AUTOMOTIVE COLLISION NON-STRUCTURAL
METAL STRAIGHTENING/REPAIR
Course Syllabus

Course Number: NSRT-0343   OHLAP Credit: No
OCAS Code: None
Course Length: 90 Hours
Career Cluster: Transportation, Distribution, and Logistics
Career Pathway: Automotive Service
Career Major(s): Collision Repair Technician

Pre-requisite(s): In this course the student will learn the basics of using metal straightening tools, such as dollies and hammers to repair minor dents and dings in sheet metal. Students will cover techniques to repair contours and bodylines in sheet metal. Metal shrinking and stretching will be taught to help students bring the metal back to original contour. Students will learn about the different body fillers. Students will learn techniques to mix and apply body filler. Students will learn to select the proper sandpaper and sanding equipment and learn techniques to sand the cured body filler to original contour then prepare the repair for primer.

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Course Objectives: A. Repair Metal Panels
1. Straighten and rough out contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools and weld-on pull attachments. (HP-I)
2. Heat shrink stretched panel areas to proper contour. (HP-I) 1
3. Cold shrink stretched panel areas to proper contour. (HP-I) 1
4. Mix body filler. (HP-I) 1
5. Apply body filler; shape during curing. (HP-I) 1
6. Rough sand cured body filler to contour; finish sand. (HP-I) 1
7. Pick, file, and disc sand the damaged area of a body panel to locate and reduce surface irregularities.

B. Demonstrate Metal Finishing and Body Filling
1. Comply with personal and environmental safety practices associated with clothing, eye protection, usage of chemicals, hand tools, and power equipment.
2. Demonstrate hammer and dolly techniques. (HP-I) 1
3. Remove paint from the damaged area of a body panel. (HP-I) 1
4. Locate and reduce surface irregularities on a damaged body panel. (HP-I) 1
5. Disc sand the repaired body panel to produce final smoothness.
6. Restore contour with heat.
7. Mix plastic/body filler.
8. Apply plastic body filler and shape during curing.
9. Rough sand cured plastic body filler to contour; finish sand.
10. Perform a small damage repair.
11. Perform a rust repair.
12. Remove damage with hydraulic jacks.
13. Remove creases and dents using power tools and hand tools to restore damaged areas to proper contours and dimensions.

C. Straighten Structural Parts
1. Analyze, straighten and align mash (collapse) damage. (HP-G) 1
2. Analyze, straighten and align sag damage. (HP-G) 1
3. Analyze, straighten and align sidesway damage. (HP-G) 1
4. Analyze, straighten and align twist damage. (HP-G) 1
5. Analyze, straighten and align diamond frame damage. (HP-G) 1
6. Remove and replace damaged frame horns, side rails, cross members according to manufacturer's specifications/procedures.
7. Restore corrosion protection to repaired or replaced frame areas. (HP-I) 1
8. Repair or replace weakened or cracked frame members in accordance with vehicle manufacturers' specifications/procedures.
9. Remove and replace damaged structural components (HP-G) 1

D. Perform Body Alignment, Unibody Inspection, Measurement, and Repair
1. Discuss body alignment basics.
2. Explain zone inspection of unibody vehicle.
3. Analyze and identify misaligned or damaged steering, suspension, and power train components that can cause vibration, steering, and wheel alignment problems; align or replace in accordance with vehicle manufacturers' recommendations. (HP-I) 1
4. Diagnose and analyze unibody vehicle centerline misalignment using centering gages.
5. Diagnose and analyze unibody vehicle height using datum line gages.
7. Determine the locations of all suspension, steering, and power train component attaching points on the body.
8. Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair. (HP-I) 1
9. Attach anchoring devices to vehicle; remove or reposition components as necessary. (HP-I) 1
10. Straighten and align cowl assembly. (HP-G) 1
11. Straighten and align roof rails/headers and roof panels. (HP-G) 1
12. Straighten and align hinge and lock pillars. (HP-G) 1
13. Straighten and align vehicle openings, floor pans, and rocker panels. (HP-G) 1
14. Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points, etc.). (HP-G) 1
15. Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering and suspension/powertrain mounting points, etc.). (HP-G) 1
16. Identify heat limitations in structural components. (HP-I) 1
17. Use proper heat stress relief methods in high strength steel in accordance with manufacturer specifications/procedures.
18. Identify heat limitations in unibody vehicles. (HP-I) 1
19. Identify proper cold stress relief methods. (HP-I) 1
20. Align or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems. (HP-G) 1
21. Restore structural foam. (HP-G) ¹

C. Repair /Replace Mechanical & Electrical Components Related to Collision Repair
   1. Inspect, adjust, repair or replace mechanical components related to collision repair.
   2. Inspect, check, repair or replace electrical components or wiring related to collision repair.
   3. Inspect, adjust, repair, or replace restraint system components.

¹ASE objective
   All unmarked objectives are TTC instructor developed.

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance.
   2. Each course must be passed with seventy (70%) percent or better.
   3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit: The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.