NATEF Task List - Collision Repair & Refinish
Structural Analysis & Damage Repair

Name: _____
Date: _____

For every task in Structural Analysis and Damage Repair, the following safety requirements must be strictly enforced: *Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal*

	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR	**Week**											
	A. Frame Inspection and Repair	1	2	3	4	5	6	7	8	9	10	11	12
HP-I	1. Measure and diagnose structural damage using a tram gauge.												
HP-I	2. Attach vehicle to anchoring devices.												
HP-G	3. Analyze, straighten and align mash (collapse) damage.												
HP-G	4. Analyze, straighten and align sag damage.												
HP-G	5. Analyze, straighten and align sideway damage.												
HP-G	6. Analyze, straighten and align twist damage.												
HP-G	7. Analyze, straighten and align diamond frame damage.												
HP-G	8. Remove and replace damaged structural components.												
HP-I	9. Restore corrosion protection to repaired or replaced frame areas.												
HP-G	10. Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.												

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	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR A. Frame Inspection and Repair (continued)	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-G	11. Align or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.												
HP-G	12. Identify or repair heat limitations and monitoring procedures for structural components.												
HP-G	13. Demonstrate an understanding of structural foam applications.												
HP-G	14. Measure and diagnose structural damage using a three-dimensional measuring system (mechanical, electronic, laser), etc.												
HP-G	15. Measure and diagnose structural damage to vehicles using a dedicated (fixture) measuring system.												
HP-I	16. Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair.												
HP-I	17. Analyze and identify crush/collapse zones.												
HP-G	18. Restore mounting and anchoring locations.												

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	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR B. Unibody and Unitized Structure Inspection, Measurement, and Repair	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-G	1. Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and chassis alignment problems.												
HP-G	2. Realign or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering and chassis alignment problems.												
HP-I	3. Measure and diagnose unibody damage using tram gauge.												
HP-G	4. Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle.												
HP-G	5. Measure and diagnose unibody vehicles using a dedicated (fixture) measuring system.												
HP-G	6. Diagnose and measure unibody vehicles using a three-dimensional measuring system (mechanical, electronic, and laser, etc.).												
HP-I	7. Determine the extent of the direct and indirect damage and the direction of impact; plan and document the methods and sequence of repair.												
HP-I	8. Attach anchoring devices to vehicle; remove or reposition components as necessary.												
HP-G	9. Straighten and align cowl assembly.												

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	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR B. Unibody and Unitized Structure Inspection, Measurement, and Repair (continued)	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-G	10. Straighten and align roof rails/headers and roof panels.												
HP-G	11. Straighten and align hinge and lock pillars.												
HP-G	12. Straighten and align vehicle openings, floor pans, and rocker panels.												
HP-G	13. Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points).												
HP-G	14. Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/power train mounting points, etc.).												
HP-I	15. Identify substrate and repair or replacement recommendations.												
HP-I	16. Identify proper cold stress relief methods.												
HP-I	17. Repair damage using power tools and hand tools to restore proper contours and dimensions.												
HP-G	18. Remove and replace damaged sections of steel body structures.												
HP-I	19. Restore corrosion protection to repaired or replaced structural areas.												

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	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR B. Unibody and Unitized Structure Inspection, Measurement, and Repair (continued)	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-G	20. Determine the extent of damage to aluminum structural components; repair, weld, or replace.												
HP-I	21. Analyze and identify crush/collapse zones.												
HP-G	22. Restore mounting and anchoring locations.												

	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR C. Fixed Glass	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-G	1. Remove and reinstall or replace fixed glass (heated and non-heated) using recommended materials and techniques.												
HP-G	2. Remove and reinstall or replace modular glass using recommended materials.												
HP-G	3. Check for water leaks, dust leaks, and wind noise.												

	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR D. Metal Welding and Cutting	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-I	1. Identify weldable and non-weldable substrates used in vehicle construction.												
HP-I	2. Weld and cut high-strength steel and other steels.												
HP-G	3. Weld and cut aluminum.												

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	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR D. Metal Welding and Cutting (continued)	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-I	4. Determine the correct GMAW (MIG) welder type, electrode/wire type, diameter, and gas to be used in a specific welding situation.												
HP-I	5. Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded.												
HP-I	6. Store, handle, and install high-pressure gas cylinders.												
HP-I	7. Determine work clamp (ground) location and attach.												
HP-I	8. Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.												
HP-I	9. Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.												
HP-I	10. Protect computers and other electronic control modules during welding procedures.												
HP-I	11. Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, clamp or tack as required.												
HP-I	12. Determine the joint type (butt weld with backing, lap, etc.) for weld being made.												

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	I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR D. Metal Welding and Cutting (continued)	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
HP-I	14. Perform the following welds: continuous, plug, butt weld with and without backing, and fillet etc.												
HP-I	15. Perform visual and destructive tests on each weld type.												
HP-I	16. Identify the causes of various welding defects; make necessary adjustments.												
HP-I	17. Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.												
HP-I	18. Identify cutting process for different substrates and locations; perform cutting operation.												
HP-G	19. Identify different methods of attaching structural components (squeeze type resistance spot welding (STRSW), riveting, structural adhesive, silicon bronze, etc.).												