Structural Repair Precautions & Specifications

Introduction

One of the main reasons for vehicles not being repaired correctly is that collision repair professionals have inadequate or conflicting information. Toyota continues to set high standards for collision repair and for many reasons, but the most significant is safety. Safety as well as quality can be easily compromised if repair professionals do not have the most accurate specifications or information, or if they choose to disregard them. By not restoring damaged vehicles to manufacturer specifications repairers are subjecting themselves to potential liability if repaired vehicles fail to perform as intended by the manufacturer. This chapter will address Toyota's position on several important structural repair topics.

Figure 3-8
TL460F308

High Strength Steel Handling Precautions

Most structural body components and all frames are made from High Strength Steel (HSS). Heating HSS components changes the fine tight crystalline structure of the steel to a coarse open structure, weakening it. Heating also destroys protective coatings exposing the steel to destructive corrosion factors. Because of the damage that can be caused to HSS, Toyota prohibits heating HSS during the repair process, and caution against heat damage that can be caused by extended HSS welding operations. More information on this topic can be found in the Fundamental Body Repair Procedures Manual, Chapter 2 Body Materials, and Collision Repair Information Bulletins (CRIBs) #89 & #136.

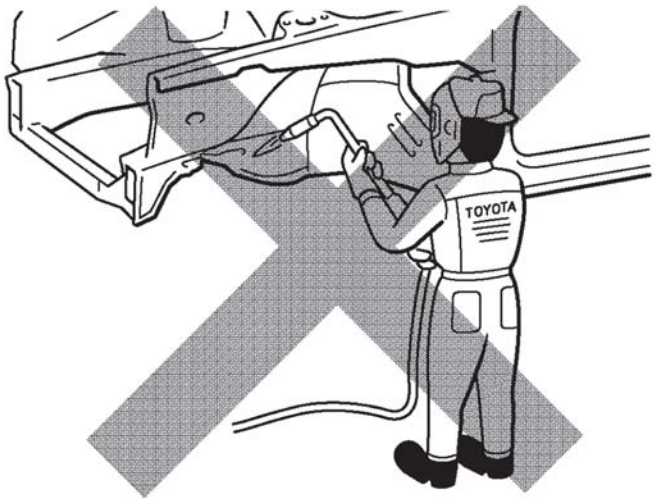
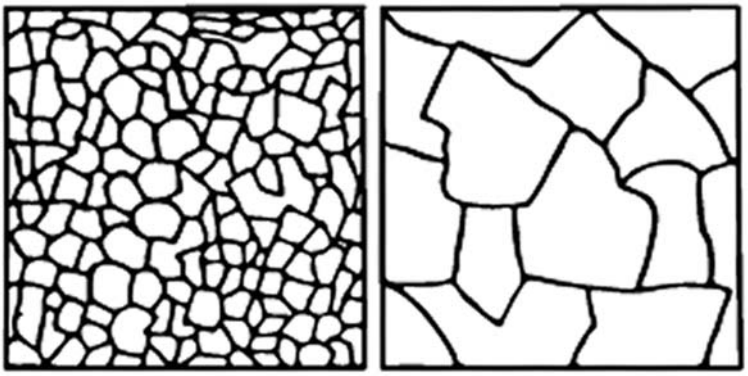


Figure 4-1
TL460F401

HSS Crystalline Structure



Before Heating **After Heating**

Figure 4-2
TL460F402

Note *Locations of HSS structural body panels and components are model specific and are published in Repair Manuals For Collision Damage, New Car Features Manuals, and/or CRIBs.*

Structural Component Bends & Kinks

A sharp deformation angle on a structural component or frame that cannot be returned to its original shape by pulling, pushing, and/or hammering is classified as a kink. Structural components are designed to perform at 100% strength in their original shape and condition. If they are deformed in a collision and un-repaired, or if they are repaired incorrectly and reused, they become unable to exhibit the same strength as the original undamaged part. It is necessary to replace components that cannot be repaired correctly through 'cold straightening' techniques such as pulling, pushing, and hammering. Repair Manuals For Collision Damage make specific reference to this topic in their 'Introduction' section.

Example - Kink

Figure 4-3
TL460F403

Sectioning

Full Body Sectioning also referred to as 'Clipping' is a repair procedure in which salvage structural body or frame components are used to replace multiple weld-on parts as a unit. Because there is a wide range of possible consequences and because Toyota believes that there are no systems or processes in place to regulate the quality of used salvage parts or their proper application, do not approve of the use of used/salvage parts. These positions are clearly supported in CRIB #122 and Parts Position Statement #MDC00117-00900. Approved sectioning procedures with genuine original equipment (OE) service parts for unibody and frame components are limited to procedures documented in model specific Repair Manuals For Collision Damage and Bulletins containing supplemental information.

COLLISION REPAIR INFORMATION

FOR THE TOYOTA DEALER

TITLE: BODY SECTIONING PAGE 1

SECTION: EXTERIOR BULLETIN #122

MODELS: ALL TOYOTA/LEXUS

DATE: FEB 2003

Toyota actively promotes quality repairs by providing Collision Repair Centers with updates and changes in collision repair procedures, standards and technology.

Full body sectioning, also known as "clipping" is ***NOT*** an approved repair procedure on any Toyota or Lexus vehicle.

Full body sectioning is generally done on a vehicle that has sustained severe rear end damage, where the front portion of one vehicle is joined to the rear portion of another vehicle.

Full body sectioning is **not approved** for the following reasons:

- Decrease in strength and safety from the original Toyota/Lexus design
- Poor fit and alignment of the body
- NVH (squeaks, rattles, etc.)
- Wind noises and water leaks
- Diminished protection from rust/corrosion

Always refer to the Toyota/Lexus model–specific repair manual for approved cut/join locations, measurements, welding requirements, and other important information.

PLEASE ROUTE THIS BULLETIN TO YOUR COLLISION REPAIR CENTER MANAGER AND COLLISION REPAIR TECHNICIANS

Figure 4-4
CRIB122

Approved Methods of Repair & Replacement

Toyota places a very high priority on restoring a damaged vehicle to manufacturer specifications. This is to ensure that a repaired vehicle will safely perform as originally intended under all future operating conditions and/or a subsequent collision. Handling precautions for HSS, structural repair precautions, the use of salvage and/or aftermarket parts, guidelines for determining if a panel should be replaced or repaired, and sectioning procedures are all specified through adequate documentation. If there is any doubt that a repaired part will lack the strength and/or crash energy management of an undamaged one, then there is no doubt that it should be replaced.

Structural Component Replacement Specifications

Repair Manuals For Collision Damage provide weld-on component replacement specifications. Specifications include:

- Complete component replacement procedures
- Component sectioning procedures
- Cut-and-join locations
- Welding specifications

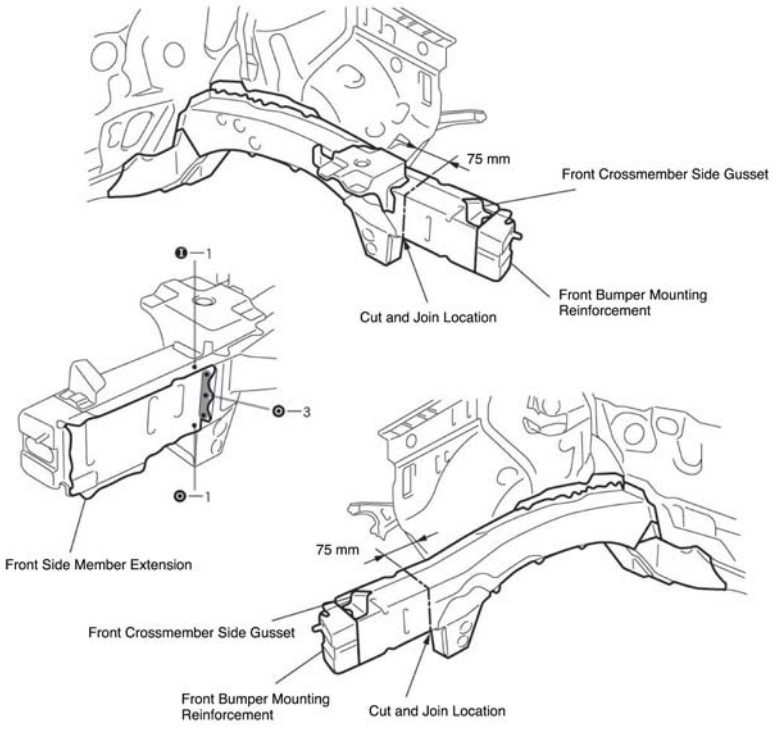


Figure 4-5
TL460F405

Approved Attachment Methods

Toyota continuously reviews ways to make component attachment both strong and visually aesthetic, but does not recognize or promote any attachment procedure that is not consistent with those specified in model specific Repair Manuals For Collision Damage. You will find in most cases that structural components require Gas Metal Arc Welding (GMAW), also referred to as Metal Inert Gas (MIG) welding, because of the combined thickness of metal being joined.

Figure 4-6
TL460F406

Activity – Component Replacement Symbol Review

Using the Chapter 4 Activity Guide provided by your instructor, identify each symbol. Identify a symbol by circling or highlighting and writing the corresponding identifier number on the worksheets (example: R1= removal saw cut symbol).

Removal

1. A saw cut symbol
2. A spot weld to be drilled through the outer panel only
3. A spot weld to be drilled through both panels

Installation

4. A continuous GMAW/MIG butt weld symbol
5. A GMAW/MIG plug weld to be made from the inside
6. A GMAW/MIG plug weld to be made from the outside

Summary & Key Review

Repairing and replacing structural components according to manufacturer standards and specifications involves knowing where to find all of the applicable information, as well as knowing how to apply it. Restoring damaged vehicles to manufacturer specification provides the best assurance that they will safely perform as closely to the original design as possible during future operation and/or subsequent collisions. For more information on this topic refer to Repair Manual For Collision Damage, Introduction Section, and topic-specific Collision Repair Information Bulletins (CRIBs).

Chapter Review Questions

1. Most structural body components and all _____ are made from High Strength Steel (HSS).
2. Locations for HSS body components are _____ specific.
3. It is necessary to _____ components that cannot be repaired by 'cold straightening' methods.
4. If there is any doubt that a _____ part will lack the strength and/or crash energy management of an undamaged one, then there is no doubt that it should be replaced.
5. Toyota does not recognize or promote any attachment _____ or procedure that is not consistent with those in model specific Repair Manuals For Collision Damage or supplemental Bulletins.