

Passenger Car Restoration Template

Eric Hopp
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Based on what I've learned, here is a template restoration plan for a steel passenger car.

Structural Inspection of Car Body

Inspect the center sill, side sills, bolters, needle beams, collision posts, and the rest of the body structure. Repairing damaged structure is very disruptive, hence expensive. Except for preservative steps, if there are structural issues, any other repairs are ill-advised.

Look for cracks, breaks, rips or tears. Look for bending, flaring, or twisting of members which should be straight or slightly cambered. Look for accumulated rust forcing joints apart, reducing cross-sections or perforating structural members.

Condition of trucks, underbody components, and interior finish are not of interest at this time, except as clues to the history of the basic body structure.

Exterior Steel Work

This serves two goals: Weather-proofing, and returning the body structure to a state of good repair.

Replace or flush-patch perforated or loose exterior skin. Replace exterior skin around windows if rust pitting or rust bulging will make a weather-tight seal impossible. Repair loose or missing safety appliances. Repair any sharp edges around the vestibule steps. Repair any and all perforations in the roof. Caulk roof joints which might let water in.

Use appropriate repair materials: Mild steel for heavyweight cars, high-strength, low-alloy steel for lightweights, stainless steel on stainless cars, and aluminum on aluminum cars.

Exterior Paint

This makes the car look good, as well as further weather-proofing it.

Remove exterior trim which should be painted underneath to prevent rust. (Window and door gaskets, stainless grab irons, diaphragm canvas.) Properly prepare the steel for paint – abrasive blasting is excellent. Use Bondo or another filler to prepare a smooth finish. Use an epoxy primer and hard, high-gloss polyurethane topcoat.

Gaskets and Glazing

Primarily a weather-proofing step, this also enhances the car's visual appeal.

Renew the gaskets around windows to keep water out of the car structure. This is also an excellent time to repair window sash and replace the glass.

Running Gear, Draft Gear and Brakes

The car now looks good externally, but may not be operable. Inspect and repair/replace trucks, wheels, journal bearings, springs, draft gear, couplers, cut levers, air brakes and hand brakes.

Bear in mind that significant changes in weight distribution, due to changed mechanical systems, may prompt spring changes to compensate.

Interior Mechanical and Electrical

Necessary repairs to interior mechanical and electrical systems generally should be done prior to interior finishing. First, it can be dirty, messy work. Second, good lighting and air handling can make the finishing work much easier. Third, if necessary, utility lines underneath the finish work can be changed out at this time.

If there are soft spots in the floor, or water damage to walls or ceiling, this is a good time to repair them.

If mechanical systems are being added or replaced with new, expect corresponding changes underneath the car at this time. Under-car equipment mounts should be designed to withstand collisions without breaking loose, should capture the equipment even if all bolts loosen and fall out, and should be compatible with the car structure. (Do not weld carbon steel to stainless, or weld/cut the bottom/tension side of structural members, without proper mitigation of the risks.)

Interior Finish

Save interior finish work until the end, when the body is weather-tight, and mechanical/electrical work will not make a mess. Finish work includes new floor covering, painting, upholstery, and hardware.