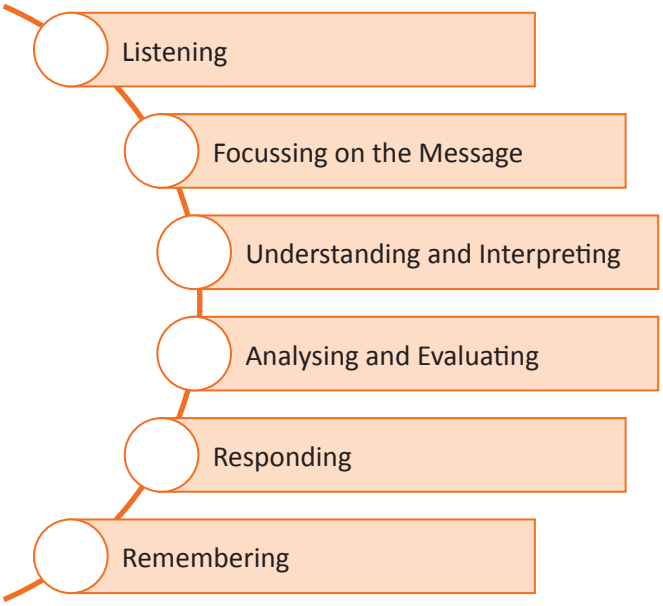
Listening Skills

Listening is the most important part of communication. It is a process that involves accurately receiving and understanding the message conveyed by the consumer. Additionally, it involves listening to what is being said as well as understanding what is unsaid or only partially said.

We listen to:

- obtain information.
- understand and learn.

Listening Involves:



Guidelines for Active Listening:

- Stop talking and start listening.
- Put the speaker at ease.
- Avoid distractions.
- Understand.
- Be patient.
- Avoid being unfair.
- Analyse the tone of the speaker.
- Listen for ideas - not just words.
- Examine non-verbal communication.
- Ask right questions to clarify any doubts.

Speaking Skills

Speaking means to converse or express one's thoughts and feelings in spoken language. Without proper speaking skills, you will not be able to express yourself and people will find it difficult to understand you.

It is important for you to know the local language so that you are able to communicate with your customers and understand their queries easily.

Guidelines for Effective Speaking:

- Speak slowly and clearly.
- Make eye contact and smile.
- Be careful in your choice of words.
- Be patient and polite.

Non-Verbal Communication

Introduction to Body Language

Body language is the cues given to others by our body while we are communicating. It not only refers to movements in our body, but also to small gestures or facial expressions that we make while communicating with others. Body language must be the same as our words, otherwise your listener will be confused.

Attitude	• Right attitude engages your receiver and sender
Greetings	• Greet others genuinely, not overenthusiastically
Eye Contact	• Maintaining eye contact displays interest
Posture	• Standing and sitting straight displays confidence
Maintain Distance	• Standing too close may make others uncomfortable

UNIT 6.3: Plan and Organise Work

Unit Objectives

At the end of this unit, you will be able to:

1. Describe how to plan and organise
2. State the benefits of planning
3. State the benefits of organising

6.3.1 Plan and Organise Work

Planning and organising is the process of completing a given task efficiently and successfully. Organising and planning includes:

- Identification of activities.
- Establishing a plan.
- Measuring actual work progress at regular intervals.
- Plan in such a way that multiple jobs are not assigned to the same timeline unless planning to multitask.
- Comparing actual work done with the plan and identifying the gaps if any.
- Coordination of work among the team.
- Finding out the reasons (if any) for deviation from the schedule.
- Taking corrective measures to rectify the deviation.

Benefits of Planning:

- Gives us clarity on what we want to achieve.
- Keeps us motivated.
- Keeps us focused.
- Makes us accountable.
- Makes us more effective.

UNIT 6.4: Problem Solving Skills

Unit Objectives

At the end of this unit, you will be able to:

1. Explain what is problem solving
2. Solve your problems efficiently

6.4.1 Problem Solving Skills

Problem solving is a process of working through details of a problem to reach a solution. In every job, a person may have to take a decision at some point. Problem solving involves taking right decisions in different situations.

How to Develop Problem Solving Skills

- Desire to actively participate in the process of improving a situation.
- Offer suggestions based on knowledge and experience to take decisions.
- Too much analysis of situation results in delaying decisions.
- Respect other people's suggestion and recommendations.
- Analyse and calculate the risk and problems which may occur after taking a decision.
- Follow workplace rules and guidelines in situations involving high level of risk at work.
- Use your job specification to take an appropriate decision.
- Do not hesitate to consult your supervisors before arriving at a decision.
- Do not make workplace decision based on emotions.
- Rational thinking is a must for taking decisions.

Exercise

Read the questions carefully and answer them.

1. The LPG Mechanic requires reading and writing skills to –
   a. update and maintain company's accounts.
   b. update serial number, date of installation in the consumer's book.
   c. read and interpret relevant organizational policies, procedures and diagrams that identify good health and hygiene practices

2. Non-verbal communication includes –
   a. Spoken elements
   b. Listening
   c. Speaking skills
   d. Body language

3. Effective speaking involves speaking _____ and _____.
   a. quickly an loudly
   b. softly and slowly
   c. slowly and clearly

4. Identification of activities, establishing a plan, measuring actual work progress, etc. are part of –
   a. Decision making and Problem solving
   b. Planning and Implementing
   c. Meeting and Discussing
   d. Planning and Organising

5. Organising includes –
   a. Identifying and defining the problem.
   b. Identifying available resources.
   c. Monitoring the outcome of the action taken.

6. The process of working through details of a problem to reach a solution is called _____.
   a. planning
   b. decision making
   c. organising
   d. problem solving

7. Whom should you consult before arriving to a decision point in problem solving process?
   a. Distributor
   b. Colleague
   c. Supervisor

8. Customer-centricity is an approach that focuses on providing a _____ customer experience
   a. good
   b. rich
   c. personal
   d. positive

9. To be customer centric, you need to display _____ and _____ behaviour.
   a. passive and positive
   b. assertive and aggressive
   c. polite and courteous

Tips

- With the help of reading and writing skills, an LPG Mechanic will be able to read the bills, safety instructions, signs and charts, and accept digital payment modes.
- Good oral communication enables to inform the customer about the safety tips and the latest schemes, ask for customer's feedback, apologise (when necessary) and thank the customer.
- Planning and Organising includes identification of activities, establishing a plan, measuring actual work progress at regular intervals. Plan in such a way that multiple jobs are not assigned to the same timeline unless planning to multitask.
- Problem Solving Skills, desire to actively participate in the process of improving a situation, offer suggestions based on knowledge and experience to take decisions, respect other people's suggestion and recommendations, analyse and calculate the risk and problems which may occur after taking a decision, follow workplace rules and guidelines in situations involving high level of risk at work.

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7. Annexure

S No.	Module No.	Unit No. and Name	Topic Name	Page No.	URL	QR Code (s)
1	Module 1	Unit 1.2 – Introduction to the Hydrocarbon Sector	Introduction to the Hydrocarbon Sector	5	https://www.youtube.com/watch?v=RtURL0FW3KI	Oil & Gas Sector
2	Module 2	Unit 2.1 – About LPG Cylinders	About LPG Cylinders	21	https://www.youtube.com/watch?v=YYZZjNeTNRU	What is LPG | How LPG cylinder works
3	Module 2	Unit 2.2 – Pre-Installation Activities	Pre-Installation Activities	28	https://www.youtube.com/watch?v=sqR-ls5OVNA	Pre Delivery Checks
4	Module 2	Unit 2.3 – Installation Activities	Installation Activities	31	https://www.youtube.com/watch?v=vPMyeUeDnpg	Installation procedure of LPG gas
5	Module 2	Unit 2.3 – Installation Activities	Installation Activities	31	https://www.youtube.com/watch?v=CUUdBq4fmHs	How to change regulator on an Indane LPG cylinder
6	Module 2	Unit 2.5 Creating Customer awareness on safe usage of LPG	Creating Customer awareness on safe usage of LPG	38	https://www.youtube.com/watch?v=S8LO-95Pjg8	Important safetytips for LPG cylinders at home
7	Module 2	Unit 2.5 Creating Customer awareness on safe usage of LPG	Creating Customer awareness on safe usage of LPG	38	https://www.youtube.com/watch?v=HvPy9RaFJ7I	LPG Safety

S No.	Module No.	Unit No. and Name	Topic Name	Page No.	URL	QR Code (s)
8	Module 2	Unit 2.5 Creating Customer awareness on safe usage of LPG	Creating Customer awareness on safe usage of LPG	38	https://www.youtube.com/watch?v=lw1kFhzLfKY	Precautions for using LPG
9	Module 2	Unit 2.6 – Emergency Procedures in Case of Fire	Emergency Procedures in Case of Fire	44	https://www.youtube.com/watch?v=RSaXCvYNq58	LPG cylinder blast and kitchen fire- fire fighting technique
10	Module 3	Unit 3.1 Attending complaints of LPG Leakage, Allied LPG Equipment's Non-functioning Complaints	Attending complaints of LPG Leakage, Allied LPG Equipment's Non-functioning Complaints	55	https://www.youtube.com/watch?v=MPYukhSgXxM	LPG Emergency Number
11	Module 3	Unit 3.1 Attending complaints of LPG Leakage, Allied LPG Equipment's Non-functioning Complaints	Attending complaints of LPG Leakage, Allied LPG Equipment's Non-functioning Complaints	55	https://www.youtube.com/watch?v=8p0N1Tn8FE4	Things to do in case of LPG leakage
12	Module 4	Unit 4.1 Carryout mandatory inspection of customer premises once in every two year	Carryout mandatory inspection of customer premises once in every two year	67	https://www.youtube.com/watch?v=Nclikkiw8ZE	HP Mandatory Inspection
13	Module 4	Unit 4.1 Carryout mandatory inspection of customer premises once in every two year	Carryout mandatory inspection of customer premises once in every two year	67	https://www.youtube.com/watch?v=6SbHUHwQcGY	HP Mandatory Inspection

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14	Module 5	Unit 5.1 Personal Hygiene Practices	Personal Hygiene Practices	75	https://www.youtube.com/watch?v=WfPw5KAsuXE	High Precision Gas Cylinder Cleaning

Notes

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