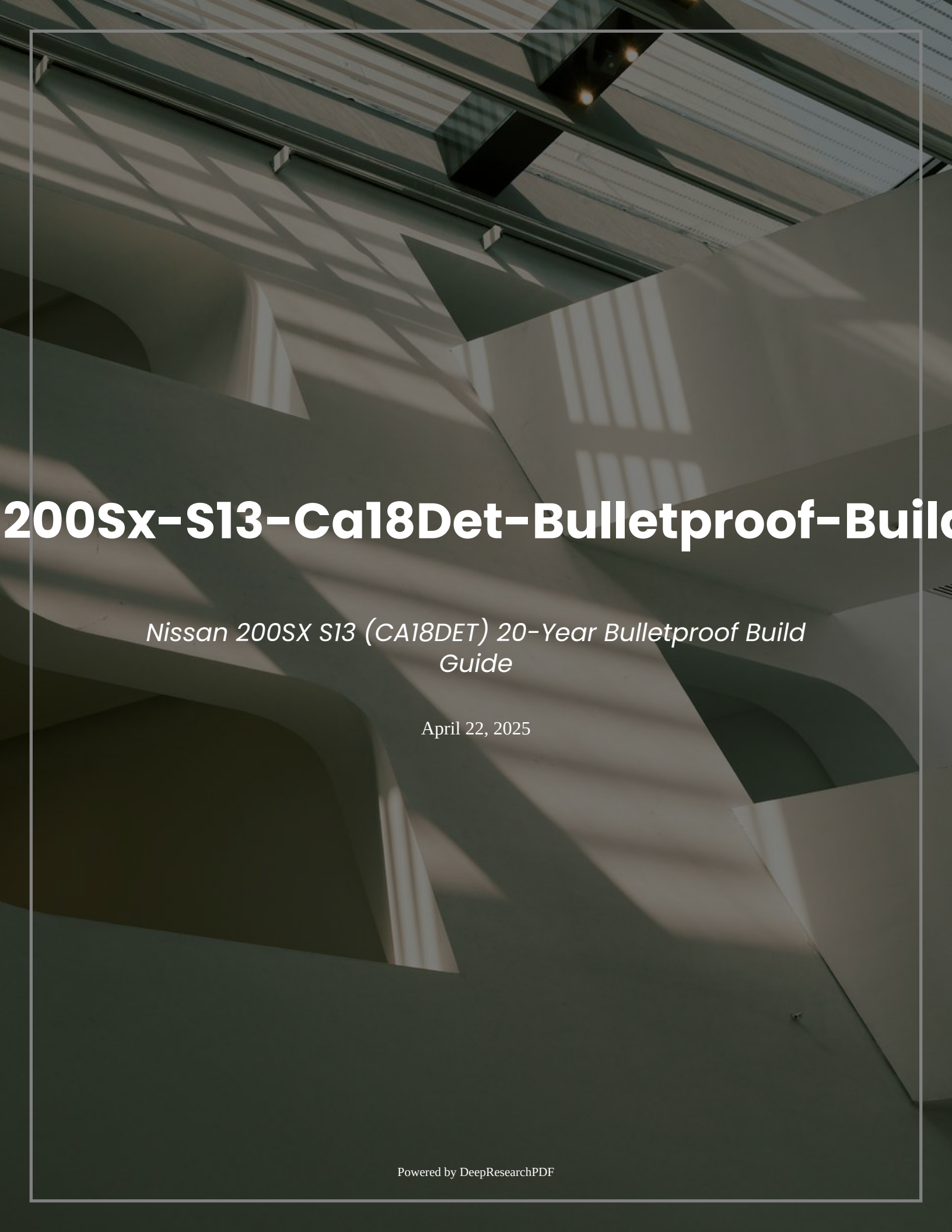

200Sx-S13-Ca18Det-Bulletproof-Build

Nissan 200SX S13 (CA18DET) 20-Year Bulletproof Build Guide

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Nissan 200SX S13 (CA18DET) 20-Year Bulletproof Build Guide

- *Goal: **Transform a mostly stock Nissan 200SX S13 (CA18DET) into an** unbreakable**, balanced race car that can handle touge runs and drift events reliably for the next 20 years. We'll build it in progressive stages – starting with basic maintenance and culminating in a fully reinforced, 250hp track machine that's still enjoyable and street-legal (with proper certifications where needed).

Each stage below outlines **specific parts/upgrades**, their **purpose**, cost-effectiveness ("bang-for-buck"), **difficulty** to install, and **priority**. By following this guide step-by-step, you'll address **reliability first**, then handling, then power, ensuring the car remains robust at each phase. Let's get started!

Stage 1: Essential Reliability & Maintenance (Drift-Ready Baseline)

- Focus:* Before adding power or suspension mods, ensure the 30+ year-old S13 is in top OEM shape. This stage covers **critical maintenance** and minor upgrades so you can do occasional donuts and small drift sessions without breaking anything. The car is mostly stock (already has a Walbro fuel pump and VLSD), so we'll replace all fluids, address known weak points, and verify the engine's health. Short bursts of fun are okay after this stage, but heavy track use should wait until Stage 2+.

- *Key tasks: **Complete fluid changes, tune-up, fix leaks, inspect the engine, and replace wear items. We'll also add basic gauges and small upgrades that give a** reliability buffer**. These steps are** high priority** and relatively easy for a DIYer.

- *Table: Stage 1 Upgrades & Maintenance**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority |

|---|---|---|---|---|

| **Engine Oil & Filter (Quality synthetic)** | Ensure proper lubrication under drift stress. Fresh oil protects the turbo and bearings. | **High** – Essential for longevity; use quality oil (e.g. 5W-40 racing synthetic) and Nissan or OEM-grade filter. | Easy (DIY oil change) | **Critical** □ |

| **Coolant Flush & New Coolant** | Prevent overheating; remove any rust/deposits from cooling system. | **High** – Old coolant loses effectiveness. Refill with OEM-spec coolant/distilled water mix. | Easy | **Critical** □ |

| **Timing Belt Kit & Accessory Belts** (if not recently done) | Prevent catastrophic failure (timing belt snapping can destroy valves). New timing belt, tensioner, idler, and accessory belts (alternator, PS). | **High** – A failed belt can ruin the engine. Use OEM or Gates kit. Do this ASAP if history is unknown. | Moderate (requires mechanical know-how) | **Critical** □ |

| **Spark Plugs (Colder grade)** | Restore ignition performance and prep for future boost increases. Prevent misfires under load. | **High** – Cheap and effective. Use NGK BCPR7ES or equivalent (one step colder than stock for turbo use). | Easy | **High** □ |

| **Ignition System Check** (Coils, wires) | Ensure strong spark. Replace weak coil packs or ignition wires; carry spares. | **Medium** – Stock CA18DET coils are decent up to ~250hp, but aging coils can cause misfire. Consider upgrade in later stage. | Easy | **High** □ |

| **Fuel Filter (e.g. Z32 filter)** | Ensure proper fuel flow and protect injectors (especially with new pump). | **High** – A 300ZX (Z32) fuel filter is a cheap, larger-capacity upgrade that fit (Official CA18DET upgrade guide by float_6969)L104□. | Easy | **High** □ |

| **Adjustable Fuel Pressure Regulator** (FPR) | Needed if a Walbro 255 pump is installed. Prevents Walbro from overpowering the stock FPR at idle (causing rich mix (Official CA18DET upgrade guide by float_6969)-L104. | **Medium** – Aftermarket FPR (e.g. Tomei, Aeromotive) ensures correct fuel pressure. Worth it for engine tune and longevity. | Moderate (requires setting base pressure with gauge) | **High** |

| **Air Filter (Cone or Modded Airbox)** | Improve airflow and filtration. The stock airbox can be opened up or use a quality cone filter. | **High** – Intake breathing helps response. Shield it from engine bay heat for better (Official CA18DET upgrade guide by float_6969)3-L121. | Easy | **Medium** |

| **Driveline Fluids** (Transmission & Differential) | Smooth shifting and diff performance; protects gears in drift abuse. | **High** – Use quality gear oil (e.g. 75W-90 GL-4 for gearbox, GL-5 for diff). Helps the stock trans and VLSD live longer. | Easy | **High** |

| **Brake Fluid Flush (High-temp DOT4)** | Renew brake fluid for safe stopping and clutch operation. Prevents fade and protects hydraulic parts. | **High** – Essential if old fluid is unknown. Use DOT4 or DOT5.1 (e.g. Motul RBF600) for higher boiling point. | Easy | **High** |

| **Brake Pads Inspection/Upgrade** | Ensure sufficient pad life and performance. Replace if low; consider sport pads. | **Medium** – Good pads (e.g. EBC Yellowstuff or Hawk HP+) improve braking for touge runs. Not too expensive for safety gain. | Easy | **High** |

| **Bushings & Mounts Inspection** | Check engine mounts, transmission mount, suspension bushings for cracks. | **High** – Worn mounts cause sloppy feel and parts hitting (e.g. engine fan into shroud). Replace in Stage 2 if bad. Nismo mounts are a g (Official CA18DET upgrade guide by float_6969). | Easy (inspection) | **High** |

| **Basic Gauges:** Boost, Oil Pressure, Water Temp | Monitor engine vitals during spirited driving. Boost gauge for turbo behavior; oil pressure to catch problems early; water temp for cooling. | **High** – **Must have** for any turbo car on track. Even a simple boost and oil pressure gauge can save

your engine (stock idiot light (Official CA18DET upgrade guide by float_6969)e). Consider an AFR gauge in Stage 4. | Easy (wiring required) | **High** □ |

| **ECU Diagnostics & Tune-up** | Run ECU codes, ensure no sensor faults. Fix any vacuum leaks, set ignition timing to factory spec (~15° BTDC). | **High** – A healthy baseline tune prevents engine damage. No cost except time. | Easy/Moderate | **High** □ |

| **Rust and Leak Check** | Inspect chassis for rust (frame rails, strut towers, floor) and fix now to preserve car 20+ years. Also fix any oil/coolant leaks. | **High** – Rust repair early will save the chassis. Small leaks (oil, coolant, PS) should be fixed to avoid failures later. | Moderate (welding for rust) | **High** □ |

| *Optional:* **Grounding Kit** | Improve electrical grounding to ensure stable sensor readings and spark. | **Low** – Cheap DIY (thick wires from battery negative to chassis/engine) (Official CA18DET upgrade guide by float_6969)idle. Not critical but nice. | Easy | Low □ |

- *Stage 1 Summary: **By completing Stage 1, you've essentially "reset" the clock on maintenance. The CA18DET should now be running smoothly on fresh fluids and ignition components. Keep an eye out for any** red flags **during this shakedown period: e.g. low oil pressure, rising coolant temps, odd noises, etc. If all is well, you have a solid foundation. You can safely enjoy some light drifting (burnouts, donuts, maybe a few laps in an open lot) to** get a feel for the car**, knowing that the basics are covered. However, sustained track sessions or heavy abuse should wait until we reinforce cooling and overhaul aging components in the next stage.

- Difficulty:* Mostly **easy DIY** (fluids, filters, plugs) with a few **moderate** tasks (timing belt, mounts). Plan a weekend to tackle all this. It's the most important stage – **don't skip it**. A little money spent here will save you big in the long run.

Stage 2: Engine Refresh and Cooling Improvements

- Focus:* Now that baseline maintenance is done, address the **longevity of the CA18DET engine** itself and cure its known weaknesses. We want the engine to survive high RPM and increased power for decades, so a **refresh or rebuild** is key. At the same time, upgrade the cooling system (and oil cooling) to handle drift and touge abuse without overheating.

In this stage, we'll **inspect and rebuild the engine as needed**: this can range from a top-end refresh (gaskets, seals) to a full bottom-end rebuild with forged internals, depending on the engine's condition and your reliability goals. Given the 20-year horizon, it's wise to at least do a **minor rebuild** of the stock engine if compression or oil pressure are marginal. The CA18DET is robust in stock form for ~250hp, but old age and track use call for renewal of critical parts. We'll also install a larger radiator, better fans, and an oil cooler – essential insurance for hard driving.

- *Key tasks: **Replace all major gaskets (especially head gasket), rubber hoses and lines, and any worn internal components. Upgrade to stronger head studs and consider forged pistons if aiming for maximum durability.** Overhaul the cooling system** with a modern aluminum radiator, proper fan setup, and add an oil cooler. This stage eliminates many potential failure points and preps the engine for safely increasing power in Stage 4.

- *Table: Stage 2 Engine & Cooling Upgrades**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority |

|---|---|---|---|---|

| **Compression & Leakdown Test** (before tear-down) | Assess engine health. Helps decide if a full rebuild is needed or a light refresh will do. | **High** – Numbers should be within spec and even across cylinders. If

low/compression uneven, plan for rings/pistons. | Easy (test) | **Critical** □ |

| **Complete Gasket and Seal Kit** (incl. head gasket) | Renew all engine gaskets: head, intake, exhaust, valve cover, oil pan, etc. Stops leaks and resets engine sealing. | **High** – Essential for an old engine. Use an MLS (multi-layer steel) head gasket for improved strength under boost (e.g. C (Part 5: CA18DET Engine Woes, Time to Build it Better - Driftopia.com)i). New valve stem seals to reduce oil burning. | Moderate (engine disassembly) | **Critical** □ |

| **Head Studs (ARP)** | Stronger clamping force than stock head bolts. Prevents head lifting and gasket failure under high load. | **High** – Proven upgrade on CA18DET builds. ARP studs can be reused and ke (Part 5: CA18DET Engine Woes, Time to Build it Better - Driftopia.com)aled. Must do if replacing head gasket. | Moderate | **Critical** □ |

| **Water Pump (Upgrade)** | New water pump for reliable coolant flow. *Use 1984 200SX CA18ET pump* – a known trick for bet (Official CA18DET upgrade guide by float_6969) CA18DET. | **High** – Old pump blades erode over time. The CA18ET pump i (Official CA18DET upgrade guide by float_6969) upgrade. Very cheap insurance against overheating. | Moderate (front of engine access) | **High** □ |

| **Oil Pump & Pickup Inspection** | Ensure strong oil pressure. Replace pump if worn; clean or replace oil pickup (can clog). | **High** – Oil starvation kills engines. Use a new OEM or high-quality pump. Check/clean the sump and pickup screen of debris. | Moderate (requires pan removal) | **High** □ |

| **Connecting Rod Bearings (ACL or OEM)** & **Main Bearings** | Fresh bearings to restore oil clearances. Crucial if old bearings show wear (common on CA18DET with age). | **High** – Prevents rod knock or failure under sustained drift RPM. Use quality bearings (ACL Race, King) if doing bottom-end. | Hard (engine bottom-end rebuild) | **High** □ |

| **Pistons & Rings** (Optional Forged upgrade) | If compression was low or you want *maximum* durability, replace piston rings or upgrade to forged pistons. Forged pistons handle detonatio (how high can i boost my ca18det with these mods? and how much HP will i get? - Nissan Forum |

Nissan Forums)t better. | **Medium** – Stock pistons are fine for ~250hp, but forged (e.g. Wiseco, CP) add safety margin (at cost of (how high can i boost my ca18det with these mods? and how much HP will i get? - Nissan Forum | Nissan Forums)rt noise). If cylinders are worn, re-bore and go forged; if stock is healthy, new rings on honed cylinders can suffice. | Hard (machine work) | Optional (Mandatory only if stock pistons damaged) |

| **Connecting Rods** (Optional Forged) | Stock rods are usually OK for 250hp; forged rods (e.g. Spool, Eagle) add strength for higher power or continuous abuse. | **Medium** – Good for future-proofing, but if aiming ~250hp limit, stock rods with ARP rod bolts are generally durable. Consider if budget allows, since engine is already open (e.g. Spool H-b (Nissan CA18DET Rebuild Kit with Spool H Beam Conrods and Ross ...)ts available). | Hard | Optional |

| **Camshaft Spray Bars & Lifters** | Clean or replace cam spray oil bars (known to clog on CA18DET) and test hydraulic lifters. Ensures proper valvetrain oiling and quiet operation. | **High** – Often overlooked. Clogged spray bars can starve cams of oil. Either thoroughly clean them or upgrade to new ones. Service or replace any noisy lifters (they can be bled/cleaned). | Moderate | **High** |

| **Timing Belt** (if not done in Stage 1) | *If not already replaced*, do it now along with the above engine work. (Use Gates or OEM belt). | **High** – Cannot stress enough; a fresh timing belt is cheap insurance. Also replace tensioner and idler pulley now if not done. | Moderate | **Critical** |

| **Engine/Transmission Mounts** (Nismo or Polyurethane) | Replace old squishy mounts. Keeps engine and gearbox stable under drifting G-forces. | **Medium** – Nismo rubber mounts are a good compromis (Official CA18DET upgrade guide by float_6969) not too harsh). Poly mounts are stiffer but add vibration. This preserves drivetrain alignment and prevents fan shroud contact, etc. | Moderate | **High** |

| **Performance Radiator (Aluminum)** | Large aluminum radiator for improved cooling capacity. Keeps engine c (Official CA18DET upgrade guide by float_6969)drift/touge runs. | **High** – The stock rad i (Official CA18DET upgrade guide by float_6969)d and likely old. Upgrading to a 2-3

row aluminum unit (Koyo, Mishimoto, CSF) greatly improves heat dissipation. Ensure it fits the S13 CA18 hose positions. | Moderate (direct fit replacement) | **Critical** □ |

| **Cooling Fans & Shroud** | Efficient fan setup to pull air through the radiator. Options: **OEM clutch fan with shroud** (very effective), or dual electric fans with controller. | **High** – The **clutch fan + shroud** is generally most reliable for S13 (no electrical failure risk, and it moves a ton of air) – many drifters stick with it for best results. If going electric, use high-flow fans (e.g. SPAL) and a proper thermostat controller. A shroud (OEM or custom) is **mandatory** to avoid hotspots. | Moderate (fan assembly install) | **Critical** □ |

| **Thermostat (High-flow)** | New thermostat (e.g. Nismo low-temp or OEM) to ensure it's opening properly. A slightly lower temp one can give more headroom before overheating. | **Medium** – Cheap part to replace while doing coolant. Don't remove thermostat entirely (engine needs to reach operating temp). Instead, a quality 68°C or 70°C thermostat can help in track conditions. | Easy | **High** □ |

| **Silicone Coolant Hoses** (Radiator and heater hoses) | Replace old rubber hoses with silicone (Samco, Mishimoto) for durability. Reduces chance of burst hoses during high heat. | **Medium** – Silicone hoses last longer and resist swelling. At minimum, put new OEM hoses if not using silicone. Carry old ones as spares. | Easy/Moderate | **High** □ |

| **Oil Cooler Kit** (with thermostat) | Add an oil-to-air cooler to keep oil temps in check. A thermostatic sandwich plate ensures oil still warms up on street. | **High** – **Vital** for drift/track longevity. CA18DETs in Europe had a fact (Official CA18DET upgrade guide by float_6969)ler (water-oil type), but it's insufficient. Aftermarket oil cooler (Setrab, Mishimoto) with braided lines will prevent oil overheating and maintain oil integrity. | Moderate (need to mount cooler and run lines) | **High** □ |

| **Baffled Oil Pan** (or DIY baffle) | Prevent oil starvation during hard cornering by adding baffles or trap doors in the sump. | **Medium** – The CA18DET's oil pan could allow oil to slosh under sustained lateral G's (drift, long sweepers). Welding in baffle plates or installing an aftermarket

baffled pan (if available) is cheap engine insurance. | Hard (requires pan removal and welding) | **Medium** □ |

| **Ancillary Replacements:** Alternator, Starter (if needed) | Test charging system and starter. Replace or rebuild if weak. | **Medium** – An old alternator might struggle with additional electrical loads (fans, pumps). Upgrading to a higher amperage unit (some use a Nissan Quest alternator on S13) can help once you add electric fans, etc. Do this now if yours is failing. | Moderate | Medium □ |

| **Sensors Refresh** (O2, coolant temp sensor, etc.) | Replace critical engine sensors if old (O2 sensor for AFR, coolant temp sensor for ECU). | **Medium** – New sensors ensure the ECU gets accurate data, which is important before tuning in Stage 4. They're not too expensive and can resolve running issues. | Easy | Medium □ |

- *Stage 2 Summary: **After Stage 2, your CA18DET should be** close to like-new internally **and far more robust. All the "while you're at it" items (gaskets, pump, belts, seals) have been addressed. You've essentially** bulletproofed the engine's core**. With the upgraded cooling system, the car can now handle full track days and drift sessions without overheating, as long as everything is installed and bled properly. Keep an eye on the new gauges: oil pressure should be healthy even when hot (thanks to the fresh bearings and pump), and coolant temps should stay in safe range with the new radiator.

At this stage, you can drive the car more aggressively with confidence. If you did a full rebuild, **break in the engine** properly (gentle driving and varying RPM for the first ~500 km, then change oil). If it was a head refresh only, it's good to go after ensuring no leaks.

- *Difficulty: **This stage ranges from** moderate to hard**. A head gasket and stud install is moderate for an experienced DIY mechanic (or hire a professional if unsure). A full bottom-end rebuild is** advanced** and might require machine shop services – not strictly necessary for ~250hp, but beneficial for long-term durability. If you lack experience, consider having an engine builder do the critical internals, and you handle re-installation and bolt-ons. The cooling

- upgrades are moderate and straightforward bolt-ons.

With a healthy and cool-running engine, we can now turn to the chassis to make the car handle the way we want.

Stage 3: Suspension Overhaul (Drift & Touge Handling)

- Focus:* Now the powerplant is solid, it’s time to make the S13 **handle and grip** like a proper racecar. Stage 3 upgrades the suspension, steering, and brakes to withstand drifting and mountain touge driving. The goal is predictable, stable handling with improved feedback and control. We will **replace 30-year-old bushings**, add **coilovers**, and increase steering angle and adjustability. This stage also lays the groundwork for a proper alignment (Stage 6) by equipping all the necessary hardware.

Key areas to address:

- **Coilovers:** Replace the tired stock shocks/springs with height-adjustable coilovers to dial in ride height, stiffness, and damping.
- **Bushings:** Renew all suspension bushings (many are likely cracked or worn). Urethane bushings or solid mounts firm up the car’s response.
- **Arms and Rods:** Add adjustable control arms (for camber, toe) and upgrade key suspension links (tension rods, tie rods) to withstand drifting forces and allow alignment tuning.
- **Steering Angle:** Drift requires more steering lock. Simple mods like rack spacers or modified knuckles can give you a greater angle to hold big slides.
- **Brakes:** Upgrade brakes now to ensure you can slow down from touge speeds or control your drift entry. We’ll borrow proven Nissan parts from bigger models.

- **Wheel Hubs:** Convert to 5-lug hubs if desired, to unlock a wider selection of wheels and to use bigger OEM brakes.
- *Important:** Doing all suspension work at once is efficient – one big teardown to install everything, then one alignment at the end. This stage greatly transforms how the car drives.
- *Table: Stage 3 Suspension & Chassis Upgrades**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority |

|---|---|---|---|---|

| **Coilover Suspension Kit** (quality coilovers) | Replace stock springs/shocks with performance coilovers (height & damping adjustable). Lowers car, reduces body roll, and allows tuning for drift vs grip balance. | **High** – The single most transformative handling upgrade. Go with reputable brands: e.g. **BC Racing BR Series** (affordable & proven ~\$1000), Tein Mono Sport, KW V3, or HSD. Aim for spring rates ~8–10 kg/mm front and 6–8 kg/mm rear (common for drift setups) unless a specific brand suggests otherwise. Avoid ultra-cheap eBay coilovers (they often ride harsh and fail early). | Moderate (bolt-on, but needs alignment after) | **Critical** □ |

| **Full Bushing Replacement** (Polyurethane bushing kit) | Replace aging rubber bushings in suspension arms, subframe, etc., with polyurethane (or new rubber). Restores tightness and alignment consistency under load. | **High** – 30-year-old rubber is likely shot, causing slop. A master poly bushing kit (Energy Suspension, SuperPro) is relatively inexpensive and dramatically improves response. It is labor-intensive to install (old bushings must be pressed/burned out), but doing it now is worth it. For a drift car, poly is fine and much better than old rubber. | Hard (requires pressing bushings in/out) | **High** □ |

| **Front Lower Control Arms** (Refresh or Upgrade) | Restore front-end stability. Options: rebuild stock LCAs with new ball joints & poly bushings, **or** upgrade to extended adjustable arms. Longer arms increase track

width and camber gain (common drift mod). | **High** – At minimum, new ([

Car Feature>> Southeast Drift S13 In Atlanta - Speedhunters](https://www.speedhunters.com/2008/11/car_feature_gt_gt_southeast_drift_s13/#:~:text=In%20case%20you%20were%20wondering,and%20Suspension%20Techniques%20sway%20bars)).g. Moog) in front LCAs. Many drifters use S14 LCAs on S13 for ~10mm extra length per side ([

Car Feature>> Southeast Drift S13 In Atlanta - Speedhunters](https://www.speedhunters.com/2008/11/car_feature_gt_gt_southeast_drift_s13/#:~:text=In%20case%20you%20were%20wondering,and%20Suspension%20Techniques%20sway%20bars))eering angle potential). Aftermarket tubular LCAs with adjustable length are another option if within budget. | Moderate | **High** □ |

| **Adjustable Rear Camber Arms** | Replace rear upper control arms with adjustable ones. Allows setting proper camber after lowering (stock will camber in too much). | **High** – Essential for rear tire grip. Brands: GKTech, Driftworks, SPL, etc. Even budget ones (ISIS/ISR) can work, but quality heim joints last longer. Set rear camber to ~-1.5° to -2° for a balance of grip and drift (we'll align in Stage 6). | Moderate | **High** □ |

| **Adjustable Rear Toe Arms** | Replace rear toe links to adjust toe angle. Lowered S13s get increased toe-in; these arms bring it back to spec or to a preferred angle. | **High** – Crucial for stability. Toe arms also help center the wheel in the arch on squat. Same brand options as camber arms. With adjustable camber and toe, you can eliminate unwanted "bushing flex" alignment changes. | Moderate | **High** □ |

| **Front Tension Rods (Caster Arms)** | Install adjustable tension/caster rods in front. Improves steering response and allows caster adjustment (which affects steering feel and self-centering). | **Medium** – Stock tension rod bushings are oil-filled and often leak/tear. Upgrading to pillowball adjustable rods (e.g. Cusco, Tein, ISR) eliminates slop. This will increase road feedback (some NVH) but is worth it for precise control. Set caster around 7° for good self-steer. | Moderate | **High** □ |

| **Steering Angle Mod** (Rack spacers or angle kit) | Increase steering lock for drifting. E.g. install spacers on the steering rack ends or swap to modified knuckles. | **Medium** – **Rack spacers** are cheap (~\$20-50) and give a noticeable angle bump (~+15%). For more angle, aftermarket knuckles (Drift Knuckles, Wisefab kit) can provide 50-70° lock but are pricier and more complex. A modest spacer setup is bang-for-buck to start; you can upgrade knuckles later if competing seriously. | Moderate (requires alignment) | **Medium** □ |

| **Tie Rods and Ends** (Upgrade) | Stronger tie rods to handle drift abuse and extra angle. Consider S14 or aftermarket tie rods, which are beefier and slightly longer. Also get tie rod ends that allow more angle (some have built-in spacers or use a smaller head to not bind). | **Medium** – S14 OEM tie rods ([

Car Feature>> Southeast Drift S13 In Atlanta - Speedhunters](https://www.speedhunters.com/2008/11/car_feature_gt_gt_southeast_drift_s13/#:~:text=In%20case%20you%20were%20wondering,and%20Suspension%20Techniques%20sway%20bars))S13 and are a common upgrade. Tein also makes tie rods with spacers specifically for more steering angle. Cost is moderate and they add durability (stock rods can bend if you hit full lock hard or a pothole). | Moderate | **Medium** □ |

| **Sway Bars (Anti-roll bars)** | Upgrade front and rear sway bars to adjust body roll and handling balance. Thicker bars reduce roll; tuning front vs rear stiffness can dial in oversteer/understeer balance. | **Low/Medium** – Not absolutely required if coilovers are stiff, but a popular upgrade. E.g. Suspension Techniques or Whiteline sway bars. For drift, many keep stock front bar or slightly bigger, and *maybe* a stock or softer rear bar to keep rear traction (some drifters even disconnect rear bar for more grip while sliding). For touge, balanced upgrade front & rear can improve cornering response. Consider adjustable endlinks as well. | Moderate | Medium □ (tune to preference) |

| **Subframe Bushings/Mounts** | Install solid or poly bushings in the rear subframe. Prevents subframe “squirm” under load (important for drift transitions) and maintains alignment. | **High** – The rear subframe on S13s

is notorious for loose bushings. Poly inserts are a quick fix, but full replacement is better. Solid aluminum bushings give the best rigidity (at cost of noise); poly is a good compromise. This mod greatly improves rear end feel. | Hard (pressing out old bushings or burning them out) | **High** □ |

| **Strut Tower Braces** (Front & Rear) | Add bolt-on strut braces to tie together the shock towers, reducing chassis flex. Improves steering response and suspension effectiveness. | **Medium** – Many S13 braces available (Cusco, Tanabe, even OEM from convertible S13 for front). They're relatively cheap and easy to install. Benefit is moderate but noticeable on an old chassis. Particularly, a rear strut bar helps stability in transitions. | Easy | Medium □ |

| **Brake Upgrade – Front** (300ZX/Z32 4-piston calipers + rotors) | Dramatically improve braking power and fade resistance by swapping to Nissan 300ZX (Z32) front brakes. These aluminum 4-pot calipers bolt up with adapter brackets and larger rotors (30mm thick). | **High** – A well-trodden path: Z32 4-piston brakes are **plug-and-play** for S13 with the right parts and going 5-lug, or you can get redrilled rotors for 4-lug. This gives you braking on par with modern sports cars, vital for mountain runs and cooling between drift runs. You'll need Z32 calipers, rotors, pads, and conversion brake lines. On a budget, even stock S14/S15 brakes (280mm) are an improvement, but Z32 is best value. | Moderate (needs some mechanical skill and bleeding) | **High** □ |

| **Brake Upgrade – Rear** (Z32 2-piston calipers + rotors) | Upgrade rear brakes to match the front. Z32 rear setup includes 2-piston calipers and larger rotors, plus an internal drum for handbrake. | **Medium** – The rear upgrade is less crucial than front, but helps overall brake balance and endurance. If using a hydraulic handbrake later (Stage 7), dual-piston rear calipers will hold better. This swap is a bit more involved (need Z32 drum handbrake assembly and cables to keep an effective parking brake). Alternatively, you can stick with stock rear calipers for now and just use good pads. | Moderate/Hard (needs adapter and e-brake cable solution) | Medium □ |

| **Brake Master Cylinder** (BM57 17/16″) | If front (and rear) brakes are upgraded, use a larger master cylinder (e.g. from Z32 or BM57) to get proper brake pedal feel and bias. | **Medium** – A larger master prevents a long mushy pedal after installing big calipers. The 17/16″ Z32 BMC is ideal when running 4-pots front & 2-pots rear. With just front upgrade, a 15/16″ BMC from an ABS S13 or S14 can also work. Cost is moderate. | Moderate (bleeding required) | Medium □ |

| **5-Lug Hub Conversion** (Front & Rear) | Convert from 4x114.3 to 5x114.3 wheel hubs. Increases wheel choices and allows use of OEM big brake rotors without re-drilling. | **Medium** – S14 5-lug hubs or aftermarket conversion hubs bolt on. This is often done in conjunction with brake upgrades and new wheels. It's not a performance gain per se, but gives you access to modern wheel sizes and the Z32 rotor fitment. If you plan to run 4-lug longer, you can redrill rotors to 4-lug as a stopgap. Ultimately 5-lug is preferred for strength and selection. | Moderate | Medium □ (do by Stage 6 if doing at all) |

- *Stage 3 Summary: **Your S13's suspension should now be completely transformed. Expect a** much stiffer, more responsive ride** – the car will feel like a go-kart compared to stock. Body roll will be greatly reduced by the coilovers and bushings, and you'll notice the car holds a drift line with more consistency (no more "mushy" feeling when you flick it). On touge runs, the car will communicate clearly through the wheel and seat, giving you confidence to push it.

The new adjustable arms mean you can dial in aggressive alignment settings (we'll cover suggestions in Stage 6). The brake upgrades ensure you can **attack corners and then scrub off speed reliably**, lap after lap. (Always bed in new pads/rotors properly before heavy use.)

With the steering angle mods and quick response suspension, initiating and holding drifts will be much easier. The car will also be more predictable when grip driving, with less understeer.

- Note:* With polyurethane bushings and solid mounts, you'll get **increased NVH (noise, vibration, harshness)**. This is expected in a race-oriented build – you might hear diff whine or feel the road texture

- more. It’s a trade-off for precision and durability. Given the “easy to live with” goal, we chose mostly poly (not solid metal) for bushings to keep some compliance.

- *Difficulty: **This stage is** moderate **to** hard** due to the breadth of work. Installing coilovers and bolt-on arms is moderate. Bushing replacement can be *labor intensive* without a press (burning out bushings is messy but effective). Take your time or do sub-projects (front suspension one weekend, rear the next). Safety first: use proper spring compressors (for removing old springs) and have jack stands on solid ground when working under the car.

After Stage 3, **get a performance alignment** (at least roughly) to make the car drivable. Even before Stage 6’s fine-tuning, you should set the camber and toe to reasonable values now to avoid excessive tire wear or dangerous handling on your test drives. For example: front camber ~-3°, toe ~0; rear camber ~-2°, toe +0.1° total in (for stability). These are ballpark – we will refine in Stage 6.

Now, with a solid engine and suspension, we move on to extracting more power from the CA18DET safely.

Stage 4: Power Upgrades (Reliable ~250HP Setup)

- Focus:* Time to give the S13 some much-needed punch. The CA18DET stock puts out around 167 hp (stock), but our target is a **reliable 250 hp** (approximately 180–200 kW) with quick response – plenty for fun drifting and touge runs without pushing the engine to its limits. This stage upgrades the **turbo and fuel system**, adds supporting mods (intercooler, exhaust, intake), and installs a programmable engine management solution to get everything tuned safely. The goal is **responsive, lag-free power** in the ~250 hp range that the car can handle all day.

Key components to address:

- **Turbocharger:** The stock T25 turbo is small and inefficient past ~0.8 bar (12 psi). We'll upgrade to a modern turbo (or a factory Nissan unit from an SR20) that can flow ~250hp worth of air with minimal lag.
- **Intercooler:** The tiny side-mount IC needs to go. A front-mount intercooler will keep charge temps low during hard runs.
- **Fuel system:** Upgrade injectors to supply the extra fuel for 250hp, and ensure the Walbro pump (already installed) is paired with an adjustable FPR (from Stage 1/2).
- **Air intake and exhaust:** Let the engine breathe – a free-flowing exhaust and intake will support the power and reduce strain.
- **Engine management:** Use either a tuned chip or a standalone ECU/piggyback to properly control fuel and ignition for the new hardware. This is **critical** for reliability – a bad tune can blow even a built engine.
- **Boost control:** Install a boost controller to precisely set and hold the desired boost (likely around 1 bar / 14-15 psi for our target with the new turbo).

By the end of Stage 4, the CA18DET will wake up significantly, making around 250hp with strong mid-range torque, while still being under-stressed. This power level, combined with the lighter S13 chassis and improved suspension, will make the car very lively.

- *Table: Stage 4 Engine Power Upgrades**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority |

|---|---|---|---|---|

| **Turbocharger Upgrade** (e.g. Garrett GT2560R aka "S15 T28") | Increase airflow for ~250hp capability. The GT2560R (from the Silvia S15) or similar will bolt to the CA manifold with (Official CA18DET upgrade guide by float_6969)nd offers quick spool and ~280hp max . | **High** – This

is the heart of the power upgrade. A used S14/S15 **T28 turbo** is a common, cost-effective choice (Official CA18DET upgrade guide by float_6969)t plug-and-play and can reach ~250whp. Alternatively, a new Garrett GT28RS (Disco Potato) or GT2860R gives modern ball-bearing response (at higher cost). Ensure to get the matching turbo lines and an adapter for the CA turbo outlet if needed. | Moderate (turbo swap) | **Critical** □ |

| **Aftermarket Exhaust Manifold** (Optional) | A tubular manifold can slightly improve flow and turbo response. Not strictly needed at 250hp. | **Medium** – The stock cast manifold is durable and fine for our power goal. Many keep it for reliability (less cracking). If you seek every bit of response, a high-quality tubular manifold can help, but avoid cheap ones (crack prone). Consider Stage 8 for a manifold if ever aiming above 300hp. | Moderate | Low □ |

| **Front-Mount Intercooler (FMIC)** | Greatly improve charge cooling vs. stock side-mount. Reduces intake air temperatures, preventing power loss and detonation at higher boost. | **High** – A FMIC is a must for sustained power. Many bolt-on kits available for S13 CA18DET. Go for a medium size (e.g. core 600x300x76mm) to fit behind the bumper with minimal cutting. More cooling means you can run higher bo (Official CA18DET upgrade guide by float_6969)Stock IC was tiny and heat-soaks easily.) | Moderate (piping install) | **Critical** □ |

| **Intercooler Piping + BOV/Recirculation Valve** | Hard pipes to replace factory rubber, and a blow-off or recirculation valve to relieve boost pressure when lifting throttle. | **High** – Metal piping (often included in FMIC kits) prevents expansion and improves thr (Official CA18DET upgrade guide by float_6969)e. **BOV**: The CA18DET had no stock BOV, causing compressor surge which is hard on the turbo. Install a BOV (recirculated into intake to avoid rich spikes since we still use MAF) to prolong turbo life. Many kits include a generic BOV, or choose a reliable one (HKS, Greddy). Recirculate it or switch to a MAP-based tune later to vent to atmosphere freely. | Moderate | **High** □ |

| **Fuel Injectors (~550cc)** | Increase fuel delivery for 250hp. Stock 370cc injectors will max out ~220-230 (how high can i boost my ca18det with these mods? and how much HP will i get? - Nissan Forum | Nissan Forums)*450–550cc **injectors for safe overhead. |** High **–** Side-feed vs Top-feed**: The CA18DET uses top-feed low impedance injectors (with resistor pack). You can g (Deatschwerks 550 cc/min Injectors for Nissan 200SX S13 (CA18DET))igh-flow injectors (DeatschWerks 550cc kit) that fit the stock rail. Alternatively, convert to top-feed high impedance with a new rail and remove resistor pack – more future-proof but more work. Either way, go with known brand injectors for relia (how high can i boost my ca18det with these mods? and how much HP will i get? - Nissan Forum | Nissan Forums)gives overhead for ~300hp if ever needed. | Moderate (fuel rail removal) |** Critical** □ |

| **Fuel Pump** (already Walbro 255LPH) & Wiring | The Walbro 255 LPH in-tank pump is already installed, which is good for this power. Ensure it's wired properly (with a relay/hardwire kit) for consistent voltage under load. | **High** – The pump is capable; just verify its installation is solid and maybe upgrade the wiring (old thin wiring can drop voltage under load). Also confirm the **adjustable FPR** (Stage 1) is installed and set to ~3 bar bas (Official CA18DET upgrade guide by float_6969)ith vacuum off, to handle the Walbro's flow. | Moderate | **Critical** □ |

| **Mass Airflow Sensor (MAS/MAF) Upgrade** | The stock CA18 MAF may top out around this power. Upgrade to a higher capacity MAF or go MAP sensor. Common upgrade is the Nissan Z32 (300ZX) MAF, which can measure up to ~500hp worth of airflow. | **Medium** – **Z32 MAF** is a popular choice; it's reliable and proven. It requires wiring in the new connector and an ECU tune that knows the Z32 calibration. Alternatively, if using a standalone ECU, consider switching to MAP sensor (speed-density) which eliminates MAF entirely. If using something like a Nistune or Horsham chip, they often are programmed for Z32 MAF and specific injectors. | Moderate (wiring + tuning) | **High** □ |

| **ECU / Engine Management** | Install a programmable ECU solution to tune for the new injectors, MAF, and turbo. Options: a chipped ECU with a

custom map (e.g. Horsham Developments Stage 2 chip for CA18DE (Official CA18DET upgrade guide by float_6969)ck (like Nistune board or SAFC + ECU re-chip), or a full standalone ECU (Link, Haltech, Megasquirt). | **High** – Getting the tuning right is *crucial* for reliability. **Budget option**: a Stage 2 pre-made chip (commonly available in Europe) tuned for ~250hp (usually expects T28 turbo, ~1 bar, Z32 MAF, 550cc injectors). This is plug-and-play but not as flexible. **Mid option**: Nistune – an installable daughterboard on the stock ECU that lets a tuner live-tune the ECU (keeping all OEM fail-safes). **High-end**: standalone ECU – costly but offers most control (might be overkill for 250hp, but great for future). In any case, get a professional dyno tune after hardware install. The result will be a smooth, safe 250hp. *(Avoid relying solely on something like an SAFC piggyback without an ECU tune – (Official CA18DET upgrade guide by float_6969)notes, that can mess with timing dangerously.)* | Hard (requires tuning expertise) | **Critical** □ |

| **Exhaust – Turbo Elbow & Downpipe** | Upgrade the turbo outlet (elbow) and downpipe to 3″ diameter. Reduces backpressure after turbo, improving spool and power. | **High** – Stock turbo elbow and downpipe are restrictive. Aftermarket elbow (specific for CA18DET or S13 SR20 one can be adapted) plus a 3″ downpipe will free up a lot of horsepower and help the turbo run cooler. Ensure it has a flex section to reduce stress. | Moderate (bolts can be stubborn) | **High** □ |

| **Exhaust – High-Flow Catalytic Converter** (or test pipe) and **Cat-Back** | Further reduce backpressure with a high-flow cat and 3″ cat-back exhaust. Increases power and turbo response, but also noise. | **High** – The full exhaust is needed to reach our power goal efficiently. Use a quality high- (Official CA18DET upgrade guide by float_6969)al core) to stay street legal and eco-friendly. For cat-back, choose something with good flow – 3″ straight-through muffler design. Brands like HKS, Apex'i, Blitz have systems; or a custom exhaust shop can make one. Expect a louder car; you can add a resonator to tame drone. | Easy/Moderate (mostly bolt-on) | **High** □ |

| **Intake Hard Pipe** (Turbo inlet pipe) | Replace the accordion stock intake pipe with a smoother, wider hard pipe. Improves airflow to turbo and

reduces effort. | **Low** – The st (Official CA18DET upgrade guide by float_6969)let has ribs and a spring inside that hurt flow. An aluminum or silicone hard intake pipe (with provisions for recirculating BOV) will marginally improve throttle response. It's a minor gain but cheap and makes maintenance easier. | Easy | Low □ |

| **Upgraded Air Intake** (pod filter or cold-air intake setup) | If not done in Stage 1, ensure the turbo is getting ample cold air. A cone filter in the engine bay is fine, but shield it from heat or draw from behind the headli (Official CA18DET upgrade guide by float_6969)um **– As noted earlier, cold air = better power. You can route a duct from the bumper to the filter, or use an airbox. It's mostly about consistency (avoiding heat soak on hot days). Cost is low if already have a cone filter. | Easy |** High** □ (if not already done) |

| **Boost Controller** (manual or electronic) | Precisely control boost level to ~14 psi (1 bar) for our target power. | **High** – A **manual boost controller** (ball-and-spring type) is cheap and effective; set and forget. An **electronic boost controller** (HKS, Greddy, or ECU-controlled) offers finer control and boost-by-gear options (overkill for now). Even a simple controller is far better than relying on the wastegate spring if you want to maximize the new turbo. Don't exceed safe boost (tuner will advise, likely ~1 bar). | Easy | **High** □ |

| **Ignition Upgrade** (coil packs or ignition amplifier) | (Optional) Ensure strong spark for increased boost. The stock ignition might be fine at 250hp, but if you experience misfires, consider upgrading coils. | **Medium** – Many CA18 owners retrofit **coilpacks fr (Nissan 180SX (CA18DET) - R8 Coil Upgrade Kit - 5-0 Ignite)rs** – e.g. Audi R8 coil conversion kits are popular. They deliver hotter spark and are fairly cost-effective. Alternatively, an ignition amplifier (HKS DLI) with stock coils can help. If Stage 2 tune-up was done and coils are healthy, you may not need this yet. Keep it in mind if any high-boost spark blowout occurs. | Easy | Medium □ |

| **Clutch Upgrade** (if not done already) | The clutch must handle ~250hp and repeated clutch kicks. Upgrade to a performance clutch kit. | **High** –

By now, if your clutch wasn't replaced, it likely will start slipping with the new power. A stage 2 or stage 3 clutch (Exedy, ACT, SPEC) with rating ~300ft-lb torque is ideal. SPEC makes CA18DET clutches; or use a KA24DE clutch as NICO suggests (Official CA18DET upgrade guide by float_6969)wheel alignment pins to fit KA clutch on CA flywheel). Expect a heavier pedal and some chatter if aggressive, but necessary for drift abuse. | Moderate | **Critical** □ |

- *Stage 4 Summary: **After completing Stage 4 and a proper tune, your CA18DET should be putting out roughly** 250 horsepower with strong midrange torque**. In a 200SX S13, this is a sweet spot – the car will be** significantly faster **on the straights and can spin the rear wheels easily on demand in 2nd or 3rd gear for drifting. Importantly, we've built this power setup with** reliability in mind**: the turbo is not pushed to its limit, the fueling is ample (injectors at maybe 70% duty at full load, pump and MAF well within capacity), and the intercooler and cooling upgrades keep temperatures in check. This means you can do back-to-back touge runs or drift runs without heat-soaking or knocking.

Remember that with great power comes great responsibility – **monitor those gauges**. Keep an eye on the wideband O2 (if one installed), boost, and oil pressure while driving hard. The tune should have some safety margin (not too lean, not too much timing). Running a conservative ignition map will help engine longevity at the expense of a few hp – a worthwhile trade-off for a 20-year build.

Now, when you test the car, you'll likely need to adjust the **boost controller** to hit target boost and ensure it's stable (no spikes). It's wise to have the car dyno-tuned or at least air-fuel checked under load after all mods – this stage is one where professional tuning pays off big time for reliability.

At this point, the car is very much "event-capable." You could take it to a drift day or a hill climb and have a blast. However, to truly make it "unbreakable," we need to shore up the drivetrain and finalize the supporting mods (tires, alignment, safety gear). The next stages will

address those.

- *Difficulty: **Stage 4 is** moderate-hard**. The hardware installation (turbo, intercooler, etc.) is moderate for a DIYer – mostly bolting things on, trimming a bit of bumper for FMIC, etc. The challenging part is the** tuning**. If you are not experienced in tuning, budget for a professional tuner to set up your ECU (especially if using a standalone or something like Nistune). This ensures you get the performance and reliability benefits without the risk of an incorrect setup. It's often worth it to invest in dyno time now rather than in a new engine later.

With power and handling sorted, we move to strengthening the drivetrain to handle this newfound performance.

Stage 5: Drivetrain and Differential Improvements

- Focus:* Strengthen the drivetrain so it can reliably transmit the increased power and endure drifting stress. The S13's gearbox, driveshaft, and differential will be put to the test with clutch kicks and hard launches. We'll ensure the clutch is up to spec (if not already upgraded), improve the shifter feel, and bulletproof the differential for consistent lockup.

This stage also considers gear ratio and traction: the stock viscous LSD (VLSD) in the 200SX may be wearing out by now, so a **proper limited-slip differential** is key for predictable drifts and powering out of corners. We'll look at upgrading to a mechanical LSD (1.5-way or 2-way) or a budget alternative if needed. Additionally, reducing slack in the drivetrain (via a one-piece driveshaft and bushings) will improve response and longevity.

- *Table: Stage 5 Drivetrain Upgrades**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority |

|---|---|---|---|---|

| **Performance Clutch & Flywheel** (if not done prior) | Ensure the clutch can handle 250hp and abusive drift kicks. A stronger clutch kit and optional lighter flywheel improve power holding and engine response. | **High** – A **Stage 2/3 clutch kit** (e.g. ACT HD, Exedy, or SPEC Stage 3) with an uprated pressure plate and sprung performance disc will hold the torque. Expect a stiffer pedal. Pair it with a lightweight flywheel (e.g. Fidanza ~4.3kg) for quicker rev-matching and easier clutch kicking. Lighter flywheel helps engine spin up faster, but too light can be tricky for street; ~5-6kg is a good compromise. | Moderate (transmission removal) | **Critical** □ |

| **Short Shifter Kit** | Improve shifter feel and reduce throw distance. Helps quick gear changes during drifting. | **Medium** – A short throw shifter (e.g. B&M;, ISR) tightens up the shift gates and gives a more precise feel. It’s a relatively cheap mod. Be cautious: some cheap ones rattle; a quality one will feel solid. Also replace the shifter bushing while in there. | Easy/Moderate | Medium □ |

| **Transmission Mount** (Poly/Nismo) | Reduce gearbox movement. Improves shifter feel and prevents mis-shifts under hard driving. | **Medium** – If n (Official CA18DET upgrade guide by float_6969)Stage 2, definitely do now. A stiffer trans mount (Nismo or polyurethane) keeps the transmission from rocking. This, combined with engine mounts, also helps keep the driveshaft alignment correct. | Easy | **High** □ |

| **One-Piece Driveshaft** (Aluminum or Steel) | Replace the two-piece stock driveshaft (with center bearing) with a single-piece unit. Increases reliability and throttle response by removing the center joint and rubber carrier. | **High** – One-piece aluminum shafts reduce rotational mass and eliminate the failure-prone center support bearing. Less slop in power delivery, and one less component to wear out. It may add a bit of NVH at certain speeds but is generally worth it for a performance build. Make sure it’s balanced well. | Moderate (direct swap) | **High** □ |

| **Limited Slip Differential (LSD)** (1.5-way or 2-way) | Provide consistent lockup of rear wheels for drifting and improved traction on acceleration. A clutch-type LSD will outperform the stock VLSD or any welded diff in both longevity and predictability. | **High** – **Best:** Aftermarket clutch-type LSD (Kaaz, Cusco, Tomei, Nismo). A 1.5-way locks on acceleration and partial on decel; a 2-way locks equally on accel/decel (preferred by many drifters for consistent slide control). These diffs a (Welding the S13 Differential (The Perfect Practice Diff) - Driftopia.com)300, but last long (rebuildable) and give awesome control. **Budget:** If cost is an issue, a welded stock diff is an option (essentially 100% lock all the time). It's very predictable for drift but harsh on the street (tires scrub in t (Welding the S13 Differential (The Perfect Practice Diff) - Driftopia.com)and stresses axles. It's nearly free (just welding labor), but not ideal for 20-year street use. If you weld, plan to eventually get a proper LSD. | Moderate (setup lash or swap pumpkin) | **Critical** □ (for serious drift, LSD or weld is a must) |

| **Differential Final Drive Gear** (Optional) | Change diff gear ratio for desired acceleration. E.g. shorter gears (numerically higher, like 4.3:1) for quicker acceleration at expense of top speed – beneficial in touge and drift to stay in power band. | **Medium** – The CA18DET S13 often came with around 3.9:1 final drive. Swapping to a diff from an automatic S13 or S14 (often 4.083) or R33 Skyline GTS (4.36) can liven up acceleration. This is optional and depends on your tracks – shorter gears help in tight courses but raise highway cruising RPM. If you get a custom LSD, you can often spec the ratio. Consider this if you find you're between gears on your favorite track. | Hard (setting up diff gears precisely) | Low □ (driver preference) |

| **Axles (Half-shafts) Refresh/Upgrade** | Check rear axle CV joints for wear. Replace boots or entire axle if needed. Upgrade to stronger axles if planning more power or using a harsh 2-way LSD. | **Medium** – Stock S13 axles can handle moderate power, but drifting puts shock loads on them. If you hear clicking, reboot or replace with remanufactured units. Some upgrade to JDM S13 axles or Z32 NA axles which are slightly beefier. Generally, if your LSD is set up right (with some give), axles will last. Keep spares if you have a welded diff – that setup is less forgiving. | Moderate |

Medium □ |

| **Clutch Hydraulics Upgrade** (Optional) | For improved clutch feel and reliability: stainless braided clutch line (bypass the clutch dampener box) and maybe an upgraded slave cylinder. | **Medium** – The stock clutch line has a dampening loop that can make bleeding tough and softens feel. An aftermarket line gives a more direct pedal feel. Also ensure the clutch master and slave are in good condition or replace them to handle the heavier clutch. This is a cheap and easy upgrade while working on drivetrain. | Easy | Medium □ |

| **Transmission** (Inspect or Upgrade) | The stock CA18DET 5-speed gearbox is generally okay up to ~250-300hp if not abused; however, after lots of drifting it may wear out. Inspect for grinds. If constantly failing, consider a stronger transmission swap. | **Medium** – Check the trans oil for metal and see if any gears grind at high RPM. Common upgrade if needed: **Z32 300ZX 5-speed gearbox** or **RB25 gearbox**, using an adapter kit – they handle much more abuse but require custom fitting and are expensive. Not necessary unless you plan to exceed our power or the stock box breaks. For longevity, treat the stock trans kindly (clean shifts, good oil). Many drift S13s run stock trans with no issues at this power. | Hard (if swapping) | Low □ (monitor condition) |

| **Poly Diff Bushings** (if not already) & Braces | Ensure the differential is firmly mounted. Poly or solid diff bushings will prevent clunk and keep the diff alignment solid. Also consider a rear subframe brace or diff brace if available to reduce wheel hop. | **Medium** – If you didn’t replace diff mounts in Stage 3 (as part of subframe bushings), do it now. Solid aluminum diff bushings will transmit gear noise but keep the diff planted. A diff brace (like GKTech rear brace) can further support the nose of the diff. These prevent excessive movement during clutch kicks and hard shifts, protecting the rear end. | Moderate | High □ |

| **Drive Train Fluids** (re-check) | After all these changes, refill/flush fluids: fresh gear oil in trans (if clutch kick wear) and diff (especially if new LSD – use proper LSD oil). | **High** – Cheap maintenance. If installing a clutch-type LSD, use the manufacturer’s recommended oil (often with friction

modifier) and follow break-in procedure (usually figure-8s). Keep it fresh for longevity. Likewise, a yearly trans oil change isn't a bad idea with frequent drifting. | Easy | **High** □ |

- *Stage 5 Summary: **The drivetrain is now prepped to** handle the power and stress**. With a strong clutch and LSD, you'll be putting the 250hp to the ground effectively. Drifting will feel more controlled because the LSD will lock the rear wheels consistently – no more one-wheel-peel or unpredictability from the old VLSD. A 2-way LSD, in particular, will make transitions ((Welding the S13 Differential (The Perfect Practice Diff) - Driftopia.com) off throttle) very predictable, since it locks on decel as well. Just be ready for some chatter or noise during tight low-speed turns (especially 2-way diffs are known to clunk; the "Super Q" versions have quieter operation at extra cost).

The one-piece driveshaft will sharpen throttle response – you might notice the car "jerks" more immediately when you tap the throttle or clutch-kick, which is good for drift but requires fine footwork for smooth driving. The drivetrain slop should be minimal now, giving you confidence when initiating slides or accelerating out of hairpins.

With the **short shifter and mounts**, gear changes will feel race-car crisp. No more misshifts or vague gear engagement. Remember to always **rev-match your downshifts** (especially with a lighter flywheel) to avoid shock to the transmission and diff – it will prolong their life.

At this point, mechanically, the car is very stout. We will now optimize the wheel/tire setup and dial in the alignment to extract all the performance from the chassis.

- *Difficulty: **Stage 5 is** moderate**. Clutch replacement is the hardest part if not already done (requires transmission removal). LSD installation can be moderate: if buying a whole diff pumpkin, it's a direct swap; if installing an LSD unit into your diff, it requires setting backlash/shimming – may need a specialist. Driveshaft is easy bolt-on. Most other items are straightforward bolt-ins. Welding a diff (if you choose that route) obviously requires welding skill. If unsure about diff setup, a shop can install the LSD and set it up for you.

After Stage 5, do a shakedown: test the clutch engagement, listen for any new noises (a mild whine from solid mounts is normal; big clunks are not). Check that the LSD functions (both wheels spin under power). Then move to refining how the car contacts the road: wheels, tires, and alignment in Stage 6.

Stage 6: Wheels, Tires, and Alignment Setup

- Focus:* Now let's maximize the grip and handling by selecting proper **wheels and tires** and performing a precise **alignment**. Good tires are crucial for any performance car – they are literally where "the rubber meets the road." In drifting, you also have to consider having spare tires and the balance between front grip and rear slip. For touge, you want sticky, confidence-inspiring rubber. We'll choose a wheel and tire combo that suits both, and set up alignment angles that allow the car to transition easily in drift yet remain stable and grippy when needed.

Additionally, going to **wider wheels and tires** may require fender modifications or a 5-lug conversion (if not done in Stage 3). We will also ensure the brakes (from Stage 3) clear the new wheels – typically 17" wheels or larger are used to clear big front calipers like Z32 brakes.

- *Goals for alignment: **Typically, drift cars run more negative camber up front for grip while counter-steering, and near-zero camber rear for maximum tire contact when power is down. Toe settings can tweak responsiveness vs stability. We'll aim for a dual-purpose alignment: something like** Front: **-3° camber, slight toe out (0.1° each side) for sharp turn-in;** Rear:** -1.5° to -2° camber, slight toe in (0.1° each side) for stability and forward bite. Caster around 7° as mentioned, for steering self-return.

Let's break down the upgrades and adjustments:

- *Table: Stage 6 Wheels, Tires, Alignment**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority |

|---|---|---|---|

| **Lightweight Wheels** (17” or 18”) | Upgrade wheels for strength, brake clearance, and wider tires. Also reduce unsprung weight if possible. | **High** – Good wheels improve performance and aesthetics. For S13, a popular choice is 17x9” or 17x8.5” front, 17x9” or 17x9.5” rear, offset around +20 to +30 (depending on fender work). 17” clears Z32 brakes and keeps tire cost lower than 18”. **Brands**: Enkei RPF1 (light and reasonably priced), Rota (budget but decent), Work Emotion, Volk TE37 (if budget allows). Even OEM wheels from 350Z or Skyline can be a cheap strong option. Choose width based on tire available and clearance – 9” wide rim lets you fit 235–255 tires well. | Easy (bolt-on, may need fender roll) | **High** □ |

| **High-Performance Tires (Front)** | Grippy tires up front for control and feedback. You want a tire that holds even at full steer angle to guide the car. | **High** – Front tire grip is your best friend in both drift (to control angle) and grip driving (for obvious reasons). Go for a **performance summer tire** or semi-slick in a medium width (e.g. 235/40R17 or 245/40R17). Examples: Yokohama Advan Neova AD08R, Bridgestone Potenza RE71RS, Nankang AR-1 or NS-2R (budget), Toyo R888R (more track focused). These will provide excellent grip and heat resistance. Cost is high but they last relatively long on front since they’re not doing burnouts. | Easy | **High** □ |

| **Tires (Rear)** – Dual sets recommended | Choose rear tires based on activity. For drift events, you’ll burn rear tires quickly; for touge/grip, you want good traction. It’s wise to have **two sets** of rear wheels/tires: one with high-performance rubber for grip, and another with more cost-effective tires for drift practice. | **High** – For drifting, a popular approach is to run a slightly harder or cheaper tire in the rear so you can slide without destroying expensive rubber. E.g. **Achilles ATR Sport, Nankang NS-20, Zeetex** – affordable tires that break loose progressively. Size maybe 235/40R17 or 245/40R17 on your rear wheels. For serious competition, you’d use the same sticky tires all around, but they will wear fast when spun. For touge and general driving, you can swap on your grippy set (matching the fronts). This strategy maximizes

bang-for-buck: daily drive and grip on good tires, and swap to drift spares for events. | Easy | **High** □ |

| **Wheel Alignment (Professional)** | Dial in camber, caster, toe to optimal specs for your dual use. A proper 4-wheel alignment ensures all Stage 3 adjustable arms do their job and the car handles predictably. | **High** – An alignment is one of the best investments after suspension mods. **Suggested baseline:** Front camber ~-3° (for grip at angle), Front toe 0 to 0.1° out (improves turn-in), Caster ~7° (as set with tension rods). Rear camber ~-1.5° (maximize contact patch under squat), Rear toe ~0.1° in each side (for stability under power). These settings will give a responsive front and a relatively stable, grippy rear that still breaks loose progressively. Communicate your usage to the alignment tech – slight adjustments might be made for preference (drift alignment often runs even more front camber and toe out, but that can reduce high-speed stability – adjust to taste). | Easy (for you, done by shop with lasers) | **Critical** □ |

| **Corner Balancing** (if possible) | If using coilovers with independent height adjustment, corner-weight the car. This balances the weight on each tire (especially important after stripping or moving heavy items) for stable handling. | **Medium** – Not everyone has access to corner scales, but many race shops do. With you (driver) in the seat and maybe half tank of fuel, they adjust coilover preload to equalize cross weights. This ensures the car doesn't favor one side in turns and behaves consistently in left vs right turns. It's more important if the car is heavily modified (engine swaps, etc.), but for a serious build and 20-year consistency, it's a nice finishing touch. | Hard (need scales) | Low □ (nice to have) |

| **Fender Rolling/Pulling** | Modify fenders to fit wider wheels/tires without rubbing. Roll the inner lip up and pull the fender if needed for clearance. | **Medium** – Likely needed if running 9" wide + low offset wheels, especially on front with angle. A fender roller tool and heat gun can flatten the lip. For a flush look and clearance, minor pulling might be needed. Alternatively, consider over-fenders (Stage 8 aesthetic mod) if you want very wide wheels later. Rolling is almost standard procedure on S13 builds. | Moderate | **High** □ (to fit the new shoes) |

| **Alignment Bolts/Equipment** (if needed) | Make sure you have the needed eccentric bolts or slip plates to achieve alignment. S13 has eccentric bolts for rear toe/camber (though we replaced arms with adjustable ones). Up front, if camber plates on coilovers aren't enough, consider lower control arm shims or aftermarket knuckle with camber gain. | **Medium** – This is just to note: ensure your alignment guy can reach the target specs. Sometimes very low cars can't get less than -3° rear camber without adjustable arms (we have them) or toe might be limited without toe arms (we did that). Since we upgraded all key parts, we should be fine. Just ensure everything is torqued and nothing slips. You might re-check alignment after a few hard drives as things settle. | N/A | Medium □ |

| **Steering Angle Check** | After alignment and wheel fitment, check that your front wheels don't rub anywhere at full lock and compression. Trim inner fender liners or wheel well sheet metal as needed. | **High** – With the increased steering angle from Stage 3, plus wider wheels/tires, rubbing is common. You might need to hammer the seam at the back of the wheel well or trim plastic liners. Also check brake lines are safely routed. This prevents tearing a tire or line when drifting at full lock. It's a small detail but critical for reliability. | Easy | **High** □ |

| **Tire Pressure Tuning** (ongoing) | Use tire pressure as a tuning tool. For drift, you might run higher rear pressures to break traction easier and lower front pressures for grip. For touge, you'd balance pressures for optimum grip (check tire manufacturer recommendations). | **High** – No cost "upgrade" but important to mention. Example: at a drift day, you might set front tires ~30 psi cold, rears ~35-40 psi cold to reduce traction in back. On a mountain run, you might go 32 psi all around (hot ~36) for maximum grip. Always monitor pressures and temps – this can tell you if alignment is right (e.g. too much inner tire wear -> maybe camber could be dialed back). Adjust pressures to fine-tune the car's handling to your liking. | Easy | **High** □ (tuning step) |

- *Stage 6 Summary:** With sticky tires and the alignment dialed, your S13 will handle *night-and-day* better than the stock car. You should now experience:

- **Sharp turn-in** and strong front grip (thanks to alignment and tire choice) – the car will go where you point it, inspiring confidence on mountain roads.
- **Predictable oversteer** on throttle – the combination of slight rear toe-in, good tires, and the LSD means the rear end breaks away progressively. In drift, you'll find it easier to initiate and hold slides, and angle can be controlled by the throttle with the front tires confidently maintaining your direction.
- **Better ride quality** than expected – quality coilovers paired with the correct alignment and corner weighting can actually ride decently on the street (stiff, but not crashing) and provide compliance when gripping. Make sure to adjust the damping on your coilovers to suit (e.g. softer for bumpy touge, stiffer for smooth track drifting).
- **No rubbing or clearance issues** if all modifications were done carefully. With rolled fenders, the suspension can compress and steer fully without destroying tires or fenders. Always double-check after a test drive – shiny spots on tire or fender indicate contact.

Your choice to maintain two sets of rear tires means you have flexibility: for a drift day, throw on the harder compound set and you won't chew through \$300 tires in an afternoon. For canyon carving or a time-attack style event, use the sticky set to maximize grip.

At this stage, the car in terms of performance is a **complete package**: robust engine, sufficient power, tuned suspension, strong brakes, and good tires. The remaining touches will be about **driver safety, control, and longevity enhancements**.

- *Difficulty: **Stage 6 is** easy to moderate** mechanically (swapping wheels and adjusting arms). The key is the intellectual part – getting alignment values right and choosing the correct tire. It's recommended to use an alignment shop with motorsport experience or string align the car yourself if you have the skill, to achieve the specs you want. Adjust and test, adjust again – alignment can be a bit of trial to get the perfect feel. Tire choice might also evolve; don't be afraid to try different

- brands once current ones wear out to see what you prefer.

Finally, we move to the **interior and safety** aspect, making the car a place the driver can confidently control and survive in if things go wrong.

Stage 7: Safety, Interior, and Driver Aids

- Focus:* Now that the car itself is extremely capable, ensure that **driver safety and control** are up to par. A fast, drift-ready car still needs a safe cockpit and proper driver equipment. This stage will add a **racing bucket seat and harness** to keep you planted, a **sports steering wheel** for better control, a **hydraulic handbrake** for easier drift initiation, and other interior tweaks that improve the driving experience. We'll also address any remaining essential safety items (fire extinguisher, cutoff switch, etc.) and lightweighting where appropriate.

The car is being converted into a full racecar, so creature comforts can be mostly forgone – but "optional luxuries" will be handled in the next stage to keep it livable where possible. In Stage 7, our priority is that the **driver has confidence and safety gear** equivalent to the car's performance.

- *Table: Stage 7 Safety & Interior Upgrades**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority |

|---|---|---|---|

| **Racing Bucket Seat** (Driver) | Secures the driver in place during high-G maneuvers. Improves car control (no sliding in seat) and safety in a crash. | **High** – A proper FIA-approved bucket (Sparco, Recaro, Bride, OMP, etc.) is one of the best investments for driver feel. It keeps you planted so you can focus on steering and pedal work, not bracing yourself. Choose one that fits your body snugly. Fixed-back fiberglass seats are common; if you plan some street use, a reclining bucket (Bride Eurosta ([

Car Feature>> Southeast Drift S13 In Atlanta - Speedhunters](https://www.speedhunters.com/2008/11/car_feature_gt_gt_southeast_drift_s13/#:~:text=To%20be%20very%20honest%20with,to%20a%20Mooneyes%20steering%20wheel))tster) could be a compromise. But for track, a fixed race seat is ideal. You may need S13-specific rails or make custom mounts to get the seating position right (lower = better for helmet room and center of gravity). | Moderate (drilling/rail fitting) | **Critical** □ |

| **Racing Harness (5- or 6-point)** | Works with the bucket seat to restrain you securely. Distributes forces in an impact over shoulders, waist, and crotch (if 6-pt). | **High** – Get a quality harness (Schroth, Takata, Willans) with proper safety certification. A 5-point is the minimum for track (submarine strap prevents sliding under belt), a 6-point is even better for comfort (two leg straps). Width 3” for shoulder/lap is common (some newer are 2” for HANS device use). **Important:** These should be mounted either to a harness bar or roll cage crossbar at the correct height (around shoulder level). Do *not* mount shoulder belts to the floor – dangerous angle. If no cage yet, (Bucket Seats/Subframes/Harnesses, S13 Bolt in ! (with pics))stall a **harness bar** behind the seats that bolts to the stock belt mounts, or wait to attach to the roll cage in Stage 8. In interim, you might run stock 3-pt belt for street and harness for track (some keep both). | Moderate | **Critical** □ (for track) |

| **Steering Wheel & Quick Release** | Smaller diameter, thicker steering wheel for better control, and a quick-release hub for easier vehicle entry/exit (and theft deterrence). | **High** – A quality wheel (350mm or 330mm diameter) like a Momo, Nardi or Sparco gives better grip and removes the old huge stock wheel. Combined with a hub and quick-release (Works Bell, NRG), it allows you to pop the wheel off to get out, especially useful if you have a fixed seat and roll cage. Make sure to get the right hub for S13 (with horn and turn signal cancel if possible). You will lose the airbag (if any) – but ’89-’94 200SX likely had none. Driving feel with a good wheel is vastly improved – more precise input and feedback. | Easy | **High** □ |

| **Hydraulic Handbrake (Hydro e-brake)** | Allows locking the rear wheels via a dedicated hydraulic lever, making drift initiations (handbrake entries) much easier and more consistent than the stock cable e-brake. | **High** (for drift) – A hydro handbrake is a staple in drift cars. It taps into the rear brake lines (or uses separate rear calipers) to directly engage rear brakes when pulled. **Setup**: You can do an inline setup (plumb the hydro cylinder into the rear brake line) – simpler, but can slightly affect foot brake feel. Or a dual-caliper setup: add a second set of brake calipers on rear discs just for the handbrake (requires dual caliper brackets on S13 and an extra caliper set, e.g., use stock calipers for hydro and Z32 for foot brake). Dual setup is ideal but more work. A vertical pull handle is common (mount near shifter). Brands like Wilwood (master cylinders) and ASD or Driftworks make kits. Once installed, you'll be able to initiate drifts with a quick yank, without stretching cables or worrying about fade. Ensure it's well mounted and doesn't interfere with your shifting arm movement. | Moderate (brake bleeding and fabrication) | **High** □ (if doing serious drifting) |

| **Roll Bar / Half Cage** (Bolt-in) | Increases safety in rollover and provides a harness mounting point. A half cage (behind front seats) or roll bar can be installed now if a full cage (Stage 8) isn't yet in. | **High** – While a full cage is ideal, a **4-point or 6-point roll bar** is a good interim step for safety. It will stiffen the chassis too. There are bolt-in options (Cusco, Safety21) that don't require welding and can be removed for street. If you plan a weld-in full cage later, you might skip this now to avoid redundancy. But if you're hitting the track often already, having at least a ro (Car Feature>> Southeast Drift S13 In Atlanta - Speedhunters) harness bar is strongly advised to protect you and properly angle the harness. Note: using harness without a roll bar can be dangerous in a rollover (you can't duck, and roof crush is a risk). So ideally do this before using harnesses on track. | Moderate (some drilling) | **High** □ (for safety with harnesses) |

| **Fire Extinguisher** (mounted in cabin) | Be prepared for fire. A 1-2kg (2-5lb) fire extinguisher mounted within reach of the driver. | **High** – Cheap insurance. Mount it securely (metal bracket) on the passenger side

floor or roll bar. Use a dry chemical or ABE-class extinguisher at minimum, or a fancy FIA plumbed system if budget. But a basic one has saved many cars from total loss. Check local race regs for required size. | Easy | **High** □ |

| **Battery Kill Switch** (and relocation if desired) | Add a master kill switch (for emergencies and when the car is parked long). Optionally relocate battery to trunk for better weight distribution and engine bay space. | **Medium** – A kill switch is often required in competition (accessible from outside). Even if not, it's good to have a quick way to cut power. Battery relocation to the trunk (right side ideally to balance driver weight) frees up space for intercooler piping and improves front/rear weight distribution slightly. Use a sealed battery box and route a thick gauge cable with proper fusible link near battery. This cleans up the bay and is a common mod. | Moderate (wire routing) | Medium □ |

| **Additional Gauges / Displays** | Install any remaining gauges not done earlier: e.g. Wideband AFR gauge (if not already for tuning), oil temperature gauge, and maybe EGT gauge if really monitoring engine health. Alternatively, an all-in-one digital dash or data logger. | **Medium** – By now you should have boost and oil pressure (from Stage 1). Adding an **oil temp** gauge is great for tracking how hard you're pushing the oil (especially with oil cooler, you want to ensure it warms up and doesn't overcool or overheat on long runs). A **wideband AFR** gauge is pretty essential if you plan to adjust anything or just to keep an eye on mixture during runs – many standalones or Nistune can output to a gauge. A digital dash (Aim, Racepak) could replace analog gauges and tie into the ECU to display many parameters, but that's more luxury. At minimum, ensure you have water temp (the stock gauge is notoriously non-linear) and maybe a warning light for low oil pressure. | Moderate (wiring) | Medium □ |

| **Interior Strip or Tidy Up** | Remove unnecessary interior pieces to reduce weight (carpet, sound deadening, rear seats) *or* tidy up the racing interior with a dash cover, gauges mounted cleanly, etc. | **Medium** – As a race conversion, you likely want to strip excess weight: rear seats (if not gone), trim panels, etc. Removing sound deadening tar can shed ~10-15

kg (messy job though). Decide how far to go while keeping it tolerable. Some leave the dash in place (often required by rules and for looks), others gut everything non-essential. At least remove loose items that could fly around. You can also add an extension to the steering column or pedal adjustments if needed for ideal driver position. Organize the interior so that it's functional: secure your ECU and wiring so nothing rattles or chafes. Maybe add a digital *lap timer* or mount for phone/GPS if you log data on touge runs. | Moderate | Medium □ |

| **Cooling for Driver** (optional) | If you removed AC and are driving on hot tracks, consider ducting or a blower to the driver, or a helmet cooling system. | **Low** – This is a comfort/safety optional. A simple 12V fan or fresh air vent can help keep driver focused. If the car still has functional **AC**, you might even keep it if rules allow – it's a luxury, but it could be considered in Stage 8. Most likely AC is ditched for weight/space by now. So just think of alternative cooling if needed (especially in a full suit on track). | Easy | Low □ |

- *Stage 7 Summary: **Your S13 is now equipped with the safety gear and driver-oriented mods to fully exploit its performance. Inside the car, you should feel** secure and in control**:

- The **bucket seat and harness** hold you firmly. No more bracing against the door – you'll feel every movement of the chassis, which actually makes it easier to sense the car's limits. Long drives on harnesses can be a bit uncomfortable, but for track use it's a huge improvement. *(Pro tip: For street driving, you can still use the stock seatbelt for convenience if your seat allows it, and save the harness for the track.)*

- The **steering wheel** is likely smaller diameter than stock, which quickens steering response. Combined with your alignment changes, you might find steering effort slightly higher at parking speeds (no biggie with PS), but at speed it's more precise. The quick-release adds a measure of security (take the wheel with you or hide it, car theft becomes harder).

- The **hydraulic handbrake** means you can initiate drifts with a light pull, without yanking your whole arm weight like the stock cable brake. It'll lock the rears reliably as long as your pads and rotors are in good shape. It's a game-changer for drift technique – use it to adjust drift angle or extend a slide when needed.
- Safety-wise, having at least a roll bar and fire extinguisher means you've mitigated a lot of risk. In an accident or rollover, you have a much better chance of avoiding injury. Always drive with a helmet on track, and with these mods, using a neck restraint (HANS device) if you have a harness is wise, since your head is held in position by the belts.

The car is *almost* a complete racecar now. Stage 8 will put the final touches and any optional enhancements or comforts you might want for the long term.

- *Difficulty: **Stage 7 ranges** easy to moderate**. Bolt-in interior parts like seats and belts require careful installation (drilling holes for harness mounts if not using stock points, etc.). The hydro handbrake is moderate (brake system work). These are all within reach of a DIYer, but take time to do properly (e.g., measure twice before drilling for seat rails or harness anchors). Always follow safety guidelines (harness angle, seat mount strength) – your life could depend on it.

Now, for the final stage, we'll complete the build with structural reinforcements, aero, and any nice-to-have extras that didn't fit in earlier.

Stage 8: Final Reinforcement, Aero, and Optional Luxuries

- Focus:* This is the finishing stage, addressing chassis reinforcement, aerodynamic enhancements, and any remaining modifications to make the car truly "hard to kill" and tailored to your preferences. Many of these items are **optional** or icing on the cake – you could consider the build "done" after Stage 7 for pure function. Stage 8 is about longevity and refinement: things like a full weld-in roll cage, seam welding the

- chassis, adding aero parts for stability, and possibly re-adding some comforts or aesthetics to make the car enjoyable for the long haul.

We'll break it down into:

- **Reinforcement:** Strengthen the chassis and key components against stress and wear.
- **Aero:** Add aerodynamic devices to improve high-speed stability and perhaps some cooling aids.
- **Luxuries:** Reintroduce or improve features that make the car easier to live with (could be heater/defrost for rainy touge nights, or an updated lighting system for safety, etc.)

By doing this last, we ensure we don't add weight or complexity until all primary performance goals are met. Now we can afford a bit of weight for stiffness or comfort since the car has plenty of performance headroom.

- *Table: Stage 8 Reinforcements & Aero**

| Upgrade / Part | Purpose & Benefit | Bang-for-Buck Notes | Difficulty | Priority (Opt.) |

|---|---|---|---|

| **Full Roll Cage** (Weld-in 6 to 8 point) | Ultimate chassis stiffening and safety. A full cage ties together the front and rear of the car, protects in rollovers, and allows mounting harnesses and other equipment solidly. | **High** – For a long-term racecar, a properly built roll cage is the best investment for safety and chassis longevity. It will prevent the chassis from twisting over years of hard use. It's also often required if you compete in advanced levels. Custom weld-in cage is best (meets specs, snug to the body). It adds weight (maybe ~40-50 kg of tubing), but in exchange you get a **tank of a chassis**. Driving feel will be sharper too (like a go-kart). Note: installation is complex – best done by a professional cage builder for compliance and quality welds. If you installed a bolt-in bar earlier, that can be removed or integrated. Ensure to add padding on cage bars near head/limbs for street driving. | Hard (professional job) | **High** □

(for racing) |

| **Chassis Seam Welding** | Weld along the factory spot-welded seams of the chassis to strengthen the unibody and prevent flex or cracking. | **Medium** – Over decades, chassis metal can fatigue. Seam welding (stitch welding) the seams in the engine bay, door sills, trunk, etc., can significantly increase rigidity. Many race teams do this on old S13 shells. It's time-consuming and should be done before repaint or with interior stripped (so now is good, since interior likely stripped). Focus on high-stress areas: suspension mounts, strut towers, around door openings. This mod pays off in consistency – alignment stays true, and weird flex issues are eliminated. If you cage the car, seam welding is a nice complement to cover all bases. | Hard (labor-intensive welding) | Medium □ |

| **Strut Braces & Fender Braces** (if not already) | Add any remaining bolt-on braces: front strut tower bar, rear strut bar (if not added), and fender braces (connect door jamb to chassis behind fender) to stiffen front end. | **Medium** – These braces reduce flex in specific areas. **Front strut bar**: ties strut towers, great if you didn't cage through the firewall. **Rear strut bar**: helps rear shock towers support each other (though a half-cage covers this). **Fender braces**: aftermarket pieces (like Nismo Power Brace or GKTech) that reinforce the front fender area, improving steering response by stiffening the front subframe to chassis connection. All these are relatively inexpensive and bolt in. If a cage is present, some may be redundant, but many drifters still use strut bars with cages for maximum stiffness. | Easy | Medium □ |

| **Aero Kit (Front Lip/Splitter, Side Skirts, Rear Diffuser)** | Enhance aerodynamic downforce/stability and cooling, and improve aesthetics. A front splitter or lip can add front downforce and direct air to radiator, side skirts reduce side airflow under car, and a rear diffuser helps with high-speed stability by smoothing airflow out the back. | **Medium** – Aero is often overlooked on drift cars (since they spend a lot of time sideways), but for touge/grip it can help significantly at speed. **Front:** A splitter with support rods that extends a few inches could give more front bite in high-speed corners and aid cooling by creating a high-pressure zone at

the radiator. **Canards** can also add some front downforce on the bumper. **Sides:** Skirts mainly help keep airflow consistent. **Rear:** A diffuser will help reduce drag and a small amount of downforce; also, a moderate **rear wing** (like a chassis-mounted GT wing or even a simple ducktail) will add stability. Choose aero based on taste and rules (some drift series limit big wings). Materials: Fiberglass is common for kits (BN Sports, Origin, etc.), but splitters often made of plywood or alumalite for durability. These mods can make the car look aggressive and can be functional if done right, but they can also be expendable (drift can break aero easily). If you do a lot of high-speed driving, it's worth it. If mostly drifting, a cool kit is mostly cosmetic aside from aiding radiator airflow. | Moderate (fiberglass fitting) | Medium (functional + aesthetic) |

| **Cooling Ducts** (Brakes and Engine) | Add ducts to direct air where needed: brake cooling ducts from front bumper to front rotors, oil cooler duct or vent, radiator shroud panel, etc. | **Medium** – Small details that help in longevity: **brake ducts** can be as simple as hose from a bumper opening to the wheel well aimed at calipers – helps avoid fade on downhill touge runs. **Radiator shroud/top panel** ensures air through radiator instead of leaking over the top. **Vent** the hood or add louver panels to let hot air out (especially after runs, helps cooldown). These keep temps in check which preserves fluids and components over time. Cost is usually low (DIY solutions or small parts). | Moderate | Medium |

| **Power Steering Cooler** | Add a small oil cooler in the PS return line. Drifting can overheat power steering fluid (lots of lock-to-lock action). A cooler prevents boiling and loss of assist. | **Medium** – A cheap ATF cooler or even repurposed oil cooler can be mounted in front and plumbed into the PS return. This keeps steering feeling consistent in long sessions. If you've ever had PS fade (fluid spits out reservoir due to boiling), this fixes it. | Easy | Medium |

| **Redundancy and Spares** (long-term prep) | Keep a stock of critical spare parts: extra igniter, coil pack, belts, fluids, etc., and maybe reinforce known weak spares (e.g., carry a spare welded diff if running one, spare axles). | **Medium** – Not a mod per se, but a strategy: Over 20 years, having spare parts ready can be the difference between a one-day fix or

months hunting rare CA18 parts. Since CA18DET is old, consider grabbing spares when you see them. E.g. spare ECU, MAF, igniter, alternator, etc. Seal them and store properly. Also use high-grade hardware and fasteners when replacing (ARP bolts, etc.). Every time you work on the car, replace any suspect hose or bolt – preventative maintenance is key for longevity. | N/A (on-going) | **High** □ (philosophy) |

| **Exterior Lights Upgrade** (optional) | If you plan to street drive or touge at night, upgrade the lighting: e.g. LED headlight bulbs or projectors in the pop-ups, brighter brake lights or an added rain light for bad weather. | **Medium** – S13 headlights are not great by modern standards. Many retrofit projectors or use LED sealed-beam replacements. This is a nice quality-of-life mod that makes night drives safer. Also consider an LED strip for third brake light if not already, for visibility. These touches make the car more streetable and reduce strain on the electrical system. | Easy | Low □ |

| **Paint or Vinyl Wrap** (finishing touch) | After all fabrication, give the car a fresh look. A nice paint job or wrap protects the body and makes it yours. | **Low** – Cosmetics, but a good paint or wrap can prevent rust (sealing any exposed metal from mods) and make you proud to show off the build. It's the reward for all the mechanical work! If budget allows, do a proper job after all else, so it won't be ruined by drilling or welding later. Alternatively, a wrap can be cheaper and is replaceable if you scuff it drifting. Put some sponsor stickers or personal livery for style. | Hard (pro job) | Low □ |

- *Stage 8 Summary: **Congratulations – at Stage 8, you have essentially built an** "unbreakable" Nissan S13**. This final stage ensures the** chassis can handle anything** you throw at it and that the car is tailored to your needs, whether that's competition or just reliable fun for decades. The aero bits will make the car more stable in high-speed sweepers and give it a pro-level look. The full cage and reinforcements mean even if you push beyond the limit, the car (and more importantly you) are protected.

Some notable outcomes now:

- The chassis stiffness, with seam welds and cage, is likely exceeding what the car had new. You might notice even better handling precision and maybe slightly increased noise (cage can resonate sounds), but the durability gained is enormous – no worries about chassis bending or cracking at strut towers (a known issue on hard-used S13s is strut tower or subframe tear, which we've mitigated).

- Aero will improve your confidence at speed – fewer corrections needed on a straight when you have a bit of downforce and less lift. Plus, the car just looks **awesome** with a proper aero kit designed for function.

- Any little luxuries you kept or added (like better lights or maybe a basic stereo if you decided to keep music for long drives) will make the car *livable*. It's loud, it's stiff, but it doesn't have to be spartan if you don't want it to be.

At this point, maintenance is your next 20-year mission: keep logs of parts, replace wear items on a schedule (oil changes every few track days, gearbox/diff oil yearly, suspension joints inspected annually, etc.). The robust parts we've chosen (for example, ARP studs, forged internals, quality brand components) mean the car can take abuse, but nothing lasts forever without care. Treat it well and it will return the favor with endless adrenaline-filled drives.

- *Difficulty: **Stage 8 can range** moderate to very hard** depending on how far you go (aero is moderate DIY, a roll cage is a specialist job). Plan out this stage carefully; for example, seam welding and cage installation ideally happen together and before painting. It might involve taking the car off the road for a while, but given this is the capstone of the build, it's worth doing right.

Finally, step back and admire what you've built: a Nissan 200SX S13 that's been comprehensively upgraded in every aspect. It's a machine ready for almost anything – dr ([

Car Feature>> Southeast Drift S13 In Atlanta - Speedhunters](https://www.speedhunters.com/2008/11/car_feature_gt_gt_

southeast_drift_s13/#:~:text=In%20case%20you%20were%20wondering,and%20Suspension%20Techniques%20sway%20bars)) (how high can i boost my ca18det with these mods? and how much HP will i get? - Nissan Forum | Nissan Forums)rack days, you name it – and built with the foresight to last for decades.

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