# Understanding Cycle Time (GE001L01)

Textbook

Version: 18.1

GE001L01-STMAN1-E

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# Contents

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# *Introduction*

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## Obligations To The Customer And Liability

The collision repair industry has an obligation to correctly repair the customer's vehicle. Collision repairs must be performed using:

- recommended or tested procedures from vehicle makers, I-CAR, and other research and testing organizations.
- quality replacement parts and materials.
- repair processes and parts as written and agreed upon in the repair order. If items on the repair agreement are not consistent with the repair order, it can be considered fraud.

Performing proper collision repairs requires using parts and procedures that keep remaining warranties intact.

Collision repairs must restore:

- safety.
- structural integrity.
- durability.
- performance.
- fit.
- finish.

Throughout the damage analysis and repair process the repairer and insurer must:

- communicate with each other.
- maintain constant communication with the customer.
- be in agreement with each other and the customer on how repairs will be performed.
- inform the customer of any changes in the repair plan from the original repair agreement, and explain the changes and why they have to be made.

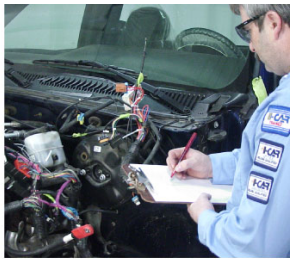
To reduce liability:

- make sure that all repairs are performed thoroughly, correctly and as listed in the damage report.
- follow proper procedures.
- have documentation of required repairs with detailed record keeping available for customers.

Technicians are considered the experts and are expected to be knowledgeable on how to perform a quality repair.

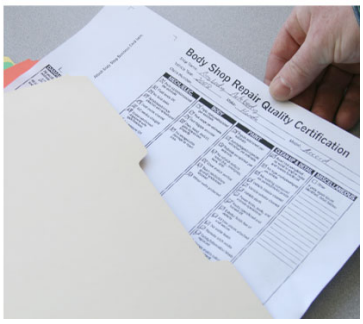
Liability insurance that covers the repair facility may not always cover all damages. For example:

- the policy may not cover faulty repairs, leaving liability responsibility completely on the facility.
- a shop owner may find that repair facility liability coverage may not cover the full amount awarded in a lawsuit. The shop owner would have to pay the difference.



It is difficult to reduce the risk of liability exposure. The part that the repairer can control is the chance of being found at fault. Chances can be minimized by:

- using recommended or tested procedures from the vehicle makers, I-CAR, or other research and testing organizations.
- using quality replacement parts and materials that restore fit, finish, durability, and perform at least as well as the original.
- keeping thorough records.




Keeping thorough records includes more than recording the date, mileage, and pre-existing damage. Record keeping also includes:

- making sure all notes are legible.
- verifying the repairs that were made or not made.
- having the customer sign a waiver for repairs that they do not want performed. Repairers must determine their liability on not repairing safety systems such as restraint and anti-lock brake systems.
- keeping computer printouts or worksheets on file showing wheel alignment readings or vehicle dimensions before and after repairs.
- keeping scan tool printouts and records of computer codes for airbag, anti-lock brake, emission, and powertrain control module (PCM) systems.

- attaching the OEM or other tested procedure printout to the vehicle repair order.
- keeping receipts for all sublet work performed.

*Refer to the video: Topics Off Limits in the presentation. This video identifies topics that should not be brought up in class.*

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# *Module 1 - Cycle Time Overview*

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**Cycle Time Introduction**

Learning objectives for this module include:

- explaining cycle time and who affects cycle time.
- identifying how to measure cycle time.
- identifying waste in the collision repair process.
- listing lean processes that can help eliminate time wasters.
- explaining how standard operating procedures (SOPs) can be used to create a consistent and high quality repair process.

*Cycle time for the repair facility begins with the initial customer contact.*

What is cycle time? It is the time from the beginning to the end of a process. The definition of cycle time varies slightly depending on perspective. For example, for the:

- customer, or vehicle owner, it is the time from when the vehicle keys are handed to a repair facility to when the keys are returned after a satisfactory vehicle repair.
- repair facility, it may be a measurement of time from when the vehicle arrived to when the vehicle is delivered to the customer.
- insurer, it is the time from the first report of the loss until the last payment of the claim. Insurers will also monitor repair facility cycle time by looking at keys-to-keys time or the length of time for a rental car.

The longer a vehicle is delayed in the repair process, the more time a vehicle stands idle. This increases the overall cost of the repair and lowers the production of the repair facility. Customer satisfaction index (CSI) is also lowered as the vehicle will no longer be delivered on the promised date. Customers want to know how long the repair will take with reasonable accuracy.

*Refer to the video: Complete Facility Overhaul in the presentation that profiles a collision repair facility that completely overhauled the process of repairing vehicles.*

*Repair technicians are not the only people who affect cycle time.*

Everyone equally affects cycle time, that is:

- everyone involved in the process of the repair order, from the front office receptionist, to the person who delivers the vehicle, to the customer.
- from initial claim, to initial repair facility contact, to final vehicle delivery and payment of the claim.
- outside sources, such as insurers, vendors, and sublet facilities.

*Cycle time can be tracked for smaller tasks, not just keys to keys.*

The benefits of reducing cycle time in the repair facility include:

- an increase in productivity. The goal is to develop an efficient production process so the vehicles flow through the repair process without any interruption. This can lead to increased capacity.
- an improved CSI, which is the measure of how the vehicle owner feels about the entire repair experience. Vehicles that are returned faster to the customer can add to the positive repair experience.
- an increased quality of work. Work that is done more efficiently has a direct effect on the quality of the work done. When there is less of a rush to get the vehicle ready for delivery, fewer things get missed. Additionally, when there is less stress, everyone in the facility has a positive attitude, it cannot help but show in the quality of the work output.
- better working conditions. In order to work more efficiently, a facility must be cleaner and more organized, making for a better place to work.

*Working continuously on each vehicle is one of the key principles of reducing cycle time.*

The principles of reducing cycle time include:

- doing tasks that allow work to be done more continuously on each vehicle, not necessarily being more productive on each vehicle. Working more continuously on each vehicle means less time spent in each repair bay as the vehicle keeps moving to the next stage of repair.
- breaking down the barriers that slow workflow.
- improving efficiency in every phase of the repair.
- changing the work process, not the type of work that is done. In other words, it requires changing methods for how the job is done, not the actual job tasks.

Methods that could be changed include making sure:

- the repair bay is clean.
- tools and parts are organized.
- steps are performed in a similar order and manner regardless of the repair.
- having / using the right tools to do the work most efficiently.

*Reducing cycle time does not mean allowing for poor workmanship, such as gaps in welds (left) or pinholes in a finish (right).*

Reducing cycle time does NOT mean:

- cutting corners.
- sacrificing quality for faster times.
- doing an incomplete or improper repair.

The goal is having a complete and safe repair, while at the same time improving the facility cycle time.

## Measuring Cycle Time

*Cycle time is a measurement of the time required to complete a task.*

In order to improve on a repair facility's cycle time, there should first be a record taken of the current average cycle time in the facility. This creates the baseline and can be done by recording the days from when the:

- vehicle was dropped off to when it was delivered back to the customer, otherwise known as keys to keys.
- repairs were started to when repairs were completed.

Can cycle time be broken down even further?

*Cycle time is tracked throughout the repair.*

Cycle time is often thought of as the amount of time it takes to fix a vehicle, from when the vehicle is dropped off to when the vehicle is picked up by the customer. However, within the repair process, there are several areas, or sub-cycles, we can focus on. These include:

- customer drop-off to when estimate is started.
- final estimate to when repairs begin.
- start of teardown to teardown completion.
- vehicle arrival to teardown completion.

Tracking sub-cycle time helps more accurately and specifically identify areas that may need improvement. If you only look at key-to-keys repair time, it is difficult to determine where there are opportunities to make improvements. Any improvement to the sub-cycle time will improve overall cycle time.

| Name | RO# | Received | Repair Started | Repair Completed | Delivered | (Days) Received To Repair Started | (Days) Repair Started To Completed | (Days) Received To Delivered |
|---|---|---|---|---|---|---|---|---|
| Jones | 5112 | 1/20 | 1/21 | 1/27 | 1/28 | 1 | 6 | 8 |
| Smith | 5113 | 1/20 | 1/25 | 2/2 | 2/2 | 5 | 8 | 13 |
| Johnson | 5114 | 1/22 | 1/25 | 1/31 | 1/31 | 3 | 6 | 9 |
| Miller | 5115 | 1/23 | 1/30 | 2/14 | 2/15 | 7 | 15 | 23 |
| Jefferson | 5116 | 1/29 | 1/29 | 1/31 | 2/1 | 0 | 2 | 3 |

*This is one example of how a repair facility can chart current cycle time.*

Vendors of shop management systems and insurance companies use various

computer programs to measure and calculate cycle times.

A simple chart can also be used for recording cycle time, for example, with rows and columns to note the day the:

- vehicle was received.
- repair was started.
- repair was completed.
- vehicle was delivered.

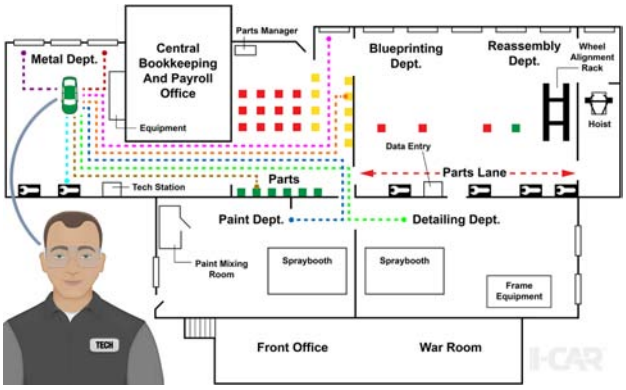
From this information, totals can be added, with the final column indicating the total cycle time.

These records should be kept for at least one month, which will serve as a baseline for future comparison. This record allows you to evaluate the numbers and determine if there is an inconsistency between jobs.

Once the average repair cycle time is identified, it can be determined if improvements to certain procedures or practices can reduce cycle time. It should also be easier to identify where there are bottlenecks in the repair process that must be addressed.

Another area that can be studied is department cycle time versus labor hours for the job. This comparison helps identify any areas where efficiency can be improved.

**Where Is Waste?**

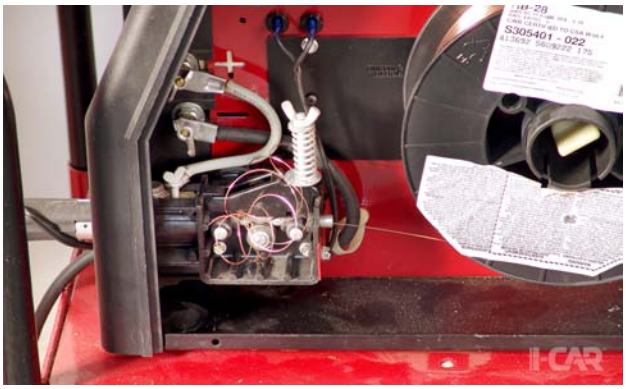



*The dotted lines in this graphic represent the extra steps a technician must take to retrieve parts, materials, and supplies.*

One of the initial steps in cycle time improvement is to find waste. Waste in a collision repair facility is any process, task, or activity that:

- takes longer than necessary. This is also called overproduction.
- involves waiting. This includes waiting for parts, sublet work, insurance authorization, or for someone to get their job done.
- is a redo of what has already been done. Repairing defects is not moving a job forward.
- is unnecessary motion. Having to walk across the repair facility floor to get a tool or safety item that should already be in the repair bay is unnecessary motion.
- is a disregard for personal safety. Not paying attention to personal safety results in accidents and injury, which is detrimental to work that needs to be done.
- has a technician doing a task with inadequate skills or doing a task that is far below their skill level.

Waste could also be defined as anything that you do that does not have value for the customer, or anything that the customer would not pay the repair facility to do.



*Maintaining equipment, such as clearing a birdsnest from a welder, is not waste unless it is ignored until the welder must be used.*

Other examples of waste in a collision repair facility include:

- equipment not adequate for the jobs that are done, or good equipment that is not maintained.
- not enough materials or supplies on hand to do the job.
- too much clutter. This means that there are too many supplies or parts that are not being used in the way of doing the job at hand. For example, there are convenience storage bins of hardware available from some vendors that stockpile too much hardware for the job at hand that can end up lying in small piles all over the repair facility.
- excess work in process. Work should only be done for the task at hand. Any other work in process is waste. One exception is maintenance done on equipment. When possible, it is recommended that maintenance be done before a vehicle enters the repair bay, not while the vehicle is in the repair bay.

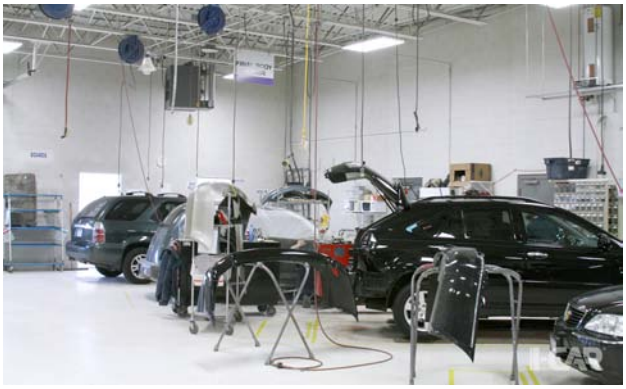
**Lean Processes**

*A clean and organized repair bay is one sign that a facility has turned to lean processing.*

One of the steps of eliminating waste is to work lean. Lean processing:

- in a one-phrase definition, is to get the right parts and materials to the right place at the right time while minimizing waste. It also requires being open to change.
- is about working efficiently.
- is about being organized.

*Constant quality control throughout the repair process is part of working lean.*



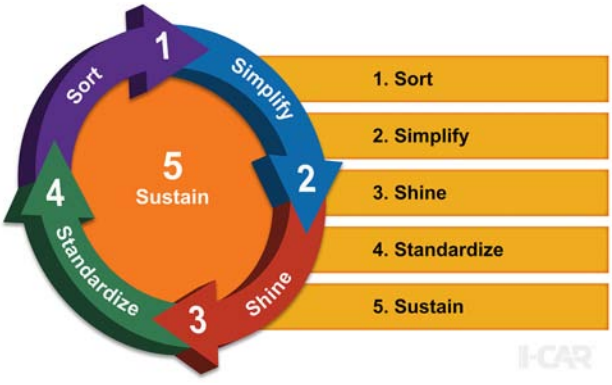
*Organized repair bays provide immediate time-saving results.*

Lean processing principles include:

- a commitment to continuously improve work quality.
- taking a proactive rather than a reactive approach. It is more productive to anticipate problems before they occur, rather than dealing with them as they come up.
- "pulling" vehicles through the repair process rather than "pushing." After one vehicle is delivered, the detailing bay is looking for a vehicle coming out of reassembly. Reassembly is looking for a vehicle coming out of refinishing. This is a pulling flow, compared to a pushing flow where vehicles are in line waiting to get worked on.

What are some lean processes that can be applied to a collision repair facility? Some examples include:

- no excess inventory kept on the production floor.
- every vehicle that is in the repair stream having some work done on it, not waiting for something or somebody so repairs can begin or continue.
- different levels of repair being done and the vehicles flowing through the facility without waiting in line for a vehicle in front.



A part of lean processing buzzword language is the “Five S’s.” These are:

1. Sort.
2. Simplify.
3. Shine.
4. Standardize.
5. Sustain.

There is overlap among the descriptions for the Five S’s, yet there are distinctive parts in each step.

*This is an example of a well sorted supply shelf that helps ensure that products can be found quickly when they are needed.*

The first of the Five S’s is SORT, which is not just organizing, but also:

- sorting out what is needed and removing what is not needed.
- discarding parts and materials that are in the way. Extra parts or materials that may never be used are occupying valuable space and getting in the way of what is used. Discard the extra inventory, or put them in storage away from the repair workflow.
- sorting so the products, tools, etc. that are used can be quickly found when needed. This overlaps the “simplify” part of the Five S’s, in that the best place to put the products, tools, etc. is in an assigned place. Generally, it is not recommended to lay out all the products and tools that you will use on a bench.

*The cabinet for this measuring system is kept orderly so technicians are able to find what they need.*

The second of the Five S’s is to SIMPLIFY by:

- making a place for everything and having everything in its place. There is no need for more than one of the same tool, adaptor, or extension. However, each tool, adaptor, and extension must have its own place so it can be quickly found when needed.
- outlining the profile of each tool on a pegboard, sometimes called “shadow boarding,” as one method for identifying places for tools.

- making sure that accessories or safety items for the job are at the point of use. For example, there should be no need to make a trip to locate a face mask or fire extinguisher if either of those are required or recommended for the job. These should be within reach. If an air compressor hose is needed often for that repair bay, the hose should be within reach.

*A repair bay that shines is a safe and efficient repair bay.*

The third of the Five S's is SHINE, in other words clean:

- the equipment, workplace, and tools. Have technicians assigned to a certain area. The same technician that used the equipment or tool should clean and ensure maintenance is done.
- while work is being done and after work is done. Make it a habit of putting tools and materials back after using them. "After work is done" does not mean just at the end of the day, but every time a vehicle leaves the repair bay. Clean the area before driving in the next vehicle.

A clean facility is also a safe facility. Organizing parts and tools will reduce tripping hazards and avoid damage to the parts, tools, or vehicle.

Make this Five S part of an SOP that is followed by each technician after the repair or at the end of the day.


*Inspecting the repair should be an SOP for every vehicle.*

The fourth of the Five S's is to STANDARDIZE by:

- developing a standardized way of doing the same task, regardless of the extent of the repairs to a vehicle.
- developing SOPs for each repair bay and for the entire repair facility.
- ensuring that the entire facility understands, supports, and is familiar with the procedures that are developed.

*If everything is clean and organized throughout the facility, it is much easier to sustain clean habits.*

The last of the Five S's is the most difficult. SUSTAIN, so the new process becomes a way of working. Technicians should not have to be told everyday to clean their area to reduce tripping hazards, or to put away their tools so they can be found for the next repair.

Sustain means making the new process a culture within the repair facility, not a one-time event and then forgotten. Sorting, simplifying, and shining should be part of what the repair facility is all about, what gives the facility an identity. It is not just some processes that everyone thought would be a good idea during a one-time get-together.

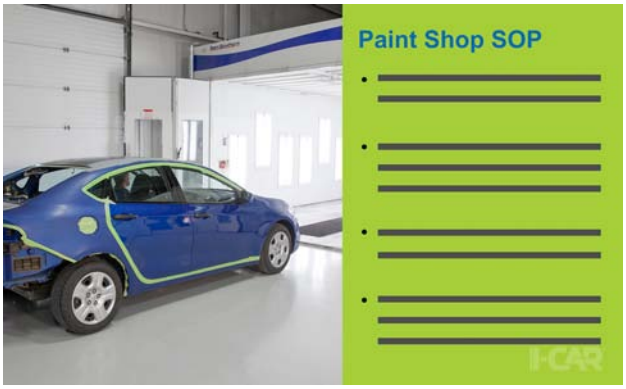
The biggest challenge is not what to change or what to change to, but to cause change and sustain it.

What are some ways to help sustain a Five S shop? Keep motivating the employees, emphasize the importance, keep explaining the efficiencies gained and how vehicle throughput is increasing. Show the numbers. Know that it takes 28 days to alter behavior.

**SOPs**

*Non-structural repair should follow the same finishing procedure for each vehicle.*

How do we ensure that a repair facility stays with a Five S philosophy? We create a standard operating procedure, or SOP, that is followed by all employees in the repair facility. What does this do for the repair process? Why is an SOP important?




*An SOP posted in the paint bay in this repair facility lists agreed-upon steps for refinishing tasks.*

SOPs in collision repair lead to:

- the same steps being done for the same jobs, even though every repair is different.

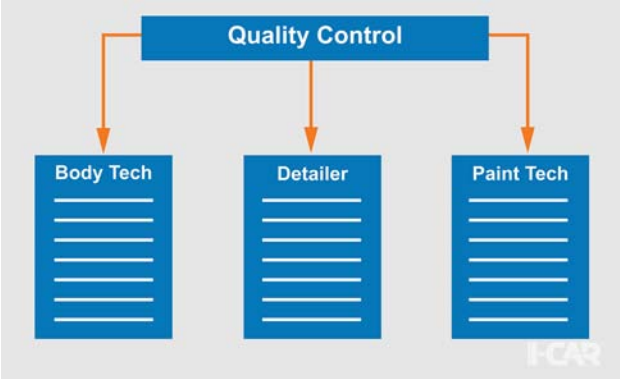
- consistent organization for each repair bay.
- ensuring the vehicle is sent to the next repair bay in a consistent state, no matter who does the repair. Using a checklist is a good way to ensure the steps are completed and consistent.
- lessening the impact of a key technician being off for the day, due to an illness or vacation. There would be less downtime or difference in the output of whomever is doing the tasks, since the steps are always the same.
- the SOPs must be printed, and perhaps even posted, in each of the repair bays. Extended versions of each SOP, including explanations of why a process is done in a certain manner, could be kept in a file.
- make a schedule to review the SOPs at least annually. The lists should be living documents, open to revisions as changes come up. Any changes, however, should be agreed upon before they are made.


*This is an example of a posted SOP for the detailing area in this facility.*

To use SOPs in the repair facility:

- allow the entire staff to have input. Managers and supervisors should only provide part of the input. Issuing SOPs in a memo with an order to do things a certain way will accomplish nothing. Allowing input from all employees helps ensure that everyone will take ownership and hold each other accountable.

*Refer to the video: Using SOPs in the presentation which explains how one service facility uses SOPs in the refinishing process.*



*Have your instructor lead you through Module 1, Activity: Making An SOP.*


*Shops often use SOP binders for the insurers they work with.*

Because there is not a uniform list of photo requirements for all insurers, it is helpful to create a binder that has each insurer's requirements. This provides an SOP to the estimator for each insurance company to avoid confusion. Use a one-page laminated sheet for each insurer.

Having an SOP manual like this ensures that there is little difference in the type of photos taken, regardless of who is taking them. For example, if an estimator is out for the day, whoever fills in will take the necessary photos according to the insurer requirements.

**Module Wrap-Up**

Topics discussed in this module included:

- cycle time and who affects cycle time.
- measuring cycle time.
- waste in the collision repair process.
- lean processes that can help eliminate time wasters.
- how SOPs can be used to create a consistent and high quality repair process.

# *Module 2 - Cycle Time Management Before Repairs*

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**Cycle Time During Pre-Repair**

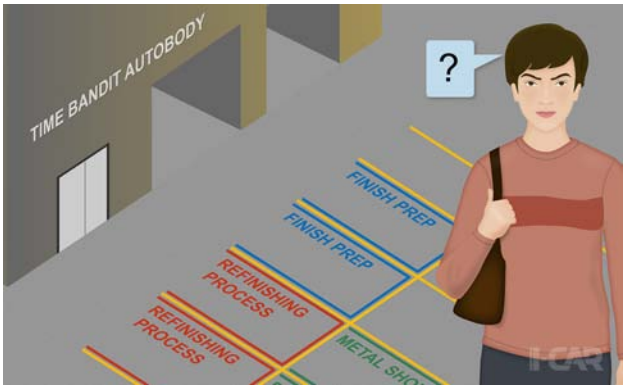
The learning objectives for this module include:

- explaining the impact that 100% teardown has on cycle time.
- explaining how to reduce supplement frequency.
- explaining how to manage the repair stream to ensure proper throughput.
- identifying cycle time issues with the parts process.

*Refer to the video: Damage Report At Time Bandit in the presentation that shows how Time Bandit Autobody writes an estimate.*

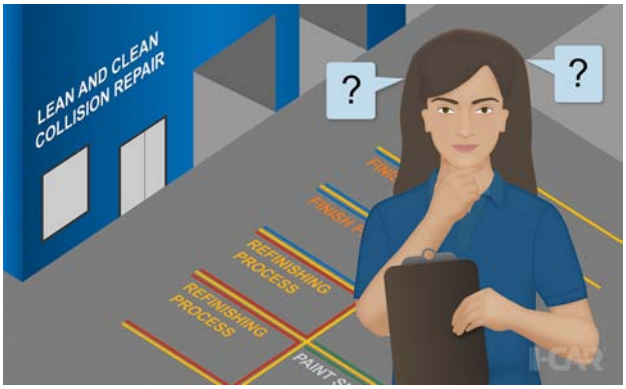
This will be a series of eight videos throughout the course, four at "Time Bandit Autobody" and four at "Lean And Clean Collision Repair." These videos are intended to show Time Bandit Autobody as a professional, compliant repair facility that has not yet taken the next step to becoming more efficient. Everyone at Time Bandit Autobody has done collision repair jobs one way for years, does not see an overall problem, and therefore, sees no reason to change. The names of both repair facilities are fictional and do not represent actual collision repair facilities. Any similarities in the names, personnel, and otherwise to actual collision repair facilities are not intended and are entirely coincidental.

When viewing this video, try to take note of the cycle time bandits or steps in the process that may lead to slowing down the process.




*Have your instructor lead you through Module 2, Activity: Review Of Damage Report At Time Bandit.*

*Refer to the video: Damage Report At Lean And Clean Collision Repair in the presentation that shows the same vehicle and the same customer asking for a damage report.*




*Have your instructor lead you through Module 2, Activity: Review Of Damage Report At Lean And Clean.*

*Reviewing the damage with the customer gives everyone a clear picture of the work to be done.*

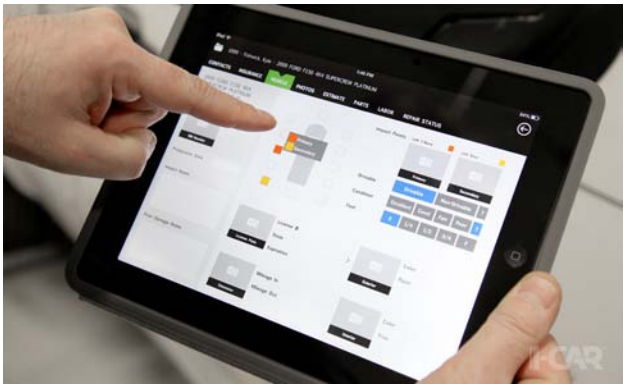
When the vehicle is dropped off, often times the estimator will avoid the walkaround with the customer. This is generally due to a:

- lack of time.
- desire to avoid confrontation with the customer, where the customer asks for free repairs.

During vehicle dropoff, it is important to have a thorough and consistent interview process that occurs with the customer.

During this interview process, the estimator can avoid uncomfortable questions by addressing them before the customer brings them up. Explain the services offered, and when non-related damage is identified, offer to make repairs for your established rate.

Avoiding the interview will cause a lack of communication about whether non-related damage should be repaired. Work in process will need to stop until the vehicle owner can be contacted.



*Make sure all damage is identified when writing an estimate.*

Cycle time bandits specific to estimating include:

- an incomplete damage report.
- hidden damage discovered after the repair process has begun.

- supplements, which are the result of an incomplete damage report.
- sublet work not identified up front, which could be another result of hidden damage.
- insurance authorization not obtained, so the repair may have to wait.

How do you reduce estimating cycle time bandits? Blueprinting.

*The process of blueprinting includes a vehicle teardown to see hidden damage.*

The damage report is completed by doing what is often termed "repair blueprinting." Blueprinting is often credited as being the number one efficiency improvement step. With this process, the repair facility can:

- see the entire repair picture before repairs are started. This allows the vehicle to enter the repair stream and continue without stopping.
- identify all parts needed down to the clips, moldings, and one-time-use fasteners to ensure all the parts are in-house before work is begun.
- determine any sublet work.
- find any hidden damage.

*Repairing a door requires removal of the interior trim.*

Hidden damage can be found by doing disassembly as part of the repair blueprint. This involves:

- removing all parts that are damaged so that all damage can be identified and all parts can be ordered. This is often called a 100% teardown.
- much more than just removing parts to see the damage. Most technicians do this type of teardown. But to accurately identify all parts required for repair, 100% teardown should include all procedures required to repair the car. This means continue the disassembly until all the damaged parts and related panels are removed from the vehicle.
- determining which clips / fasteners must be ordered. Because some clips / fasteners will break during removal, identifying these up front will allow them to be ordered and be on hand during the reassembly process. There is no reason for a

facility to assume the cost of even the smallest clip. If it is part of the repair, include it on the estimate. Over time, these small part prices can add up.
- bagging and labeling parts that will be reinstalled.
- repair or replace decisions being made as the damage is revealed. This requires vehicle maker-specific repair recommendations to be available at this time which will show how a part should be repaired and any recommended tools, material, or equipment. Copies can be made and attached to the repair order.

Teardown may also include:

- recording stages of the disassembly with digital photos.
- taking measurements. This could be done with a tape measure or electronic measuring system. If electronic measuring is available, a printout of the measurements could be used.

When doing teardown, note that the 100% teardown rule should not be compromised based on job size. This will cause problems and affect cycle time.

Performing a complete teardown to verify all damage is better done up front. It may feel like wasted time or inefficient use of time, but it allows a smoother repair. Benefits include: all parts are ordered, and no surprises during the repair, resulting in better cycle time and higher profitability.

*This type of clip can break easily during part removal.*

So how much does a clip truly cost? There are varying price levels depending on the amount of effort required to find a replacement clip. Note that staff time far outweighs the actual cost of the part.

*The technician is helping identify part replacement options.*

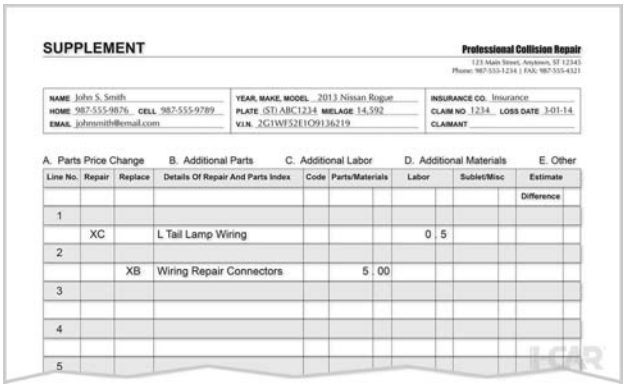
Why is technician input valuable when writing an estimate? Technician input helps:

- determine what can be repaired and what must be replaced.

- with the parts ordering, such as what can be reused and what needs to be purchased.

Writing an estimate without technician input can lead to a part:

- installed on the vehicle even when it is not needed. In a time when severity is driving up the number of totals, it becomes more critical to understand what can be repaired and what absolutely must be replaced. A technician may be able to work on dents during the blueprinting process to verify repairability.
- being discarded. While this may seem like a waste, and it is, it can also be classified as fraud. The repair facility was paid labor and parts cost to replace a part, and they did neither. This can potentially cause legal problems for a repair facility.



SUPPLEMENT

Professional Collision Repair

123 Main Street, Anytown, ST 12345
Phone: 987-555-1234 | FAX: 987-555-4321

NAME John S. Smith
HOME 987-555-9876 CELL 987-555-9789
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YEAR, MAKE, MODEL 2013 Nissan Rogue
PLATE (ST) ABC1234 MILEAGE 14,592
V.I.N. 2G1WF52E1O9136219

INSURANCE CO. Insurance
CLAIM NO. 1234 LOSS DATE 3-01-14
CLAIMANT

A. Parts Price Change B. Additional Parts C. Additional Labor D. Additional Materials E. Other

| Line No. | Repair | Replace | Details Of Repair And Parts Index | Code | Parts/Materials | Labor | Sublet/Misc | Estimate |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Difference |
| 1 | | | | | | | | |
| | XC | | L Tail Lamp Wiring | | | 0.5 | | |
| 2 | | | | | | | | |
| | | XB | Wiring Repair Connectors | | 5.00 | | | |
| 3 | | | | | | | | |
| | | | | | | | | |
| 4 | | | | | | | | |
| | | | | | | | | |
| 5 | | | | | | | | |

*Supplements increase cycle times.*

Actual supplement costs vary according to what needs to be repaired. But it is important to look beyond just part and labor cost. Supplement costs include:

- decreased CSI. Customers will feel frustrated when the vehicle is not delivered on the date promised.
- longer keys to keys. This is measured by not only the shop, but insurance companies as well.
- endangering a DRP relationship. It is understood that some insurance companies grade on supplement ratios. If the ratio is too high, this can strain a DRP relationship. So to avoid supplements on lower cost items, some facilities have been known to either absorb the cost of the supplement to keep the ratio lower or perform a less-than-optimal repair. Shops should not get caught in this trap. This is not proper operating procedure and not recommended when trying to maximize profits. So how do repair facilities avoid encountering this situation? Follow proper repair blueprinting and ensure 100% teardown on all jobs.
- decreased profits (valuable time is lost moving vehicle in and out of the workstream while potentially waiting for parts to arrive).

What is a supplement? A supplement is generally considered the correction of a mistake. As an industry, supplements have become too commonplace and accepted as just a part of doing business. Don't let this be the culture in your facility.

Repairs are more efficient and profitable if more time is taken at the beginning than filing a supplement in the middle or end of the repair. There is a saying that you should slow down to go faster. Going slower on the front end during blueprinting means faster repairs toward the end of the process. Avoid the temptation and pressure to hurry through the estimating and blueprinting process.

The reason behind 100% teardown is to avoid the supplement. If proper teardown is achieved, and all parts have been identified, including all clips and fasteners, it is said that up to 80% of all jobs can avoid the supplement.


*Try to identify where supplements are occurring the most.*

To help identify where supplements are commonly occurring in your repair facility:

- look for trends or patterns in the supplements.
- evaluate invoices, look for commonalities that can identify what is leading to most supplements.

*Other pre-repair tasks may be pre-washing the vehicle and removing pinstriping.*

Supplement reduction / cycle time reduction can be assisted by doing a variety of pre-repair tasks. Pre-repair tasks may include:

- locating the vehicle maker service information that is necessary for the repair.
- documenting the paint code. This can be communicated to the refinish area so a test panel can be made, if necessary, and the paint matched before the vehicle gets to that stage. It may also help to get the refinishing department involved at this point to help make decisions about what parts need to be removed to help the refinishing process.
- a pre-wash to ensure that the proper color is matched. This also removes oil and water-soluble contaminants from the panel surfaces and removes dirt from wheelhouses to keep the repair floor clean. A pre-wash also helps locate all the damage, such as scratches and minor dents,

and provides potential upsell opportunities for non-collision related damage.
- removing pinstriping if the panel will be refinished.

*Repair notes between departments can be written directly on the vehicle.*

On-vehicle notes, or vehicle mapping, is an idea that can be used throughout the repair process. This can be an SOP for a repair facility. This process includes:

- uses water-soluble markers to write information directly on the vehicle. Do not use grease pencils, which cannot be washed off adequately. The notes may be color-coded. For example, green could mean do the repairs, yellow could mean the repair is pending authorization, and red could mean do not repair.
- identifying pre-existing damage, for up-selling to the customer, and avoiding future confrontations.

On vehicle notes are a good communication tool between departments. Communication between departments is a key to improving cycle time. On-vehicle notes can be part of the communication process by:

- communicating between the technicians in the pre-repair planning area and elsewhere in the repair facility.
- providing a better communication tool where there may be a language barrier. The use of shorthand, different colored markers, and symbols is much quicker to understand than trying to read a damage report or a set of special instructions for a certain repair.
- helping to reduce redundancy. One of the keys to reducing cycle time is to avoid doing the same task more than once. When decisions are made in the pre-planning stage, they do not need to be made again. A record of what was found, using on-vehicle markings, helps eliminate redundant operations.

On vehicle notes must be standard for the facility. For example, the use of color-codes, symbols, abbreviations, and the level of detail of each must be consistent and well understood by everyone.

**Getting The Correct Parts In-House**

*Refer to the video: Repairs At Time Bandit Autobody in the presentation.*


*Have your instructor lead you through Module 2, Activity: Review Of Repairs At Time Bandit.*

*Refer to the video: Repairs At Lean And Clean Collision Repair in the presentation where it's time for finish prep and refinishing at Time Bandit Autobody.*


*Have your instructor lead you through Module 2, Activity: Review Of Repairs At Lean And Clean.*


*It is a good idea to check if the part is the right part as soon as it arrives.*

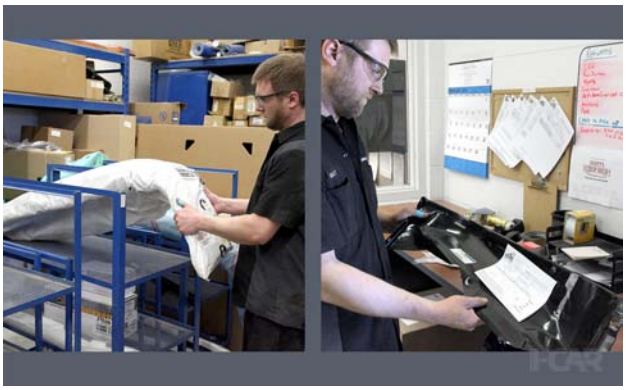
Cycle time bandits in the parts process include:

- the wrong parts being ordered or sent. Parts should be checked in and verified as correct as soon as they arrive.
- an incomplete parts list.
- an incomplete order sheet.
- parts on backorder.
- parts getting lost in the repair facility.


*This bin categorizes repair orders as being late, up for today, or for tomorrow's workload.*

What can be done during the parts ordering process to reduce cycle time? Ideas for improving the parts ordering process include:

- working with one person at each vendor. This allows the parts manager to develop a professional relationship with the vendor representative. Familiarity helps make the parts ordering process more efficient.
- keeping a copy of the parts order in the repair file.
- having the estimating program generate a parts order list. Do not depend on this list for accurate part numbers, especially for small parts such as clips and other fasteners. Part numbers can change. They may also be listed wrong in the estimating guide. To ensure the part is correct, specify the part name and location to the vendor for these accessory parts.
- adding any necessary information with the parts orders. This could include the repair order number, part numbers, photo, and any special instructions.
- verify if any clips were broken or found to be missing during removal and need to be added to the parts order.
- making sure the correct VIN is provided to the parts department.



*Verifying the correct part is done during the parts receiving process.*

What can be done during the parts receiving process to reduce cycle time? Improving the parts receiving process may include:

- having the vendor assist with unpacking the parts.
- verifying that the proper parts have been received while the vendor is still there. A process must be set up where mirror-matching parts not only looks at the primary part received, but also mirror matches right down to the broken clips that should have been shipped with the part.
- determining, when the parts are received, if damaged parts will be repaired or returned.

- labeling parts and attaching the necessary hardware directly to the part.
- storing the parts on a specific parts cart that is dedicated to the repair order.
- clip organization includes bagging and labeling the clips as a vehicle is disassembled. It may also be using a specific container, such as a tackle box, to help organize the clips and fasteners.

*An organized part rack tells the story of which parts are in and which parts are being waited on.*

Parts cart organization can be a useful communication tool if used properly. For example, each shelf can have a specific role. The top rack can be used for parts that are being R&I'd. The two racks in the middle could contain parts that must be replaced. These two shelves communicate to technicians, estimators, and production managers where the parts ordering is at, what has come in, and what has not arrived. Obvious trash or damaged parts could go on the bottom shelf.

Shelf organization provides a good visual cue of the parts order status. This is not industry standard, but an example of how some shops use cart organization to convey repair status.

**Managing The Repair Stream**

*It would be difficult to move vehicles around in this repair facility.*

Managing vehicle throughput is key for cycle time. It is necessary to identify what can cause delays, work stoppages, etc. Workflow delays include lightly damaged vehicles:

- waiting in line while a heavily damaged vehicle is in the repair stream waiting for parts or decisions to be made on how to do the structural repairs. If all repairs are on a schedule, the heavily damaged vehicle would not be in the repair stream until parts are available or repair decisions have been made.
- being used as “fillers” while there is a delay for another repair, such as waiting for parts. All repairs should be on a schedule. If repairs have begun on a vehicle, all the parts are available and all decisions have been made on the repair. There should be continuous work, and no delays.

Lightly damaged should have a separate schedule, and maybe even a separate repair lane.


*Avoiding bottlenecks in the repair process ensures a consistent throughput.*

What are some methods for maintaining consistent throughput?

- Identifying shop, technician, department capacities
- Shop walkthrough
- Proper scheduling

A vehicle should not be dropped off by a customer and then have to wait to be worked on. This is why understanding capacities is important and how it ties to vehicle scheduling. For example, when taking in work, it should match maximum capacity for labor hours based on existing staff. If the number of labor hours exceeds capacity, vehicles will have to remain idle until they can be worked on.

Shop walkthroughs, multiple times a day, help identify work stoppages. At that point, determine why a vehicle is sitting idle. Is it waiting for parts or materials? Is technician workload an issue? Is it waiting for work from a sublet vendor? Determine where the issues are and figure out how to avoid the issue on future jobs.

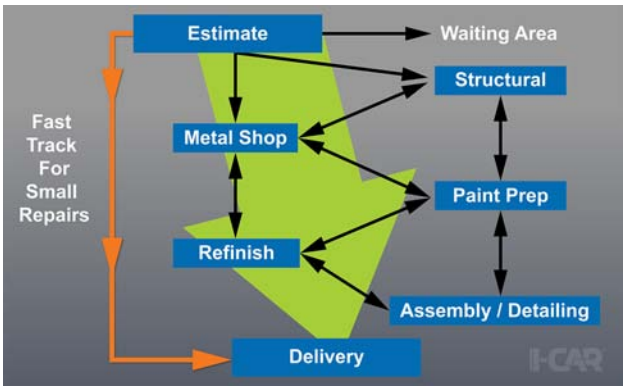
Maintaining consistent throughput also means avoiding bottlenecks that can occur during the repair process. Bottlenecks push vehicles out of the workstream, causing them to sit idle until a technician is available to continue the work.

*Damage can be ranked by severity, clockwise from the top: one (heavy), two (medium), and three (light).*

Damaged vehicles could be triaged by severity, where:

- level one damage is one- or two-day jobs on vehicles that are lightly damaged. It may be confined to one panel where hidden damage is highly unlikely.
- level two damage may require three to five days for repair. This type of damage may go beyond one panel, and where there may be some hidden damage.
- level three damage may require more than five days for repair. This

damage might have to be assigned to the structural repair area before repair blueprinting can be done as some pre-pulling may be required before disassembly.

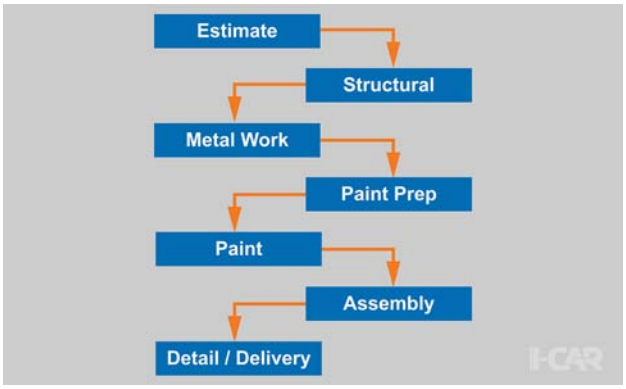



*A repair facility could have a "fast track" or "quick lane" so small dent repairs could bypass others in the repair stream.*

Some repair facilities have assigned some level-one damaged vehicles to a separate repair lane. These are small "quick" repairs that:

- are small dent repairs that are confined to one panel.
- can be routed so the repair process bypasses others. The Axalta "Smart Cycle Time" program refers to this bypass route as an "Express Lane."
- as a result, are not treated as job fillers.

This type of repair lane is not just for large facilities. Small facilities can also successfully set up a bypass lane to move some light repairs quickly through the repair stream.




*When the vehicle never backs up in the repair stream, the facility is operating like an assembly line.*

Another approach some facilities have taken is the assembly line repair, where:

- the repair process is like a remanufacturing process.
- the vehicle never backs up, but always moves forward to the next station.
- there is still a full-team approach.
- technicians work their own specialty and only work in that area of the repair facility.

There may be different production lanes in these assembly-line facilities, depending on the severity of the repair.

**Module Wrap-Up**

Topics discussed in this module included:

- the impact that 100% teardown has on cycle time.
- how to reduce supplement frequency.
- how to manage the repair stream to ensure proper throughput.

- cycle time issues with the parts process.

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# *Module 3 - Cycle Time Management During Repairs*

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**Vehicle Repair**

Learning objectives for this module include:

- identifying potential structural repair area cycle time bandits and SOP solutions.
- identifying potential non-structural repair area cycle time bandits and SOP solutions.
- identifying potential refinishing and detailing repair area cycle time bandits and SOP solutions.
- listing ideal vehicle delivery methods.

*A frame rack should not be used to hang exterior body panels after structural repairs are complete.*

Cycle time bandits specific to the structural repair area include:

- a frame rack being used for making non-structural repairs and not pulls, and therefore, another vehicle waiting until the frame rack is available. Note that some repair processes require that a vehicle be left on the frame rack to maintain proper structural alignment during welding or bonding of certain structural parts.
- vehicle specifications not being available when straightening is to be performed, resulting in more time delays.
- proper measuring fixtures not being available when a fixture bench is used.

*Measuring is part of the straightening process and done before complete disassembly.*

Ideas for SOPs in the structural repair area process include:

- having vehicle maker procedures for the repair that is to be done accompanying the repair order.
- ensuring that the vehicle is straightened to specifications and documentation put in the repair file.
- dressing and inspecting welds.
- anchoring and pulling clamps and measuring system equipment are in good condition, properly stored, and in working order.
- welding equipment being properly maintained.

*Moving vehicles in and out of the repair stream is a cycle time bandit.*

Cycle time bandits specific to the metal shop include:

- different steps and materials used depending on the technician and the job. The steps and materials should be consistent no matter who does it. This is a communication issue, where the technician does not know the expectations. The exception, however, is when the vehicle maker has a specific procedure.
- having to move vehicles in and out of the repair bay due to missing parts or missed damage.

*A well-organized materials cabinet reduces the amount of time spent searching for an item.*

Ideas for SOPs in the non-structural repair area include:

- final sanding using the same grits of sandpaper and filler for the same stages in the repair process.
- having materials well stocked and located where they are used.

*Refer to the video: Finish Prep At Time Bandit Autobody in the presentation where it's time for finish prep and refinishing at Time Bandit Autobody.*

*Have your instructor lead you through Module 3, Activity: Progress At Time Bandit.*

Other areas of cycle time bandits in the finish prep and refinishing process may include:

- The customer shows up for her vehicle because no one called her to inform her of the delay. She also was not sure when she was supposed to come get her vehicle. This added to her negative impression of the facility.
- The production supervisor should not have given her an exact day when the vehicle would be ready.
- The painter had to mix more paint to refinish another bumper cover for the same job.

*Refer to the video: Finish Prep At Lean And Clean Collision Repair in the presentation.*

*Have your instructor lead you through Module 3, Activity: Progress At Lean And Clean.*

*An SOP for the spraybooth is to only use the room for specific tasks, such as making sprayout panels.*

SOP ideas for improving spraybooth productivity include:

- using the spraybooth only for bagging, painting, and drying. The spraybooth is not the location for applying masking or paint prep work.
- managing dry times better so most production time is not spent waiting for paint to dry. The facility could make it an SOP to schedule dry times to coincide with off-production times, such as during breaks.

Allowing improper dry times is NOT an answer for improving productivity in the spraybooth.

*Use of a checklist is key to using consistent steps in the detailing area.*

The best way to make sure detailing is done consistently and completely is to:

- use checklists for every stage. Use a separate checklist for final interior and exterior detailing.
- ensure every vehicle is always detailed the same way, to the same level. Checklists will help ensure this. For example, use the same order of washing to ensure dirt is not carried around the vehicle. Use the same soap-to-water ratio in the wash water. Use the same products for cleaning the interior and polishing the exterior.

If something extra is done to the vehicle, besides general detailing, tell the customer. For example, tell the customer if a stain was removed or a fabric tear repaired. This contributes to a better CSI.

*Reviewing the damage report with the customer and going over the repairs is the appropriate delivery method.*

"Hope" should not be final quality control before delivery to the customer in that you "hope" the staff did a good job repairing the vehicle. This happens where there is little confidence in the vehicle delivery to the customer. So the facility simply hands the keys over to the customer and hopes they don't notice any substandard repairs.

There should be confidence in the repair. A repair facility should be proud of the work they have done and highlight the complete repair to the customer during delivery, pointing out all the work performed on the vehicle - including special requests by the customer. Also do not be afraid to point out items that you included free of charge during the delivery process. This is a good sales technique to help promote future business.

Before delivery, a final checklist should be used as an SOP. This provides a consistent review of repairs and improves CSI by allowing the shop to find problems rather than the customer.

Quality control is also not simply a delivery item, but rather an SOP for each step a vehicle makes through the collision repair process. For example, there is an SOP for weld quality, for panel straightening, for mechanical repairs, etc. The goal is to fix any issues before the vehicle advances to the next step in the repair process or the next department. Quality should be built into the repair; it is not "fixing mistakes" at the end.

*Providing a solid repair for the next stop in the repair process ensures the vehicle keeps moving forward.*

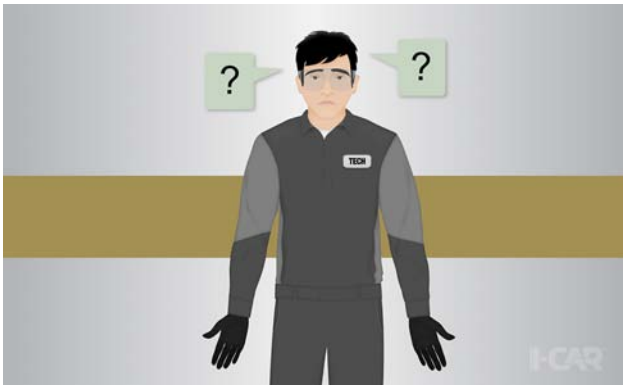
Cycle time can generally be reduced throughout the entire repair process by first of all taking pride in the work being done. Satisfy internal customers (co-workers) since each:

- department is a customer of the previous department in the process.
- repair is a product of the facility.
- repair is a marketing piece for the facility.

Having this attitude throughout the facility increases professionalism, which is

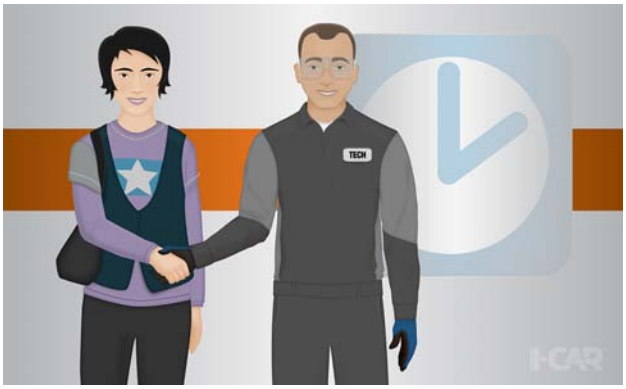
related to every other step that is taken to improve efficiency.

*Refer to the video: Delivery At Time Bandit Autobody in the presentation.*




*Have your instructor lead you through Module 3, Activity: Review Of Delivery at Time Bandit.*

*Refer to the video: Delivery At Lean And Clean Collision Repair in the presentation.*




*Have your instructor lead you through Module 3, Activity: Review Of Delivery at Lean And Clean.*

**Module Wrap Up**

Topics discussed in this module included:

- potential structural repair area cycle time bandits and SOP solutions.
- potential non-structural repair area cycle time bandits and SOP solutions.
- potential refinishing and detailing repair area cycle time bandits and SOP solutions.
- ideal vehicle delivery methods.