used engine
rebuilt to drive again

CASE STUDY: FORD F-150 2004-2010 5.4L TRITON V8 SWAP WITH 5.4L TRITON FROM 2009-2010

Client Success Story – Used Engine For Sale

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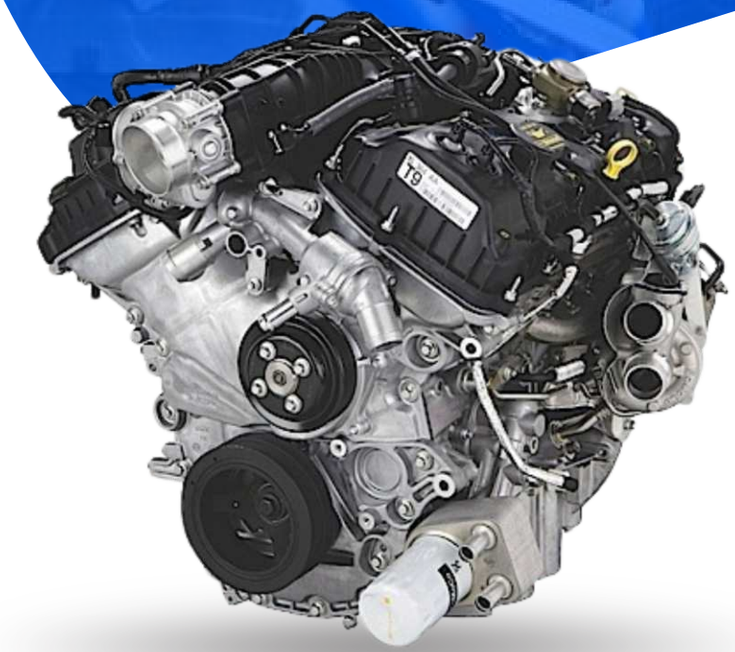
Client Overview

Name: Joseph Garcia
Location: Ozark, Missouri

The client is a contractor from rural Missouri, who is dependent on his Ford Truck. After 198,000 miles, his 2010 Ford F-150 with a 5.4L Triton V8 had started to give up. It started to lose power and misfires had become a common thing. Many other small problems like poor fuel economy were a clear sign that engine was on its last leaf.



Problems Faced by the Client

The vehicle was stalling intermittently. Cold starts were rough. Diagnostic trouble codes showed repeated misfires in multiple cylinders. Local shops quoted $6,000 to $7,000 for a new engine and labor. The client needed a more practical fix.

Objectives:

Main goal was to get the truck back on the road in minimal time & staying in budget constraints of the client. Restoration of towing capability and drivability were second goals. Rebuilding the old motor was canceled due to high mileage of the engine. Swapping with a used but healthy 5.4L Triton became the best path forward.

Vehicle and Engine Details:

Original Truck: 2010 Ford F-150 SuperCrew, 4WD, 5.4L Triton V8
Donor Engine: 2006 Ford F-150 5.4L Triton V8 from salvage, 112,000 miles, compression tested and leak-down tested

Solution Provided By Used Engine For Sale

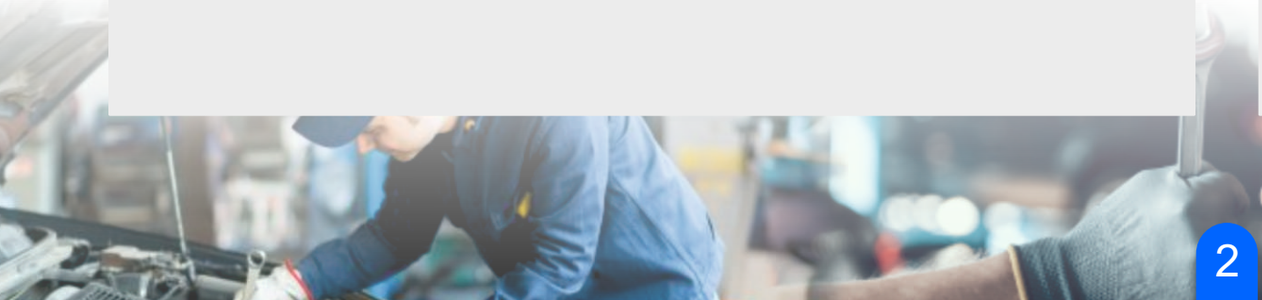
Reasons for Engine Selection:
The 5.4L 3-valve Triton used from 2004–2010 has a common block architecture. We Choose a 2006model, so that the process can be kept the simple. This also reduced chances of fitment issues. Also, the engine was available locally with a good 6-month warranty.

Compatibility Analysis

Physical Fitment : Mounting points matched perfectly. Both engines used the same motor mounts, making installation straightforward.

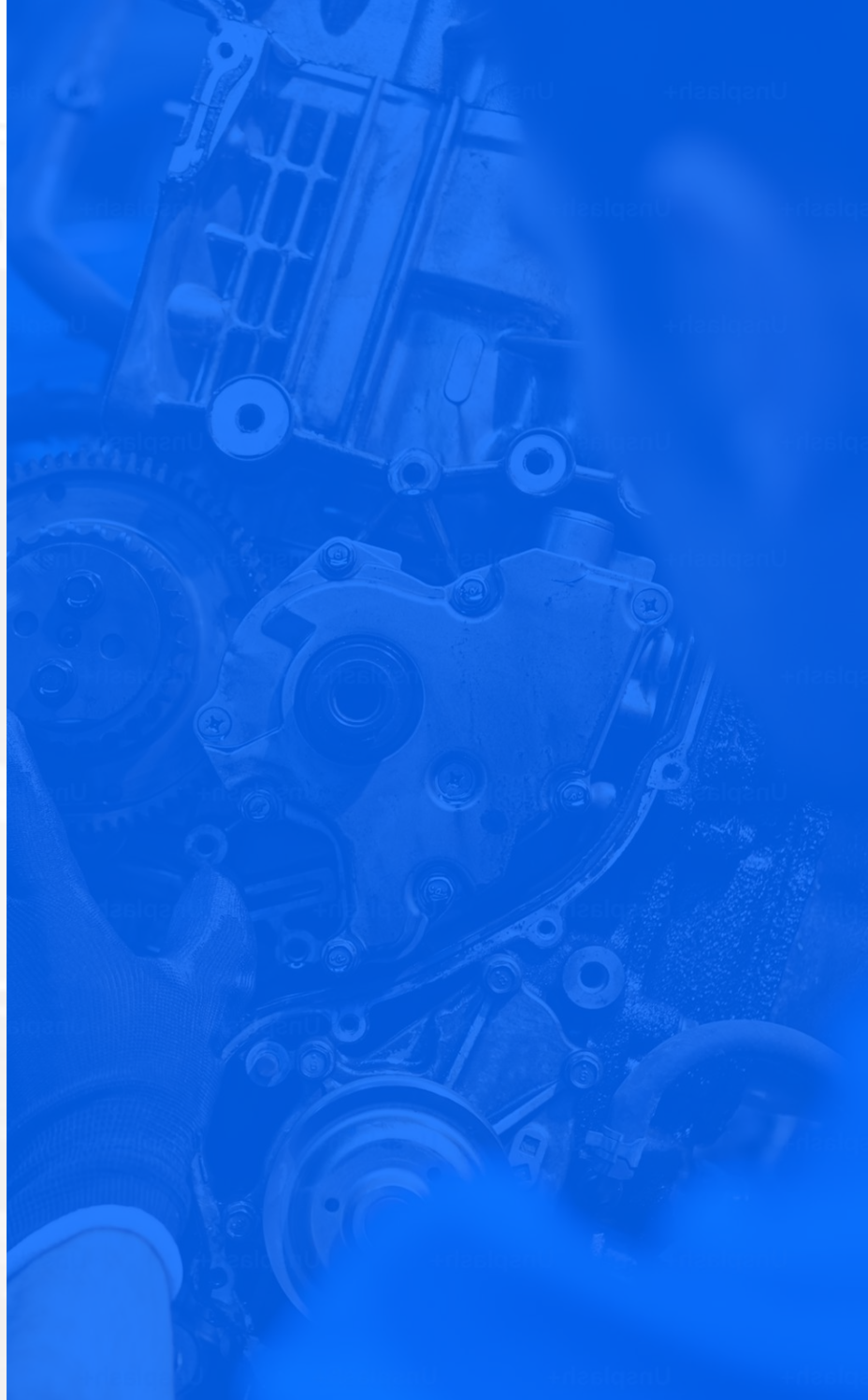
Transmission & Drivetrain Compatibility : The 6R80 automatic transmission mated up with no modifications. Flexplate, torque converter, and driveshaft were reused.

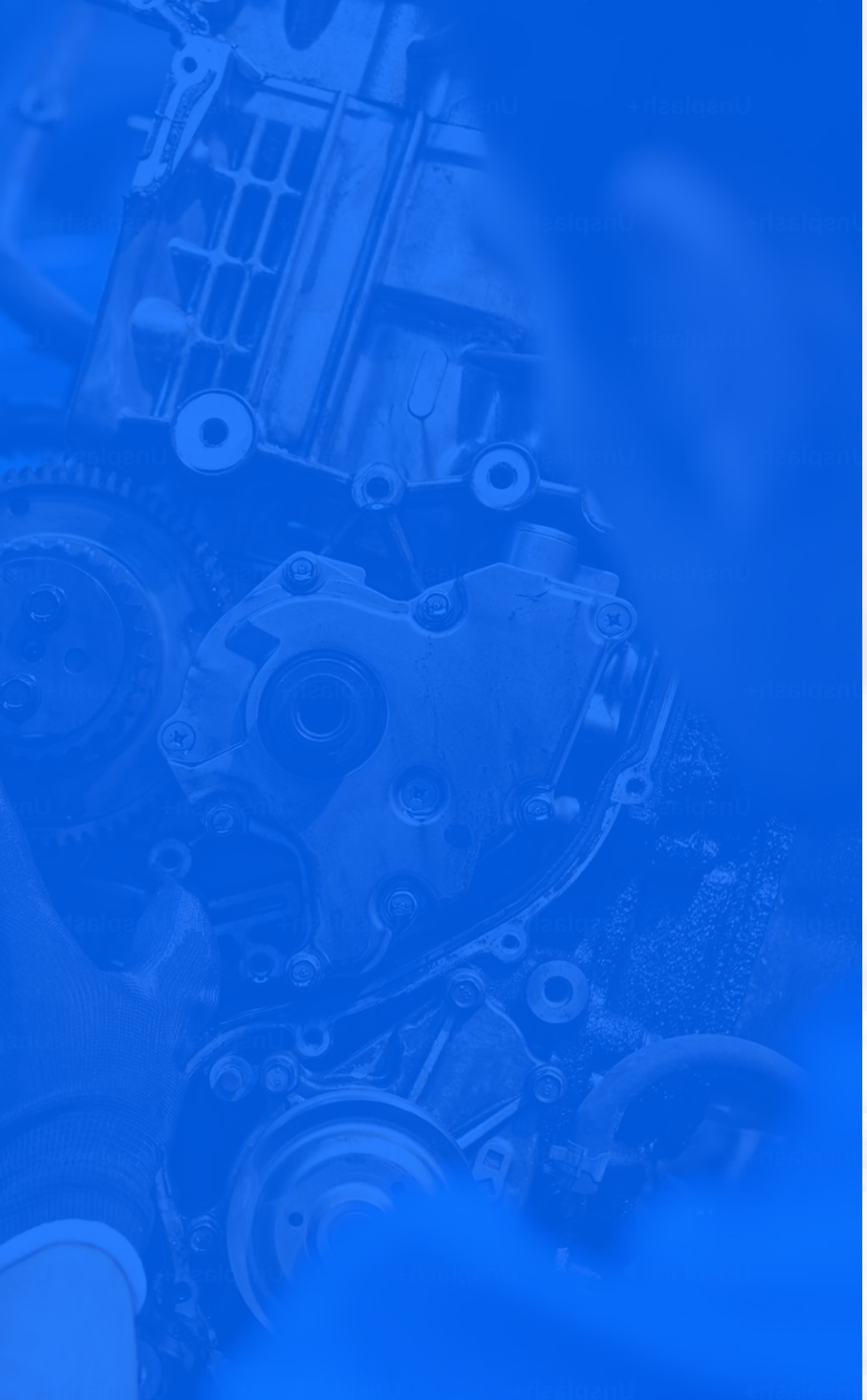
Electrical & ECU Considerations ; Some sensors (camshaft and crankshaft position) required swapping over from the original 2010 engine to avoid ECM mismatch. Minor wiring harness adjustments were made. No need for a full standalone ECU.



Cost Estimation:

Component	Estimated Cost (USD)
Used Engine:	$2,250
Labor:	$2,040 (32 hours @ $65/hr)
Fluids & Filters:	$210
Gaskets, Plugs, Belts:	$120
Total Cost:	$4,620





Required Tools & Equipment:

Common Metric Toolkit
Engine hoist
Floor jack and stands
Ford IDS software (for re-learn and throttle reset)
Torque wrench
Basic welding setup (not used but on standby)

Implementation & Installation

1. Removal of Original Engine

Battery disconnected. Front clip stayed on. Intake, radiator, fan, A/C compressor (left connected), driveshaft, and transmission bolts were removed. Hoisted out the original engine.

2. Custom Engine Mounts

Not required. Mounting locations identical.

3. Driveshaft & Transmission Adaptation

No fabrication. Transmission and driveshaft alignment was perfect.

4. Cooling System Changes

Swapped radiator hoses and thermostat housing from the 2010 engine to match existing radiator ports. Fan and shroud were reused. Oil cooler checked and cleaned.

- **Fuel System Upgrades**

  Fuel injectors and rails from the original engine were installed on the donor engine to avoid mismatch in pressure specs and connectors.

- **Wiring & ECU Tuning**

  Used the 2010 intake manifold and throttle body to ensure throttle control worked correctly. ECM updated using Ford IDS. No major reprogramming needed — basic throttle body re-learn and crankshaft position re-sync.

- **Installation of Used Engine**

  Donor engine was mounted using existing mounts. Torqued all bolts to factory specs. Fluids topped. Wiring harness cleaned and routed as per original configuration. First startup happened without error codes or warnings.

- **Wiring & ECU Tuning:** Standalone ECU wired in parallel with Tacoma's body ECU. Took 3 days to trace out key signals for RPM, coolant temp, A/C triggers, and throttle control. Custom map written to support idle, acceleration, and AFR targets.

- **Installation of Used Engine:** We prepped the engine on a stand—compression tested, gaskets replaced, new plugs and sensors. Once mounts and trans alignment were set, the engine dropped in clean. Wiring was routed for service access. All vacuum lines and heater hoses were run neatly. Final tweaks were made for throttle pedal response and idle control.Delivery was made directly to a local European performance shop in Scottsdale, with whom we coordinate installations regularly.

Testing & Performance Evaluation

Initial Startup & Tuning:

Engine fired on first try. Idle was stable after 30 seconds. No leaks. AFR held steady at 14.6 under idle.

Performance Metrics:

- Horsepower (Before): Est. 170 (due to cylinder misfires)
- Horsepower (After): Est. 275 (factory spec restored)
- Torque: Restored to factory 310 lb-ft
- Weight Distribution: No changes
- Drivability: Smooth throttle, responsive under load, no lag or hesitation

Reliability Check:

No overheating during 30-minute idle and road tests. Oil pressure held steady. No vibrations or unexpected noise.

Results & Conclusion

Success Metrics

Swap met all the goals. The truck now runs clean, passes OBD-II checks, and handles daily towing duties. No check engine lights or warnings after 500 miles of mixed driving.

Cost vs. Benefit Analysis

Total spent: $4,620

Estimated cost of new engine and dealer install: $7,400

Savings: $2,780

Value gained: Full engine replacement, restored performance, peace of mind with warranty

Final Thoughts

A realistic and detailed planning made this swap a success. Parts were chosen wisely. Labor was efficient. Reusing components where safe helped reduce costs. Anyone who is looking for a swap for their 2004–2010 F-150 5.4L Triton V8 with a 2009–2010 counterpart, this case proves it can be done cleanly, safely, and within budget.

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