

**T.C.
MİLLÎ EĞİTİM BAKANLIĞI**



MEGEP

**(MESLEKİ EĞİTİM VE ÖĞRETİM SİSTEMİNİN
GÜÇLENDİRİLMESİ PROJESİ)**

MOTORLU ARAÇLAR TEKNOLOJİSİ

OTOMOTİV TEKNİK İNGİLİZCE II

ANKARA 2007

Milli Eğitim Bakanlığı tarafından geliştirilen modüller;

- Talim ve Terbiye Kurulu Başkanlığının 02.06.2006 tarih ve 269 sayılı Kararı ile onaylanan, Mesleki ve Teknik Eğitim Okul ve Kurumlarında kademeli olarak yaygınlaştırılan 42 alan ve 192 dala ait çerçeve öğretim programlarında amaçlanan mesleki yeterlikleri kazandırmaya yönelik geliştirilmiş öğretim materyalleridir (Ders Notlarıdır).
- Modüller, bireylere mesleki yeterlik kazandırmak ve bireysel öğrenmeye rehberlik etmek amacıyla öğrenme materyali olarak hazırlanmış, denenmek ve geliştirilmek üzere Mesleki ve Teknik Eğitim Okul ve Kurumlarında uygulanmaya başlanmıştır.
- Modüller teknolojik gelişmelere paralel olarak, amaçlanan yeterliği kazandırmak koşulu ile eğitim öğretim sırasında geliştirilebilir ve yapılması önerilen değişiklikler Bakanlıkta ilgili birime bildirilir.
- Örgün ve yaygın eğitim kurumları, işletmeler ve kendi kendine mesleki yeterlik kazanmak isteyen bireyler modüllere internet üzerinden ulaşabilirler.
- Basılmış modüller, eğitim kurumlarında öğrencilere ücretsiz olarak dağıtılır.
- Modüller hiçbir şekilde ticari amaçla kullanılamaz ve ücret karşılığında satılamaz.

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EXPLANATIONS

KOD	222YDK008
ALAN	Motorlu Taşıtlar Teknolojisi
DAL/MESLEK	Tüm Dallar
MODÜLÜN ADI	Otomotiv Teknik İngilizce 2
MODÜLÜN TANIMI	Otomotiv teknolojisi alanında kullanılan İngilizce teknik terimler, kavramlar ve yayınların tekniğine uygun olarak okunabilmesini sağlayan eğitim materyalidir.
SÜRE	40/32
ÖN KOŞUL	Otomotiv Teknik İngilizce 1 modülünü başarmış olmak.
YETERLİK	Otomotiv alanında kullanılan İngilizce teknik terimleri anlamak ve bilmek.
MODÜLÜN AMACI	<p>Genel Amaç Otomotiv gövde ve boya teknolojisi ile ilgili teknik İngilizceyi okuma, anlama, yazma ve konuşma düzeyinde öğreneceksiniz.</p> <p>Amaçlar</p> <ol style="list-style-type: none">1. Otomotiv panel ile ilgili teknik İngilizceyi kullanma yeterliklerini kazanacaksınız.2. Otomotiv gövde ile ilgili teknik İngilizceyi kullanma yeterliklerini kazanacaksınız.3. Otomotiv gövde yardımcı donanımları ile ilgili teknik İngilizceyi kullanma yeterliklerini kazanacaksınız.4. Otomotiv boya yüzey hazırlama ile ilgili teknik İngilizceyi kullanma yeterliklerini kazanacaksınız.5. Otomotiv boya yüzey dolgu ve diğer konuları ile ilgili teknik İngilizceyi kullanma yeterliklerini kazanacaksınız.
EĞİTİM ÖĞRETİM ORTAMLARI VE DONANIMLARI	<p>Ortam Derslikler, internet ortamı, işletmeler ve araştırmaya yönelik etkinlikler yapılabilecek tüm ortamlar.</p> <p>Donanım Sınıf ortamındaki araç gereçlerin yanı sıra projeksiyon cihazı ve bilgisayarlar.</p>

**ÖLÇME VE
DEĞERLENDİRME**

Ölçme

Bu modülde bulunan her bir faaliyetin sonunda bilgilerinizi ölçebileceğiniz, ölçme araçlarına yer verilmiştir. Ayrıca farklı kaynaklarla da bilgilerinizi ölçebilirsiniz.

Değerlendirme

Cevaplarınızı, cevap anahtarı ile karşılaştırarak değerlendirme yapabilirsiniz. Ayrıca performans değerlendirme ile öğrendiklerinizi değerlendirebilirsiniz.



INTRODUCTION

Sevgili Öğrenci,

Otomotiv sanayi ve otomotive bağlı sektörler her geçen gün hızla büyüyüp gelişmektedir. Buna bağlı olarak otomotiv sanayinde en ileri seviyede bulunan Avrupalı firmaların internet sayfalarından yeni gelişmeleri takip edebilmek ve bu alanda yayınlanmış makaleleri ve yenilikleri izleyebilmek için teknik İngilizce konusunda bazı bilgi ve yeterliliklere sahip olmak gerekmektedir. Sizlere tavsiyelerimiz bu modülde bulunan temel bilgileri öğrenerek yeni araştırmalar yapmanız ve her alanda gerekli olan İngilizceyi en azından kendi alanınız dâhilinde kavrayabilmenizdir. İleri uygarlıklar seviyesine ulaşabilmek ancak onların mevcut teknolojilerini takip ederek yeni teknolojileri üretmekle mümkün olacaktır.

Sizlere sunulan bu modülleri başarıyla tamamlamanız halinde; Avrupalı meslektaşlarınızla aynı seviyede ve onlarla rekabet edebilecek teknik bilgiye sahip birer teknik eleman olarak yetişeceksiniz. Ancak iyi bir teknik eleman olmanın en önemli şartı; kendi mesleği ile ilgili alanlarda sürekli uygulama yapmak ve çalışmaktır. İyi öğrenilmiş bir meslek başarının ilk anahtarıdır. Unutmayın ki; otomobil de bir zamanlar hayaldi ve şu an geldiği nokta hayal edilemez, fakat gerçektir. Bununla birlikte gelişmiş ülkelerin en büyük gelir kaynağıdır. Aylarca uğraşarak 100 dönüm tarladan alınan buğdayın getirisi ancak lüks bir otomobilin kine eşit olmaktadır. Ülkemizde de rahmetli iş adamlarımız Vehbi Koç ve Özdemir Sabancı' nın hayalleri ve büyük çabalarıyla başlayan ve hızla büyüyerek, yüz binlerce insanımıza ekmek kapısı açan bu sektör sizlerinde katkıları ve çalışmalarıyla, ilerleyerek devam edecektir. Bu iş adamlarımızın en büyük hayali olan Türkiye' nin kendi aracını üretmesi projesinde yer almanız dileğiyle, hepinize eğitimlerinizde ve iş hayatınızda başarılar dileğiyle..



LEARNING ACTIVITY-1

AIM

Otomobil üzerindeki gövde parçalarının İngilizce terimleri hakkında bilgi sahibi olacaksınız.

SEARCH

- Ø İngilizce hazırlanmış firma kataloglarını inceleyerek ve internet üzerinden araştırmalar yaparak konuyu detaylı olarak araştırınız.

1. AUTOMOTIVE PANEL

1.1.Doors

Doors are first parts of automotive panel. There are two or four doors on the automotive body. There are two doors in front of the car and two doors behind of the car. If the car has only two doors, they are in front of the car. They are made of sheet iron and may be unstitched. The doors are used for getting in and out the car by people. You can see a car and its doors in the picture 1.1.



Picture 1.1: Car and its doors



Picture 1.2: Front door

1.2. Engine bonnet (hood)

The bonnet is second part of automotive panel. It is made of sheet iron and it covers the engine unit. There is only one engine bonnet and baggage bonnet on the automotive body. Look at the picture 1.3 to see the engine bonnet on the car.



Picture 1.3: Engine bonnet and door

1.3. Baggage bonnet (trunk lid)

The baggage bonnet is made of sheet iron. It is located behind of the car and covers the baggage unit. Engine and baggage bonnet may shell out parts of automotive. You can see the baggage bonnet in picture 1.4.



Picture 1.4: Baggage bonnet

MEASURING AND EVALUATION

TEST QUESTIONS 1 (Compare the Information)

Read the sentences and answer the questions. After this, compare your answers with the answer key at the end of the module.

1. What is the automotive door made of?
A) It's made of plastic material
B) It's made of steel material
C) it's made of sheet iron material
D) it's made of wood material
2. What are the automotive windows made of?
A) They are made of wood material
B) They are made of plastic material
C) They are made of steel material
D) They are made of glass material
3. Which one may be used to pull out parts on the automotive body?
A) The ceiling
B) The doors
C) The engine unit
D) The bottom
4. Which one may not be used to pull out parts on the automotive body?
A) The door
B) The glass
C) The engine bonnet
D) The ceiling
5. How many doors are there on the sedan automotive?
A) There are three doors
B) There are four doors
C) There are two doors
D) There are six doors

Ø After reading each sentence, put T (true) or F (false) in the blank.

6. () The baggage bonnet is made of sheet iron.
7. () The engine bonnet covers the engine unit.
8. () There are three or six doors on the automotive body.
9. () The doors aren't used for getting in and out the car by people.
10. () There are two engine bonnets and baggage bonnets on the automotive body.

LEARNING ACTIVITY-2

AIM

Otomobil üzerindeki gövde parçalarının İngilizce terimleri hakkında bilgi sahibi olacaksınız.

SEARCH

- Ø İngilizce hazırlanmış firma kataloglarını inceleyerek ve internet üzerinden araştırmalar yaparak konuyu detaylı olarak araştırınız.

2. AUTOMOTIVE BODY

2.1. Automotive Ceiling

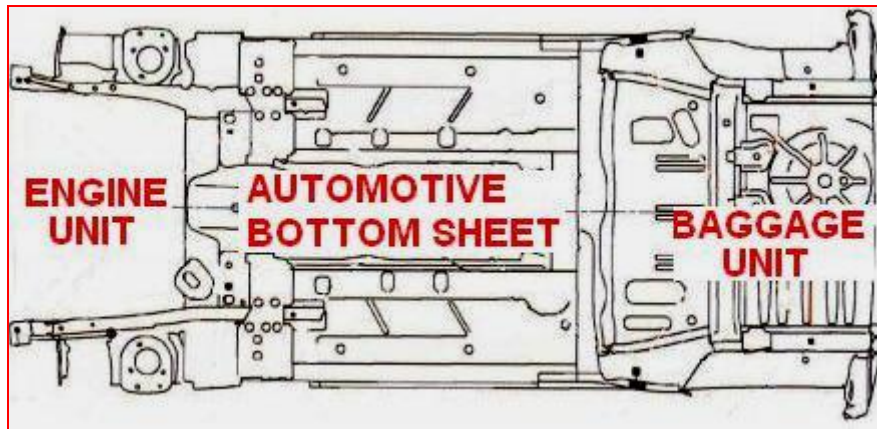
The automotive ceiling is the first part of automotive body. It is made of sheet iron and it covers the automotive top. The ceiling can be opened completely or partly for some automobiles. The ceiling which can be opened completely is called cabriolet. The ceiling may not shell out because it is welded on the body. Look at the picture 2.1 to see the ceiling.



Picture 2.1: Automotive ceiling

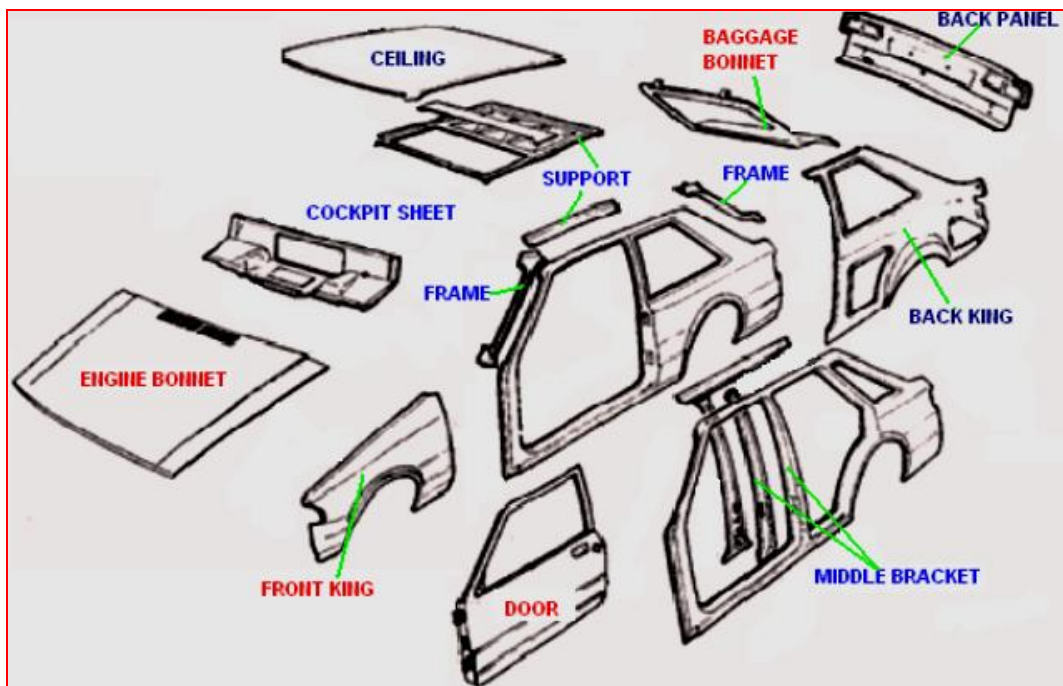
2.2. Automotive Bottom

The automotive bottom is the second part of automotive body. The bottom carries passengers and the other parts of automobile. It is made of steel sheet iron. Both sides of its surfaces are coated with pitch in order to get endurance against rust. Look at the picture 2.2 to see the bottom sheet iron.



Picture 2.2: Automotive bottom

Look at the picture 2.3 to see the all parts of the panel.



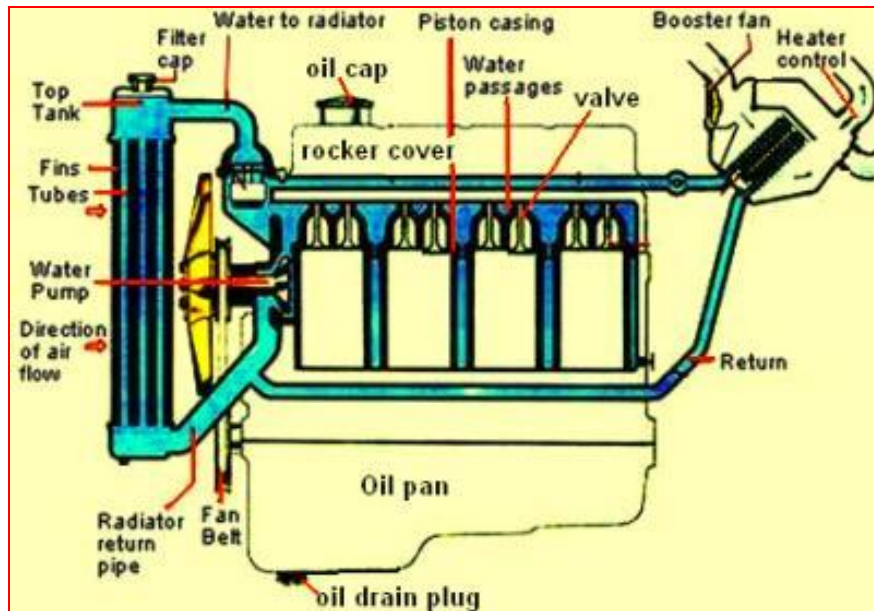
Picture 2.3: Body parts

2.3. Automotive Baggage And Engine Unit

2.3.1. Engine And Engine Unit

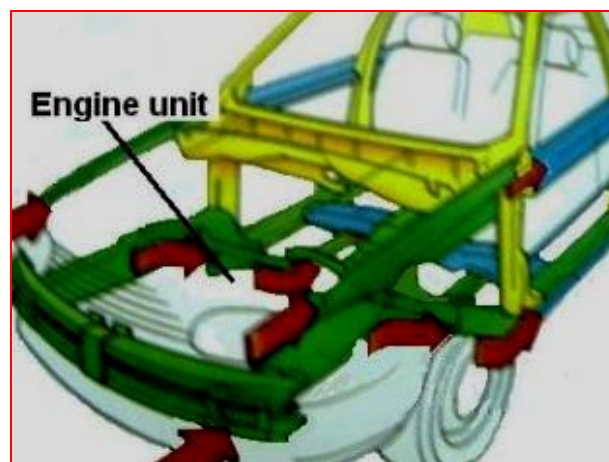
All motor vehicles have engines. Three engine types are generally used. These are petrol engines, liquid petrol gas engines and diesel engines. There are spark plugs in all petrol engines but diesel engines don't have spark plugs. They have fuel injectors. There are

valves in the four stroke engines. There are no valves in the two stroke engines. Two stroke engines are used in the motorcycles. The four stroke engines have oil sump but there aren't two stroke engines. The oil is mixing with fuel before using two stroke engines. Generally; the all automotive engines have water cooled systems and radiator. Look at the picture 2.3 to see the automotive engine and water cooling system.



Picture 2.3: Automotive engine and water cooling system

Automotive baggage and engine unit are combined to the bottom of the car. The engine unit is carrying engine and other companion. Look at the picture 2.3 to see the automotive engine unit.



Picture 2.3: Automotive engine unit

These highly durable new materials replace 50% of the waste cotton in phenolic felt by glass fibre. The process which is used combines current air lay technology to thermo compression.

Ø Benefits;

- Improved mechanical behaviour,
- Fire resistance,
- Acoustic performance,

Look at the picture to see the isolation component of the engine unit.



Picture 2.4: Engine unit isolation component

2.3.2. Baggage Unit

A baggage unit carries spare wheel, jack, fuel depot and luggage. This compartment offers multi-level storage in station wagons, SUVs and off-road vehicles. It has a double-wall load floor with an integrated hinge and a set of handle hooks for attaching shopping bags. You can see the baggage bonnet in picture 2.5.



Picture 2.5: Baggage bonnet

Ø Benefits;

- Parcel shelf and trunk partitioning,
- Higher load volume for closed trunk,
- Parcel shelf can be moved to back seat,
- 100% washable.

Look at the picture 2.6 to see the baggage unit isolation and floor (upholstery).



Picture 2.6: Baggage unit isolation and floor

Look at the picture 2.7 to see the liquid gasket, silicone and adhesive cement for protect the body from the corrosion.



Picture 2.7: Silicone, adhesive cement and gun

MEASURING AND EVALUATION

TEST QUESTIONS 2 (Compare the Information)

Read the sentences and answer the questions. After this, compare your answers with the answer key at the end of the module.

1. What is the automotive ceiling made of?
A) it's made of plastic material
B) it's made of steel material
C) it's made of wood material
D) it's made of sheet iron material
2. What is the isolation component made of?
A) It is made of wood material
B) It is made of plastic material
C) It is made of steel material
D) It is made of fibreglass material
3. Which one has got a special isolation component?
A) The ceiling
B) The door
C) The engine unit
D) The glass
4. Which one is more important than the other parts of the automotive?
A) The door
B) The glass
C) The engine
D) The ceiling
5. How many ceilings are there on the automotive?
A) There is one
B) There are four
C) There are two
D) There are three

Ø After reading each sentence, put T (true) or F (false) in the blank.

6. () The engine bonnet is made of sheet iron.
7. () The ceiling covers the engine unit.
8. () The isolation component has got acoustic performance
9. () A baggage unit carries spare wheel, jack, fuel depot and luggage.
10. () The windows aren't used for ventilation interior of the car.

LEARNING ACTIVITY-3

AIM

Otomobil gövdesi üzerindeki farklı parçaların İngilizce terimleri hakkında bilgi sahibi olacaksınız.

SEARCH

- Ø İngilizce hazırlanmış firma kataloglarını inceleyerek ve internet üzerinden araştırmalar yaparak konuyu detaylı olarak araştırınız.

3. AUTOMOTIVE BODY AUXILIARY SYSTEMS

3.1. Automotive Glass Systems

Automotive glasses provide seeing outside while people are in the car. Front and back glasses are fixed. Side glasses can open for ventilating inside of the car. The glasses must be strong for an accident. If the glasses have poor quality, they may cause death of the passenger. Automotive glasses are presented in four kinds according to their position on the cars. These are;

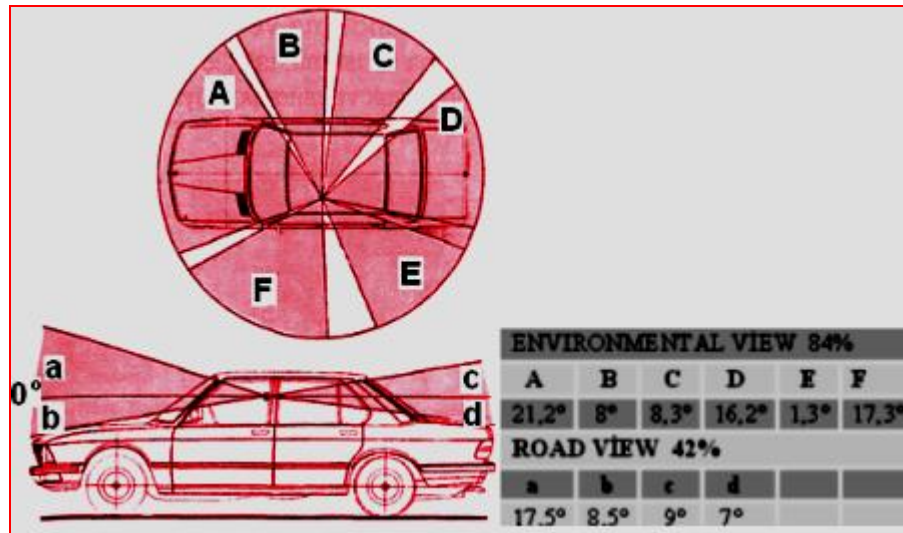
- Front glass (windscreen)
- Back glass (back window)
- Side glasses (left and right side windows)

Look at the picture 3.1 to see the automotive glasses.



Picture 3.1: Glasses on the car

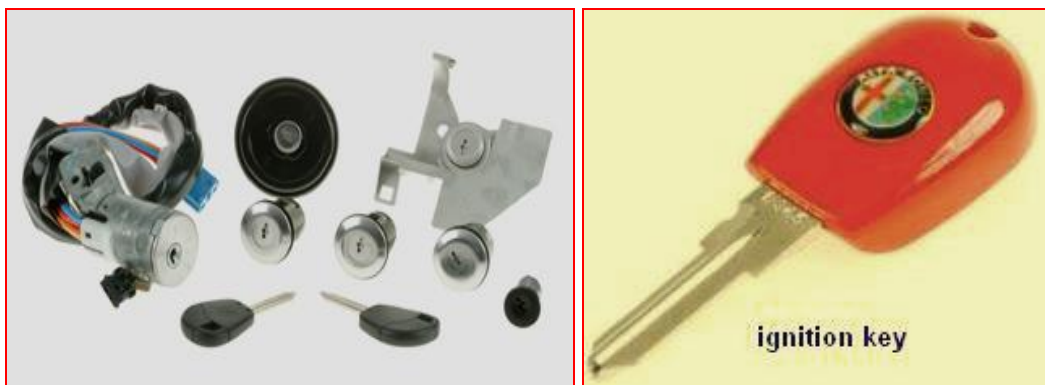
The glasses must be designed like picture 3.2 for a good view on the automotive.



Picture 3.2: View angle on the car

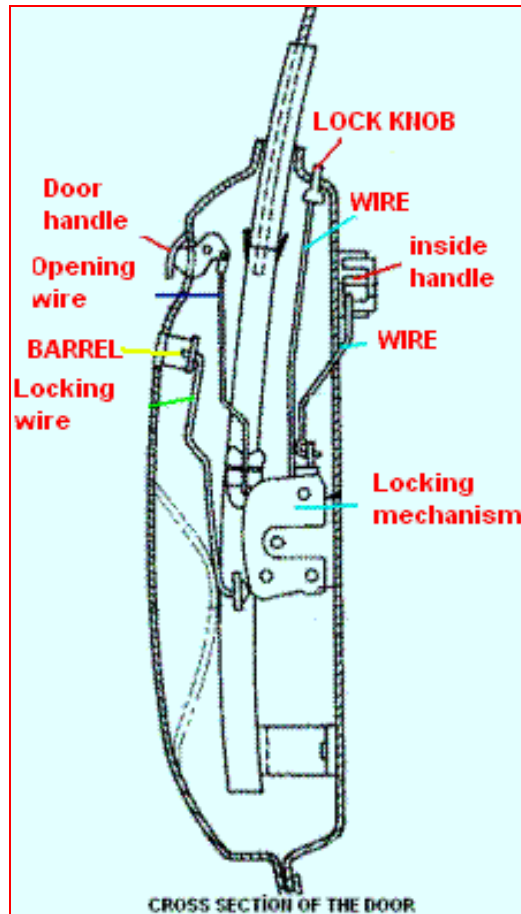
3.2. Automotive Door Lock Systems

Automotive door lock systems can turn on and turn off the doors. So we can lock and open the doors and baggage when we want. The locks have to get safety. However the drivers can open the entire door by the automatic door lock system. Look at the picture 3.3 to see the door lock systems and keys.



Picture 3.3: Door lock systems and keys

You can see the locking mechanism on the cross-section door in picture 3.4.



Picture 3.4: Cross-section of the door

3.3. Automotive Seat And Seat Frame Systems

The firms are also developing seat frames that can absorb severe impacts. All new products are tested in the Seating test canter, equipped with powerful simulation, calculation and virtual development tools. For example, it is an active anti-submarining mechanism which prevents the occupant from sliding under the seatbelt in the event of impact. Vehicles are subjected to virtual crashes in order to test airbag deployment and the resistance of seats to the impact of luggage in the rear of the vehicle. Slim line seats help to optimize the vehicle's interior space. Look at the picture 3.5 to see the different automotive new slim line, front driver and passenger seats.



Picture 3.5: Automotive front seats

3.3.1. Head Support

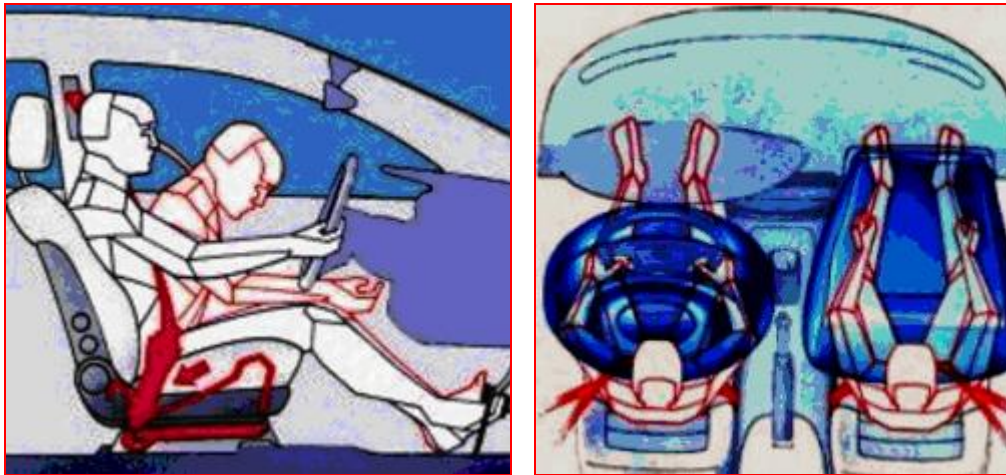
Head support mechanism supports human neck. Sometimes head support is safe for passenger's life when the car crashes. It is important as safety belt. Look at the picture 3.6 to see the head support and mechanism.



Picture 3.6: Head support mechanism

3.3.2. Safety Belts And Air-Bags

Safety belts and air-bags are very important for passenger safety. These components protect passenger's life while big accident. You can see safety belts and air-bags while crash in picture 3.7.



Picture 3.7: Safety belts and air-bags

3.3.3. Design Of Automotive Interior



Picture 3.8: Automotive back seats

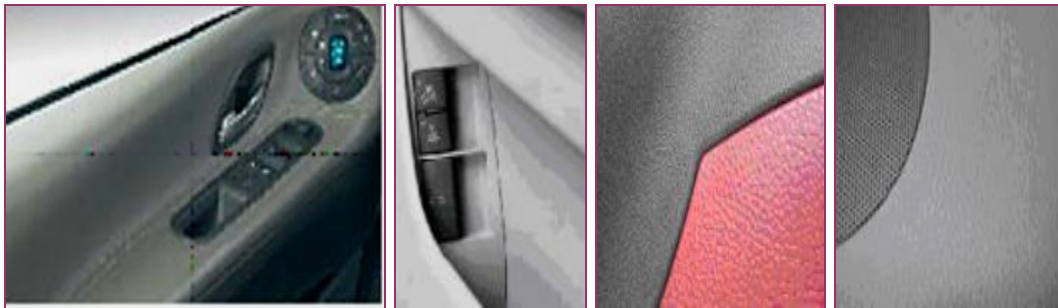
You can see the back seats in the car in picture 3.8. The door is unique in that it is part of both the interior and exterior of the vehicle, and must meet a wide variety of end-user needs. Door design and manufacture must take into account integration into the bodywork and respect the vehicle's visual, safety and ergonomic imperatives. Like the other parts of the cabin, the door must also meet the automaker's specifications in terms of perceived quality and weight, in addition to sealing tightly when shut. In door structures, innovation is focused on generalizing the use of composite plastics, which allow for greater precision and flexibility in production than metals and the development of extremely competitive solutions in terms of technical performance, weight. For its door panel and door module structures, firms use a full range of synthetic and natural materials, including thermoplastics, highly-engineered thermoplastic composites, metal-plastic hybrids, fibre-reinforced polyurethanes and wood natural fibre composites. For the surfaces, textile, foil, skin and leather are processed using technologies such as thermoforming, slush, back-foaming and

overmoulding, and different materials are often combined to harmonious effect. The door plays a crucial role in protecting occupants in the event of a frontal and side impact. Look at the picture 3.9 and 3.10 to see the design of car's interior.



Picture 3.9: Design of car's interior (upholstery)

Central to the structure and animation of the car interior, cockpit modules combine design with functionality.



Picture 3.10: Use material for design of car's interior

This high class polyurethane skin for instrument panels or door panels has set a new standard in terms of perceived quality and design features. After painting in the open and grained mould, liquid polyurethane is injected in order to obtain a constant thickness in the finished skin.

Ø Benefits;

- High-quality surface: grain, soft touch, low gloss
- Sharp radii and colour variability in line with new design trends
- Environmentally friendly material
- Constant thickness
- Properties highly suitable for airbag deployment

The latest generation of polyurethane foam offers enhanced load-bearing capacity and resilience, thanks to a new molecular structure.

Ø Benefits;

- This high-performance foam offers the human body better support and contact comfort.
- The material offers improved durability and damping properties compared to conventional foam.
- The foam can be used in thin layers to produce slimmer seats with the same level of comfort as standard seats.



Picture 3.11: Foam

This metal-plastic hybrid cockpit structure integrates the structural and air-distribution functions in a single part. It was designed for a world platform and can be fitted with different styling for different brands.

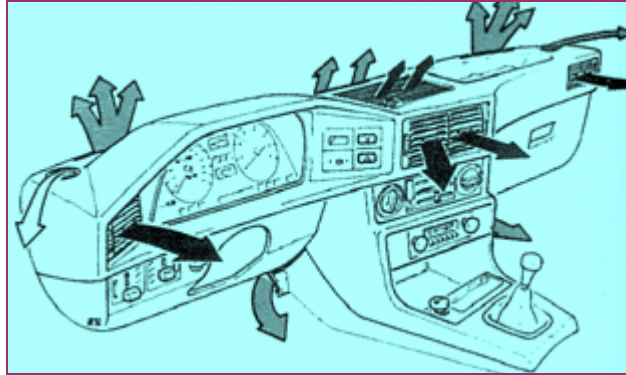
Ø Benefits;

- Weight reduction,
- Comfort improvement by reducing vibrations,
- Best-in-crash safety performance,
- Standardized "hidden" part fitted with brand dedicated instrument panels.

Look at the picture 3.12 and 3.13 to see the automotive cockpit.



Picture 3.12: Automotive cockpit

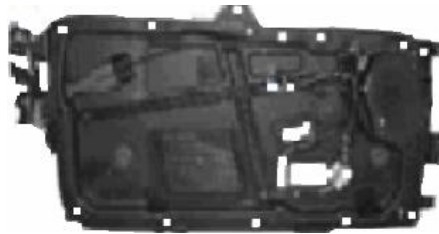


Picture 3.13: Automotive cockpit and gauges

The high integrated module; integrates all the main functions of a door - window-lifter, electric/electronic components, loudspeaker, latch system - on a sealed plastic carrier.

Ø Benefits;

- The plastic carrier enables a high level of integration, with parts such as window-lift rails, motor housing, energy absorption pads, fixings and sealing directly integrated,
- A complete, pre-tested module is delivered to the automaker, which therefore enjoys enhanced quality, improved logistics and reduced weight and cost.
- In addition, the end-user benefits through fuel savings, better acoustic behaviour and higher performance.



Picture 3.14: Door's interior component

This high class polyurethane skin for instrument panels or door panels has set a new standard in terms of perceived quality and design features. After painting in the open and grained mould, liquid polyurethane is injected in order to obtain a constant thickness in the finished skin.

Ø Benefits;

- High-quality surface: grain, soft touch, low gloss
- Sharp radii and colour variability in line with new design trends
- Environmentally friendly material
- Constant thickness and properties highly suitable for airbag deployment.

MEASURING AND EVALUATION

TEST QUESTIONS 3 (Compare the Information)

Read the sentences and answer the questions. After this, compare your answers with the answer key at the end of the module.

1. What is the automotive seat made of?
A) It's made of plastic and textile material
B) It's made of steel material
C) it's made of wood material
D) it's made of sheet iron material
2. What is the automotive cockpit made of?
A) It is made of wood material
B) It is made of plastic material
C) It is made of metal-plastic hybrid material
D) It is made of fibreglass material
3. Which one has got a special acoustic isolation component?
A) The ceiling
B) The door
C) The cockpit
D) All
4. Which one is more important than the other parts of the automotive?
A) The door
B) The safety belt
C) The seat
D) The glass
5. Why is necessary foam in the automotive use?
A) For safety
B) For acoustic performance
C) For comfort
D) All

Ø After reading each sentence, put T (true) or F (false) in the blank.

6. () The head support is made of sheet iron.
7. () The cockpit modules combine design with functionality.
8. () The isolation component is necessary for comfort.
9. () The safety belt is more important than the head support.
10. () All new seats are tested in the seating test centres.

LEARNIGN ACTIVITY-4

AIM

Otomobil gövde boyama konusundaki yüzey hazırlama ile ilgili İngilizce terimler hakkında bilgi sahibi olacaksınız.

SEARCH

- Ø İngilizce hazırlanmış firma kataloglarını inceleyerek ve internet üzerinden araştırmalar yaparak konuyu detaylı olarak araştırınız.

4. AUTOMOTIVE PAINT SURFACE PREPARATIONS

4.1. Metal Surface Preparation

To prepare for polyester body filler the feather edges of both the old paint and the black primer from the new panel must be sanded. This can be done manually or with an orbital sanding machine. A high quality refinishing job, for example on a virtually new car, must result in a very good finish quality, which means that comprehensive body filling and priming work with careful fine sanding will be required. Look at the picture 4.1 to see the metal surface preparing.



Picture 4.1: Metal surface preparing

The appearance of a finish depends not only on the paint materials and how they are processed but also on the condition of the spraying and drying booths and that of the other equipment. Paints should be applied at an ambient temperature of between 18 °C and 25 °C. The air used for spraying must be free oil and water. The spraying pressure must be constant.

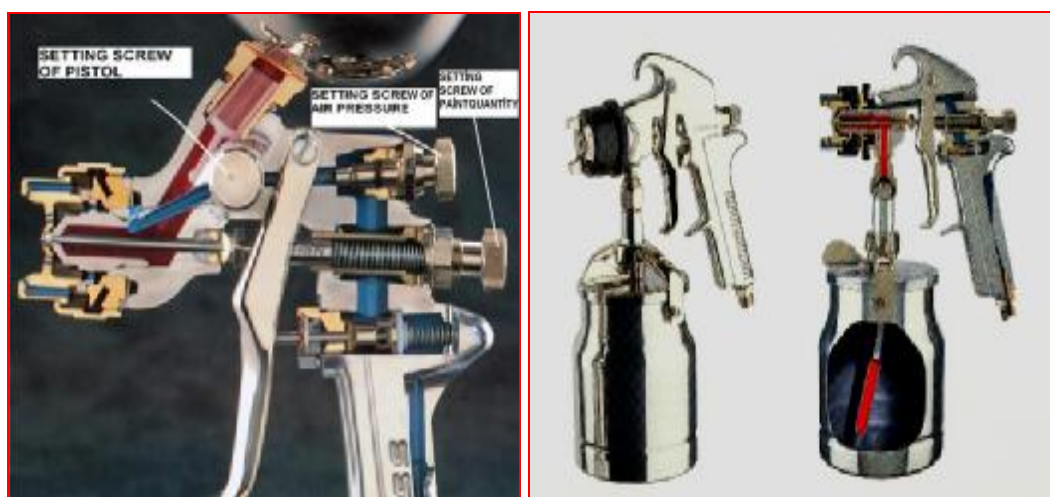
The choice of the correct nozzle and the cleanliness of both the nozzles and the air caps are also important since there will not be an even spraying pattern otherwise. Look at the picture 4.2 to see the sanding paper and waxy gland



Picture 4.2: sanding paper and waxy gland

4.1.1. The Air

The air drawn in from outside must be filtered and warmed. This applies particularly in the colder seasons and especially in the case of combi-booths, i.e. spray booths that also serve as drying booths. The amount of air to be drawn in depends on the size of the spray booth and is also directly related to the amount of air extracted. In all cases, however, enough air must be drawn in for the pressure in the spray booth to be higher than the pressure outside. The filters used must of course be adapted to this purpose and kept clean at all time. The air speed should not be too high either since the paint applied would then dry too quickly on the surface. The result would be poor flow and also the formation of specks due to insufficient overspray absorption. Furthermore, if the surface dries too rapidly, this can lead to loss of gloss and wrinkling. The paint spray is doing with paint pistol. Look at the picture 4.3 to see the paint spraying pistol.



Picture 4.3: Paint spraying pistol cross-section

The paint firms offer comprehensive range of products for the repair trade which allows body shops to select the ideal refinishing process by choosing fast or slow hardeners, thinners and additives. Only by the selection of and specialisation in certain materials and procedures can efficient and economic paint jobs be achieved. What is most important for a good result is to stick to the recommended application data in respect of mixing ratios, film thickness, viscosity and drying time etc.

4.1.2. Paint Spraying

Spraying and drying booths are kept free of dust mainly by means of an efficiently functioning ventilation system, which is also necessary for safety reasons. In order to avoid build-ups of explosive mixtures of solvent vapour and air. The result of repair job depends not only on the spraying technique, but also to a great extent on a proper ventilation system. The volume of air needed in a spray booth is approx (20,000 m³). The air used for spraying should not be drawn from the workshop because this would require a higher level of dust filtering. Look at the picture 4.4 to see the paint spraying process.



Picture 4.4: Paint spraying process

4.2. Plastic Surface Preparing

Multi-purpose system is suitable for all paintable plastic materials on cars. Pure polypropylene (pp) and polyethylene (pe) can't be painted. In order to guarantee paintability, modified plastic materials are used for vehicle parts that shall be painted. Although these plastic parts often labelled (pp), the materials nevertheless paintable. In plastics refinishing, the paint materials to be used must be specially adjusted to the properties, for example the elasticity of the plastics to be refinished. The recommended refinishing processes are detailed in paint firm's technical manual. Especially, plastic thinner must be used for cleaning the plastic surface. Filling paste must be practised on the surface after the cleaning. The surface is sanding at the moment. The adhesion primer is spraying when the surface is dry. Last of all; the paint is spray and should be waited for drying.

MEASURING AND EVALUATION

TEST QUESTIONS 4 (Compare the Information)

Read the sentences and answer the questions. After this, compare your answers with the answer key at the end of the module.

1. What are you doing first for preparing the metal surface?
 - A) Painting
 - B) Sanding
 - C) Filling
 - D) Clearing
2. What are you preparing the spray paint with?
 - A) Pistol
 - B) Gun
 - C) Spatula
 - D) Sand
3. Approximately, how much volume of air is needed in a spray booth?
 - A) 10,000 m³
 - B) 20,000 m³
 - C) 25,000 m³
 - D) 30,000 m³
4. Which one is dangerous than the other material?
 - A) Water
 - B) Glass
 - C) Solvent
 - D) Air
5. What is necessary for painting of plastic surface?
 - A) Solvent
 - B) Water
 - C) Adhesion primer
 - D) Filling primer

Ø After reading each sentence, put T (true) or F (false) in the blank.

6. () The sand paper is made of sand.
7. () Pure polypropylene (pp) and polyethylene (pe) can be painted.
8. () The air drawn in from outside must be filtered and warmed
9. () The air speed should be too high in order to the paint applied dry too quickly on the surface.
10. () The adhesion primer is used for a paint of plastic surface.

LEARNING ACTIVITY-5

AIM

Otomobil gövde boyama konusundaki İngilizce terimler hakkında bilgi sahibi olacaksınız.

SEARCH

- Ø İngilizce hazırlanmış firma kataloglarını inceleyerek ve internet üzerinden araştırmalar yaparak konuyu detaylı olarak araştırınız.

5. AUTOMOTIVE SURFACE FILLING

5.1. Filling Paste Practices

Filling paste and hardener must be mixed before using. In order to achieve a perfect adhesion with the polyester body filler, the substrate must be degreased thoroughly using two clean cloths and degreaser. The joint between the old and the new panel can be made invisible using polyester body filler. Look at the picture 5.1 to see the filling paste and hardener mixture.



Picture 5.1: Filling paste and hardener and mixing both of them

Look at the picture 5.2 to see the filling paste practices.



Picture 5.2: Filling paste practices

After drying the polyester body filler must be sanded preferably using dry sanding paper. The original shape can be restored easily by help of a sanding block. Before the spray filler is applied, both the old paint and the black primer on the new panel must be sanded which can be done manually or with an orbital sanding machine. While the new panels and repaired ones are being sprayed in the filler, the car must be covered to protect against overspray. Look at the picture 5.3 to see the sanding and cleaning the surface after filling paste practices.



Picture 5.3: Sanding and cleaning the surface after filling paste practices

5.2. Filling Undercoat Practices

Prior to the application of each paint product, the substrate must be thoroughly degreased. Well protected against inhaling of paint fumes and vapours, the sprayer can now apply the filler. Once the filler is dry and hardened trough, it must be sanded with either wet or dry sanding paper, manually or with an orbital sanding machine. During this step, the interior of the car is protected against sanding dust or the residue from sanding water. The last dust particles are blown away with clean compressed air. (Primer filler have very good

anti-corrosive properties, easy and quick sanding). Look at the picture 5.4 to see the filling undercoat practices.



Picture 5.4: Filling undercoat practices

Before application of the colour coat the panels must be treated again with degreaser to remove all contamination. Masking is necessary to avoid overspray from the whole of coat on other parts of the car. The colour accuracy of the repair paint must be checked against the original car colour. Forced drying at 60°C is possible to speed up the drying process. (Automotive must be dry in the paint oven at the end of the paint process). Look at the picture 5.5 to see the refinishing practice.



Picture 5.5: Painting (refinishing) practice

You must use mask when you make painting practice. Look at the picture 5.6 to see the paint masks.



Picture 5.6: Paint masks

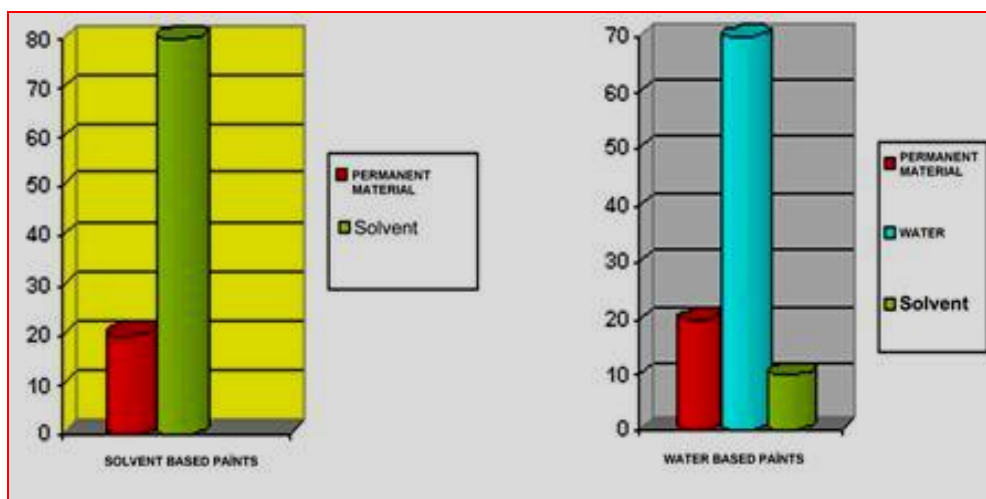
5.3. Automotive Painting

5.3.1. Solvent Based Paints

Solvent based paints are contents of high ratio solvent. Solvent damages human health and environment. However it is flammable and dangerous material. So, this paint is not used in Europe. But solvent based paints are faster dryable than water based paints.

5.3.2. Water Based Paints

Water based refinishing, which allows to achieve the same quality level as solvent based paint materials involves the use of appropriate water based products. The most important advantage of this environmentally acceptable process is that solvent consumption can be reduced by up to 80% compared to solvent-based refinishing systems. Look at the graphic to see the compare paint material.



Graphic 1: Compare the solvent based paints and water based paints

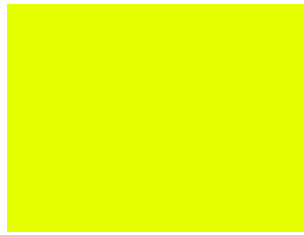
5.3.3. Colour of Paints

The determination of the correct colour is one of the decisive process steps in automotive refinishing. Speed and precision are crucial factors as the human eyes are rather critical. A repair job is an expert repair job only if there is absolutely no difference between original finish and refinish. So the paint shops must use firms colour system and measuring device for precision. Look at down to see the variety of colours.

Ø Main colours



Red



Yellow



Blue

Ø Distance colours



Green

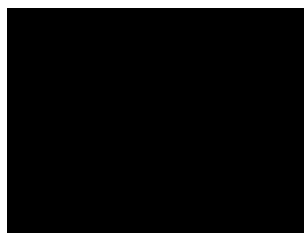


Orange



Purple

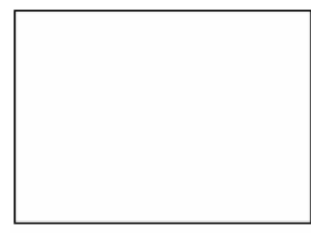
Ø Neutral colours



Black



Grey



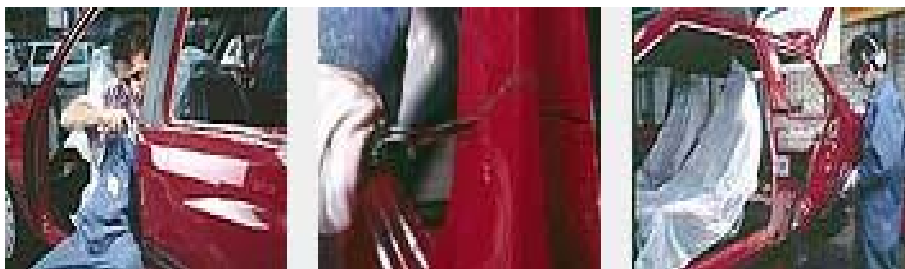
White

5.4. Refinishing Practice

1. The best place to have your damaged car repaired is a damage repair workshop also known as "body shop".
2. An expert estimates the damage and the cost for repair. He also determines if the damaged panels can be repaired or need to be replaced.
3. The first step in the repair process is washing the car, this is essential to remove road dirt and other contamination.



4. The next step is to remove all "lose" parts such as door locks, lights, bumpers and windows.
5. In the panel beating section the damaged panel will be separated from the car body using a special sawing machine (or manually with a handsaw).
6. After grinding or drilling all welding spots the panel can be removed (for safety reasons hands, eyes and ears must be well protected).



7. The new panels are fitted to the car and placed in the correct position.
8. With this action the panel will be precisely aligned with the adjacent body parts.
9. The new panel is welded to the car body; the weld seam must be smoothened as much

as possible with a disc grinder.



10. To prepare for polyester body filler the feather edges of both the old paint and the black primer from the new panel must be sanded. This can be done manually or with an orbital sanding machine.
11. In order to achieve a perfect adhesion with the polyester body filler the substrate must be degreased thoroughly using two clean cloths and degreaser.
12. The joint between the old and the new panel can be made invisible using polyester body filler.



13. After drying the polyester body filler must be sanded preferably using dry sanding paper. The original shape can easily be restored with help of a sanding block.
14. The car is now transported to the preparation area where the next repair steps will take place.
15. Before the spray filler can be applied both the old paint and the black primer on the new panel must be sanded which can be done manually or with an orbital sanding machine.



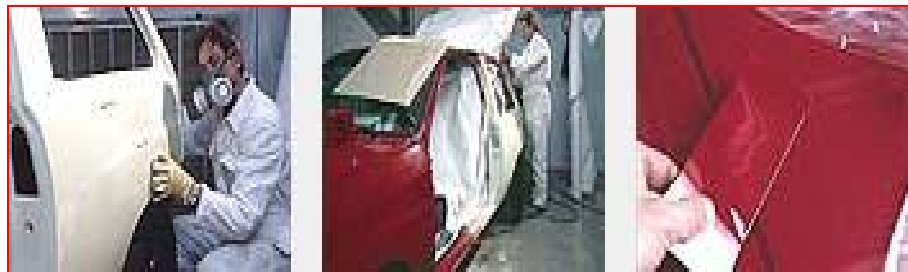
16. When the new panels and repaired ones are being sprayed in the filler, the car must be covered to protect it against overspray.
17. Prior to the application of each paint product the substrate must be thoroughly degreased.
18. Well protected against inhaling of paint fumes and vapours the sprayer can now apply the filler.



19. Directly after the filler a mist coat of a dark coloured paint can be applied. This is called guide coat and it is used to make the sanding results visible and to save a lot of time during the sanding process.
20. Once the filler is dry and hardened trough, it must be sanded with either wet or dry sanding paper, manually or with an orbital sanding machine. During this step the interior of the car is protected against sanding dust or the residue from sanding water.
21. The last dust particles are blown away with clean compressed air.



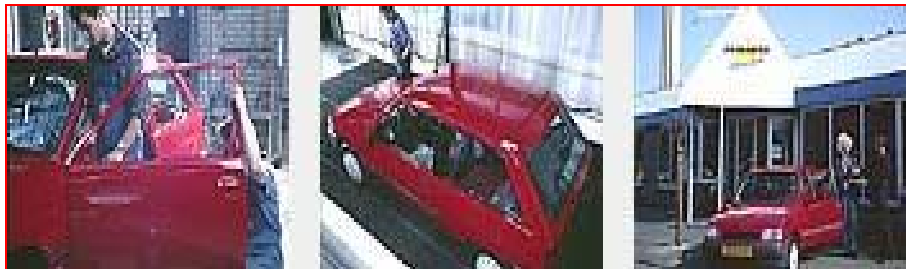
22. Before application of the colour coat the panels must be treated again with degreaser to remove all contamination.
23. Masking is necessary to avoid overspray from the colour coat on other parts of the car.
24. The colour accuracy of the repair paint must be checked against the original car colour.



25. In a spray booth with a good extraction and filtered fresh air the paint can be sprayed on the car.
26. Forced drying at 60°C is possible to speed up the drying process.
27. Specialized equipment such as paint spray guns must be thoroughly cleaned after use.



- | | |
|-----|--|
| 28. | When the paint is fully dry, all parts can be refitted to the car and rust proofing can be applied when necessary. |
| 29. | The repair process ends with washing the car and the "finishing touch" |
| 30. | The car can be delivered to a happy customer and nobody see that the car has been ever damaged! |



MEASURING AND EVALUATION

TEST QUESTIONS 5 (Compare the Information)

Read the sentences and answer the questions. After this, compare your answers with the answer key at the end of the module.

1. What is a little water included based paints?
 - A) Water
 - B) Steel
 - C) Thinner
 - D) Solvent
2. What is the solvent based paint made of?
 - A) It is made of water based material
 - B) It is made of plastic material
 - C) It is made of solvent material
 - D) It is made of fibreglass material
3. Which one is not under coating component?
 - A) Primer
 - B) Paint
 - C) Filling paste
 - D) Primer filler
4. Which one is true for paint practise?
 - A) Sanding- clearing- filling paste- sanding and clearing- primer- painting
 - B) Sanding- clearing- primer- filling paste-painting
 - C) Sanding- clearing- primer- filling paste-painting- sanding and clearing
 - D) Sanding- clearing- filling paste-painting- sanding and clearing
5. How many main colours are there in nature?
 - A) There is one colour.
 - B) There are four colours.
 - C) There are three colours.
 - D) There are two colours.

Ø After reading each sentence, put T (true) or F (false) in the blank.

6. () There are three neutral colours.
7. () The hardener mixes the filling paste.
8. () The water based paint is harmful for environment.
9. () The primer is not effective for corrosion.
10. () Automotive must be dried in the paint oven at the end of the paint process.

UYGULAMALI TEST

Aşağıdaki testi okuyarak seçtiğiniz uygun cevabın altına işaret koyunuz, evet cevabınızın çoğunlukta olması bu modülü başarıyla tamamladığınızı göstermektedir.

Değerlendirme Ölçütleri	Evet	Hayır
Ø Otomobil paneli hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil gövde elemanları hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil döşeme sistemleri hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil kilit sistemleri hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil cam sistemleri hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil boya yüzey hazırlama hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil boya astar ve macun uygulamaları hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil boya uygulamaları hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Otomobil tamir bakım servisi uygulamaları hakkında teknik İngilizce bilgisine sahip oldunuz mu?		
Ø Konuların sonundaki test sorularını çözerek cevaplarınızı karşılaştırdınız mı?		
Ø Konuyla ilgili araştırmalar yaptınız mı?		

DEĞERLENDİRME

Faaliyet sonucu Hayır cevaplarınız için ilgili konuları tekrar ediniz.

ANSWER KEYS

TEST 1		TEST 2		TEST 3	
1	C	1	D	1	A
2	D	2	D	2	C
3	B	3	C	3	D
4	D	4	C	4	B
5	B	5	A	5	D
6	T	6	T	6	F
7	T	7	F	7	T
8	F	8	T	8	T
9	F	9	T	9	F
10	F	10	F	10	T

TEST 4		TEST 5	
1	D	1	D
2	A	2	C
3	B	3	B
4	C	4	A
5	C	5	C
6	T	6	T
7	F	7	T
8	T	8	F
9	F	9	F
10	T	10	T

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