

Fourth Generation Ford Mustang Workshop Manual

(1994–2004 SN-95/New Edge)

1. Engine Systems

4.6L Modular V8 (2V/4V)

Specifications:

- **Displacement:** 4.6L (281ci)
- **Bore/Stroke:** 3.55" x 3.54"
- **Compression Ratio:**
 - 2V: 9.4:1
 - 4V (Cobra): 9.85:1

Valve Adjustment (4V):

- Hydraulic lash adjusters (zero clearance)
- **Torque:** Rocker arm bolts - **18 ft-lbs**

Timing Chain Replacement:

1. Lock crankshaft with Ford tool **303-507**.
 2. Align timing marks:
 - Crank keyway at 12 o'clock.
 - Camshaft dots facing each other.
 3. **Torque:**
 - Cam sprocket bolts: **18 ft-lbs**
 - Timing cover bolts: **89 in-lbs**
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2. Transmission & Drivetrain

T-45/T-56 Manual Transmission

Gear Ratios:

Gear	T-45 (GT)	T-56 (Cobra)
1st	3.37:1	2.97:1
6th	0.67:1	0.62:1

Fluid Specifications:

- **T-45:** Mercon V (3.5 qts)
- **T-56:** Dexron III (4.0 qts)

4R70W Automatic Transmission

Shift Kit Installation:

1. Replace separator plate (Ford **4L2Z-7Z490-AA**).
 2. **Torque:** Valve body bolts - **97 in-lbs**
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3. Suspension & Steering

Front Suspension:

- **Spring Rate:**
 - GT: 450 lb/in
 - Cobra: 600 lb/in
- **Alignment Specs:**
 - Camber: -0.5° to -1.0°
 - Toe: 0.05" IN

IRS (1999–2004 Cobra):

- **Bushing Replacement:**
 1. Press out rubber bushings (OTC **1123** tool).
 2. Install polyurethane bushings (Energy Suspension **4.3154**).
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4. Electrical System

Common Repairs:

- **PATS Key Programming:**
 1. Insert master key, turn to RUN for 3 sec.
 2. Cycle ignition OFF→ON 8x within 10 sec.
- **Blend Door Actuator Replacement:**
 1. Remove glove box (7mm screws).
 2. **Torque:** Actuator screws - **18 in-lbs**

Wiring Diagrams:

- **Fuel Pump Circuit:**
 - Relay (Pin 30 → 87): 12V feed (14ga red wire)
 - Inertia switch: Under passenger kick panel
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5. Brake Systems

Cobra Brembo Upgrade:

1. **Spindle Mod:** Grind 0.125" for caliper clearance.
2. **Master Cylinder:** Ford **2W7Z-2140-AA** (1-1/16").

ABS Diagnostics:

- **Tool:** Ford NGS/Mongoose Pro
 - **Test Mode:** Cycle pump 5x (30-sec intervals).
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6. Performance Upgrades

Supercharger Kit (Vortech V-2):

- **Boost:** 6–8 PSI (stock internals safe)
- **Fuel Upgrades:**
 - 42 lb/hr injectors
 - Walbro 255 LPH pump

Exhaust Header Install:

- **Long-Tubes:** Requires EGR delete (tuner required).
 - **Torque:** Header bolts - **25 ft-lbs** (staged)
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7. Torque Specifications

Component	Torque (ft-lbs)	Notes
Cylinder Head Bolts	26 + 90°	Sequence critical
Flywheel Bolts	85	Loctite 263
Wheel Lug Nuts	100	Chrome lugs reduce 10%

8. Fluid Capacities

System	Capacity	Fluid Type
4.6L V8	6.0 qt	5W-20 Synthetic
T-45 Trans	3.5 qt	Mercon V
IRS Diff	2.6 pt	75W-140 Synthetic

9. Troubleshooting

Engine Misfire (4.6L):

- Test COP coils (**4.6–5.2Ω** resistance).
- Inspect spark plugs (gap: **0.052–0.056"**).

Harsh Shifts (4R70W):

- Replace separator plate (Ford **4L2Z-7Z490-AA**).
 - Reset adaptive learning (cycle ignition 10x).
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10. Special Tools

Tool	OEM Part #	Use Case
Cam Locking Kit	303-507	Timing chain jobs
Spark Plug Thread Kit	5553	Aluminum head repair

11. Maintenance Schedule

Service	Interval (Miles)
Oil Change	3,000–5,000
Coolant Flush	30,000
Transmission Fluid	60,000

12. Appendix

Parts Cross-Reference:

OEM Part	Aftermarket Equivalent
COP Coil (F6DZ-12029-B)	MSD 32849
Fuel Filter (F6DZ-9155-B)	Wix 33032

Wiring Color Codes:

- **Red/Blue:** Ignition +12V
 - **Black/White:** Ground
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13. Advanced Diagnostics

P0171/P0174 (Lean Codes):

1. **Smoke Test:** Check for vacuum leaks (smoke machine required).

2. **MAF Cleaning:** Use CRC **05110** (no direct contact).
3. **Fuel Pressure Test:** 35–45 PSI at idle.

ABS Light On:

1. **Wheel Speed Sensor Test:**
 - Resistance: **800–1,400Ω** (front), **1,000–1,600Ω** (rear).
 - Air gap: **0.028–0.032"**.
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14. Body & Interior

Convertible Top Repair:

1. **Hydraulic Pump Reset:**
 - Cycle ignition 5x with top switch held down.
2. **Seal Replacement:**
 - Use 3M **08609** urethane.

Dashboard Removal:

1. **Steering Column:** Lower with Torx T50 (18 ft-lbs reinstall).
 2. **Torque:** Dashboard bolts - **89 in-lbs**.
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15. Factory Recalls/TSBs

TSB 03-06-01:

- **Issue:** Harsh 1-2 shift (4R70W).
- **Fix:** Reprogram PCM with Ford IDS.

Recall 99S27:

- **Issue:** Speed control deactivation switch fire risk.
 - **Fix:** Replace switch (Ford **F65Z-9C968-AA**).
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16. Performance Tuning

EEC-V PCM Tuning:

- **Software:** SCT X4 or HPTuners.
- **Parameters:**

- Rev limit: **6,250 RPM** (stock) → **7,000 RPM** (safe).
- Fuel injector slope: **42 lb/hr** (matched to upgrades).

Suspension Upgrades:

- **Coilovers:** KW Variant 3 (600 lb/in front spring rate).
 - **Sway Bars:** Eibach **3582-320** (35mm front/24mm rear).
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17. Torque Spec Addendum

Component	Torque (ft-lbs)
Intake Manifold Bolts	18
Exhaust Manifold Studs	22
Differential Cover	25

18. Fluid Spec Addendum

System	Capacity
Power Steering	1.8 qt
Cooling System	13.5 qt

19. Special Procedures

Headlight Motor Gear Replacement:

1. **Gear Kit:** Ford **F5RZ-13A025-AA**.
2. **Test Cycle:** Run motors 10x after repair.

Fuel Tank Replacement:

1. **Support:** Use transmission jack.
2. **Vent Line Routing:** Avoid kinks near EVAP canister.

20. Final Checks

Post-Repair Verification:

1. **Idle Relearn:**
 - Warm engine to 190°F.
 - Idle 10 mins with A/C off.
2. **Road Test:** Monitor for driveline vibration (55–65 MPH).