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Under the Bonnet: Technical Restoration of Classic British Cars

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Introduction

British classics occupy a unique place in motoring history. From the cheeky practicality of the Mini to the timeless lines of the MGB and the spirited Triumphs, these cars reward their owners not only on the road but in the workshop. Under the Bonnet is for enthusiasts who want to do more than polish and preserve; it is for those ready to lift the bonnet, roll up sleeves, and return these machines to their best—mechanically correct, visually authentic, and built to a standard that can stand scrutiny on the concours lawn.

This book is a practical manual for DIY restorers and small workshops. It assumes you value method and craftsmanship over shortcuts, and it gives you structured, step-by-step processes for everything from assessing a candidate car to laying down the final coat of paint. You will find detailed guidance on planning a realistic scope, building a budget, and sequencing the work so momentum is maintained and mistakes are minimized. Where appropriate, we provide checklists, measurement baselines, and decision trees to help you choose the right path for your car, your skills, and your wallet.

The heart of a restoration is metalwork and mechanicals, and we approach both with clarity. Corrosion is inevitable in cars of this era; we show you how to identify the subtle signs of structural decay, cut back to sound metal, fabricate patches and panels, and weld safely and accurately. On the mechanical side, we cover the period-correct engines you're likely to encounter—A-series and B-series fours and popular Triumph units—breaking down teardown, inspection, machining considerations, and assembly techniques that prevent oil leaks, overheating, and premature wear.

Originality matters, but so does reliability. Throughout, we highlight sympathetic upgrades that are invisible or reversible—improvements to cooling, lubrication, electrical protection, and fastener strategy that don't compromise authenticity. We dive into SU and Stromberg carburetors, Lucas ignition and charging systems, and the nuances of gearboxes, overdrives, and differentials, emphasizing correct specifications while offering practical tips for tuning and troubleshooting. The goal is a car that starts on the button, drives straight, stops confidently, and presents as it should.

Parts quality can make or break a project. We demystify the world of OEM, NOS, remanufactured, and reproduction components, explaining how to evaluate suppliers, test fit panels, and verify tolerances before committing to paint or final assembly. Because budgets are not infinite, we discuss where to invest in top-tier parts and where thoughtful refurbishment can achieve the same result. You'll also learn strategies for cataloging hardware, preserving original finishes, and keeping clear

photographic and written records that add value and guide reassembly.

Finally, we recognize that restoration is as much a project-management challenge as a technical one. We provide workable schedules, milestone checklists, and risk-mitigation tactics to keep the build on track, whether you're squeezing work into weekends or running a small shop. The closing chapters bring everything together with case studies of a Mini, an MGB, and a Triumph—illustrating choices, trade-offs, and the craftsmanship that elevates a sound repair into a concours-worthy restoration. If you're ready to put craft and care at the center of your build, this book will meet you under the bonnet.

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CHAPTER ONE: Choosing the Right Project Car: Mini, MGB, and Triumph

The hunt for a project car is a mix of romance and reconnaissance. It begins with an image: a dust-covered Mini in a barn, an MGB under a tarp in a garage, or a Triumph parked behind a hedge, its chrome dulled by time. Before you shake hands or exchange bank transfers, however, you must be ruthlessly pragmatic. The dream is easy; the metal, wood, and paint tell a less forgiving story. Your goal is to find a car that matches your budget, your skills, and the hours you actually have, not the ones you wish you had.

Start with the basics: paperwork and provenance. A car with a clear title, a correct chassis number, and a trail of MOT certificates or registration documents is worth a premium over a mystery. Matching engine and gearbox numbers matter, especially for concours aspirations, but they are not a guarantee of quality. A restored car with non-original numbers may still be a sound driver, yet it will never win the big shows. Investigate history before emotion takes over; the cheapest car is rarely the least expensive when you uncover hidden structural defects.

For the three marques this book focuses on, know the eras and what they mean. Early Minis, from the 1960s through the 1970s, are simple and direct, with A-series engines and minimal electronics. MGBs evolved from roadside fixable classics in the roadster and GT variants, with HGi models in the mid-1970s offering emissions equipment that complicates tuning. Triumphs, especially the TR range and the Spitfire, carry the charm of the sixties and seventies, but the later TR7 and Dolomite present different challenges, including more complex emissions and electronics. Familiarity with these generations keeps expectations realistic.

An honest assessment of your goals is crucial. If concours perfection is the target, you'll need a car with minimal filler, verifiable original panels, and the correct finishes for its year and market. For a driver-grade restoration, you can tolerate more minor deviations, prioritizing structural integrity and mechanical reliability over perfect panel gaps. Decide this upfront. The scope dictates the budget, the timeline, and the donor car you should choose. Aim for a car that supports your goal rather than fighting you at every step.

When the car is in front of you, inspect the body structure first. Look for obvious signs of filler or poor paintwork. A straight edge or a magnet can reveal secrets: a magnet that refuses to stick in certain areas likely indicates heavy filler. Swirl marks and uneven orange peel can hint at rushed paint, which often masks hasty repairs. Ask for

the car to be cold when you arrive. A warm engine can hide starting issues, and a freshly washed undercarriage often obscures rust. Ask pointed questions and listen for evasive answers.

Rust is the great adversary of British cars. Pay close attention to sills, floor pans, inner and outer wheel arches, and the boot floor. On Minis, watch the A-panel, scuttle, and the front subframe mounts. On MGBs, inspect the door bottoms, rocker panels, and the structural members around the rear suspension. Triumphs, particularly TR6s, can suffer from rot in the sills and the boot floor, while Spitfires are notorious for the front chassis legs. Structural rust behind cosmetic issues can turn a simple project into a major metalworking exercise.

The chassis and subframes deserve specific attention. Minis have a front subframe that can corrode significantly around mounting points and the steering box area. MGBs feature a separate chassis that can hide rust under body mounts and around the rear spring hangers. Triumphs vary by model; TRs have sturdy chassis but can suffer from hidden corrosion in the outriggers and front frame horns. Tap around weld seams and joints with a small hammer or a screwdriver handle. Dull, dead sounds suggest hidden rot; bright, ringing metal is more reassuring.

Interior condition tells a story of care or neglect. Check the condition of the seats, door cards, and headliner. Deteriorated foam and perished vinyl are common and expected, but water stains under carpets indicate leaks that may lead to structural rust. On MGBs and Triumphs, inspect the floors for dampness; lift the carpets if possible. In Minis, check the scuttle and the heater matrix area. Sunroofs and convertible tops on MGBs and Triumphs are notorious for leaks; examine the drain channels and the bulkhead for corrosion.

Under the bonnet, take stock of the engine and gearbox. For the A-series, look for oil around the rocker cover, sump, and distributor. A clean engine may be freshly rebuilt or recently pressure-washed. Check the oil cap and dipstick for mayonnaise-like emulsification, which suggests coolant ingress. On B-series engines and Triumph units, inspect the block for cracks near the thermostat housing and the head gasket area. Listen for timing chain rattle, and check the gearbox for smooth engagement. Overdrive-equipped cars should test the overdrive function promptly.

Electrics on British cars can be charming or maddening. Test every switch, light, and gauge. Lucas systems are robust when correct and intact, but hacked wiring looms can lead to fires. Look for signs of smoke around the fuse box or aftermarket accessories. A voltmeter across the battery can reveal charging issues. On later Triumphs and MGBs with emissions equipment, check that vacuum hoses are present and intact. The absence of critical hoses can indicate a previous owner removed emissions components improperly, affecting drivability and authenticity.

Carburetion and fuel systems warrant scrutiny. SU carburetors on Minis and MGBs should open and close smoothly; check for worn throttle linkages and leaks. Stromberg carbs on later cars should present clean operation and intact seals. Fuel tanks are often neglected; rust inside leads to blocked filters and poor running. Ask when the tank and pump were last replaced. Inspect the fuel lines for perishing. An engine that runs poorly when cold may only need tuning, but chronic issues could point to cam wear or low compression.

Compression testing is a simple but effective tool. On a warm engine, remove all spark plugs, disable the fuel pump or ignition, and test each cylinder. A healthy A-series typically shows readings within ten percent of each other, usually above 150 psi. B-series engines and Triumph units vary, but consistency across cylinders is more important than absolute numbers. Low readings may indicate valve issues, ring wear, or head gasket failure. A leak-down test can pinpoint the fault later, but a compression test is a good initial filter.

Check the transmission and differential for play and noise. On Minis, the gearbox is integral and robust, but fifth gear can wear. MGBs generally have sturdy gearboxes, but the rear differential can whine if worn. Triumphs, especially overdrive cars, can present linkage wear and leaks. Lift the car if possible and check for play in propshaft UJs and diff bearings. Listen for whines or clunks during test drives. These issues are fixable, but budget accordingly if the car needs a full gearbox or differential rebuild.

Suspension and steering geometry can reveal hidden damage. On Minis, check the rubber suspension cones for perishing and the front subframe for cracks. MGBs should have intact trunnions and kingpins; the rear axle can present spring and shock issues. Triumphs often have lever-arm dampers that may need refurbishment. Drive the car over bumps and listen for clunks. Test the steering for play and the brakes for straight stops. A car that pulls to one side may need more than a simple brake job; it could indicate chassis misalignment.

Rust repairs on panels can be clever or crude. Look for overspray on door seals, window rubbers, and trim. Check door fit and panel gaps; uneven gaps suggest poor previous repairs. On Minis, the door alignment is a known art; poor gaps are a red flag. On MGBs and Triumphs, check the scuttle and the A-pillar alignment. Shine a flashlight along panels to spot ripples and waves. While minor dings are acceptable, significant misalignment may indicate structural issues that demand professional attention.

Paint quality can hide many sins. British cars originally had simple lacquer systems. Later repacks may use two-pack urethanes, which are durable but less authentic for concours. Check paint depth with a gauge if available; thick readings suggest filler. Ask about the preparation process and the materials used. A quality respray is expensive; a poor one will flake and blister, undoing your labor. For concours cars,

correct color codes and paint types matter. For drivers, durability is key, but authenticity still counts where visible.

Look for the right car for the right reason. Early Minis, especially the classic 850 and 1000 models, are simple and widely supported, but they can be small and tinny for modern roads. MGBs offer a larger, more comfortable platform with a robust engine; they are relatively straightforward to work on and parts are plentiful. Triumphs span a range, from the delicate Spitfire to the more substantial TR6. Each has a distinct character, parts ecosystem, and common pitfalls. Choose the one that fits your vision and your driveway.

Value assessment is about context. Check classifieds, auction results, and club forums for comparable cars. Ask owners in clubs for advice; they will often tell you what to watch for and what typical restoration costs are. Remember that cars with “fresh paint” can hide expensive rot, while a rough but complete car may be a better foundation. The cost of missing parts, especially trim and date-specific components, can add up quickly. Always budget a buffer for surprises, because they are guaranteed.

The pre-purchase inspection, whether by you or a professional, is your last line of defense. If the car has an MOT history, review it for recurring issues. Ask for service records, restoration receipts, and photos of previous work. If the seller refuses a thorough inspection or discourages a test drive, walk away. There are other cars. The right project will be honest about its flaws and transparent about its history. Your job is to find the one that matches your skills, ambition, and patience.

Practicality matters when selecting a car. Consider where you will store it and what tools you have. A car that requires a full body-off restoration may be too ambitious for a single-car garage and limited weekends. Conversely, a solid driver needing mechanical refresh may fit your schedule better. Be realistic about your workspace. Adequate ventilation for painting, space for subframe removal, and room to organize parts are essential. A good fit between car and environment keeps the project enjoyable and safe.

Don't underestimate the value of a car with good documentation. The presence of the owner's manual, service book, and a set of original tools can be more than sentimental; they provide clues to the car's history and correct specification. Some clubs offer build sheets and production records. These details help you verify authenticity and guide correct restoration choices. A car with a documented rebuild of the engine or gearbox can be a strong candidate if the work was done correctly. When in doubt, ask for receipts and build photos.

Color and trim choices matter for concours but also for your satisfaction. MGBs, for example, had a rotating palette of period-appropriate colors, and interiors varied by

year and market. Minis had distinctive seat fabrics and dash finishes. Triumphs featured different vinyl types and wood veneers. Decide whether you want the factory-correct look or a personal touch. If concours is the aim, color codes must be accurate and trim patterns original. If driver enjoyment is primary, you can be more flexible, but tasteful choices preserve value.

Once you narrow your candidates, set a scoring system. Rate each car on structural integrity, mechanical condition, electrical health, trim completeness, paint quality, and paperwork. Assign a value to each category and calculate a total. Compare this to the asking price and your budget. This approach helps you avoid falling for the glossy photos while ignoring a rotten sill. It also gives you a negotiating framework. If you find a car with a strong structure and drivetrain but poor paint, that is often a good value.

Finally, consider the support network around the marque. Parts availability, club expertise, and local specialists can make or break a restoration. Minis have a vast aftermarket and active clubs; you can find almost any part, from genuine panels to performance upgrades. MGBs are well supported, with excellent technical documentation and active communities. Triumphs vary; TR6 parts are plentiful, while later models like the TR7 may be harder to source. Choose a marque with the resources to back your project, and your restoration will be smoother and more enjoyable.

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