

# **Auto Estimating: A Guide To Writing Estimates**

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This book follows the 2013 NATEF/ASE Damage Analysis, Estimating, and Customer Service tasks, which may be useful when taking the ASE B6 certification exam. However, neither the author nor the publisher claim or guarantee that all information on the exam is covered in this book or the test results that can be expected after reading the book. This book is intended as a supplement to other auto estimating training and to broaden knowledge about auto estimating.

The information in this book is provided by a Master ASE Certified instructor. The content is written from experience, training, and the opinions of the author.

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# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter I  
The Auto Repair Estimate  
and Estimating Environment

“Organization is what you do before you do something, so that when you do it, it is not all mixed up.” — A.A. Milne

### **What This Chapter Covers**

This chapter covers what an auto estimate and a supplement are, how they are generated, who needs auto estimators, and provides tips for setting up an estimating environment.

### **Why This Is Important**

As an estimator, it is important to fully understand what all purposes the estimate serves. It's also important to properly set up the estimating environment to become efficient at generating thorough auto estimates.

### **Topics Covered In This Chapter Include:**

- Auto Repair Estimates
- Supplements
- Methods Used To Write Estimates
- The Sequence of Writing an Estimate
- Who Needs Estimates
- Setting Up The Estimating Environment
- Tools Needed To Generate Auto Estimates

This chapter has been aligned with the following 2013 NATEF/



ASE tasks:

- A:1 Position the vehicle for inspection. HP-G

## What Is An Auto Repair Estimate



Replace Right Front Fender

Auto repair estimates are called different names, including damage report, damage estimate, and auto estimate, but they are all basically the same thing. A damage estimate, however, is more than just a sheet of paper listing the total cost of repairs. An estimate is a contract or a mutual agreement between two people. As with real estate, the owner and buyer must agree on a price and sign a contract of their agreement. An auto damage estimate is done the same way, as there should be an agreement between the repair shop and customer, and the customer should sign the agreement to authorize the repair shop to repair the vehicle.

One thing the estimator must explain to the customer, which is often misunderstood, is that the total amount is just an estimate. Auto repair estimates do not guarantee the exact amount of the final invoice. There may be hidden damage, parts price adjustments, or many other factors that may change before the vehicle is completed.

As an estimator, it's your job to have excellent communication

with the customer. You need to let the customer know that the estimate is subject to cost adjustments. You must also help the customer understand that the estimate or signed agreement is only good for items written on the estimate. If any additional work is needed, you will need to contact the customer and agree on the new amount.

## **Supplements**

When additional charges need to be added, the estimator will need to generate an additional estimate. This is called a supplement, which may include additional parts or labor as needed. As mentioned, the estimator must contact the customer to let them know the amount of the supplement.

An accident usually results in a claim with an insurance company. Therefore, if there is a claim, the estimator is also responsible for communicating with the insurance company. I am not going to get into how to deal with insurance companies, as the procedures each insurance company follows differ from one to another. If you represent a direct repair program (DRP) with an insurance company, then there will be specific procedures to follow when submitting a supplement.

This book is focused on the relationship with the customer, because the customer who brought their vehicle to your repair shop trusts that you will properly repair it to its pre-accident condition. The customer is also the person who will continue to use your body shop for their collision and painting needs. So always put the customer first and strive to provide stellar service and customer satisfaction.

Once the customer and insurance company agree to the

additional supplement charges, the repairs can continue. The final invoice will include the charges of the original repair estimate and the supplement.

### **Methods Used To Write Estimates**

Auto repair estimates used to be written by hand using Mitchell (or other publishers) estimating guides. This involved writing all the damage on an estimate form and looking in the estimating guide to get all the parts prices and labor times needed to estimate the job. Then the estimator would calculate the total. Computer-generated estimates have simplified and faded out most handwritten estimates, but when learning how to estimate, I believe it is crucial to learn all the basics first, which requires estimating guides, a blank estimate form, and a pen. Learning to handwrite estimates is the foundation of becoming an effective estimator. Just as every house or building must have a strong foundation, an estimator must master the basics first.

### **The Sequence Of An Estimate**

Most estimating guides and computer systems are set up with the same sequence—starting with the front bumper and ending with the rear bumper. This is important to know as you want to write the estimate in the same order. For example, if you are writing an estimate on a vehicle that has damage on the front end, start with the front bumper and move toward the back of the vehicle one part at a time. The sequence also moves from the outside toward the inside, for instance, front bumper cover, front reinforcement bar, front grille, right front fender, etc. When you use this guide, it will be easy to follow along when adding the prices and labor times.

## Who Needs Estimators?



Every collision repair shop will need someone to write estimates for its customers. The body shop manager may generate the estimates at smaller shops, while bigger shops may have more than one estimator. I have also heard an estimator referred to as a customer adviser. The estimator meets the customer, generates damage estimates, works closely with insurance companies, and keeps everyone updated on the repair process. Having good communication skills is very important.

Insurance companies also need the assistance of estimators. When you generate auto repair estimates for an insurance company, your title may be auto estimator or auto appraiser. Appraisers may generate their own estimates, or they may inspect the damage and agree to the body shop's estimate. Procedures for authorizing repairs will differ with each insurance company.

## **Setting Up The Estimating Environment**

As with any work environment, it's important to have the correct working environment when inspecting vehicles and generating estimates thoroughly and efficiently.

I remember when most estimates were written out in the parking lot, and some shops may still do it this way. If the estimating area is set up correctly, however, it will help produce thorough estimates with minimal supplements.

### **Lighting**

Good lighting is very important when inspecting a vehicle. Whether you have a covered area, a stall inside the shop area, a separate shop, or are out in the parking lot, you need to be able to see the damage clearly. Regardless of how good the lighting is (shop lighting, sunlight, etc.), there will be areas of the vehicle that are hard to see. A flashlight will help you see these dark areas.

### **Underneath Inspection**

Many times the estimator will need to inspect underneath the vehicle. Ideally, a stall with a lift will be available, which will allow the estimator to inspect and measure the underbody, suspension, and other components under the vehicle if necessary.

If you do not have a lift, then have a creeper, floor jack to raise the vehicle, and jack stands to secure it. Raising the vehicle will provide more access to inspect damage below.

### **Organized Work Area**

The auto estimating area must be well organized, clean, and provide an easy work flow to move cars in and out. All tools and supplies should be easily accessible. It would be unprofessional and take unnecessary time to walk through the shop looking for a floor jack or a screw driver. Accordingly, an organized work environment is key when it comes to inspecting and generating auto estimates.

## **Tools Of The Trade**

The tools an estimator may need vary depending on the repair shop's standard operating procedure (SOP), but some common tools are shown below.

### **Camera**

The estimator will need to take photos of the damage. Photos help others see what the estimator sees; they tell a story. Photos are documentation to prove the extent of the damage to the customer and the insurance company. Photos of the overall damage and photos of each individual damaged part will need to be taken.

I have used my iPhone to take photos of damage, but according to Larry Montanez of P&L Consulting, photos need to be of high quality, and smart phones do not produce the quality needed. You may consider upgrading to a digital camera that can zoom in on the damaged parts and produce a high-quality photo. One good thing about purchasing a digital camera is that the expense is over once you have bought it. I remember using 35 mm cameras and having the film developed, which was quite expensive.

Another good feature with most digital cameras, including smart phones, is that a video can be recorded for later reviewing or sharing with the customer or insurance company if needed.

## **Flashlight**

I mentioned this earlier, but a flashlight or droplight can help you inspect hard-to-see damage.

## **Hand Tool Set**

The estimator probably doesn't need a roll around toolbox loaded with tools, but a few basic tools will be needed, including wrenches, sockets and ratchet, and screwdrivers. In addition to the basic hand tools, a few trim tools for removing clips will also be useful.

## **Paint Mil Gauge**

A paint mil gauge is needed to determine the paint thickness on parts that need to be painted. Inspecting paint and paint mil thickness will be covered in chapter 2.

## **Body Filler Gauge**





A body filler gauge works best, but a magnet may be useful to inspect and determine if parts have had previous body filler applied. Locating body filler too thick may require additional labor. More information for inspecting for previous body filler will be covered in chapter 2.

## Measuring Devices



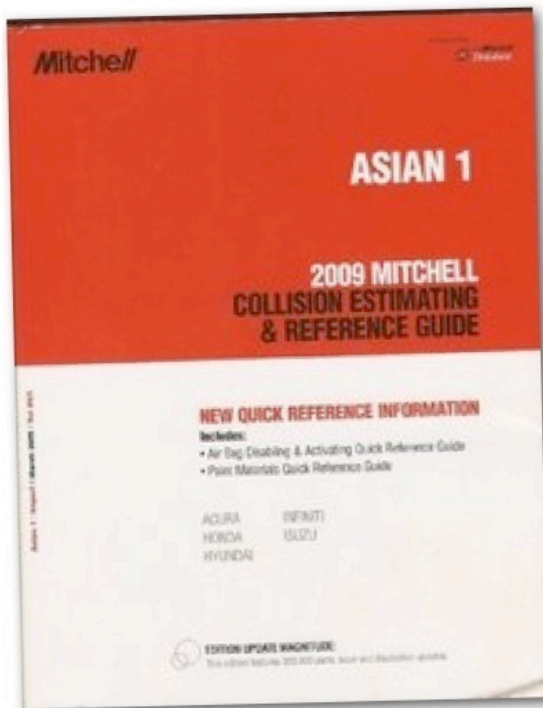
This is an example of a tram gauge used for point to point measurements.

Measurements may need to be made during the inspection process. Tools used to measure include tape measure, tram gauge, ruler, and possibly a computerized measuring system to fully analyze the damage.

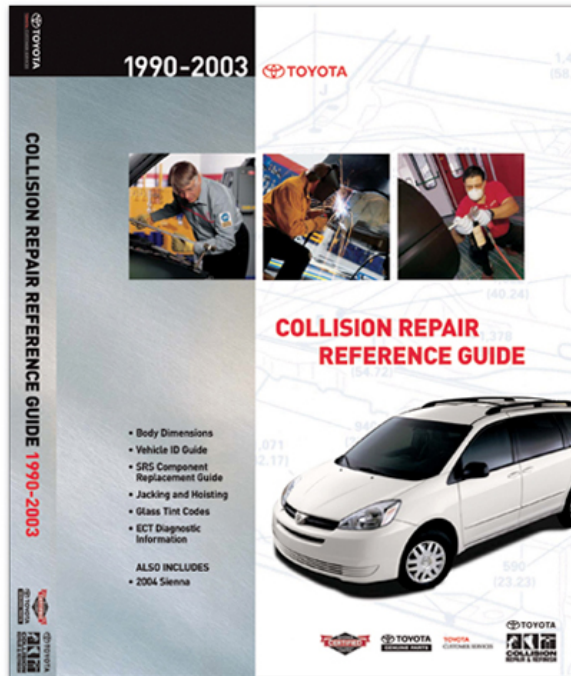
### **Scan Tool**

A scan tool may be needed to check error codes that may have been caused from the accident. This can be check engine light, airbag, etc.

### **Estimating and Procedure Guides**



The estimator will need estimating guides or an estimating computer system for labor times and prices for parts. Most shops now use estimating computer systems. Different systems are available, but the three major systems include CCC One, Mitchell, and AudaTex.



Collision repair procedure guides or online databases for OEM-recommended procedures need to be accessible to determine repair methods required for each make and model of a vehicle being worked on.

## Office Supplies

The estimator will need pens, notepads, and blank estimates or whatever method the shop uses to record data during the inspection process. Depending on the estimating system and the standard operating procedure of the repair shop, an electronic device may also be used to record such data.

## Computer and Phone

The estimator will need a computer or an electronic device to generate the estimate and a printer to print the estimate. A phone will be needed to make calls to insurance adjusters, suppliers, and customers.

## **Consultation Area**

The estimator will need to consult with customers, which may be an area set up in the estimating area or a separate office area. Some shops may even have a consulting office for claims adjusters to use when they come to your shop to generate estimates.

# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter 2  
The Big Picture

“I think it’s really important to look at the big picture instead of just one competition.” ~Shannon Miller

## **What This Chapter Covers**

This chapter will explain how to gather the necessary information about the damaged vehicle and things to look for when inspecting the vehicle to help get a general idea of what happened during the accident and the extent of damage.

## **Why This Is Important**

As an estimator, it is important to understand the process of gathering information, analyzing the extent of damage, and having a general idea of what needs to be repaired.

## **Topics Covered In This Chapter Include:**

- Gathering The Information
- Making The Process As Painless As Possible For The Customer
- Claim and Accident Report
- Initial Walk Around Inspection
- Taking Photos
- Predetermined Accident Sequence
- Inspecting Hidden Damage

This chapter has been aligned with the following 2013 NATEF/ ASE tasks:

- A:2 Prepare vehicle for inspection by providing access to damaged areas. HP-G
- A:3 Analyze damage to determine appropriate methods for overall repairs. HP-I
- A:5 Gather details of the incident/accident necessary to determine the full extent of vehicle damage. HP-G



## **Gathering Information About The Accident**

The estimator will need to gather as much information about the accident as possible before actually inspecting the vehicle. One of the best resources to learn about the accident is the vehicle owner or the person driving the car when the accident occurred. It's a good idea to get the customer involved and to have them explain what happened, what direction the vehicles were moving, and who was in the vehicle at the time of the accident.

This will give you an idea of what to look for during the first overall inspection. Some questions you may want to ask are shown below:

- How many people were in the vehicle at the time of the accident?
- Where were the passengers sitting?
- What were the road conditions (dry, wet, ice, etc.)
- Was the car moving or not moving at the time of the accident?
- What direction was the vehicle traveling at the time of the accident?
- Do you have any other information you can share with me?

## **Accidents Are Not Common For The Customer**



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Keep in mind that an accident is not common for the customer. This may be the first accident they were involved in, and they may be confused due to stress or not remember some of the facts about the accident. Or they may try to persuade you that the accident was not their fault. Regardless of what they say, be certain to use common sense when verifying what the customer tells you compared with the damage to the vehicle.

If you can sense that the customer is confused, upset, nervous, or angry, then try to help them stay calm and assure them that it is your job to help them through the process. A vehicle represents the second-largest investment for many people, and dealing with an accident is a situation no one wants to be in. So try to make the process as painless as possible for the customer.

## **Claim and Accident Report**

Accidents usually involve an insurance claim and may have a claims report. This report may help while gathering information about the accident, but this information will need to be reviewed and verified for accuracy.

You may also ask if there was an accident report. This may help answer questions as well. If an accident report is available, it will also need to be reviewed and verified for accuracy.

## **Initial Walk Around Inspection**

Once you have collected the information about the accident, perform the initial walk around inspection, which will give you the big picture of the overall accident.

It may be helpful to have the customer there when doing the walk around inspection if any questions should arise. However, if there is extensive damage, it may take some time and require removing parts to do a thorough inspection. If this is the case, you may want to explain the process to the customer so they can plan accordingly. Or you can assist them with getting a rental, getting them to their home or work, or whatever the case may be.

## **Photos**

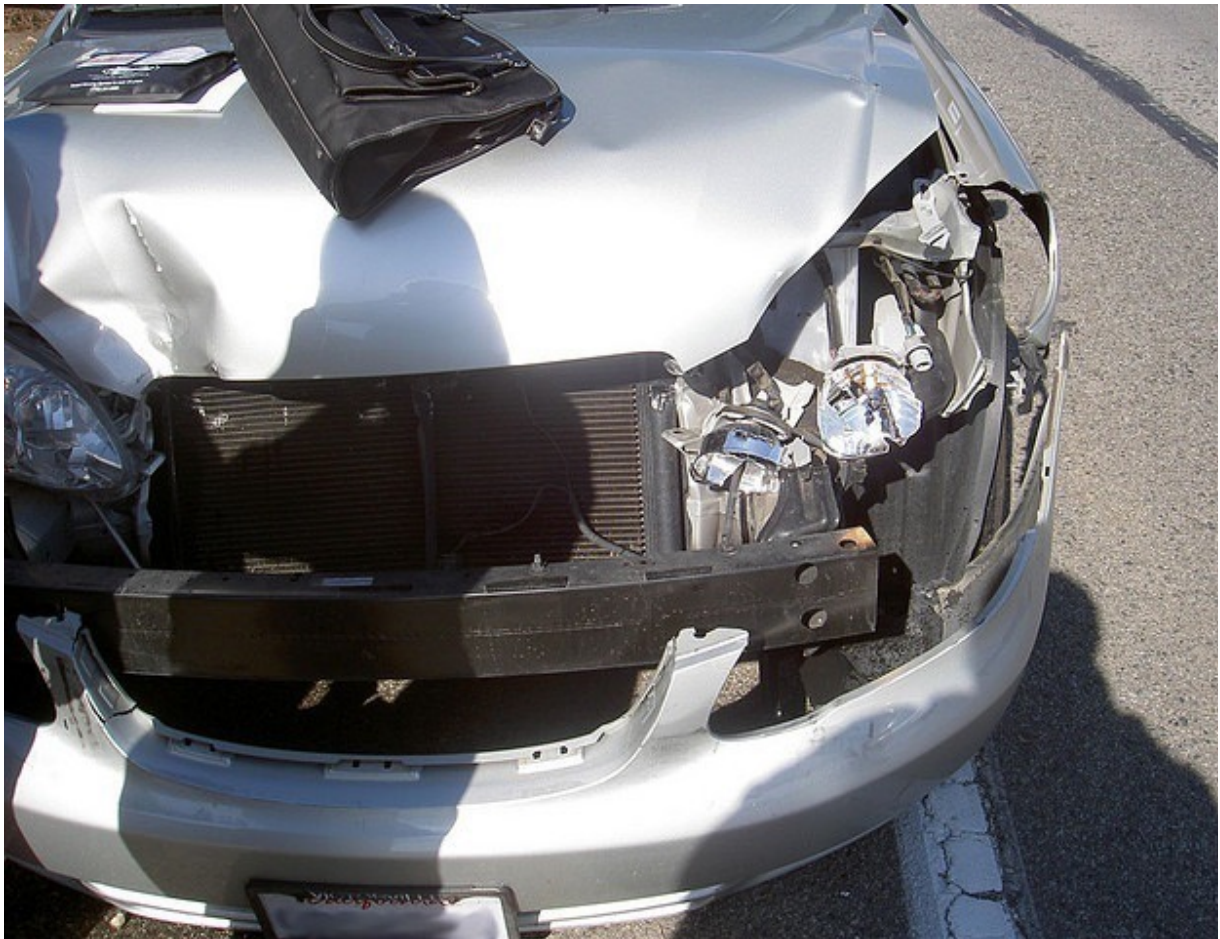
Take good photos during the entire process, but for this chapter, you want to take several photos of the overall damage with perhaps a photo of each corner of the vehicle. Photos of each individual part group will be taken later.

To record your findings, have a notepad that can be taken back to the estimating system. If you're using an electronic device, such as

an iPad, you may be able to record your information to the estimating system during the inspection. Regardless of the method used, record the findings and make necessary notes.

The focus of this chapter is to perform a walk around of the entire vehicle to get a basic idea of the extent of the damage and overall big picture. The next step will be thoroughly inspecting each part group individually, which may require removing parts.

### **Predicted Accident Sequence**



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Although there are no absolutes when it comes to auto accidents, another tip that may give some clues about the accident is the predicted sequence of actions of the people involved.

If you are traveling down the road and see a car coming toward you, what are you going to do? Chances are you will hit your brakes and/or turn away from the oncoming car or object.

That is what most people's natural response will be without thinking about it. If the first action is hitting the brakes, it can help determine what damage may be present. As the brakes are slammed, the momentum of the vehicle is transferred to the front as it goes down. While the front of the vehicle moves down, the rear of the vehicle rises higher. When the impact happens, it is safe to assume that the damage will be higher in the front than if the brakes were not applied. If the damage is higher, this may cause more damage to be transferred through the upper parts of the vehicle and result in sag damage.

Many people will have another response. Most are normally going to turn the wheel away from the oncoming vehicle or object. As the vehicle turns, it is now at an angle with the front end down and the rear high when the impact occurs. Now it is safe to assume that the vehicle may also have sideways damage.

By keeping this sequence of predetermined reactions in mind as you begin inspecting the vehicle with the 5 zones of damage, which we will cover in chapter 3, you will begin to have a clear idea of what damage may be present and what to look for. This will help you generate a more thorough auto repair estimate.

Some people, though, may have different reactions than most other people. Or someone may have been reaching down to get

something or texting and did not have time to hit the brakes or swerve. In this case, the predetermined reaction theory will not apply.

## Inspecting Hidden Damage



An example of removing the bumper cover to inspect hidden damage.

Many times to properly inspect a damaged vehicle, it is necessary to remove parts to gain access to the area needing to be inspected. For instance, a front bumper cover may need to be removed to determine if the reinforcement bar or impact absorber is damaged.

This may also include removing dirt and road grime for better visibility of the part being inspected.

A quick side note about removing damaged parts. More time may be required to remove these than undamaged parts. If the estimator only adds the time given in the estimating guide to remove the part, then the estimator may be cutting the estimate short. It may even require straightening parts to gain access to bolts. Additional time will then need to be added to the estimate.

I wanted you to be aware of this as we move forward through the inspection process. We will cover adding not included operations and thoroughly inspecting each part group in other chapters.

# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter 3  
Vehicle Damage



“The basic question is not what is best, but who shall decide what is best”. ~Thomas Sowell

### **What This Chapter Covers:**

This chapter is going to explain the different types of damage found on vehicles, how to inspect the damage, how to determine if the damage needs to be repaired or replaced, and types of materials auto parts are made from.

### **Why This Is Important:**

As an estimator, it's important to identify the different types of damage, identify what types of materials parts are made from, and determine if parts need to be repaired or replaced.

### **Topics Covered In This Chapter Include:**

- Direct and Indirect Damage
- 5 Zones of Damage
- Prior Damage
- Betterment
- Types of Frame Damage (sidesway, sag, mash, diamond, twist)
- Inspecting Structural and Nonstructural Damage
- Inspecting Mechanical, Suspension, and Electrical Damage
- Inspecting The Paint Finish

- Inspecting Interior, Restraint System, and Accessories
- Determining To Repair or Replace
- Types of Steel, Plastic, and Composites
- Fasteners

This chapter has been aligned with the following 2013 NATEF/ ASE tasks:

- A:4 Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage. HP-G
- A:6 Identify and record pre-existing damage. HP-I
- A:7 Identify and record prior repairs. HP-G
- A:8 Perform visual inspection of structural components and members. HP-G
- A:9 Identify structural damage using measuring tools and equipment. HP-I
- A:10 Perform visual inspection of non-structural components and members. HP-I
- A:11 Determine parts, components, material type(s) and procedures necessary for a proper repair. HP-I
- A:12 Identify type and condition of finish; determine if refinishing is required. HP-I
- A:13 Identify suspension, electrical, and mechanical component physical damage. HP-G

- A:14 Identify safety systems physical damage. HP-G
- A:15 Identify interior component damage. HP-I
- A:16 16. Identify damage to add-on accessories and modifications. HP-G
- A:17 Identify single (one time) use components. HP-G
- B:4 Identify safety systems; determine replacement items.  
HP-G
- C:4 Identify steel types; determine repairability. HP-G
- C:5 Identify aluminum/magnesium components; determine repairability. HP-G
- C:6 Identify plastic/composite components; determine repairability. HP-G

## Types of Damage



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There are basically two types of damage, which can be broken down into five zones: direct damage and indirect damage.

### Direct and Indirect Damage

Direct damage is the most obvious damage. Direct damage may also be called primary damage. This type of damage is the point of impact, which is very easy to identify. When repairing a vehicle, we have the first in, last out rule. The point of impact would be the “first in” location of the damage. This should be the last area to be repaired. Anytime you see direct damage, there is usually going to be indirect damage.

Indirect damage also called secondary damage, which is harder to identify. This is the damage that is caused by energy transferring

during the collision. This may include buckles, popped spot welds, cracked seam sealer, and misaligned panel gaps. On unibody vehicles, indirect damage can occur throughout the entire vehicle, which will require a thorough inspection and may require measuring the vehicle. Following the first in, last out rule, indirect damage will be repaired first.

## 5 Zones Of Damage

Let's break this down further and look at the five zones of damage on a vehicle.

- **Zone 1** is direct damage—the point of impact. Direct damage may include body parts, structural parts, mechanical, and suspension components. For instance, the vehicle may have been hit in the front fender, which also took a hit to the front tire and wheel. This may result in damaged body parts, structural damage, and damaged suspension components.
- **Zone 2** is indirect or secondary damage, which is caused from the force of the impact and direct damage. This is perhaps the hardest damage to identify. Thorough inspection of the entire car may be necessary to locate indirect damage.
- **Zone 3** is mechanical, suspension, and electrical component damage. I am sure that you've heard the law "an object in motion tends to stay in motion." Your mechanical components, such as your engine, transmission, and drive train, can be damaged in an accident. If the vehicle is traveling at 50 mph and comes to a sudden stop, the weight of the engine still wants to travel at 50 mph forward (inertia force). This can cause damage to motor mounts and other attachment points. If one of these components is in the path of the point of impact, then the component needs to be inspected to

determine if it's damaged.

- **Zone 4** is the passenger compartment. The same Newton law applies to people in the vehicle. Passengers can damage seat belts, knee bolster panels, and other interior parts. This may also result in air bag deployment, which requires additional operations to repair the vehicle. This is why it is important to know who was in the vehicle during the accident and where they were sitting. This will help you to properly inspect the passenger compartment.

- **Zone 5** represents exterior components and trim that are attached to the vehicle. These additional items can be damaged or cause damage during an accident. Another thing you may consider when inspecting the vehicle for damage are items in the vehicle. Were there heavy items in the trunk space or passenger compartment? A flying tool box can damage the vehicle. These are some things to keep in mind when writing auto repair estimates. Consider each zone when inspecting the damage of a vehicle.

- **Preexisting Damage**

- Preexisting damage, which is also called prior damage, may or may not affect vehicle repairs. Nonrelated prior damage may include damage on adjacent panels not involved in the accident, but a panel may have prior damage that was damaged during the accident. For example, a panel may have rust damage and then additional damage from the accident. This would be related prior damage because the prior damage is going to affect the repairs of the damaged part. So if you are repairing the vehicle according to preexisting damage, do you repair the damage without repairing the rust? Since the panel needs to be repaired properly, the rust will need to be repaired when repairing the damage caused by the

accident.

### **Betterment**

Repairing the rust and the damage caused by the accident may result in a deduction from the insurance company or additional pay from the vehicle owner, as the part will be in better condition than it was before the accident. This is called a betterment adjustment.

Tires are another example of betterment. If a tire was damaged during an accident, it may need to be replaced, but if the tire only had 50% life remaining, the new tire will be much better than the tire was before it was damaged. Therefore, an adjuster may only pay for 50% of the cost of the new tire.

### **Frame Damage**

A frame can be damaged in three dimensions: length, width, and height. Let's take a quick look at the different types of frame damage and determine which dimension it affects.

#### **Sidesway**

Sidesway is when the front or rear has been hit from the side or from an angle. The frame or unibody structure is pushed to the right or left. It is possible to have double sidesway if both the front and rear are pushed to the right or left. This type of damage may resemble the shape of a banana.

Sidesway is measured from the center plane of the vehicle. Therefore, this type of damaged is measured using width measurements.

Narrow body gaps on one side of the car and wide body gaps on

the other side of the vehicle are a good visual indication of sideway damage.

### **Sag**

Sag occurs when an area is pushed down lower than it should be, generally around the cowl area. This damage may be caused by the front of the car being lower due to braking before impact.

Sag is measured using the datum plane of the vehicle. Therefore, this type of damage is measured using height measurements.

Narrow body gaps at the top of the door to the fender and wide body gaps at the bottom of the fender to the door are good visual indications of sag damage.

### **Mash**

Mash occurs when the impact pushes the front or rear vehicle inward. This type of damage is caused by the impact of the accident, which makes the vehicle frame or structure shorter than originally.

Mash is measured using the zero plane of the vehicle. Therefore, this type of damage is measured using length measurements.

Narrow gaps on the side of impact may be a visual indication of mash damage, but this type of damage may be hard to identify without measuring.

### **Diamond**

Diamond damage is hard impact damage that causes the frame to be pushed out and has a slight diamond shape. This type of damage is usually found on body over frame vehicles.



Diamond damage is determined by cross-measuring to check for squareness. Therefore, this type of damage is measured by the point-to-point method, which is a type of length measurement.

Hood and deck lids that are misaligned due to the squareness of the frame being off are good visual indications of this type of damage.

### **Twist**

Twist damage occurs when one corner of the vehicle is higher than it should be. This can be caused by the vehicle taking an impact, such as hitting the median or curb at high speeds.

Twist damage is measured using the vehicle datum plane. Therefore, this type of damage uses height measurements.

Twist does more damage to the underside of the vehicle, which may make visual inspection difficult. This type of damage may need to be measured to properly analyze the damage.

### **Center Plane**

The center plane runs between the vehicle and provides width measurements.

### **Datum Plane**

The datum plane is an imaginary line established by vehicle specifications to measure height.

### **Zero Plane**

The zero plane is established by vehicle specifications to measure

length.

## Inspecting Non-Structural Damage



Photo of a dent needing repaired.

Inspecting nonstructural parts, which are the cosmetic parts of the vehicle, include front and rear bumper covers, fenders, hood, roof panel, door panels, quarter panels, bed sides, deck lids, tailgates, grille, molding, back and side glass, and emblems.

Inspect each of these part groups for damage. Damage may include direct damage from the impact of the accident and indirect damage. Determine what type of material the parts are made from. The types of materials will be covered later in this chapter, but this may help determine if the part may be repaired or need to be

replaced.

Inspect the parts for rust or other preexisting damage that may interfere with repair or may require replacement.

Some nonstructural parts are severely damaged and require replacement. The labor required and cost of a part may be the deciding factor if the part should be repaired or replaced. For instance, a dent on a front fender that takes three hours to repair is more likely to be replaced than such a dent on a rear quarter panel because it takes more labor time to replace a quarter, and the cost of the quarter panel is usually considerably more than a front fender.

### **Inspect For Previous Repairs**

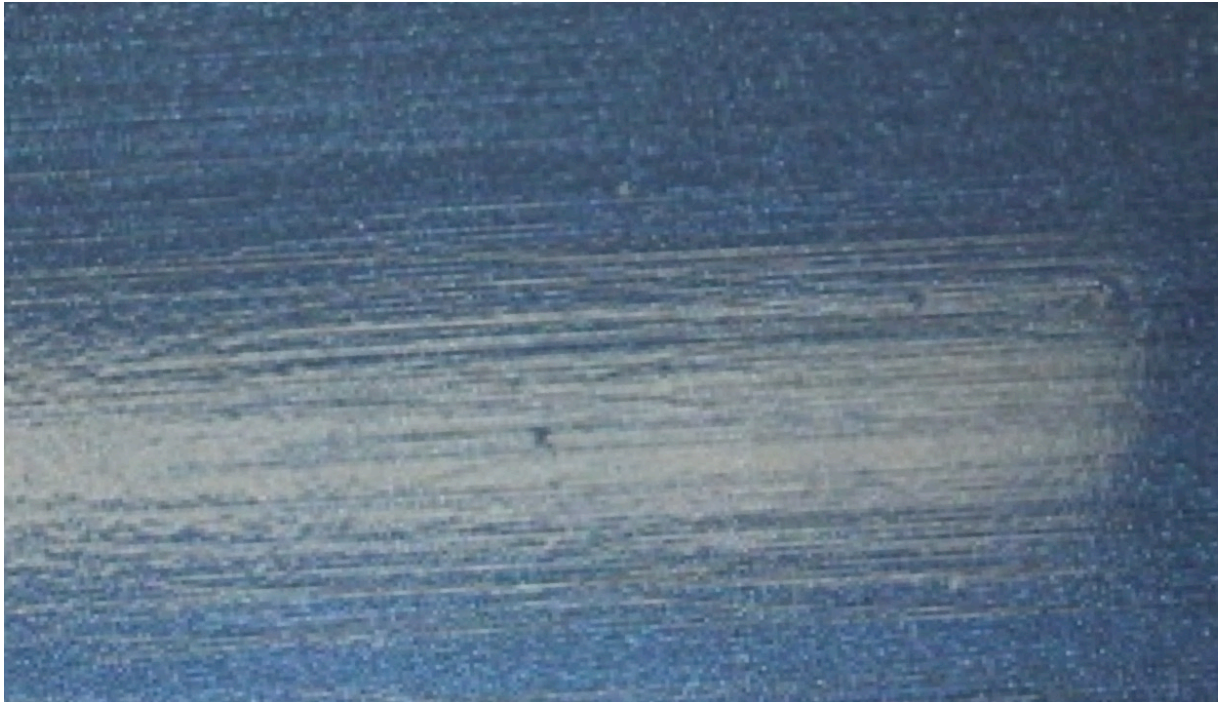


Photo of sand scratch swelling. A sign of previous body work.

Inspect the vehicle for previous repairs. This is not previous

damage, but determine if the vehicle has been repaired in the past. Obvious signs may include hard or rough paint lines in jambs, mismatched paint, excessive orange peel, sand scratch swelling, or body filler.

There may not be a problem if body filler has been applied to the surface, but if the body filler is too thick, it may take additional labor time to remove the old body filler, straighten the metal, and reapply body filler to properly repair the damaged area.

One way to determine if there is body filler is to use a body filler gauge. This gauge will help you identify how thick the body filler is to determine if the damaged area will need additional work or not. A magnet can be used but does not provide a reading the estimator can record on the repair estimate.

Once the vehicle has been checked for previous repairs, the estimator can determine what repair path to take. The previous repairs and the damage to the panel may even result in the panel being replaced instead of being repaired.

### **Inspecting Structural Damage**



Inspecting underneath the vehicle for structural damage.

Perform a visual inspection of the structural parts to determine if there is any damage. Look for bent or misaligned parts. If a part is bent, it may be able to be straightened. If a part is kinked, generally, it will require replacement.

To determine if a part is kinked, look for a sharp bend. A kinked part may include rips or tears or be collapsed or deformed.

Direct damage will be easy to identify when inspecting structural parts, but indirect damage can travel through the entire vehicle on unibody designs. This makes it very difficult to determine the amount of damage without measuring the vehicle.

When inspecting for indirect damage, look for popped spot welds, cracks in seam sealer, misaligned body gaps, or buckles.

To perform a thorough inspection, measuring may be necessary. Comparison measurements from one side to the other can help identify possible damage.

A tape measure or tram gauge measures point to point. This type of measuring can measure length, width, and cross-measuring diagonally to measure squareness of the vehicle.

Self-centering gauges can be used to measure centerline and height.

Computer systems using laser or ultrasonic sonar can perform three-dimensional measuring (length, width, height) at the same time. This type of measurement will be the most accurate.

### **Inspecting Mechanical/Suspension/Electrical Damage**

Some mechanical components that are damaged during an accident may be overlooked without close observation. However, keep in mind that some of these may require further diagnosis to determine if they are working properly.

Also keep in mind which electrical parts may need to be removed during the repair process. Even if the part is not damaged, it is recommended that if any electrical parts are within 12 inches of where welding is required, the component should be removed to prevent damaging it.

### **Inspecting The Paint Finish**



Inspecting paint condition.

An estimator must identify the type and condition of the paint. Knowing the paint system will help determine the cost of materials to paint the part. Determine if the paint system is single stage, base coat, clear coat, or tri-coat.

**Single stage** paint is a paint that does not require clear coat. This will require less spraying time and less cost for materials than other paint systems.

**Base Coat/Clear Coat** is the base color (pigment) that requires a clear coat. This will require more spraying time and more material cost than single stage paint. Note that most new vehicles today require a clear coat.

A **Tri-coat** is a base coat (pigment), mid coat (tinted clear or pearl coat), and then clear coat. Tri-coat will take more spraying time and more material cost than base coat/clear coat.

Determining which paint system is present can greatly affect the total cost of the estimate.

## How To Determine The Paint System



Ford's paint code are usually on the drivers door or door jamb.

The best way to ensure you have the correct paint system for the vehicle is to use the paint code. You can reference the color code to a paint chip book to determine what system is used on the vehicle, but some computer estimating systems provide this information in their database. Simply reference the paint code with the database, and it will show what paint system is used.

Some pearl paint jobs are easy to visually identify, but many colors are used today, and many of them will be hard to visually determine if it's tri-coat or not. Always check the paint code to make certain.



## **Inspecting The Condition Of The Paint Finish**

An estimator must inspect the condition of the paint on any painted parts. Look for paint defects, such as peeling, checking, blistering, chipping, rust, cracking, or any other problems.

If the paint finish has one or more of these problems, the part may need to be stripped to metal or partially stripped. This is an additional cost for labor and materials that will need to be added to the estimate.

If there are no signs of paint failure or problems, then the paint mil thickness will need to be checked next using a paint mil gauge. If the paint mil thickness exceeds 12 to 14 mils, the part will need to be partially stripped to reduce the mil thickness. This is not included in the refinish operation and will also need to be added to the estimate.

Remember that inspecting the paint finish for defects or mil thickness does not only include the parts on the vehicle but also any used parts that may be purchased for the repair.

## **Inspecting Interior**



As mentioned before, determining who was in the vehicle at the time of the accident and where they were sitting will give clues regarding where to look for interior damage. Any objects that may have been in the vehicle and moved around during the accident due to inertia force could cause damage to interior parts.

**Interior parts to inspect:**

- Dashboard
- Instrument Cluster
- Stereo Controls
- Steering Wheel
- Glove Box Door
- Knee Bolster Panel

- Center Console
- Door Panels
- Seat and Seat Brackets
- Seat Belts

Check these parts to determine if any damage was caused to the part during the accident. Also look for blood or something that could have spilled and stained the interior during the accident.

Close inspection will be needed to determine if the damage and/or stains are from the accident or just normal wear and tear.

If the damage and stains are not related to the accident, insurance will not pay. This is an opportunity, however, for the estimator to sell additional work to the customer. Chances are the customer will be willing to pay the additional cost to have the interior cleaned and stains removed while their vehicle is in the repair shop if you ask them.

### **Inspecting Seat Belts**

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discoloration due to ultraviolet exposure, dusty/dirty conditions, abrasion to seat belt webbing, or damage to the buckle, latch plate, retractor, hardware, or any other obvious problem must be replaced immediately regardless of mileage.

Additional information and resources for inspecting seat belts can be found on the website. Visit the resource section of this book for information.

## **Inspect Air Bags**

Inspect the vehicle for deployed air bags. If an air bag has been deployed, it must be replaced. You will need to look up the specific procedures for the make and model. Here are a few tips when inspecting the air bags.

**Step 1:** Research The Vehicle

**Step 2:** Identify Information Source

**Step 3:** Identify Deployed Components

**Step 4:** Scan The Vehicle

Some steering wheel columns are collapsible. Measurements will need to be taken to determine if the steering wheel is collapsed or not.

Also note that air bags must be ordered by color. It is not recommended to paint the cover to match the car's interior.

Additional information and resources for inspecting air bags can be found on the website. Visit the resource section of this book for information.

## **Inspecting Accessories**

Accessories that may have been added to the vehicle may include body kits, bumper covers, spoilers, scoops, louvers, bug shields, window visors, bed caps, bed liners, and many other items. These accessories should be inspected for damage. If damaged, a determination needs to be made if the part should be repaired or replaced.

Most accessories will not be listed in estimating guides or estimating systems. Repair or replace time will need to be determined at the estimator's discretion. The estimator will also need to make an online search or call a supplier for the cost of the accessory.

### **Determining To Replace or Repair**



What would you do? Repair or replace

One of the things that will need to be determined when completing the repair plan is if the part should be repaired or replaced. There are several factors we must consider.

1. Can the part be repaired? This is the most obvious reason, as some parts are too damaged to repair. If the part is not reparable, the only other option is to replace it.

2. What is considered too damaged to repair? There is a general rule of thumb, but this is not set in stone. This is the kink vs. bend rule. If the part has a crease, which is a sharp bend of a small radius at a 90-degree angle over a short distance, the part is kinked and should be replaced. If the crease is less than described, you may repair it. Other indications of a kinked part include buckles, rips, or tears. As I mentioned, however, this is just a general rule of thumb.

3. Is the part available? This is certainly going to help you determine if it should be repaired or replaced. As mentioned, some damage may be too severe to repair, but if you can find a replacement part, it may be worth putting in extra effort and time to repair the part, if it can be saved.

4. Will it cost more to repair? This is also going to have a variation of answers. For example, if you're a body shop that charges \$50 per hour, it would be better to replace an \$80 front fender if it has a 3-hour dent. Replacement is \$80, and the repair would cost \$150 . . . simple math, right? What if you are a DIY doing this in your garage? Well, the labor is free, so it may be worth your time to spend three to five hours on an \$80 fender.

5. Is it recommended? Some material is not recommended for repair. Different material types are going to be covered in this chapter, but replacement may be the only option.

## **Types of Materials Used To Manufacture Vehicles**



There is a wide range of materials used to manufacture vehicles. On a modern-day vehicle, you may find different types of steel, aluminum, magnesium, plastic, and composites.

### **Types Of Steel**

There several types of steel used to produce automobiles. In addition to the types of steel used, a galvanized coating may be applied to the part to provide superior corrosion protection.

Galvanized coating can be identified by the pattern of the steel. If you have ever noticed what an unpainted tin barn or shop looks like, then you should be able to identify galvanized coated metal.



Example of galvanized coated steel.

Another way to determine galvanized coating is by inspecting a panel after it has been damaged. If there is bare metal exposed that is visible but no rust is present, then the part is probably galvanized. It is possible that during the accident some of the galvanized coating was scraped off and starting to rust, but if you look closely, you will probably see portions of the metal adjacent to the rust that are not rusted.

NOTE: Extra safety precautions should be taken when welding galvanized steel. The coating produces a harmful gas when welded, and an approved respirator must be worn when welding galvanized steel. A respirator should always be worn when welding body parts, but it's extremely important with galvanized steel.

### **Mild Steel**

Mild steel is soft and flexible. This type of steel was the first steel used to produce automobiles and is still used on vehicles



today, but less mild steel is being replaced with high–strength steel and ultrahigh–strength steel for strength and overall weight reduction.

The flexibility of mild steel makes it easy to shape and repair without tearing or cracking. Heat does not affect mild steel, which makes this steel easy to weld or straighten.

The problem with mild steel is that it relies on its thickness to provide strength. With the push for increased fuel mileage, lighter steels that provide the same strength are starting to be used.

### **High–Strength Steel**

High–strength steel (HSS) is lighter and stronger than mild steel. HSS started being used on vehicles in the mid–’70s. While HSS is stronger than mild steel, the steel is harder and more rigid. Therefore, HSS is harder to straighten than mild steel and is more likely to tear or crack.

HSS is also more sensitive to heat than mild steel, and care must be taken not to overheat it. Overheating could destroy the metal, resulting in an improper repair. If the vehicle is involved in an accident after the repair, the metal will not provide adequate strength and protection for the passengers, which could lead to unnecessary injuries or deaths.

There are heat indicators to let you know when the metal has reached a certain temperature to prevent overheating. The recommended procedures must be checked for each make and model of the vehicle you are working on. While some manufacturers may allow a certain amount of heat to be used during the repair process, other manufacturers may recommend that no heat be used.

## **Ultrahigh–Strength Steel**

Ultrahigh–strength steel (UHSS) is very hard, rigid, and strong. UHSS is used to provide maximum strength and protection. This type of steel can be found on many bumper reinforcements, intrusion beams inside of doors, and other structural parts. Using this steel is on the increase to provide maximum protection to the passengers and to decrease the overall weight of the vehicle.

This type of steel is starting to surface in pillars and other structural parts around the passenger compartment. Therefore, it is crucial to check the recommended procedures to determine where this steel is located and the repair recommendations for each make and model.

Typically, UHSS cannot be heated or repaired. The part will need to be replaced. This steel is extremely hard and rigid and will crack or tear if attempting to repair it. Anchoring points may also be damaged before this type of steel is straightened, which may require additional anchoring if attempting to straighten the damage.

Heating could destroy the metal, resulting in improper repair. If the vehicle is involved in an accident after the repair, the metal will not provide adequate strength and protection for the passengers, which could lead to unnecessary injuries or deaths.

## **Boron Steel**

Boron steel is extremely hard and rigid but generally cannot be repaired or heated. If the part is made from boron, it will need to be replaced. Be certain to check recommended procedures when removing and replacing boron parts.

## **Laminated Steel**

Laminated steel aka quiet steel is composed of layers of steel with a laminate between them. Laminated steel reduces road noise and vibration, providing a quieter experience for the passengers.

Generally, it is not recommended to weld this type of steel. The laminated steel is attached using rivet bonding methods. Check the recommended procedures for repair or replacement recommendations.

## **Hydroformed Steel**

Hydroforming is a specialized type of die that uses high-pressure hydraulic fluid to press room temperature working material into a die to form the part. This works well for making complex shapes and produces a strong, rigid, and lightweight part.

Hydroformed steel is used on structural parts for unibody and body over frame vehicles. This type of steel is generally weldable and allows for sectioning. Be certain to check the recommended procedures before attempting to section or repair hydroformed steel.

## **Plastic**



The government started pushing carmakers to make cars more fuel efficient. One obvious solution was to make the car lighter, so carmakers started working with metals and other materials to reduce weight in vehicles. Lighter metal started being designed, such as high-strength steel, to allow the metal to have equivalent strength with much thinner and lighter metal. At the same time, engineers started brainstorming and began using lightweight plastic for many of the parts that had been made of steel in the past. Apparently, the results were positive, as there is now more plastic in each new body style of cars.

### **More Fuel Economy**

To this day, the government requires carmakers to meet certain standards in order to sell cars in the US. Automakers are going to do whatever it takes to make this happen.

Now that the Department of Transportation and the EPA have locked in the new fuel efficiency of 54.5 miles per gallon by 2025, I

believe there will be a push to increase the use of plastics, composites, and aluminum to lighten cars. We are currently at 27.5 MPG, so auto manufacturers have a lot of work to do over the next 11 years. You may be thinking that more economical cars will be produced, but the vehicles will need to sell too! Customers demand all the bells and whistles, room, and luxury. To meet customer demand and the required MPG rules, who knows what may be coming our way.

Here is an article with more information about the new 54.5 MPG rules. [http://www.cnbc.com/id/48829545/Getting\\_to\\_54\\_MPG\\_Will\\_Change\\_What\\_We\\_Drive](http://www.cnbc.com/id/48829545/Getting_to_54_MPG_Will_Change_What_We_Drive)

### **Identifying Plastic**

One way to determine the type of plastic on a part is to look for International Organization for Standardization (ISO) stamped on the backside of the part. These codes are not all located in the same place, which makes it hard to find the plastic type. Some parts may not even have the the ISO.

If you are not able to find the ISO, it is difficult to determine the type of plastic, which may also be a blend of various plastics. If this is the case, the process of selecting the best plastic rod will be difficult to determine if trying to weld a damaged plastic part.

Here is a link to help identify types of plastic: <http://www.urethanesupply.com/identify.php>

### **Two Types Of Plastic**

Plastic falls into two categories—thermoset plastic and thermoplastic.

- Plastic that can be reshaped with heat and/or welded using a plastic welding system is a **thermoplastic** part.
- Plastic that cannot be reshaped with heat or plastic welded is a **thermoset plastic** part.
- Adhesive repairs can be made on both thermoplastic and thermoset plastics.

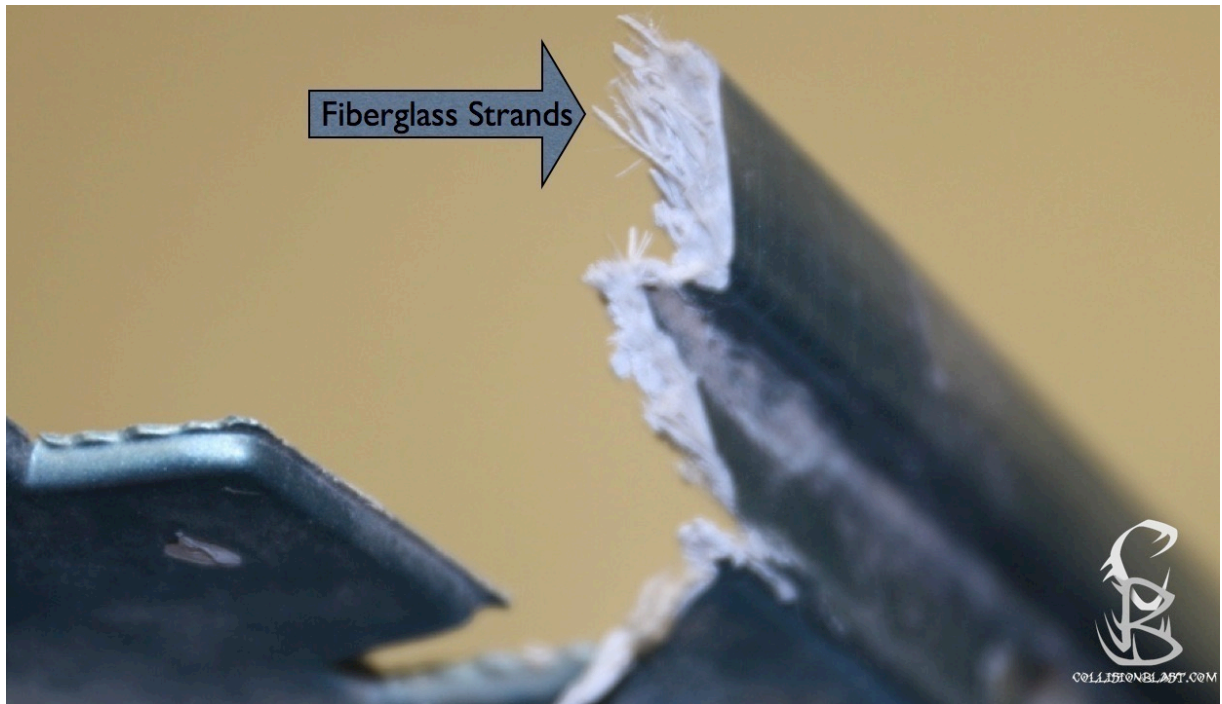
## Composites



Corvettes have been made with different composite through the years. Starting with fiberglass, then SMC, and now carbon fiber.

Composites consist of disparate or separate parts or elements; compound. For instance, mixing fiberglass strands and resin creates a strong material known as fiberglass. Most composites in the automotive industry use some sort of fiber reinforcement.

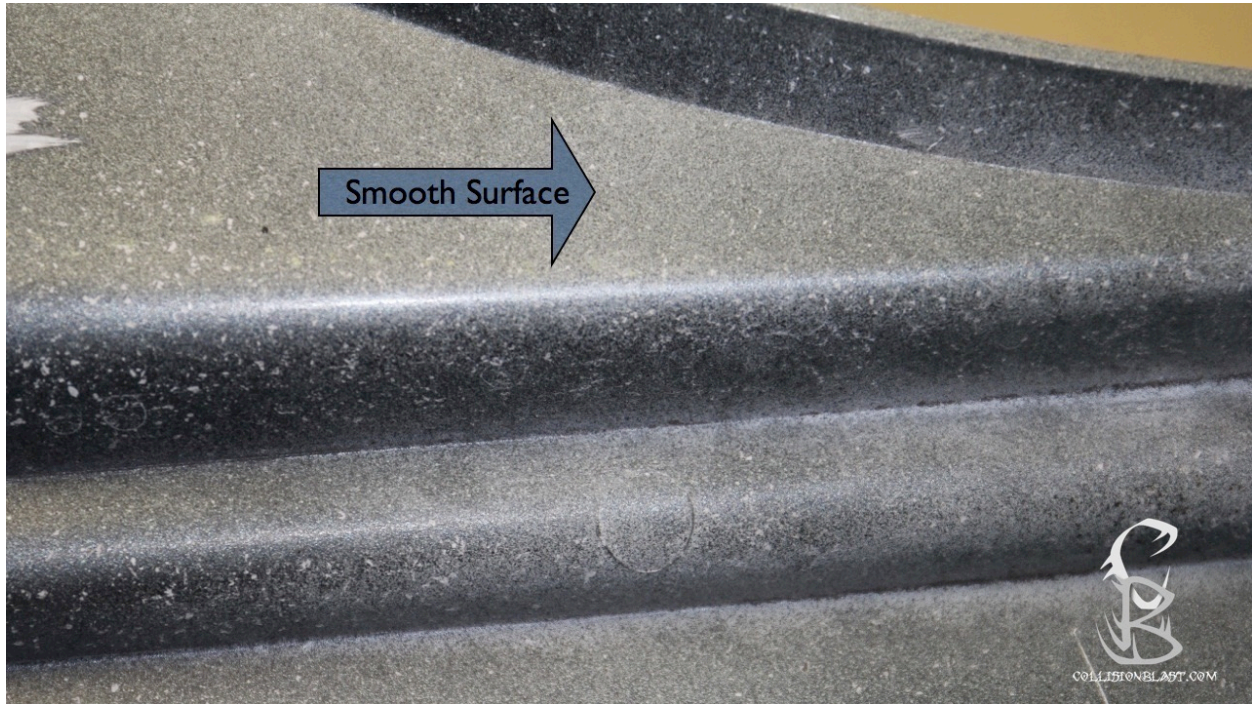
## Sheet Molded Compound



Notice the fiber strands in this broken panel. Fiberglass or SMC?

Sheet-molded compound (SMC) is fiber-reinforced plastic. It is a strong, rigid, and lightweight composite material.

This type of composite has replaced most of the parts that used to be made with fiberglass. In fact, the two could be confused if the fiber strands are visible when an SMC part is broken. SMC has a smooth surface on the backside, while fiberglass strands can be seen on the backside of fiberglass.



This is the back side of the broken piece above. The backside is smooth, which is an indication of SMC.

SMC is used for body parts, such as header panels and hoods, on a vehicle. SMC must be repaired using SCM repair adhesive. Traditional fiberglass repair methods will not properly repair SMC.

### **Carbon Fiber**

Carbon fiber is a strong, stiff, thin fiber of nearly pure carbon, made by subjecting various organic raw materials to high temperatures, combined with synthetic resins to produce a strong, lightweight material.

Carbon fiber has been used in aviation for years, but some carbon fiber is being used to manufacture vehicles, and with the increased push for fuel economy, carbon fiber may be used more in the automotive industry as we move forward. Many aftermarket parts are also using carbon fiber to produce lightweight



performance parts.

The disadvantage of carbon fiber is the cost. It is more expensive than other materials used to manufacture vehicles. There are some repair procedures for repairing carbon fiber, but recommendations are limited.

## **Aluminum**

Aluminum is currently being used on vehicles, but aluminum will perhaps be used more in upcoming years. Aluminum is lighter than steel, provides adequate strength, and is not susceptible to rust like steel.

Many higher-end cars, like Jaguar, have already been produced with an all-aluminum structure. However, the common body shop that does not work on higher-end cars has not been too concerned about the new trend of aluminum. That is about to change because the next-generation F-150 Ford pickup is switching from steel to aluminum. What body shop does not work on Ford pickups? That's right. This trend will affect every body shop in business.

One problem with aluminum is that body shop technicians don't have experience with this material. Less welding and more rivet bonding procedures are going to be recommended from auto manufacturers.

Another problem is galvanic corrosion, which occurs when two dissimilar metals are immersed in a conductive solution and are electrically connected. If aluminum and steel come in contact with each other, galvanic corrosion will occur.

This could happen by simply working on a metal vehicle next to

an aluminum vehicle. If any metal sparks or dust lands on aluminum, the steel particles will become embedded in the aluminum. This may not even be noticeable at first, but after the aluminum part has been primed and painted, the galvanic corrosion process begins underneath the coatings. The vehicle may look great when it leaves the repair shop, but it may be back due to galvanic corrosion spreading and bubbling the paint.

This will require repair shops to have a completely separate work area or building and separate tools for aluminum repairs.

Body repair shops will need to develop a particular process for working on aluminum parts and have an extra work area or sublet aluminum work to an aluminum specialty shop.

## **Magnesium**

Magnesium is a silver-white metal of the alkaline earth series. It is used to make strong, lightweight alloys, especially for the aerospace industry, and is also used for some automotive parts.

It is extremely important to check the recommended procedures for the make and model of each vehicle you are working on to determine what materials are used on the vehicle. If magnesium is used for a part, be certain to follow the recommended procedures for the part.

If magnesium catches fire, it is extremely hard to put out. It burns very hot and may cause the entire vehicle to burn. Extreme caution should be taken when welding near magnesium parts.

## **Glass**

Two types of glass are used on vehicles. Tempered glass is used

for the back glass and side glass, and laminated glass is used for front windshield glass.

### **Tempered Glass**

Tempered glass is a toughened safety glass designed to withstand more impact without breaking than regular glass. Tempered glass is used for all of the glass parts on a vehicle except for the windshield. If this glass breaks, it's designed to crumble into small pieces that do not splinter and are not extremely sharp.

Tempered glass will not crack. The entire glass part will crumble if broken. You will never see a crack in side or back glass.

### **Laminated Glass**

Laminated glass is used for front windshields. This type of glass has layers of glass with a laminate between the glass. Laminated glass is designed to stay together in one piece, but the glass can easily crack. Broken laminated glass can break into sharp splinters.

Windshields are considered a structural part on unibody vehicles because they are glued to the A pillars and roof, which help support the structure.

### **Methods Used For Attaching Parts**

Many methods are used to attach parts in the automotive industry, including clips, rivets, adhesives, fasteners, and welds.

#### **Clips**

Clips come in every shape and size imaginable and can be metal or plastic. Clips can be difficult to remove and be damaged if care is

not taken. In fact, some clips are designed to be broken if removed and replaced. Clips can be made from metal, but plastic clips are more common on modern vehicles.

To properly remove clips, special clip removal tools are needed. Using a screwdriver to pry on the clips will usually result in breaking the clip. If clips are broken during the removal process, new clips will need to be used when reinstalling the part.

## **Rivets**

Rivets are perhaps one of the biggest changes in repair methods that I have seen lately. Rivets used along with adhesive are replacing many welding methods. They also work well for joining different kinds of metals.

## **Adhesives and Welds**

More adhesives are being used to secure parts. For example, a door skin or roof panel may use adhesive around the flanges. Quarter panels may use a combination of welds and adhesives. Regardless of where adhesives are used on a vehicle, it can make removal difficult if not aware of the adhesive. Once you know where the adhesive is located, simply use a heat gun to heat the area where adhesives are applied. This will soften the adhesive, making it easier to remove.

Structural parts are usually welded together. One advantage of using welds over other methods of attachment is that welds do not add much weight if any to the vehicle. For instance, a factory spot weld does not use any filler material during the welding process. Therefore, no weight is added to the vehicle.

## **Fasteners**

Fasteners consist of screws, nuts and bolts, rivets, or clips. A wide range of fasteners is used on vehicles. We've already covered many of them, but now let's go over speciality fasteners.

### **One-Time Fasteners**

One-time fasteners are fasteners that should not be reused. This may be due to stretching, deforming, and corrosion to name a few. Let's look at a few of these types of fasteners.

### **Torque-To-Yield Bolts**

These bolts are recommended to be torqued to a specific amount, but this may stretch, deform, or weaken the bolt. Once removed, the bolt should not be used again. Although the bolt may look undamaged, it should be replaced.

### **Coated Fasteners**

Some fasteners are coated to prevent corrosion. For instance, when bolting an aluminum fender with a steel bolt, galvanic corrosion will occur where the two metals touch. The coating acts like insulation to prevent the two metals from touching each other. If the aluminum fender is replaced, it may be recommended to replace all fender bolts.

### **Safety Fasteners**

Some clips are designed to have a specific amount of resistance, for instance, a clip attaching a panel where an air bag is located. If the clip is too tight or too big, it may delay the air bag timing. If the clip is too small, worn, or too loose, the air bag may deploy too

soon. Anytime the clip is removed, it must be replaced with a new one.

### **How To Identify One-Time Fasteners**

Many of the torque-to-yield bolts are going to be steering and suspension parts, restraint system parts, and driveline parts. Coated fasteners may be used with aluminum parts, but manufacturer-recommended procedures should always be viewed to determine the location of one-time fasteners and procedures to replace them.

# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter 4  
The Necessary Parts  
of an Estimate

“The discipline of writing something down is the first step towards making it happen.” ~Lee Iacocca

### **What This Chapter Covers:**

This chapter covers all of the necessary information needed on an auto repair estimate, the names used to describe the different parts of a vehicle, the sequence to follow when inspecting a vehicle, and how to access and understand the estimating procedure pages.

### **Why This Is Important:**

An estimator must know how to locate and record the necessary customer and vehicle information to ensure they are using the correct estimating guide information. The estimator must also know the names of the parts to record the correct parts. To work efficiently, the estimator needs to know what estimating sequence to follow and be able to access the estimating procedure pages if a question arises.

### **Topics Covered In This Chapter Include:**

- Record Customer Information
- Record Vehicle Make and Model
- Record and Decode VIN
- Record Production Date
- Record Vehicle Mileage
- Record Date of Accident



- Locate and Record Paint Code
- Record Insurance Information
- Nomenclature—The Parts of a Vehicle
- Estimating Sequence When Inspecting Damage
- Understanding The Procedure Pages
- OEM–Recommended Procedures

This chapter has been aligned with the following 2013 NATEF/ ASE tasks:

- B:1 Determine and record customer/vehicle owner information. HP–I
- B:2 Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant. HP–I
- B:3 Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications. HP–I
- B:5 Apply appropriate estimating and parts nomenclature (terminology). HP–I
- B:6 Determine and apply appropriate estimating sequence. HP–I
- B:7 Utilize estimating guide procedure pages. HP–I

- B:8 Apply estimating guide footnotes and headnotes as needed. HP-I

The last thing you want is to be delayed by needing to speak to the owner before you can continue the repairs only to discover that you cannot get in touch with them. Perhaps they have gone on vacation and the only contact information the estimator recorded was their home phone number. You will not have a happy customer when they return expecting their vehicle to be ready.

## **Vehicle Information**

You will also need the vehicle information—make, model, and style. Be certain to record the VIN (vehicle identification number). This may be used to determine the correct parts to order and have many other uses as well. The VIN can actually tell you quite a lot about the vehicle. Record the mileage, license plate number, and the date. This is all important information to have for future purposes.

### **Make and Model**

Record the make and model of the vehicle. Is it a coupe, sedan, etc.? You will also want to record any packages that the vehicle is equipped with.

### **Decoding The VIN**

This number tells a lot about the vehicle. There are 17 characters in a VIN, and each one means something different. The VIN will vary depending on the manufacturer, but the first digit will let us know where the vehicle was made. The 10th digit will always let us know the model year.

To determine what all of the characters stand for, you can look in the P-Pages, which will help us decode the vehicle. If using a computer system, it will probably decode the VIN after entering it

into the system. With CCC One, you must put in the VIN to complete the estimate. Once the VIN is put into the computer correctly, CCC will decode the VIN for us.

If you recorded the VIN incorrectly, you will not be able to proceed. So it is important to record it properly. Writing it down correctly will also save you another trip to the car to determine if you were wrong on one of the numbers.

The correct VIN will also help you when ordering parts to ensure you are ordering the correct parts. Misordered parts are an ongoing issue, which delay repairs, increase recycle times, and may break a promise date of completion to the customer.

There is a VIN decoding resource on the website.

### **Production Date**

The VIN will provide the year the car was made, but when ordering parts or for some recommended procedures the production date may be needed. The manufacturer could have tweaked a part slightly or changed the recommended procedure or a certain task.

### **Vehicle Mileage**

Recording the mileage is easy to overlook when writing an estimate, but it is important to get the mileage for several different reasons. I always like to record the mileage for documentation. I have heard of customers claiming that their vehicle was driven around town using all of their gas. It may be necessary to test-drive a vehicle before returning it to the customer, but with the mileage recorded before repairs were made you will have documentation of

actual miles the car was driven while in the shop for repairs and assure the customer that your shop does not participate in this type of activity. Always document everything, as it may protect you at a later time.

### **Date Of Estimate**

You will also need to record the date the vehicle was estimated. Normally, an estimate is only good for one month. With price changes, the estimate may become invalid with incorrect prices, which will need to be adjusted. It is also important to record the date the estimate was written because the condition of the vehicle can change. For example, when you wrote the estimate, the vehicle may have had surface rust. Several months later, the rust may affect a panel, which will need to be replaced or additional labor required to repair the damage.

### **Prior Damage**

Prior damage is damage that was present before the accident occurred. This is important to discover, as insurance will not pay for prior damage. Prior damage may be on adjacent panels, or it may be on the damaged panel that you are estimating. For example, if a vehicle has a small dent on the front of the right front fender with prior damage on the back of the right front fender, insurance will not pay for the time to repair the damage to the rear of the fender. The damage will probably need to be repaired, but it will be at the cost of the customer, not the insurance company.

Another reason to document prior damage is to have documentation that the damage was there before the vehicle was repaired. This will eliminate the customer claiming that the damage

occurred while the vehicle was in the shop being repaired.

The customer may not have even noticed prior damage. Pointing it out to them not only covers the shop but also will be an up-sell to repair the damage as a customer pay job. Don't miss these opportunities to capture this additional revenue. Whether the customer wants to pay for the prior damage or not, they will know the damage is there and will not assume it happened while in the shop when their vehicle is returned to them.

### **Finding The Paint Code**

Paint codes can be in various locations depending on make and model. The P-Pages or your estimating system will usually give you the location of the paint code. You will need to know if the car has clear coat, tri-coat, or in rare cases quad coats. This will all change the cost of paint labor and paint material costs.

Paint companies also have software to help determine the paint code. PPG has an online paint code finder at [www.PPGPaintIt.com](http://www.PPGPaintIt.com)

### **Insurance Claim Information**

Most accidents will involve an insurance claim. If so, record the name of the insurance company, their number, claim number if one has been generated, and the name and number of the insurance adjuster.

This information should be recorded, as the estimator is responsible for communicating with the adjuster to arrange for the damage to be repaired.

### **A Communication Tool**

There are many parts to an auto repair estimate. The main thing to remember is that the estimate needs all the information to provide a good communication tool that will show the big picture. The more information you have on it, the clearer the big picture will look. The more customer information, vehicle information, insurance information, and facts about the accident you collect, the better communications you will have throughout the entire process. A little extra work on the front side will save you a lot of time and headaches in the long run.

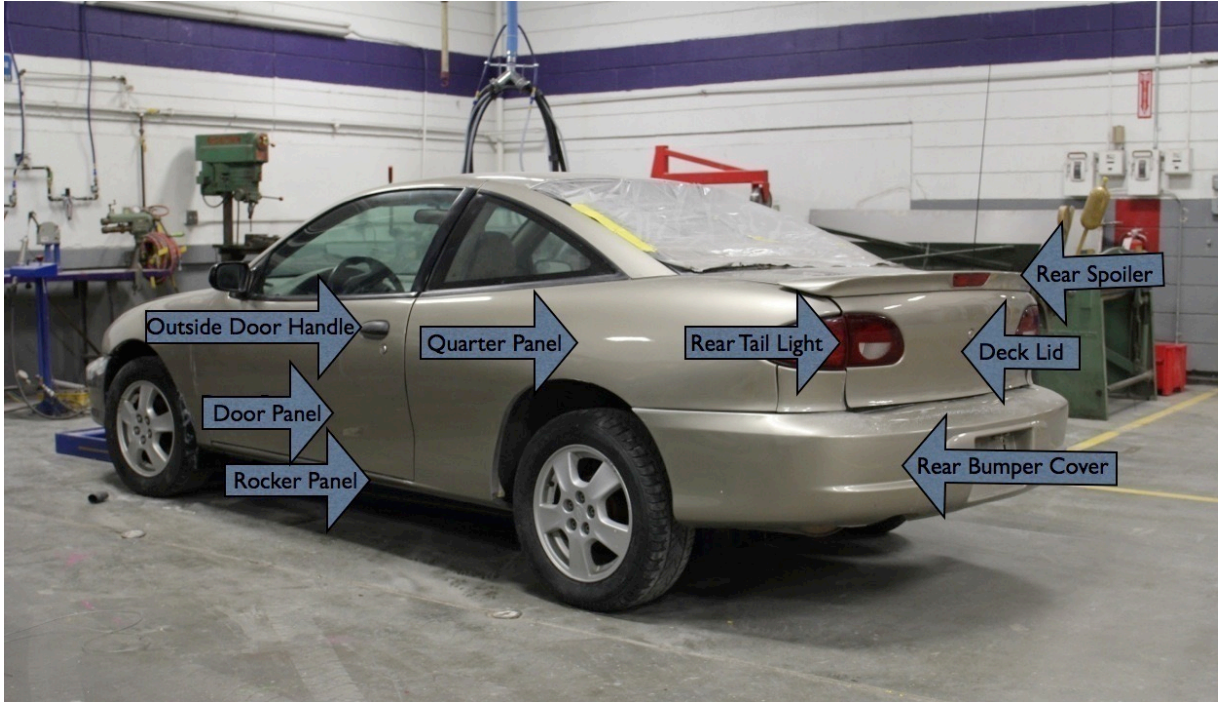
## **Nomenclature**

An estimator needs to be able to identify parts and to know what the parts are called. This will help with the inspection and also help communicate the damage to customers, the insurance company, part suppliers, shop managers, and technicians.

Below are a few photos of nonstructural and structural parts, but many individual parts are not listed. These parts will be listed individually in the estimating guide or estimating system.

You can also study part names by each make and model by visiting <http://www.parts.com> and selecting the vehicle you want to look up. This will give you a breakdown of the parts along with their names.

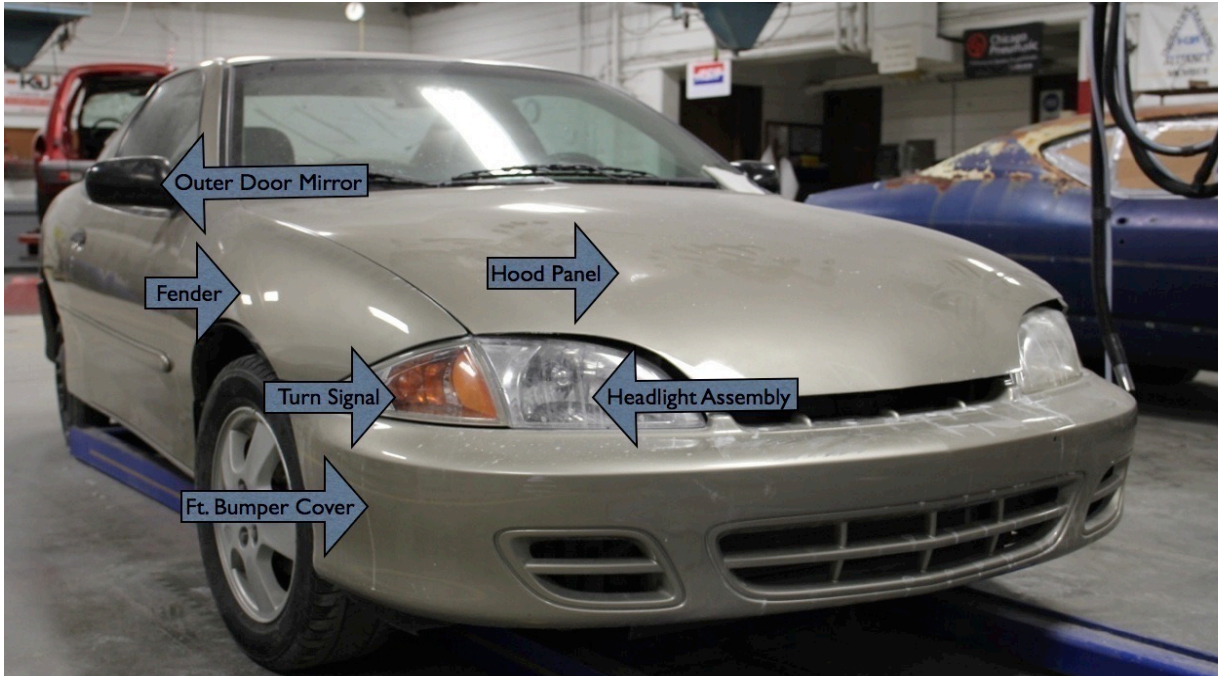
## **Non-Structural Parts**



This photo shows:

- Rear Bumper Cover
- Deck Lid aka Trunk or Luggage Lid
- Quarter Panel
- Door Panel
- Rear Taillight
- Rear Spoiler
- Rocker Panel
- Outside Door Handle





This photo shows:

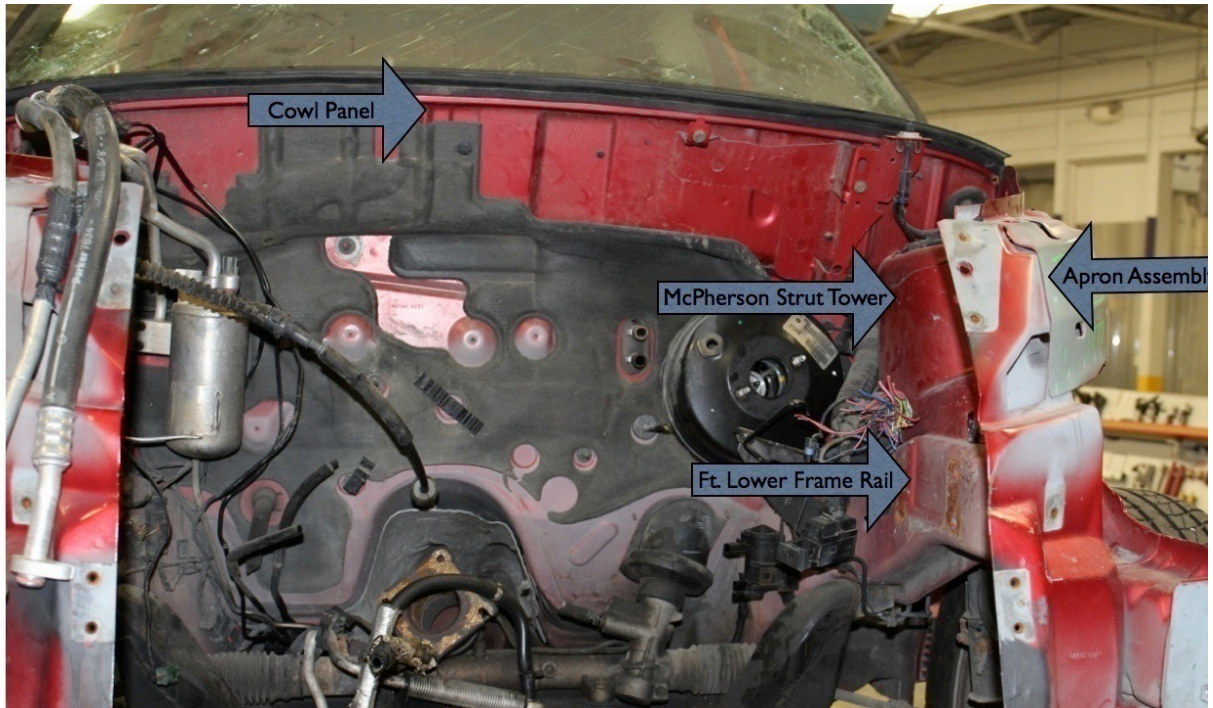
- Front Bumper Cover
- Headlight Assembly
- Turn Signal
- Hood Panel
- Fender
- Outer Door Mirror



This photo shows:

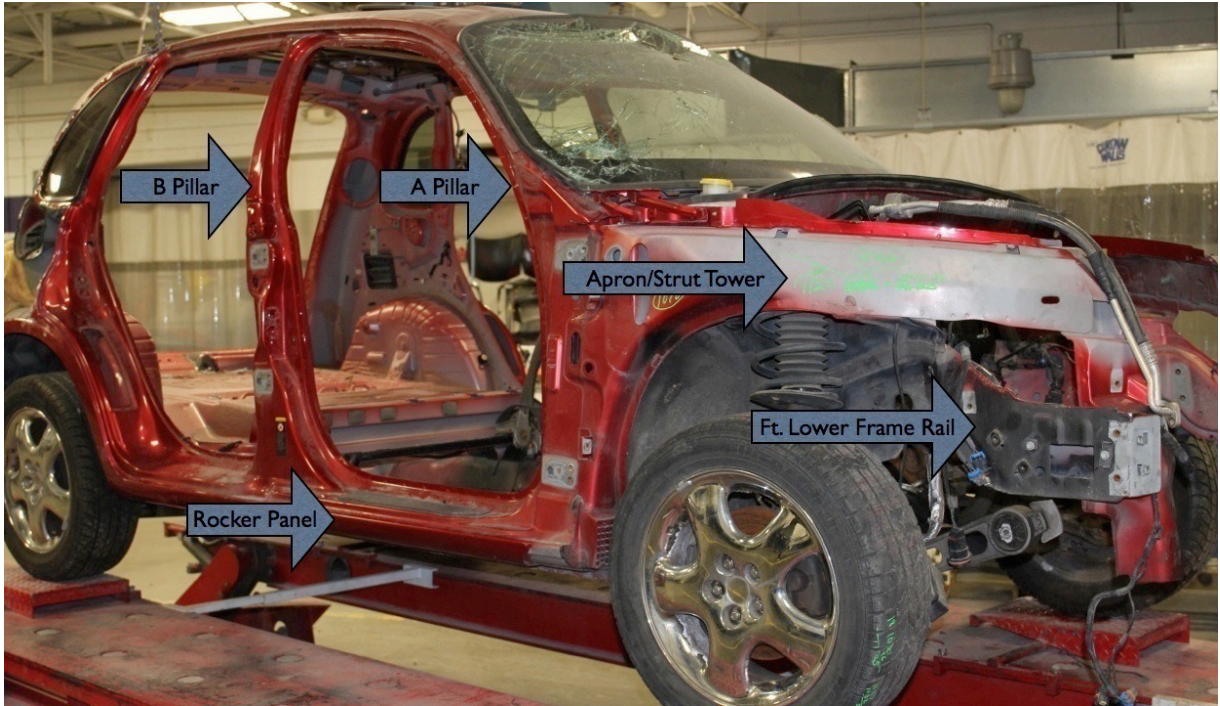
- Quarter Glass
- Back Glass
- Roof Panel
- Door Side Glass
- Door Belt Molding
- Door Lock Cylinder

### **Structural Parts**



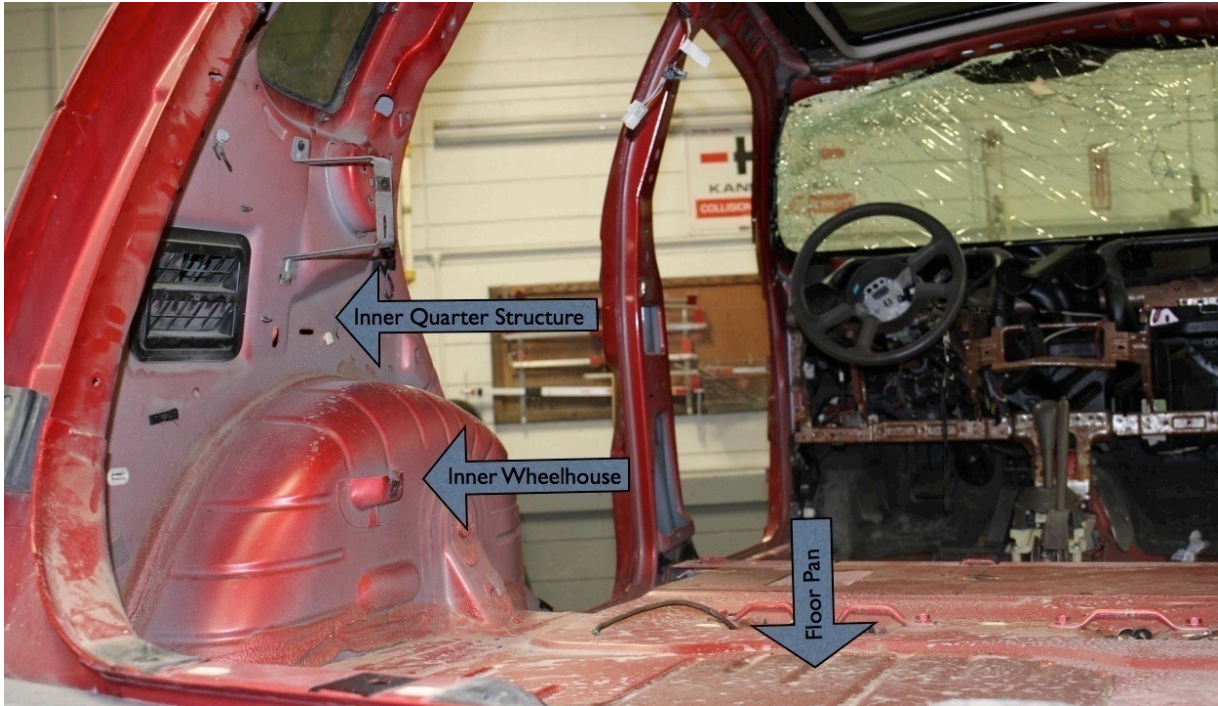
This photo shows:

- Cowl Panel
- McPherson Strut Tower
- Front Lower Rail
- Apron Assembly



This photo shows:

- Front Lower Rail
- Apron/Strut Assembly
- A Pillar
- B Pillar
- Rocker Panel



This photo shows:

- Inner Quarter Structure
- Inner Wheelhouse
- Floor Pan

There are obviously many more parts than listed. Read the parts description in the estimating guides of the different makes and models to become more familiar with them or visit the website I listed above.

Be aware that some parts in the estimating guide may be called something different in the body shop. I will list a few of the parts with different names below.

- A Pillar—Windshield Pillar

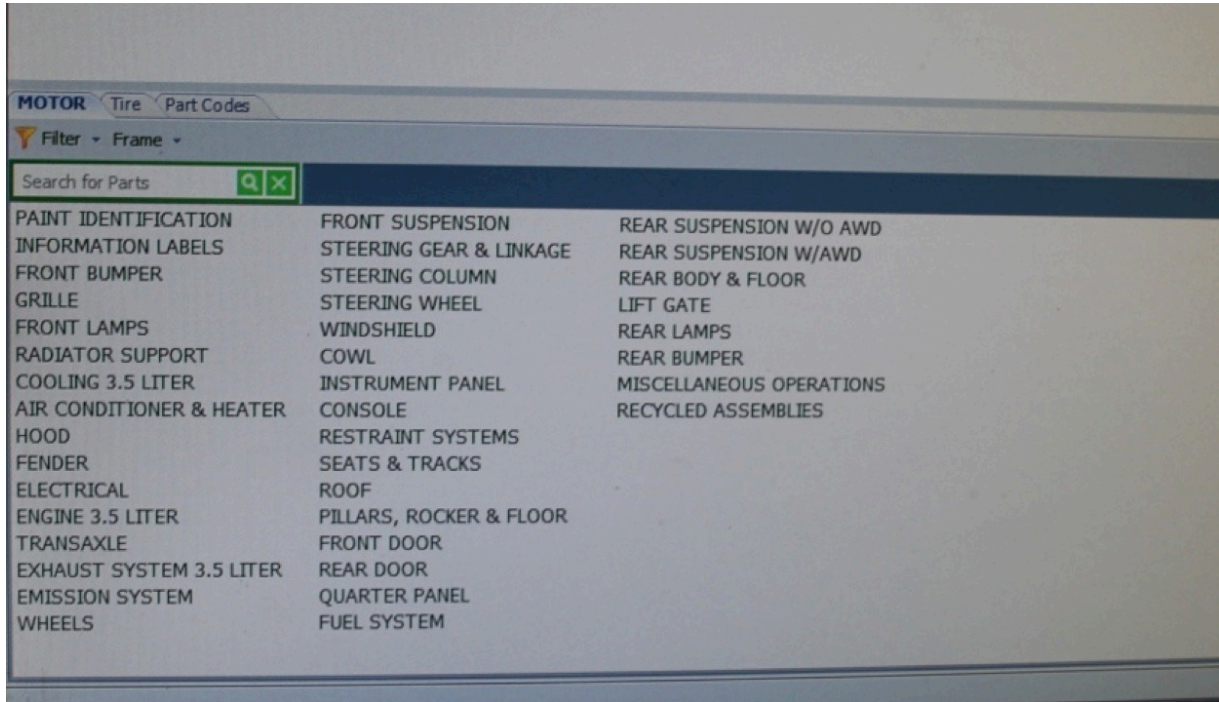
- Replacement Outer Door Panel—Door Skin
- Deck Lid—Trunk Lid—Luggage Lid
- Center Body Pillar—B Pillar

## **Estimating Sequence When Inspecting Damage**

To become efficient at writing estimates, the estimator needs to follow the same sequence as the estimating guide or computer system. Most guides and systems start at the front of the vehicle and move toward the back. The sequence also starts on the outside of each group of parts and moves toward the inside.

For instance, let's say we have a damaged front bumper cover and hood. First, inspect the bumper cover and determine if the bumper cover needs to be repaired or replaced. Before moving to the next part group, let's make sure we have everything in the bumper group. Moving inward on the bumper group, we may have an impact absorber, reinforcement bar, broken clips, etc. Determine if any parts in the bumper group need to be repaired or replaced. Next, move to the next panel, moving toward the back of the car. Looking at the part groups in the CCC One, the next part group would be the grille, front lamps, radiator support, etc.

Notice in the photo of CCC One below the sequence of the part groups. When the estimator clicks on one of the part groups, the system will show all the parts for that specific part group. This system will show diagrams of the parts, prices, and labor times.



Notice in the photo how the sequence starts with the front bumper and ends with the rear bumper.

The P–Pages included in your estimating guide are very helpful and should be viewed regularly. You will find abbreviations used, definitions, information about labor notes, what each procedure includes and what it does not include, and much more.

Please note that each estimating guide or system will vary on procedures and terms. Check the P–Pages in the guide or system you use to ensure correct information.

In the resource section, I have an online resource for Mitchell’s and Motors P–Pages.

## Common Terms

Shown below are a few of the most common terms you will need to memorize and be familiar with.

**Remove and Install (R&I):** R&I is the process of removing a part and installing the same part. For instance, a door may need to be removed to gain access to the area being repaired. This may only include unbolting the hinges and unplugging the wire harness. If the door is being replaced, the door panel, handle, glass, regulator, and all of the hardware will need to be transferred from the old door to the new door. R&I will take less time than replacing the door.

**Remove and Replace (R&R):** R&R is the process of removing a part and replacing the part with another part. This will require all of the hardware to be transferred to the new part. R&R will require more time than R&I.

**Overhaul (O/H):** O/H is the process of completely tearing an assembly apart and putting it back together. An example of this would be a bumper assembly that is O/H. This would include removing the bumper assembly from the vehicle, tearing the assembly apart, putting the assembly back together, and then installing. The estimating guide will provide this option for parts that may be O/H.

**Disconnect and Reconnect (D&R):** D&R is the process of disconnecting a part and later reconnecting it. For example, most repairs require the battery to be disconnected to perform repairs. When the work has been completed, the battery can be reconnected. This is different and takes less time than removing the battery.

**Overlap:** If adjoining parts are being replaced, there is an overlap in both operations. A deduction must be made from the total operations. For example, if a radiator support is being replaced, a



overlap deduction may be deducted if the bumper is already removed.

**Frame Setup:** This procedure involves setting the vehicle and clamping onto the frame machine and preparing the vehicle for pulling.

## **Symbols**

¶—PART FOOTNOTE: Special part situations or requirements are denoted with a footnote symbol. The explanation follows as closely as possible to the part referenced.

#—LABOR FOOTNOTE: Special labor situations or requirements are denoted with a different footnote symbol. The explanation follows as closely as possible to the time referenced.

m—A designation that appears in a separate text column to the left of the labor time column to identify components for which R&I or R&R is commonly considered to be a mechanical operation when performed in a collision repair environment.

s—A designation that appears in a separate text column to the left of the labor time column to identify unibody structural components—those that support the weight of the vehicle and absorb the energy of the impact as well as road shock.

d—DISCONTINUED PART – When an OEM part is no longer available.

(P)—PAINT TO MATCH: A designation that appears immediately after a part description or application to identify components that must be painted to match the exterior/interior color of the vehicle.

(R)—REMANUFACTURED PART

## **P–Pages**

- The P–Pages are an excellent source to determine:
- What is included in an operation and what is not
- Definitions used in the estimating process
- Terms used in the industry
- Symbols used in the estimating guide
- Part identification

## **OEM–Recommended Procedures**

I have sprinkled throughout this book the importance of the estimating P–Pages and the recommended procedures. Don't confuse the two. When talking about recommended procedures, I am talking about the OEM–recommended procedures, which are specific recommended procedures for each make and model of vehicle being worked on.

The recommended procedures are very important to determine how specific operations should be performed, especially with newer vehicles having different metals and composites. The days of uniform procedures are gone. Every make and model may have different procedures for each operation.

## **Where Do I Find The Recommended Procedures?**

CCC One integrated many of the recommended procedures into their estimating system, which I have found very useful. When the

estimate is being generated in the computer system, the recommended procedures can be pulled up. Other computer estimating systems may offer the same thing.

If the estimating system does not have OEM-recommended procedures integrated, then there are several other ways to access the information.

Collision Repair Guides can be purchased for specific makes and models. They are not cheap and having a guide for every make and model would be quite expensive.

Databases such as Alldata Collision Connect is an online paid service for an annual fee. I will include information about Alldata in the resource area.

Some websites have OEM providers, which will allow you to reference a specific make and model. Much of the information is free, but some are paid. You can also purchase information by the day or week, which is fairly inexpensive. To learn more about this, visit [www.oemonestop.com](http://www.oemonestop.com)

# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter 5  
Labor Rates and  
Labor Times

“It has been my observation that most people get ahead during the time that others waste.” ~Henry Ford

### **What This Chapter Covers:**

This chapter covers how to determine and calculate body, paint, structural, and mechanical labor rates and materials needed. This includes material and operations found in the estimating guide and operations not found in the estimating guide.

### **Why This Is Important:**

For an estimator, it's important to understand how labor rates and material charges are determined. To create revenue and profit for the repair shop and technicians, the estimator must identify and add operations not found in the guide to the estimate to stay ahead in today's challenging marketplace.

### **Topics Covered In This Chapter Include:**

- Estimating Guide Labor Times
- Repair Shop Labor Rates
- Understanding Estimating Times in Tenths
- Labor Categories—Body, Refinish, Mech, Structural
- Judgement Labor Time
- Adding Not Included Operations
- Getting Not Included Paint For Operations
- General Not Included Operations

- Increase Shop Profit
- Sublet Work

This chapter has been aligned with the following 2013 NATEF/ASE tasks:

- B:8 Apply estimating guide footnotes and headnotes as needed. HP-I
- B:9 Estimate labor value for operations requiring judgment. HP-G
- B:10 Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish).
- B:16 Determine price and source of necessary sublet operations. HP-G
- B:17 Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items. HP-G

This chapter covers labor rates and material charges. This is a good time to mention the importance of doing your best when it comes to this chapter. The collision repair industry, like other industries, has become very competitive. Insurance companies save money on claims. It's not their fault. They deal with insurance fraud, and a few shops may have tried to take advantage of insurance jobs.

Regardless of the reason, the reality is that the repair shop and technician should be paid for the work performed. As I've mentioned many times in this book, we're working for the customer. It is our job to assure the customer that high-quality work is being performed on their vehicle to repair it back to its safe and pre-accident condition. Never allow shortcuts to be taken to save someone else money.

Insurance companies require more documentation than they used to, and they need to clearly understand why you are charging what is on the estimate. They want to make certain the operations on the estimate are required and materials are needed as stated on the estimate. Chapters 5 and 6 cover adding operations and materials that are not included in the estimating guide. Take the extra time needed to read these chapters, check out the additional resources, do your own research, or whatever it takes to educate yourself on these topics. By doing this, you will better understand how to deal with insurance companies, get paid for the work performed, and stay ahead in today's challenging marketplace.

### **How Are Estimating Guide Times Determined?**

The labor times in estimating guides and computer estimating systems is the time it should take a skilled technician to perform the task. However, this is for new, undamaged parts. The labor time

does not include pulling damaged parts to gain access to bolts that may be rusted or corroded bolts and harder to remove than new ones. If this is necessary, you need to add the additional access time to the estimate.

### **Shop Labor Rate**

The shop labor rate is what the shop charges per hour. This varies depending on the shop, as each shop is responsible for setting its own labor rate. In fact, it is against the law for shops to get together and discuss labor rates. That would be considered price fixing, which is illegal. Here is an example of a repair shop's labor rate. If the shop's labor rate is \$45.00 per hour and the estimating guide shows 3 hours to replace a fender, the shop would charge \$135.00 for this job. This does not include supplies or tax.

$$\text{\$45 Per Hour} \times 3 \text{ Hours} = \text{\$135}$$

### **Estimating Times In Tenths**

All estimating guides use tenths. You may see 2.3, which is 2 hours and 18 minutes. There are 6 tenths in an hour, so multiply each tenth by 6 to determine the time in minutes. For instance, .5 equals 30 minutes, and 1.5 equals 1 hour and 30 minutes. This gives us an idea of how labor times are provided.

$$2.3 \text{ Hours} = 2 \text{ Hours} + 3 \times 6$$

$$2.3 \text{ Hours} = 2 \text{ Hours and } 18 \text{ Minutes}$$

- **0.1 = 6 minutes**
- **0.2 = 12 minutes**



- **0.3 = 18 minutes**
- **0.4 = 24 minutes**
- **0.5 = 30 minutes**
- **0.6 = 36 minutes**
- **0.7 = 42 minutes**
- **0.8 = 48 minutes**
- **0.9 = 54 minutes**
- **1.0 = 60 minutes or 1 hour**

### **Labor Categories**

Labor times fall into different categories, which are body labor, refinish labor, frame labor, and structural labor. It is important to record the type of labor correctly, because most shops charge different labor rates for each labor category. For instance, a shop may charge \$45 per hour for body and refinish labor, \$60 per hour for structural labor, and \$75 per hour for mechanical labor. These are just figures I provided as an example, but the estimator must know what labor category each task falls under.

### **Body Labor**

Body labor usually consists of nonstructural labor, such as replacing body panels, body repair, and plastic repair. According to the Mitchell P-Pages, when repairing body damage, body labor includes all of the steps to straighten the damage, applying fillers, shaping the filler, and finishing the filler with 150-grit sandpaper. Feather edging and all finer grits of sandpaper used after that point

will fall into the refinish labor.

### **Refinish Labor**

Refinish labor picks up where body labor leaves off if painting is required, for instance, the damaged area that was finished off with 150-grit sandpaper from the body department. Now the paint department gets the job and feather edges the damaged area, applies primer and block sands, cleans, masks, paints, and clear coats—basically all of the steps necessary to paint and clear coat the parts being painted.

The refinish time for each part will be provided by the estimating guide or estimating system.

### **Structural Labor**

Structural labor is time for straightening structural damage. If there are tasks classified as structural repairs, some estimating guides and systems will show an (s) by the labor time or in labor notes. The structural labor rate should be applied to these operations.

### **Mechanical Labor**

Mechanical labor usually includes replacing mechanical, electrical, and suspension components. For instance, in a front-end collision, many times the radiator and a/c were damaged and will need to be replaced. These tasks are generally considered a mechanical task. Most estimating guides and estimating systems will show an (m) by the labor time or in the labor notes. The mechanical labor rate should be applied to these operations.

Although the estimating systems may classify the task as

structural or mechanical, the repair shop SOP may have a different opinion. These categories are not fixed.

## Judgment Time



What would you do, repair or replace? If repairing, how many hours would you write on the estimate?

Judgment time is an estimated time given to a procedure by the estimator that is not provided in the estimating guide or estimating system.

Not every operation is going to be included in the estimating guide. For instance, the labor time for all of the dent repair, plastic repair, frame repair, and many other operations are not in the estimating guide. This is where experience is important. When you have to determine or estimate the time it should take to repair a

dent on a right front fender, it is called judgment time, because you are the judge and make the call. Therefore, judgment times can vary greatly from shop to shop and estimator to estimator.

### **Estimating Labor For Add-on Accessories**

The estimating guide provides labor times for OEM parts, but labor time will not be provided for add-on accessories. The labor will be a judgment time given by the estimator to perform the operation, which may include such accessories as body kits, bed liners, and bed rails.

We covered adding the labor time to the repair estimate from the estimating guide. We also covered judgment time, which is not in the estimating guide. However, each part replaced or operation performed is going to have other items, which are items or labor time that is not included in the time provided in the guide. These items will need to be added to the estimate. This is what an estimator needs to pay extra attention to, as many mistakes are made with such operations, and a lot of money is left unclaimed.

### **It's Like Going To Walmart**

What is included and what is not included in each operation? This is something that you need to ask yourself every time you add a line to your estimate. This is where most mistakes are made when writing an estimate, which results in dollars lost for the shop. There are a great many not included operations that go unclaimed on most estimates. Many times the estimator claims they do not put it on the estimate because the insurance company will not pay for it. There is some truth behind this story, but it is usually because they

did not write it on the estimate correctly. You must itemize each procedure if you plan to get paid for it. It is like going to Walmart. Have you ever gone to Walmart and put many items into your cart, but when you went to check out, the price almost gives you a heart attack? Well, let's take this one step further. What if they gave you a receipt with just the total amount on it? You would probably claim that they made a mistake. When you get the itemized receipt, however, you realize all of the prices are correct. It just added up to more than you thought it would.

I don't know if this has ever happened to you, but it happens to me all of the time. Insurance adjusters are the same way. If it is not crystal clear what the estimate is charging for, they claim that it is not right, and they do not want to pay that amount. I sure wish I could do that at the store! If you have every item listed separately, though, they can see that your charges are legitimate.

To determine what not included operations you can add to your estimate, look in your P-Pages. Everything that is included and everything that is not included will be listed. I recommend that you take some time and study the P-Pages and know them by heart.

### **Getting Paid For Not Included Operations**

As an estimator, you must try to get paid for all of the work performed and materials used. Does this mean that the insurance company will pay for anything you ask for? Probably not, but it's the estimator's job to negotiate and try to get paid for everything.

Remember, you are working for the customer and should strive to provide quality work, not cut corners to save money for the insurance company.

## **Ask For It**

Insurance companies are a lot like the IRS. There are many things that insurance companies are willing to pay for just as the IRS has many tax-saving benefits for businesses. If you don't ask for it, however, neither one will offer to give it to you. I am not saying that insurance companies will pay you for everything you ask for, but it is certain you will not get paid for the operation if you don't ask for it.

There may be as much not included time on a part as the time given to R&R the part. Let's take a look at an example.

### **Fender:**

#### **Included Operations**

- Remove and install or replace:
- Headlamp assembly if attached to fender
- Cornering lamp if so equipped
- Side marker lamp if so equipped
- Turn indicator lamp if so equipped
- Parts attached to fender except those listed in the Not Included section
- Replace clip-type moulding for base model vehicle

#### **Not Included Operations**

- Refinish front fender

- Aim lamps if attached to fender
- Remove and install front bumper
- Remove and install hood
- Remove and install or replace wheel
- Remove and install adhesive exterior trim; clean and retape
- Replace new adhesive exterior trim
- Install stripes, decals, transfers, or overlays
- Drill installation holes
- Cut installation holes

### **Ask Yourself**

If you are a new estimator, you need to get the list out and go over it for every part that you are replacing. Ask yourself if any of the not included operations are required to perform the specific job that you are estimating. For instance, on the fender above, ask: Will new adhesive need to be replaced on the trim? If the fender has trim that will need to be removed, then add time for it on the estimate. If not, don't add it. Go through the not included operations to determine which ones apply to the vehicle being repaired. This is just an example of a fender. The not included operations get quite extensive on parts like door skins.

### **General Not Included Operations**

In addition to looking at each specific part to determine the items not included, there are some overall items that may apply. Be

certain to look over this list when checking for additional items to add to the estimate.

- Access Time: Remove damaged parts by cutting, pushing, pulling, etc., to gain access.
- Anticorrosion Application: Remove or apply weldable zinc primers, wax, petroleum-based coatings, undercoating, or any type of added conditioning.
- Broken Glass Cleanup: Anytime glass has been broken in an accident, the time to replace the glass does not include time to clean up the broken glass.
- Detail: Time to clean or detail the vehicle is not included.
- Drill Holes: If holes are required for emblems or any other reason.
- Time to reset memory code function for seat, stereo, etc. When battery has been disconnected.
- Fabrication: Fabrication and installation of reinforcements or inserts.
- Frame Setup: Time to set up frame to measure and pull.
- Free Up Parts: Additional time to free up parts frozen with rust and corrosion.
- Measure and Identify: Time to measure and identify structural damage.
- Transfer Time: For welded, riveted or bonded brackets,

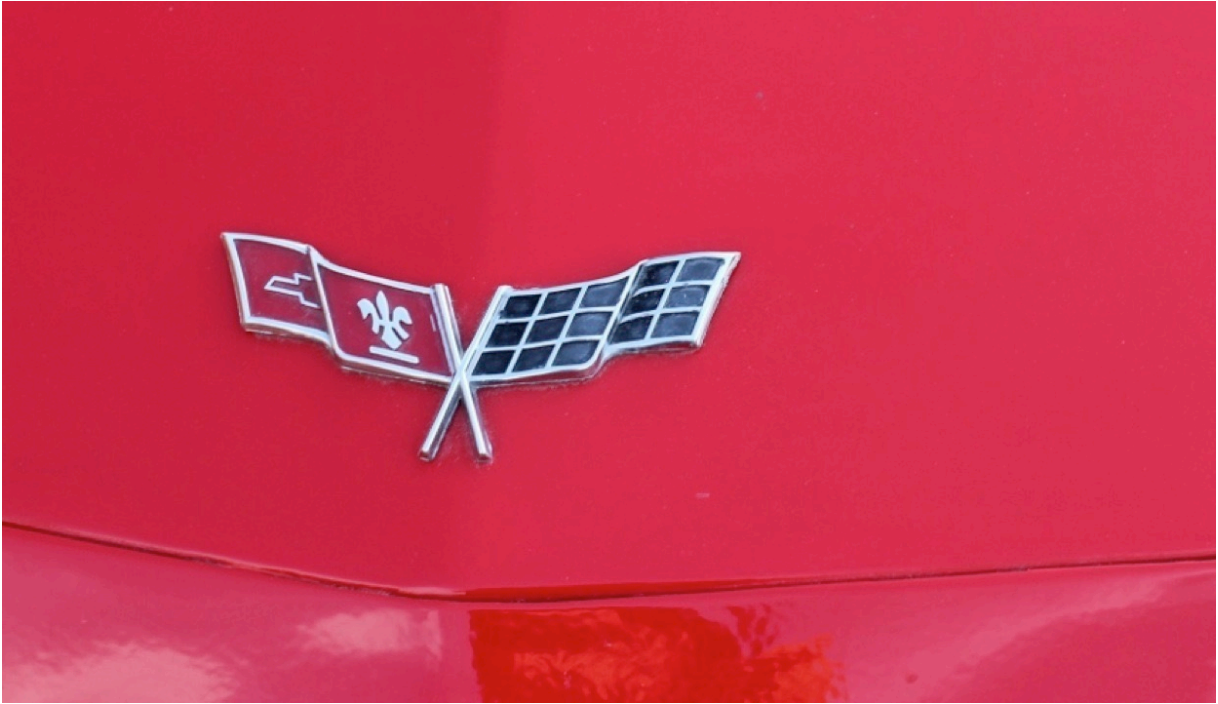


braces, or reinforcements from an old part to a new part.

- Trim and Fit: Time to trim and fit for new fiberglass, steel, and aluminum panels.
- Non-OEM Components: Time to remove add-on equipment, such as a bed liner.
- Feather, Prime, and Block: If the repair included damage that was repaired and required body filler, time for feather edging the damaged area, masking for primer, applying self etch or epoxy primer to bare metal, apply primer surfacer, apply guide coat, and block sand the primer surfacer.
- Color Sand and Buff: If dirt, excessive orange peel, or runs are in the finished painted surface, color sanding and buffing will be required.

This will give you an idea of the not included items. However, I strongly recommend that time be spent looking at the P-Pages of the estimating guide or computer system you use.

**Increase Shop Profits**



Emblems must be R&I if a panel is painted or replaced. Don't forget to add to the estimate.

Now you can see the amount of money that you may leave unclaimed on each panel. Many of the not included items will need to be performed on each part repaired or replaced.

Of course, only add what applies. You do not want to add time to R&I the hood if you do not need to remove the hood to R&R the fender. Look over the list on each panel that you estimate, and add what applies to the estimate. If a fender pays 3.0 hours, you may be able to add an extra .5 or more hours of not included operations. This will lead to major profit for the company and technician at the end of a day, week, and year. Who knows how much .2 or .3 for every emblem you replace may add up to at the end of one year!

### **Tell A Story**

The key is to list each item separately. You need to tell a story

with your estimate, and it needs to be easy to understand. If you try to bulk or clump items together, chances are the insurance adjuster may refuse to pay. The estimate needs to show the big picture crystal clear for everyone to easily understand.

### **The P-Pages**

The P-Pages or procedure pages have a lot of useful information you need to learn. I recommend that you study the P-Pages and learn them well. You can access a copy of the Mitchell or Motor P-Pages in the resource section.

### **Sublet Work**

Sublet is work the repair shop charges for but has someone else perform. For instance, the estimator may charge the customer to align the suspension but have a suspension shop perform the alignment. The customer will pay the repair shop for the alignment, and the repair shop is responsible for paying the suspension shop.

Sublet work may include suspension work, mechanical work, glass work, window tinting, sprayed on bed liners, stripes and decals, aluminum repairs, towing, or other procedures the repair shop may not perform. Some repair shops perform all of their own work, while others sublet parts of their work to other businesses.

It's like a home contractor. They provide a homeowner with a bid and contract the concrete to a concrete company and the electrical work to an electrician and so forth.

There should be some percentage of a markup on sublet work, as it takes time to set appointments and arrange to have all of the

sublet work completed. The percentage of markup is usually going to be 20% to 30%, but this is going to be up to the shop manager or estimator and their relationship with the businesses they use.

# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter 6  
Types of Parts

“I always say don’t make plans, make options.” ~Jennifer Aniston

### **What This Chapter Covers:**

This chapter covers the different types of parts and quality of parts used in the automotive industry.

### **Why This Is Important:**

An estimator must know the different types and quality of parts available to be able to determine the best option for each make and model being repaired.

### **Topics Covered In This Chapter Include:**

- OEM Parts
- Availability of Parts
- Aftermarket Parts
- CAPA–Certified Parts
- Used Parts
- Remanufactured, Rebuilt, and Reconditioned Parts

This chapter has been aligned with the following 2013 NATEF/ ASE tasks:

B:11 Select and price OEM parts; verify availability, compatibility, and condition. HP–G

B:12 Select and price alternative/optional OEM parts; verify availability, compatibility and condition. HP–G

B:13 Select and price aftermarket parts; verify availability, compatibility, and condition. HP-G

B:14 Select and price recyclable/used parts; verify availability, compatibility and condition. HP-G

B:15 Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition. HP-G

## **Types Of Parts**

When it comes to new parts, there are many options to choose from. Not all parts are created equal, but there is a place for them depending on the vehicle being repaired. This chapter will cover the different types of parts, which will help you determine which option is best for each make and model vehicle being worked on.

If you have determined that a part must be replaced, then replacement parts will need to be used. On the estimate, indicate the cost of the part, the part number, and whether a right or left part is needed. For example, a fender has a right side and a left side. However, a hood does not. If the part is an original equipment manufacturer (OEM) part, then all of this information will be listed in the estimating guide or the computer estimating system. If the part is aftermarket, used, reconditioned, or an add-on part, then a call may need to be made to determine the cost. The labor time will give you an idea of the labor and paint time to replace the part, but additional time may need to be added to the estimate.

The labor provided in the estimating guide is for new and undamaged OEM parts. If an aftermarket part does not fit properly, additional time may be required to adjust and fit. Another example is when using used or recycled parts. The part may require cleanup time or additional time to repair damage. This additional time may need to be added to the estimate as well.

Let's take a closer look at the different types of parts you may use during the repair process.

### **OEM Parts**

OEM parts are the original parts made by the vehicle



manufacturer. These parts meet the the crash-test standard for the vehicle. OEM parts also have the proper e-coat and corrosion protection the vehicle manufacturer intended. Most body shops prefer using OEM parts, as they fit well and meet all of the requirements the auto manufacturer requires.

OEM parts may be more expensive than aftermarket parts, and many insurance companies may recommend using aftermarket parts. Some auto manufacturers have programs to price match aftermarket parts. If you prefer to use OEM parts, you may do some research to determine if these are available. I have a website for this in the resource section.

### **Availability Of Parts**

Occasionally, you may not be able to buy OEM parts because they may not be available. This is something that needs to be determined during the estimating process. If the parts are not available, the part will be listed as discontinued. If the part has been discontinued, other options include aftermarket, used, or remanufactured, which will require the estimator to check to see if the part is available with these options.

### **Aftermarket Parts**

Aftermarket parts are made for companies other than the vehicle manufacturer. This allows many companies to manufacture the parts. Different aftermarket manufacturers means that the parts may be of different quality depending on the manufacturer. In other words, not all aftermarket parts are of equal quality. The price can vary greatly as well. Some aftermarket manufacturers may have parts that fit well, have been crash-tested, and have the proper e-coat for corrosion protection, but there may be other aftermarket

parts that do not fit well, have not been crash-tested, and have a cheap black primer that does not provide adequate corrosion protection.

### **CAPA-Certified Parts**

One thing to look for with aftermarket parts is if the part is a certified auto part (CAPA). This certification means that the parts have been tested and meet a certain criteria. To learn more about CAPA certification, visit our resource section.

For the price and part number, a separate aftermarket guide provided by the aftermarket part manufacturer will be needed. Many computer estimating systems intergrate aftermarket suppliers and parts in the estimating system. A call will often need to be made to the supplier to verify that the part is available and the cost.

### **Used Parts**

Used parts may also be referred to as recycled or salvage parts. Used parts are parts removed from another vehicle. They may be a good alternative to OEM parts, but you could encounter many problems.

For example, a used part may or may not be an OEM part. If the part had been replaced previously, it may have been replaced with a used, aftermarket, or OEM part.

Another problem with used parts is that they could be damaged or have rust. The paint mil thickness and other paint problems may exist. The part will need to be inspected to determine if the part needs to be stripped to metal, partially stripped, or repaired.

If any of these used parts have any of these conditions, then additional time will need to be added to the estimate.

There are instances when used parts work well. For example, a used door usually includes the door shell, the glass, window regulator, door handle, door hinges, and most of the hardware. This can cost considerably less than a door shell and new individual parts, especially if several of the components were damaged on the door during the accident, which will need to be replaced.

The cost for used parts will not be listed in estimating guides.

Some computer estimating systems may intergrate used parts, and some databases list used parts, such as [www.car-parts.com](http://www.car-parts.com), but it's a good idea to give the supplier a call to verify the cost and availability.

### **Remanufactured, Rebuilt, and Reconditioned Parts**

Some types of parts may be remanufactured, rebuilt, or reconditioned. For instance, some companies repair plastic bumper covers and sell them as reconditioned parts. A metal bumper may be straightened and re-chromed. Engines and other mechanical parts have been rebuilt and sold as rebuilt parts.

Usually, there is an option of buying remanufactured parts when you go to the parts store, such as alternators, starters, and even brake pads. Basically, this is a used part that has had the worn parts replaced.

When adding these types of parts to an estimate, an online search, a catalog from the supplier, or a call will need to be made to the supplier to verify the cost and availability of the part.

## **Parts Revenue**

Determining the best option for parts, locating the parts, and ordering them can take a lot of time. Some body shops have a parts person who orders the parts. The time spent ordering parts must make revenue. This is usually done by charging retail to the customer, and the discount you receive from parts vendors is going to be the generated parts revenue, which generally amounts to 20% to 30% of the parts price, but this is going to depend on relationships with parts vendors and the discount the vendor will provide.



# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter 7  
Calculating The Labor  
and Material Cost

“Nothing is particular hard if you divide it into small jobs.” ~Henry Ford

### **What This Chapter Covers:**

This chapter covers how to deduct for paint overlap and how to calculate the different labor operations and material cost.

### **Why This Is Important:**

An estimator must know how to calculate labor times and material costs and add not included materials with a total amount to provide the customer with a complete repair estimate.

### **Topics Covered In This Chapter Include:**

- Deducting For Paint Overlap
- Adding For Clear Coat
- Adding For Tri-Coat
- Adding For Two-Tone
- Calculating Materials Cost
- Adding Not Included Materials Cost

This chapter has been aligned with the following 2013 NATEF/ASE tasks:

- B:18 Recognize and apply overlap deductions, included operations, and additions. HP-I
- B:19 Determine additional material and charges. HP-G

- B:20 Determine refinishing material and charges. HP-I
- B:20 Apply math skills to establish charges and totals. HP-I



## **Deduct For Paint Overlap**

In the Mitchell estimating guides, refinish labor time, R&I time, and O/H time are usually right under the title of each part. The R&R time is usually listed with the part.

All paint times given in the guide are for painting one panel at a time. Many times, however, we paint more than one part at a time. For example, if a car was hit in the front, it may damage the hood and both front fenders. Therefore, three parts would be painted at the same time.

Would it take the same amount of time to do all three panels at the same time as opposed to pulling the car in and out of the booth three separate times to paint each panel separately? Of course it would save time to paint them all at once. You would only mask once, mix paint once, spray the paint once, and clean your spray gun once. We should deduct part of the time when painting more than one panel.

The first major panel will not have any deduction for overlap, but for each additional major adjacent panel, the estimator needs to deduct .4. If it is not an adjacent major panel, the estimator will need to deduct .2.

In the example above, we have a hood and two fenders. Let's say the guide gives 3.0 paint labor time for each panel. With no deductions, you have a total of 9.0 refinish hours. That would not be correct because we did not deduct for overlap. An adjustment to the time will need to be made.

The first major panel is the hood, which gives us 3.0 hours. The next major adjacent panel is the fender, which gives us 3.0 hours.

Since this is an adjacent major panel, we will deduct .4, giving us 2.6 hours. The next major adjacent panel is the other fender, which gives us 3.0 hours. We will deduct .4 from that time as well, giving us 2.6 hours. The total paint time will now be  $3.0+2.6+2.6 = 8.2$ .

This is .8 less time that we will charge after deducting overlap. Remember that panels not adjacent to the panel you're painting will only have .2 deducted per panel.

Here is an example of how this works on an estimate.

Click On Example To Enlarge

<b>Description</b> <small>First Panel Deduct 0.0/ Adjacent Panels Deduct -.4 / Non Adjacent Panels Deduct 0.2</small>	<b>Body Labor</b>	<b>Paint Labor</b>
<b>Repair Hood</b>	<b>2.5</b>	3.0
Deduct For Overlap <small>( First Panel - 0.0)</small>		0.0
Adjusted Paint Time		<b>3.0</b>
<b>Repair Right Front Fender</b>	<b>2.0</b>	3.0
Deduct For Overlap <small>(Adjacent Panel - -.4)</small>		<b>-0.4</b>
Adjusted Paint Time		<b>2.6</b>
<b>Repair Left Front Fender</b>	<b>1.0</b>	3.0
Deduct For Overlap <small>(Adjacent Panel - -.4)</small>		<b>-0.4</b>
Adjusted Paint Time		<b>2.6</b>
<b>Total Labor Times</b>	<b><u>5.5</u></b>	<b><u>8.2</u></b>

## Major Panels

Deducting for paint overlap should only be applied to major panels. Major panels include the following:

- FRONT PANEL
- FRONT SHEET METAL

- FENDER
- FENDER AND RADIATOR SUPPORT
- HOOD
- ROCKER
- ROCKER AND CENTER PILLAR
- DOOR
- DOORS AND CENTER PILLAR
- DOORS/CENTER PILLAR AND ROCKER
- DOORS/CENTER PILLAR/ROCKER AND QUARTER
- ROOF
- ROOF AND BACK PANEL
- BACK AND CORNER SIDE PANELS CAB ASSEMBLY
- REAR SECTION
  - REAR SECTION AND ROOF QUARTER AND BACK PANEL
  - QUARTER AND ROCKER PANEL QUARTER PANEL
  - PICKUP BED PICKUP BED SIDE VAN SIDE PANEL LUGGAGE LID  
LIFTGATE OR TAILGATE

### **Adding For Clear Coat**

When writing auto repair estimates, the auto estimator must add

for clear coat. The clear coat takes time to spray on the vehicle, and it takes more paint materials. Therefore, there should be a charge for the time that it takes to mix and apply the clear coat and a charge for the cost of materials used.

The time should be added to the refinish labor category to cover both labor time and material charge. We will discuss how to determine the material charge below.

You may be thinking that most vehicles have clear coat; why doesn't the guide include the time it takes to clear coat? Not all cars have clear coat, and you should not get paid for an operation that you did not perform. I think it is fair for technicians to get paid for everything that they do, but if we start charging for things that we don't do, fraud results and can lead to a lot of trouble. So if you're going to add for clear coat or any other not included operations, make sure it needs it.

If you clear one panel, you will need to mix your clear, tack the surface that you're spraying, spray the clear on the panel, and clean your spray gun. To calculate time for clear coat, you add 40% per refinish hour of the time given to paint the panel. If you're spraying a panel with 3.0 hours, you would multiply  $3.0 \times 40\% = 1.2$ . So to paint and clear this panel you have  $3.0 + 1.2 = 4.2$  total paint time.

For each additional panel, you will need to deduct for overlap and then add 20% for clear coat. For example, if the adjacent panel gives 3.0 hours, we will deduct .4 to give us 2.6. Now multiply  $2.6 \times 20\% = .5$ . Add  $2.6 +$  clear time of .5 to get a total of 3.1 paint time to paint and clear the adjacent panel. This same formula will apply to each additional panel. Deduct overlap and multiply by 20%. There is a maximum clear coat time of 2.5. Once the clear coat time reaches 2.5 hours, this is the full amount allowed to charge for clear coat.

With the exception of a complete paint job, I can't find it in the P- Pages, but I always charged 4.0 hours to clear coat a complete vehicle.

Let's take a look at the previous example but with adding clear coat.

Click On Example To Enlarge

<b>Description</b> <small>Add 40% Per Refinish Hour on 1<sup>st</sup> Panel/ 20% Per Refinish Hour Each Additional Panel</small>	<b>Body Labor</b>	<b>Paint Labor</b>
<b>Repair Hood</b>	<b>2.5</b>	3.0
Deduct For Overlap		0.0
Add For Clear Coat <small>(First Major Panel 40% Per Refinish Hour - 3.0 x 40%)</small>		1.2
Adjusted Paint Time		<b>4.2</b>
<b>Repair Right Front Fender</b>	<b>2.0</b>	3.0
Deduct For Overlap		-0.4
Add For Clear Coat <small>(Additional Major Panel 20% Per Refinish Hour - 2.6 x 20%)</small>		0.5
Adjusted Paint Time		<b>3.1</b>
<b>Repair Left Front Fender</b>	<b>1.0</b>	3.0
Deduct For Overlap		-0.4
Add For Clear Coat <small>(Additional Major Panel 20% Per Refinish Hour - 2.6 x 20%)</small>		0.5
Adjusted Paint Time		<b>3.1</b>
<b>Total Labor Times</b>	<b><u>5.5</u></b>	<b><u>10.4</u></b>

### For Tri-Coat

Adding for tri-coat or three-stage paint is similar to adding for clear coat. Tri-coat consists of base coat, mid-coat, and clear coat,

which are three different operations that you must do to get the paint to match properly. The mid-coat may be a pearl coat or a tinted clear to create different effects, including shifting colors and adding more depth.

It may be very difficult to determine by looking at a paint color if it is a tri-coat or not. To be certain you are charging for the correct operation, locate the paint code on the vehicle and look it up.

The estimating guide will give you some general ideas of where these paint code labels may be located and will help you identify tri-coat colors.

When adding for tri-coat, you do not add for clear coat. The clear coat time is included in the tri-coat application. Use the same formula by deducting for overlap and for calculating clear coat, except use 70% per refinish hour to your first panel and 40% per refinish hour to each additional panel.

To calculate time for tri-coat, you add 70% per refinish hour of the time given to paint the panel. If you're spraying a panel with 3.0 hours, you would multiply  $3.0 \times 70\% = 2.1$ . So to apply base coat, mid-coat, and clear coat this panel, you have  $3.0 + 2.1 = 5.1$  total paint time.

For each additional panel, you will need to deduct for overlap and then add 40% per refinish hour for tri-coat. For example, if the adjacent panel gives 3.0 hours, we will deduct .4 per panel to give us 2.6. Now multiply  $2.6 \times 40\% = 1.0$ . Add  $2.6 +$  tri-coat time of 1.0 to get a total of 3.6 paint time to apply tri-coat to the adjacent panel. This same formula will apply to each additional panel. Deduct overlap and multiply by 40% per refinish hour.

Let's examine the same example that we've been discussing with tri-coat.

Click On Example To Enlarge

<b>Description</b> <small>Add 70% Per Refinish Hour On 1<sup>st</sup> Major Panel/ 40% Per Refinish Hour Each Additional Panel</small>	<b>Body Labor</b>	<b>Paint Labor</b>
<b>Repair Hood</b>	<b>2.5</b>	<b>3.0</b>
Deduct For Overlap		0.0
Add For Tri-Coat <small>(First Major Panel 70% Per Refinish Hour - 3 x 70%)</small>		2.1
Adjusted Paint Time		<b>5.1</b>
<b>Repair Right Front Fender</b>	<b>2.0</b>	<b>3.0</b>
Deduct For Overlap		-0.4
Add For Tri-Coat <small>(Additional Major Panel 40% Per Refinish Hour - 2.6 x 40%)</small>		1.0
Adjusted Paint Time		<b>3.6</b>
<b>Repair Left Front Fender</b>	<b>1.0</b>	<b>3.0</b>
Deduct For Overlap		-0.4
Add For Tri-Coat <small>( Additional Major Panel 40% Per Refinish Hour - 2.6 x 40%)</small>		1.0
Adjusted Paint Time		<b>3.6</b>
<b>Total Labor Times</b>	<b><u>5.5</u></b>	<b><u>12.3</u></b>

### Adding For Two-Tone

Two-tones are not included in the time given to refinish a panel. Two-tone means there are two different colors on the vehicle. This does not include custom paint jobs or stripes. Time for many of those operations will be a judgment time at the estimator's discretion and expertise.

For two-tones, another simple formula is used to determine the time to estimate for this operation.

To calculate two-tone, add 50% per refinish hour for your first major panel and 30% per refinish hour for each additional panel. Basically, it is the same formula as clear coat, just different numbers to plug in. However, this two-tone calculation does not add the clear coat. It is possible to have a single-stage, two-tone paint job, so clear is not figured into the two-tone time.

If the first panel gives 3.0 to refinish the panel, there is no overlap deduction on the first panel. Multiply  $3.0 \times 50\% = 1.5$ . If the part is base coat/clear coat, then add for clear coat by multiplying  $3.0 \times 40\% = 1.2$ . Now you have  $3.0 + 1.5$  (two-tone)  $+1.2$  (clear) for a total of 5.7 hours of paint time.

If the second panel gives 3.0 to refinish the panel, deduct .4 for overlap.  $3.0 - .4 = 2.6$ . Calculate two-tone by multiplying  $2.6 \times 30\% = .8$ . Next, calculate clear by multiplying  $2.6 \times 20\% = .5$ . Now you have  $2.6 + .8$  (two-tone)  $+ .5$  (clear) for a total of 3.9 hours of paint time.

Let's take a look at the same example that we've been working on and determine what the refinish time will be with two-tone added.

Click On Example To Enlarge 



<b>Description</b> Add 50% Per Refinish Hour On 1 <sup>st</sup> Major Panel/ 30% Per Refinish Hour Each Additional Panel	<b>Body Labor</b>	<b>Paint Labor</b>
<b>Repair Hood</b>	<b>2.5</b>	<b>3.0</b>
Deduct For Overlap		0.0
Add For Two-Tone (First Major Panel 50% Per Refinish Hour – 3 x 50%)		1.5
Add For Clear Coat		1.2
Adjusted Paint Time		<b>5.7</b>
<b>Repair Right Front Fender</b>	<b>2.0</b>	<b>3.0</b>
Deduct For Overlap		-0.4
Add For Two-Tone (Additional Panel 30% Per Refinish Hour – 2.6 x 30%)		0.8
Add For Clear Coat		0.5
Adjusted Paint Time		<b>3.9</b>
<b>Repair Left Front Fender</b>	<b>1.0</b>	<b>3.0</b>
Deduct For Overlap		0.4
Add For Two-Tone (Additional Panel 30% Per Refinish Hour – 2.6 x 30%)		0.8
Add For Clear Coat		0.5
Adjusted Labor Times		<b>3.9</b>
<b>Total Labor Times</b>	<b>5.5</b>	<b>13.5</b>

## Add For Edging and Underside

I am going to cover edging, spraying underside, and blending, but I am not going to provide an example or include it in the material charge example. Adding for these refinish operations is straightforward. No deduction for paint overlap is taken for these refinish operations.

Time is provided to edge or paint the underside of parts. In all of our examples, we only repaired the parts. Normally, when you repair a part, the jamb or inside of the panel does not need to be repainted. However, anytime you replace the part, it will be necessary to paint the edge or underside.

For example, if we replace a right front fender and it pays 3.0, that does not include edging the jambs of the fender. All you need to do is look in the estimating guide and it will give you the time for edging or to paint the underside of the panel. The right front fender may state to add .5 for edging. This would give you a total paint time of 3.5 to paint the right front fender.

There is no overlap deductions for edging or spraying the underside, but the clear coat, tri-coat, or two-tone formulas still apply.

Many new cars have different color schemes for the insides of the panels. Therefore, you should be able to add for two-tone if this is the case.

## **Blending**

Blending is the process of blending clear coat into an adjacent panel and clear coating the whole panel. To calculate blend time, use the paint time given in the estimating guide and divide the number by 2 or multiply the refinish hours by 50%. For example, let's say the job we've been working on needs the front door to be blended into. To keep it simple, we'll say the door refinish time given in the estimating guide is 3.0 hours. No overlap deductions are taken with blend time. Take the 3.0 hours and multiply it by 50% for a total of 1.5 refinish hours.  $3.0 \times 50\% = 1.5$ . A total of 1.5 hours will be added to the refinish labor on the estimate.

### **1. Traditional Materials Charge**

The amount to charge for paint materials is determined by our

refinish labor hours. The estimator calculates the total number of refinish labor hours and multiplies by a determined number. We used to multiply it by 50% of the refinish labor, but with the increased material costs, the number is usually higher now. In this example, we'll use 50%, but the number will be determined by the repair shop. If the refinish labor is \$40 per hour, the charge for materials will be \$20 per refinish if following the 50% calculation.

If you charged 3.0 hours to paint a fender and the materials charge rate is \$20.00, then the material charge will be \$60 for paint materials.

### **What Is Not Calculated**

What this method does not pay for is any adhesives, fillers, clips, etc., that you may use. With the price of these materials, you can lose money if you're not careful. Be certain to add the materials that are not included in the refinish labor time. More information about not included materials will be covered later in this chapter.

### **Charging For Materials From The Refinish Time**

Let's take a look at the two-tone example that we've been working on and determine what the charge for materials will be. We're going to use \$40 for the labor rate and \$20 for the materials.

This method of calculating material charges is the method that has been used for many years and still is today. Computer estimating systems, such as CCC One, will use this calculation and calculate the charge for materials.

Click On Example To Enlarge

Description	Body Labor	Paint Labor
<b>Repair Hood</b>	<b>2.5</b>	<b>3.0</b>
Deduct For Overlap		0.0
Add For Two-Tone (First Major Panel 50% Per Refinish Hour - 3 x 50%)		1.5
Add For Clear Coat		1.2
Adjusted Paint Time		5.7
<b>Repair Right Front Fender</b>	<b>2.0</b>	<b>3.0</b>
Deduct For Overlap		-0.4
Add For Two-Tone (Additional Panel 30% Per Refinish Hour - 2.6 x 30%)		0.8
Add For Clear Coat		0.5
Adjusted Paint Time		3.9
<b>Repair Left Front Fender</b>	<b>1.0</b>	<b>3.0</b>
Deduct For Overlap		0.4
Add For Two-Tone (Additional Panel 30% Per Refinish Hour - 2.6 x 30%)		0.8
Add For Clear Coat		0.5
Adjusted Labor Times		3.9
<b>Total Labor Times</b>	<b>5.5</b>	<b>13.5</b>
<b>If Labor is \$40 Per Hour</b>	<b>\$220 Body Labor</b>	<b>\$540 Paint Labor</b>
<b>If Material Rate is \$20 Per Refinish Hour</b>		<b>\$270 Materials</b>

**13.5 is the refinish time**

**13.5 x \$20 = \$270 (if the material rate is \$20 Per Refinish Hour)**

**The material charge for this job would be \$270.00**

### **Not Included Materials**

The refinish materials charge figured by the refinish hour does not include many of the supplies used to repair a vehicle. These materials may be required to properly repair the vehicle to pre-accident condition. If the estimator overlooks or fails to add these

materials to the estimate, then the repair shop will not be paid for the materials used. Be certain to itemize the materials on the estimate. Do not add a line for additional materials and add one lump sum.

The customer or insurance company will not understand what the lump sum charge represents and may complain when agreeing to pay for it.

Below are some suggested materials a shop may use that should be added to the estimate.

- Grinding discs
- Dent Repair Supplies (studs for pulling, etc.)
- Body Filler
- Glaze Putty
- Sandpaper For Feather Edging Damaged Area
- Primer Surfacer
- Guide Coat For Block Sanding Primer Surfacer
- Sandpaper For Block Sanding Primer Surfacer
- Adhesives
- Crash Wrap
- Plastic or Masking Material For Covering Car
- Textured Coatings

- Buff and Polishing Supplies
- Detailing Supplies
- Coolant Fluid
- Transmission Fluid
- Power Steering Fluid
- Flex Additives
- Adhesion Promoters
- Seam Sealer
- Sound Deadener Material
- Gravel Guard
- Double-Sided Tape
- Anticorrosion Materials
- Undercoatings

Some shops are experiencing a loss in materials and have moved away from charging materials by the refinish hour method. Instead, they are using an itemized system that lists each item they use, from the number of ounces of paint to the number of razor blades. This method is going to take more time, but systems like <http://www.pmclogic.com/> are available to help make this easier.

# AUTO ESTIMATING



A GUIDE TO WRITING  
AUTO REPAIR ESTIMATES

Chapter 8  
Generating The Estimate

“Any fool can know. The point is to understand” ~Albert Einstein

### **What This Chapter Covers:**

This chapter covers analyzing auto damage and using the information to actually generate the estimate. It also covers what to do if the estimating guide does not provide adequate time for a procedure and how to determine if a vehicle is a total loss.

### **Why This Is Important:**

An estimator must know how to use the information gathered during the inspection to generate an auto estimate. The estimator also needs to know if the vehicle may be considered a total loss.

### **Topics Covered In This Chapter Include:**

- Analyzing The Damage To Complete Inspection
- Generating A Computerized Estimate
- Disputing Estimating Guide Operation Using DEG
- What Is A Total Loss Vehicle?

This chapter has been aligned with the following 2013 NATEF/ASE tasks:

- B:22 Interpret computer-assisted and manually written estimates; verify the information is current. HP-I
- B:23 Identify procedural differences between computer-assisted systems and manually written estimates. HP-G
- B:24 Identify procedures to restore corrosion protection;



establish labor values, and material charges. HP-G

- B:25 Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value. HP-G
- B:26 Recognize the differences in estimation procedures when using different information provider systems. HP-G
- B:27 Verify accuracy of estimate compared to the actual repair and replacement operations.

## **Analyze The Damage and Complete Inspection**

Once you have all of the information you need about the accident, you may decide to assist the customer and help them with a rental car or offer to give them a ride back to work or their home. It may not be necessary for the customer to be there while you write the estimate, as it may take time, which many people don't have.

Now the estimator can perform the thorough inspection, which may include the following:

- Visual inspection of all body gaps for misalignments, popped loose spot welds, cracked seam sealer, etc.
- Raise the hood to inspect the engine compartment.
- Raising the vehicle to inspect underneath the vehicle.
- Measuring to determine if any frame or unibody damage is present and determining the severity of the damage.
- Inspecting mechanical, electrical, and suspension components.
- Looking inside the passenger compartment and at the restraint system and interior components.
- Removing parts to gain access to possible hidden damage.

Starting at the damaged area and following the estimating sequence, inspect each part group before moving to the next group. For example, inspect the front bumper cover. If the bumper cover needs to be removed to inspect the impact absorber and reinforcement bar, then go ahead and remove it. Inspect all of the

parts in the bumper section.

When performing the inspection, take photos of the damage. This is where high-quality photos are needed. The photos should tell a story on their own. These photos will be recorded with the claim and may need to be shared with the customer or insurance company.

As the estimator writes a thorough estimate, the vehicle may require disassembly of parts and/or raising the car off the ground to determine the extent of damage. For example, the estimator or a technician may need to remove the front bumper to determine what parts are damaged behind the bumper cover. By inspecting the damage this way, you should have a very thorough estimate when completed. After the inspection is completed and the estimate is generated, call the customer to discuss the repairs needed and the steps necessary to get started.

If an insurance company is involved, you will also want to discuss repairs with them. This will let the insurance company know that the customer has already authorized your shop to perform the repairs.

The main point of this lesson is to write a thorough estimate, as it serves many purposes. With today's complex vehicles, the days of writing a visual estimate without tear down are gone. Cycle times and the lean process push to eliminate unnecessary work, which includes writing supplements on every vehicle that you work on resulting additional work for the estimator and delay the repairs of the vehicle.

A well-written estimate will also give your technicians a better idea of what all they need to do on the vehicle. The estimate serves many purposes, but a communication tool should be a vital purpose

—a communication tool between the repair shop, the customer, the insurance company, and the technician.

## **Generating Computerized Estimates**

Do you remember when businesses started using more computers? I kept hearing how much paperwork was going to be saved and how much easier the computers would make our work. Well, years later, I'm still not fully convinced of that opinion. It seems like we have more forms, files, and paperwork than we ever had before. I keep hearing paperless, but I am not seeing it. I think perhaps that for every item that goes paperless, there are two or three additional things that we must manage.

However, I do like the ways computers work and believe that we keep better records of everything. I think that we did not have a lot of the work before computers because we were not doing it. We really have all of our records at our fingertips even though it seems like a lot of work to manage.

It was painful getting to this point as an estimator. I remember the first computerized estimating system that Mitchell came out with. We had twice the number of estimating guides to pack around, and we still had to flip through the pages to swipe the bar codes. I did not like that system, but they have greatly improved through the years. The systems today make it much easier to write auto repair estimates. I mean, who can't point and click?

One advantage of computerized auto repair estimates is that there are no errors. An auto estimator can still leave a lot of money on the table by not adding not included operations, but computers have eliminated all of the calculation errors because it calculates the

totals for us.

Have you ever lost something? It is pretty hard to misplace an estimate when it is stored in your computer as well. Therefore, computers are more accurate and remove much of human error out of the equation, but this does require more work by backing up and maintaining your computer system.

Most computer estimating systems update their information monthly or weekly. This is a huge benefit, considering how quickly part prices can change. When we used the estimating guides, they were sent out every three months, and they would already be out of date before you received your new copy.

The computer also eliminates a lot of writing. Remember that I said to list each item separately? With a computer system, you may only have to type a few of the operations that are not in the system and you can point and click most of your estimate with ease.

The Internet has also made it possible to work directly with insurance companies. Both the shop and the insurance company can look at the same estimate and view the digital photos online. This was the birth of the Direct Repair Program (DRP). There are mixed emotions about these programs. I am not going to get into that in this book, but I have a video on the resource site that will explain more about the DRP.

### **Labor Time Allowed In Estimating Guides Are Not Set In Stone**

First of all, we call the estimating guide a guide for a reason. The labor times are not necessarily set in stone. If you feel the labor

time or other issues with a procedure are not fair, you can dispute the operation.

There is a website for submitting your questions at [www.DEGWeb.org](http://www.DEGWeb.org). Many times technicians and/or estimators do not feel that the estimating guide or computerized system allows enough time to perform the operation, but they just take it as the gospel, as they do not know how to challenge their concern.

### **The Problem Will Only Be Corrected If They Know About It**

If you truly feel that the guide is not giving you enough labor time, go to the above website and submit your concern, which has caused many changes to be made to the different estimating guides. Estimating software companies will never know there is a problem with their database if we do not let them know.

Think about it. There is a lot of information available when it comes to providing a database that has the labor operations for every vehicle out there. Mistakes will be made in the database, or things may have been overlooked.

The best thing is that if an adjustment is made, it will add the additional time or operation every time any estimator is generating an estimate performing the procedure. If it is changed in the database, insurance companies will pay it with no questions asked.

The bad thing is that there are still many things that are missing. For instance, there may be a make or model that does not have any refinish time when replacing a front rail. Every shop performing this procedure is losing revenue. It then becomes very important to observe the procedures, listen to the technicians, and submit your concerns to DEG. You're helping the entire collision repair industry

if you help make a correction.

For more information about DEG, please visit the resource section of this book.

## **What Is A Total Loss Vehicle?**

A total loss is when the cost to repair the vehicle exceeds a percentage of the actual cash value (ACV).

There are two misconceptions concerning a totaled vehicle. The first is that a vehicle is beyond repair. The second is that the costs to repair the vehicle will exceed the value of the vehicle. While there could be some truth in both statements, neither is entirely correct.

### **Beyond Repair**

Some accidents result in the vehicle being severely damaged and not able to be repaired. You may hear someone ask how bad an accident was and they reply, "It was totaled!" This answer, though, does not tell you much. The replacement of a few parts on an older vehicle not worth much money could total the vehicle. If the vehicle happened to be a 2014 Ford pickup crew cab, however, a lot of damage would be needed before the pickup would be considered totaled.

In most cases, a total loss does not mean the vehicle is beyond repair, but that the cost of the repairs is too high.

### **Repairs Exceed ACV**

This is almost an accurate statement and may be true in some

states, but in many states repairs do not have to exceed the ACV, only a percentage of it. For instance, an insurance company may use 70% of the ACV as their percentage, which means that when a vehicle's damage reaches 70% of the ACV, they classify the vehicle as a total loss.

### **Actual Cash Value**

When a vehicle is bought new, it starts depreciating. The value become less with time and mileage. The insurance adjuster will look at such resources as NADA, Kelly Blue Book, or other reports showing what cars are selling for at local dealerships to determine the value of the vehicle. Another source to help determine the ACV is to look in your local classifieds for the make and model and in similar condition as the totaled vehicle was before the accident.

### **Salvage Vehicles**

Insurance companies issue the vehicle owner the amount of the agreed ACV and then sell the car at auction. The salvage value will vary depending on the value of the parts that can be sold.

### **What Percentage Totals A Vehicle**

There is not one correct answer for this, as insurance companies or states may set different percentages, but 70% is a ballpark figure that I've heard many insurance companies use.



# AUTO ESTIMATING



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Chapter 9  
Vehicle Construction

"It's a never ending battle of making your cars better and also trying to be better yourself" ~Dale Earnhardt

### **What This Chapter Covers:**

This chapter is going to briefly cover vehicle construction. As an estimator, it is important to know how a vehicle is designed, the different types of frames, and the different metals and composites that are used in modern-day vehicles.

### **Why This Is Important:**

As an estimator, it is important to know how a vehicle is designed, the different types of structures, and the different metals and composites that are used on today's vehicles.

### **Topics Covered In This Chapter Include:**

- Sections of a Vehicle
- Sides of a Vehicle
- Frame Types: (Body Over Frame, Unibody, Space Frame)
- Crush Zones

This chapter has been aligned with the following 2013 NATEF/ ASE tasks:

- C:1 Identify type of vehicle construction (space frame, unibody, body-over-frame). HP-G
- C:2 Recognize the different damage characteristics of space frame, unibody, and body-over-frame vehicles. HP-G

- C:3 Identify impact energy absorbing components. HP-G

## Sections Of A Vehicle

There are three basic sections of a vehicle—the **front section** (from the front windshield area to the front of the vehicle), the **center section**, also referred to as the passenger compartment (from the front windshield area to the back glass area), and the third area is the **rear section** (from the back glass to the rear of the vehicle). As an estimator, these are important to know because the front and rear sections are designed with crush zones, which crush and twist to absorb energy from the impact. The center section is designed to be stiff and strong to transfer energy from the accident around the passengers. Most damage from front-end and rear-end collisions is going to be in the front or rear sections of the vehicle.

## Sides Of A Vehicle



The direction we face a car changes, but the sides of a car stay

the same.

The car is divided into two sides: right and left. This establishes a centerline of the vehicle, which can be used for measuring. The way to determine which side is which is by sitting in the car facing forward like you are driving the car. Your right hand will be the right side, and your left hand will be the left side. Or, the driver's side is always the left side, and the passenger side is always the right side. This will be helpful when recording the damaged parts to ensure you have the correct parts and when looking at vehicle specification information.

## **Frame Types**

All of the frames on modern vehicles are designed with crush zones, but there are different types of frames.

### **Body Over Frame**

Body over frame aka full frame, consists of two pieces: the frame and the body. With the body or body parts removed, the motor and suspension are still attached to the frame.

### **Unibody Structure**

Uni means one. For instance, a unicycle has one wheel. So, a unibody means one body. In other words, the entire structure of a unibody vehicle consists of one structure. Actually, there are many pieces welded together, but it is considered one structure.

Mechanical and suspension components and body parts are attached directly to the structure. The body parts help lock and

strengthen the structure.

## Space Frame



A funny car is an example of a space frame. The frame is fully supported without the body on it.

Space frames are a type of unibody construction that does not require any of the outer body parts for strength. An example of this would be a funny race car. The funny car is fully functional without the body shell on it. Saturn uses a space frame. The only purpose of the body parts is to cover the structure. The design of the parts may also help with aerodynamics, which will increase fuel mileage.

We have discussed all of the parts of the estimate, customer

service, sales, and now we need to briefly discuss vehicle construction. As an estimator, it is important to know how a vehicle is designed, different types of frames, and the different metals and composites that are used in vehicles today.

## **Crush Zones**

Crush zones are built into the vehicle frames and parts to give upon impact. Crush zones crush and slow the vehicle before the sudden stop, much like an impact absorber. As an estimator, this is important to understand, as you do not want to section in a crush zone area, as this may disturb the original integrity of the vehicle. If the vehicle is involved in another accident, it should react the same way as before.

## **Identifying Crush Zones**

Crush zones can be a number of engineered designs. For instance, a crush zone may be an indentation in the part, holes, dimples, slots, etc. However, one thing you need to be aware of is that some vehicles are being produced with crush zones you cannot see. This is designed with tailor-welded blanks. The metal is actually rolled thinner in the crush zone areas and thicker in the areas where more strength is required. The only way to determine these types of crush zones is to look at the repair procedures for that specific vehicle.

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Chapter 10  
Customer Service  
and Sales



“For a repair shop to stay in business, the estimator must make the sale.”

### **What This Chapter Covers:**

This chapter covers how to create an environment that the customer will feel comfortable in and wants to do business with you, how to sell the job to the customer, and how to provide good customer service.

### **Why This Is Important:**

An estimator must know how to sell the job to the customer to produce revenue for the repair shop and technicians. Once you have a customer, the estimator needs to know how to provide excellent customer service to keep the customer for their future body and paint needs.

### **Topics Covered In This Chapter Include:**

- Making A Good First Impression
- What Customers Want
- Don't Sell The Wrong Benefits
- Dealing With Angry Customers
- Good Communication
- Methods Of Communication
- Dressing The Part
- Explaining The Process To The Customer

- Don't Judge Your Customers and Miss Sales

This chapter has been aligned with the following 2013 NATEF/ ASE tasks:

- D:1 Acknowledge and/or greet customer/client. HP-I
- D:2 Listen to customer/client; collect information and identify customers/client's concerns, needs and expectations. HP-I
- D:3 Establish cooperative attitude with customer/client. HP-I
- D:4 Identify yourself to customer/client; offer assistance. HP-I
- D:5 Deal with angry customer/client HP-I
- D:6 Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process. HP-G
- D:7 Recognize basic claims handling procedures; explain to customer/client. HP-G
- D:8 Project positive attitude and professional appearance. HP-I
- D:9 Provide and review warranty information. HP-I
- D:10 Provide and review technical and consumer protection information. HP-G
- D:11 Estimate and explain duration of out-of-service time. HP-G

- D:12 Apply negotiation skills to obtain a mutual agreement.

HP-G

- D:13 Interpret and explain manual or computer-assisted estimate to customer/client. HP-I

## **Making A Good First Impression**

As an estimator, you represent the shop. The estimator is usually the first and main person the customer talks with and deals with during the repair process.

What the customer thinks about the repair shop (good or bad) will highly reflect the way they were greeted by the estimator. People form opinions quickly, so the estimator may only have a brief time to create a positive first impression.

When greeting the customer, introduce yourself and let them know it's your job to help them during the repair process. The estimator may be accustomed to the repair process and forget that many customers are not familiar with it. This may be their first accident and first time being in this situation. Don't assume they already know the minor details.

## **What Do Your Customers Want?**

The estimator needs to sell the customer on the benefits, but don't assume every customer will see the same things as a benefit. For example, we wash the car. That may be a selling point for one customer, but perhaps another customer already knows this service is provided at other body shops. Therefore, they don't really see that as a benefit that sets your shop apart from the others.

How will you know what motivates your customer? It's simple. You ask them . . . or sometimes just listen. Many times the customer will want to explain their situation to you. The absolute worst thing you can do is cut them off. Estimators may hear the same stories over and over, but if you will listen closely, the customer may say little things, which are their hot spot. For

example, the customer may be quite concerned with how they are going to get to work while their vehicle is being repaired. If you have loaner cars, sell them on providing them with a car. Or they may wonder how you are going to contact the insurance company and rental company for them so they will not have to worry about it. But don't make this your one and only sales pitch for every customer. Perhaps the customer has four other cars to drive. In that case, a rental car is not going to be a hot spot. So work on selling the benefit to your customers, but if you find a hot spot, make that your focus.

### **Don't Sell The Wrong Benefits**

I remember one time I wanted to purchase a new computer. I had already done the research and knew exactly what I wanted. I walked into the store with every intention to buy a new Mac computer. A salesman greeted me and asked if he could help. I told him I was interested in a Mac computer. The guy was nice and tried to be helpful and explained how Macs were much more expensive than many of their other computers they had in stock. He explained everything wrong with a Mac and kept suggesting different computers. What he didn't know, though, is that I was already sold on the MovieMaker program Mac offers, and that was the main reason I wanted the computer.

He did not know because he did not ask. He was trying hard to make a sale, but I had to politely tell him that I was still thinking about it. I left the store a little confused . . . do I want a Mac or not? I thought about it for several days and decided to go ahead and purchase what I had originally intended. Fearing that this salesman may try to sell me something economical, I went to another store to make the purchase. I am sure the salesman sincerely believed that

every customer's biggest concern is the price. While price is important to me, my biggest concern was something else . . . that only a Mac offered.

The key is to ask customers questions and listen carefully. Let them know that you are sincerely concerned about their needs.

### **Make The Sale Early and Often, But Know When To Stop**

Have you ever seen an auto estimator spend a lot of time generating a repair estimate, you know, going through all of these steps. Then when the estimator has it completed, he or she hands it to the customer and says, "If you would like me to schedule this, let me know so that we can order parts."

I know I've seen that, and I've done that before. Don't give them the opportunity to get away. Some repair estimates can consume a lot of time. Try to close the deal. You don't have to wait until the estimate is completed to ask for the job. In fact, the estimator can ask the customer if they would like to sign the estimate to authorize repairs before inspecting a car. If your repair shop has loaner cars, ask the customer if they would like for you to get them set up with a loaner car or ask the customer if you can contact the insurance company to determine if their policy comes with car rental. There are many creative ways to ask for the job throughout the estimating process.

When the sale has been made . . . stop! Do not think you have to continue to sell every benefit your company has to offer. They are sold, and now they want service. If the customer authorizes the repairs, take your salesman's cap off and put your customer service cap on.

## **The Angry Customer**

Yes, the estimator will occasionally have to deal with an angry customer. In a perfect world, everyone would look at everything from a positive point of view, but we live in the real world. Every customer you deal with is already upset that they had an accident and have the added stress of dealing with the insurance company and the repair shop. The customer is uncertain of the outcome. How will they get to work? Is the vehicle going to be the same? Regardless of their attitude, the whole situation is an inconvenience to them.

Most customers will appreciate the stellar customer service you provide for them, but some are not going to be happy regardless of how smooth the process goes. Realize that some people are just that way. Strive to provide the best customer service to them, but don't take it personally if someone is upset. More than likely, they are upset about the accident and the inconveniences that come with an auto accident. A vehicle represents many people's second-biggest investment, and an auto accident is stressful.

Some customers just want to vent. They want to share their pain with you. Many times after they get everything out and can see the estimator is concerned about their problems, their attitude will change, and they'll become much easier to work with.

## **Good Communication**

It is crucial for auto estimators to have good communication skills. The estimator will need these to sell the job to the customer, provide good customer service, and keep the customer, insurance company, and shop manager updated on the repair process.

If you learn that the vehicle is not going to be repaired on the promised date, let the customer know immediately so that they can rearrange their schedule. They may get a little upset, but if they show up on delivery day and then you let them know . . . it's not going to be pretty. The customer may have made plans to pick up their car and go on a trip or something else, and now they are scrambling to figure out what they are going to do.

### **Methods Of Communication**

To communicate with someone years ago, we had to be face-to-face or call them on the phone. That is not the case today. Nowadays, we can call, text, email, and communicate in many other ways. Everyone has a preferred method to be contacted. Be certain to get the different ways to contact the customer and ask them what they want you to do. One customer may consider texting impersonal and prefer a call. Others may be busy and on the go all the time and prefer a text.

Once the customer tells you their referred method, use it to keep them updated.

### **Insurance Claims Handling Process**

The focus of this chapter is on providing good customer service, but most accidents will include an insurance claim. The estimator needs to have a basic understanding of the claims handling process. Remember that this may be a new experience for the customer, and they may look to the estimator's expertise for answers.

### **Dressing The Part**

If you are sick and go to a doctor, you would expect to see him or



her in a white lab coat. You would expect a police officer to be in uniform, and it seems that a banger should be wearing a suit. My point is that every professional has a specific look, and customers are going to have certain expectations of how estimators present themselves.

Some body shops may have a certain dress code or provide company uniforms. If not, don't forget to dress like a professional.

### **Explaining The Process To The Customer**

It is the estimator's job to explain the body and paint warranty the shop offers to their customers, consumer protection information, how long the repairs are expected to take, and the repair estimate.

There are resources and examples of the claims handling process, warranties, and consumer rights on the website for this book. Visit the resource section to learn how to access these resources.

### **Negotiating Skills**

The estimator must have negotiation skills to negotiate with the customer to agree on a mutual agreement and have the customer authorize and sign the estimate or repair order. The estimator may also need to apply negotiating skills when working with an insurance company or adjuster to ensure that the shop is getting paid for all of the necessary operations performed to the vehicle to repair it back to its pre-accident condition.

### **Don't Judge Your Customers and Miss Sales**

I think we have all been guilty of doing this, but we need to work

on it. For instance, we may think a customer is getting an estimate for the insurance company so that they can pocket the money or go to a competitor. We may take a look at the vehicle and determine they will not want to spend the money or don't have the money to have the repairs performed. For whatever reason, estimators may jump to conclusions at times and believe that this customer is a waste of their time. I am not saying that the estimator should try to capture every job, as some jobs may not align with your repair shop. For instance, your body shop may not perform restoration. The best thing to do in a situation like this is help them find a shop that will perform the work for them.

This reminds me of a story I heard from a man named David Dykes. One morning in 1956 a rough-looking guy walked into a Cadillac dealership in Tennessee. He was poorly dressed in dirty overalls, muddy boots, and was wearing an old hunting cap with his hair sticking out the sides. He walked around the dealership for awhile, but no one came to help him. In the meantime, the salesmen were just standing around watching him. They were waiting for him to leave.

He continued to look at the cars, though, so the manager finally told the newest salesman to ask the bum to leave. Instead, the salesman went over and asked if he could help him. The man asked a few questions about the cars, and the new salesman politely answered the questions. Then he asked, "Do you take cash or checks?" The salesman almost laughed but politely said that they accepted either one.

The fellow said fine. I will take a Cadillac in every color you have in stock. He was Elvis Presley, and the new salesman sold six Cadillacs that day. So, the salesman's kindness paid off. And

perhaps your kindness may pay off too. You may not accidentally sell a repair job to a celebrity as in this story, but you may make a sale. Perhaps the customer was planning to take the car somewhere else to have the repairs made, but with your sales ability, the customer decided to trust you and leave their car with you.



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Resources

## **Don't Skip This Section – Web Enhanced Access Information**

I hope you found value and got some tips for auto estimating from reading this book. I have much more information, test quizzes, resources, videos, and all of the resources mentioned in this book are on our web enhanced site. The site is free for anyone who purchase this book and the website will be updated with new content periodically.

**I would appreciate it if you rate this book and leave feedback on Amazon to let me know how I am doing.**

### **Book Members Website Access**

The site is password protected. The password is damagereport one word all lower cap.

**Access the website at [www.CollisionBlast.com/Estimate](http://www.CollisionBlast.com/Estimate) click on the link on the upper right side of the website and enter the password damagereport**

Thanks for reading this book,

Donnie Smith

# AUTO ESTIMATING



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About The Author

## About The Author



My passion for working on cars started when I was a kid. I helped my dad and older brother work on cars as a hobby.

In high school I enrolled in auto shop and painted my first car. After stepping back and seeing the finished product, I knew that I was hooked for life. After painting my first car, a 1979 Camaro, I started painting cars for my friends at my house.



⇨ My Friends Started Asking Me To Paint Their Cars, So Started Painting Cars On The Side While In High School

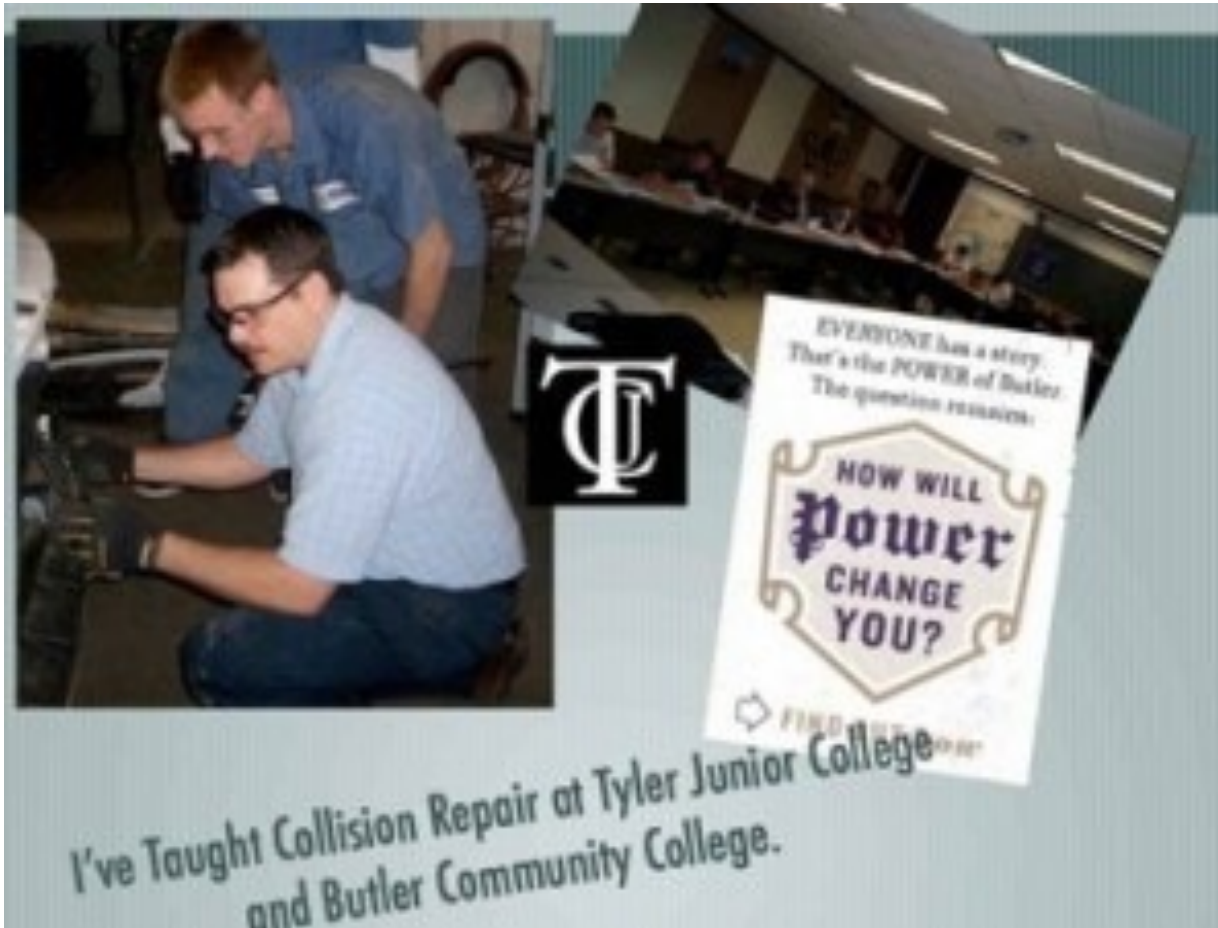


After graduating high school I attended the collision repair program at WyoTech. Since then I have worked for body shops and a body tech, paint tech, and an estimator. I have managed and owned a body shop. For the past 9 years I have been teaching collision repair for an NATEF Accredited school that is also a member of the I-CAR Industry Training Alliance. I stay up-to-date with the collision repair industry by attending training on a continuing basis, I am a member of ASA and the active in the collision repair industry with my website <http://CollisionBlast.com> and I've had the opportunity to meet some interesting people in the industry.



I'm not bragging, but feel fortunate and excited that I've been able to meet some of the people I have. You can find more photos on [www.CollisionBlast.com](http://www.CollisionBlast.com)

**Why Teach**



My passion for collision repair has transformed into a passion for teaching others. I started teaching collision repair in 2004. I taught for three years at Tyler Junior College, then accepted a job as the lead collision repair instructor at Butler Community College. There is a lot of satisfaction and pride that comes from teaching. Teaching also requires the instructor to learn. Knowing how to do something is one thing, but understanding it in a way to transfer your knowledge to the student requires a deeper level of learning. So I agree with the saying, the best teachers are the best learners.

I am still a full time instructor, but also started teaching through Collision Blast, videos, and eBooks to provide training for the DIY enthusiast or anyone wanting to learn more about auto body and

paint.

I have started restoring a 1966 Mustang my twin boys and believe this provides quality parent/son time. Kids may not remember the things you bought them, but they will remember the time spent working on a project together. So I am especially passionate to help others who may have a parent/child project sitting in the garage.

### **What Are My Qualification To Write This Book and Teach You:**

- **Graduated WyoTech in 1988 and Have Years Of Experience**
- **Degree in Collision Repair and Management**
- **Master ASE Certified**
- **PPG Certified**
- **I-CAR Instructor Work Shop Certified**
- **Member of ASA**
- **Custom Paint Certificate From WyoTech**
- **Custom Metal Working Certificate from UTI**
- **Numerous Other Certificates in Collision Repair and Teaching**
- **Attend SEMA, NACE, VISION and Many Other Training Events**
- **Technical Educator**

- **Passion To Share My Knowledge With Others**

Thanks again for reading this book.

Donnie Smith

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