FIRE DEPARTMENT • CITY OF NEW YORK

STUDY MATERIAL FOR THE

CERTIFICATE OF FITNESS EXAMINATION

A-35

Supervision of Air Compressors (Citywide)

All applicants are required to apply and pay for an exam online before arriving at the FDNY. It can take about 30 minutes to complete.

Simplified instructions for online application and payment can be found here:
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/fdny-business-cof-individuals-short.pdf

Create an Account and Log in to:
http://fires.fdnycloud.org/CitizenAccess

This book is provided to the public for free by the FDNY.

Note: This certificate of fitness incorporates sections of the:
G-35 (To Operate Air Compressors) and W-11 (Testing Air Receivers)
Certificate of Fitness in addition to other sources of information.

ALSO INCLUDED IN THIS BOOKLET YOU WILL FIND THE FOLLOWING:
NOTICE OF EXAMINATION (NOE)

CONTENTS

EXAM SPECIFIC INFORMATION FOR
A-35 CERTIFICATE OF FITNESS

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http://fires.fdnycloud.org/CitizenAccess/SAML/NYCIDLogin.aspx

REQUIREMENTS FOR CERTIFICATE OF FITNESS APPLICATION

General requirements:
Review the General Notice of Exam:
https://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf

Special requirements. A-35 Certificate of Fitness: None

Application fee (Cash is NO LONGER ACCEPTED):
Pay the **$25** application fee online or in person by one of the following methods:

- Credit card (*American Express, Discover, MasterCard, or Visa*)
- Debit card (*MasterCard or Visa*)
- In person: Personal or company check or money order (*made payable to the New York City Fire Department)*

A convenience fee of 2% will be applied to all credit card payments.

For fee waivers submit: ***(Only government employees who will use their COF for their work- related responsibilities are eligible for fee waivers.)***

- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; ***AND***
- Copy of identification card issued by the agency

REQUIREMENTS FOR ALTERNATIVE ISSUANCE PROCEDURE (AIP)

No AIP available. This certificate of fitness can only be obtained by passing the computer exam at the FDNY Headquarters.

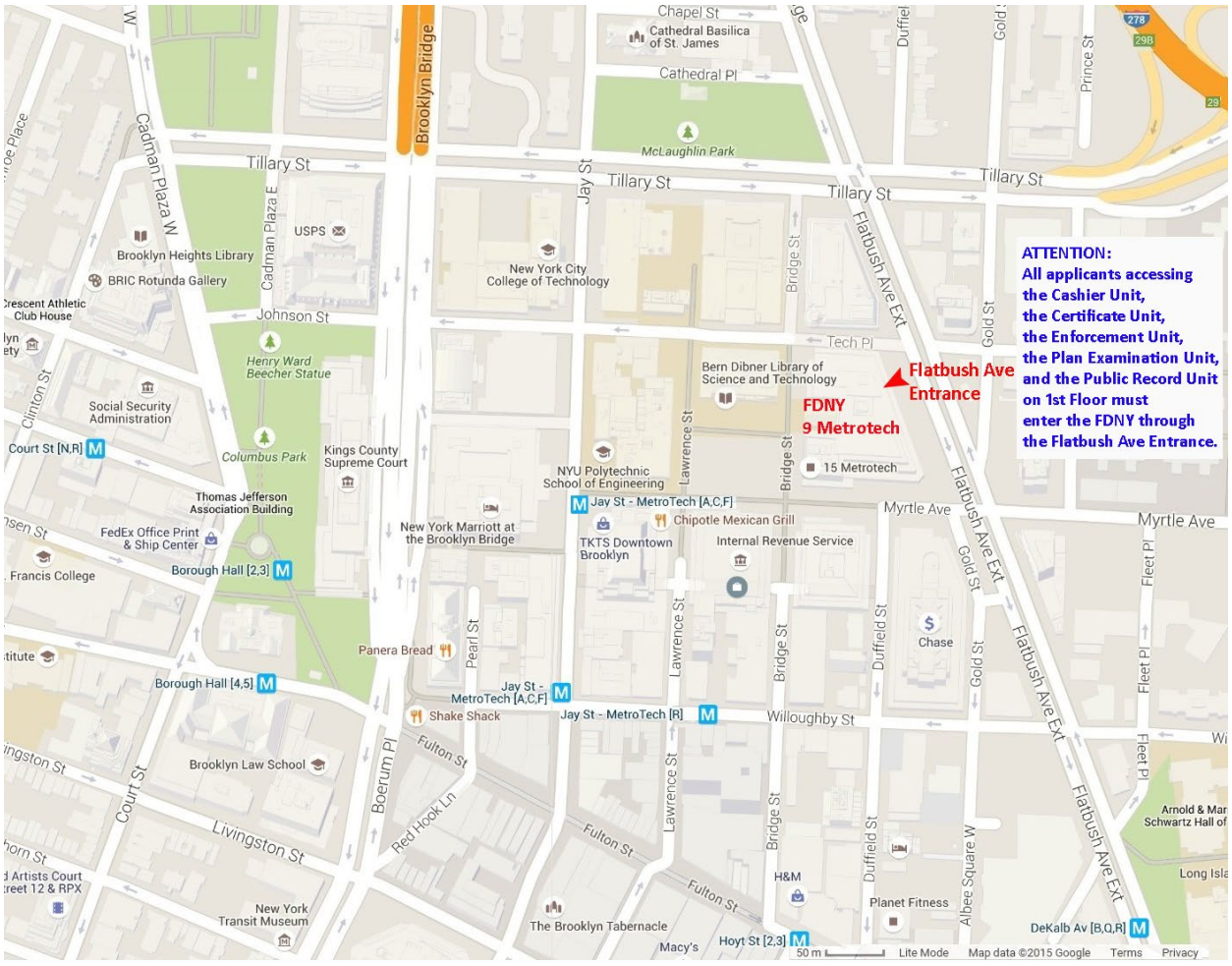
EXAM INFORMATION

The **A-35** exam will consist of **20** multiple-choice questions, administered on a "touch screen" computer monitor. It is a time-limit exam. Based on the amount of the questions, you will have **30** minutes to complete the test. A passing score of at least 70% is required in order to secure a Certificate of Fitness.

Please always check for the latest revised booklet at FDNY website before you take the exam.

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-a35-noe-study-materials.pdf

Exam site: **FDNY Headquarters,** 9 MetroTech Center, Brooklyn, NY. Enter through the **Flatbush Avenue entrance (between Myrtle Avenue and Tech Place)**.



RENEWAL REQUIREMENTS

General renewal requirements:
Review the General Notice of Exam:
https://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf

Special renewal requirements for A-35 COF: None

The FDNY strongly recommends the A-35 COF holders to renew the COF on-line. To learn the simplified on-line renewal:
https://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-simplified-renewal-short.pdf

QUESTIONS?

FDNY Business Support Team: For questions, call 311 and ask for the FDNY Customer Service Center or send an email to FDNY.BusinessSupport@fdny.nyc.gov

STUDY MATERIAL AND TEST DESCRIPTION

This study material contains the information you will need to prepare for the examination for the Certificate of Fitness to Operate and Maintain Air Compressors. The study material includes information taken from relevant sections of the Fire Prevention Code and the Building Code of New York.

Fire Department Certificates of Fitness are extremely important. A holder must secure and protect his or her Certificate of Fitness in much the same manner as one would a driver's license. It must be available upon demand by a duly authorized Fire Department representative. It is very important for you to review the information in the study guide very carefully. The study material does not contain all of the information you need to know in order to perform your duties. It is your responsibility to learn whatever else you need to know to do your job effectively, and in keeping with all Fire Department rules and regulations as well as all other pertinent laws.

All questions on the Certificate of Fitness examination provide a multiple choice selection of answers, with four alternative answers to each question. Only one answer is correct for each question. If you do not answer a question or if you mark more than one alternative your answer will be scored as incorrect. A score of 70% correct is required on the examination in order to qualify for the Certificate of Fitness. Read each question carefully before marking your answer. There is no penalty for guessing.

2022 FIRE CODE ENACTED

The amended New York City Fire Code, to be known as the 2022 Fire Code, takes effect on April 15, 2022. **It may not have been updated in this study material and the exam will be mainly based on this booklet, not the 2022 Fire Code. However, as the Certificate of Fitness holder, it is your responsibility to become familiar with the applicable sections of the new 2022 Fire Code.**

Design and installation provisions.

The design and installation provisions of the 2022 Fire Code shall apply to:

- Facilities established and conditions arising on or after 04/15/2022.
- Facilities and conditions not lawfully existing prior to 04/15/2022.

The facilities and conditions lawfully existing prior to the 04/15/2022 can be continued in compliance with the requirements of the former Fire Code/Fire Rule except as otherwise provided in the New Fire Code 102.5.

Operational and maintenance provisions.

The operational and maintenance provisions of the 2022 Fire Code, including permit and certification requirements, shall apply to all facilities, operations, conditions, uses and occupancies, regardless of when they were established or arose.

Whenever this code is amended or a rule is promulgated to require a permit or certificate for a facility, operation, condition, use or occupancy, and no permit or certificate was previously

required therefor pursuant to this code or the rules, such facility, operation, condition, use or occupancy may be continued without such permit or certificate until 04/15/2023, except as may otherwise be provided by such amendment or rule.

The 2022 Fire Code can be obtained via the following website:
http://www1.nyc.gov/site/fdny/codes/fire-code/fire-code.page

The 2014/2022 New York City Fire Code Cross-Reference Table can be referred to the following website:
http://www1.nyc.gov/assets/fdny/downloads/pdf/codes/fire-code-cross-reference.pdf

Sample Questions

The following questions represent the "format" of the exam questions, not the content of the real exam.

1. **An air compressor system is primarily used for:**
   A) fire fighting operations.
   B) storing and making use of pressurized air.
   C) forcing water through fire sprinklers in a building.
   D) running elevators in a high rise apartment building.

The correct answer is "**B**". You would press "**B**" on your touch-screen monitor.

2. **When air is pressurized by an air compressor it:**
   A) collects water from the surrounding air.
   B) becomes cold.
   C) becomes hot.
   D) forces dirt out of the storage tank.

The correct answer is "**C**". You would mark "**C**" on your touch screen monitor.

PART 1. INTRODUCTION

Air Compressors are used in various situations. They are power industrial equipment and construction tools. Air compressors enable the efficient repair of all types of vehicles and facilitate their safe operation on our public thoroughfares. They are important in manufacturing and are central to product development and creation.

Air Compressors can be very dangerous if not carefully operated and maintained. The compressing atmospheric air requiring a FDNY permit must be performed by or under the supervision of a person holding a Certificate of Fitness. The supervision may be personal or general supervision as per the 2022 edition of the New York City Fire Code.

PERMITS

A FDNY permit is required if a compressor is used to compress any nonflammable, corrosive or oxidizing gas, including air to a pressure exceeding 100 psi. However, outdoor air compressing (other than a fair or festival) is not required a FDNY permit. These permits are issued by the Bureau of Fire Prevention.

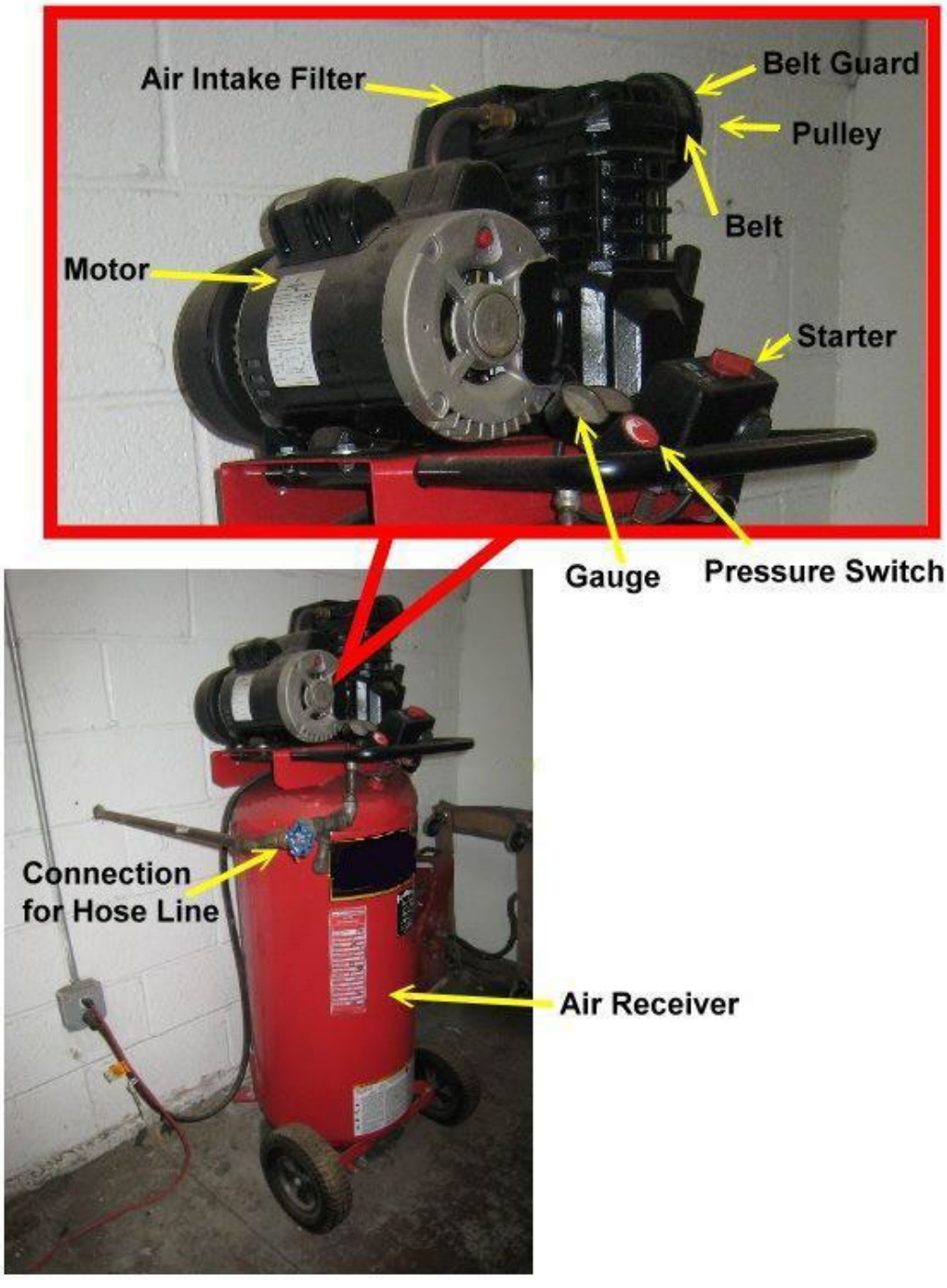
AIR COMPRESSORS

An air compressor takes the air in a room and forces it into a container under pressure. The more air forced into the container the greater the air pressure that builds up inside. The compressed air can be discharged from the container at a controlled rate. The compressed air is used to power a variety of tools and machinery. For example, compressed air is used to power pneumatic wrenches and lifts in automobile service stations. Compressed air is also used for heavy machinery and paint spray booths in industrial plants.

There are several types of air compressors. The different types include the reciprocating, centrifugal, rotary and scroll compressors. The only real difference between these compressors is the way in which they compress the air. The most commonly used air compressor is the reciprocating air compressor. Air compressors are sometimes called air pumps. The air compressors can be powered by electric motors, internal combustion engines or steam turbines. The most common power source is an electric motor. A typical industrial air compressor is shown on the next page.

In some locations there may be a build up of flammable gases. For example, there may be a build up of flammable gases in service stations and workshops. Flammable gases are usually heavier than air and fall to the floor before spreading outward. The flammable gases are easily ignited by sparks and high temperatures. They may be ignited by the heat generated by the air compressor. If the flammable gases are ignited inside the compressor it will cause an explosion.

For this reason steps must be taken to make sure that no flammable gases are drawn into the air compressor. This is done by raising the air compressor at least 5 feet above ground level. The raised air compressor is less likely to ignite the flammable gases. Meeting this height requirement may done in several ways. For example, the compressor may be placed on a shelf or a bench. Or the air receiver tank may be turned and stood on end. Then the air compressor is bolted to the top of the air receiver.



PART 2. OPERATION OF AIR COMPRESSORS

BASIC OPERATION OF AN AIR COMPRESSOR

The operating principles of an air compressor are very simple. The entire unit is driven by an electric motor. This motor then activates a series of drive belts. The belts on the air compressor serve to power the moving parts of the unit. These belts are very similar to the belts that drive the power steering and alternator in an automobile.

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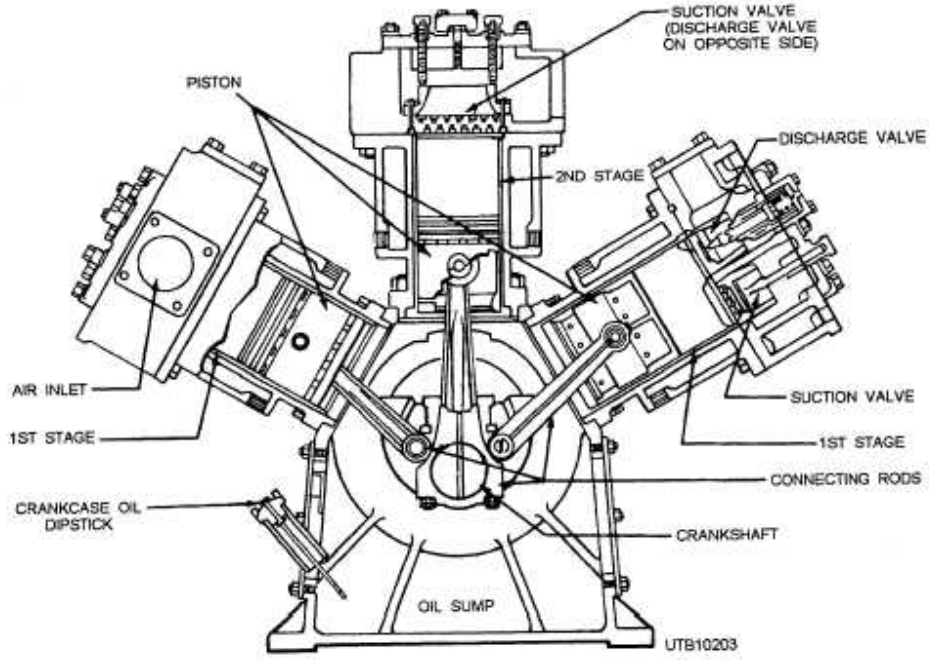
The air is compressed in a compression chamber. The compression chamber consists of a piston inside a cylinder. The piston moves up and down. When the piston moves downward it draws air into the cylinder. The air is drawn in through an intake valve. The intake valve automatically opens when the piston moves downward. When the piston reaches the bottom of the cylinder it changes direction. As the piston moves upward the intake valve is automatically closed. The closed intake valve prevents the air from escaping from the cylinder.

The upward stroke of the piston compresses the air. When air pressure reaches a certain level it forces open a discharge valve. The discharge valve is spring loaded. When the discharge valve opens the compressed air is released into an air receiver. The air receiver is sometimes called an air tank. The compressed air is then taken from the air receiver when it is needed to supply the tools or machinery.

Ordinarily an air compressor with one cylinder and one piston is called a single stage air compressor. Air compressors with more than one piston and one cylinder are called multi-stage air compressors; however, there are air compressors with multiple pistons and cylinders that are single stage. This is because each cylinder discharges directly into the air receiver. In a multi-stage air compressor, each cylinder will increase the pressure of the air by taking air from the discharge side of the previous cylinder and increasing the pressure to a new level. Once it reaches the last cylinder the pressurized air is discharged into the air receiver. When air is compressed it becomes heated. An intercooler is installed between the stages of the air compressor. The intercooler cools the air as it travels between the compression stages.

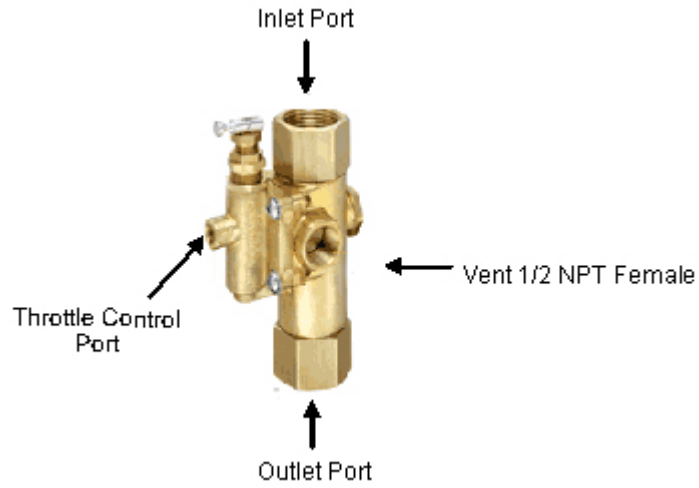
A Diagram of a Reciprocating Air Compressor is shown below:



In some systems the compressed air is forced from the air receiver into storage containers. These containers allow the compressed air to be used later as needed.
Some systems may use several connected air compressors. The air is drawn into the first compressor and then forced into the second compressor. The second compressor then forces the compressed air into the next compressor. This occurs until the air has passed through all of the connected compressors. Each time the air passes through a compressor the air pressure is increased. Finally the compressed air is forced into the hose line or a storage container. This system is used when there is a need for air under very high pressure.

SAFETY COMPONENTS OF THE AIR COMPRESSOR

The air compressor is fitted with several safety components. These components are briefly described below. The first is an **UNLOADING VALVE**. The unloading valve allows the air to escape from the compression chamber when there is a strain on the electrical motor. The strain usually occurs when the electric motor running the compressor is first started. After a few cycles of the motor the valve is closed. In most air compressors the unloading valve operates automatically. However in older compressors it may need to be manually operated. The manufacturer's instruction manual should be followed when starting an older compressor. Note a picture of an unloading valve on the next page:



UNLOADING VALVE

A secondary valve called a **CHECK VALVE** ensures that compressed air does not flow out when the unloading valve activates. A check valve prevents the backflow of air from the tank to the compressor head. Through the fitting, the air from the compressor head can flow out the unloading valve line. When the compressor stops after reaching cut out pressure, it commonly also activates the unloading valve.

An air compressor tank check valve must be installed between the air compressor head air line and the unloading valve air line. If this was not accomplished air would escape as soon as the air compressor stopped and the unloading valve opened. The air would bleed off from the compressor piston, and all of the air in the compressor tank would escape into the atmosphere. When the air compressor is operating properly, the pressure switch calls for air and turns on the electric compressor motor. The unloading valve is closed at the same time and air can no longer be released. **Note the Photo of a Check Valve below:**

A **PRESSURE GAUGE** is installed as part of the compression unit. It indicates the pressure inside the air receiver. The Certificate of Fitness holder should pay close attention to the reading

on the pressure gauge. The pressure inside the air receiver must never exceed the manufacturer's recommendations. If the pressure is greater than the recommended level it may cause an explosion. The pressure in the air receiver is controlled by the pressure switch. Simply turn the switch in the desired direction to adjust the pressure.

PRESSURE RELIEF VALVES are also installed on the system. These valves allow air to escape from the system when the pressure is too great. The valves operate automatically. They may also be operated manually by pulling on the ring attached to the pressure relief valves.

The **AIR INTAKE VALVE** is fitted with an air filter. The filter prevents dust from being drawn into the compression cylinder. If dust enters the compressor it may result in a fire inside the cylinder. The heat inside the cylinder can cause the dust to catch fire. A fire inside the cylinder may cause damage to the air compressor. For this reason it is important make sure that the air filter is clean and securely connected to the compressor.

Moisture can cause problems when using an air compressor to power machinery. For this reason another filter must be installed to take out the moisture out of the compressed air. The moisture is usually removed using a **FILTER AND MOISTURE SEPARATOR ASSEMBLY (FMSA)**. The FMSA is installed between the air compressor and the air receiver. It removes the moisture and dust from the compressed air before it enters the air receiver. A drain cock is attached to the FMSA. It is used to drain the water and dirt from the FMSA. **Note the Photo of an FMSA below:**

FILTER AND MOISTURE SEPARATOR ASSEMBLY

An **AUTOMATIC CONTROL DEVICE** is attached to the air receiver. It controls the starting and stopping of the air compressor. It shuts down the compressor when the air pressure in the air receiver is adequate. It then restarts the air compressor when there is a need for more pressure.
The **SAFETY RELIEF VALVES** keep an air compressor tank from bursting should your pressure switch stop working.

Note below the Photo of a Safety Relief Valve:

A SAFETY RELIEF VALVE

Note below the Photo of a Destroyed Air Compressor after Safety Relief Valve Failure:

Sometimes a **CONSTANT SPEED CONTROL SWITCH** is installed on the system. This is used when there is a steady or constant demand for compressed air. The switch allows the air compressor to run continuously. The compressor runs at a safe speed while supplying the desired amount of compressed air. If the demand drops the excess compressed air is simply allowed to escape into the atmosphere. The unneeded compressed air is released through the pressure release valve.

A **COOLING SYSTEM** is installed in each air compression unit. The compression chamber and the compressed air must be cooled. Small compressors are usually air-cooled. The air is circulated around the compressor by a fan. Large air compressors are usually water-cooled. Cold water is pumped throughout the compressor. Both the air and water-cooling systems prevent the compressors from overheating and causing serious damage.

The air compressor is also fitted with a **LOW OIL LEVEL INDICATOR SWITCH**. This indicator switch will automatically shut down the air compressor if the oil level is low. The compressor should not be operated if the oil is low. This can cause serious damage to the compressor. Do not attempt to run the air compressor until the oil is replaced.

PART 3. MAINTENANCE & SAFETY PROCEDURES

When starting the compressors be sure to follow the guidelines outlined by the manufacturer when performing maintenance or making repairs.

The entire system must be visually inspected by the Certificate of Fitness holder before the air compressor is started. This visual inspection should make sure that the components listed on the following pages are correctly installed and in good working order.

The Certificate of Fitness holder should remain in the area for a few minutes after the air compressor has been started. This is to make sure that the compression unit is operating safely. Make sure that the air compressor is operated at safe speeds. Do not run the compressor at speeds above its recommended operating range. The operating range is indicated in the manufacturer's manual. Always remember that compressed air can be dangerous. Dust or debris blown off your clothing by an air compressor can drive either of those under your skin resulting in death. An eardrum can be ruptured at a blast level of 40 PSI. Compressed air entering through the mouth can destroy your lungs and rupture other internal organs. Eyesight can be easily damaged. Always wear safety glasses when operating an air compressor.

Never place any combustible materials on the air compressor. These materials may be ignited by the high operating temperatures of the air compressor. Do not use air compressors near devices, machinery or equipment which produce heat. Solar heat is not known to cause overheating of an air compressor tank.

Never make repairs to the compressor while it is running. The compressor must always be turned off when making repairs. As an added precaution, the electrical supply to the machine should be shutdown. Compressed air should also be drained from the compressor before starting any work.

The air compressor should be serviced and repaired by a qualified repair technician. An oil leak, for example, can be extremely hazardous. This is especially true in a garage where torches or flames are used. Another example pertains to maintenance. The NYC Fire Code no longer requires an affidavit indicating an air receiver is hydrostatically tested, and defect free. A hydrostatic test every 5 years at a minimum is nonetheless recommended to ensure the integrity of the tank.

All major repairs must be made by a qualified technician; however, the Certificate of Fitness holder may make minor repairs and perform maintenance on the air compressor. For example, certificate of fitness holders must know how to correct the air compressor’s cooling system. They may replace belts, change the air intake filter, and the lubrication oil. A Certificate of Fitness holder must look and listen for leaks. Leaks are more prominent during the colder months when sealing materials shrink. A Holder must pay close attention to the air receiver tank, compressor tubing and fittings as these are the locations where leakage most typically occurs. They must know how and when these tasks should be accomplished. An incorrectly maintained air compressor is a potential fire hazard.

An air compressor and its storage tanks may be cleaned using a soap and water solution. Never use benzene, kerosene or other light oils for this purpose. These oils may cause an explosion if mixed with air under pressure. It is important to point out that both oil and water can be dangerous and cause an explosion if they actually enter an air compressor tank.

MAINTENANCE FOR AIR COMPRESSOR SYSTEM COMPONENTS

Note maintenance information concerning the various air compressor system components as follows:

The Cooling System

The cooling system should be tested every 6 months to make sure that it is working correctly. The water supply control valves should always be open when the air compressor is in operation.

The Air Intake Filter

The air intake filter should be inspected and cleaned weekly. It should be replaced every 6 months. If at any time the filter is damaged it should be replaced.

The Lubrication Oil

The Certificate of Fitness holder should refer to the manufacturer's manual to determine the safe operating temperatures of the lubrication oil. The level of the lubricating oil (lube oil) should be checked weekly using the dipstick. The lube oil is designed to lubricate the moving parts on the air compressor. The oil used must be of the grade specified by the compressor manufacturer. The lube oil should be replaced every six months.

The Automatic Low-level Oil Indicator Switch

The automatic low-level oil indicator switch should be tested every 3 months. This is tested by manually draining the oil from the air compressor when it is running. The indictor switch will shut down the air compressor within a few minutes if it is working correctly. When testing the compressor in this way, do not run the air compressor for a long period of time. If the switch is defective, it should be repaired or replaced. The air compressor should be refilled with oil before it is used again. **Note the Photo of the Oil Drain Valve below:**

OIL DRAIN VALVE

The Air Receiver

Water builds up in the moisture separator assembly and the air receiver must be drained daily; however, there is one exception. Do not drain moisture from the air compressor when the ambient temperature drops below 40 degrees Fahrenheit. This is done by opening the drain valve and draining off the excess water. All safety valves should be manually operated every week. This is to ensure that they will function correctly in case of an emergency. It is recommended that the air receiver tank be pressure tested at a minimum of every 5 years by a qualified technician.

The Hose Connections

All hose connections on the air compressor should be checked frequently by the Certificate of Fitness holder to make sure that they are tight. Never twist, bend or curl an air hose to stop the air hose. That's the job of the air valve. You should not patch a leaking hose with duct tape. You can replace the hose, or you can repair the leak by cutting out the bad section and joining the hose back together with a connector and clamps. The safety valves and gauges should be checked regularly to make sure that they are in good working order.

The Belts

The belts must be inspected by the Certificate of Fitness Holder to make sure that the air compressor is running at the correct speed. First turn off the compressor and disconnect the power supply. If the belts are covered by a protective guard, remove the guard. If the belts are frayed or visibly damaged they must be replaced. To test the belt tension, firmly press down on the belt. If the belt moves more than one the inch, the flywheel may need to be adjusted. Make the adjustments as needed. If the adjustment does not work replace the belts with the belts as specified by the manufacturer.

The Electrical Connections

All electrical connections, fuses, and cables must be visually inspected by the Certificate of Fitness holder. A qualified electrician must be notified if there is evidence of any defective parts. The electrician must pay close attention to the motor starter. The motor starter protects the compressor against thermal overload. Thermal overload is caused by excessive electrical currents.

The Pressure Switch

It is essential that the Certificate of Fitness holder ensures the pressure switch is working correctly. The pressure switch is a pressure regulating device. It shuts down the air compressor when pressure in the air receiver reaches a certain preset level. Then it restarts the compressor when the pressure falls below a certain level. The shut down and restart levels depend on the size of the compressor and the demand for compressed air. The pressure switch prevents the air pressure inside the tank from reaching dangerous levels. Dangerously high pressure levels may cause the tank to rupture or explode. The steps to test the pressure switch are as follows:

1. Start the air compressor. Allow the pressure in the air receiver to build up to normal operating levels. Pay close attention to the pressure gauge.

2. When the gauge indicates that the pressure is above normal operating levels the pressure switch should shut down the compressor automatically. If the compressor does not shut down automatically the pressure switch may be adjusted. If the adjustment does not correct the problem, the switch is defective. A defective pressure switch must be replaced before the compressor may be restarted.

Some air compressors are designed to operate continuously. They have a different pressure switch device. This device does not shut down the entire air compressor. Rather it allows the compressor to run but prevents the compressor from compressing air. The testing procedures should check that air is no longer compressed when the preset level is reached. The air compressor must have a warning label indicating the level of pressure which is considered dangerous. This should be clear in the air compressor manual as well.

The Pressure Relief Valve

The Certificate of Fitness holder must test the pressure relief valve to ensure it is working safely and efficiently. The pressure relief valve acts as a backup safety device to the pressure switch. It is designed to automatically open when the pressure in the receiver reaches dangerous levels. The pressure relief valve is tested by running the air compressor with the pressure switch fully open. When the pressure switch is fully open it cannot shut down the compressor.

The valves should be set no less than 15 psi or 10 percent (whichever is greater) above the operating pressure of the compressor but never higher than the maximum allowable working pressure of the air receiver. If the pressure relief valve does not open it may be defective. The valve may also be defective if it opens before the receiver reaches normal operating pressure. Defective relief valves must be replaced before the compressor is restarted. The Certificate of Fitness holder must also check to make sure that the pressure relief valve is of the correct size. The pressure relief valves must meet the manufacturer's specifications. These specifications are outlined in the air compressor maintenance manual.

The Operating Temperature

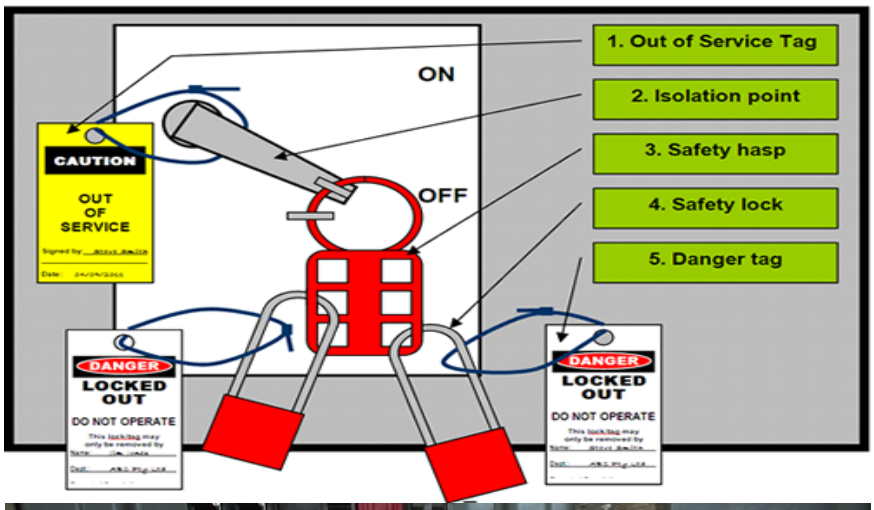
The air compressor must be tested to make sure that it is running within normal operating temperature ranges. Guidelines for acceptable operating temperatures are specified in the maintenance manual. This test reduces the likelihood of the air compressor overheating. Overheating may cause irreparable damage to the compressor. An overheating air compressor is a potential fire hazard. If an overheating problem is discovered the water cooling mechanisms must be checked. The cooling mechanism is tested to make sure that an adequate water supply is reaching the air compressor. Any blockages, leaks or other defects must be repaired or defective parts replaced.

Lockout/Tagout Safety Procedures

Lockout/Tagout is a safety procedure which is used in industrial and research settings to ensure that dangerous machines are properly shut off and not started up again prior to the completion of maintenance or servicing work. This may include machinery making use of compressed gases, such as an air compressor. It requires that power sources be "isolated and rendered inoperative" before any repair procedure is started. "Lock and Tag" entails locking the device or the power source with a hasp, and placing it in such a position that no hazardous power sources can be turned on. The procedure also requires a tag to be affixed to the lockout device indicating that it should not be turned on.

The OSHA standard for "The Control of Hazardous Energy (Lockout/Tagout),Title 29 CFR, Part 1910.147 addresses the practices and procedures necessary to disable machinery or equipment, thereby preventing the release of hazardous energy while employees perform servicing and maintenance activities. The Certificate of Fitness holder should have an understanding of how this regulation applies to his or her work environment.

Machine operators, craft workers and laborers are among the 3 million workers who service equipment and face the greatest risk. Compliance with the lockout/tagout standard prevents an estimated 120 fatalities and 50,000 injuries each year. Workers injured on the job from exposure to hazardous energy lose an average of 24 workdays for recuperation.



Lithium-ion safety

Lithium-ion batteries are rechargeable batteries found in electric bikes, scooters, cars, laptops, tablets, phones, and many other common household devices.

Lithium-ion battery fires have caused deaths, serious injuries, and devastating damage to property around the city. It's important to follow rules for safe storage, charging, and disposal for these types of batteries.

If you own a lithium-ion powered device or plan to buy one, the FDNY has important safety tips that you should follow. These tips apply to all devices powered by lithium-ion batteries, including phones, tablets, laptops, e-cigarettes, toys, high-tech luggage, and even robotic vacuum cleaners.

Immediately stop using or charging battery and call 911 if you notice:

- **Fire or Smoke**
- **Overheating**
- **Change in color or shape**
- **Odd noises**
- **Leaking**
- **Strange smell**

ALWAYS:	NEVER:

• purchase and use devices certified by a Nationally Recognized Testing Laboratory (NRTL).
• follow the manufacturer's instructions for:
  • charging and storage.
  • correct battery, cord, and power adapter
• keep exit path clear at all times.
• plug directly into a wall electrical outlet for charging.
• keep batteries and devices at room temperature.
• store and/or charge batteries away from anything flammable.
• keep away from heat sources.
• bring batteries to a **NYC Battery Recycling Center.** Visit nyc.gov/batteries for more information.
	• use aftermarket batteries or chargers.
	• use damaged or altered batteries
	• plug into a power strip or overload an outlet.
	• overcharge or leave battery charging overnight.
	• charge a battery or device under your pillow, on your bed, or near a couch.
	• leave e-bikes or e-scooters unattended while charging.
	• block your primary way in or out of a room/space with e-bikes, e-scooters, wheelchairs, etc.
	• place batteries in Trash or Recycling bin. **It is ILLEGAL.** Visit nyc.gov/batteries for disposal locations and information.

In the event of a Fire,
Leave and CLOSE the door.
Call 911 once you are in a safe location.

Charging Lithium Ion

Lithium-ion batteries do not have to be fully charged; partial charge is the most suitable.
When **charging more than five (5)** personal mobility devices or their removable batteries, it must be in a **dedicated room with ventilation** and a self-closing door.
For a total battery capacity of 20 kilowatt-hours (kWh), a 2-foot separation between charging batteries is required. For a total battery capacity up to 50 kWh, a 3-foot separation is needed.

Chargers must only be used with a compatible battery pack. The original equipment manufacturer (OEM) charger interplays with the battery pack using the battery management system (BMS). The wrong battery/charger combination may not work safely. For example, the 100% cutoff to prevent overcharging, which damages batteries, may not work which can easily create hazardous conditions such as fires, explosions and/or injuries.

Always check with the manufacturer or retailer of the personal mobility device, an authorized repair shop or a testing laboratory such as Underwrites Laboratories (UL) to see if replacement is recommended or listed and safe for use with that device. Using unauthorized parts, including batteries and/or chargers, may cause damage, fire and possibly void your warranty.

Extinguishing Lithium-ion

Water may not prevent a battery from burning and spreading. Battery cells are known to explode and quickly spread to another battery. It can spread to another devices.

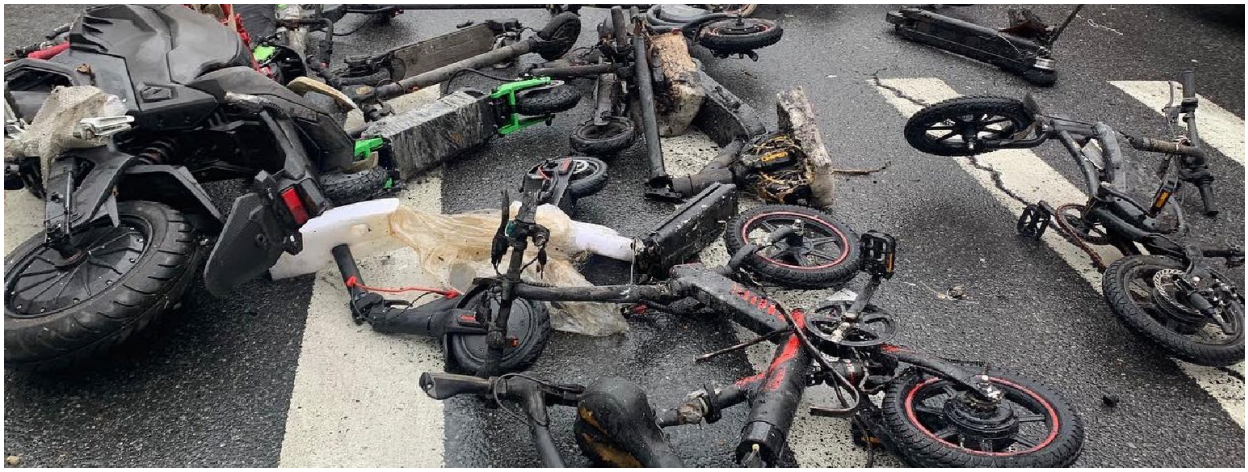
Fire Extinguishers
do not work
on lithium-ion batteries fires.

Unexpected Re-ignition.

Reignition is common. Lithium-Ion Batteries are known to unexpectedly re-ignite (without warning) minutes, hours and even days after all visible fire has been put out.

Lithium-ion batteries can enter an uncontrollable, self-heating state. This can result in the release of gas, cause fire and possible explosion.

These batteries may continue to generate heat even when there is no visible sign of fire. Once heat reaches a certain level fire may reignite on the battery and surrounding area.



FIRE EXTINGUISHERS

At least one portable fire extinguisher having the appropriate size and rating shall be provided in the storage area. Portable fire extinguishers shall be located in conspicuous locations, along normal travel paths, within a 30-foot travel distance, where they will be readily accessible and immediately available for use.

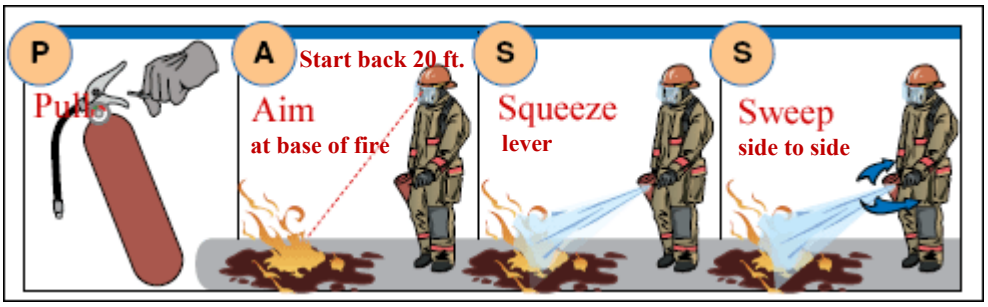
Travel Distance is the actual walking distance from any point to the nearest fire extinguisher.

According to the ***National Fire Protection Association (NFPA)*** **and** ***Fire Department Rule****,* fire extinguishers are categorized according to their compatibility with the fuel they are expected to extinguish, or the danger of energized electrical equipment. Fuels include four basic groups: wood, liquids, metals, and animal fats; and the hazard of electrical conductivity. Further, extinguishers are designated by alphabetical letters and symbols as shown in the table below:

CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
A	Wood, paper, cloth, trash & other ordinary materials.	
B	Gasoline, oil, paint and other flammable liquids.	
C	May be used on fires involving live electrical equipment without danger to the operator.	
D	Combustible metals and combustible metal alloys.	
K	Cooking media (Vegetable or Animal Oils and Fats)	

In case of any fire, immediately call 911.

Fire extinguishers must be used in accordance with the instructions painted on the side of the extinguisher. They clearly describe how to use the extinguisher in case of an emergency. The Certificate of Fitness holder should be familiar with the use of portable fire extinguishers. When it comes to using a fire-extinguisher just remember the acronym P.A.S.S. to help make sure you use it properly. **P.A.S.S. stands for Pull, Aim, Squeeze, Sweep.** An example of these instructions is depicted in the picture below.



Portable fire extinguisher (PFE) tags

Installed portable fire extinguishers must have an FDNY standard PFE tag affixed. This tag will have important information about the extinguisher. By November 15, 2019, all portable fire extinguishers must have the new PFE tags. The FDNY will only recognize new PFE tags and will be issuing violations to business that have PFE installed without a proper tag.

The color of the fire extinguishers may be changed by the FDNY every few years. The FDNY recommends two ways to verify the tag's legitimacy:

1. Hologram:

A real hologram strip shown on the tag is 3 inches long by ¼ inch wide. Counterfeit tags will NOT have a high-quality silver hologram. The hologram on a counterfeit tag will NOT change color as it is moved against the light.

2. QR code

IF you scan the QR code, it should direct you to the updated FDNY approved fire extinguisher company list. You can use the company list to verify if the company printed on the list is currently approved by the FDNY.

If your PFE tags cannot be verified via these two methods, contact your supervisor. If you suspect your PFE is a counterfeit, contact FDNY immediately by e-mail: Tags.Decal@fdny.nyc.gov

PFE tag (This tag is released for 2021-2023)

If your PFE tags look different than the one pictured above, contact your supervisor.
If you suspect your PFE is a counterfeit, contact FDNY immediately by e-mail: Tags.Decal@fdny.nyc.gov

Portable Fire Extinguisher Inspections

MONTHLY

The portable fire extinguishers are required to be checked monthly. The owner of the business is responsible to select a person to do a monthly inspection. This monthly inspection is called a "quick check".

The **QUICK CHECK** should check if:

(1) the fire extinguisher is fully charged;
(2) it is in its designated place;
(3) it has not been actuated or tampered with;
(4) there is no obvious or physical damage or condition to prevent its operation.

The information of the monthly inspection record must include the date of the inspection, the name/initials of the person who did the inspection. This monthly quick check is documented on the back of the PFE tag or by an approved electronic method that provides a permanent record.

ANNUALLY

At least annually all Portable Fire Extinguishers must be checked by a W-96 Certificate of Fitness holder from FDNY approved company. After each annual inspection W-96 COF holder will replace the PFE tag. The information of the annual inspection record must be indicated on the new PFE tag.

Notifications:

The person responsible for the supervision of air compressors should notify the site safety manager if an unsafe condition has been created. Any person who becomes aware of a fire or explosion or any other emergency shall immediately report such emergency to the Fire Department (Call 911). No owner or other person shall issue any directive or take any action to prevent or delay the reporting of a fire or other emergency to the Fire Department. After calling the Fire Department, the supervisor or the site safety manager or other designated person should also be notified.

The Certificate of Fitness holder must know the locations of and how to operate all fire extinguishing devices, control devices, and fire alarm stations installed at the facility. In case of a fire, explosion, major spill or emergency, **the Certificate of Fitness (C of F) holder must notify the Fire Department by calling 911 immediately**.

After notification by phone, the local fire alarm must be sounded. In some cases, the activation of the fire alarm will transmit a signal to the Fire Department via a FDNY approved central station company. The C of F holder shall initiate an orderly evacuation when necessary, following a hazardous incident, and take reasonable steps to isolate the hazard until the Fire Department arrives. The Certificate of Fitness holder must answer any questions asked by Firefighters and officers when they arrive. For example, he or she must indicate the location of the fire, describe the type of fire protection devices available, and describe the materials stored on the fire floor. The Bureau of Fire Prevention must be notified as soon as possible after an

explosion or fire has occurred. The Bureau of Fire Prevention may require a detailed report on the causes and the consequences of the explosion or fire. Generally, this report must be filed within ten days after the incident.