

Cozart Garage Engine Project Companion

Illustrated Edition

Planning guidance and printable workshop records

COMPANION 1.0 / OCTOBER 24 2026



Keep the project organized

Build a usable record from identification through teardown, machine-shop work, assembly checks and first start. Thirteen workflow chapters and nine reusable worksheets keep the decisions, measurements and follow-up together. Use this companion alongside the service information for your engine and instructions for the installed parts. Engine-specific torque values, numbered tightening sequences, service limits and wiring pinouts are not included.

Engine project focus

Includes LS 5.3 and 2011 Sierra LC9 planning examples. Workshop photos show several projects and engine types; they are documentation examples rather than LC9 parts or assembly references.

Cozart Garage | Cover artwork is illustration

How to use this companion

Use the chapters to plan the work and the worksheets to preserve its record. The guide follows the project from identification and shop preparation to teardown, machine-shop decisions, assembly checks and startup observations.

Use the controlling instructions

Get the applicable engine service information and instructions for every installed part. Record the engine identity, part number, document and revision with the job. Resolve any conflict before ordering, machining or assembly.

Read the pictures correctly

The six owner-supplied workshop photographs show documentation examples from different projects. They do not identify the parts in your engine. The seven workflow graphics organize checkpoints; they do not establish physical bolt locations, timing marks or tightening sequences. Cover artwork is illustration.

Keep an open items list

Write down missing instructions, unidentified hardware, measurement concerns and decisions that still need approval. Assign the next action and keep the issue visible until the supporting information is recorded.

The printable workbook includes project planning, parts inventory, machine-shop work, cylinder and piston measurements, bearing clearances, ring gaps, applied torque records, startup observations and maintenance. Blank fields are for your actual build; they do not imply a specification.

Read the build before starting

Plan safe lifting, disconnect power as the service procedure directs, relieve fuel-system pressure, control fluids and support the transmission independently. Use suitable lifting points, rated equipment and a clean measurement area. Stop when identity, clearance, alignment or load control is uncertain.

Chapter 1 inspection and documentation



Figure 1.1 Baseline vehicle photograph. Owner-supplied project example; confirm engine identity from its actual identifiers.

Record identity before ordering

Keep the vehicle record separate from the engine record if a replacement may have been installed. Photograph the engine identifiers, castings and hardware before choosing the service information or ordering parts.

Avoid a generation shortcut

Block material alone does not establish the engine family. Read the identifiers and component architecture together, and record the result with the sources used for the decision.

Define a parts policy

List which components will remain factory configuration and which will change. Treat every change as a fit, control-system and specification check.

Chapter 3 Engine Removal Planning

Disconnect, label, support, and lift under control.

Treat removal as a sequence of verified subsystems, not one large lift.

Photograph Before Disconnecting

Capture grounds, connectors, hose routing, brackets, harness clips, accessory placement, and transmission interfaces.

Isolate The Systems

Disconnect the battery, relieve pressure using the applicable procedure, drain fluids, and protect open lines.

Label Every Connection

Tag electrical, fuel, cooling, vacuum, heater, exhaust, and accessory connections as they are cleared.

Support The Drivetrain

Secure the vehicle and transmission before mounts or bellhousing connections are released.

Apply Light Tension First

Use a small amount of hoist tension to reveal missed connections before committing to the lift.

Lift With A Spotter

Move slowly, protect the vehicle, and never work under a suspended engine.

Stop and Check

If the engine resists movement, stop. A missed connection is cheaper to find than to tear loose.

Chapter Checkpoint

Battery isolated []

Fluids contained []

Connections labeled []

Vehicle / transmission supported []

Lift path clear []

Worksheet 1 Project build record

Complete this record using the exact engine and installed component information. Blank fields are intentional.

Project: _____ Builder: _____

Vehicle and VIN: _____ Engine RPO: _____

Primary use: _____ Budget: _____

Target date: _____ Service source: _____

Build goals and decisions

Goal	Plan	Source	Status

Milestones

Milestone	Target date	Completed	Notes

Notes: _____

Worksheet 7 Torque verification log

Complete this record using the exact engine and installed component information. Blank fields are intentional.

Engine and application: _____ Fastener type: _____

Torque wrench ID: _____ Angle gauge ID: _____

Applied stages

Component	Source and sequence	First stage	Second stage	Angle or final	Initials

A completed entry requires the correct fastener, thread treatment, tightening order and all stages. No value in this log is implied by the blank form.

Notes: _____