

**AUTOMOTIVE BODY REPAIR AND PAINT WORK  
LEVEL II  
BASED ON MARCH, 2022, CURRICULUM VERSION I,**



**Module Title: Touching Up Minor Vehicle Paintwork Damage**

**Module code: EIS BRP2 M10 0322**

**Nominal duration: 60Hour**

**Prepared by: Ministry of Labor and Skill**

**September, 2022  
Addis Ababa, Ethiopia**

## ACKNOWLEDGMENT

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## Introduction to the Module

This unit describes the skills and knowledge required to prepare spray painting equipment and applies paint materials to minor vehicle paintwork damage. This unit involves preparing for the task, selecting and using specialist tools and equipment, mixing and matching paint and touching up painted surfaces to pre-damage condition, and completing workplace processes and documentation.

### This module covers the units :

- Prepare to apply paint touch-ups
- Apply touch-up paint
- Complete work processes

### Learning Objective of the Module

- Prepare to apply paint touch-ups
- Apply touch-up paint
- Complete work processes

### Module Instruction

For effective use this modules trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Perform Operation Sheets which were provided at the end of units
4. Do the “LAP test” giver at the end of each unit and
5. Read the identified reference book for Examples and exercise

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## Unit one: Prepare to apply paint touch-ups

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Accessing and interpreting touch-up information
- Selecting and inspecting paint materials
- Identifying hazards and managed risks
- Planning work

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Access and interpret touch-up information
- Select and inspect paint materials
- Identify hazards and managed risks
- Plane work

### 1.1 Accessing and interpreting touch-up information

Automotive touch up repair” means the application of automotive topcoat finish materials to cover minor finishing imperfections less than or equal to one inch in diameter.

A car that is used is bound to obtain a few paint chips. Debris from the road kicks up while driving to chip the sides, adverse weather can wreak havoc on the hood, and accidents can happen any time. These chips are usually too small to warrant a new paint job or professional assistance at all. However, if the affected area is smaller than a pencil eraser, you can use touch-up paint to repair the damage yourself

#### 1.1.1. Work instructions

A document describing specific activities and tasks containing a great amount of detail. As a component of a process, defines how one or more activities in a procedure should be executed in detail, using technology or other resources. A Document containing detailed instructions that specify exactly what steps to follow to carry out an activity. A work instruction contains much more detail

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than a Procedure and is only created if very detailed instructions are needed. Work Instructions describe how the activity is performed.

How to write step-by-step instructions

Describe the detailed instructions for the work. Identify roles and responsibilities.

Give each activity its own title.

One role activities. Don't combine two roles in the same step.

Number each step.

Use consistent formatting.

Document control-Version

Date, Doc name, Detail of change, Review date, etc.

### 1.1.2 Job specifications

A job specification is a written statement of educational qualifications, specific qualities, level of experience, physical, emotional, technical and communication skills required to perform a job, responsibilities involved in a job and other unusual sensory demands. It also includes general health, mental health, intelligence, aptitude, memory, judgment, leadership skills, emotional ability, adaptability, flexibility, values and ethics, manners and creativity, etc.

#### **Purpose of Job Specification**

Described on the basis of job description, job specification helps candidates analyze whether are eligible to apply for a particular job vacancy or not.

It helps recruiting team of an organization understand what level of qualifications, qualities and set of characteristics should be present in a candidate to make him or her eligible for the job opening.

Job Specification gives detailed information about any job including job responsibilities, desired technical and physical skills, conversational ability and much more.

It helps in selecting the most appropriate candidate for a particular job.

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## II, Job Specification Information: -

The first step in the programmer of job specification is to prepare a list of all jobs in the company and where they are located. The second step is to secure and write up information about each of the jobs in a company. Usually, this information about each of the jobs in a company. Usually this information includes:-

Physical specifications: - include the physical qualifications or physical capacities that vary from job to job. Physical qualifications or capacities include physical features like height, weight, chest, vision, hearing, ability to lift weight, ability to carry weight, health, age, capacity to use or operate machines, tools, equipment etc.

Mental specifications: - include ability to perform, arithmetical calculations, to interpret data, information blue prints, to read electrical circuits, ability to plan, reading abilities, scientific abilities, judgment, ability to concentrate, ability to handle variable factors, general intelligence, memory etc.

Emotional and social specifications: - are more important for the post of managers, supervisors, foremen etc. These include emotional stability, flexibility, social adaptability in human relationships, personal appearance including dress, posture etc.

Behavioral Specifications: - play an important role in selecting the candidates for higher-level jobs in the organizational hierarchy. This specification seeks to describe the acts of managers rather than the traits that cause the acts. These specifications include judgments, research, creativity, teaching ability, maturity trial of conciliation, self-reliance, dominance etc.

### 1.1.3 Workplace Health and Safety (WHS) requirements

**Safety** means protecting yourself and others from possible danger and injury. You do not want to get hurt, and you do not want to hurt others. But you could hurt yourself or others if you become careless and thoughtless

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## Work Safety

### A. Knowledge during the work

Always work safely to prevent injuries.

Take care to prevent accidents to yourself.

### B. Factors of the accidents

Accidents due to human factors: Accidents caused by the improper use of a machine or tool, by wearing inappropriate clothes, or by the carelessness of the technician.

Accidents due to physical factors: Accidents caused by the malfunctioning of a machine or tool, the lack of integrity of a safety device, or a poor working environment.

### C. In the Workshop

Always keep your workplace clean to protect yourself and others from injury. Do not leave tools or parts on the floor where you or anyone else. They might trip over them. Make a habit of putting them on a workbench or work stand. Immediately clean up any spilled fuel, oil, or grease to prevent yourself or others from slipping on the floor. Do not assume an uncomfortable posture while working. It will not only affect your work efficiency but it could cause you to fall and injure yourself. Be extremely careful when handling heavy objects because you could be injured if they dropped on your feet. Also, remember that you could hurt your back if you try to lift an object *that* is too heavy for you. To move from one area of the workplace to another, make sure to walk on a designated walkway.

#### 1.1.4 Protective clothing and equipment

Hazards exist in every workplace in many different forms: sharp edges, falling objects, flying sparks, chemicals, noise and a myriad of other potentially dangerous situations. Controlling a hazard at its source is the best way to protect employees.

Personal protective equipment, commonly referred to as “PPE”, is equipment worn to minimize exposure to a variety of hazards..

All PPE clothing and equipment should be of safe design and construction, and should be maintained in a clean and reliable fashion.

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PPE is defined in the Regulations as „all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects him against one or more risks to his health or safety’,

### **Personal protective equipment**

Personal protective equipment (PPE) is protective clothing, helmets, goggles, or other garments or equipment designed to protect the wearer's body from injury or infection. The hazards addressed by protective equipment include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter.

## **1.2 Selecting and inspecting paint materials**

### 1.2.1 Types of Paints’

**Show car paint** professionals often have certain techniques that they use when painting vehicles. These techniques not only provide a good exterior finish, but also protect the metal from oxidation.. Some paints that are commonly used by paint pros include Hi-Grade Automotive Enamel, Durability Plus Catalyzed Enamel, Single-use Polyurethane paints with sealers and base coat with urethane clear coats.

#### **Oil-based paints:-**

For oil based paints, linseed oil was chosen because it is drying oil. When thinned with organic solvents such as turpentine for easier oil, its drying speed was enhanced.

To make the drying even faster, drying agents such as cobalt com were frequently added. Because the addition of driers was most done in hot or boiling oil, boiled linseed oil was preferable.

The dry of linseed oil paints was relatively rapid first, for several day immediately after application, and paint soon felt dry to the touch. Important to remember, however, that linseed oil paint continues precisely to crosslink, over decades and thus continues brittleness as the paint ages

#### **Water -based paints: -**

Water-based and solvent-based paint technologies are similar in their core composition. Both contain pigment for color, a binder to form the paint film, and a carrier that transports the pigment and binder through the spray gun onto the surface being painted.

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The key difference is the carrier: solvent or water. When it's water, painters must adjust their mixing, spraying, and drying techniques. Water base paints were fairly strong, with the pigments well bounds in hide glue distempers', but they did not hold up to abrasions.

### **Synthetic paints:-**

An alkyd resin is made by reacting a natural drying oil with a hard, synthetic material.

A chemical used in very small amounts to control the growth of bacteria and fungi in paint.

Biocides are used to prevent spoilage of paint in the can and to prevent fungal attack of the dried paint film.

### **Vinyl paints**

Vinyl paint is a water-based paint containing vinyl plastic that is designed to stick to surfaces such as siding, floors, plastics and seat covers. The vinyl paint soaks into the surface of the material, becoming part of the original surface. Most vinyl paint is opaque and does not easily come off the surface. However, some surfaces resist the application of vinyl paint.

There are many different formulas for vinyl paint, all designed for specific tasks.

### **Benefits**

One of the main benefits of using vinyl paint rather than another formula of paint is that vinyl paint offers great coverage. While other paints require two or even three coats, one coat of vinyl paint is almost always as much as you need to apply. Because vinyl paint is flexible, it lasts longer on well-used areas. Even old vinyl seats that have been recovered with vinyl paint will remain painted after extended use.

### **Undercoats**

Undercoat and primer paint may seem to be one and the same. However, the two are actually poles apart. While the primer paint is used right before painting a new surface, the undercoat paint is used before painting a surface that has been painted in the past. In other words, an undercoat can be a primer but a primer is never an undercoat.

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Since primers and undercoats are completely distinct therefore they must be chosen with care. Think of the project you have at hand before you purchase any one of the two. You can make your choice after taking into consideration the substrate in question that has to be painted.

An **undercoat's** key purpose is to provide a smooth, uniform, even surface for topcoats. They are particularly useful with enamel topcoats, because they supplement topcoat film thickness and help impart a more substantial, denser finished look.”

### **Lacquers**

Often used to refer to the clear or colored finish that is used to furnish works to give them a more polished look whilst serving as a form of protection, lacquer is a type typically denotes a paint that dries up as the solvent evaporates leaving a hard, durable and shiny.

Lacquer can provide glossy or resinous, which is usually hard and smooth. The clear type lacquers would provide a slightly yellow look to the material that they are applied on, whereas the colored once would give the desired hue. Lacquer coating is different from varnish coating due to the chemical construction, colour and durability of it.

.Using lacquer to coat can be an ideal method to protect them against different harmful agents such as water and oil. This method also gives a very presentable look with options to customize it in anyway a person wants.

### **Enamels**

Enamel paint is paint that air-dries to a hard, usually glossy, finish, used for coating surfaces that are outdoors or otherwise subject to hard wear or variations in temperature; it should not be confused with decorated objects in "painted enamel", where vitreous enamel is applied with brushes and fired in a kiln. The name is something of a misnomer, as in reality, most commercially available enamel paints are significantly softer than either vitreous enamel or shoved synthetic resins, and are totally different in composition; vitreous enamel is applied as a powder or paste and then fired at high temperature. There is no generally accepted definition or standard for use of the term enamel paint, and not all enamel-type paints may use it.

Typically the term "enamel paint" is used to describe oil-based covering products, usually with a significant amount of gloss in them, however recently many latex or water-based paints have adopted

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the term as well. The term today means "hard surfaced paint" and usually is in reference to paint brands of higher quality, floor coatings of a high gloss finish, or spray paints. Most enamel paints are alkyd resin based. Some enamel paints have been made by adding varnish to oil-based paint.

### **Paint thinners and paint reducers**

Thinners and reducers in automotive paints are both solvents used to thin paint. These additives make the paint flow better so the result is even, professional coats. While the purpose of the two is basically the same, thinners and reducers are used on very different paints. Using the wrong one could ruin your paint.

### **Paint Type**

The main difference between thinners and reducers is in the paint type that is being applied. Thinners are for lacquer-based paints. Reducers are used for urethane-based paints. The two solvents are not interchangeable. For example, if the paint is an enamel-based product, do not use a thinner, but rather a reducer.

### **Manufacturer Instructions**

Each brand of automotive paint will come with instructions on which solvent to use and what the mixing requirements are for the paint and solvent. It is very important that you follow the directions from the manufacturer exactly to get the best results. The paint will tell you explicitly whether a thinner or a reducer should be used to thin the paint.

### **Signs of Mismatched Solvents**

Some symptoms that the solvent used was incorrectly matched to the paint include poor gloss and adhesion, dullness, chalking, cracks or splits, blisters, sanding swell, blushing or bleed-through of color..

## **1.3. Identifying hazards and managed risks**

### **Factors of the accidents**

1. Accidents due to human factors: Accidents caused by the improper use of a machine or tool, by wearing inappropriate clothes, or by the carelessness of the technician.
2. Accidents due to physical factors: Accidents caused by the malfunctioning of a machine or tool, the lack of integrity of a safety device, or a poor working environment.

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## **Hazard due to Faulty Working Habits or Conditions**

Here are some of the major hazards that might be due to working habits of the employees or to the general working conditions:

1. Smoking while handling dangerous materials such as gasoline or solvents. This can result in a major fire or explosion.
2. Careless or incorrect handling of paint, thinners, solvents, or other flammable fluids.
3. Blocking exits. Areas around exit doors and passage ways leading to exits must be kept free of all obstructions. If you wanted to get out in an emergency, for example, when a fire or explosion occurred---a blocked exit could mean serious injury or even death

## **The hazards and types of PPE to control**

### **Eyes**

Hazards: chemical or metal splash, dust, projectiles, gas and vapor, radiation

.Options: safety spectacles, goggles, face shields, visors

### **Head**

Hazards: impact from falling or flying objects, risk of head bumping, hair entanglement.

Options: a range of helmets and bump caps.

### **Breathing**

Hazards: dust, vapor, gas, oxygen-deficient atmospheres.

Options: disposable filtering face piece or respirator, half or full-face respirators, air-fed helmets, breathing apparatus

### **Protecting the body**

Hazards: temperature extremes, adverse weather, chemical or metal splash, spray from pressure leaks or spray guns, impact or penetration, contaminated dust, excessive wear or entanglement of own clothing.

Options: conventional or disposable overalls, boiler suits, specialist protective clothing, that is chain-mail aprons, high-visibility clothing.

### **Hands and arms**

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Hazards: abrasion, temperature extremes, cuts and punctures, impact, chemicals, electric shock, skin infection, disease or contamination.

Options: gloves, gauntlets, mitts, wrist cuffs, armlets

### **Feet and legs**

Hazards: wet, electrostatic build-up, slipping, cuts and punctures, falling objects, metal and chemical splash, abrasion.

**Options:** safety boots and shoes with protective toe caps and penetration resistant mid-sole, gaiters, leggings, spat.

## **1.4 Planning work**

### **Here are some of the most important tools in an auto body shop.**

Dual-Action Sander, Spray gun, Air compressors, Spray booths, Machine buffs and polishes, Mixing equipment, Paint stirring equipment, Paint straining and thinning equipment

### **Spray Equipment:-**

The application system required under this procedure must have these capabilities:-

Spray wands of various lengths.

Fan –shaped spray patterns covering 360 degree.

Safety Equipment: - Spray Safety (To prevent injury during spraying operations, wear theses protective equipment), NIOSH- (approved fume respirator or fresh-air system),

Preventive clothing, Rubber gloves, Face shield or safety glasses.

### **Before using hand tools inspect /check for the following:**

- ✓ The outside of the tool is free of grease, oil and accumulated foreign matter
- ✓ The tool has no visible cracks in jaws or handle
- ✓ Blades or bits are not damaged, cracked, etc.

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- ✓ Handles are not cracked, damaged or loose from heads of hammers, axes mauls and other similar tools
- ✓ Tips of screwdrivers, chisels or other similar tools show no excessive wear
- ✓ Gripping surfaces pliers, wrenches or other similar tools are not worn
- ✓ Tools such as chisels and punches do not have mushroomed heads
- ✓ Cutting tools such as chisels and axes are sharp
- ✓ Tool appears to be in generally good condition

**Before using portable power tools inspect for the following:**

- ✓ The outside of the tool is free of grease, oil and accumulated foreign matter
- ✓ Tool power-source shows no damage (cord, air line, battery, etc.)
- ✓ Tool is double insulated and tool housing is not damaged
- ✓ If so equipped, electrical cord third prong (ground) is intact
- ✓ All shields, guards or attachments required by OSHA or manufacturer are present
- ✓ Rotating or moving parts of tool are guarded to prevent physical contact
- ✓ Tool is not leaking fluid such as gasoline, oil etc.
- ✓ Blades or bits are not damaged, cracked, excessively worn, etc.
- ✓ Tool appears to be in generally good condition
- ✓ Proper PPE is available

**Spray painting equipment for the auto refinishing shop consists of:**

- ✓ Spray guns and cups (either suction or pressure feed)
- ✓ Air compressor of adequate size
- ✓ Oil and water extractor and air regulator combination to filter air and regulate pressure

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- ✓ Air hose of sufficient size(inside diameter) to convey air from the regulator to the spray gun without causing an excessive drop in pressure
- ✓ Spray booth or enclosure to ensure a healthy, safe, dust free working area.

### 1.4.1 SPRAY GUN

An air spray gun can be defined as a tool that turns a liquid in to tiny droplets by means of air pressure. This process is called atomization.

### PRINCIPAL PARTS OF SPRAY GUN

The principal parts or components of a typical air spray gun are illustrated in Figure below.. Some guns are equipped with a removal spray head unit containing the air cap, fluid tip, and fluid needle.

- or nozzle
- Fluid tip or nozzle
- Fluid needle valve
- Trigger
- Fluid control (or spreader) knob
- Air valve
- Pattern (or fan adjustment)control knob
- Gun body (or handle

### TYPES OF AIR SPRAY GUNS

As pointed out in table there are three basic methods of paint supply or feed to the air spray gun

- **Suction (or siphon) feed type**

**The suction feed type** air spray gun is by far the most used type in auto paint shops. The paint material is held in a 1-quart (0.94liter) cup attached to the gun.

The suction feed gun is by far the most popular type of gun in auto refinishing shapes for all types of work (spot, panel and overall).

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- **Compression feed type**

**The pressure feed** gun is mainly used for overall painting of vehicles (including trucks and vans), for spraying some heavier refinishing material that are too heavy to be siphoned from a container, or where volume painting is required..

- **Gravity feed type**

**In the gravity feed system**, the paint is supplied by gravity and the material is suction forced at the nozzle tip. This system is ideal for heavier material such as lightweight body filler. The handling of the gun is the same as suction feed type gun.

<b>TYPE</b>	<b>PAINT FEED METHOD</b>	<b>ADVANTAGES</b>	<b>DISADVANTAGES</b>
Suction feed type	<b>Paint container is installed below the spray nozzle and paint is supplied by suction force alone</b>	Stable gun operation, Easy to refill container or make color changes	Difficult to spray on horizontal surfaces and some variations occur in discharge volume due to variations in viscosity. Has a larger paint container than gravity feed type but this causes quicker painter fatigue.

Pressure type	Paint is pressurized by a compressed air taken or pump	Large surface can be paint without stopping to refill container or make colr changes	Not suitable for small area painting. Color changes and gun cleaning take time
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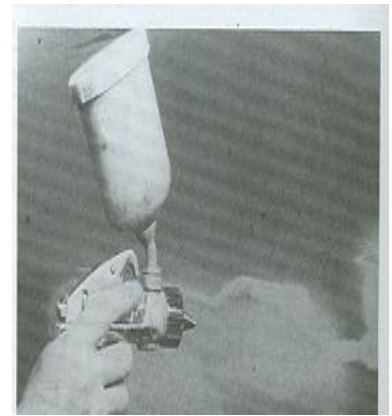
Gravity feed type	As the paint cup is installed above the spray nozzle, paint is supplied by gravity and a suction force at the nozzle yip.	Because there is no change in paint viscosity, there is no variation in the injection volume. The position of the cut can be changed according to the configuration of the painted item	Because the cup is installed above the injection nozzle, it adversely affects gun stability. Cup capacity is small so not useful for painting larger surface
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Suction feed type spray gun



Pressure feed type spray gun



Gravity feed type spray gun

Fig.1.2 three basic methods of paint supply

### High Volume Low Pressure (HVLP) Spray Gun

#### Item Description

Here we are offering a Professional 7-Piece HVLP Spray Gun Kit. Kit contains 1.8mm; 1.4mm and 1.0mm spray guns will allow you to spray a wide spectrum of coatings! This spray gun kit supplies low pressure through the air cap which makes the spraying softer, easily controlled and less overspray in high transfer efficiency. Ideals for basecoats, clear coats, single stages and primers.

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### Features:

Designed to provide equal atomization and particle size for all kinds of surface painting. Light weight, ergonomic design and easy trigger pivot reduces operating fatigue. Stainless steel nozzle and needle to allow use aqueous based paint for long time Precise 1.8mm, 1.4mm& 1.0mm stainless steel needle and nozzle set. 3 Knobs for full adjustment: fluid, pattern and air pressure controls. Two 1000ml and one 100ml aluminum cups with lids A aluminum carrying case w/ locks for easily taking with Comes with a air regulator with gauge as free gift

### Applicants:

1.8mm set-up is ideal for the atomization of primers, sealers, thinned latex/oil base, and other medium to heavy viscosity coatings. This 1.4mm set-up for spraying basecoats, clear coats, single stage and other light to medium viscosity coatings. 1.0mm spray gun used for tight areas, small jobs and touch up

### Specifications:

Spray Gun	Full Size Spray Guns		Mini Size Spray Gun
Nozzle Size	1.8 mm	1.4 mm	1.0 mm
Air Inlet	1/4"		
Type of Feed	Gravity		
Recommended Air Pressure	0-43 psi (0-2.9 bar)		0-30 psi (0-2 bar)
Max. Pressure of Air	43 psi (2.9 bar)		30 psi (2 bar)
Paint Capacity	1000 ml		100 ml
Average Air Consumption	5-10 cfm		1-4 cfm
Pattern Width	6.3"-9.4" (160-240mm)		3.1"-3.9" (80-100 mm)
Operating Pressure	87 - 116 psi		



Fig.1.3 Air Spray Gun Kit Two 1000ml and one 100ml aluminum cups with lids air regulator with gauge

#### 1.4.2 Compressed Air Supply Equipment

The compressed air supply system is designed to provide an adequate supply of clean, dry air at a predetermined pressure to insure efficient operation of all pneumatic equipment in the body shop. The system can vary in size from small portable units to large in-shop installations

An air compressor sometimes referred to as an air pump, can be one compressor or a series of compressors. The compressor is the "heart" of the system. The power source is generally an electric motor. (Portable gasoline-driven compressors are available for work outside the shop.) A portable piston compressor mounted on wheels may be adequate for small jobs and one air tool

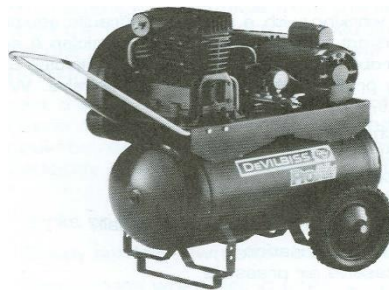


Fig.1.4 compressed air supply system

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## Compressor-Types

There are three basic types of air compressors: the diaphragm type, the piston type, and the rotary screw type

- **Diaphragm-Type Compressor**

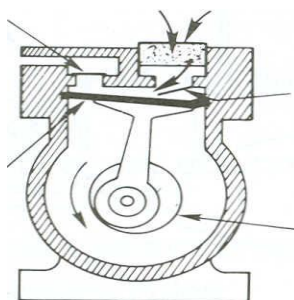
The *diaphragm-type compressor* uses a flexible synthetic rubber membrane to produce a pumping action. This type of compressor is often used on very small compressors to power small air brushes

- **Piston-Type Compressor**

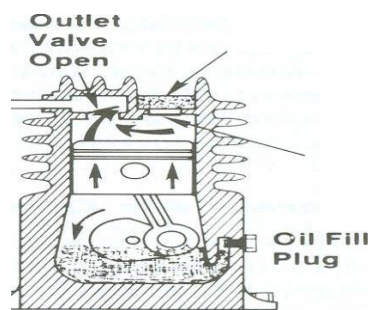
The *piston-type air compressor* pump develops compressed air pressure through the action of a reciprocating piston. Piston compressor pumps are available in single or multiple cylinder and single- or two-stage models. Selection depends on the volume and pressure required.

- **Rotary Screw Air Compressor**

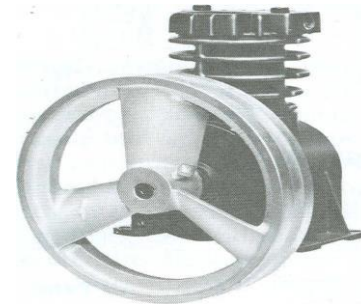
Rotary screw-type air compressors have been a standard in other industries. The rotary screw air compressor is a highly efficient and dependable machine. However, because of an oil output problem, this type was never accepted by the automotive refinishing profession.



Diaphragm type



Piston type



Rotary screw type

Fig.1.5 three basic types of air compressors

## Air pressure regulators

Pressure regulators are valves that automatically cut off the flow of a gas or liquid when it is at a certain pressure. Regulators are also used to allow high-pressure fluid supply tanks or lines to be reduced to a usable and safe pressure for different applications.

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Fig.1.6 Devil Bliss DVFR-2 Filter Regulator, Coalescer

The main function of **pressure regulator** is to match the flow of gas through the regulator to the demand for gas placed upon it, whilst maintaining a constant output pressure. If the load flow decreases, then the regulator flow must decrease also. If the load flow increases, then the regulator flow must increase in order to keep the controlled pressure from decreasing due to a shortage of gas in the pressure system.

### 1.4.3 Spray booths

A compartment, room or enclosure, of fireproof construction such metal, built to confine and exhaust the overspray and fumes resulting from spray finishing.

Intake filters are used to clean dirt and contaminants from the air entering the **paint booth's** chamber. They're located in the ceiling of a downdraft **paint booth** and in or near the doors of a cross draft **booth**.

#### Benefits of a spray booth?

A well designed and maintained spray booth will provide a number of advantages. It will segregate the spraying operation from other activities, making both the spraying and other operations cleaner and safer. It reduces fire and health hazards by containing the

Overspray and fumes. It provides an area which is easier to keep clean, which means both the operator and the object being sprayed are likely to stay cleaner.

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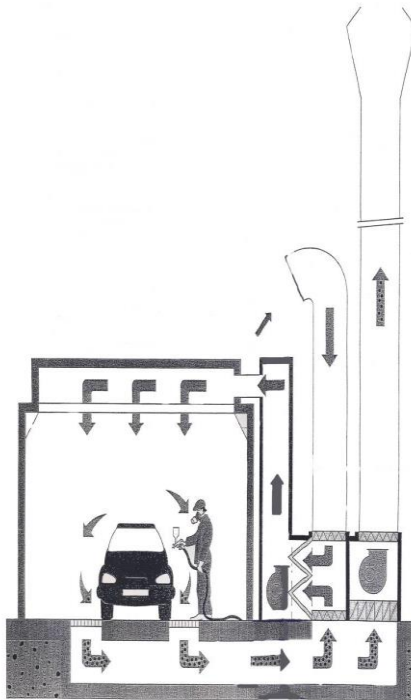


Fig.1.7 Spray Booths

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**Self-Check -1**

**Written Test**

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:  
----- IS used to refer to the clear or colored finish that is used to furnish works to give them a more polished look.

A/ Undercoats paint B/ Lacquers paint C/ Enamel paint D/ Synthetic paints

----- is used to describe oil-based covering products, usually with a significant amount of gloss in them. A. Enamel paint B/ Vinyl paints C/ thinners D/ reducers

**Match Column “A” with Column “B”**

**Column “A”**

\_\_\_\_\_3/ its drying speed was enhanced

\_\_\_\_\_4./\_did not hold up to abrasions

\_\_\_\_\_5/\_used right before painting a new surface

\_\_\_\_\_6/\_used before painting a surface that

has been painted in the past D/ Undercoat paint

**Column “B”**

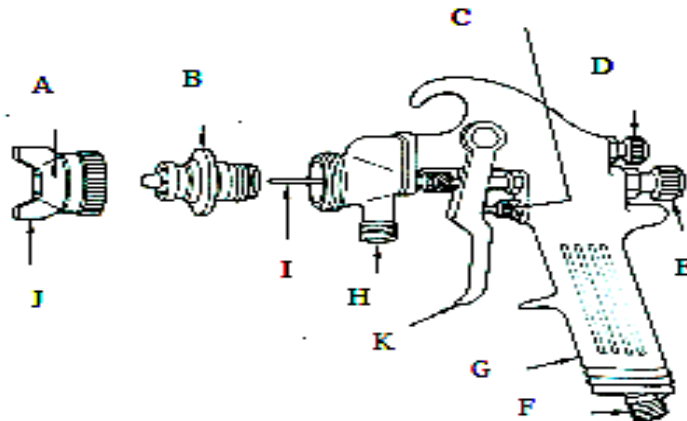
A/ Water base paints

B/ oil based paints

C/ Primer paint

Among those different types of paints, list at list five of them.

1. What is difference between thinners and reducers
2. Identify the component parts of a spray gun from the figure below



A. \_\_\_\_\_

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B. \_\_\_\_\_

G. \_\_\_\_\_

C. \_\_\_\_\_

H. \_\_\_\_\_

D. \_\_\_\_\_

I. \_\_\_\_\_

E. \_\_\_\_\_

J. \_\_\_\_\_

F. \_\_\_\_\_

K. \_\_\_\_\_

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## Unit Two: Apply touch-up paint

This unit to provide you the necessary information regarding the following content coverage and topics:

- Cleaning and preparing surface area
- Preparing and matching touch-up paint materials
- Applying touch-up paint
- Sanding touch-up paint area
- Applying glaze and sealant

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Clean and prepare surface area
- Prepare and match touch-up paint materials
- Apply touch-up paint
- Sand touch-up paint area
- Apply glaze and sealant

### 2.1 Cleaning and preparing surface area

Keeping work place clean and safe

- Prevent Slips, Trips, and fall. Keep floors clean and dry. ...
- Eliminate Fire Hazards. ...
- Control Dust. ...
- Avoid Tracking Material. ...
- Prevent Falling Objects. ...
- Clear Clutter. ...
- Store Items Properly. ...
- Use and Inspect Personal Protective Equipment and Tools.

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- Effective work place cleaning to keep everyone safe
- Ensure all spills are immediately cleaned up. ...
- Maintain clean light fixtures to improve lighting efficiency.
- Keep aisles and stairways clear. ...
- Regularly inspect, clean and repair all tools

### **Preparing and maintaining safe working areas**

- Provide clean floors and stairs, with effective drainage where necessary.
- Provide clean premises, furniture and fittings.
- Provide containers for waste materials.
- Remove dirt, refuse and trade waste regularly.
- Clear up spillages promptly.
- Keep internal walls or ceilings clean
- **Clean the mouthpieces properly.**

### **How do you maintain tools and equipment?**

#### **Steps**

Clean your tools. Cleaning the tools regularly is essential to their proper functioning.

Protect electrical cords. Airlines and electrical cords are prone to heavy damage since they are generally in the way of construction vehicles, and foot traffic. ...

- Lubricate tools. ...
- Inspect tools regularly. ...
- Store tools with care

**Four general types of maintenance** philosophies can be identified, namely corrective, preventive, risk-based and condition-based **maintenance**.

### **Properly Maintaining Your Cleaning Tools**

- Basics. Clean brooms, brushes and mops after that day's use. ...
- Brooms. Comb out broom fibers regularly to remove any debris. ...

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- Storage. Always use a holder to keep brooms stored off the floor or store with the bristles upright. ...
- Cotton Mops. After each use, rinse cotton mops in hot water and white vinegar.
- Scrub brushes.

### Steps in Cleaning Tools

1. Wear protective clothing and goggles.
2. Gather the tools to be cleaned in the designated area for cleaning.
3. Segregate the tools according to the kind of dirt they have.
4. Measure and pour enough amount of cleaning solvent to the washing pan.
5. Submerge the tools in the washing pan.
6. Use paint brush to remove the dirt from the tools.
7. Get the tools from the washing pan and wipe them with rags until dry.
8. Arrange the tools in designated rack or cabinet.
9. Clean and store all materials used for cleaning.

#### 2.1.1 Spray guns maintaining/ Cleaning process

Prior to the introduction of paint gun cleaning systems, all spray equipment was cleaned by hand using the following basic steps:

- Remove all remaining paint from the cup.
- With the air hose and cup removed, pull the gun trigger to remove all remaining paint from the siphon tube.
- Rinse the cup with a small amount of thinner.
- Pour clean thinner into the cup and reattach it to the gun.
- With the air supply reattached, spray the thinner through the gun to remove any paint remaining in the interior orifices.
- Remove the cup and pour thinner out of the cup.
- Wipe off the outside of the gun, and inside and outside of the cup using a rag or paper towel.
- Remove the air cap and clean with a cleaning brush. A cleaning brush is also used to clean other external moving parts and behind the trigger.

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- Reassemble the gun and return it to its storage area.

Many painters remove the air cap from the gun and place it in the cup.

A small amount of thinner is left in the cup so the cap can soak during storage.

Using metal objects to clean the small passageways can result in severe damage which greatly reduces the efficiency of the spray gun. If needed, use a soft wooden toothpick to remove obstructions from the orifices.

These manual cleaning techniques, still commonly used in many small shops, release an excessive amount VOCs to the atmosphere.

### 2.1.2 Maintaining Air pressure regulators

#### Procedure:

- Locate the air regulator drain valve
- Release the valve

(NOTE: Water will run out of valve under air pressure. Allow to do so until air becomes dry. In systems where large volumes of air are used, draining of the regulator should be done several times a day. The air regulator should be drained every morning.)

(CAUTION: System is under high air pressure. Do not get foreign matter in eyes or on skin.) **then**  
:-

#### 1. Rinsing regulator with fresh (warm) water

- Rinse it within few hours after the dive
- Dry the dust cap before putting it on the first stage
- Do not soak the first stage
- Soak some regulator parts for a while
- Wiggle the second stages underwater
- Do not press the purge button
- Clean the mouthpieces properly.

### 2.1.3 Maintaining Air compressors

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## DRAIN AND SERVICE AN AIR COMPRESSOR

I. Tools, equipment, and materials needed: - Air compressor and Oil

### II. Procedure

- Turn off electric power to compressor
- Drain air from compressor (NOTE: Leave air valve open nearest compressor.)
- Locate water drain and open (NOTE: If system has a high side drain valve with an internal siphon tube, air pressure will have to remain in the tank to make it drain. If valve is in the bottom, let all air pressure out of the tank to prevent air lock which will not allow the tank to drain properly.)
- Locate air intake filter
- Dry filter (NOTE: If dirty, replace.)
- Oil bath -Clean filter and refill with oil (NOTE: Use recommended weight to prevent the oil from being sucked into the compressor.)
- Locate pump crankcase oil drain plug and remove
- Drain oil into drain pan
- Install plug and tighten (NOTE: Always tighten a drain plug at the time you install it.)
- Fill compressor crankcase (NOTE: Follow the directions provided by the manufacturer as to type oil, weight, and amount.)

### **Air Compressor maintenance Guide**

#### **How to Make Your Air Compressor More Efficient**

- Improve the Quality of the Air Intake.
- Match the Air Compressor Controls.
- Improve System Design.
- Consider Compressed Air Needs.
- Minimize Pressure Drop.
- Maintain Your Compressor.
- Quincy's Efficient Air Compressors.

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The process and regularity of compressor service and maintenance depends on the individual processor. For example, a compressor using petroleum-based oil needs an oil-change every 500 hours of service. A unit using synthetic oil raises that interval to 2,000 hours of service.

#### 2.1.4 Maintaining/Cleaning Spray booths

How do you clean paint booth?

If you have a smaller paint booth, you can use a simple scrubbing brush with a solution of water and paint remover to clean it. Rinse with water once you've sufficiently cleaned paint from the booth. If you have a larger paint booth, you'll want to use a pressure washer to properly clean it.

#### Regularly Replace Filters

Replacing the extract filters on your spray booth between services is just as important as the regular maintenance checks to ensure your spray booth is working both to its optimum efficiency and productivity, as well as ensuring you remain compliant with EPA legislation.

#### ❖ Mixing equipment

Wash latex paint off the mixer bit with warm water. wipe oil paint from the lid with rag soaked in paint thinner.

If you are using the entire can of paint, punch a hole in the paint lead to make the splatter shield instead of using card board

#### 2.1.5 Maintaining Paint Touch-up Equipment

#### CLEAN THE AIRBRUSH THOROUGHLY AFTER EACH USE.

- Remove the mixing cup from the airbrush.
- Hold your finger over the spray end of the airbrush.
- Push the lever so the paint remaining in the airbrush goes into the cup.
- Place the airbrush and siphon on a container filled with paint thinner. Spray the airbrush, turning the spray tip adjuster in and out, until it is completely flushed out.
- Disassemble the airbrush and clean it thoroughly with a pipe cleaner that has been dipped in Reducer. Also clean the siphon lid.

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- You must disassemble in order to have the airbrush perfectly clean. Spraying thinner through it, or soaking in thinner is not satisfactory. It must be disassembled and cleaned.
- The airbrush is ready to use with another paint color or to store away.

### Paint stirring equipment

As a guide, **often** recommend that at minimum, plan **laboratory equipment** servicing for at least once a year, regardless of how busy your machinery is. If using them very intensively, then a 6 monthly servicing schedule **can** ultimately ensure that **laboratory equipment** is kept in top condition.

- **Clean** work areas upon completion of an experiment or at the end of each day.
- Bench tops and bench liners should be free of visible contamination.
- Reduce the risk of slips, trips, and falls by **cleaning** up liquid or solid spills immediately, **keeping** doors and drawers closed and passageways clear of obstructions

#### 2.1.6 . Paint straining and thinning equipment

Despite the exposure to detergent and water, your washing machine can get dirty and retain odors. When clothing or rags with paint thinner are laundered, residual odours can be left behind inside the washing machine. When left in the machine, paint thinner smell can be transferred to the next load of wash. To avoid this occurrence and remove the chemical odors from your washing machine, you must use effective cleaning supplies and methods to clean and deodorize your appliance

#### **Paint thinner smell in the washing machine can make clothing smell, too**

**Step 1:-**Wet a cleaning cloth with full-strength white vinegar.

- Apply a dusting of baking soda to the wet cloth.

**Step 2:- Scrub** the inside of the washing machine, including the underside of the lid or door. Add more vinegar and baking soda as needed to clean the washing machine and deodorize the smell of paint thinner.

**Step 3:- Rinse** the inside of the washing machine by wiping it with a damp cloth.

- Rinse the cloth frequently to remove baking soda residue.

**Step 4:-** Bleach helps to clean, sanitize and deodorize the washing machine.

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Pour 1/2 cup of chlorine bleach into the bleach dispenser. Fill the washing machine with hot water and run it on a full cycle.

**Step 5:- Open** the washing machine door and allow the inside to air dry completely

### 2.1.7 Maintaining Machine buffs and polishes

Any paint coating found inadvertently applied to areas where it is not required e.g. machined or polished surfaces, surface of stainless steel or non-ferrous alloys, name plates, manufacturers identification tags, instruments and instrument glasses, sight glasses, control valve stem, high friction grip bolt assemblies, etc. shall be hand wiped clean with thinner or cleaner while the coating is still wet or rubbed down with fine sand paper if it is dry and restored to their original surface condition

## 2.2 Preparing and matching touch-up paint materials

- **Body Fillers**

- ✓ Filler is a material used to fill a damaged area
- ✓ Mixing board is the surface used to mix filler
- ✓ Light body filler is used as a very thin top coat of filler for final leveling
- ✓ Fiberglass body filler is used where rust repair or strength are important
- ✓ Using too much hardener is a common mistake
  - Causes the filler to set before you have time to spread it, among other problems



Figure 2.10. A body filler

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A body filler is a two-part material that is mixed together and then applied over small dents in metal body parts. The body filler will heat up and cure in a few minutes so it can be sanded.

- Masking Materials
  - Overspray is unwanted paint spray mist floating around the spray gun
  - Masking paper is designed to cover body parts not to be painted
  - Masking plastic should not be used next to area being sprayed
    - Paint can drip onto the body surface
  - Wheel masks are pre shaped to fit over wheels
  - Fine-line masking tape is very thin and smooth
    - Produces a better paint part edge
  - Duct tape protects parts when grinding or sanding
  - Masking liquid or coating is usually a spray able material for protection from overspray
  - Masking liquid washes off with soap and water
- Abrasives
  - An abrasive is any material used for cleaning, sanding, smoothing, or material removal
  - Grit refers to a measure of the size of particles on sandpaper or discs
  - Grit numbering system denotes how coarse or fine an abrasive is
  - Very coarse grit (16 to 60) quickly removes paint and takes it down to bare metal
  - Generally start with the finest grit that is practical
- Scuff Pads
  - Scuff pads are tough synthetic pads used to clean and lightly scratch surface paints and parts
  - Handy for scuffing irregular surfaces
    - Door jambs, inside of the hood and deck lids, etc.

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- Scuffing cleans and lightly scuffs these areas so the paint, primer or sealer will stick

- **Adhesives**

- Adhesives bond parts to one another
- Weather strip adhesive holds rubber seals and similar parts in place
- Plastic adhesives or emblem adhesive is used to install emblems and trim onto painted surfaces
- Adhesive release agent is a chemical that dissolves most types of adhesives



Figure 2.9. Polish the paint surface

Here the detail technician is using a high-speed buffer to polish the paint surface. On new paint, it will increase smoothness and gloss. On old paint, it will remove the oxidized or dulled paint surface and uncover the bright, original color again.

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## 2.3 Applying touch-up paint

### 2.3.1 Priming and Painting Chipped Areas

Figure out the exact paint color on your car.

If your car has its original paint job, you can do an online search for your car's make, model, color, and the words "paint code." You can also look on the car for the code if you can't find it online. Check the door jam, near the VIN number, and on firewall (bulkhead) to find the paint code number

**Note:** The firewall is the piece of sheet metal that separates the engine under the hood from the passengers inside the vehicle. You will need to open your hood to find this number.

#### **Buy a matching touch-up paint color.**

Go to your local auto parts store or contact your car dealership with your paint color in hand. If you have a common car, they will likely have touch up paint for your paint job in stock. If you have an unusual or rare car, they may have to order your touch up paint.

- Touch up paint comes in several types of containers. It often comes in small jars of the paint or in paint pens.
- It's important to get an exact match to your car's color, so don't settle on a color that is just close to your car's.
- Light-colored cars can be difficult to find a perfect color match. Consult an auto paint specialist if you are having difficulty finding the right color

#### **Apply rust arrestor on the chipped area.**

Before touching the chipped area up, it's important to prevent rust from spreading underneath your touch-up job in the future. Paint on a small amount of rust inhibitor over the chipped area before the primer

**Note:** Rust arrestor is available at most auto parts stores. Make sure the one you use states on the package that it can be used under paint

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### **Apply primer, if necessary.**

- Squeeze a dab of primer onto the area if the chip reaches metal. If the chip is surface-level, you can skip this step. Primer is needed for deep chips because regular paint will not adhere to bare metal.
- Spread the primer around the small chip with a tiny brush. Only use enough primer for one thin coat.
- Allow the primer to dry completely.

Avoid getting primer on the car paint outside of the chipped area. It will ruin the finish.

### **Test the paint.**

Apply some of the paint to an area on the car that isn't visible, such as the lip under a door. It is important to make sure the paint you've purchased will not react poorly to your existing paint and also that it matches well.

**Tip:** Shake the paint well before testing it. This will ensure that the true color and consistency are tested.

### **Apply the touch-up paint to the primed area.**

- Spread 2 to 3 layers of touch-up paint on the area. The touched-up spot will look elevated above the rest of the paint, which is how it should look.
- If the paint chip is on a vertical surface on your car, it's especially important to wait until the touch-up paint dries between layers so it doesn't run.
- The painted area should be raised so that it can be sanded down smooth with the rest of the paint job once it is dry.

### **Allow drying time between coats and after the layers are applied.**

Between each layer let the paint dry for an hour. This will ensure that each layer is set and doesn't get smeared by the next. Also, wait at least 24 hours before continuing the process after you have applied all your layers

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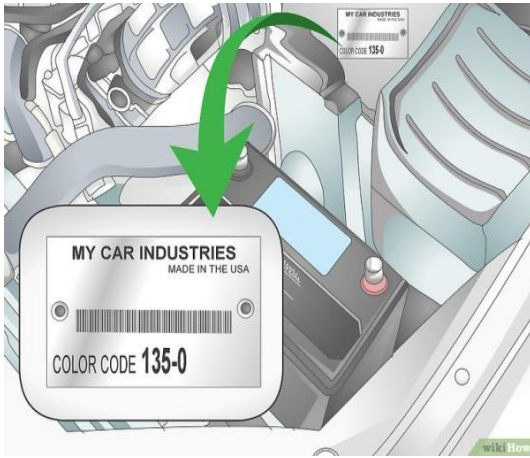


Fig: 1. Figure out the exact paint color on your car



Fig: 2. Buy a matching touch-up paint color

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Fig : 3. Apply rust arrestor on the chipped area



4. Apply primer, if necessary



Fig: 5. Test the paint



| Fig: 6. Apply the touch-up paint to the primed area

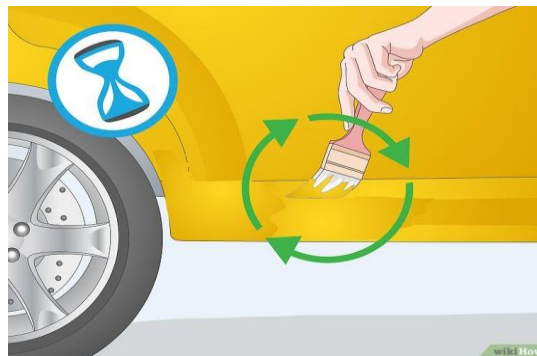


Fig: 7. Allow drying time between coats and after the layers are applied

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### 2.3.2 Finishing the Surface

#### **Sand the touched-up area until it is smooth.**

Start by sanding the area with 1000-grit sandpaper, making sure to move very slowly and gently. Once the touched-up area appears close to level with the rest of the pain, continue to sand gently with 2000-grit sandpaper. After that, rub the area with 3000-grit sandpaper until the touch-up paint is even with the rest of the vehicle.

As your sandpaper gets finer, it will remove less and less of the paint. Don't be tempted to push really hard with the sandpaper because of this.

It is ok if you sand a small amount of the surrounding painted area. This will be fixed by the top coat you will apply over the whole area.

#### **Apply the top coat.**

- Paint the top coat over the entire area that is discolored. Typically this includes the chipped area and the existing paint surrounding it that has been lightly sanded. Try to get the top coat as smooth and even as possible, using a clean brush, even strokes, as several thin layers
- Allow your top coat to dry for 10 to 20 minutes between coats.
- It's best to apply several thin coats instead of one thick coat.
- Follow the directions that came on your top-coat container. In some cases they will tell you to apply several coats and in others the directions will state that one coat is enough.

#### **Sand the area once more with 3000-grit sandpaper.**

Giving the surface one last sanding will ensure that the clear coat you applied is smooth and blended with the existing top coat. Sand it until the repaired area is flush with the rest of the paint surface on the car

**Note:** At this point the chipped area should disappear into the rest of the paint job.

#### **Polish and wax the entire car.**

Once you have repaired your paint chips it's nice to give your whole car a bit of care. Polishing and waxing the car will help the repaired area blend in with the rest of the paint job and it will protect the fixed area from more damage.<sup>[13]</sup>

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1. Sand the touched-up area until



2. Apply the top coat it is smooth



3. Sand the area once more with



4. Polish and wax the entire car

### 2.3.3 Paint mixing procedures

Most paints have to be mixed with a reducer, thinner or hardener so they attain the right viscosity. If the paint is too thin, it will run and show lines. On the other hand if it is too thick, it won't flow out easily from the spray gun. Refer to the technical data sheets for the product you purchase and then mix the paint

One of the most important techniques used to get a paint job done properly is correct mixing of the paint. Follow the instructions listed on the paint package and use a paint mixing pail to help you attain the right viscosity. You may have to use a particular brand of thinner or reducer if required. Paint that's too thin will run lines, while paint that's too thick won't flow out easily from the spray gun.

Using the paint formula on the screen, select the paint toners needed to mix the desired paint color. Line the toner bottles up in order as listed in the formula.

- Turn on the paint scale. Hold the CAL (calibration) button until the screen reads "500.0". Release the CAL button and the scale will stay at 500. Now, gently place the 500-gram weight on the scale. If the scale reads "500.0" it is properly calibrated. If it does not read "500.0", then hold the CAL button again until the screen reads "500.0" .
- Place a 1/4 ounce mixing cup on the scale. Press the TARE button. The scale should read "0.00" with the cup in place. Now you are ready to mix the paint.
- Open the first bottle of paint toner listed in the formula and pour the paint toner carefully by drops until it reaches the first weight measurement shown. (One drop equals approximately .03 grams.) For the Ford example, pour the first paint toner until the scale reads "2.71" grams.
- Close the bottle, wipe the lid clean, and put the paint toner bottle away.
- DO NOT CLEAR THE SCALE. Open the second bottle of paint toner and drop the toner into the mixing cup until you reach the next weight measurement listed. Close this bottle, clean it and put it away. For the Ford example, the scale should now read "3.85" grams.
- Continue to add paint toner to the mixing cup for the rest of the measurements listed in the formula. For the Ford example, pour paint toner 02 until the scale reaches "4.44" grams, and so on until all the tints have been added to the mixing cup.

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- Remove the mixing cup from the scale and close the lid tightly. Place the cup in a paint shaker for about 5 minutes. Begin vehicle preparation.
- You can save leftover containers of paint tint for future use. However, experience shows that most leftover paint is never used again. It is better to give the paint to the customer or to dispose of it.

A. After the paint mixture has been thoroughly agitated on the shaker, you need to prepare the paint for application to the vehicle by mixing it with Reducer.

You must add Reducer to Base coat. You must add Activator and Hardener to Clear coat.

B. In the Ford example you will have 4.82 grams of paint. Now place an empty 1/4 oz. cup on the scale. Push tare so the scale reads 0.00. From the cup with 4.82 grams of paint pour into empty cup until scale reads 3.00 grams. Now add 1.5 grams of reducer (2 to 1 Ratio).

Mixing Ratios for Base and Clear used for Chip or Scratch Repair

Grams Base coat + 1 Grams Reducer

3 Grams Clear coat + 1 Gram Hardener + 1 Gram Activator

- If you are only doing chip & small scratch repair, there is no need to apply clear coat over the base coat. Instead, add 10% to 15% hardener to the reduced base coat.
- For example, if you have 5.0 grams of reduced base coat, add .5 to .75 grams of hardener. This will provide needed gloss to base coat for 1-step repair.
- When you use base coat paint, you must apply a clear coat to the touch-up area.

Note: Mixing ratios for Clear coat are as follows:

Clear coat = 3 Parts Clear + 1 Part Hardener + 1 Part Activator

#### 2.3.4 Paint straining

The defects which are commonly found in paint work are as follow

Blistering, Blooming, Fading. Flaking, Flashing, And Grinning. Running, Sagging Cause: Liquid solvent (thinners/reducers) becomes 'trapped' in the paint film when the surface layer skins over too quickly, preventing their evaporation into the atmosphere. Solvents that vaporize within the paint film leave bubbles, pinholes or craters as they push .

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## Paint thinning

Thinning paint includes certain techniques that will ensure you of excellent results that you expect.

### Practical Paint Thinning Tips

Latex is a type of water-based paint, which you can thin using water. On the other hand, oil-based paints require the use of oil-based type of paint thinner. Generally, latex has a much thicker consistency than oil-based ones. Hence, you will need to thin it first before use to ensure the even and smooth application on any surface.

#### Steps-

- ✓ **Check the quality of the paint to make sure it needs thinning**
- ✓ Keep in mind that some latex paints require thinning while others may be ready for use. So, it helps to begin by conducting a test that will check if thinning is even necessary
- ✓ You may do so by inserting a tool in the paint can such as a stick that is used for stirring.
- ✓ If you notice that the paint begins to drip easily off the tool, then this means there is no need to thin it. On the other hand, a clumpy or thick quality of paint that remains on the stirring tool means that you need to thin it to ensure a smoother application.

### Use the right amount of water to begin thinning the paint

When you have checked thoroughly the quality or consistency of the paint, then you can begin applying some water to it. Stirring just won't work, so you will need the right amount of water and mix this with the paint. To start, prepare an empty can where you can thin a gallon of paint. These steps will help you start thinning the paint properly:

- Fill the empty can with half a gallon of water.
- Pour the latex paint and 1/2 gallon of water.
- Then, add another half a gallon of water and pour the paint mixed with some water, in a back and forth manner.
- If you wish, you may also add some water to a few gallons of tinted type of paint. This way, you can obtain the similar consistency and color in the can of paint
- As you stir the paint well, the quality will become much smoother.
- Keep in mind, though, that the stirring rod for the electric rod is quite sharp.

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This means, you will need to get rid of the stirring attachment after you have unplugged the electric drill's power cord.

- ✓ As you stir the paint, consider applying these techniques:
- ✓ Stir the paint manually for about 5 to 10 minutes since stirring for only a minute or two will not ensure the proper mixing of the paint.
- ✓ Apply an upward combined with a downward and spiral motion when you stir the paint.
- ✓ If possible, you may consider thinning the latex paint by pouring paint in a back and forth manner using two empty cans of paint.

For over a gallon of latex paint with custom color, you may pour the paint back and forth several times, also considered as the boxing method.

Another way of thinning water-based paint is by using commercial products such as a thinning additive. For instance, these additives are useful when thinning or conditioning the paint. Hence, they help you apply paint easily without creating brush marks.

When it comes to buying paint thinner, be sure that you purchase one that is compatible to the paint you are planning to thin. Then, add the thinner in the right quantity to ensure the smooth quality and texture necessary for painting it easily on any surface. Consider adding thinner gradually and in small amounts, and simply pour in a few more until you have determined the quantity needed in thinning the paint properly.

By applying these techniques, you can make sure that the paint is thinned appropriately before use.

### **2.3.5 Paint matching**

#### **MATCH COLOR**

Equipment and materials needed :- Spray gun, and Tinting colors

#### **Procedure:**

- Spray a test card
- Spray over light gray primer card
- Spray over dark gray primer card
- Spray over red oxide primer card
- Check against color on vehicle and choose closest match

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- Try spray gun techniques
- Spray wet
- Spray dry
- Increase gun pressure
- Decrease gun pressure
- Increase. ‘in distance
- Decrease gun distance

(NOTE: Above procedure will lighten or darken colors.)

**Check match against color on vehicle and choose closest match**

- ✓ Tint color
  - ✓ Use only a small amount of paint
  - ✓ Add only drops of tinting color at a time
  - ✓ Spray on test card and compare to automobile
  - ✓ Check in daylight
  - ✓ Check in artificial (shop) light
  - ✓ Use tinting chart to choose solution to get the necessary match
- **Base Color (Basecoat):** A color coat requiring a clear coat. Base Color provides color and appearance, while the clear coat provides gloss as well as UV protection and chemical resistance. Base color is also referred to as a "two stage" coating because you first apply Base Color, then secondly the Gloss Clear.  
There are also "three stage" Base Colors consisting of a solid Base Color (stage1), a metallic or pearl second Base Color (stage2), and then finally Gloss Clear(stage3).  
Base Color can be matched to any OEM (Original Equipment Manufacturer) vehicle .Base Wheel Color is designed to match most popular OEM Wheels
  - **Clear Gloss (Clear coat):** The clear, non-pigmented top coat that is applied over a Base Color (basecoat). Most late-model cars have factory-applied clear coat paints. Clear coat provides gloss and protection, increases paint durability, and provides resistance to harmful environmental effects.

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If you have chips, nicks or scratches that have not penetrated the paint, and the color is still showing, you may be able to touch up directly with Clear Glow



### 2.3.6 Hand painting procedures including rolling

The use of brushes or rollers for touch-up/repair on localized damaged surfaces where proper coating by spray application is not feasible may be used upon COMPANY approval.

When using brushes, ensure that a smooth coat, as uniform in thickness as possible, is obtained with no deep or detrimental brush marks.

Paint shall be worked into all crevices and corners. Runs and sags shall be brushed out immediately during paint application

### 2.3.7 Buffing and polishing

**Polishing** and **buffing** are finishing processes for smoothing a work piece's surface using an abrasive and a work wheel or a leather strop. ... **Polishing** is a more aggressive process while **buffing** is less harsh, which leads to a smoother, brighter finish.

**Buffing** will remove this excess product, leaving a smooth and even finish with increased gloss. In the case of **buffing** polish, you are essentially removing excess product in order to remove old polish residue, paint residue and make it easier to see whether the surface is **done**, or if it needs more **polishing**

This is an adjective which, in youth **slang**, means attractive or well-toned. Somebody who is **buff** has an attractive body, they look 'fit'

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### 2.3.8 Paint Mixing, Matching, and Applying

Determine type and color of paint already on vehicle by manufacturer's vehicle information label.

- ✓ Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer's procedures.
- ✓ Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.
- ✓ Apply selected product on test and let-down panel in accordance with manufacturer's recommendations; check for color match.
- ✓ Apply single stage topcoat for refinishing.
- ✓ Apply basecoat/clear coat for panel blending or partial refinishing.
- ✓ Apply basecoat/clear coat for overall refinishing.
- ✓ Denis, buff, and polish finishes where necessary.

Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.

- ✓ Refinish rigid, semi-rigid and flexible plastic parts.
- ✓ Clean, condition and refinish vinyl (e.g. upholstery, dashes, and tops).
- ✓ Apply multi-stage (tricot) coats for panel blending or overall refinishing.
- ✓ Identify and mix paint using a formula.
- ✓ Identify poor hiding colors; determine necessary action.
- ✓ Tint color using formula to achieve a blend able match.
- ✓ Identify alternative color formula to achieve a blend able match.

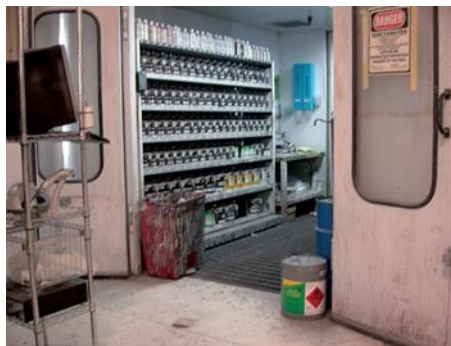


Figure 2.8. shop's painter or refinish

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The mixing room contains all of the ingredients used by the shop’s painter or refinish technician. The small room has extra ventilation to remove paint fumes while mixing paint or primer ingredients. Only mix and use paint materials from the same manufacturer or paint system.

#### ADJUSTING THE SPRAY (For suction feed spray gun)

A good spray pattern depends on the proper mixture of air and paint droplets much like a fine tuned engine depends on the proper mixture of air and gasoline. There are three basic adjustments, which under normal conditions will give the proper spray pattern, degree of wetness, and air pressure for suction feed guns.

- Adjust the air pressure to the specification indicated on the paint can
- Set the size of the spray pattern using the fan adjustment or pattern control knob
- Set the fluid control knob to regulate the amount of paint according to the selected pattern size: backing the knob out increases the paint flow turning the knob decreases paint flow.

#### 2.3.10 Testing the Spray Pattern

After setting the air pressure, the fan size, and the fluid flow, tests the spray pattern on a piece of masking paper or newspaper.

Hold the gun 6 to 8 inches for lacquer, 8 to 10 inches for enamel. Pull the trigger all the way back and release it immediately. This burst of paint should leave a long, slender pattern on the test paper. Spraying primer-surfacer usually requires a smaller spray pattern. Turn the pattern control knob in until the spray pattern is 6 to 8 inches wide. For spot repair, the pattern should be about 5 to 6 inches from top to bottom

#### 2.3.11 Painting the Vehicle

Thin the topcoat you’ll be using with thinner, just like primer. Recommended ratios will be on the back of the paint can. Apply topcoat using the same techniques as with the primer. The painting and curing times will also be quite similar to the primer, taking about 10 minutes to p and 20 minutes to an hour to cure. As with the primer, allow the paint to dry thoroughly between each coat.

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Figure 2.11. Primer-sealer

Primers are needed for the paint to bond to the substrate securely. There are many variations such as primer-sealer that increases adhesion and also blocks out any color or chemical differences of the old paint

- Apply up to 3-4 coats of paint, or as your supplies allow. If you run out around coat two, you will need to get more to ensure proper coverage and an even coat.
- Before completing the last pass with topcoat, wipe down the car and remove any powdery residue that may have built-up with 2000-grit sandpaper. Wipe the car down again with a clean rag.

### The Application Stroke

The proper stroke is most important in obtaining a good refinishing job. To obtain a good stroke, proceed as follow:

- ✓ Hold the spray gun at the proper distance from the surface

**Short-** the high velocity air tends to ripple wet film

**Long-** a greater percent of thinner evaporated (dry film result), loss of material

- ✓ Hold the gun level and perpendicular to the surface, otherwise uneven paint film will result

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- ✓ Do not fan the gun and do not use wrist motions if a uniform film is desired. The only time it is permissible to fan the gun is on a small spot spray where the paint film at the edges of the spot should be thinner than the center portion
- ✓ Move the gun with a steady deliberate pass, about 1 foot per second. Moving the gun too fast will produce a thin film, while moving it too slowly will result in the paint running.
- ✓ Release the trigger at the end of each pass
- ✓ Difficult areas such as corners and edges should be sprayed first

Generally, start at the top an upright surface such as a door panel. The spray gun nozzle should be level with the top of the surface, this means that the upper half of the spray pattern will hit the masking. The second pass is made in the opposite direction with the nozzle level at the lower edge of the previous pass and the other half is sprayed on the unpainted area.

The last pass should be made with the lower half of the spray pattern below the surface being painted. The procedure just followed is called a *Single Coat*. For a double coat, repeat the single coat procedure immediately. Generally, two or more double coats are required to properly apply a lacquer topcoat.

Allow for flash time (the time required for the solvents to evaporate and the finish to dull slightly.) or several minutes between coats.

## 2.4 Sanding touch-up paint area

### 2.4.1 Cleaning and Sanding the Surface

Wash the car. Focus on deep cleaning the area where the paint is chipped. Making sure the area is clean will help you identify all the spots that need to be touched up and will reduce the risk of getting dirt and grime in the new paint.

- ✓ Use car washing soap, water, and a clean, soft cloth to clean the scratched area.
- ✓ Be sure to thoroughly dry the area that is scratched after you wash it

### **Check for rust and remove any you find.**

Look at the scratched area for discoloration on the metal. If you find an area that is dark red or brown, it is likely rust. Use sand paper to remove all areas of discoloration and then wipe down the area with a dry cloth to remove any dust

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**Note:** Removing the rust will help minimize the chance of rust developing under the paint in the future

Apply a wax and grease remover to the area being fixed.

- ✓ It's important to remove any wax on areas that need to have paint adhere to them. Wax isn't typically removed by soap and water, so a specific remover is needed.
- ✓ Wax removers are available at most auto parts stores. These rust removal products are made specifically for removing rust on the bodies of cars.

Sand the area to prep the surface.

Use a small piece of sandpaper to sand all around the scratch. Try to remove all loose paint from the area while you sand. This process will also give the touch-up paint a clean surface to stick to.

**Tip:** Sand the area with 220-grit sandpaper. This will allow the primer to stick



Fig: 1. Cleaning and Sanding the Surface



Fig: 2. Check for rust and remove any you find

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Fig:3. Apply a wax and grease remover to the area being fixed



Fig:4. Sand the area to prep the surface



### Applying glaze and sealant to touched up paint area

#### Glazing Putty/Finishing Fillers

**Galvanizing** is the process of coating steel with zinc. It is one of the principal methods of corrosion protection applied during the manufacturing process. On galvanized steel, the zinc forms a natural barrier between the steel and the atmosphere. As the zinc corrodes a layer of zinc oxide will form on the surface exposed to the atmosphere. Unlike iron oxide, or rust the zinc oxide adheres to the zinc coating tightly forming a natural barriers between the zinc and the atmosphere.

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- Glazing putty is for filling small holes or sand scratches
- Spot putty has more solids than glazing putty
  - Should not be used for large surface depressions
- Two-part putty comes with its own hardener
- Some two-part putties can be applied over paint to reduce sanding time

✓ **Sealers**

- Sealers prevent water and air leaks between parts
- Seam sealers make a leak proof joint between body panels
- Tube sealers are applied from a tube or with a caulking gun
- Silicone sealers are not paintable and should not be used in auto body repair
- Ribbon sealers must be worked onto the parts with your fingers
- Bleeding or bleed through means colors in old prime coat or paint seep into new paint
- Sealer is a mid coat between the paint and the primer or old paint to prevent bleeding
- Sealers cannot be used as a primer
- Primer-sealer provides the same protection as primers but also seals over a sanded old finish to provide uniform color holdout

✓ **Primers and Sealers**

- Plain primer is a thin undercoat designed to provide adhesion for the paint
  - Used when the surface is smooth
- Self-etching primer has acid in it to prepare bare metal so the primer will adhere
- Epoxy primer is a two-part primer that cures fast and hard
  - Greatly increases body filler adhesion and corrosion resistance over bare metal

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<b>Self-Check -2</b>	<b>Written Test</b>
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**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

Which of the following materials is used to mix most paints?

A/ a reducer,      B/ thinner      C/ hardener      D all are the correct answers.

1. If the paint is too thin, what will happen?
2. If the paint is too thick, what will happen?
3. What is the difference between **Base Color (Basecoat)** and clear coat in paint matching?

<b>Operation Sheet 1</b>	<b>Surface Preparation</b>
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### Procedures for surface Preparation

#### Steps:-

- Clean and Sand the Surface ( Wash the car)
- Check for rust and remove any you find
- Apply a wax and grease remover to the area being fixed
- Sand the area to prep the surface
- Wash and dry the car touch up areas

#### ❖ Tools and Equipment:

- Sand papers
- Scuffs pad
- Solvents
- Dryer
- Wax remover



**Operation Sheet- 2**

**Priming and Painting Chipped Areas for hand brushing**

**Procedures for Priming and Painting Chipped Areas (for hand brushing)**

**Steps:-**

- Figure out the exact paint color on your car.
- Buy a matching touch-up paint color
- Apply rust arrestor on the chipped area
- Apply primer, if necessary
- Test the paint
- Apply the touch-up paint to the primed area
- Allow drying time between coats and after the layers are applied
- Finishing the surface
- Sand the touched-up area until it is smooth
- Apply the top coat.
- Sand the area once more with 3000-grit sandpaper
- Polish and wax the entire car

**❖ Tools and Equipment:**

- 3000-grit Sand papers
- Scuffs pad
- Primer and Base Coat
- Paint
- Hardener
- Wax remover
- Rolling Brush

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**Operation Sheet-3**

**Paint Mixing, Matching, and Applying**

**Procedures for Paint Mixing, Matching, and Applying**

**Steps:-**

- Determine type and color of paint already on vehicle by manufacturer’s vehicle information label.
- Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer’s procedures.
- Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.
- Apply selected product on test and let-down panel in accordance with manufacturer’s recommendations; check for color match.
- Apply single stage topcoat for refinishing.
- Apply basecoat/clear coat for panel blending or partial refinishing.
- Apply basecoat/clear coat for overall refinishing.
- Denis, buff, and polish finishes where necessary.
- Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.
- Refinish rigid, semi-rigid and flexible plastic parts.
- Clean, condition and refinish vinyl (e.g. upholstery, dashes, and tops).
- Apply multi-stage (tricot) coats for panel blending or overall refinishing.
- Identify and mix paint using a formula.
- Identify poor hiding colors; determine necessary action.
- Tint color using formula to achieve a blend able match.
- Identify alternative color formula to achieve a blend able match.

❖ **Tools and Equipment:**

- Thinner

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- Primer and Base Coat/clear coat
- Paints
- Hardener
- Wax remover
- Rolling Brush
- Mixing and Painting Room

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<b>Operation Sheet-4</b>	<b>Painting the Vehicle (Application stroke)</b>
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### Procedures for Painting the Vehicle (Application stroke)

#### Steps:-:

- Thin the topcoat you'll be using with thinner, just like primer. Recommended ratios will be on the back of the paint can.
- Apply topcoat using the same techniques as with the primer.
- Apply up to 3-4 coats of paint, or as your supplies allow.
- Before completing the last pass with topcoat, wipe down the car and remove any powdery residue that may have built-up with 2000-grit sandpaper. Wipe the car down again with a clean rag.

#### The Application Stroke

- Hold the spray gun at the proper distance from the surface
- Hold the gun level and perpendicular to the surface,
- Do not fan the gun and do not use wrist motions if a uniform film is desired.
- Move the gun with a steady deliberate pass, about 1 foot per second.
- Difficult areas such as corners and edges should be sprayed first
- Generally, start at the top an upright surface such as a door panel.
- The second pass is made in the opposite direction with the nozzle level at the lower edge of the previous pass and the other half is sprayed on the unpainted area.
- The last pass should be made with the lower half of the spray pattern below the surface being painted
- The procedure just followed is called a **Single Coat**. For a double coat, repeat the single coat procedure immediately. Generally, two or more double coats are required to properly apply a lacquer topcoat.
- Lacquering the Vehicle
- Repeat the painting/primer steps with the lacquer, covering with 1-2 coats.

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- While clear coat is still wet, remove any masking from areas that weren't being painted. Use caution to prevent blemishing the clear coat or getting tape stuck in it.
- Allow the lacquer to cure for the recommended time. Once dry, inspect the vehicle for any blemishes or runs. Sand these down lightly and re-spray.
- Buff your vehicle with a buffer, making sure not to linger on one spot too long as this could burn the paint.

❖ **Tools and Equipment:**

- Thinner
- Primer and Base Coat/clear coat
- Paint
- Hardener
- Wax remover
- Rolling Brush
- Mixing and Painting Room
- 2000-grit sandpaper
- Rags

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## LAP Test 2.1.

### Practical Demonstration

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Time started: \_\_\_\_\_ Time finished:

\_\_\_\_\_

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 8:00hour.

Task 1. Prepare surface

Task 2. Prime and paint chipped areas (hand brushing)

Task 3. Mix, Match, and Apply Paint

Task 4. Paint the Vehicle/Application stroke

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### Unit Three: Complete work processes

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Conducting final inspection
- Clearing work area
- Completing documentation

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Conduct final inspection
- Clear work area
- Complete documentation

#### 3.1 Conducting final inspection

##### Housekeeping Signs

- The workplace or office is a place where productivity is expected and having a pleasant work area certainly adds to a positive environment. Employees can do their part in addition to
- regular cleaning staff housekeeping and caretaker maintenance to keep it clean, safe, and
- Cleaning up is not just a measure of respect for the work space, it also removes hazards. Plan to easily and regularly remove trash and debris. Enforce a strict cleanup policy throughout the work space. Keep work areas tidy as well by minimizing the number of wires running around. Extension cords quickly become tripping hazards, and power strips also cause trouble on the ground or as they tumble erratically on a desktop. We suggest you provide access to grounded outlets all along the perimeter of the room and/or dropped from the ceiling for each workbench.
- Tools need to have enough space to be operated safely and not endanger the operator or other people in the space. People need to concentrate when trying new tools, especially ones that can injure. Make sure there is enough real estate to use a tool safely. Work areas need to be well lit and clean. Ventilation and/or air filtering is required for many tools.
- The equipment itself needs to be as safe as possible. Tools should be well maintained and not have safety features removed or defeated. This is especially important when using secondhand

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tools that might not have a perfectly safe heritage. When acquiring new tools consider spending the extra money on models with advanced safety features, such as Saw Stop table saw.

- Make well-stocked first-aid kits visible and easily accessible throughout your space. Post clear and visible warning signs on all equipment and where necessary. Provide personal safety equipment such as goggles, earplugs, gloves, etc. to those who don't have their own.
- Accidents may happen. They probably will, and let's hope they are all minor. Nonetheless, do make sure that there is a legal entity that owns the space so that the effects of a serious injury don't extend the horror with legal ramifications

### **Kinds of Cleaning Solvents**

Solutions are homogeneous mixture of two or more components. They can be gaseous, liquid or solid. When we speak of a solution, we usually think of a solid dissolved in water. While water is the most common solvent, other liquids are frequently employed as solvents for certain substances for example wax maybe dissolved in gasoline. The dissolved material in a solution is termed as solute (e.g. wax) while the dissolving medium is called solvent (e.g. gasoline). However, the term can be interchanged depending on which substance is of greater amount.

Solvent is a component of a solution that dissolves solute and is usually present in large

- healthy for all.

proportion or amount. It can be classified as polar or non polar. Polar solvents are solvents which dissolve/are soluble in water; while non polar solvents are solvents which do not dissolve/are insoluble in water. Solvents usually used for cleaning in automotive shops are: water, gasoline, kerosene, thinner and detergent soap.

#### **▪ Properties of Cleaning Solvents**

A useful generalization much quoted is that “Like dissolves like”. More specifically, high solubility occurs when the molecules of the solute are similar in structure and electrical properties to the molecules of the solvent.

When there is a similarity of electrical properties; e.g. high dipole element between solute and solvent, the solute-solvent attractions are particularly strong. When there is dissimilarity, solute-solvent

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attractions are weak. For this reason, a polar substance such as H<sub>2</sub>O usually is a good solvent for a polar substance such as detergent soap but a poor solvent for a non polar substance such as gasoline.

### Uses of Cleaning Solvents

1. **Gasoline** - It is used to wash oil/greasy tools/equipment.
2. **Diesel** - It is used to wash oil engine, transmission and other parts of the vehicle.
3. **Kerosene** - It is used to remove dust, grease oil, paint, etc.
4. **Thinner** - It is used to remove spilled paint on the floor, walls and tools.
5. **Soap and water** - It is used to wash/clean upholstered furniture such as seats, tables, cabinets, etc.

#### ▪ Complete work and clean up

- ✓ Work is completed and appropriate personnel notified in accordance with workplace procedures.
- ✓ Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures.
- ✓ Reusable material is collected and stored in accordance with workplace procedures.
- ✓ Equipment used is cleaned, checked, maintained and stored in accordance with workplace procedures.
- ✓ Work completion details are finalized in accordance with workplace procedures

#### 3.1.1 Clean up procedures

- Clean up every time whenever you leave an area, including sweeping the floor.
- Clean and return all tools to where you got them.
- Use compressed air sparingly; never aim it at another person or use it to clean hair or clothes.
- Shut off and unplug machines when cleaning, repairing, or oiling.
- Never use a rag near moving machinery.
- Use a brush, hook, or a special tool to remove chips, shavings, etc. from the work area. Never use the hands.
- Keep fingers clear of the point of operation of machines by using special tools or devices, such as, push sticks, hooks, pliers, etc.

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- Keep the floor around machines clean, dry, and free from trip hazards. Do not allow chips to accumulate.
- Mop up spills immediately and put a chair or cone over them if they are wet enough to cause someone to slip.

### 3.1.2 Inspection of work tools/equipment

The purpose of inspection is to identify whether work tool/equipment's and working area can be operated, adjusted and maintained safely. Not all work area, tools/equipment's needs formal inspection to ensure safety and in many cases a quick visual check before use will be sufficient. However inspection is necessary for any work area, tools/ equipment's where significant risks to health and safety may arise from incorrect installation, reinstallation, deterioration or any other circumstances. The need for inspection and inspection frequencies should be determined through risk assessment.

#### ▪ Importance of inspection

As an essential part of a health and safety program, workplaces should be inspected. **Inspections are important as they allow you to:**

- ✓ listen to the concerns of workers and supervisors
- ✓ gain further understanding of jobs and tasks
- ✓ identify existing and potential hazards
- ✓ determine underlying causes of hazards
- ✓ monitor hazard controls (personal protective equipment, engineering controls, policies, procedures)

#### ▪ Recommend corrective action

Some common poor work practices include:

- ✓ using machinery or tools without authority
- ✓ operating at unsafe speeds or in other violation of safe work practice
- ✓ removing guards or other safety devices, or rendering them ineffective
- ✓ using defective tools or equipment or using tools or equipment in unsafe ways
- ✓ using hands or body instead of tools or push sticks

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- ✓ overloading, crowding, or failing to balance materials or handling materials in other unsafe ways, including improper lifting
- ✓ repairing or adjusting equipment that is in motion, under pressure, or electrically charged
- ✓ failing to use or maintain, or improperly using, personal protective equipment or safety devices
- ✓ creating unsafe, unsanitary, or unhealthy conditions by improper personal hygiene, by using compressed air for cleaning clothes, by poor housekeeping, or by smoking in unauthorized areas standing or working under suspended loads, scaffolds, shafts, or open hatches

▪ **Inspection Procedures**

**When conducting inspections, follow these basic procedures:**

- ✓ Draw attention to the presence of any immediate danger--other items can await the final report.
- ✓ Shut down and "lock out" any hazardous items that cannot be brought to a safe operating standard until repaired.
- ✓ Do not operate equipment. Ask the operator for a demonstration. If the operator of any piece of equipment does not know what dangers may be present, this is cause for concern. Never ignore any item because you do not have knowledge to make an accurate judgment of safety.
- ✓ Look up, down, around and inside. Be methodical and thorough. Do not spoil the inspection
- ✓ with a "once-over-lightly" approach.
- ✓ Clearly describe each hazard and its exact location in your rough notes. Allow "on-the-spot" recording of all findings before they are forgotten. Record what you have or have not examined in case the inspection is interrupted.
- ✓ Ask questions, but do not unnecessarily disrupt work activities. This may interfere with efficient assessment of the job function and may also create a potentially hazardous situation.
- ✓ Consider the static (stop position) and dynamic (in motion) conditions of the item you are inspecting. If a machine is shut down, consider postponing the inspection until it is functioning again.
- ✓ Discuss as a group, "Can any problem, hazard or accident generate from this situation when looking at the equipment, the process or the environment?" Determine what corrections or controls are appropriate.

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- ✓ Do not try to detect all hazards simply by relying on your senses or by looking at them during the inspection. You may have to monitor equipment to measure the levels of exposure to chemicals, noise, radiation or biological agents.
- ✓ Take a photograph if you are unable to clearly describe or sketch a particular situation.

## 3.2 Clearing work area

### 3.2.1 Control the Waste

#### Waste from repair

- Waste from repair activities must be contained to prevent releases of dust and debris before the waste is removed from the work area for storage or disposal.
- Collect and control all your waste. This includes dust, paint chips, protective sheeting, dirty water, cloths, mop heads or rag, wipes, protective clothing, respirators, gloves, architectural components and other waste.
- Use heavy plastic sheeting or bags to collect waste. Seal the bag securely with duct tape.
- At the conclusion of each work day and at the conclusion of the renovation or clean, wastes that has been collected from renovation activities must be stored to prevent access to and the release of dust.

Be aware of waste disposal or avoiding rules.

- Most waste generated during these activities is classified as solid, non-hazardous waste, and should be taken to a licensed solid waste landfill. Where waste may be considered hazardous and require special disposal methods. See the following link for further information: [www.epa.gov/lead/pubs/fslbp.htm](http://www.epa.gov/lead/pubs/fslbp.htm).
- Always check state and local requirements before disposing of waste. Some are more stringent than federal regulations.

### Verify Work Completion with the Cleaning Verification Procedure or Clearance

- When all the work is complete, and before interior space is reoccupied, you must determine whether it is a safe environment to live in.

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- To ensure work areas are safe for preoccupancy, cleaning verification is required by the repair, Repair and Painting Rule.

### 3.2.2 Wastage Disposing Method

#### A. **Cleaning:**

A layer of oil, grease and dirt gets coated to the vehicle and its parts with time and usage. Before performing in maintenance work on the vehicle the unwanted layer should be removed. This can be done by hand or by means of certain cleaning methods.

A safe shop is the clean shop. You can make the shop safe by keeping the floor clean. Cleaning up spilled liquids before starting work will make final clean up easier and quicker.

B. A place for burning wastes or to bury them should be prepared far away from the workshop. Material movement and storage activities should be fully integrated to form a coordinated, operational system which spans receiving, inspection, storage, production, assembly, packaging, unitizing, order selection, shipping, transportation and the handling of returns.

Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used.

The basic function of material handling is to choose most appropriate materials handling equipment which is safe and can fulfill material handling requirements at the minimum possible overall cost and to choose production machinery and assist in plant layout so as to eliminate, as far as possible, the need of materials.

### 3.2.3 Removing waste and scrap

Scrap consists of recyclable materials left over from product manufacturing and consumption, such as parts of vehicles, building supplies, and surplus materials. Unlike waste, scrap has monetary value, especially recovered metals, and non-metallic materials are also recovered for recycling.

Scrap value is the worth of a physical asset's individual components when the asset itself is deemed no longer usable. ... An item's scrap value is determined by the supply and demand for the materials it can be broken down into. Scrap value is also referred to as the residual value, salvage value, or break-up value

### **Simple Ways to Reduce Waste In Your Home**

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- Get to know the rules of recycling.
- Ditch the plastic bags.
- Make a meal plan.
- Start relying on reusable containers.
- Start composting.
- Learn to repair rather than discard.
- Cancel unnecessary mail.
- Stop using disposable plates.

### Here are types of waste

- Liquid Waste. Liquid waste is commonly found both in households as well as in industries. ...
- Solid Rubbish. Solid rubbish can include a variety of items found in your household along with commercial and industrial locations. ...
- Organic Waste. Organic waste is another common household. ...
- Recyclable Rubbish. ...
- Hazardous Waste.

Most recycling pick-up companies accept **metal**, so unless the **metal** you have is valuable, **recycle** it in your blue bin. You can make the most money on aluminum, brass and copper at the **scrap yard**. Bronze, cast **iron**, **steel** and tin are all recyclable in the blue bin.

## 3.3 Completing documentation

### Documentation for Training

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Training records shall be maintained as evidence of training delivery and assessment of competence.

### **WHS Induction**

All new managers and workers are required to be provided with WHS information regarding the workplace as part of their overall induction and introduction to . A thorough WHS induction process assists new staff to feel welcome, become integrated into the organization and ensure that they are able to work safely.

The WHS Induction Checklist at Attachment 3 should be used in conjunction with the general induction training program for land workers to ensure that all new workers are aware of the WHS systems, policies and procedures in place within .

### **Procedure**

The Station Manager must ensure a WHS induction is provided on the new team leader or worker's first day. If the Station Manager is not available, he or she should organize for a replacement to conduct the induction. The Station Manager must:

- use the attached WHS Induction Checklist (Attachment 3) to ensure that all WHS issues are covered
- on completion of the induction, sign the checklist and ensure that the new worker also signs
- file a copy of the induction checklist on the worker's file
- provide the new worker with access to this WHS Management Plan and the WHS Policies and Procedures Manual.

A new Station Manager will be inducted by the outgoing Manager or a Board Member

### **3.3.1 The Risk Management Process**

WHS risk management should be undertaken for all activities where there is the potential for harm including: > before activities commence; > before the introduction of new equipment, procedures or processes; > when equipment, procedures or processes are modified.

**Step 1:** Identify the Hazard A hazard is a source or potential source of injury, ill health or disease. Hazard identification is the process of identifying all situations and events that could cause injury or illness by examining a work area/task for the purpose of identifying all threats which are 'inherent in

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the job’. Tasks can include, but may not be limited to using tools, hazardous chemicals, dealing with people, lifting/moving items and mustering.

**Step 2:** Assess the Risk Assessing the risk from a hazard determines its significance. Firstly, consider the consequences should something happen; will it cause a serious injury, illness or death or a minor injury.

Secondly, consider how likely is this to occur—very likely, not likely at all or somewhere in between?

**Some of the things to think about include:**

- how often is the task undertaken
- how frequently are people near the hazard
- how many people are near the hazard at a particular time
- has an incident happened before
- have there been any ‘near misses’

Use the table below to determine how significant the risk is.

Where a manager, worker, contractor, or visitor to the workplace identifies a hazard, requires that it is eliminated or reduced in consultation with the relevant stakeholders.

- Step 1: identify the Consequences—or how severely could it hurt someone
- Step 2: identify the Likelihood—or how likely is it for an injury to occur
- Step 3 & 4: identify the Risk Priority Score—to prioritize your actions
- Step 5: apply the hierarchy of hazard control
- Step 6: identify who, how and when the effectiveness of controls will be checked and reviewed

**DOCUMENTS TO BE DISPLAYED**

- Emergency contacts page (Attachment 1)
- Emergency Evacuation Plan > Return to Work Policy
- Work Health and Safety Policy
- Accident/Incident Notification details
- Compensation and Return to Work information

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<b>Self-Check -3</b>	<b>Written Test</b>
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**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ----- consists of recyclable materials left over from product manufacturing and consumption, such as parts of vehicles, building supplies, and surplus materials  
A/ Waste          B/ Product          C/ Scarp          D/ None
2. Scrap value is also referred to as:-  
A/ Residual value,      B/ Salvage value,      C/ Break-up value      D/All correct
3. What are the five types of waste?
4. What is Scrap value?

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