

1. What “performance” actually means

Set expectations early.

- Power vs torque vs drivability
 - Peak numbers vs usable powerband
 - Reliability, longevity, and budget (the triangle you can’t escape)
 - Defining the goal: street, track, drag, endurance, off-road
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2. Air in, air out, fuel, spark

The core rule of engine performance.

- Volumetric efficiency (without scary math)
 - Why airflow is king
 - Fuel delivery basics
 - Ignition timing and combustion efficiency
 - “An engine is just an air pump” (but a complicated one)
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3. Bottom end fundamentals

Where reliability and RPM limits are decided.

- Block strength and preparation
 - Crankshaft types (cast vs forged)
 - Rods and pistons (materials, weight, strength)
 - Compression ratio: power vs knock vs fuel choice
 - Bearing clearances (power vs longevity)
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4. Top end and airflow

Where most power gains live.

- Cylinder head design basics
 - Valve size
 - Port shape vs port size

- Flow vs velocity
 - Valvetrain stability at high RPM
 - Why bad head work kills engines faster than stock heads
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5. Camshaft selection

One of the most misunderstood parts.

- Duration, lift, overlap (conceptually)
 - How cam choice shapes the powerband
 - Street cam vs race cam realities
 - Matching the cam to compression, heads, and RPM range
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6. Induction systems

How the engine breathes.

- Naturally aspirated vs forced induction
 - Intake manifold design and runner length
 - Carburetion vs fuel injection
 - Throttle response vs peak power
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7. Exhaust system design

Power you don't see but definitely feel.

- Headers: length, diameter, collector design
 - Backpressure myths
 - Scavenging and exhaust tuning
 - Matching exhaust to engine RPM goals
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8. Forced induction (if applicable)

High reward, high risk.

- Turbo vs supercharger basics
- Boost vs compression ratio

- Intercooling importance
 - Heat management
 - Why tuning matters more than hardware here
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9. Engine management and tuning

Where good builds live or die.

- ECU fundamentals
 - Fuel maps and ignition timing
 - Knock control
 - Dyno tuning vs street tuning
 - Why “safe” tunes still blow engines
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10. Cooling, oiling, and durability

The boring stuff that saves engines.

- Oil pressure vs oil flow
 - Sump design and oil starvation
 - Cooling system capacity
 - Heat as the enemy of power and reliability
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11. Assembly precision

This separates builders from parts-changers.

- Measuring everything (not trusting specs)
 - Torque procedures and fasteners
 - Ring gaps and why boost changes everything
 - Cleanliness and attention to detail
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12. Common mistakes and myths

- Bigger parts automatically make more power
- Chasing peak horsepower only

- Ignoring the drivetrain
 - Overbuilding one part and neglecting another
 - Internet dyno numbers vs reality
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13. Cost vs gains

- Dollars per horsepower
 - Smart upgrades vs flashy upgrades
 - When stock parts are actually excellent
 - Knowing when to stop
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14. Final takeaway

- Performance is about **balance**
 - A fast engine is a system, not a collection of parts
 - The best builds meet their goals—not Instagram
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