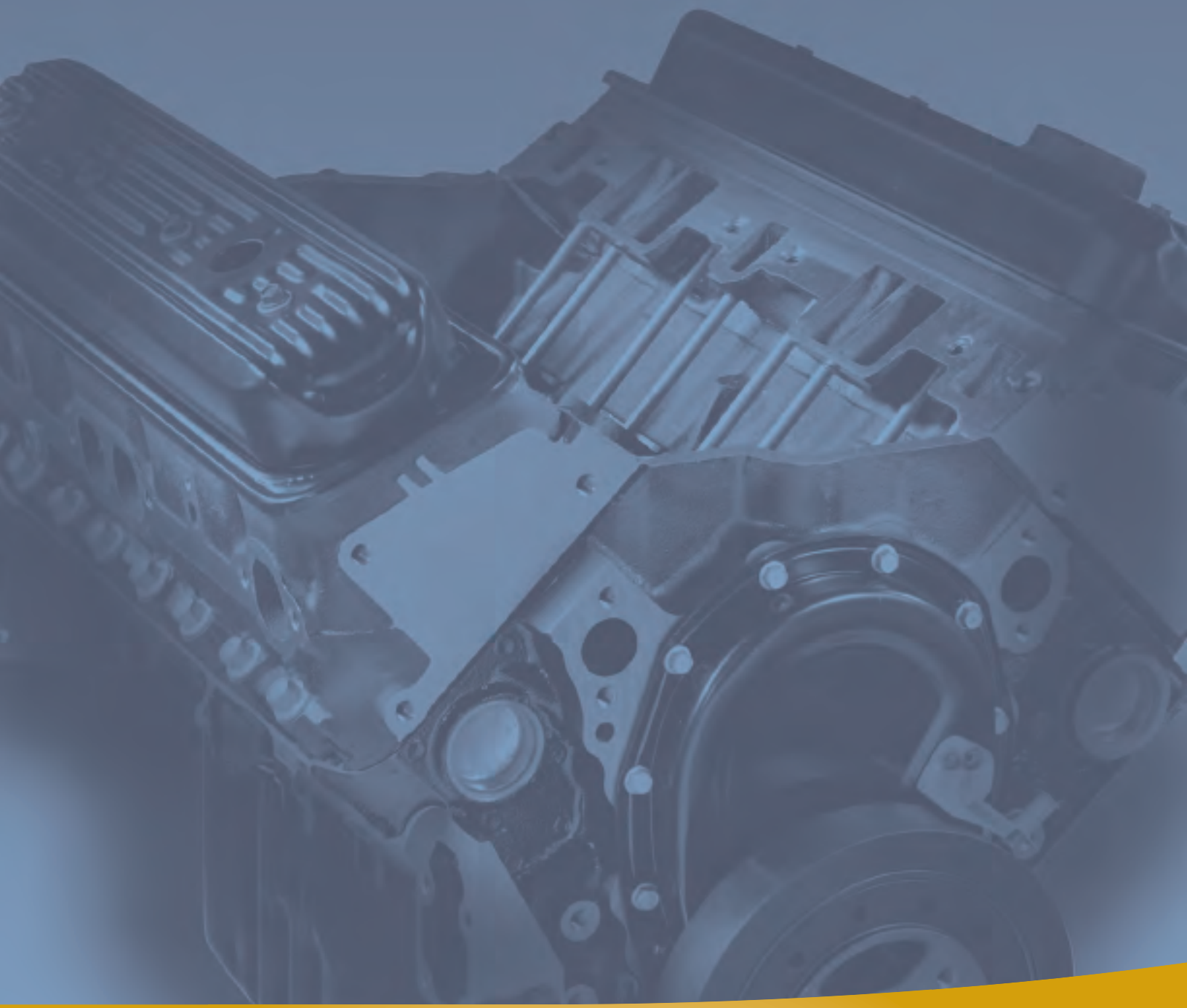
# GM Goodwrench Engines Catalog

August 2004



Goodwrench Engines

# TABLE OF CONTENTS

**Click on any of the following sections or sub-sections to link directly to the information.**

# INTRODUCTION

## HOW TO USE THIS REFERENCE GUIDE

Your new 2004 Goodwrench Engine Reference Guide contains a quick reference section and a color-coded index that is exclusive for each section of this book. Listed below are explanations of the format for each individual section.

**QUICK REFERENCE INFORMATION**
This section is located at the beginning of this reference guide. This section contains everything that you need to know about warranty, component parts specifications for new and remanufactured engines, general installation procedures, general engine diagnostics, and core return procedures.

**ENGINE FAMILY APPLICATION, CONTENT AND INSTALLATION***
This portion of the catalog contains engine-specific content, application information, and any additional installation instructions needed for a particular engine. The quickest method in finding a particular engine would be to refer to the color-coded index (if liter sequence is known). All part numbers are numerically listed in each color-coded section. Also, there is a color-coded index guide on the outer back cover of this book. However, if the liter is unknown, a part number sequence listing is available in the index of this reference guide.

Red = this section contains all 4-cylinder engines
Green = this section contains all V6 and I6 engines
Blue = this section contains all V8 gasoline and diesel engines

**REPLY CARD**
We would like to hear from you. Please fill out the reply card and tell us what you think about the Goodwrench Engine Reference Guide and product offerings.

*For additional assistance on engine content or installation, contact PARTECH at 1-800-433-6961.

# COMPONENT PARTS SPECIFICATIONS

## GOODWRENCH REMANUFACTURED ENGINES

This is a generic summary of the type of parts found in Goodwrench remanufactured engines. Each engine family is different from other engine families, and remanufacturing specifications can be unique to a specific engine part number.

**New Components** are those that are always installed new (OE designed) during the remanufacturing process.

**Qualified Components** are those used parts that are reclaimed by cleaning and checking to OE specifications.

**Remanufactured Components** are those used parts that are reclaimed by machining to specifications established by GMSPO Engineering with the consultation and direction of General Motors Powertrain (GMPT) Engineering. Changes to OE specifications are typically validated by dynomometer durability testing. All GMSPO remanufactured parts are shipped clean and ready for installation unless otherwise noted in the installation instructions.

***THE USE OF SURFACE CONDITIONING DISKS TO REMOVE THE BLACK OXIDE FINISH OR GASKET MATERIAL ON SEALING SURFACES IS STRICTLY FORBIDDEN AND MAY LEAD TO PREMATURE BEARING FAILURE.***

### COMPONENT SUMMARY LIST

| NEW COMPONENTS | QUALIFIED COMPONENTS |
|---|---|
| Bearings - All | Balance Shafts |
| Bolts - Cylinder Head (typically) | Ball-Rocker Arm |
| Camshaft (flat lifter only) | Bracket - Engine Lift |
| Cup Plugs and Freeze Plugs | Caps (valve) |
| Gaskets - All | Cover - Fuel Pump Opening |
| Gear - Balance Shaft Drive (typically) | Fasteners - Various |
| Gear - Balance Shaft Driven (typically) | Front Covers (if applicable) |
| Flat Lifters | Intake Manifold (if applicable) |
| Nut-Connecting Rod | Oil Fill Cap |
| Nut - Rocker Arm Stud | Oil Pan |
| Oil Pump | Pushrods |
| Pistons & Pin and Rings | Retainer - Lifter |
| Seals - All | Rocker Arms |
| Sprocket - Camshaft and Crankshaft | Rocker Covers (if applicable) |
| Timing Chain | Rotators (valve) |
| Valve - Oil Filter Bypass | Shaft - Distributor to Oil Pump |
| Valves - Inlet and Exhaust | Valve Springs |

# COMPONENT PARTS SPECIFICATIONS

## GOODWRENCH REMANUFACTURED ENGINES

### COMPONENT SUMMARY LIST cont.

| REMANUFACTURED COMPONENTS | Attribute | Differs from OE Specifications |
|---|---|---|
| Cylinder Block | Balance Shaft Bore | Same as OE Specifications |
| | Camshaft Bore | Same as OE Specifications |
| | Cylinder Bore | Typically .010", .020" up to .030" oversize, same surface finish and geometry as OE - varies by engine family. |
| | Deck Height | Same to .010" under OE. |
| | Head Gasket Surface | Same (including flatness, surface finish, etc. - may be machined to achieve OE spec). |
| | Lifter Bore | Same as OE Specifications |
| | Main Bearing Bore | Honed to OE specs.* |
| | Other | Welding permitted for cosmetic purposes - no welding in cylinder bore. Thread repair (Heli-coli or Time-sert) is permitted. |
| Cylinder Head | Head Gasket Surface | Same (including flatness, surface finish, perp, etc. - may be machined to achieve OE spec). |
| | Valve Guides | Same surface finish and geometry. |
| | Valve Seats | Reconditioned to OE specifications - replaced when necessary. |
| | Other | Thread repair (Heli-coli or Time-sert) is permitted with limits. Cosmetic welding is permitted except in the combustion chamber area. |
| Crankshaft | Main and Rod Journals | .010", .020", possibly .030" undersize (Dia) - varies by engine family - same surface finish and geometry. |
| | Other | No welding or straightening allowed. |
| Camshafts (Roller Lifter Only) | Lobes | Roller lifter camshafts polished and qualified to OE specifications, no rework allowed. |
| Connecting Rods | Diameter of Big End | Parting line may be machined (max .030") and big end honed. Keep center to center distance to OE specification. |

**Assembly information -OE bearing clearances are maintained. Fasteners are tightened in sequence and torques.*

# COMPONENT PARTS SPECIFICATIONS

## RPO LISTING - ENGINES

| RPO | MY | RPO Description |
|---|---|---|
| LA1 | 96-02 | 6 Cyl, 3.4L, MFI, HO |
| LA5 | 83-86 | 1.8L (1.8J), L4, MF1 |
| LA7 | 85-86 | 1.5L (1.5-5), L4 (Diesel) |
| LA9 | 96-02 | 4 Cyl, 2.2L, MFI, DOHC |
| LB1 | 85-92 | 4.3L (4.3N), V6 |
| LB4 | 82-97 | (4.3Z), V6, EFI |
| LB4 | 85-98 | (4.3L), V6 90 DEG Gas TBI |
| LB6 | 85-90 | 2.8L (2.8W), V6, EFI |
| LB7 | 01-02 | Diesel, 8 Cyl6.6-1, V8, DI, Turbo, HO, Isuzu |
| LB8 | 85-89 | 2.8L (2.8S), V6, MFI |
| LB9 | 82-83 | 5.0L (5.0F), V8, EFI |
| LC0 | 86-89 | 1.5L (1.5-9), L4 (Turbo) MFI |
| LC1 | 82-84 | 2.8L (2.8-1), V6, 2BBL, HO |
| LC2 | 86-87 | 3.8L (3.8-7), V6, SFI, HO/Turbo |
| LC2 | 89-89 | 3.8L (3.8-7), V6 (Turbo), SFI, HO/Turbo |
| LC3 | 80-82 | 229 C.I.D. (229K), V6, 2BBL |
| LC3 | 83-84 | 229 C.I.D. (229-9), V6, 2BBL |
| LC4 | 80-85 | 4.1L (4.1-4), V6 |
| LC5 | 78-78 | 231 C.I.D. (231G), V6 |
| LC5 | 85-85 | 1.5L (1.5K), L4, 2BBL |
| LC5 | 86-89 | 1.5L (1.57), L4, 2BBL |
| LC6 | 78-79 | 231 C.I.D. (231-2), V6, 2BBL |
| LC7 | 87-88 | 4.1L (4.1-7), V8 |
| LC8 | 78-82 | 231 C.I.D. (231-1), V6, 4BBL Turbo |
| LC8 | 83-83 | 231 C.I.D. (231-8), V6, 4BBL Turbo |
| LC9 | 78-79 | 196 C.I.D., V6, 2BBL |
| LC9 | 85-88 | 1.6L (1.6-4), L4, 2BBL |
| LD2 | 85-96 | 2.3L (2.3D), L4, DOHC |
| LD2 | 93-96 | 2.3L (2.3G), L4, DOHC, U-Van, Export |
| LD4 | 78-78 | 250 C.I.D., Stan 6 Cyl |
| LD4 | 87-95 | 2.3L (2.3D), L4, DOHC |
| LD5 | 76-87 | 231 C.I.D., (231A), V6, 2BBL |
| LD7 | 75-77 | 231 C.I.D., (231C), V6, 2BBL |
| LD8 | 93-02 | 8 Cyl, 4.6L, V8, DOHC, SFI, (281 C.I.D.)(Northstar) |
| LD9 | 96-02 | 4 Cyl, 2.4L, SFI, DOHC |
| LE2 | 80-80 | 2.8L (2.8X), V6, 2BBL |
| LE2 | 81-86 | 2.8L (2.8X), V6, 2BBL |
| LE3 | 79-84 | 250 C.I.D., L6 |
| LE4 | 80-80 | 400 C.I.D. (400X), V8, 4BBL |
| LE4 | 92-94 | 2.0L (2.0H), L4, MFI, OHC, 122 C.I.D. |
| LE8 | 76-91 | 7.4L-W, V8, 454 C.I.D., 4BBL |
| LE8 | 01-01 | 2.5L, V6 |
| LE8 | 87-87 | 454, 7.4L, V8, 4BBL (different int & exh manifold) |
| LE9 | 81-86 | 305 C.I.D. (305H), 5.0L, V8 |
| LF3 | 81-86 | V8, 5.0L-F, 305 C.I.D., 4BBL |
| LF3 | 86-86 | 305, V8, TBI |
| LF4 | 76-80 | 400 C.I.D. (400R), V8, 4BBL |
| LF5 | 79-91 | 350 C.I.D., V8, 5.7L-P, 2BBL |

| RPO | MY | RPO Description |
|---|---|---|
| LF5 | 92-00 | 350 C.I.D., V8 |
| LF6 | 96-02 | 6 Cyl, 4.3L, CPI, V6, 90 DEG |
| LF7 | 79-79 | 260 C.I.D. (260P), Diesel V8 |
| LF8 | 76-80 | 454 C.I.D. (454S), V8 |
| LF9 | 78-85 | 350 C.I.D. (350N), Diesel V8 |
| LG0 | 85-95 | 2.3L (2.3A), L4, MFI |
| LG0 | 91-91 | 2.3L (2.3A), LA (high output), OHC |
| LG1 | 96-96 | 2.4L, MFI, SOHC, 4 Cyl |
| LG1 | 01-02 | 2.4L, MFI, SOHC, 4 Cyl |
| LG2 | 86-88 | 3.8L (3.8B), V6, SFI |
| LG3 | 76-76 | 305 C.I.D. (305Q), V8 |
| LG3 | 77-78 | 305 C.I.D. (305U), V8 |
| LG3 | 79-79 | 305 C.I.D. (305G), V8 |
| LG3 | 86-88 | 3.8L (3.8-3), V6, SFI, HO, 231 C.I.D. |
| LG3 | 01-02 | 262 C.I.D. (4.3L), V6, OEM |
| LG4 | 78-88 | 305 C.I.D. (305H), V8-Pass |
| LG5 | 89-90 | 3.1L (3.1V), V6, EFI |
| LG6 | 87-96 | 3.1L (3.1D), V6, TBI |
| LG7 | 85-94 | 3.3L (3.3N), V6, MFI |
| LF7 | 02-02 | 305 C.I.D. (5.0L), V8, OEM |
| LG8 | 84-84 | 5.0L, V8 |
| LG8 | 85-90 | 5.0L (5.0-9), V8 (HI Output) |
| LG8 | 99-02 | 6 Cyl, 3.1J, SFI, V6 |
| LG9 | 76-81 | 305 C.I.D. (305G), V8 |
| LH0 | 88-96 | 3.1L (3.1T), V6, MFI |
| LH0 | 90-94 | 3.1L (3.1T), V6, Export |
| LH0 | 92-94 | 3.1L (3.1T), V6, Export |
| LH7 | 81-84 | 2.8L (2.8Z), V6 (HI Output), 2BBL |
| LH8 | 82-86 | 1.8L (1.8-0), L4, TBI |
| LH8 | 85-86 | 1.8L (1.8-0), L4, EFI |
| LH9 | 91-95 | 250 C.I.D. (4.1L), 6 Cyl |
| LJ5 | 81-86 | 1.8L (1.8D), Diesel L4 |
| LK9 | 82-85 | 3.0L (3.0E), V6, 2BBL |
| LL1 | 83-84 | 2.8L (2.8L), V6 |
| LL2 | 82-83 | 2.8L (2.8R), V6 |
| LL2 | 90-93 | 2.8L (2.8R), V6 |
| LL6 | 96-00 | 6 Cyl, 3.0L, MFI, DOHC, V6, HO |
| LL7 | 99-01 | 4 Cyl, 2.0L, MFI, DOHC, Turbo, HO |
| LL8 | 87-89 | 2.0L (2.0-1), L4 (HI Output) |
| LL8 | 01-02 | 4.2L, DOHC, L, MFI, Alum 6 Cyl |
| LM1 | 76-82 | 350 C.I.D. (350L), V8 |
| LM1 | 83-88 | 350, V8 |
| LM3 | 90-93 | 2.2L (2.2G), L4, TBI |
| LM4 | 02-02 | 8 Cyl, 5.3L, SFI, Alum |
| LM7 | 99-02 | 8 Cyl, 5.3L, MFI |
| LM9 | 84-86 | 3.8L (231-9), V6, SFI, Turbo |
| LN2 | 91-02 | 4 Cyl, 2.2L-4, MFI, 133 C.I.D. |
| LN3 | 84-85 | 3.8L (231-3), V6, MFI |

# COMPONENT PARTS SPECIFICATIONS

## RPO LISTING - ENGINES

| RPO | MY | RPO Description |
|---|---|---|
| LN3 | 88-92 | 3.8L (3.8C), V6, MFI |
| LN3 | 99-00 | 3.8L (3.8H), V6, MFI |
| LN4 | 97-99 | Diesel, 6 Cyl, 7.1L, Turbo |
| LN7 | 85-88 | 3.0L (3.0L), V6 (HI Output), MFI |
| LN8 | 83-94 | 2.5L (2.5E), L4, EFI |
| LN8 | 85-91 | 2.5L (2.5E), L4, TBI |
| LP2 | 89-01 | 1.0L (1.0-6), L3 (Digital Fuel Injection) |
| LP3 | 75-77 | 5.7L-E, 350 C.I.D., 4BBL |
| LP4 | 97-02 | 8 Cyl, 7.4L (7.4D), MFI |
| LP9 | 84-85 | 5.7L (SEO), V8 |
| LQ0 | 96-98 | 4Cyl, 2.6L, MFI, Isuzu |
| LQ1 | 91-99 | 3.4L (3.4X), MFI, OHC, V6, HO, DOHC |
| LQ2 | 83-85 | 2.0L (2.0Y), L4 |
| LQ4 | 98-02 | 8 Cyl, 6.0L, MFI |
| LQ5 | 82-86 | 2.0L (2.0P), L4, TBI |
| LQ6 | 87-92 | 4.5L (4.5-8), V8 (Digital Fuel Injection) |
| LQ7 | 82-85 | 2.2L (2.2S), Diesel L4 |
| LQ8 | 82-83 | 2.5L (2.5F), L4, 2BBL |
| LQ9 | 81-86 | 2.5L (2.5-2), L4, TBI |
| LQ9 | 01-02 | 6.0L (6.0N), V8, MFI, Iron, High Output |
| LR0 | 90-99 | 7.0L, 8 Cyl |
| LR1 | 82-85 | 1.9L (1.9A), L4 |
| LR2 | 82-90 | 2.8L (2.8B), V6 |
| LR4 | 99-02 | 8 Cyl, 4.8L, MFI |
| LR6 | 88-89 | 4.5L (4.5-5), V8 (Digital Fuel Injection) |
| LR6 | 90-90 | 4.5L (4.5-5), V8, MFI |
| LR8 | 82-93 | 2.5L (2.5R), L4, TBI |
| LR9 | 82-84 | 2.0L (2.0B), L4, 2BBL |
| LR9 | 85-86 | 2.0L (2.0P), L4, EFI |
| LS0 | 88-00 | V8, 6.0L |
| LS1 | 97-02 | 8 Cyl, 5.7L, SFI, Alum |
| LS2 | 85-86 | 4.3L (4.3-7), Diesel V6 |
| LS3 | 87-93 | 1.0L (1.0-2), L3 Turbo |
| LS4 | 76-76 | 8 Cyl, 7.4L, 4BBL |
| LS5 | 80-81 | 4.3L (4.3S), V8, 2BBL |
| LS5 | 89-95 | 1.6L (1.6U), L4, TBI, OHC, 98 C.I.D. |
| LS6 | 01-02 | 8 Cyl, 5.7L, SFI, Alum, High Output |
| LS6 | 78-79 | 4 Cyl, 2.5L, 2BBL |
| LS8 | 79-79 | 151 C.I.D., L4, 2BBL |
| LS9 | 76-86 | 350 C.I.D. (350L), V8 |
| LT1 | 92-98 | 8 Cyl, 5.7L (5.7P), MFI, HO |
| LT2 | 83-92 | 2.0L (2.0K), L4, EFI |
| LT3 | 87-90 | 2.0L (2.0M), L4, MFI |
| LT4 | 76-76 | 8 Cyl, 6.6L, 4BBL |
| LT4 | 96-96 | 8 Cyl, 5.7L, MFI, High Output |
| LT4 | 97-99 | 8 Cyl, 5.7L, MFI |
| LT5 | 89-96 | 5.7L (5.7J), TPI |
| LT6 | 79-85 | 4.3L (4.3V), Diesel V6 |

| RPO | MY | RPO Description |
|---|---|---|
| LT6 | 82-84 | 4.3L (4.3V), Diesel V6 |
| LT7 | 82-85 | 4.3L (4.3T), Diesel V6, 260 C.I.D. |
| LT8 | 82-87 | 4.1L (4.1-8), V8 |
| LT9 | 80-89 | 350, V8 |
| LU2 | 85-91 | 4.3B (4.3B), V6 HI Output |
| LU3 | 02-02 | 6 Cyl, 4.3L, MFI, V6, 90 DEG |
| LU4 | 99-01 | 4 Cyl, 2.3L, MFI, Low Pressure Turbo, DOHC |
| LU5 | 82-82 | 5.0L (5.07), V8, 305 C.I.D., TBI |
| LU5 | 83-83 | 5.0L (5.0S), V8, 305 C.I.D., TBI |
| LU8 | 80-81 | 4.9L, Turbo Charged, 301 C.I.D., 4BBL, F-car only |
| LV2 | 80-90 | 307 C.I.D. (307Y), V8, 5.0L, 4BBL |
| LV2 | 83-84 | 307 C.I.D. (307-9), V8, HI Output Thrust (W/W40) |
| LV4 | 91-93 | 1.6L (1.6-8), L4, DOHC Turbo |
| LV6 | 90-02 | 4 Cyl, 1.8L (1.8-8), MFI |
| LV8 | 75-81 | 260 C.I.D., V8, 4.3L-F, 2BBL |
| LV8 | 82-82 | 260 C.I.D. (260-8), V8 |
| LW0 | 88-93 | 1.6L (1.6-5), L4, DOHC |
| LW2 | 90-90 | 4.5L (4.5-3), V8, MFI |
| LW5 | 99-01 | 3.0L, MFI, V6, Turbo, DOHC, Opel |
| LW6 | 91-01 | 4Cyl |
| LW9 | 80-83 | 2.5L (2.5-5), L4, 2BBL |
| LX0 | 90-02 | Diesel, 6 Cyl, 6.6L, L6, Turbo |
| LX2 | 72-76 | V8, 500 C.I.D., 8.2L, 4BBL |
| LX2 | 91-00 | 8.2L (8.2), V8, TBI |
| LX3 | 76-77 | 1.4L-1, L4 |
| LX5 | 98-02 | 6 Cyl, 3.5H, MFI, DOHC, V6 |
| LX6 | 77-78 | 151 C.I.D., L4, 2BBL |
| LX8 | 78-80 | 2.5L (2.5V), L4, 2BBL, 151 C.I.D. |
| LY5 | 76-78 | 1.6L (1.6E), L4 |
| LY8 | 98-01 | 4 Cyl, 1.3L, MFI, OHC |
| LY9 | 85-85 | 1.0L (1.0M), L3 |
| LY9 | 86-88 | 1.0L (1.0-5), L3 |
| L01 | 88-01 | 1.6L (1.6-6), L4, MFI, SOHC |
| L03 | 88-93 | 5.0L (5.0E), V8, TBI |
| L03 | 87-96 | 5.0L (5.0H), V8, TBI |
| L05 | 89-93 | 5.7L, EFI |
| L05 | 91-97 | 5.7L (5.7-7), 8 Cyl |
| L05 | 87-96 | 5.7L, TBI |
| L09 | 94-97 | 6 Cyl, 2.5L, Fuel Injection |
| L11 | 75-77 | 140 C.I.D. (140), OHC, L4 |
| L13 | 75-76 | 140 C.I.D. (140), L4 |
| L17 | 78-79 | 1.6L (1.6E), L4, 1BBL |
| L17 | 80-81 | 1.6L (1.6-9), L4 |
| L17 | 82-87 | 1.6L (1.6C), L4, 2BBL |
| L18 | 79-80 | 4 Cyl, 1.6L-0, 2BBL |
| L18 | 00-02 | 8 Cyl, 8.1L, MFI, 496 C.I.D. |
| L19 | 82-99 | 7.4L (7.4N), V8, EFI |
| L21 | 98-01 | 8 Cyl, 7.4L (7.4B), MFI, Performance |

# COMPONENT PARTS SPECIFICATIONS

## RPO LISTING - ENGINES

| RPO | MY | RPO Description |
|---|---|---|
| L22 | 74-86 | 250 C.I.D. (250), L6 |
| L25 | 75-96 | 292 C.I.D. (292T), L6 |
| L26 | 78-79 | 200 C.I.D., V6 |
| L26 | 91-96 | 4.9L (4.9B), V8, MFI |
| L27 | 90-95 | 3.8L, SFI, V6, HO, 231 C.I.D. |
| L27 | 77-79 | 4.9L (301Y), 301 C.I.D., 2 BBL, V8 |
| L29 | 91-01 | 8 Cyl, 7.4L, MFI |
| L30 | 76-76 | 8 Cyl, 5.0L, CPI |
| L30 | 95-02 | 8 Cyl, 5.0L, CPI |
| L31 | 93-02 | 8 Cyl, 5.7L, CPI |
| L32 | 75-77 | 350 C.I.D., 5.7L-H, V8, 2BBL |
| L32 | 93-95 | 3.4L, V6 (3.4S), SFI, OHV |
| L33 | 77-79 | 425 C.I.D. (425), V8 |
| L34 | 99-02 | 2.0L, MFI, DOHC, 4 Cyl |
| L34 | 76-82 | 350 C.I.D. (350R), V8 |
| L35 | 78-79 | 425 C.I.D. (425), V8, EFI |
| L35 | 85-02 | 4.3L (4.3W), CPI, V6, 90 DEG |
| L36 | 95-02 | 6 Cyl, 3.8K, MFI, V6, HO |
| L37 | 93-02 | 4.6L, V8, DOHC, SFI, 281 C.I.D. (Northstar) |
| L37 | 78-81 | 301 C.I.D., 4.9L (4.9W), V8, 4BBL |
| L38 | 83-94 | 2.5L (2.5A), 4 Cyl |
| L39 | 79-82 | 267 C.I.D. (267J), V8 |
| L40 | 92-96 | 4 Cyl, 2.3L (2.3-3), MFI, SOHV |
| L43 | 79-90 | V8, 427 C.I.D., 7.0L, W/4BBL Carb |
| L44 | 85-88 | 2.8L (2.8-9), V6, HI Output, MFI |
| L46 | 82-82 | 1.8L (1.8G), L4 |
| L47 | 94-01 | 8 Cyl, 4.0L, SFI, DOHC |
| L48 | 77-80 | 350 C.I.D. (350), V8, 4BBL |
| L49 | 78-80 | 350 C.I.D. (350B),V8 |
| L49 | 82-82 | 5.7L, V8 |
| L49 | 84-96 | Diesel, 6.5L (6.5P), V8 |

| RPO | MY | RPO Description |
|---|---|---|
| L54 | 86-86 | Diesel, 4.3L (4.3-8), V8 |
| L56 | 88-00 | Diesel, 8 Cyl, 6.5 (6.5S), Turbo |
| L57 | 87-02 | Diesel, 8 Cyl, 6.5L(6.5Y), HO |
| L57 | 94-01 | Diesel, 6.5L (6.5Y), V8 |
| L61 | 80-84 | 368 C.I.D. (368), V8 |
| L61 | 99-02 | 2.2L, 4 Cyl, MFI, DOHC - Lotus Car |
| L62 | 80-85 | 368 C.I.D. (368-9), V8 |
| L65 | 76-77 | 350 C.I.D. (350G), V8 |
| L65 | 85-02 | Diesel, 6.5L (6.5F), Turbo, HI Output |
| L67 | 91-02 | 3.8L (3.8-1), SFI, V6, Super-charged |
| L68 | 85-91 | 2.5L (2.5U), L4, TBI |
| L69 | 83-83 | 5.0L (305-7), V8, HI Output, 4BBL |
| L69 | 84-88 | 5.0L (305G), V8, HI Output, 4BBL |
| L72 | 92-97 | 4 Cyl, 1.3L, TBI |
| L73 | 88-93 | 1.6L (1.6-6), L4, TBI |
| L74 | 73-76 | 455 C.I.D., 4BBL |
| L75 | 72-76 | 455 C.I.D., 4BBL |
| L76 | 76-77 | 350 C.I.D., V8, 4BBL |
| L77 | 74-77 | 350 C.I.D. (350J), V8 |
| L77 | 78-80 | 350 C.I.D. (350X), V8 |
| L77 | 81-81 | 350 C.I.D. (350B),V8 |
| L78 | 76-79 | 400 C.I.D., V8, 4BBL |
| L80 | 77-79 | 403 C.I.D. (403), V8 |
| L81 | 81-81 | V8, 5.7L |
| L81 | 97-02 | 6 Cyl, 3.0L, MFI, HO |
| L82 | 73-82 | 350 C.I.D. (350), V8, Special HI Perf |
| L82 | 93-99 | 3.1L (3.1M), 6Cyl, V6, MFI, HO |
| L83 | 82-82 | 5.7L (5.7-8), V8, TBI |
| L83 | 84-84 | 5.7L (5.7-8), V8, CFI - Crossfire, TBI |
| L98 | 85-92 | 5.7L (5.7-8), 350 C.I.D., TPI |
| L99 | 94-97 | 8 Cyl, 4.3L, MFI |

# GENERAL INSTALLATION PROCEDURES

# WARNING!

**When cleaning gasket sealing surfaces on new and remanufactured engines and/or cleaning parts from the failed engine to be reused, the use of surface conditioning discs that contain abrasives, such as aluminum oxide, may cause premature bearing failure.**

**THE USE OF SURFACE CONDITIONING DISCS IS STRICTLY FORBIDDEN.**
**(i.e., SCOTCH BRITE™, ROLO BRISTLE DISCS™, Soc Att™, ABRASIVE DISCS)**

**If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler must be replaced. If the vehicle is equipped, the oil lines must be removed from the vehicle and thoroughly flushed or replaced. Warranty data show that more than half of all warranty claims for premature failures are associated with lack of proper lubrication. Failure to perform these repairs will void your Goodwrench Engine Warranty.**

Before installing any engine, verify that you have the correct engine for the application. Refer to the appropriate Vehicle Chassis Service manual for proper repair procedures and specifications (i.e., fastener torque, torque sequencing, ignition timing, valve adjustment, coolant fill, air purge and fluid volumes).

Some engines have been remanufactured subsequent to the model year of the vehicle and may contain design refinements not included in the original service information (i.e., 1989 engines may incorporate design features normally found in newer models). If future service is necessary for the engine, consult the GM Parts Catalog, GM Part and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

# GENERAL INSTALLATION PROCEDURES

## TRANSFERABLE ENGINE COMPONENTS

Take out the old engine, mount it on an engine stand, and carefully remove those components that are to be transferred to the new engine. The following list of components should be removed and inspected for wear and damage. If the components are damaged or were the cause of the original engine failure, they should be replaced.

- **Harmonic Balancer**
  - Many times, the harmonic balancer's sealing surface is damaged or warped. The balancer should be carefully inspected and, if necessary, replaced to prevent a leak in the front cover seal.
- **Intake Manifold**
  - Inspect the intake manifold's machined surfaces for flatness using a straight edge. If the manifold is warped or the machined sealing surfaces are damaged, it may not seal properly, allowing water and other contaminants to enter the combustion chamber or lubricating system.
  - Check for cavitation erosion or pitting.
  - Check for obstructions or carbon in the internal EGR or exhaust crossover passages. Check for cracks at the bolt holes and the sensor mounting holes.
  - Always clean the intake manifold thoroughly before placing it on the new engine. Any foreign objects within the intake manifold could be drawn into the combustion chamber and cause considerable damage to the pistons, valves, heads and other vital parts of the engine.
  - ***Warning*** - Do not use any form of blasting media and/or surface conditioning discs when cleaning the intake manifold.
- **Valve Covers**
  - Inspect the sealing surfaces of the valve covers for flatness and check for cracks at the flanges and bolt holes. If any cracks are found on the covers, they must be replaced. Do not try to repair them.
  - Clean the covers and check for loose baffles at the fill holes and PCV outlets. Replace the cover(s) if they are defective.
- **Oil Pan**
  - Inspect the oil pan rail for flatness. Check for cracking at the pan radius area and at the bold holes. Check the front and rear oil pan seat rails for cracks or damage. If cracks are found replace the oil pan. Do not try to repair them.
  - Inspect the oil drain plug for stripped threads or a loose weld nut. Do not try to repair cracks or a loose weld nut.
- **Front Cover and Lower End**
  - Replace the crankshaft seal in the front cover. Do not use the old seal.
  - Inspect the cover for cracks and heat checks, as well as inspecting the bolt holes for cracks. The blind holes will also need to be checked for cracks, as well as pulled threads and restricted depth. If any cracks are found, replace the cover.
- **Mechanical Fuel Pump**
  - Clean the fuel pump and inspect the wear pad on the drive arm. Remember that mechanisms inside the pump wear. If the fuel pump has many miles on it or if excessive wear is present, replace it.
- **Flywheel / Flex Plate / Ring Gear**
  - Check the flywheel for flatness using a dial indicator. Refer to the manufacturer's published information regarding exact specifications. Check for damaged teeth on the ring gear or flywheel. Replace if worn or damaged.
  - Inspect the mounting holes and the torque converter or pressure plate mounting holes for cracks or wear. Inspect the clutch contact surfaces for heat cracking and discoloration. If cracks are found, replace the plate.
  - **On manual transmission vehicles, the crankshaft pilot bearing must be transferred or replaced as required.**

# GENERAL INSTALLATION PROCEDURES

## TRANSFERABLE ENGINE COMPONENTS - cont.

- **Exhaust Manifold**
  - Inspect the manifold flanges for flatness and for carbon 'witness' marks, indicating a leak. If leaks are present or the exhaust manifold sealing surfaces are not flat, replace it with a new manifold.
  - Check the manifold for cracks, especially the external EGR connections, the exhaust pipe flanges, and the manifold mounting flanges. Compare the mounting hole spacing on individual runners to the new cylinder head for exhaust manifold shrinkage. If there is shrinkage, replace the manifold.
- **Pressure Plate / Release Bearing**
  - Inspect the clutch contact surface for heat checking or cracks. Check the release fingers for wear and even height.
  - Check the release bearing for facial wear and smooth rotation and the pressure plate for flatness.
- **Clutch Disc**
  - The clutch disc will need to be inspected for oil contamination and excessive wear, such as heat cracking of frictional material, worn frictional material, loose rivets and broken springs. If any of these conditions occur, replace the clutch disc.
- **Water Pump**
  - It is recommended to replace the water pump when installing a new engine. However, if the old pump is reused, check for cavitation erosion, impeller looseness, front seal leakage and smooth bearing feel. Replace the pump if it shows signs of wear.
- **Spark Plug Wires**
  - Thoroughly inspect the wires and boots for cracking, tearing, carbon tracking or other signs of damage. Suspect wires should be replaced.
- **Distributor (if applicable)**
  - Inspect the distributor for signs of oil contamination.
  - The drive gear should be checked for honed teeth. The shaft should rotate freely, with no side play, and the body and block seals should be free from distortion and cuts.
  - The cap/rotor should be free of corrosion, cracks and burrs. The distributor/oil pump drive should be free of nicks, burrs, and chipped teeth. If any of these conditions are present, replace the distributor.
- **Other Transferable Components**
  - Alternator (generator) and relative brackets
  - Air conditioning compressor
  - Power steering pump
  - Sensors
  - All pulleys and other bracketry

Ensure that all components are clean, all gasket material is removed, and they are free of wear and cracks. If any of these components can not be cleaned or repaired to good working order or are not within the manufacturer's specifications, replace them. Remember to be careful when cleaning aluminum components so that the sealing surfaces are not nicked or gouged.

When cleaning gasket sealing surfaces on new and remanufactured engines and/or cleaning parts from the failed engine to be reused, the use of surface conditioning discs that contain abrasives, such as aluminum oxide, may cause premature bearing failure.

**THE USE OF SURFACE CONDITIONING DISCS IS STRICTLY FORBIDDEN.**
**(i.e., SCOTCH BRITE™, ROLO BRISTLE DISCS™, Soc Att™, ABRASIVE DISCS)**

# GENERAL INSTALLATION PROCEDURES

## NON-TRANSFERABLE ENGINE COMPONENTS

Some components off the old engine will not be able to be used on the new replacement engine. This is because they will hinder the performance of the engine if they are not replaced. Or, they are part of routine maintenance and the opportunity to replace them should not be overlooked.

- **Oil Filters**
  - Oil Filters must always be replaced.
- **Thermostat**
  - The thermostat previously used in the original engine may be clogged or is worn out. The thermostat must be replaced prior to installing the new engine.
- **Oil Pump, Pick-up Tube and Screen**
  - These components come with the new engine.
- **PCV Valve and Crankcase Breather Filter**
  - These should be replaced to ensure that the emission standards of the engine are met and to prevent sludge, caused by gasses, and oil to build up in the crankcase.
- **Spark Plugs**
  - Be sure the new spark plugs are the proper heat range for the vehicle and engine application.
  - Failure to change the plugs or to get the proper heat range can cause the plugs to misfire, resulting in damage to the pistons through pre-ignition detonation.
  - Be sure the spark plug has the proper gap and seat for the vehicle application to avoid damage to the piston or blow-by damage.
- **Air Filters**
  - If the air filter is not replaced on a regular basis, the particles not being filtered can cause accelerated wear on the cylinder walls, piston rings and bearings
  - A dirty air filter can act as a choke and affect fuel consumption and engine performance.
- **Cooling System Sealing Tabs**
  - Necessary to Aid in sealing porosity and to clean silicates from the water pump shaft to prevent shaft seal damage.
- **Fuel Filter**
- **Engine Oil**
- **Antifreeze / Coolant**
- **Engine Oil Cooler (with every bearing failure)**

While the engine is apart and out of the vehicle, replace basic maintenance parts such as filters, hoses and belts.

- **Fuel Filters**
  - Used filters can become clogged, restricting fuel flow.
- **Hoses**
  - Hoses become brittle with age and may need to be replaced. Check the service manual for the vehicle application for proper hose replacement types and part numbers.
- **Belts**
  - Belts become brittle with age or glazed if they have been slipping. Check the service manual for the vehicle application for the proper belt replacement types and part numbers.

Take time to check the working condition of components such as the starter motor, cooling fan motor, battery and battery cables and fuel injectors. These components may need to be replaced in order for the new engine to function properly.

# GENERAL INSTALLATION PROCEDURES

## INSTALLATION PROCEDURES

### *Flush the Cooling System*

A properly functioning cooling system is one of the most important items in installing an engine. It is important to rid the system of corrosion and other contaminants to ensure that the new engine has the proper heat transfer taking place. Otherwise, the engine will over heat and cause considerable damage. In addition to flushing the system, take time to verify the reliability and overall quality of the entire system, including the radiator and hoses. Flush the radiator thoroughly and check for blockages. Replace or inspect hoses and check for cracks, rips, brittleness and soft spots. By ensuring the entire cooling system is in proper working order, the chance of repeat engine failure is significantly reduced.

If the old engine is still running, flush the cooling system before removing the old engine. If the engine is not running, be sure to flush the cooling system immediately after replacing it with the new engine. Refer to the service manual for the specific instructions for flushing the cooling system for the vehicle.

After flushing the cooling system, add cooling system tabs (part number 1051687). Cooling system tabs aid in sealing porosity in aluminum and remove silicates from the water pump shaft that form from the coolant.

### *Installation*

The following is an outline of the steps involved in installing an engine. They give a general overview of the order in which the transferable components from the old engine should be placed on the new engine. To begin, mount the engine on an engine stand with the oil pan facing upwards, intake valley facing downwards. Throughout the entire installation process, be sure to torque all bolts and other fasteners according to the manufacturer's specifications.

1. Install the oil pump and the oil pump shaft. **Fill the pump with GM E.O.S., part number 1052367, to aid in the initial suction and priming of the pump.** Do not use white lithium grease to pack the oil pump. This grease won't breakdown and will clog oil passages, which could cause engine oil starvation and seizing.

2. Install the new oil pick-up tube and screen and the crankshaft oil slinger. Be sure not to install the oil screen too close to the oil pan. Installing it too close can hinder the pick-up of oil causing oil starvation and seizing. Be sure to check the service manual for proper distance specifications.

3. Pour 1/4 of a can of GM E.O.S., part number 1052367, over the crankshaft, distributing it over the entire length of the crank.

4. Install the front cover using a front cover alignment tool. Apply gasket adhesive to the assembly to keep the gaskets in place during installation. Lubricate the front cover crankshaft seal with clean engine oil or E.O.S.
   - Be sure to seal the bolts that are entering the water jackets with RTV sealant.
   - Put the RTV sealant in the damper key slot to seal the key to the keyway.

5. Install the damper using the damper installation tool. Be sure to visually inspect the alignment before proceeding.

6. Install the water pump.
   - Be sure to coat the bolts that enter the water jackets with sealant.
   - Apply RTV sealant to the front cover and block joint.

7. Place the oil pan gasket on the block rail applying sealant at the mating corners. Be sure to properly align the oil pan, gasket and block. Be sure the drain plug is tight.

# GENERAL INSTALLATION PROCEDURES

## INSTALLATION PROCEDURES cont.

8. Rotate the engine on the engine stand so that the intake valley is facing up and the oil pan is facing down.

9. Pour the remainder of the E.O.S. over the rocker arm assemblies and camshaft.

10. **Pre-lube the engine with A.P.I. Starburst certified motor oil.** Pre-lubing the engine is necessary to avoid dry start damage. The most efficient way to pre-lube the engine is to use the **J-45299 engine pre-luber.** This will work on all applications. However, if no engine pre-luber is available and the engine has a mechanical distributor, the engine can be pre-lubed by priming the oil pump with a hand-held drill.

    Using an oil pump priming tool or distributor shaft, rotate the oil pump with a drill at 200 to 500 RPM for two minutes after pressure builds up in the engine. This is to flush any debris from the engine without a load on the bearings while maximum clearances are present. Be sure to rotate the drill in the same direction as the distributor.

11. Install the intake manifold side gaskets and the end seals on the block and cylinder heads, placing RTV sealant on the corners.

12. Install the intake manifold, making sure to tighten the bolts in the proper sequence. Refer to the service manual for that vehicle and application for the specific sequence. Tighten the bolts from the inside out, alternating sides and criss-crossing front to back. If the intake manifold does not seal properly to the heads, water and other contaminants can enter the combustion chamber causing considerable damage.

13. Install the valve covers and be sure to tighten those fasteners in the proper sequence. The valve covers need to seal properly to avoid damage to the engine. Refer to the service manual for that vehicle and applications for the specific sequence and torque values.

14. Set the static ignition timing. Refer to the service manual for the proper procedure.

15. Install the exhaust manifold(s).

16. Install the fuel pump and fuel lines being sure of proper routing for the fuel lines.

17. Install the vacuum hoses. Check hoses for condition and replace as necessary.

18. Install the components listed below:
    - Front end bracketry
    - Crankshaft pulley
    - Water pump pulley
    - Air conditioning compressor
    - Air pump
    - Alternator (generator)
    - Power steering pump
    - All sensors that were removed from the original engine
    - Engine mounts (engine to frame)
    - External EGR components

# GENERAL INSTALLATION PROCEDURES

## INSTALLATION PROCEDURES cont.

19. Remove the engine from the engine stand.

20. Install the flywheel and clutch components.

21. Install the engine in the vehicle.

### *After Installation*

Before the initial start up:

- Make sure the battery is fully charged.
- Make sure the engine has been pre-lubed, the oil is at its proper level, and the engine is pressurized completely.
- Check the transmission fluid, power steering fluid, brake fluid and coolant levels and condition. Change as necessary.
- Pressure check the cooling system, not exceeding 20 psi (138 kPa).
- Check hoses, cylinder head and freeze plugs.
- Check the radiator core, transmission oil cooler and the drain cock.
- Be sure the radiator cap maintains pressure and is the correct application.

Check the routing of the various other components, such as:

- Belts - check the tension and adjust them accordingly
- Electrical harnesses - check the ignition wiring and firing order, and the harnesses and wires to the alternator (generator), cooling fan, starter, sensors and the carburetor
- Intake system - check the ducts, filters and vacuum hoses for proper placement and condition
- PCV system - check the hoses and clamps for proper placement and condition
- Fuel lines - check for proper placement and condition
- Refer to the Vehicle Emissions Control information label for the proper hose routings.

### *After Initial Start-up Checklist*

Check for fluid leaks in the following areas:

- The entire fuel system
- Valve / Camshaft cover gaskets
- Cylinder head gaskets
- Oil filter
- Oil level indicator
- Oil pressure sending unit
- Cup plugs or pipe plugs at the end of the oil passages
- Oil pan gaskets
- Oil pan front and rear end seals
- Crankshaft front and rear seals
- Side bolts

*Note:* If any leaks are found but the source of the leak is not detectable, use the 'black light and dye kit' or the 'pressure method' to pinpoint the source of the leak.

- GM engine oil fluorescent tracer dye, part number 12345795
- GM transmission fluorescent tracer dye, part number 12345796
- GM coolant system fluorescent tracer dye, part number 12345797

# GENERAL INSTALLATION PROCEDURES

## INSTALLATION PROCEDURES cont.

Check for fluid levels and conditions of the following:

- Engine Oil
  - Check for factory recommended pressure (see manual).
  - Verify oil level is at manufaturer's recommended amount.
- Engine Coolant
  - Make sure the thermostat is functioning properly.
  - Be sure the coolant is flowing freely through the system and that no blockages are present.

Check the following fluids for level, color and smell. Drain and flush before refilling, if necessary. Refer to service manual for further details.

- Transmission fluid
- Power steering fluid
- Brake fluid

### *Abnormal Noises*

With engine running, listen for noises such as:

- Detonation
- Exhaust leaks
- Vacuum leaks
- Tapping / Knocking
- Loose or broken attaching components
- Drive belts

Dynamic ignition timing should be set at this time, if applicable. Incorrect timing is a common cause of engine failure. Be sure the vehicle's timing is correct. If unsure about specifications or procedures used in adjusting the timing and the idle speed, check the manufacturer's published information. Also, refer to the Vehicle Emission Control information label for specifications.

Check the engine vacuum. Install a vacuum gage at the intake manifold. The vacuum gage should read steady at approximately 18 in Hg at idle or above depending on the altitude. A low vacuum reading may indicate a restricted exhaust system, while a fluctuating vacuum may indicate internal engine concerns.

Other items:

- Cylinder heads, retorque if necessary
- Check belt tension, if applicable
- Check component routing

# GENERAL INSTALLATION PROCEDURES

## INSTALLATION PROCEDURES cont.

### *Engine Break-In*

Once the engine has been successfully installed and the oil pump has been primed, start the engine and let it idle at 1600 to 2000 RPM for 10 to 20 minutes allowing the oil pressure and temperature to stabilize. Refer to the service manual for the proper pressure range. During this time, where applicable, adjust the timing and valve clearance and check for leaks.

Road test the vehicle for a minimum of 10 miles (16.09 km) with combined city and highway driving. Do not exceed 50 miles per hour (80 kph) or use any fast throttle responses.

Instruct the customer that the first service interval for changing oil and the oil filter should be between 300 and 500 miles (500 km and 800 km). For subsequent service, refer to the manufacturer's recommended intervals.

# GENERAL ENGINE DIAGNOSTICS

Proper diagnosis of a failed engine is critical. Otherwise, the same failure cause will affect the performance and reliability of the best replacement engine. As such, verifying proper operation of the various engine systems is mandatory to avoid another failure that may not be covered under warranty. If the cause of failure was inadequate or improper maintenance, the owner should be informed that recommended schedules must be followed on the replacement.

## CAUSES OF ENGINE FAILURE

Engines rely on a number of related systems for their operation, performance and durability. The related systems include:

- Starting and Charging
- Ignition
- Fuel
- Valve Train
- Lubrication
- Cooling
- Emission Controls
- Engine Controls

Various problems in any one of these systems can degrade engine performance and prevent the engine from operating at all. In most cases, specific trouble symptoms will become evident before the engine suffers a catastrophic failure or serious internal damage to require its replacement. On newer vehicles, electronic engine controls and On Board Diagnostics (OBDII) are able to identify potential problems requiring service before a symptom is noticed.

While many factors can impact engine performance and driveability, the most common causes of engine failure include the following:

- Insufficient Lubrication
- Oil Contamination
- Poor Coolant Circulation
- Pre-Ignition or Detonation

Usually the reason an engine failed is apparent. Insufficient lubrication may have caused serious wear and seizure of internal engine parts. Oil contamination may have caused premature failure of bearings or other components. Poor coolant circulation may have caused overheating which ruptured gaskets or caused the engine to seize. Pre-ignition or detonation in the combustion chambers may have caused piston and valve damage, or ruined the cylinder block and head.

*You will usually know why a replacement engine is needed, but identifying what led to the reason for failure is more important.*

# GENERAL ENGINE DIAGNOSTICS

## DIAGNOSING AN ENGINE FAILURE

### Preliminary Checks

Several preliminary checks are recommended when a customer arrives with a serious engine operating concern:

1. Understand the specific customer concern and the problem symptoms.
2. Verify the concern under the same conditions that it occurred.
3. Perform a visual/physical inspection for the following symptoms or signs of engine failure causes:
   - Serious oil or coolant leaks which may indicate engine block cracks or cylinder head gasket failure.
   - Engine noises that may indicate internal engine problems other than timing or fuel system defects.
   - Overheating caused by inadequate cooling from a plugged radiator, stuck thermostat or collapsed coolant hoses.
   - Excessive wear caused by a lack of lubrication from using an incorrect oil, inadequate oil changes, a too-low oil level, or a plugged filter, PCV valve or EGR valve.
   - Incorrect timing causing overheating or performance problems.
   - Unusual odors in the engine compartment, which may indicate excessive oil consumption, coolant hose/water pump failure, melted wiring or ruptured/melted seals or gaskets.
   - Obvious exhaust emissions, with odor and colors, which may indicate combustion problems.
   - Electrical failures from disconnected connectors or broken or melted wires.
   - Engine performance problems from kinked, split or missing vacuum hoses.
   - Hard starting, rough idling from collapsed or damaged air intake components.
   - Electrical or mechanical malfunctions caused by improper installation of non-factory accessory items.
4. Never overlook the possibility that poor engine performance, even an inoperable condition, may be caused by problems in other systems - starting/charging, ignition, fuel, intake and exhaust, lubrication, cooling, emission controls and engine controls.
   - A weak battery, defective starter motor or failed generator will prevent proper engine start-up and may damage components.
   - Incorrect ignition timing settings, as well as various defective ignition components, can easily shut down engine operations.
   - Fuel system problems, such as blockage, contamination and defective/incorrect parts can cause serious engine concerns.
   - Defective intake and exhaust systems can affect combustion quality and lead to detonation problems.
   - Contaminated lubrication and cooling systems can lead to catastrophic engine failure.
   - Insufficient engine cooling can lead to severe parts damage and even seizure from overheating.
   - Emission-control settings and defective components may affect engine operation or cause serious problem symptoms.
   - Electronic-control system components provide essential engine operating data to the PCM and must be checked with a scan tool or specific DTCs.

# GENERAL ENGINE DIAGNOSTICS

## Insufficient Lubrication Diagnosis

Proper lubrication is critical for engine life. Engine parts are exposed to extremely high temperatures, pressures and mechanical friction. Without sufficient lubrication, these parts can quickly fail from abnormal wear, deep scoring and complete seizure involving metal welding.

All engines have a recommended lubricant or oil type, certified by the American Petroleum Institute (API). A Starburst certified oil is the recommended oil for vehicles. Containers for this oil have a "starburst" certification mark that makes it easier to select engine oils that meet performance standards set by international vehicle makers. Containers of Starburst certified oil also have the standard API "donut" certification mark, which identifies the viscosity, API performance category and energy conservation characteristics. Using the incorrect oil can lead to insufficient lubrication.

Engines also have a recommended oil capacity and change interval. Insufficient lubrication occurs when the oil level is below the minimum recommended level because of leakage or burn-off, or when the oil flow through the engine lubrication passages is blocked because of mechanical problems or sludge formation. The oil filter should be changed at the same time as the oil.

If an engine failure is caused by lack of lubrication, check for leakage from external components. Flush an external oil cooler and lines; ***replace the cooler if a catastrophic engine failure occurred***. Make sure that the correct viscosity oil was used and that the oil filter and PCV vales were properly installed. Also, check the engine itself. Compression-set manifold gaskets, worn valve guides or piston rings can lead to excessive oil use.

## Oil Contamination Diagnosis

Contamination is one of the worst enemies of engine lubrication. Any foreign materials entering the crankcase, as well as wear materials from inside the engine itself, can wear the cylinder walls and pistons/rings, bearings, shafts, timing components, oil pump parts and valve train components. Oil contamination is one of the most common causes of bearing failure.

Usually, engine failures caused by oil contamination are relatively easy to diagnose because component failures, restricted oil flow, or a lack of maintenance have caused the very obvious lubrication system problems. The lubricating oil can also be degraded by coolant contamination from a cracked cylinder block or head. Or, the oil can be diluted and have reduced lubricating capabilities by mixing with unburned fuel that washes past worn piston rings. The oil may have also been contaminated by improper repair procedures that introduced dirt, abrasives or other foreign materials.

- If the oil drained from the failed engine contains metallic particles, sludge, sediment, or varnish remnants, the cause or causes should be determined. Check the following:
  - If the engine oil had not been regularly changed at recommended intervals, the engine may have had a serious deposit build-up that was flushed into the oil upon failure.
  - If an incorrect engine oil (not API-certified) was used or the oil was not regularly changed according to operating conditions, heavy sludge deposits and sediment should be expected.
- If the oil is diluted with coolant or fuel, check the following:
  - Oil diluted with Coolant: An oil cooler failure, casting crack or gasket leak may be indicated.
  - Oil diluted with Fuel: A too-rich fuel mixture, leaking fuel injector, defective ignition system, or severely worn rings may be indicated.

**Warranty analysis shows that the use of abrasive surface-conditioning discs, sandpaper or grinders to remove gasket residue during engine service is one of the leading causes of bearing failure. The following abrasive disc products should NEVER be used on these high-quality new and remanufactured engines:**

- **ScotchBrite™ abrasive discs**
- **Rolo Bristle Discs™ abrasive discs**
- **Soc Att™ abrasive discs**

***The only method of gasket removal approved by GM Goodwrench is using a hand scrapper.***

# GENERAL ENGINE DIAGNOSTICS

## Poor Coolant Circulation Diagnosis

Proper engine operation depends on coolant to flow through the engine water jackets and absorb the heat of combustion, and then to transfer it to the outside air by flowing through the radiator. A typical engine (coolant) operating temperature is about 200°F (94°C); some older engines run cooler and some newer engines run hotter.

With proper flow, the engine coolant in most vehicles can readily absorb, transfer and release heat. When the flow or volume of coolant is too low, engine temperatures may rise beyond design specifications. The engine may seize as various parts burn off lubrication and expand. Engine failures caused by overheating from poor coolant circulation are common.

The most common cause of engine overheating is poor coolant circulation. **If the cause of the overheating problem is not corrected, a replacement engine will also fail.** The following checks must be performed:

- *Coolant Type and Level* - Coolant types and levels are specified for most engines.
- *System Blockage* - Various conditions may partially block cooling system passages and prevent adequate coolant flow. Some of these conditions include sediment and scale build-up in the radiator or the heater core, or sludge build-up in the engine water jackets or coolant passages. The radiator and heater core must be flushed and clean to insure that sediment will not enter the new engine or possibly limit coolant flow again. A thermostat stuck closed must also be replaced. GM Parts recommends always replacing the thermostat whenever a replacement engine is installed.
- *System Leakage* - Loose clamps on hoses, deteriorated hoses, radiator core or heater core pinhole leaks, a defective radiator drain cock, a failed water pump and internal engine cracks and gasket failures are all problems that can cause a loss of coolant.
- *Gasket Failure* - A defective or failed head gasket may allow exhaust gas to leak into the cooling system. These gases will from strong acids when combined with the coolant, and lead to serious radiator corrosion and damage other parts. Combustion leaks in the valve areas can cause cracked valve seats and cylinder heads. The leaking gases force coolant away from the leak area during heavy acceleration. The area overheats and can crack when acceleration stops and the coolant ruches back to the leak area.
- *Rust* - Rust formation in the cooling system can also prevent proper coolant flow and lead to engine overheating. This is most often caused by operating the vehicle for extended periods of time with a low coolant level. Especially systems with long-life coolants such as DEX-Cool are not immune to this problem. The low coolant level, not the coolant itself, is at fault for rust formation. To correct the problem, the entire cooling system may require extensive flushing. Refer to GM Bulleting 99-06-02-012B.

**Only use distilled water to mix with new coolant. Never add tap water.**

## Pre-Ignition or Detonation Diagnosis

With normal engine operation, the combustion process is smooth from beginning to end, as the air-fuel mixture is compressed and burned evenly for maximum power. Today's internal combustion engines operate on a basic four-stroke cycle:

- *Intake*: The camshaft opens the intake valve and the air-fuel mixture enters the cylinder as the piston moves to its lowest point, Bottom Dead Center (BDC).
- *Compression*: The intake valve closes and the piston moves to Top Dead Center (TDC). The air-fuel mixture is compressed to about one-eighth or ninth of its original volume.
- *Power*: The spark plug fires, igniting the compressed air-fuel mix. This releases a tremendous amount of energy against the piston, pushing it back to BDC. This power is transferred to the crankshaft.
- *Exhaust*: The camshaft opens the exhaust valve as the piston moves back to TDC and forces out burned gases. The exhaust valve then closes and the intake valve opens to begin the cycle again.

With the correct air-fuel mixture and proper valve and spark timing, the basic four-stroke cycle takes place in each engine cylinder according to a certain sequence. Maximum power is generated at a smooth power flow results in optimum engine performance. The long-term effects of using incorrect air-fuel mixtures and/or incorrect valve or ignition timing may cause pre-ignition, detonation or run-on.

*Pre-ignition* occurs when the air-fuel mixture ignites too early, usually before the compression stroke is completed. *Detonation* occurs when the air-fuel mixture burns unevenly and the end gases explode violently near the end of the power stroke. *Run-on* occurs when "hot spots" (carbon deposits from an incompletely burned rich mixture) ignite the air-fuel mixture without a spark, causing combustion with the ignition off.

The common owner concern is engine "knocking". Uncorrected, the damage can be significant and require an engine replacement. Such damage can include cracked pistons, damaged rings, blown head gaskets and even cracked heads if the detonation is severe enough. Depending on the cause, the air-fuel ratio may require adjustment, incorrect timing reset to specifications or carbon deposits removed using an engine cleaner.

If the engine failure has been caused by pre-ignition or detonation damage, the fuel, ignition and emission-control systems must be thoroughly checked for the cause of the problem. On newer vehicles, Diagnostic Trouble Codes (DTCs) may be set and indicate where system repairs are needed. Replacing an engine without correcting the failure cause will lead to another failure.

- *Fuel System* - Check the air induction system as well as the fuel bending and metering devices. Both a too-rich air-fuel mixture as well as a too-lean mixture can cause pre-ignition or detonation. An incorrect mixture may also create carbon deposits because of an inefficient combustion process.
- *Ignition System* - Check all of the devices that control the ignition timing. Usually, timing that is too advanced may cause pre-ignition or detonation. If the vehicle has a distributor, check the cam lobes and bushings, as well as the mechanical/vacuum advance mechanisms. Also, check the harmonic balancer for mislocation of the outer ring, or for poor condition of the rubber between the inner and outer rings. Check the camshaft and crankshaft sensors on vehicles without distributors. A failed knock sensor or defective ignition module can also cause an extremely advanced spark timing. The ECM reads sensor input to run timing as advanced as possible without causing knock. Problems with valve train timing should also be considered.
- *Emission Controls* - Typical emission-control components that can cause pre-ignition with a too-lean air-fuel mixture include the EGR valve, MAP or MAF sensors, TPS and IAC valve. Check the engine control module as well. Typical components that could cause a too-rich mixture (and create carbon deposits) included ECT sensor, IAC valve, MAP or MAF sensors, EVAP, O2S and PCV. Normally, checking these emission-control components must be done with a scan tool after the replacement engine is installed. If the engine still runs, check these devices prior to replacing the engine.

# GENERAL ENGINE DIAGNOSTICS

## ENGINE TESTING

A variety of procedures are used to check engine performance and identify causes of operating concerns. With the electronic engine controls and On Board Diagnostics used on today's vehicles, the approach to troubleshooting has changed considerably.

### Manifold Vacuum Check

Manifold vacuum tests can provide an excellent indication of overall engine condition. Problems with manifold and combustion chamber sealing, valve action and condition, ignition timing, the air-fuel mixture, PCV operation and exhaust restrictions can be identified.

Vacuum gauge readings will be affected by variations in atmospheric pressure (altitude, weather, etc.). However, the action of the gauge needle is more important than the specific vacuum reading. Vacuum gauge readings can indicate a number of engine operating problems. General procedures include:

1. Connect a tachometer into the engine (ignition system).
2. Connect a vacuum gauge to an intake manifold port.
3. Start and run engine until it reaches normal temperature.
4. Run the engine at idle, low cruise and high cruise.
5. Note the vacuum readings and any fluctuations at each speed.
   - Normal readings should be 15 - 22in. HG with the needle steady, indicating good combustion chamber sealing.
   - A steady low reading indicates late ignition valve timing, low compression or vacuum leaks.
   - A fluctuating reading indicates uneven compression, incorrect air-fuel ratios, uneven timing, misfiring plug, or vacuum leaks.
   - Readings that drop irregularly at idle indicate sticking valves.
   - Readings higher than normal at idle indicate incorrect timing.
   - A reading that does not increase when the throttle closes from high cruise may indicate worn rings, cylinders or valves.
   - A reading that drops at high cruise, but does not increase when the throttle closes, may indicate a restricted exhaust system.

These vacuum tests do not isolate a worn cylinder or distinguish between late ignition timing or valve timing. However, the results can lead to more detailed testing of indicated problems.

# GENERAL ENGINE DIAGNOSTICS

## Engine Compression Check

An engine compression check measures the ability of the cylinders to hold compression. If cylinder compression leaks, power is lost. Using a gauge, compression readings are taken for each engine cylinder and compared with specifications. A typical gauge will have an adapter that either screws or plugs into the spark plug (glow plug) holes. For gasoline engines, it should be able to read up to 250psi (1722kPa). For diesel engines, it should read up to 800psi (5512kPa).

Use the following procedures for an engine compression test:

1. Preliminary test preparations include making sure that:
   - The battery is fully charged.
   - The correct type of oil has been used.
   - The oil level is correct for the crankcase capacity.
   - A remote starter is connected, if needed.
2. Disable the ignition (or diesel injection system).
3. Remove the spark plugs (glow plugs); use compressed air to clean the area around the plugs before removing them.
4. Block the throttle plate wide open (allowing air into the engine and preventing engine flooding that would reduce cylinder lubrication).
5. For a "dry" compression test:
   - With the compression gauge on 'zero', crank the engine through four compression strokes.
   - Record the compression reading.
   - Repeat the check and record the readings for each cylinder.
   - If some cylinders have low compression, test "wet".
6. For a "wet" compression test:
   - Inject about 15ml (1 tbs.) of oil into each cylinder through the plug hole.
   - Crank the engine through four compression strokes.
   - Check each cylinder that previously read low.
   - Record the compression readings.

***Notice:*** A "wet" compression test will <u>not</u> be valid on engines with horizontal pistons. The oil will not flow evenly around the pistons.

Specifications may list a minimum pressure and an allowable variation between cylinders. Depending on the engine, some recommend no more than a 20psi variation between cylinders. Others recommend that the compression in any one cylinder should not be less than 75-percent of the highest cylinder. Generally, even if a specification is not listed, serious internal wear or sticking rings are indicated if compression is below 100psi.

Guidelines for interpreting the results of compression testing include the following:

- *Normal* - Compression builds up quickly and evenly to specified levels in each cylinder. All cylinders should be within 20 percent of each other.
- *Piston Rings Leaking* - Compression is low on the first stroke and tends to build up on the following strokes, but does not reach normal. Readings improve considerably with the addition of oil. The piston rings are most likely leaking.
- *Valves Leaking* - Compression is low in the first stroke and does not tend to build up on the following strokes. Does not improve much with the addition of oil. The valves are most likely leaking.
- *Leaking Gasket* - Two adjacent cylinders have lower-than-normal compression, and injecting oil into these cylinders does not increase compression. The head gasket between the two cylinders is most likely leaking.

***Important:*** If the results of the Engine Compression Test are not conclusive (the cause of low compression), perform a Cylinder Leakage Test.

# GENERAL ENGINE DIAGNOSTICS

## Cylinder Leakage Test

A cylinder leakage test also checks compression, but in a different way. A special leakage tester, which may or may not be built into an engine analyzer, applies shop air pressure to a cylinder with the piston at TDC on the compression stroke. With the piston at TDC, both valves are closed and very little air should escape except for a small amount past the piston ring gaps. The tester pressure gauge shows leakage as a percent of cylinder compression. While specifications vary, any reading above 20-percent would indicate excessive leakage. Specific results can pinpoint the source of compression leakage.

Follow the specific tester instructions and use the following procedures to perform a cylinder leakage test:

1. With the engine at operating temperature, disable the ignition (or diesel injection system).
2. Remove the spark plugs (glow plugs), air cleaner and oil dipstick or filler cap.
3. Block the throttle wide open.
4. Disconnect the PCV hose from the crankcase.
5. Remove the radiator cap; add coolant, if needed.
6. Rotate the crankshaft (or crank the engine) until the piston for the cylinder being checked is at TDC.
7. Apply air pressure to the cylinder and read the tester gauge.
   - Less than 10% = good compression
   - 10% to 20% = fair compression
   - 20% to 30% = poor compression
   - More than 30% = serious problem
8. If the cylinder leakage is more than 20-percent, listen for air leaking from the following sources:
   - Air escaping from the crankcase or oil filter/dipstick indicates worn/broken rings, a cracked piston or worn cylinder walls.
   - Air escaping from the intake indicates a worn intake valve.
   - Air escaping from the tailpipe indicates a worn exhaust valve.
   - Air bubbles in the coolant indicate a blown head gasket or a cracked head or block.
   - Air blowing from an adjacent spark plug (glow plug) hole indicates a leaking head gasket or a casting crack between the two cylinders.

Repeat these test procedures for each of the cylinders. The leakage tester reading should not vary more than 10-percent between all of the cylinders.

## Camshaft Gear Timing Check

If engine tests did not reveal serious engine damage, use the following procedures to check for proper camshaft gear timing:

1. Remove or disconnect all of the spark plugs (glow plugs).
2. Remove the valve cover and rocker arms for the #1 cylinder.
3. Mount a dial indicator on the exhaust pushrod (or top of valve retainer for OHC) to read the camshaft exhaust lobe lift.
4. Rotate the crankshaft slowly clockwise (CW), until the dial indicator shows maximum exhaust lobe lift.
5. Place a chalk mark on the harmonic balancer (torsional damper) next to the timing tab.
6. Remove the dial indicator from the exhaust pushrod and reposition it on the intake pushrod.
7. Rotate the crankshaft slowly clockwise (CW), until the dial indicator shows maximum intake lobe lift.
8. Place a second mark on the harmonic balancer, again next to the timing tab.
9. Measure the distance of each chalk mark to the factory-set camshaft gear-timing groove (TDC) in the harmonic balancer.
   - If the distance of each chalk mark to the factory groove for TDC is roughly the same, the camshaft timing gear is properly indexed (positioned) to the crankshaft gear.
   - If the distance of each chalk mark to the factory groove is not the same, differing by an inch or more, the camshaft timing gear is not properly indexed to the crankshaft gear by at least one tooth or more.

Besides camshaft gear timing, setting ignition timing to specifications is also important for proper engine operation. If a catastrophic engine failure did not occur and if engine tests indicated that replacement is not necessary, correcting the timing may resolve a customer concern.

# GENERAL ENGINE DIAGNOSTICS

## Engine Mechanical Diagnosis

Diagnosing various engine mechanical concerns involves starting with the owner concern (problem symptom), understanding that several possible causes may contribute to that symptom. Also, using certain checks or tests to eliminate some causes and to find the root cause.

| Concern | Possible Cause | Check or Test |
|---|---|---|
| Engine will not turn over | – Electrical failure (battery, starter, solenoid) | – Turn engine over by hand to verify that this is not a mechanical failure. |
| | – Hydrostatic lock | – Determine fluid (coolant, oil, water) source. Remove plugs, suction out cylinders. Pressure test cooling system with plugs out. Determine damage and/or repair cause. |
| | – Seized engine | – Look for external causes, such as accessories. Turn with breaker bar to verify mechanical failure. |
| Engine cranks, will not start | – Restricted exhaust system | – Remove intermediate exhaust pipe before catalytic converter. First test cranking vacuum; locate restriction. |
| | – Fuel, ignition system problems | – Check for proper fuel pressure, injector pulse, spark. |
| | – Low compression | – Stuck or burned valves, pistons/rings; head gasket; valve timing. Perform compression test, check oil viscosity. |
| Rough Idle | – Fuel, ignition or emission-control system problems | – Check/test engine vacuum, ignition firing patterns (scope), and EGR function. |
| | – Uneven cylinder compression | – Perform compression test (wet and dry). |
| | – Bent pushrod/broken valve spring | – Repair, identify cause and residual damage. |
| | – Faulty engine mount | – Load engine with brake applied, shift D-R-D as mounts are checked. Replace as needed. |
| Smoke | – White - Water vapor | – Determine if normal or cooling system problem. Pressure test cooling system both cold and hot. |
| | – Blue - Oil burning | – See checks for excessive oil loss. |
| | – Black - Poor combustion (excess fuel) | – Check air-fuel ratio for too-rich mixture. Use exhaust gas analyzer to check for HCs. |
| Excessive oil loss | – Continuous WOT driving, severe engine service (towing, load) | – Check with owner; higher-than-normal oil consumption may be due to operating habits. |
| | – External oil leaks | – Inspect, perform dye/black light check as needed. |
| | – Improper oil viscosity | – Change oil to specified; check consumption. |
| | – Defective PCV system | – Test vacuum; make sure baffles have not been removed. |
| | – Worn valve guides or seats | – Check for blue smoke upon start-up. May require service or replacement; disassembly/inspection. |
| | – Worn piston rings | – Perform compression test; much higher wet compression test results typically indicate worn piston rings. |

# GENERAL ENGINE DIAGNOSTICS

## Engine Mechanical Diagnosis *cont.*

| Concern | Possible Cause | Check or Test |
|---|---|---|
| Low oil pressure | – Loose or plugged oil pick-up screen | – Perform visual inspection, service or replace as required, identify any other damage. |
| | – Faulty pressure switch or sensor | – Test oil pressure. Replace switch/sensor. |
| | – Defective oil pressure gauge | – Check with known good gauge. |
| | – Incorrect oil viscosity | – Change oil to specified; check pressure. |
| | – Diluted oil | – Change oil. Inspect for contaminants (water, dirt, fuel, etc.) |
| | – Worn oil pump | – Check pump; replace as needed. |
| | – Plugged oil filter | – Change oil; check for contaminants. Test bypass valve. Check lubrication system pressure, engine operating. |
| | – Excessive bearing clearances, spun bearing, contaminates | – Check oil viscosity. Also check for contamination from surface-conditioning discs or rotary buffers. |
| Overheating | – Coolant circulation inadequate | – Check for defective water pump, thermostat sticking closed, low coolant level. |
| | – Coolant level too low | – Check boil-over history (owner input), external/internal leakage with underhood steam, exhaust white smoke. |
| | – Internal blockage or cracks | – Flush cooling system; check for leaks/exhaust vapor. |
| | – Airflow across radiator inadequate | – Check for damaged cooling fins in radiator/AC condenser; also, blockage in airflow path, damaged air dam. |
| | – Head gasket(s) ruptured | – Check for air bubbles in radiator coolant; test for exhaust gases in coolant. |

# GENERAL ENGINE DIAGNOSTICS

## Engine Noise Diagnosis

Engine noises, like various symptoms of engine mechanical problems, can provide direction for specific checks and further testing.

| Noise | Symptom Description | Check or Test |
|---|---|---|
| Double knock | Light crankshaft-speed knocking noise heard for the first few minutes after start-up. | Check for a loose piston pin. |
| Rattling | – Light, irregular, "dieseling" or "marbley" rattle, ticking noise heard for first few minutes of start-up.<br>– Light, regular, camshaft-speed ticking noise, heard best when the engine is increased to 2000 rpm, then released to idle | – Check for several loose piston pins.<br>– Check for defective/misaligned balance shaft bearing. |
| Thumping | Light, regular thumping noise heard best near accessory drive belt pulleys. | Check drive belt pulley tensioner. Adjust to specified deflection. Check pulley alignment. |
| Dull Knock | Heavy, regular, dull metallic knock that occurs on acceleration, under load. | Check for incorrect main bearing clearances. |
| Chirping, Squealing | Steady "chirping" at nominal speeds, loud squealing upon acceleration or tight turns. | Check drive belts for looseness/glazing; check pulleys/tensioner; check for paint in grooves. |
| General Knock | Includes dull, regular and metallic knocking. | Check for incorrect connecting rod bearing clearances, piston scuffing, tight piston pin, clogged anti-drainback filter. |
| Sharp Knock | Light, regular, sharp metallic rapping of clattering knock heard best at speeds between 25 and 35 mph. | Check for loose flexplate bolts, cracked flexpate, incorrect connecting rod bearing clearances. Repair as required. |
| Loud pop | GM Northstar - Pop when key is released after extended crank and failure to start. | May be a normal pressure release from the fuel induction system/intake manifold. Refer to GM Bulletin 57-60-02. |
| Valve train noise | – Worn or defective camshaft may be problem.<br>– Loose rocker arm attachments<br>– Worn rocker arm or pushrod<br>– Broken valve springs<br>– Sticking Valves<br>– Worn, dirty, defective lifters<br>– Defective fuel pump, pushrods<br>– Low oil pressure<br>– Worn valve guides<br>– Collapsed Lifters | – Check for popping noise through throttle body; perform visual inspection; check with dial indicator.<br>– Visual inspection; service as required.<br>– Diagnosis cause and repair.<br>– Visual inspection; vacuum gauge test.<br>– Visual inspection; vacuum gauge test.<br>– Visual inspection.<br>– Visual inspection.<br>– Check oil pressure; repair as needed.<br>– Perform vacuum test; use dial indicator to check wear.<br>– Oil drained out of lifters, replace as indicated. |

# GENERAL ENGINE DIAGNOSTICS

## Engine Noise Diagnosis *cont.*

| Noise | Symptom Description | Check or Test |
|---|---|---|
| Tick | – GM C/K vehicles - On cold start at low temperatures during engine deceleration after idle flare. Not consistently repeatable. | – Confirm proper VCM calibration. Refer to GM Bulletin 99-06-04-014 for details. |
| Knock, engine cold. Continues for 2 to 3 minutes. Increases with torque. | – Flywheel may be contacting splash shield.<br>– Loose or broken torsional damper or drive pulleys.<br>– Excessive piston-to-bore clearance (piston slap).<br>– Bent connecting rod. | – Perform visual inspection.<br>– Remove accessory belts; perform visual inspection.<br>– Check with bore gauge and T-gauge micrometer.<br>– Perform visual inspection. |
| Heavy knock, engine hot, torque applied. | – Broken harmonic balancer or pulley hub.<br>– Loose torque converter bolts.<br>– Exhaust system grounding out.<br>– Cracked flywheel, loose rivets.<br>– Incorrect main bearing or rod bearing clearance. | – Remove drive belts; perform visual inspection, service or replace as required.<br>– Visual inspection.<br>– Visual inspection; carbon knock possible.<br>– Visual inspection.<br>– Visual inspection. |
| Light knock, engine hot, under light load conditions. | – Pre-ignition; ignition control problems; detonation.<br>– Poor fuel quality<br>– Loose torque converter bolts.<br>– Exhaust leak at manifold.<br>– Excessive rod bearing clearance. | – Check engine codes and ignition timing settings; reset to specifications; check EGR for blockage.<br>– Owner input; use known good fuel.<br>– Visual inspection.<br>– Visual inspection.<br>– Visual inspection |
| Start-up knock, lasts a few seconds. | – Timing chain tensioner not properly set.<br>– Improper oil viscosity.<br>– Bearing knock.<br>– Hydraulic lifter bleed down. | – Check filter with anti-drainback valve.<br>– Change oil; check engine performance for knock.<br>– Confirm that filter has anti-drainback valve.<br>– Check requires special equipment. |
| Knock at idle, engine hot. | – Drive belts too tight; accessory belt pulley bearing loaded.<br>– Improper oil viscosity.<br>– Noisy piston pin (double knock).<br>– Loose torsional damper. | – Remove accessory belts; observe change, if any.<br>– Change oil; check engine performance for knock.<br>– Short out suspect cylinder; noise should disappear.<br>– Perform visual inspection with engine under load. |

# 4-Cylinder Engine Family Gasoline

## APPLICATION, CONTENT & INSTALLATION PROCEDURES

***This is a guide only. For specific questions, information and applications regarding any engine, please refer to the appropriate electronic GM Parts Catalog or contact PARTECH at 1-800-433-6961.***

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12363193** 133 CID New **2.2L**

| | | |
|---|---|---|
| 1990-91 | Chevrolet | J, L (LM3)(2.2G) |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Oil Pan, and Spark Plugs

**Notes:** Does not contain Flywheel, Oil Fill Tube, C/case Vent Sys, Therm, Int or Exh Manif, Elec Ign Mod, Cr/shf Posn, Knock, Map, Cool Temp or Oil Lvl Sen.

**Replaces:** 12363161 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12363194** 133 CID New **2.2L**

| | | |
|---|---|---|
| 1992-93 | Chevrolet | J, L (LN2)(2.2-4) |
| 1993 | Oldsmobile, Buick | A (LN2)(2.2-4) |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Oil Pan, and Spark Plugs

**Notes:** Does not contain Flywheel, Oil Fill Tube, C/case Vent Sys, Therm, Int or Exh Manif, Elec Ign Mod, Cr/shf Posn, Knock, Map, Cool Temp or Oil Lvl Sen.

**Replaces:** 12363160 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12363195** 133 CID New **2.2L**

| | | |
|---|---|---|
| 1994-95 | Oldsmobile, Buick | A (LN2)(2.2-4) |
| 1994-95 | Chevrolet | L (LN2)(2.2-4) |
| 1994 | Chevrolet | J (LN2)(2.2-4) |
| 1995 | Chevrolet, Pontiac | J (LN2)(2.2-4) |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Oil Pan, Spark Plugs, and Oil Filter

**Notes:** Does not contain Flywheel, Oil Fill Tube, C/case Vent Sys, Therm, Int or Exh Manif, Elec Ign Mod, Cr/shf Posn, Knock, Map, Cool Temp or Oil Lvl Sen.

**Replaces:** 12363158 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12465411** 133 CID Reman **2.2L**

| | | |
|---|---|---|
| 1994-95 | Chevrolet, GMC | S1 (LN2)(2.2-4) |
| 1994-95 | GMC | Z1 (LN2)(2.2-4) |

***Engine-Specific Content:*** Front Cover, Oil Pan, and Oil Filter

**Notes:** Does not contain Flywheel, Crankcase Vent Sys, Thermostat, Intake or Exhaust Manifold, Crankshaft Posn, Knock, Map, Cool Temp or Oil Level Sensors.

**Replaces:** 12363159, 12363198 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12465434** 134 CID Reman **2.2L**

| | | |
|---|---|---|
| 1996 | Chevrolet, GMC | S1 (03-53)(LN2)(2.2-4) |

***Engine-Specific Content:*** Front Cover and Oil Pan

**Notes:** Does not contain Flywheel, Crankcase Vent Sys, Thermostat, Intake or Exhaust Manifold, Crankshaft Posn, Knock, Map, Cool Temp or Oil Level Sensors.

**Replaces:** 12360470, 12363199 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12465435** 134 CID Reman **2.2L**

| | | |
|---|---|---|
| 1997 | Chevrolet, GMC | S1 (LN2)(03-53) |

***Engine-Specific Content:*** Crankshaft Pulley, Oil Pan, Front Cover, and Spark Plugs

**Notes:** Does not contain Flywheel, Crankcase Vent Sys, Thermostat, Intake or Exhaust Manifold, Crankshaft Posn, Knock, Map, Cool Temp or Oil Level Sensors.

**Replaces:** 12363176, 12363200 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12465447** 134 CID New **2.2L**

| | | |
|---|---|---|
| 1998 | Chevrolet, GMC | S1 (LN2)(2.2-4)(03-53) MFI |

***Engine-Specific Content:*** Crankshaft Pulley, Oil Pan, Front Cover, Spark Plugs, and Valve Covers

**Notes:** Does not contain Flywheel, Crankcase Vent Sys, Thermostat, Intake or Exhaust Manifold, Crankshaft Posn, Knock, Map, Cool Temp or Oil Level Sensors.

**Replaces:** 88894190, 88890516, 12482042 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12593224 134 CID New 2.2L

| | | |
|---|---|---|
| 2002-05 | Chevrolet, Pontiac | J (L61)(2.2-4) MFI |
| 2002-04 | Oldsmobile | N (L61) |
| 2002-05 | Pontiac | N (L61) |
| 2004-05 | Chevrolet | N (L61) |

***Engine-Specific Content:*** Oil Pan, Front Cover, and Valve Cover

**Replaces:** 12574621, 12586529 **Replaced By:**

**Notes:** If using on vehicle with manual transmission, transfer flywheel from existing engine. For 2003 MY, fuel rail/injectors must be changed to 2003 content.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 12593292 134 CID New 2.2L

| | | |
|---|---|---|
| 2004 | Chevrolet | 3Z (L61) |
| 2005 | Chevrolet | 3A (L61) |

***Engine-Specific Content:*** Oil Pan and Front Cover

**Replaces:** 12587403 **Replaced By:**

**Notes:** If using on vehicle with manual transmission, transfer flywheel from existing engine.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88894187 134 CID New 2.2L

| | | |
|---|---|---|
| 1999-2002 | Chevrolet, Pontiac | J (LN2)(2.2-4) MFI |

***Engine-Specific Content:*** Front Cover, Spark Plugs, and Valve Cover

**Replaces:** 88890515,12482041 **Replaced By:** 88984243

### INSTALLATION INSTRUCTIONS

Installation instructions are included with the engine.

## 88894189 134 CID New 2.2L

| | | |
|---|---|---|
| 1998 | Chevrolet, Pontiac | J (LN2)(2.2-4) MFI |

***Engine-Specific Content:*** Oil Pan, Front Cover, Spark Plugs, and Valve Covers

**Replaces:** 88890514, 12482040 **Replaced By:** 12465446

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88984244** 134 CID New **2.2L**

| | | |
|---|---|---|
| 1999-2000 | Chevrolet, GMC | S1 (LN2) |
| 2000 | Chevrolet, GMC | S1 (L43) |
| 2001-02 | Chevrolet, GMC | S1 (L43) MW2, M30, NC1, NF4, NF7 |
| 2003 | Chevrolet, GMC | S1 (LN2) M30, MW2 |

***Engine-Specific Content:*** Front Cover, Spark Plugs, and Valve Covers

**Replaces:** 88894188, 88890517, 12482367, 12482043 **Replaced By:** 12465447

**Notes:** Exhaust manifold may need to be changed for applications with A.I.R.

## INSTALLATION INSTRUCTIONS

Installation instructions are included with the engine.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12360619 138 CID Reman 2.3L

| | | |
|---|---|---|
| 1989-90 | Pontiac, Oldsmobile | N (LG0)(2.3A) |
| 1990 | Chevrolet | L (LG0)(2.3A) |
| 1990 | Oldsmobile | W (LG0)(2.3A) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, Spark Plugs, and Water Pump

### INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12360620 138 CID Reman 2.3L

| | | |
|---|---|---|
| 1991 | Chevrolet | L (LG0)(2.3A) |
| 1991 | Chevrolet, Pontiac | N (LG0)(2.3A) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, Spark Plugs, and Water Pump

### INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12360623 138 CID Reman 2.3L

| | | |
|---|---|---|
| 1994 | Chevrolet | L (LG0)(2.3A) |
| 1994 | Pontiac, Chevrolet | N (LG0)(2.3A) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, P/S Pump Pulley, Spark Plugs, and Water Pump

### INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12360624 138 CID Reman 2.3L

| | | |
|---|---|---|
| 1987-88 | Pontiac, Oldsmobile, Buick | N (LD2)(2.3D) |

***Engine-Specific Content:*** Camshaft Housing, Crankshaft Housing, Front Cover, Oil Check Valve, Oil Pan, Oil Pump w/Screen, P/S Pump Pulley, Spark Plugs, Timing Chain Housing, Timing Chain Tensioner and Guides, Water Pump

### INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12360625 138 CID Reman 2.3L

| | | |
|---|---|---|
| 1989 | Pontiac, Oldsmobile, Buick | N (LD2)(2.3D) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

### INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12360626 138 CID Reman 2.3L

| | | |
|---|---|---|
| 1990-91 | Pontiac, Oldsmobile, Buick | N (LD2)(2.3D) |
| 1990-91 | Pontiac, Oldsmobile | W (LD2)(2.3D) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

### INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12360627** 138 CID Reman **2.3L**

1993 Pontiac, Oldsmobile N (LD2)(2.3D)

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

## INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**12361504** 138 CID Reman **2.3L**

1992 Pontiac, Oldsmobile N (LD2)(2.3D)

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

## INSTALLATION INSTRUCTIONS

This engine has been remanufactured subsequent to the model year of the vehicle and as such may incorporate design refinements not included in original service information (i.e., 1989 engines by incorporate design features normally associated with newer models). If future service is necessary for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle chassis service manual for proper repair procedures.

- After removing old engine, use new seals and gaskets and transfer all necessary components, such as oil fill tube and cap/indicator.
- Attach Quad IV engine decal (enclosed in instruction envelope).
- Install replacement engine and add 4 quarts of Starburst certified oil of a viscosity recommended for your climate, and prime oil system.
- Check oil level on dipstick and add oil as required to reach the full mark.

**CAUTION:** The oil pump in this engine must be primed before starting. Crank engine for a minimum of 30 seconds with the ignition system disconnected. Oil pressure warning light must go off (if equipped with a pressure gauge, the gauge must read normal pressure for that model year). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 24571996 138 CID New 2.3L

| | | |
|---|---|---|
| 1994 | Chevrolet | L (LG0)(2.3A) |
| 1994 | Pontiac, Oldsmobile | N (LG0)(2.3A) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

**Replaces:** 24574880 **Replaced By:**

**Notes:** Does not contain Flywhl, Oil Fill Tube, C/case Vent Sys, Therm, Int or Exh Manif, Elec Ign Mod, Cr/shf Posn, Knock, Map, Cool Temp or Oil Lvl Sen.

### INSTALLATION INSTRUCTIONS

Please Notes that instructions only apply to certain applications and are provided only as a clarification for adapting current model Goodwrench engines into past model applications.

- The mounting boss on the oil pan for the radiator outlet pipe bracket has been eliminated. This bracket does not require attachment on the Goodwrench engine.
- LG0 (2.3A) engines may require transferring crankshaft balancers. Ensure that the crankshaft balancer on the Goodwrench engine is the same diameter as the original balancer. If not, transfer the original balancer to the Goodwrench engine.
- Pontiac Grand Prix and Oldsmobile Cutlass Supreme with LD2 (2.3D) or LG0 (2.3A) engines require an M12 x 1.75 bolt (part number 22579611) along with the two included M12 x 1.75 engine lift bracket bolts, to attach the engine mount strut bracket to the engine drill out the hole (12.5MM) on the bracket to allow for the larger M12 x 1.75 bolts. (One bolt - 22579611 - is included in service engine installation kit, catalog group 0.010).
- Pontiac Grand Prix and Oldsmobile Cutlass Supreme only - The new Goodwrench engine requires transferring the water pump cover from the original engine. This is necessary to ensure that the water pump cover contains the nipple required for the heater hose. The water pump cover gaskets should be replaced at this time. (Gaskets are included in the service engine installation kit. See catalog group 0.010.)

## 24573746 138 CID New 2.3L

| | | |
|---|---|---|
| 1995 | Chevrolet, Pontiac | J (LD2)(2.3D) MJ1 |
| 1995 | Pontiac, Oldsmobile, Buick | N (LD2)(2.3D) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

**Notes:** Does not contain Flywhl, Oil Fill Tube, C/case Vent Sys, Therm, Int or Exh Manif, Elec Ign Mod, Cr/shf Posn, Knock, Map, Cool Temp or Oil Lvl Sen.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**24575362** 138 CID New **2.3L**

1995 Chevrolet, Pontiac J (LD2)(2.3D) MN4

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

**Notes:** Does not contain Flywhl, Oil Fill Tube, C/case Vent Sys, Therm, Int or Exh Manif, Elec Ign Mod, Cr/shf Posn, Knock, Map, Cool Temp or Oil Lvl Sen.

## INSTALLATION INSTRUCTIONS

Please Notes that instructions only apply to certain applications and are provided only as a clarification for adapting current model Goodwrench engines into past model applications.

- The mounting boss on the oil pan for the radiator outlet pipe bracket has been eliminated. This bracket does not require attachment on the Goodwrench engine.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12360467 146 CID New 2.4L

| | | |
|---|---|---|
| 1996 | Chevrolet, Pontiac | J (LD9) |
| 1996 | Pontiac, Oldsmobile, Buick | N (LD9)(2.4T) |

***Engine-Specific Content:*** Camshaft Housing, Front Cover, Oil Check Valve, Oil Pan, P/S Pump Pulley, Spark Plugs, and Water Pump

**Notes:** Does not contain Flywheel, Oil Fill Tube, C/case Vent Sys, Thermostat, Int. or Exhaust Manifold, Elec. Ign. Mod, Crankshaft Posn, Knock, Map, Cool Temp or Oil Level Sensor. Order 11516479 self taping screw for Cm/Shf Posn sensor

**Replaces:** 24573914 **Replaced By:** 12465099

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 12462258 146 CID New 2.4L

| | | |
|---|---|---|
| 1997-98 | Chevrolet, Pontiac | J (LD9)(2.4T) |
| 1997-98 | Chevrolet, Pontiac, Oldsmobile, Buick | N (LD9)(2.4T) |
| 1999 | Pontiac | N (LD9)(2.4T) |

***Engine-Specific Content:*** Front Cover, Oil Check Valve, Oil Pan, Water Pump, and Spark Plugs

**Notes:** Does not contain Flywheel, C/case Vent Sys, Thermostat, Int. or Exhaust Manifold, Elec. Ign. Mod, Crankshaft Posn, Knock, Map. Order 11516479 self taping screw for Cm/Shf Posn Sensor. For 2nd design, see 12465154.

**Replaces:** 12363189 **Replaced By:** 12465153

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 12465498 146 CID Reman 2.4L

| | | |
|---|---|---|
| 1999-2002 | Chevrolet, Pontiac | J (LD9) |
| 1999-2001 | Oldsmobile | N (LD9) |
| 1999 | Chevrolet | N (LD9) |
| 1999 | Pontiac | N (LD9) |
| 2000-01 | Pontiac | N (LD9) |

***Engine-Specific Content:*** Oil Pan, Timing Chain & Housing, Spark Plugs, Water Pump, and P/S Pump Pulley

**Notes:** Does not include Flywheel, Crankcase, Thermostat, Intake or Exhaust Manifold, Electric Ignition Module, Crankshaft Posn., and Oil Level Sensors. For 1st design, see 12462258.

**Replaces:** 12465154, 88894199, 88890518 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351901** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1990 | Chevrolet, Pontiac Oldsmobile, Buick | A (LR8)(2.5R) |
| 1990 | Chevrolet | W (LR8)(2.5R) |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Internal Balancer, Oil Pan, and Valve Rocker Cover

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351904** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1986 | Chevrolet, Pontiac Oldsmobile, Buick | A (LR8)(2.5R) |
| 1986 | Chevrolet | P (LR8)(2.5R) |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Internal Balancer, Oil Pan, and Valve Rocker Cover

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351905** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1985 | Chevrolet, Pontiac Oldsmobile, Buick | A (LR8)(2.5R) |
| 1985 | Pontiac | P (LR8)(2.5R) |
| 1985 | Chevrolet, Buick | X (LR8)(2.5R) |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Internal Balancer, Oil Pan, and Valve Rocker Cover

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351906** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1984 | Chevrolet, Pontiac Oldsmobile, Buick | A, X (LR8)(2.5R) |
| 1984 | Pontiac | P (LR8)(2.5R) |

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351907** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1982-83 | Chevrolet, Pontiac<br>Oldsmobile, Buick | A, X (LR8)(2.5R) |

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351909** 151 CID Reman **2.5L**

1989 Pontiac, Oldsmobile Buick N (L68)(2.5U)

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351910** 151 CID Reman **2.5L**

1988 Pontiac, Oldsmobile Buick N (L68)(2.5U)

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351911** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1987 | Pontiac, Oldsmobile<br>Buick | N (L68)(2.5U) w/M.T. |

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351912** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1987 | Pontiac, Oldsmobile Buick | N (L68)(2.5U) w/A. Trans |

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351913** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1985-86 | Pontiac, Oldsmobile Buick | N (L68)(2.5U) |

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351914** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1989-90 | Chevrolet, GMC | M1, S1 (LN8)(2.5E) |
| 1989-91 | Chevrolet, GMC | Z1 (LN8)(2.5E) |
| 1991 | Chevrolet, Oldsmobile GMC | S1 (LN8)(2.5E) |

***Engine-Specific Content:*** Front Cover and Oil Pan

**Notes:** Must purchase balancer separately, not included in assembly components.

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351915** 151 CID Reman **2.5L**

1988 Chevrolet, GMC M1, ST1, Z1 (LN8)(2.5E)

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351917** 151 CID Reman **2.5L**

1986 Chevrolet M1, ST1 (LN8)(2.5E)

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351918** 151 CID Reman **2.5L**

1985 Chevrolet M1, ST1 (LN8)(2.5E)

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351919** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1988 | Chevrolet, Pontiac, Oldsmobile, Buick | A (LR8)(2,5R) |
| 1988 | Pontiac | P (LR8)(2.5R) |

***Engine-Specific Content:*** Front Cover

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351920** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1990 | Pontiac, Oldsmobile, Buick | N (L68)(2.5U) |

***Engine-Specific Content:*** Front Cover

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351921** 151 CID Reman **2.5L**

1991 Oldsmobile, Buick N (L68)(2.5U)

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351923** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1991-93 | Chevrolet, Oldsmobile, GMC | S1 (L38)(2.5A) |
| 1991-93 | GMC | Z1 (LLV)(L38)(2.5A) |

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12351924** 151 CID Reman **2.5L**

| | | |
|---|---|---|
| 1989 | Chevrolet, Pontiac, Oldsmobile, Buick | A (LR8)(2.5R) |

***Engine-Specific Content:*** Front Cover and Oil Pan

## INSTALLATION INSTRUCTIONS

The Goodwrench 2.5 engine has been remanufactured subsequent to the model year of the vehicle and may incorporate design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.

Before installing this engine, refer to the appropriate vehicle service chassis manual for proper repair procedures and owner's manual for capacities.

- Initially add 3 quarts of Starburst certified oil in viscosity suitable to your climate conditions. Prime system and check oil level on dipstick. Add oil as required to reach full mark.
- Use new seals and gaskets. Transfer all necessary components to the replacement engine. Thoroughly clean all old parts to avoid possible contamination and leaks.
- If harmonic damper hub is grooved in seal contact area, replace the damper to prevent oil leaks.
- The rear most intake manifold bolt **MUST** go through the engine lift bracket or an equivalent thickness spacer. Failure to do so permits the bolt to contact the #8 push rod resulting in lifter noise and possible damage to the engine.
- Rocker cover installation: A) use RTV on dimpled covers, B) use cork/rubber gasket (with compression limiters) with non-hemmed holes on covers, C) use silicone/steel reinforced gasket with non-dimpled, non-hemmed rocker covers.
- Attach the enclosed decal to clean rocker cover.
- Install the appropriate bushing in the crank end depending on if equipped with automatic or manual transmission.
- Check the cooling system for proper operation.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Turn engine for a minimum of 30 seconds with the coil or injector wire disconnected. Oil pressure warning light must go off (if equipped with a pressure gage, the gage must read 30 PSI minimum). **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# Straight 4 In-Line Engine Family Gasoline

## APPLICATION, CONTENT & INSTALLATION PROCEDURES

***This is a guide only. For specific questions, information and applications regarding any engine, please refer to the appropriate electronic GM Parts Catalog or contact PARTECH at 1-800-433-6961.***

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12585215** 173 CID New **2.8L**

2004 Chevrolet, GMC ST1 (LK5)(2.8-8) MA5, M30, JJA

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# Straight 5 In-Line Engine Family Gasoline

## APPLICATION, CONTENT & INSTALLATION PROCEDURES

***This is a guide only. For specific questions, information and applications regarding any engine, please refer to the appropriate electronic GM Parts Catalog or contact PARTECH at 1-800-433-6961.***

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12585341** 214 CID New **3.5L**

2004 Chevrolet, GMC S1 (L52) M30, MA5 - DOHC

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12585342** 214 CID New **3.5L**

2004 Chevrolet, GMC T1 (L52) - DOHC

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# V6 Engine Family
# Gasoline

## APPLICATION, CONTENT
## &
## INSTALLATION PROCEDURES

***This is a guide only. For specific questions, information and applications regarding any engine, please refer to the appropriate electronic GM Parts Catalog or contact PARTECH at 1-800-433-6961.***

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**10054502** 173 CID New **2.8L**

| | | |
|---|---|---|
| 1982-86 | Chevrolet, Pontiac | A (LE2)(2.8X) |
| 1982-85 | Chevrolet, Buick | X (LE2)(2.8X) |
| 1982-84 | Pontiac, Oldsmobile | X (LE2)(2.8X) |
| 1985-86 | Buick | A (LE2)(2.8X) |
| 1985-96 | Oldsmobile | A (LE2)(2.8X) |

***Engine-Specific Content:*** Flywheel, Oil Pan, Torsional Damper, and Valve Covers

**Replaces:** 10065260 **Replaced By:**

**Notes:** Automatic Transmission Only

## INSTALLATION INSTRUCTIONS

- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.
- This engine is built with current valve rocker cover. It may be necessary to use covers from replaced engine.
- This engine incorporates a 'balanced' automatic flywheel, part number 14018713. If replacement is necessary, replace with part number 14018713.

**12507648** 173 CID New **2.8L**

| | | |
|---|---|---|
| 1982-86 | Chevrolet, GMC | T1 (LL2)(2.8R)(LR2)(2.8B) |

***Engine-Specific Content:*** Flywheel, Oil Pan, Front Cover, Oil Fill Cap, Torsional Damper, and Valve Covers

**Notes:** Automatic Transmission Only

## INSTALLATION INSTRUCTIONS

- This engine incorporates a 'balanced' automatic flywheel, part number 14100557. If replacement is necessary, replace with part number 14100557.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.
- This engine is built with current valve rocker cover. It may be necessary to use covers from replaced engine.
- On fuel injection models, plug fuel hole with:
  1 of 14064231 Cover - Fuel Pump opening
  2 of 11500914 Bolts
  2 of 580379 Washers
  RTV Sealer

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12523277 173 CID New 2.8L

| | | |
|---|---|---|
| 1987-89 | Chevrolet, Pontiac | F (LB8)(2.8S) A/Trans |
| 1987-89 | Chevrolet, GMC | ST1 (LL2)(2.8R)(2.8S) A. Trans |

***Engine-Specific Content:*** Oil Pan, Valve Covers, Flywheel, and Torsional Damper

**Notes:** Automatic Transmission Only

### INSTALLATION INSTRUCTIONS

- This engine incorporates a 'balanced' automatic flywheel, part number 14097667. If replacement is necessary, replace with part number 14097667.
- This engine is built with 1992 production parts. For service, use 1992 parts. Covers from replaced engine may have to be used.
- On "F" cars and "S" trucks: A) remove oil pan and replace with part number 10078999, B) remove oil pump screen assembly and replace with part number 10118624, C) use oil level indicator from replaced engine.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.

## 12523279 173 CID New 2.8L

| | | |
|---|---|---|
| 1987-89 | Chevrolet, Pontiac | F (LB8)(2.8S), M. Trans |
| 1987-90 | Chevrolet, GMC | ST1 (LL2), M. Trans |
| 1991-93 | Chevrolet, GMC | S1 (LL2)(2.8R), M. Trans (ML3) |

***Engine-Specific Content:*** Oil Pan, Valve Covers, Flywheel, and Torsional Damper

**Notes:** Manual Transmission Only

### INSTALLATION INSTRUCTIONS

- This engine incorporates a 'balanced' flywheel, part number 14100556. If replacement is necessary, replace with part number 14100556.
- On "F" cars, remove flywheel and replace with part number 14100559.
- This engine is built with 1992 production parts. When servicing, use 1992 parts. Valve covers from replaced engine may have to be used.
- On "F" cars and "S" trucks: A) remove oil pan and replace with part number 10078999, B) remove oil pump screen assembly and replace with part number 10118624, C) use oil level indicator from replaced engine.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12371987** 191 CID Reman **3.1L**

1997 Chevrolet, Oldsmobile N (L82)

***Engine-Specific Content:*** Front Cover, Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensor, Lower Intake Manifold, Engine Oil and Additive

**Replaces:** **Replaced By:** 89037574

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12480240** 191 CID New **3.1L**

1998-99 Chevrolet, Oldsmobile N (L82)

***Engine-Specific Content:*** Front Cover, Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensor, Lower Intake Manifold, Engine Oil and Additive

**Replaces:** **Replaced By:** 89037575

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12480242** 191 CID New **3.1L**

1994-95 Chevrolet, Pontiac U Van (LG6)(3.1D) MD9, C40, C67
1994-95 Oldsmobile U Van (LG6)(3.1D) MD9, C67

***Engine-Specific Content:*** Front Cover and Pointer, Lower Intake Manifold, Oil Pan, and Valve Covers

**Replaces:** 12522926 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12513152** 191 CID New **3.1L**

1990 Chevrolet, Pontiac U (LG6)(3.1D)
Oldsmobile

***Engine-Specific Content:*** Front Cover, Lower Intake Manifold, Oil Pan, and Valve Covers

## INSTALLATION INSTRUCTIONS

- This engine incorporates 1993 production parts. When servicing internal components and the dipstick and tube assembly, use 1993 LG6 service parts.
- The engine is built to production point of build torque specifications, loss of some bolt torque is normal. It is not necessary to retorque any bolts.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12513153 191 CID New 3.1L

| | | |
|---|---|---|
| 1990 | Chevrolet, Pontiac, Oldsmobile, Buick | W (LH0)(3.1T) |
| 1991 | Buick | W19 Type 1 VIN 400001 thru 800000 |

***Engine-Specific Content:*** Front Cover, Lower Intake Manifold, Oil Pan, and Valve Covers

**Notes:** If engine is received without dampener, must order part number 10166353.

### INSTALLATION INSTRUCTIONS

- This engine incorporates 1993 production parts. When servicing internal components and the dipstick and tube assembly, use 1993 LH0 service parts.
- The engine is built to production point of build torque specifications, loss of some bolt torque is normal. It is not necessary to retorque any bolts.

## 12522927 191 CID New 3.1L

| | | |
|---|---|---|
| 1991-92 | Chevrolet, Pontiac | J (LH0)(3.1T) |
| 1991-92 | Pontiac, Oldsmobile | W (LH0)(3.1T) |
| 1991 | Chevrolet | L (LH0)(3.1T) |
| 1991-92 | Chevrolet | W (LH0)(3.1T) (exc. N14) |
| 1991 | Buick | W (LH0)(3.1T) Type 2 VIN from 800001 |
| 1992-93 | Chevrolet | L (LH0)(3.1T) |
| 1992 | Buick | W (LH0)(3.1T) |
| 1993 | Chevrolet, Pontiac | J (LH0)(3.1T) |
| 1993 | Chevrolet | W (LH0)(3.1T) (exc. N14, NB2) |
| 1993 | Pontiac, Oldsmobile, Buick | W (LH0)(3.1T) (exc. NB2) |
| 1994 | Chevrolet, Pontiac | J (LH0)(3.1T) MD9, MG2 |
| 1994 | Chevrolet | W (LH0)(3.1T) M13, NB2, NA5 |

***Engine-Specific Content:*** Front Cover, Lower Intake Manifold, Oil Pan, and Valve Covers

**Replaces:** 12516160 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12522928 191 CID New 3.1L

| | | |
|---|---|---|
| 1993-95 | Oldsmobile, Buick | W (L82)(3.1M) M13 |
| 1994-95 | Oldsmobile, Buick | A (L82)(3.1M) |
| 1994-95 | Chevrolet | L (L82)(3.1M) M13 |
| 1994-95 | Pontiac, Oldsmobile, Buick | N (L82)(3.1M) |
| 1994-95 | Pontiac | W (L82)(3.1M) |
| 1995 | Chevrolet | W (L82)(3.1M) |

***Engine-Specific Content:*** Front Cover, Lower Intake Manifold, and Valve Covers

**Replaces:** **Replaced By:** 89037572

### INSTALLATION INSTRUCTIONS

This engine includes an oil pan with an oil level sensor. For vehicles that are not equipped for an oil level sensor, use sensor as plug for hole, or use oil pan from replaced engine.

## 12539087 191 CID New 3.1L

| | | |
|---|---|---|
| 1996 | Pontiac | N (L82) VB1 |
| 1996-98 | Pontiac, Buick | N (L82)(3.1M) |
| 1996-97 | Chevrolet, Pontiac, Oldsmobile, Buick | W (L82)(3.1M) M13 |
| 1996 | Oldsmobile, Buick | A (L82)(3.1M) |
| 1996 | Chevrolet | L (L82)(3.1M) M13 |
| 1996-98 | Oldsmobile | N (L82)(3.1M) |

***Engine-Specific Content:*** Front Cover, Lower Intake Manifold, Oil Pan, Valve Covers, Oil Level Sensor, Engine Oil and Additive

**Replaces:** **Replaced By:** 89037573

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88894110 191 CID New 3.1L

| | | |
|---|---|---|
| 1999 | Chevrolet, Oldsmobile | N (LG8)(3.1J) SFI, NC1 |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensor, Lower Intake Manifold, Engine Oil and Additive

**Replaces:** 12480891 **Replaced By:** 89038376

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 88894112 191 CID New 3.1L

| | | |
|---|---|---|
| 2000 | Pontiac, Buick | W (LG8)(3.1J) SFI, NC1, NF4 |
| 2000 | Chevrolet | N, W (LG8)(3.1J) SFI, NC1, NF4 |
| 2001 | Chevrolet | W (LG8) NC1, NF4, NF7 |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensor, Lower Intake Manifold, Engine Oil and Additive

**Replaces:** 88893923, 12568295 **Replaced By:** 89038377

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017454 191 CID New 3.1L

| | | |
|---|---|---|
| 2003-05 | Buick | W (LG8) |
| 2003 | Chevrolet | N (LG8) |
| 2003 | Pontiac | W (LG8) |

***Engine-Specific Content:*** Front Cover, Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensors, Oil Filter Cap, and Lower Intake Manifold

**Replaces:** 88984280 **Replaced By:**

**Notes:** When replacing a 2003MY engine, use the oil pan that corresponds with that particular application.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89038378 191 CID Reman 3.1L

| | | |
|---|---|---|
| 2000-02 | Chevrolet | N (LG8) |
| 2000-02 | Pontiac, Buick | W (LG8) |
| 2000 | Chevrolet | W (LG8) NF2 |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensor, and Lower Intake Manifold

**Replaces:** 88894111, 88893298, 12568294 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89037576 191 CID Reman 3.1L

| | | |
|---|---|---|
| 1998-99 | Chevrolet, Pontiac, Buick | W (L82) |

***Engine-Specific Content:*** Front Cover, Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensor, Lower Intake Manifold, Engine Oil and Additive

**Replaces:** 12480241 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12356519** 204 CID Reman **3.3L**

1989 Oldsmobile, Buick A, N (LG7)(3.3N)

***Engine-Specific Content:*** Front Cover and Oil Pump

**Notes:** For "N" car applications, transfer oil filter adapter from old engine or order new as detailed in the instructions. Does not contain Rocker Covers, Oil Pan, Manifolds or Balancer.

## INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3300 engine decals (enclosed in instructions envelope) to clean valve covers.

**Oil Filter Adapters:** For "N" car applications, transfer the oil filter adapter from the old engine or use new part number 25537239 for 1989-91 or 24500718 for 1992-93 models.

**CAUTION:** The oil pump in this engine must be primed before starting. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**12356520** 204 CID Reman **3.3L**

1990 Oldsmobile, Buick A, N (LG7)(3.3N)

***Engine-Specific Content:*** Front Cover and Oil Pump

**Notes:** For "N" car applications, transfer oil filter adapter from old engine or order new as detailed in the instructions. Does not contain Rocker Covers, Oil Pan, Manifolds or Balancer.

## INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3300 engine decals (enclosed in instructions envelope) to clean valve covers.

**Oil Filter Adapters:** For "N" car applications, transfer the oil filter adapter from the old engine or use new part number 25537239 for 1989-91 or 24500718 for 1992-93 models.

**CAUTION:** The oil pump in this engine must be primed before starting. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**12356521** 204 CID Reman **3.3L**

1991 Oldsmobile, Buick A, N (LG7)(3.3N)

***Engine-Specific Content:*** Front Cover and Oil Pump

**Notes:** For "N" car applications, transfer oil filter adapter from old engine or order new as detailed in the instructions. Does not contain Rocker Covers, Oil Pan, Manifolds or Balancer.

## INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3300 engine decals (enclosed in instructions envelope) to clean valve covers.

**Oil Filter Adapters:** For "N" car applications, transfer the oil filter adapter from the old engine or use new part number 25537239 for 1989-91 or 24500718 for 1992-93 models.

**CAUTION:** The oil pump in this engine must be primed before starting. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12356522 204 CID Reman 3.3L

| | | |
|---|---|---|
| 1992 | Oldsmobile, Buick | A, N (LG7)(3.3N) |
| 1992 | Pontiac | N (LG7)(3.3N) |

***Engine-Specific Content:*** Front Cover and Oil Pump

**Notes:** For "N" car applications, transfer oil filter adapter from old engine or order new as detailed in the instructions. Does not contain Rocker Covers, Oil Pan, Manifolds or Balancer.

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3300-engine decals (enclosed in instructions envelope) to clean valve covers.

**Oil Filter Adapters:** For "N" car applications, transfer the oil filter adapter from the old engine or use new part number 25537239 for 1989-91 or 24500718 for 1992-93 models.

**CAUTION:** The oil pump in this engine must be primed before starting. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12356523 204 CID Reman 3.3L

| | | |
|---|---|---|
| 1993 | Oldsmobile, Buick | A, N (LG7)(3.3N) |
| 1993 | Pontiac | N (LG7)(3.3N) |

***Engine-Specific Content:*** Front Cover and Oil Pump

**Notes:** For "N" car applications, transfer oil filter adapter from old engine or order new as detailed in the instructions. Does not contain Rocker Covers, Oil Pan, Manifolds or Balancer.

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3300-engine decals (enclosed in instructions envelope) to clean valve covers.

**Oil Filter Adapters:** For "N" car applications, transfer the oil filter adapter from the old engine or use new part number 25537239 for 1989-91 or 24500718 for 1992-93 models.

**CAUTION:** The oil pump in this engine must be primed before starting. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12537812 207 CID New 3.4L

| | | |
|---|---|---|
| 1991-93 | Chevrolet, Pontiac | W (LQ1) M27 |
| 1991-92 | Oldsmobile | W (LQ1) M27 |

***Engine-Specific Content:*** Crankshaft Balancer, Flywheel Assembly, Oil Pan, Oil Level Indicator and Tube, Front Cover, Timing Belt System, Camshaft with Hsg. and Cover, Crank and Cam Posn. Sensors, and Lower Intake Manifold

**Replaces:** 24503079 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88894033 207 CID New 3.4L

| | | |
|---|---|---|
| 2000 | Pontiac | N, U (LA1) NF2 |
| 2000 | Chevrolet | W (LA1) NF2 |
| 2000 | Chevrolet, Oldsmobile | U (LA1) NF2 |
| 2000 | Oldsmobile | N (LA1) NA7, NF2 |
| 2001-02 | Pontiac | B, N, U (LA1) NF7 |
| 2001-02 | Chevrolet | U, W (LA1) NF7, NF4 |
| 2001-02 | Oldsmobile | U (LA1) NF7 |
| 2002 | Buick | B (LA1) NF7 |

***Engine-Specific Content:*** Front Cover, Oil Pan, and Valve Covers

**Replaces:** 88893925, 12569554 **Replaced By:** 89038388

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88894034 207 CID New 3.4L

| | | |
|---|---|---|
| 2001-02 | Pontiac | B (LA1) KC4, NC8 |
| 2001-02 | Pontiac | B (LA1) NC8 (exc. KC4) |
| 2001 | Pontiac | U (LA1) NC8 |
| 2001-02 | Chevrolet, Oldsmobile | U (LA1) NC8 |
| 2002 | Buick | B (LA1) NC8 |
| 2002 | Pontiac | U (LA1) NC8, KC4 |
| 2002 | Pontiac | U (LA1) NC8 (exc. KC4) |
| 2002 | Pontiac | U (LA1) NT3 |

***Engine-Specific Content:*** Front Cover, Oil Pan, and Valve Covers

**Replaces:** 12569555 **Replaced By:** 89038387

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 88984251 207 CID New 3.4L

| | | |
|---|---|---|
| 1999 | Pontiac, Oldsmobile | N (LA1) |
| 1999 | Chevrolet, Pontiac, Oldsmobile | U (LA1) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, and Valve Rocker Covers

**Replaces:** 12480881 **Replaced By:** 89038384

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88984287 207 CID New 3.4L

| | | |
|---|---|---|
| 2003 | Pontiac | U (LA1) NT3 |

***Engine-Specific Content:*** Oil Pump, Front Cover, Oil Pan, Oil Filter, Valve Rocker Covers, Oil Level Sensor, Oil Fill Cap, and Lower Intake Manifold

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88984288 207 CID New 3.4L

| | | |
|---|---|---|
| 2003 | Chevrolet | W (LA1) |
| 2003-04 | Oldsmobile | N (LA1) |
| 2003-05 | Pontiac | N (LA1) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, and Rocker Covers

**Replaces:** **Replaced By:** 89017445

**Notes:** When replacing a 2003MY engine, use the oil pan that corresponds with that particular application.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017444 207 CID New 3.4L

| | | |
|---|---|---|
| 2003-05 | Pontiac, Buick | B (LA1) |
| 2003-04 | Oldsmobile | U (LA1) |
| 2003-05 | Chevrolet, Pontiac | U (LA1) |
| 2004-05 | Chevrolet | W (LA1) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, and Rocker Covers

**Replaces:** 88984289, 88984286 **Replaced By:**

**Notes:** When replacing a 2003MY engine, use the oil pan that corresponds with that particular application.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 89017445 207 CID New 3.4L

| | | |
|---|---|---|
| 2003 | Chevrolet | W (LA1) |
| 2003-04 | Pontiac, Oldsmobile | N (LA1) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, and Rocker Covers

**Replaces:** 88984288 **Replaced By:**

**Notes:** When replacing a 2003MY engine, use the oil pan that corresponds with that particular application.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89038381 207 CID Reman 3.4L

| | | |
|---|---|---|
| 1996 | Chevrolet, Pontiac, Oldsmobile | Z (LA1) |
| 1997 | Chevrolet, Pontiac Oldsmobile | U (LA1) |

***Engine-Specific Content:*** Front Cover, Oil Pan, and Valve Covers

**Replaces:** 88984249, 12539088 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89038382 207 CID Reman 3.4L

| | | |
|---|---|---|
| 1998 | Chevrolet, Pontiac, Oldsmobile | U (LA1) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, and Valve Rocker Covers

**Replaces:** 88984250, 12371991 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89038385 207 CID Reman 3.4L

| | | |
|---|---|---|
| 2000 | Chevrolet | W (LA1)(3.4E) MFI HO (NC1) |
| 2000 | Pontiac, Oldsmobile | N (LA1)(3.4E) MFI HO (NC1) |
| 2000 | Chevrolet, Pontiac, Oldsmobile | U (LA1)(3.4E) MFI HO (NC1) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, and Rocker Covers

**Replaces:** 88893924, 12482058 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12458123** 214 CID New **3.5L**

| | | |
|---|---|---|
| 1999-2000 | Oldsmobile | W (LX5)(3.5H) MFI DOHC (NF2) |

***Engine-Specific Content:*** Crankshaft Balancer Assembly, Crank & Cam Posn. Sensors, Camshaft Covers, Front Cover Assembly, Filter, Level Indicator Assembly, Oil Level SW, Oil Pan, Flywheel, Spark Plugs, Engine Oil Additive, Water Pump/Pulley Assembly, Water Outlet, and Thermostat

**Notes:** Does not include Intake Manifold/Thermal Body Assemblies.

**Replaces:** 12458066 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12458124** 214 CID New **3.5L**

| | | |
|---|---|---|
| 2000-02 | Oldsmobile | W (LX5)(3.5H) MFI DOHC (NC1) |
| 2001-02 | Oldsmobile | G (LX5)(3.5H) MFI DOHC (NC1) |

***Engine-Specific Content:*** Balancer, Flywheel, Oil Pan, Oil Pump, and Oil Filter

**Notes:** For engines with physical ID of KWA or KXA, reuse Thermostat Housing.

**Replaces:** 12564895 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12593699** 214 CID New **3.6L**

2004-05 Cadillac D (LY7) M82, MV1

***Engine-Specific Content:*** Oil Pan and Front Cover

**Replaces:** 12585320 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12593700** 214 CID New **3.6L**

2005 Cadillac D,E (LY7)

***Engine-Specific Content:*** Oil Pan and Front Cover

**Replaces:** 12585321 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12595157** 214 CID New **3.6L**

2005 Buick B,W (LY7)

***Engine-Specific Content:*** Oil Pan and Front Cover

**Replaces:** 12585319 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12360021 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1989 | Oldsmobile, Buick | C, E, H (LN3)(3.8C) |
| 1989 | Pontiac | H (LN3)(3.8C) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Oil Pump with Gears and Cover.

**Notes:** For "E" car applications, transfer oil filter adapter from old engine or order new. Engine does not include Rocker Covers, Oil Pan, Intake Manifold or Exhaust Manifold.

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12360022 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1990 | Oldsmobile, Buick | C, E, H (LN3)(3.8C) |
| 1990 | Pontiac | H (LN3)(3.8C) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Oil Pump with Gears and Cover

**Notes:** For "E" car applications, transfer oil filter adapter from old engine or order new. Engine does not include Rocker Covers, Oil Pan, Intake Manifold or Exhaust Manifold.

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12360023 231 CID Reman 3.8L

1991 Pontiac, Oldsmobile Buick H (LN3)(3.8C)

***Engine-Specific Content:*** Crankshaft Balancer, Crank and Cam Posn Sensor, Engine Coolant Temp Sensor, Front Cover, Int Air Temp Sensor, Map Sensor, Oil Level Sensor, Oil Pressure Sensor, Spark Plugs, Themostat and Water Pump

**Notes:** Does not include Intake Manifold, Exhaust Manifold and attaching parts.

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12360686 231 CID Reman 3.8L

1986 Oldsmobile, Buick A, C, E, H (LG2)(3.8B)

***Engine-Specific Content:*** Front Cover and Oil Pump

### INSTALLATION INSTRUCTIONS

- Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

  **Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.
- For 1986-87 "E" car applications, transfer the oil filter adapter from the old engine or use new part number 25537239.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12360687 231 CID Reman 3.8L

1985 Oldsmobile, Buick A, C (LN3)(231-3)

***Engine-Specific Content:*** Front Cover

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12362213 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1990-91 | Buick | W (L27) |
| 1991 | Oldsmobile, Buick | C, E (L27) |
| 1991 | Pontiac, Oldsmobile, Buick | H (L27) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Timing Chain Dampener, and Oil Pump

### INSTALLATION INSTRUCTIONS

- Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.
  **Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.
- For 1988-91 "E" car applications, transfer the oil filter adapter from the old engine or use new part number 25537239.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12362214 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1992 | Oldsmobile, Buick | C, E, H (L27)(3.8L) |
| 1992 | Pontiac | H (L27)(3.8L) |
| 1992 | Buick | W (L27)(3.8L) |
| 1992 | Chevrolet, Pontiac, Oldsmobile | U Van (L27)(3.8L) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Timing Chain Dampener, and Oil Pump

### INSTALLATION INSTRUCTIONS

- Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.
  **Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.
- For 1992 "E" car applications, transfer the oil filter adapter from the old engine or use new part number 24501299 and bolts 25519262.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12362215 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1993 | Oldsmobile, Buick | C (L27)(3.8L) |
| 1993 | Pontiac, Oldsmobile, Buick | H (L27)(3.8L) |
| 1993 | Buick | W (L27)(3.8L) |
| 1993 | Chevrolet, Pontiac, Oldsmobile | U Van (L27)(3.8L) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Timing Chain Dampener, and Oil Pump

### INSTALLATION INSTRUCTIONS

- Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.
  **Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.
- For 1993-95 "W" and "Z" car applications, transfer the oil filter adapter from the old engine or use new part number 24501300 and studs 24500567.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12362216 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1994 | Oldsmobile, Buick | C, H (L27)(3.8L) |
| 1994 | Pontiac, Oldsmobile, Buick | H (L27)(3.8L) |
| 1994 | Buick | W (L27)(3.8L) |
| 1994 | Chevrolet, Pontiac, Oldsmobile | U Van (L27)(3.8L) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Timing Chain Dampener, and Oil Pump

### INSTALLATION INSTRUCTIONS

- Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.
  **Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.
- For 1993-95 "W" and "Z" car applications, transfer the oil filter adapter from the old engine or use new part number 24501300 and studs 24500567.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12362217 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1995 | Buick | H, W (L27)(3.8L) |
| 1995 | Chevrolet, Pontiac, Oldsmobile | U Van (L27)(3.8L) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Timing Chain Dampener, and Oil Pump

### INSTALLATION INSTRUCTIONS

- Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.
  **Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.
- For 1993-95 "W" and "Z" car applications, transfer the oil filter adapter from the old engine or use new part number 24501300 and studs 24500567.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12362218 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1991-92 | Buick | C (L67)(3.8L) |
| 1992 | Oldsmobile | C (L67)(3.8L) |
| 1992 | Pontiac | H (L67)(3.8L) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Timing Chain Dampener, and Oil Pump

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.
**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12362219 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1993 | Buick, Oldsmobile, | C (L67)(3.8L) |
| 1993 | Pontiac | H (L67)(3.8L) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Timing Chain Dampener, and Oil Pump

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.
**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12362220 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1995 | Buick | G (L67) |
| 1994 | Oldsmobile, Buick | C (L67) |
| 1994 | Pontiac | H (L67) |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Oil Pump w/Gears, Timing Chain Dampener, and Oil Pump

**Notes:** 1st design has 5/16" oil pan bolts and 3-bolt cam thrust plate. 2nd design, see 12362221.

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12362221 231 CID Reman 3.8L

| | | |
|---|---|---|
| 1995 | Oldsmobile, Buick | C (L67)(3.8-1) |
| 1995 | Pontiac, Oldsmobile | H (L67)(3.8-1) |
| 1995 | Buick | G (L67)(3.8-1)* |

***Engine-Specific Content:*** Balance Shaft, Front Cover, Oil Filter Adapter, Oil Pump w/Gears, Timing Chain Dampener, and Oil Pump

**Notes:** *2nd design has 1/4" Oil Pan Bolts and 2-bolt Cam Thruster Plate; 1st design, see 12362220.

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12481315 231 CID New 3.8L

| | | |
|---|---|---|
| 2000-04 | Buick | C (L36)(3.8K) |
| 2000-04 | Pontiac, Buick | H (L36)(3.8K) |

***Engine-Specific Content:*** Flywheel, Oil Pan, Lower Intake Manifold, Front Cover, Water Pump, Balancer, and Crank & Cam Posn. Sensors

**Replaces:** 12564295 **Replaced By:** 89017668

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12482057 231 CID New 3.8L

| | | |
|---|---|---|
| 2000-03 | Pontiac | H (L67)(3.8-1) SFI, SC |
| 2000-04 | Buick | C (L67)(3.8-1) SFI, SC |

***Engine-Specific Content:*** Balancer, Flywheel, Oil Pan, Front Cover, Oil Filter, Lower Intake, Valve Covers, Crank & Cam Posn. Sensors, and Oil Level Sensor

**Replaces:** 12568293 **Replaced By:** 89017665

### INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**89017416** 231 CID New **3.8L**

| | | |
|---|---|---|
| 2004 | Pontiac | W (L32) |

**Replaces:** **Replaced By:** 89017666

## INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**89017667** 231 CID New **3.8L**

| | | |
|---|---|---|
| 1996-99 | Buick | C (L67)(3.8-1) |
| 1996-99 | Buick | G (L67)(3.8-1) |
| 1996-99 | Pontiac, Oldsmobile | H (L67)(3.8-1) |
| 1997-2003 | Pontiac | W (L67)(3.8-1) |
| 1997-2004 | Buick | W (L67)(3.8-1) |
| 2004-05 | Chevrolet | W (L67)(3.8-1) |

***Engine-Specific Content:*** Balancer, Crank & Cam Posn. Sensors, Front Cover, Flywheel, Lower Intake Manifold, Valve Covers, Oil Level Sensor, Oil Pan, and Water Pump

**Notes:** Does not contain Exhaust Manifold and attached parts. May be necessary to replace Oil Level Sensor with new or Trans Original Sens. Engine comes with 97-00 Flywheel.

**Replaces:** 12480888, 12371978, 24508875 **Replaced By:**

## INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**89017669** 231 CID New **3.8L**

2005 Chevrolet W (L26)

***Engine-Specific Content:*** Crank Balancer, Flywheel, Oil Pan, Front Cover, Oil Filter, Lower Intake, Valve Covers, Crank & Cam Posn. Sensor, and Oil Level Sensor

**Replaces:** 12480889, 12480887, 89017262 **Replaced By:**

## INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**89017670** 231 CID New **3.8L**

2004 Pontiac, Buick W (L26)

***Engine-Specific Content:*** Crank Balancer, Flywheel, Oil Pan, Front Cover, Oil Filter, Lower Intake, Valve Covers, Crank & Cam Posn. Sensor, and Oil Level Sensor

**Replaces:** 12480889, 12480887, 89017262 **Replaced By:**

## INSTALLATION INSTRUCTIONS

Do not remove the engine vehicle identification plate from the original engine. Identification of the engine being installed must comply with any applicable state laws or regulations.

**Goodwrench Decals:** Attach two 3800-engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Refer to owner's manual for proper oil type and quantity. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12361241** 262 CID Reman **4.3L**

| | | |
|---|---|---|
| 1985 | Chevrolet, Pontiac | B (LB4)(4.3Z) |
| 1985 | Chevrolet | G (LB4)(4.3Z) |
| 1985 | Chevrolet, GMC | C1,2 G1,2 K1, M1 (LB1)(4.3N) |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12361243** 262 CID Reman **4.3L**

| | | |
|---|---|---|
| 1987-90 | Chevrolet | B (LB4)(4.3Z) |
| 1987-88 | Chevrolet | G (LB4)(4.3Z) |
| 1987 | Pontiac | G (LB4)(4.3Z) |
| 1987 | Chevrolet, GMC | CK1, R1,2, V1, RV1 (LB4)(4.3Z) |
| 1987-89 | Chevrolet, GMC | M1 (LB4) |
| 1988 | Chevrolet, GMC | CK1,2,3, V2 (LB4)(4.3Z) |
| 1988-91 | Chevrolet, GMC | ST1 (LB4)(4.3Z) |
| 1989-91 | Chevrolet, GMC | CK1,2 (LB4)(4.3Z) Exc. Emis. above 8500lb. GVW (NA4) |
| 1987-90 | Chevrolet, GMC | G1,2,3 (LB4)(4.3Z) |
| 1990 | Chevrolet, GMC | LM1 (LB4)(4.3Z) |
| 1991 | Chevrolet, GMC | G1,2,3 (LB4)(4.3Z) Exc. Emis. above 8500lb. GVW (NA4) |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12361247 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1992 | Chevrolet | B (LB4)(4.3Z) |
| 1992 | Chevrolet, GMC | CK1, ST1 (LB4)(4.3Z) |
| 1992 | Chevrolet, GMC | CK2 (LB4) NA1 |
| 1992 | Chevrolet, GMC | LM1 (LB4) |
| 1992 | Chevrolet, GMC | G1,2,3 (LB4)(4.3Z) Exc. Emis. above 8500lb. GVW (NA4) |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve. Engine not used on GMC Typhoon and Syclone models.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12361248 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1992 | Chevrolet | LM1, ST1 (L35)(4.3W) |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12361249** 262 CID Reman **4.3L**

1993 Chevrolet, GMC ST1 (LB4)(4.3Z)

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve. Engine not used on GMC Typhoon and Syclone models.

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**12361251** 262 CID Reman **4.3L**

1993 Chevrolet, GMC CK1,2 (LB4)(4.3Z) NA5
1993 Chevrolet, GMC G1,2,3 (LB4)(4.3Z) (exc. NA4)
1993 Chevrolet, GMC LM1 (LB4)(4.3Z)

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12361252** 262 CID Reman **4.3L**

1993 Chevrolet B (LB4)(4.3Z)

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**12361253** 262 CID Reman **4.3L**

1993 Chevrolet, GMC LM1, ST1 (L35)(4.3W)

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12363728 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1994 | Chevrolet, GMC | CK1,2 (LB4)(4.3Z) |
| 1994 | Chevrolet, GMC | ST1 (LB4)(4.3Z) MY2, M30 |
| 1994 | Chevrolet, GMC | LM1 (LB4)(4.3Z) M30 |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve. Does not include Oil Pan or Rocker Covers, order separately.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12363729 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1994 | Chevrolet GMC | G3 (LB4)(4.3Z) w/NAI Emis. Sys (under 8500lb. GVM) |
| 1994 | Chevrolet, GMC | G1,2 (LB4)(4.3Z), M30 |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12363730 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1994 | Chevrolet, GMC | LM1 (L35)(4.3W) M30 |
| 1994 | Chevrolet | ST1 (03-53)(L35)(4.3W) MY2, M30 |
| 1994 | Chevrolet, GMC | ST1 (06-16)(L35)(4.3W) M30 (exc. CTF) |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12366016 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1995 | Chevrolet, GMC | CK1,2 (LB4)(4.3Z) |
| 1995 | Chevrolet, GMC | G1,2 (LB4)(4.3Z) M30 |
| 1995 | Chevrolet, GMC | ST1 (LB4)(4.3Z) |
| 1995 | Chevrolet, GMC | G3 (LB4)(4.3Z) w/NAI Emis. Sys (under 8500lb. GVM) M30 (A/Trans) |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12366017 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1994 | Chevrolet, GMC | ST1 (L35)(4.3W) M30, CTF |
| 1995 | Chevrolet, GMC | ST1 (L35)(4.3W) M50, M30, NM8 (exc. NM8) |
| 1995 | Chevrolet, GMC | ST1 (L35)(4.3W) M50, NM8, W99 (exc. NM8) |
| 1995 | Chevrolet, GMC | LM1 (L35) M30 |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12369214 262 CID Reman 4.3L

| | | |
|---|---|---|
| 1997-98 | Chevrolet, GMC | P3 (L35) MTI (exc. KL5) |
| 1997-99 | Chevrolet, GMC | G2,3 (L35) MTI, NA4, ZK3 |

***Engine-Specific Content:*** Oil Pump

**Notes:** Includes 21-PSI Oil Pressure Bypass Valve. When used in place of 12369214 for 98 and prior vehicles, flywheel 12557584 is required.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12515469** 262 CID New ***Heavy Duty*** **4.3L**

| | | |
|---|---|---|
| 1985-89 | Chevrolet, GMC | P4 Eng Dress Kit (LSA)* |
| 1990-93 | Chevrolet, GMC | CK2, P3 (LB4)(4.3Z), Emis. above 8500lb. GVW (NA4) |
| 1991-93 | Chevrolet, GMC | G3 (LB4)(4.3A) Emis. above 8500lb. GVW (NA4) |

***Engine-Specific Content:*** Front Cover, Oil Fill Cap, Oil Pan, Oil Pump w/Screen, Torsional Damper, Valve Rocker Cover

**Notes:** *Effective with engine codes ADF, AJZ, FLX, and XDF.

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88893272** 262 CID New **4.3L**

| | | |
|---|---|---|
| 1996 | Chevrolet, GMC | P3 (L35)(4.3W) CPI, MT1* |
| 1996-2000 | Chevrolet, GMC | CK1, S1 (L35) |
| 1996-2000 | Chevrolet, GMC | G1,2 (L35) M30, NA1 (exc. ZK3) |

***Engine-Specific Content:*** Front Cover, Oil Fill Cap, Oil Pan, Oil Pump w/Screen, Torsional Damper, Valve Rocker Cover

**Notes:** When replacing a 1998 and prior Goodwrench engine (12532552), also use 1-12557587 flywheel for A. Trans or 1-12557586 for M. Trans. *Use together with 12557584 flywheel when replacing a Goodwrench engine (12532552) for P3 application.

**Replaces:** 12456496, 12532552 **Replaced By:** 89017329

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88893274** 262 CID New **4.3L**

| | | |
|---|---|---|
| 1996-2000 | Chevrolet, GMC, Oldsmobile | T1 (L35) |
| 1996-2000 | Chevrolet, GMC | LM1 (L35) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, and Valve Rocker Covers

**Notes:** When replacing a 1998 and prior engine, also use 1-12557587 flywheel for A. Trans or 1-12557586 flywheel for M. Trans. Also needs Pilot Bearing 12557583.

**Replaces:** 12456499 **Replaced By:** 89017333

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88893275** 262 CID New **4.3L**

1996-99 Chevrolet, GMC S1 (LF6) M30, M50

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, and Valve Rocker Covers

**Notes:** When replacing a 1998 and prior engine, also use 1-12557587 flywheel for A. Trans or 1-12557586 flywheel for M. Trans.

**Replaces:** 12456500 **Replaced By:**

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

**88893276** 262 CID New **4.3L**

1996-99 Chevrolet, GMC T1 (LF6)

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, and Valve Rocker Covers

**Notes:** When replacing 1998 and prior (12532550), also use together with 12557587 Flywheel for automatic transmission or 12557586 for manual transmission usage.

**Replaces:** 12456501 **Replaced By:**

## INSTALLATION INSTRUCTIONS

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 88894118 262 CID New 4.3L

2001-02 Chevrolet, GMC G2,3 (L35)(4.3W) MT1

***Engine-Specific Content:*** Harmonic Balancer, Balance Shaft, Oil Pan, Front Cover, and Rocker Covers

**Replaces:** 12570473 **Replaced By:** 89017322

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 89017321 262 CID New 4.3L

| | | |
|---|---|---|
| 2001-02 | Chevrolet, GMC | CK1 (L35)(4.3W) |
| 2001-02 | Chevrolet, GMC | S1 (L35)(4.3W) |
| 2001-02 | Chevrolet, GMC | G1,2 (L35)(4.3W) M30 |
| 2002 | Chevrolet, GMC | CK1 (LU3) |

***Engine-Specific Content:*** Light Duty - Shallow Oil Pan, Oil Pump, Front Cover, and Rocker Covers

**Replaces:** 12570472, 88894116 **Replaced By:**

**Notes:** Swap Oil Pan from original engine or buy new (12555653) as required for Oil Level Switch.

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 89017323 262 CID New 4.3L

| | | |
|---|---|---|
| 2001 | Chevrolet, GMC | LM1 (L35) |
| 2001-02 | Chevrolet, GMC | T1 (L35) |
| 2001-03 | Chevrolet, GMC | T1 (LG3) M30 |
| 2002 | Chevrolet, GMC | LM1 (LU3) |

***Engine-Specific Content:*** Light Duty - Deep Oil Pan, Harmonic Balancer, Front Cover, and Rocker Covers

**Replaces:** 88894117, 12570474 **Replaced By:**

### INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 89017324 262 CID New 4.3L

| | | |
|---|---|---|
| 2003-04 | Chevrolet, GMC | S1 (LU3) |
| 2003-04 | Chevrolet, GMC | CK1 (LU3) |
| 2003-04 | Chevrolet, GMC | G1,2 (LU3) |
| 2004 | Chevrolet, GMC | R1 (LU3) |
| 2005 | Chevrolet, GMC | S1 (LU3) M50, M30 |

***Engine-Specific Content:*** Oil Pump, Front Cover, and Rocker Covers

**Replaces:** 88984291, 12578698 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017325 262 CID New 4.3L

| | | |
|---|---|---|
| 2003-04 | Chevrolet, GMC | T1 (LU3) |
| 2003-04 | Chevrolet, GMC | LM1 (LU3) M30 |
| 2005 | Chevrolet | ST1 (LU3) M30, ZR2 |

***Engine-Specific Content:*** Oil Pump, Front Cover, and Rocker Covers

**Replaces:** 88984292, 12578699 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**89017331** 262 CID New **4.3L**

| | | |
|---|---|---|
| 1997-99 | Chevrolet, GMC | P3 (L35) MT1 |
| 1997-00 | Chevrolet, GMC | G2,3 (L35) MT1, NA4 (exc. ZK3) |

***Engine-Specific Content:*** Front Cover, Oil Fill Cap, Oil Pan, Oil Pump w/Screen, Torsional Damper, Valve Rocker Cover

**Notes:** When replacing a 1998 & prior GW engine (12369214), also use flywheel (12557584)

**Replaces:** 88893273, 12456497 **Replaced By:**

## INSTALLATION INSTRUCTIONS

Instruct customer that the first service interval including an oil and filter change should be between 300 and 500 miles.

- **Replacement of oil related parts:** If the original engine failed either catastrophically or due to bearing failure, the engine oil cooler **MUST BE REPLACED** and the oil lines and remote filter adapter **MUST BE REMOVED** from the vehicle and thoroughly flushed or replaced. ***Ingestion of fibers and grit from conditioning pads (i.e. Scotch Brite) is the number one cause of 4.3L engine failure.***
- **Intake Manifold:** For some engine assemblies (see service manual), sealer (part number 12346004) or equivalent **MUST BE APPLIED** to lower intake manifold bolts when installing the lower intake manifold. Failure to do so will usually result in increased oil consumption by allowing oil from the engine valley to be drawn into the intake manifold plenum. Since the plenum drain holes empty into cylinder #3 and #4, oil fouling will be greater on the spark plugs in these cylinders.
- **Front Covers:** 4.3 blocks with ten-bolt front cover provisions accept either ten-bolt metal covers or, after removing dowel pins, accept six-bolt plastic covers. On OBD II equipped engines, reluctor ring must also be transferred.

**CAUTION:** The oil pump in this engine must be primed before starting engine. **DAMAGE WILL RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

# Straight 6 In-Line Engine Family Gasoline

## APPLICATION, CONTENT & INSTALLATION PROCEDURES

***This is a guide only. For specific questions, information and applications regarding any engine, please refer to the appropriate electronic GM Parts Catalog or contact PARTECH at 1-800-433-6961.***

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88984238** 256 CID New **4.2L**

2002-04 Chevrolet, GMC ST1 (LL8)

***Engine-Specific Content:*** Oil Filter, Oil Pan, Water Pump, Spark Plugs, and Flywheel

**Notes:** When used for 2002 application, the Spark Plugs, Knock Sensors and Oil Pan must be changed to 2002 parts.

**Replaces:** 88984108, 88894203 **Replaced By:** 89017685

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# V8 Engine Family
# Gasoline

## APPLICATION, CONTENT
## &
## INSTALLATION PROCEDURES

***This is a guide only. For specific questions, information and applications regarding any engine, please refer to the appropriate electronic GM Parts Catalog or contact PARTECH at 1-800-433-6961.***

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12567312** 244 CID New **4.0L**

1995-99 Oldsmobile G (L47)(4.0C)

***Engine-Specific Content:*** Drive Belt Tensioner, Front Cover, Oil Filter, Oil Level Sensors, Oil Press Sensor, Oil Pump w/Screen, and Water Pump w/Pulley

**Notes:** Exc. Intake and Exhaust Manifold.

**Replaces:** 12369567 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894238** 244 CID New **4.0L**

2001-02 Oldsmobile G (L47)

***Engine-Specific Content:*** Drive Belt Tensioner, Front Cover, Oil Filter, Oil Level Sensors, Oil Press Sensor, Oil Pump w/Screen, Water Pump w/Pulley, and Balancer

**Notes:** Exc. Intake and Exhaust Manifold.

**Replaces:** 12458125 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88984255** 244 CID New **4.0L**

2003 Oldsmobile G (L47)

**Replaces:** 12577028 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88894191** 262 CID New **4.3L**

1994-95 Chevrolet B (L99)(4.3W) (exc. KL5)

***Engine-Specific Content:*** Oil Pan, Water Pump, Oil Pump, and Timing Chain

**Notes:** To be used for gasoline. Will not work for W/KL5. See partial engine 12524501 - 1994-96 (W/KL5).

**Replaces:** 12513025 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894192** 262 CID New **4.3L**

1996 Chevrolet B (L99)(4.3W) (exc. KL5) Natural Gas

***Engine-Specific Content:*** Oil Pan, Water Pump, Oil Pump, and Timing Chain

**Notes:** Does not include Intake Manifold, Exhaust Manifold, Flywheel, Ignition/Starter, or attaching parts. Will not work for W/KL5.

**Replaces:** 12533598 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12369568** 280 CID New **4.6L**

| | | |
|---|---|---|
| 1993 | Cadillac | E, V (L37)(4.6-9) |
| 1994 | Cadillac | K (L37)(4.6-9) |

***Engine-Specific Content:*** Cam & Crank Posn Sensors, Camshaft Covers, Crankshaft Balancer, Front Cover, Flywheel, Oil Filter w/Adapter, Oil Pan, Oil Pump, PCV Valve, Spark Plugs, Thermostat & Housing, and Water Pump w/Pulley

**Notes:**

**Replaces:** **Replaced By:** 12567315

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12567313** 280 CID New **4.6L**

| | | |
|---|---|---|
| 1995-99 | Cadillac | K (L37)(4.6Y) |

***Engine-Specific Content:*** Cam & Crank Posn Sensors, Camshaft Covers, Crankshaft Balancer, Engine Oil Manifold, Front Cover, Flywheel, Oil Fill Cap, Oil Filter w/Adapter, Oil Level Indicator & Tube Assembly, Oil Level Sensor, Oil Pan, Oil Pump Suction Pipe, PCV Valve, Spark Plugs, Temperature Sensor, Thermostat & Housing, Water Pump w/Housing, and Water Pump w/Pulley

**Notes:** 1998 KS/KY models transfer or purchase Oil Level Indicator and Tube. 1995-97 models transfer or purchase Oil Filter Adapter (with oil clr ports). Early 1995 models, install fresh Air PCV Tube from group 1.762.

**Replaces:** 12369570, 12529514 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12567314** 280 CID New **4.6L**

| | | |
|---|---|---|
| 1995-99 | Cadillac | K (LD8)(4.6Y) |

***Engine-Specific Content:*** Cam & Crank Posn Sensors, Camshaft Covers, Crankshaft Balancer, Engine Oil, Front Cover, Flywheel, Oil Fill Cap, Oil Filter w/Adapter, Oil Pan, Oil Pump, and PCV Valve

**Notes:** On 1995-97 models, transfer or purchase Oil Filter Adapter (with oil clr ports). Early 1995 models, install fresh PCV Tube Assembly, part number 12552458.

**Replaces:** 12369571, 12529515 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12567316** 280 CID New **4.6L**

| | | |
|---|---|---|
| 1993 | Cadillac | E (LD8)(4.6Y) |
| 1994 | Cadillac | K (LD8)(4.6Y) |

***Engine-Specific Content:*** Cam & Crank Posn Sensors, Camshaft Covers, Crankshaft Balancer, Front Cover, Flywheel, Oil Filter w/Adapter, Oil Pan, Oil Pump, PCV Valve, Spark Plugs, Thermostat & Housing, Water Pump w/Pulley, and Engine Oil

**Replaces:** 12369569, 12529512 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894239** 280 CID New **4.6L**

| | | |
|---|---|---|
| 2001-02 | Cadillac | K (L37) |

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894240** 280 CID New **4.6L**

| | | |
|---|---|---|
| 2001-02 | Cadillac | K (LD8) |

**Notes:** When used for Eldorodo, swap dipstick tubes.

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894249** 280 CID Reman **4.6L**

| | | |
|---|---|---|
| 2000 | Cadillac | K (LD8) |

**Replaces:** 12458126 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894250** 280 CID Reman **4.6L**

| | | |
|---|---|---|
| 2000 | Cadillac | K (L37) |

**Notes:** Engine assembly is used with and without V03 option. Comes with cooler adapter, remove for applications without V03.

**Replaces:** 12458127 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88984253** 280 CID New **4.6L**

| | | |
|---|---|---|
| 2003 | Cadillac | K (L37) Northstar |

**Replaces:** 12577026 **Replaced By:**

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88984254** 280 CID New **4.6L**

| | | |
|---|---|---|
| 2003 | Cadillac | K (LD8) Northstar |

**Replaces:** 12577027 **Replaced By:**

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017411** 280 CID New **4.6L**

| | | |
|---|---|---|
| 2004 | Pontiac | H (LD8) |
| 2004 | Cadillac | K (LD8) |

**Replaces:** **Replaced By:** 89017626

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017446** 280 CID New **4.6L**

| | | |
|---|---|---|
| 2004 | Cadillac | Y (LH2) |

**Replaces:** 89017394 **Replaced By:** 89017549

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017447** 280 CID New **4.6L**

| | | |
|---|---|---|
| 2004 | Cadillac | E (LH2) |

**Replaces:** 89017393 **Replaced By:** 89017550

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12457703** 292 CID New **4.8L**

1999 Chevrolet, GMC CK1 (LR4)(4.8V) M30

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Pan, and Oil Filter

**Replaces:** **Replaced By:** 88890536

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12457704** 292 CID New **4.8L**

1999 Chevrolet, GMC CK1 (LR4) MG5

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Pan, and Oil Filter

**Replaces:** **Replaced By:** 88890536

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88893289** 292 CID New **4.8L**

2000 Chevrolet, GMC CK1 (LR4) M30

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Front Cover, Water Pump and Rocker Covers

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88893290** 292 CID New **4.8L**

2000 Chevrolet, GMC CK (LR4) MG5

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Front Cover, Water Pump and Rocker Covers

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017353** 292 CID New **4.8L**

2000-04 Chevrolet, GMC CK1 (LR4)
2003-04 Chevrolet, GMC G2,3 (LR4) MT1

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Front Cover, Water Pump and Rocker Covers

**Replaces:** 88894060, 88893290, 88893289, 88894257, 88984274 **Replaced By:** 89017656

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12518296 305 CID New 5.0L

| | | |
|---|---|---|
| 1988-92 | Chevrolet, Pontiac | F (L03)(5.0H) |
| 1989-93 | Chevrolet | B (L03)(5.0H) |
| 1989-92 | Buick | B (L03)(5.0H) |
| 1991-92 | Oldsmobile | B (L03)(5.0H) |
| 1991-92 | Cadillac | D (L03)(5.0H) |

***Engine-Specific Content:*** Front Cover, Oil Fill Cap, Oil Pan, and Valve Rocker Cover

### INSTALLATION INSTRUCTIONS

- This engine is built with 1993 production components. When servicing engine, use 1993 service parts.
- For "D" and "F" car applications, remove oil pan and replace with pan from replaced engine or order oil pan kit, part number 12518044.
- For applications without oil level sensors, plug hole using plug, part number 3448834, and T/W thread sealer, part number 12345493.
- Engine built after 04/13/94 have roller timing chains. For second service, sprocket part numbers 12552129 and 14088784, chain part number 14088783 and bolt part number 9417950 must be used. Engines built with link timing chain must use camshaft sprocket part number 10168441, crankshaft sprocket part number 10128346, chain part number 10128485 and bolt part number 3874878.
- This engine is built to production point of build torque specifications, and loss of some bolt torque is normal. It is not necessary to retorque any bolts.

## 12518298 305 CID New 5.0L

| | | |
|---|---|---|
| 1987-95 | Chevrolet, GMC | G1,2 (L03)(5.0H) |
| 1987 | Chevrolet, GMC | R1,2 V1 (L03)(5.0H) |
| 1988-95 | Chevrolet, GMC | CK1,2 (L03)(5.0H) |

***Engine-Specific Content:*** Front Cover, Oil Fill Cap, Oil Pan, and Valve Rocker Cover

**Replaces:** 10181385 **Replaced By:**

### INSTALLATION INSTRUCTIONS

- This engine is built with 1993 production components. When servicing engine, use 1993 service parts.
- Install clutch pilot bearing, part number 03752487, for manual transmission applications.
- This engine is built with cylinder heads that have counter-bored inlet manifold attaching end holes (for piloted inlet manifold side gaskets) that require 1/4" longer fasteners.
- On 1987-90 models, the following parts are required:

  | | |
  |---|---|
  | R.H. Front | 09439918* |
  | R.H. Rear | 15538420* |
  | L.H. Front | 10108663 |
  | L.H. Rear | 09439918* |

  *Use sealer part number 1052080. Use inlet manifold gasket kit part number 12506365.
- On 1987 RV10 & R20 models: Remove and discard front cover. Install front cover from original engine or obtain front cover assembly part number 10089669. Install torsional damper from original engine or obtain torsional damper part number 10066046.
- This engine incorporates current valve rocker cover. It may be necessary to use covers from original engine.
- This engine is built to production point of build torque specifications, and loss of some bolt torque is normal. It is not necessary to retorque any bolts.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12530284 305 CID New 5.0L

| | | |
|---|---|---|
| 1996-99 | Chevrolet, GMC | CK1,2 (L30)(5.0M) MG5, M30 |
| 1996-2002 | Chevrolet, GMC | G1,2 (L30)(5.0M) M30 |

***Engine-Specific Content:*** Front Cover, Oil Fill Cap, Oil Pan, and Valve Rocker Cover

**Notes:** For 2001 G-van application, service engine block contains English threads. When used for 2001 vehicles, must also use 2000 MY Starter/Trans/Eng mounting bolts.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 22538277 307 CID Reman 5.0L

| | | |
|---|---|---|
| 1986-90 | Cadillac | D (LG8)(5.0-9) B05 |
| 1986-87 | Oldsmobile | G (LG8)(5.0-9) |

***Engine-Specific Content:*** Crankshaft, Inj Pump Drive, Oil Pump w/Screen, Conn. Rod and Bearings, Pistons, Camshaft, Cylinder Heads, Valves, Lifters, Push Rods, and Timing Chain

**Notes:** Engine does not include Water Pump, Intake or Exhaust Manifold, Flywheel, Front Cover or Oil Pan.

**Replaces:** 22536528 **Replaced By:**

### INSTALLATION INSTRUCTIONS

- Oil Pump Screen Height: The oil pump pickup screen has a possibility of being moved out of location during normal handling of the engine. Prior to reinstallation of the oil pan, check the location of the screen.
- Oil Pump: On all "E" or "K" models, remove the oil pump from the old engine. If the engine being replaced has high mileage, it is suggested you purchase a new oil pump. If it is low mileage and the oil pump worked well, transfer the pump from the old engine. Failure to change the pump will result in oil starvation because of the pickup screen height.
- This remanufactured engine contains the following materials for your use:
  Valve cover labels - after installation in the car, affix to each valve cover
  Bill of lading for core return - fill out and supply to carrier when core is shipped

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12457705** 323 CID New **5.3L**

| | | |
|---|---|---|
| 1999 | Chevrolet, GMC | CK1,2 (LM7)(5.3T) M30 |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Pan, Oil Filter, and Valve Rocker Covers

**Replaces:** **Replaced By:** 88890540

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88893291** 323 CID New **5.3L**

| | | |
|---|---|---|
| 2000 | Chevrolet, GMC | CK1 (LM7)(5.3T) MFI |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Pan, Oil Filter, and Valve Rocker Covers

**Replaces:** 12565185 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017354** 323 CID New **5.3L**

| | | |
|---|---|---|
| 2001 | Chevrolet, GMC | CK1,2 (LM7) |
| 2002 | Chevrolet, GMC | C1,2 K1 (LM7) |
| 2002-04 | Chevrolet, GMC | CK1 (L59) M30 |
| 2003-04 | Chevrolet, GMC | GH 1,2 (LM7) M30, NC8, NF4, NT9 |
| 2003-04 | Chevrolet, GMC | CK1 (LM7) M30 |
| 2004 | Chevrolet, GMC | CK1 (LM7) M33 |

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Front Cover, Water Pump, and Rocker Covers

**Replaces:** 88984275, 88894061, 88894258 **Replaced By:** 89017657

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017355** 323 CID New **5.3L**

| | | |
|---|---|---|
| 2003-04 | Chevrolet, GMC | ST1 (LM4) M30 |

***Engine-Specific Content:*** Oil Pump, Front Cover, Water Pump, and Rocker Covers

**Replaces:** 88984276, 12577732 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 10067353 350 CID New 5.7L

| | | |
|---|---|---|
| 1983-85 | Chevrolet | B (LM1)(350-6) SEO |
| 1979-84 | Chevrolet, GMC | CK1 (06)(LT9)(350M) (LS9)(350L) |
| 1979-85 | Chevrolet, GMC | K1 (LS9)(350L) |
| 1980-85 | Chevrolet, GMC | G1,2,3 (LT9)(350M) (LS9)(350L) (LM1)(350L) |
| 1981-82 | Chevrolet, GMC | CK1 (03)(LM1)(350L) |
| 1985 | Chevrolet, GMC | CK1(06) G1 (LS9)(350L) |

***Engine-Specific Content:*** Front Cover, Oil Pan, and Valve Covers

**Notes:** Refer to Service Catalog for detailed usage requirements.

**Replaces:** 14009800 **Replaced By:**

### INSTALLATION INSTRUCTIONS

- Part number 10067353 Goodwrench 5.7 Liter (350 C.I.D.) V8 engine is to be used on 1973 through 1985 Chevrolet passenger cars (also 1977-79 Buick, Oldsmobile, and Pontiac) with VIN "K" or "L" and 1973 through 1985 Chevrolet-GMC light duty truck with VIN "Y" or "L".
- Not to be used for Taxi, Police, High-Performance, LPG or Low Compression Export applications; also, 1974 California passenger car.
- Remove any paint from cylinder block to clutch housing or transmission mounting surface and crankshaft before installing engine.
- Check engine restrictor at center of inlet manifold side gaskets from replaced engine and procure one of the following units:

| Unit Part Number | Restrictor |
|---|---|
| 10174954 | L.H. open, R.H. 5/8" |
| 00345195 | Both 5/8" |
| 10147994 | Both open |

- Two timing pointers are provided with this assembly. Determine and install correct pointer or install front cover assembly from replaced engine.
- Some models may require R.H. cylinder head be drilled and tapped (3/8"-16") for exhaust manifold rear bolt attachment.
- Plug either L.H. or R.H. side of cylinder block with plug furnished. Plug side opposite of dipstick location.
- This engine is built to production point of build torque specifications, and loss of some bolt torque is normal. It is not necessary to retorque any bolts.

## 12455109 350 CID New 5.7L

| | | |
|---|---|---|
| 1997-98 | Chevrolet | Y (LS1)(5.7G) |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, Intake Manifold, Fuel Rail, and Water Pump

**Replaces:** **Replaced By:** 88894382

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12457660** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1999 | Chevrolet | Y (LS1)(5.7G) |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, Intake Manifold, Fuel Rail, and Water Pump

**Replaces:** **Replaced By:** 88890543

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12513151** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1991-93 | Chevrolet | B (L05)(5.7K), Exc. SEO Police Car (9C1) |
| 1992-93 | Buick | B (L05)(5.7K) |
| 1991-93 | Cadillac | D (L05)(5.7K) |
| 1992 | Oldsmobile | B (L05)(5.7K) |

***Engine-Specific Content:*** Crankshaft Hub, Oil Pan, and Valve Rocker Cover

## INSTALLATION INSTRUCTIONS

- Part number 12513151 5.7 Liter engine is built with 1993 model year designed oil pan (no rail bead) and oil pan gasket. When servicing this engine, it is required that replacement parts be of that same type of design.
- On "D" car models 1992 & prior, remove oil pan and replace with original or with new part number 12518044.
- Engines built after 04/13/94 have roller timing chains. For second service, use sprocket part number 12552129 and part number 14088784, chain part number 14088783 and bolt part number 9417950. Engine built with link timing chain must use camshaft sprocket part number 10168441, crankshaft sprocket part number 10128346, chain part number 10128485 and bolt part number 3874878.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12520270 350 CID New 5.7L

| | | |
|---|---|---|
| 1987-94 | Chevrolet, GMC | G3 (L05)(5.7K) Emis. Sys (above 8500lb. GVW) NA4 |
| 1987-90 | Chevrolet, GMC | P2,3 (L05)(5.7K) Emis. Sys (above 8500lb. GVW) NA4 |
| 1987-91 | Chevrolet, GMC | RV2,3 (L05)(5.7K) Emis. Sys (above 8500lb. GVW) NA4 |
| 1988-95 | Chevrolet, GMC | CK2,3 (L05)(5.7K) Emis. Sys (above 8500lb. GVW) NA4 |
| 1991-96 | Chevrolet, GMC | P3 (L05)(5.7K) |
| 1994-96 | Chevrolet, GMC | G3 (L05)(5.7K) MT1 (exc. KL5, 5Z1, 9C2, NM8) |
| 1994-96 | Chevrolet, GMC | G3 (L05)(5.7K) NM8, MT1 (exc. 9C2) |
| 1994-96 | Chevrolet, GMC | G3 (L05)(5.7K) 5Z1 (exc. 9C2, NM8) |
| 1995 | Chevrolet, GMC | G3 (L05)(5.7K) MT1, 9C2, 5Z1 (exc. NM8) |

***Engine-Specific Content:*** Front Cover, Oil Pan, Torsional Damper, and Valve Rocker Cover

**Replaces:** 12509657 **Replaced By:**

### INSTALLATION INSTRUCTIONS

- Part number 12520270 5.7 Goodwrench 5.7 Liter engine is built with 1993 model year designed oil pan (no rail bead), oil pan gasket, and oil pump assembly. When servicing this engine, it is required that replacement parts be of the same type and design.
- This engine is built with current-production valve rocker covers. It may be necessary to use cover from replaced engine.
- On models with a 5-Quart Oil Pan, remove oil pan and oil pump assembly. Replace with original or new oil pan assembly part number 12518043, oil pump assembly part number 10168529, and screen oil part number 10166159.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.

## 12530282 350 CID New 5.7L

| | | |
|---|---|---|
| 1999-2000 | Chevrolet, GMC | CK1 (L31) M30 (exc. NM8) |
| 1996-98 | Chevrolet, GMC | CK1,2 (L31)(5.7R) M50, M30 (exc. NM8) |
| 1996-2002 | Chevrolet, GMC | G1,2 (L31)(5.7R) M30 |

***Engine-Specific Content:*** Crankshaft Hub, Front Cover, Oil Pan, and Valve Rocker Cover

**Notes:** For 2001 G-van application, service engine block contains English threads. May require Valve Covers to be transferred from original engine for some applications

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 12530283 350 CID New 5.7L

| | | |
|---|---|---|
| 1996-2000 | Chevrolet, GMC | CK2,3 (L31) MT1 (exc. NM8, KL5) |
| 1996-2000 | Chevrolet, GMC | CK2,3 (L31)(5.7R) MW3 (exc. NM8) |
| 1996-2002 | Chevrolet, GMC | G2,3 (L31)(5.7R) MT1 |
| 1996-99 | Chevrolet, GMC | P3 (L31)(5.7R) MW3, MT1 (exc. NM8, KL5) |

***Engine-Specific Content:*** Crankshaft Hub, Front Cover, Oil Pan, and Valve Rocker Covers

**Notes:** For 2001 G-van applications, service engine block contains English threads. When used for 2001 and 2002 vehicles, must also use 2000 MY Starter/Trans/Eng mounting bolts.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12534776** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1996 | Chevrolet | Y (LT4) |

***Engine-Specific Content:*** Front Cover, Oil Pan, Oil Pump w/Shaft and Cover, Water Pump w/Shaft and Cover

**Notes:** Does not include Inlet Manifold, Exhaust Manifold, Starter, Flywheel, Water Pump, Ignition or Attaching Parts

**Replaces:** **Replaced By:** 88894198

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12568758** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1987-92 | Chevrolet, GMC | G1,2,3 (L05)(5.7K) MD8 |
| 1987 | Chevrolet, GMC | RV1,2 (L05)(5.7K) Emis. Sys (under 8500lb. GVW) NA1 |
| 1988 | Chevrolet, GMC | CK1,2 (L05)(5.7K) |
| 1988-91 | Chevrolet, GMC | RV1 (L05)(5.7K) |
| 1989-95 | Chevrolet, GMC | CK1,2 (L05)(5.7K) Emis. Sys (under 8500lb. GVW) NA1 |
| 1993-94 | Chevrolet, GMC | G1,2,3 (L05)(5.7K) Emis. Sys (under 8500lb. GVW) NA1 |
| 1995 | Chevrolet, GMC | G2,3 (L05)(5.7K) M30 Emis. Sys (under 8500lb. GVW) NA1 |

***Engine-Specific Content:*** Front Cover and Pointer, Oil Pan, Torsional Damper, and Valve Rocker Covers

**Replaces:** 12520268 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12568759** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1986 | Chevrolet, GMC | CK1 (LS9)(350L) |
| 1986 | Chevrolet, GMC | G1,2,3 (LS9)(350L) |

***Engine-Specific Content:*** Front Cover and Valve Rocker Covers

**Replaces:** 10048971 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12569010** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1996-2003 | Chevrolet, GMC | W4 (L31) |

***Engine-Specific Content:*** Oil Pan

**Notes:** For 2001 application, must use 2000 transmission/engine and starter mounting bolts. Service engine block has English mounting threads.

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12569068** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1993-95 | Chevrolet, GMC | W4 (L05) |
| 2000 | Chevrolet, GMC | W4 |

***Engine-Specific Content:*** Oil Pan

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88893286** 350 CID New **5.7L**

| | | |
|---|---|---|
| 2000 | Chevrolet | Y (LS1)(5.7G) MFI Alum |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, Intake Manifold, Fuel Rail, and Water Pump

**Replaces:** **Replaced By:** 88890544

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88893287** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1999-00 | Chevrolet, Pontiac | F (LS1)(5.7G) |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, Intake Manifold, Fuel Rail, and Water Pump

**Replaces:** 12457659 **Replaced By:** 88890545

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894086** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1998 | Chevrolet, Pontiac | F (LS1)(5.7G) |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, Intake Manifold, Fuel Rail, and Water Pump

**Replaces:** 12455110 **Replaced By:** 88894386

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894193** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1994-95 | Chevrolet, Buick | B (LT1)(5.7P) |
| 1994-95 | Cadillac | B (LT1)(5.7P) |

***Engine-Specific Content:*** Crankshaft Hub and Valve Rocker Cover

**Replaces:** 12513026 **Replaced By:**

**INSTALLATION INSTRUCTIONS**

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88894194** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1996 | Chevrolet, Buick | B (LT1)(5.7P) |
| 1996 | Cadillac | B (LT1)(5.7P) |

***Engine-Specific Content:*** Front Cover, Oil Pan, Oil Pump w/Shaft and Cover, Water Pump w/Shaft and Cover

**Notes:** Does not include Inlet Manifold, Exhaust Manifold, Starter, Flywheel, Ignition, or Attaching Parts

**Replaces:** 12533599 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894195** 350 CID New **5.7L**

| | | |
|---|---|---|
| 1995 | Chevrolet, Pontiac | F (LT1)(5.7P) |
| 1995 | Chevrolet | Y (LT1)(5.7P) |

***Engine-Specific Content:*** Crankshaft Hub, Front Cover, Oil Pan, and Valve Rocker Cover

**Replaces:** 12524896 **Replaced By:**

## INSTALLATION INSTRUCTIONS

- On "Y" car applications, valve covers, oil pan, and oil pump screen must be replaced with original parts or purchased new as follows:

| Valve Covers (w/gasket) | Valve Cover Bolts | Oil Pump Screen | Oil Pan Kit/Pan Gasket |
|---|---|---|---|
| 12552321 LH | 10108675 | 12550106 | 10242242 |
| 12552322 RH | 10108674 | | 10108676 |

- If there is insufficient 'press' after installing the oil pump screen, replace oil pump with part number 12555283.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 88894196 350 CID New 5.7L

| | | |
|---|---|---|
| 1993-94 | Chevrolet, Pontiac | F (LT1)(5.7P) |
| 1992-94 | Chevrolet | Y (LT1)(5.7P) |

***Engine-Specific Content:*** Crankshaft Hub, Front Cover, Oil Pan, and Valve Rocker Cover

**Replaces:** 12523000 **Replaced By:**

### INSTALLATION INSTRUCTIONS

- On "Y" car applications, valve covers, oil pan, and oil pump screen must be replaced with original parts or purchased new as follows:

| Year | Valve Covers | Valve Cover Bolts | Oil Pump Screen | Oil Pan Kit/Pan Gasket |
|---|---|---|---|---|
| 1992 | N/A LH | 10088165 | 12550106 | 10242242 |
| | 10055782 RH | | | 10108676 |
| 1993 | 12552321 LH* | 10108675 | 12550106 | 10242242 |
| | 12552322 RH* | 10108674 | | 10108676 |
| 1994 | 12552321 LH* | 10108675 | 12550106 | 10242242 |
| | 12552322 RH* | 10108674 | | 10108676 |

  *Includes valve cover gasket
- If there is insufficient 'press' after installing the oil pump screen, replace oil pump with part number 12555283.
- This engine is built with 1994 production parts. When servicing the cylinder head and valve train, use 1994 components.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.

## 88894197 350 CID New 5.7L

| | | |
|---|---|---|
| 1996-97 | Chevrolet, Pontiac | F (LT1)(5.7P) |
| 1996 | Chevrolet | Y (LT1)(5.7P) |

***Engine-Specific Content:*** Front Cover, Oil Pan, Oil Pump w/Shaft and Cover, Water Pump w/Shaft and Cover

**Notes:** Does not include Inlet Manifold, Exhaust Manifold, Starter, Flywheel, Water Pump, Ignition or Attaching Parts

**Replaces:** 12533597 **Replaced By:**

### INSTALLATION INSTRUCTIONS

- On "Y" car applications, valve covers, oil pan, and oil pump screen must be replaced with original parts or purchased new as follows:

| Valve Covers (w/gasket) | Valve Cover Bolts | Oil Pump Screen | Oil Pan Kit/Pan Gasket |
|---|---|---|---|
| 12552321 LH | 10108675 | 12550106 | 10242242 |
| 12552322 RH | 10108674 | | 10108676 |

- If there is insufficient 'press' after installing the oil pump screen, replace oil pump with part number 12555283.
- This engine is built to production point of build torque specifications, and loss of some torque is normal. It is not necessary to retorque any bolts.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88894384** 350 CID New **5.7L**

2001 Chevrolet Y (LS6)

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Front Cover, Water Pump, and Rocker Covers

**Replaces:** 88894057 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017349** 350 CID New **5.7L**

2003-04 Chevrolet Y (LS6)

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Oil Pump, Front Cover, Water Pump, and Rocker Covers

**Replaces:** 88984272, 88894254 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017352** 350 CID New **5.7L**

2004 Pontiac 8V (LS1) GH4

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Oil Pump, Front Cover, Water Pump, and Rocker Covers

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**89017548** 350 CID New **5.7L**

2001-04 Chevrolet Y (LS1)
2001-02 Chevrolet, Pontiac F (LS1)

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Oil Pump, Front Cover, Water Pump, and Rocker Covers

**Replaces:** 89017348, 89017384, 89017275, 88984271 **Replaced By:**

**Notes:** 2001 applications may require rocker arm covers to be transferred form original engine.

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**89017653** 350 CID New **5.7L**

2005 Cadillac D (LS6)

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Oil Pump, Front Cover, Water Pump, and Rocker Covers

**Replaces:** 89017350 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12339198 366 CID Reman 6.0L

| | | |
|---|---|---|
| 1985-90 | Chevrolet, GMC | B6, C6,7, P6, S7 (L86)(366) |
| 1988-90 | Chevrolet, GMC | C6,7 (LS0)(366) NA5 |
| 1988-90 | Chevrolet, GMC | B6 (LS0)(L86) |
| 1990 | Chevrolet, GMC | C5,6,7 (LS0)(366) |

**Notes:** First design 1995 Head Casting is 14081052 (except Columbia)(for 1st design, see 12339197).

### INSTALLATION INSTRUCTIONS

- This Chevrolet Mark IV engine has been remanufactured subsequent to the model year of the vehicle and incorporates design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Parts and Accessories information bulletins and Chevrolet dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.
- Use new seals and gaskets. Install the supplied oil pump and transfer all necessary components including oil pan, and valve covers to the replacement engine. Thoroughly clean all old parts to avoid possible contamination.
- 1990 trucks have an ESC sensor. It may be necessary to tap the oil tube-mounting hole with 1/4-18 dry-seal tap to install the sensor on the replacement engine. Use a thread sealer to prevent coolant leaks.
- On certain models with shallow oil pan, a new oil pump assembly, part number 14067529, with shorter pick-up tube must be installed in place of the pump supplied with this engine.
- Attach two Goodwrench engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting the engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Use 6 quarts of A.P.I. Starburst certified oil in the viscosity suitable for your climate conditions. **DAMAGE COULD RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED PROPERLY.**

## 12457706 366 CID New 6.0L

| | | |
|---|---|---|
| 1999-2000 | Chevrolet, GMC | CK2 (LQ4)(6.0U) MFI (MT1) |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, and Valve Covers

**Replaces:** **Replaced By:** 88890542

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12465229** 366 CID New ***Electric Fuel Pump Application Only*** **6.0L**

| | | |
|---|---|---|
| 1986-89 | Chevrolet, GMC | M4,5,6 (L86) MF1 (exc. oil cooler KPS, air comp application) |
| 1986-90 | Chevrolet, GMC | M4,5,6 (L86) BQG, KPS (exc. BQG)(with kit #15662081) |
| 1986-90 | Chevrolet, GMC | M4,5,6 (L86) MF1, MT9, KPS (exc. BQG)(with kit #15662081) |
| 1986-89 | Chevrolet, GMC | C6,7 (L86) (exc. KPS) (with M.T. and #15667482) |
| 1986-89 | Chevrolet, GMC | C6,7 (L86) KPS (with M.T. and # 15662081)(exc. air comp application) |
| 1986-89 | Chevrolet, GMC | C6,7 (L86) ME4, ME6 (exc. KPS) |
| 1986-89 | Chevrolet, GMC | C6,7 (L86) MF1 (exc. KPS) (w/IMF9) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) ME4, ME6 (with kit #15637482)(exc. air comp application) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) ME4, ME6, KPS (with kit #15662081)(exc. air comp application) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) MF1, KPS (exc. air comp application) |
| 1989-90 | Chevrolet, GMC | C6,7 (LS0) MF1 (exc. KPS)(with air comp kit #15637482) |
| 1989-90 | Chevrolet, GMC | C6,7 (LS0) M.T. (air comp #15637482) |
| 1989-90 | Chevrolet, GMC | C6,7 (LS0) KPS (exc. KPS) |
| 1989-90 | Chevrolet, GMC | B6 (LS0) (exc. KPS) (M.T., air comp #15637482) |
| 1989-90 | Chevrolet, GMC | B6 (L86) 366 (LS0) MF1 (exc. oil cooler KPS, air comp application) |
| 1990 | Chevrolet, GMC | C5,6,7 (LS0) (exc. KPS) |
| 1991 | Chevrolet, GMC | B6 (LS0) 366 |
| 1991-98 | Chevrolet, GMC | C6,7 (LS0) |
| 1992-96 | Chevrolet, GMC | P6 (LS0) |
| 1993-98 | Chevrolet, GMC | B7 (LS0) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, Valve Rocker Covers

**Notes:** ***Electric Fuel Pump Application Only.*** When replacing engines with 8-inch dampener, must also use 1-12529747 water pump.

**Replaces:** 12530366 **Replaced By:**

## INSTALLATION INSTRUCTIONS

NOTICE: When using this engine to replace 1990 and prior applications, the following kits are required:

| Retrofit Kit # | Model | Year | Restrictions |
|---|---|---|---|
| 12531193 | C6,7 | 1991-98 | |
| 12531193 | B7 | 1997-98 | |
| 12531193 | P6 | 1992-96 | |
| 15637113 | C6,7 | 1989-90 | |
| 15637113 | B6 | 1989-90 | |
| 15637114 | C6,7 | 1989-90 | |
| 15637114 | C5,6,7 | 1990 | |
| 15637114 | B6 | 1989-90 | |
| 15637115 | C6,7 | 1989-90 | |
| 15662928 | M4,5,6 | 1986-90 | |
| 15662928 | C6,7 | 1986-89 | |
| 15662943 | M4,5,6 | 1986-90 | |
| 15662943 | C6,7 | 1986-89 | |
| 15662944 | C6,7 | 1986-89 | |

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88890535** 366 CID New ***Mechanical Fuel Pump Application Only*** **6.0L**

| | | |
|---|---|---|
| 1986-89 | Chevrolet, GMC | M4,5,6 (L86) (exc. KPS) w/M.T. |
| 1986-89 | Chevrolet, GMC | M4,5,6 (L86) MF1 (exc. oil cooler KPS, air comp application) |
| 1986-90 | Chevrolet, GMC | M4,5,6 (L86) BQG, KPS (exc. BQG) (with kit #15662081) |
| 1986-90 | Chevrolet, GMC | M4,5,6 (L86) MFI, KPS (exc. BQG) (with kit #15662081) (IMT9) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) ME4, ME6 (exc. oil cooler application ) (with kit 15637482) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) ME4, ME6, KPS (exc. air comp application) (with kit 15662081) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) MF1 (exc. KPS) (with kit #15637482) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) MF1, KPS (exc. air comp application) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) (exc. KPS) (with M.T. and kit #15667482) |
| 1986-89 | Chevrolet, GMC | C6,7 (L86) KPS (exc. air comp application) (with M.T. and kit #15662081) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) ME4, ME6 (exc. KPS) |
| 1986-90 | Chevrolet, GMC | C6,7 (L86) MF1 (exc. KPS) |
| 1989-90 | Chevrolet, GMC | B6 (LS0) (exc. KPS) (M.T., air comp #15637482) |
| 1989-90 | Chevrolet, GMC | B6 (L86) 366 (LS0) M.T. (exc. oil cooler KPS, air comp application) |
| 1989-90 | Chevrolet, GMC | B6 (L86) 366 (LS0) MF1 (exc. oil cooler KPS, air comp application) |
| 1989-90 | Chevrolet, GMC | C6,7 (LS0) KPS (exc. KPS) |
| 1990 | Chevrolet, GMC | C5,6,7 (LS0) (exc. KPS) |
| 1991 | Chevrolet, GMC | B6 (LS0) 366 |
| 1991-98 | Chevrolet, GMC | C6,7 (LS0) |
| 1992-96 | Chevrolet, GMC | P6 (LS0) |
| 1993-98 | Chevrolet, GMC | B7 (LS0) |
| 1997-98 | Chevrolet, GMC | F6,7 (LS0) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, Valve Rocker Covers

**Notes:** ***Mechanical Fuel Pump Application Only.*** When replacing engines with 8-inch dampener, must also use 1-12529747 water pump.

**Replaces:** 12530366 **Replaced By:**

## INSTALLATION INSTRUCTIONS

NOTICE: When using this engine to replace 1990 and prior applications, the following kits are required:

| Retrofit Kit # | Model | Year | Restrictions |
|---|---|---|---|
| 12531193 | C6,7 | 1991-98 | |
| 12531193 | B7 | 1997-98 | |
| 12531193 | P6 | 1992-96 | |
| 15637113 | C6,7 | 1989-90 | |
| 15637113 | B6 | 1987-90 | |
| 15637114 | C6,7 | 1989-90 | |
| 15637114 | C5 | 1990 | |
| 15637115 | C6,7 | 1989-90 | |
| 15637115 | B6 | 1989-90 | |
| 15662928 | M4,5,6 | 1986-90 | |
| 15662928 | C6,7 | 1986-89 | |
| 15662943 | M4,5,6 | 1986-90 | |
| 15662943 | C6,7 | 1986-89 | |
| 15662944 | C6,7 | 1986-89 | |

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 89017356 366 CID New 6.0L

| | | |
|---|---|---|
| 2003-04 | Chevrolet, GMC | CK2,3 (LQ4) MW3 |
| 2001-04 | Chevrolet, GMC | CK1,2,3 (LQ4) MT1 (exc. KL5) |
| 2003-04 | Chevrolet, GMC | K1 (LQ4) M32 |
| 2003-04 | Chevrolet, GMC | G2,3 (LQ4) MT1 (exc. KL5) |
| 2003-04 | Hummer | N 257 (LQ4) M32, NC1, NT9 |

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Front Cover, and Water Pump

**Replaces:** 88984277, 88894062, 88894259 **Replaced By:** 89017659

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017357 366 CID New 6.0L

| | | |
|---|---|---|
| 2001 | Chevrolet, GMC | K1 (LQ4) KL5 |
| 2001 | Chevrolet, GMC | CK2,3 (LQ4) KL5 |
| 2002-04 | Chevrolet, GMC | CK1,2,3 (LQ4) MT1, KL5 |
| 2003-04 | Chevrolet, GMC | G2,3 (LQ4) MT1, KL5 |
| 2003-04 | Chevrolet, GMC | W4 (LQ4) |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, and Valve Covers

**Replaces:** 89017358, 88984278, 88894260, 88894063 **Replaced By:** 89017660

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017358 366 CID New 6.0L

| | | |
|---|---|---|
| 2003-04 | Chevrolet, GMC | W4 (LQ4) |

***Engine-Specific Content:*** Front Cover, Harmonic Balancer, Oil Filter, Oil Pan, and Valve Covers

**Replaces:** 88984282 **Replaced By:** 89017357

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017359 366 CID New 6.0L

| | | |
|---|---|---|
| 2002-03 | Chevrolet, GMC | K1 (LQ9) |
| 2004 | Chevrolet, GMC | CK1 (LQ9) M32 |

***Engine-Specific Content:*** Harmonic Balancer, Oil Pan, Front Cover, and Water Pump

**Replaces:** 12573037, 88894261, 88984279 **Replaced By:** 89017661

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**89017654** 366 CID New **6.0L**

2005 Chevrolet Y (LS2)

***Engine-Specific Content:*** Oil Pan and Front Cover

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12339196 427 CID Reman 7.0L

| | | |
|---|---|---|
| 1985-90 | Chevrolet, GMC | C7 (L43) |
| 1988-90 | Chevrolet, GMC | C6,7 (L43) NA5 (427) |
| 1990 | Chevrolet, GMC | C5,6,7 (LR0) |
| 1990 | Chevrolet, GMC | P6 (LR0) |

**Notes:** Head casting is 14081052 (except Columbia)(for 1st design, see 12339195).

### INSTALLATION INSTRUCTIONS

- This Chevrolet Mark IV engine has been remanufactured subsequent to the model year of the vehicle and incorporates design refinements not included in original service information (i.e., 1982 engines may incorporate design features normally associated with 1987 models). If future service is required for this engine, consult GM Parts catalogs, GM Part and Accessories information bulletins, and Chevrolet dealer service bulletins for proper service parts and service procedures necessary to accommodate these revisions.
- Use new seals and gaskets. Install the supplied oil pump and transfer all necessary components including oil pan and valve covers to the replacement engine. Thoroughly clean all old parts to avoid possible contamination.
- 1990 trucks have an ESC sensor. It may be necessary to tap the oil-tube mounting hole with 1/4-18 dry-seal tap to install the sensor on the replacement engine. Use a thread sealer to prevent coolant leaks.
- On certain models with shallow oil pan, a new oil pump assembly, part number 14067529, with shorter pickup tube must be installed in place of the pump supplied with this engine.
- Attach two Goodwrench engine decals (enclosed in instructions envelope) to clean valve covers.

**CAUTION:** The oil pump in this engine must be primed before starting engine. Refer to vehicle service chassis manual for proper priming procedures. Also, check engine oil level before starting engine. Use 6 quarts of Starburst certified oil in the viscosity suitable for your climate conditions. **DAMAGE COULD RESULT IF ENGINE IS STARTED WITHOUT OIL OR IF OIL PUMP IS NOT PRIMED.**

## 12530427 427 CID New 7.0L

| | | |
|---|---|---|
| 1995 | Chevrolet, GMC | C6,7 (LR0) |
| 1995-96 | Chevrolet, GMC | P6 (LR0) MF1 |
| 1995-98 | Chevrolet, GMC | B7 (LR0) MF1, ENN |
| 1996 | Chevrolet, GMC | C6,7 (LR0) MWW, MWX (exc. ENN) |
| 1996-98 | Chevrolet, GMC | C6,7 (LR0) ME4, ME6, MF1, MT9, MWX |

**Notes:** 6-bolt Front Cover

**Replaces:** 12524680 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12532427** 427 CID New **7.0L**

| | | |
|---|---|---|
| 1986-90 | Chevrolet, GMC | C6,7 (L43) MFI, MT9 |
| 1991-98 | Chevrolet, GMC | C6,7 (LR0) ME4, ME6, JE4 |
| 1992-96 | Chevrolet, GMC | P6 (LR0) |
| 1994-96 | Chevrolet, GMC | B7 (LR0) |

**Notes:** Rocker cover may have to be swapped for some applications. See catalog for retrofit and RPO specific information.

**Replaces:** 12524683, 10181240 **Replaced By:**

## INSTALLATION INSTRUCTIONS

Part number 12532427, Goodwrench 7.0 Liter engine assembly, has been developed as a service replacement engine for 1986-1994 medium duty truck 427 C.I.D. engine applications.

***NOTICE:*** When using this engine to replace 1990 and prior applications, the following kits are required:

| Retrofit Kit # | Model | Year | Restrictions |
|---|---|---|---|
| 15637119* | C7 | 1990 | LR0 w/M.T. |
| 15637120* | C7 | 1990 | LR0 w/MF1 |
| 15637121* | C7 | 1990 | LR0 w/ME4, ME6 Trans |
| 15662931 | C7 | 1986-89 | L43 w/M.T. |
| 15662932 | C7 | 1986-89 | L43 w/MF1, MT9, IMT9 |
| 15662933 | C7 | 1986-89 | L43 w/ME4, ME6 |
| 15662932 | P6 | 1986-90 | L43 w/MF1, MT9, IMT9 |

**indicates kit includes oil cooling.*

| Oil Cooling Kit | Model | Year | Restrictions |
|---|---|---|---|
| 15662081 | C6,7 | 1986-90 | LR0, L43 w/oil cooling |
| 15662081 | P6 | 1986-90 | L43 w/KPS (exc. BQG) |
| 15662082 | P6 | 1986-90 | L43 w/KPS and BQG |

| Air Compressor Kit | Model | Year | Restrictions |
|---|---|---|---|
| 15637482 | P6 | 1986-90 | L43 |
| 15637482 | C6,7 | 1986-90 | L43 |
| 15637483 | C6,7 | 1990 | 427 LR0 VIN "H" |

***NOTICE:*** This engine comes equipped with an 8" front damper. On 1991 through 1994 trucks, you must purchase a new water pump and lower radiator hose. For 1990 and prior, you must replace the water pump with part number 12529747 to clear the 8" damper.

| Year | Water Pump | Hoses | Usage |
|---|---|---|---|
| 1991-94 | 12529192 | 15967462 | Exc. MWE |
| 1991-94 | 12529192 | 15967464 | w/MWE |
| 1986-90 | 12529747 | | |

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 12339193 454 CID Reman 7.4L

| | | |
|---|---|---|
| 1980-86 | Chevrolet, GMC | C2 CK3 (LE8)(7.4W) |
| 1987-90 | Chevrolet, GMC | R2,3 (L19)(7.4N) |
| 1987-89 | Chevrolet, GMC | RV2,3 (LE8)(7.4W) |
| 1987-88 | Chevrolet, GMC | V3 (L19)(7.4N) |
| 1988-90 | Chevrolet, GMC | CK3 G3 (L19)(7.4N) |
| 1990 | Chevrolet, GMC | C1 (L19)(7.4N) |

**Notes:** Domestic - 2 or 4 bolt main, unleaded fuel only. On all 76 models and 77-85 P3 (42) models, a new shallow oil pump, p/n 14067529, must be installed

**Replaces:** 14105965 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 12339194 454 CID Reman *Leaded Fuel Only* 7.4L

| | | |
|---|---|---|
| 1974-80 | Chevrolet, GMC | C2,3 (454S) NM8 |
| 1980-86 | Chevrolet, GMC | C2 CK3 (LE8)(454W) NM8 |
| 1987-90 | Chevrolet, GMC | R2,3 (L19)(7.4N) NM8 |
| 1987-89 | Chevrolet, GMC | RV2,3 (LE8)(454W) NM8 |
| 1988-90 | Chevrolet, GMC | CK3 G3 (L19)(7.4N) |
| 1990 | Chevrolet | C1 (L19)(7.4N) |

**Notes:** Leaded fuel only. 2-bolt or 4-bolt design. On all 76 models and 77-85 P3 (42) models, a new shallow oil pump, p/n 14067529, must be installed

### INSTALLATION INSTRUCTIONS

All 1976 through 1990 C, K G P 123 trucks originally manufactured with 454 engines with the following restrictions:

- Remanufactured engine may be 2 or 4 bolt design.
- Not recommended for high-performance use.
- 1977 through 1985 P3 (42) models have shallow oil pan. For these models, new pump part number 14067529 must be installed in place of the pump supplied with the engine.
- 1990 production engines use ESC knock sensor. Remanufactured engines must be modified for use on 1990 vehicles by tapping the dipstick tube-mounting hole to 1/4-18 dry-seal pipe thread sealer for ESC sensor assembly.

## 12353125 454 CID Reman 7.4L

| | | |
|---|---|---|
| 1982-86 | Chevrolet, GMC | C2 (LE8)(7.4L) |
| 1982-86 | Chevrolet, GMC | CK3 (LE8)(7.4L) |
| 1987-88 | Chevrolet, GMC | V3 (L19)(7.4L) |
| 1987-89 | Chevrolet, GMC | RV2,3 (LE8) |
| 1987-90 | Chevrolet, GMC | R2,3 (L19)(7.4L) |
| 1988-90 | Chevrolet, GMC | G3 (L19)(7.4L) |
| 1988-90 | Chevrolet, GMC | CK3 (L19)(7.4L) |
| 1990 | Chevrolet, GMC | C1 (L19)(7.4L) |

**Notes:** On vehicles with shallow oil pan design, a new oil pump, p/n 14067529 with shorter pick tube, must be installed (1977-83 P3 models). 4-bolt main caps, crank and rod bearings are 0.010 oversize max.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88890529** 454 CID New **7.4L**

| | | |
|---|---|---|
| 1974-86 | Chevrolet, GMC | C2,3 K3 (LE8)-454N (LF8)-454W |
| 1984-93 | Chevrolet, GMC | P3 (LE8)(LF8)(L19) KC4 |
| 1987-91 | Chevrolet, GMC | R2,3 (L19)(LE8) |
| 1987-91 | Chevrolet, GMC | V3 (L19)(LE8) |
| 1988-93 | Chevrolet, GMC | CK1,2,3 (L19) |
| 1988-93 | Chevrolet, GMC | G3 (L19)-454N |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Oil Fill Cap, Oil Pan, Oil Pump w/Screen, Oil Pump Drive Shaft, Valve Rocker Cover

**Notes:** Does not use old oil adapter. Cooler lines go to block.

**Replaces:** 12531454, 10181230 **Replaced By:**

## INSTALLATION INSTRUCTIONS

- All part number 88890529, Goodwrench 7.4 Liter engine assembly, has been developed as a service replacement engine for 1974-1993 light duty truck 454 C.I.D. engine applications.
- When using this engine to replace 1990 and prior applications, the following kits are required:

| Retrofit Kit | Model | Year | Restriction |
|---|---|---|---|
| 15637091 | C1,3 | 1988-90 | Automatic Transmission |
| 15637092 | K3 | 1988-90 | Automatic Transmission |
| 15637093 | C3 | 1988-90 | Manual Transmission |
| 15637094 | K3 | 1988-90 | Manual Transmission |
| 15637099 | G3 | 1988-90 | All (w/Oil Cooling) |
| 15637100 | P3 (32) | 1974-90 | w/A.T. |
| 15637101 | P3 (32) | 1974-90 | w/A.T. |
| 15637105 | P2,3 | 1987-90 | w/M.T. |
| 15637105 | C2,3 | 1974-86 | w/M.T. |
| 15637106 | R2,3 | 1987-90 | w/A.T. |
| 15637106 | C2,3 | 1974-86 | w/A.T. |
| 15637107 | V3 | 1987-90 | w/M.T. |
| 15637107 | K3 | 1974-86 | w/M.T. |
| 15637108 | V3 | 1987-90 | w/A.T. |
| 15637108 | K3 | 1974-86 | w/A.T. |

| Oil Cooling Kit | Model | Year | Restriction |
|---|---|---|---|
| 15637095 | CK3 | 1988-90 | KC4 &SA5, SA6 |
| 15637096 | C1 | 1990 | KC4 (Exc. SA5, SA6) |
| 15637096 | CK1 | 1988-90 | KC4 (Exc. SA5, SA6) |
| 15637102 | P3 (42) | 1987-90 | KC4 |
| 15637103 | P3 (32) | 1987-90 | KC4 & EN2 |
| 15637104 | P3 (32) | 1987-90 | KC4 &EN |
| 15637104 | P3 (32) | 1984-86 | KC4 |
| 15637109 | R2,3 | 1987-90 | KC4 |
| 15637109 | C2,3 | 1983-87 | KC4 |
| 15637109 | C2,3 | 1974-82 | KC4* |
| 15637110 | V3 | 1987-90 | KC4 |
| 15637110 | K3 | 1983-86 | KC4 |
| 15637110 | K3 | 1974-82 | KC4* |

*oil cooler part number 3053355 is required.

- This engine is built to production point of build torque specifications; loss of some torque is normal. It is not necessary to retorque any bolts.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 88890530 454 CID New 7.4L

| | | |
|---|---|---|
| 1994-95 | Chevrolet, GMC | CK2,3 (L19)(7.4N) MT1, MT8, MW3 |
| 1994-96 | Chevrolet, GMC | G3 (L19)(7.4N) MT1 |
| 1994-97 | Chevrolet, GMC | P3 (L19)(7.4N) MT1 |

***Engine-Specific Content:*** Crankshaft Balancer, Front Cover, Oil Fill Cap, Oil Pan, Oil Pump w/Screen, Oil Pump Drive Shaft, and Valve Rocker Covers

**Replaces:** 12530454, 12524681 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88890531 454 CID New 7.4L

| | | |
|---|---|---|
| 1996-2000 | Chevrolet, GMC | CK2,3, G3 (L29)(7.4J) MT1, MW3 |
| 1996-99 | Chevrolet, GMC | P3 (L29) MT1 |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, Valve Rocker Covers, and Harmonic Balancer

**Replaces:** 12534454 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88890532 454 CID New 7.4L

| | | |
|---|---|---|
| 1998-99 | Chevrolet, GMC | P3 (L21) MT9, NB6, NF2 |
| 1999-2000 | Chevrolet, GMC | C6,7 B7 (LP4)(L21) |

***Engine-Specific Content:*** Oil Pan, Oil Filter, Front Cover, Valve Rocker Covers, and Harmonic Balancer

**Replaces:** 12457454, 12456454 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 89017263 496 CID New 8.1L

| | | |
|---|---|---|
| 2001-03 | Chevrolet, GMC | CK2,3 (L18) |
| 2001-02 | Chevrolet, GMC | G3 (L18) |

**Replaces:** 12568410, 88894037, 88894283, 88894285, 89017231

**Replaced By:** 89017488, 89017594

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017265 496 CID New 8.1L

| | | |
|---|---|---|
| 2001-02 | Chevrolet, GMC | B7 (L18) |
| 2001-02 | Chevrolet, GMC | C6,7 (L18) |
| 2002-03 | Chevrolet, GMC | C6HO,7HO (L18) |
| 2003 | Chevrolet, GMC | C6,7,8 (L18) |

**Replaces:** 12568414, 88894038, 88894284, 88894286, 89017233

**Replaced By:** 89017487, 89017595

**Notes:** 2002 and previous MY, transfer harmonic balancer, valve covers, spark plug wire harness, ignition coils, and ignition coil harness.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017426 496 CID New 8.1L

| | | |
|---|---|---|
| 2003-04 | Chevrolet, GMC | C4,5 (L18) ML6, MTX, M74 |

**Replaces:** 89017264, 89017232, 88894380

**Replaced By:** 89017486

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 89017487 496 CID New 8.1L

| | | |
|---|---|---|
| 2001-02 | Chevrolet, GMC | B7 (L18) |
| 2001-02 | Chevrolet, GMC | C6,7 (L18) |
| 2002-03 | Chevrolet, GMC | C6HO,7HO (L18) |
| 2003-04 | Chevrolet, GMC | C6,7,8 (L18) |

**Replaces:** 12568414, 88894038, 88894284, 88894286, 89017233, 89017265, 89017427

**Replaced By:** 89017595

**Notes:** 2002 and previous MY, transfer harmonic balancer, valve covers, spark plug wire harness, ignition coils, and ignition coil harness.

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**89017488** 496 CID New **8.1L**

| | | |
|---|---|---|
| 2001-02 | Chevrolet, GMC | G3 (L18) |
| 2001-02 | Chevrolet, GMC | CK2,3 (L18) NM2 |
| 2001 | Chevrolet, GMC | CK2,3 (L18) NB6, NF2, NC1 |
| 2002-04 | Chevrolet, GMC | CK2,3 (L18) |
| 2003 | Chevrolet, GMC | CK2,3 (L18) MN8, M74 |
| 2003-04 | Chevrolet, GMC | C314 (L18) |

**Replaces:** 12568410, 88894037, 88894283, 88894285, 89017231, 89017263, 88894039, 89017428

**Replaced By:** 89017594

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# V8 Engine Family
# Diesel

## APPLICATION, CONTENT
## &
## INSTALLATION PROCEDURES

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**12457636** 395 CID New **6.5L**

| | | |
|---|---|---|
| 1997-98 | Chevrolet, GMC | B7 (L65) |

**Replaces:** **Replaced By:** 88894129

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**12457637** 395 CID New **6.5L**

| | | |
|---|---|---|
| 1996 | Chevrolet, GMC | G2,3 (L65)(6.5F) |

**Replaces:** **Replaced By:** 88894127

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894125** 395 CID New **6.5L**

| | | |
|---|---|---|
| 1994-96 | Chevrolet, GMC | CK1,2,3 P3 (L65) |
| 1996 | Chevrolet, GMC | P3 (L65) MF1, MT9 |

**Notes:** On models without crankshaft sensor, plug hole at lower left-hand corner with part number 10231255. For 1996 and prior with .375 THD for oil cooler hose, use connector part number 12554978

**Replaces:** 12457640 **Replaced By:**

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894126** 395 CID New **6.5L**

| | | |
|---|---|---|
| 1997-99 | Chevrolet, GMC | P3 (L65) MT1, NA7, NB6, NF2 |
| 1997-99 | Chevrolet, GMC | CK1,2,3 (L65) |
| 2000 | Chevrolet, GMC | CK2,3 (L65) |
| 2001-02 | Chevrolet, GMC | C310,314,318 (L65) |

**Replaces:** 12457641 **Replaced By:**

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

**88894128** 395 CID New **6.5L**

| | | |
|---|---|---|
| 1997-2001 | Chevrolet, GMC | G2,3 (L65) MT1 |

**Replaces:** 12457638 **Replaced By:**

**INSTALLATION INSTRUCTIONS**
No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

## 88894130 395 CID New 6.5L

| | | |
|---|---|---|
| 1982-86 | Chevrolet, GMC | CK1,2 (6.5L) |
| 1983-93 | Chevrolet, GMC | G2,3 (6.5L) |
| 1988-91 | Chevrolet, GMC | CK1,2,3 (6.5L) |
| 1992-93 | Chevrolet, GMC | CK1,2,3 (LH6)(LL4) |
| 1994-95 | Chevrolet, GMC | CK1,2, (L49)(L56) MT8, M30, MT1 |
| 1994-95 | Chevrolet, GMC | G2 (L49) M30, NA5, NA6, NB2 |
| 1994 | Chevrolet, GMC | G3 (L57) MT1, NA5, NB2 |
| 1995-96 | Chevrolet, GMC | CK1,2 G3 (L56) |
| 1997 | Chevrolet, GMC | CK1,2 (L56) MT1, NF2 |

**Notes:** On models without crankshaft sensor, plug hole at lower left-hand corner with part number 10231255. For 1996 and prior with .375 THD for oil cooler hose, use connector part number 12554978

**Replaces:** 12457643, 12456104 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88894131 395 CID New 6.5L

| | | |
|---|---|---|
| 1998 | Chevrolet, GMC | CK1,2, (L56) MT1, NF2 |

**Replaces:** 12457642 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

## 88894132 395 CID New 6.5L

| | | |
|---|---|---|
| 1999 | Chevrolet, GMC | P3 (L57) C7A, NB6 |
| 1998 | Chevrolet, GMC | P3 (L57) MW3, MT1, C7A, C7E, NB6 |

**Replaces:** 12457645 **Replaced By:**

### INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# GOODWRENCH SERVICE REPLACEMENT ENGINES

**88894133** 395 CID New **6.5L**

| | | |
|---|---|---|
| 1999 | Chevrolet, GMC | P3 (L57) C7E, C7M, C7P, C7S, NB6 |
| 1999 | Chevrolet, GMC | P3 (L57) NF2, NA6 |
| 1998 | Chevrolet, GMC | P3 (L57) MT1, MW3 |
| 1991-98 | Chevrolet, GMC | P3 (L57) |
| 1982-90 | Chevrolet, GMC | P3 (6.5L) |

***Engine-Specific Content:*** Balancer and Oil Pan

**Notes:** On models without crankshaft sensor, plug hole at lower left-hand corner with part number 10231255. For 1996 and prior with .375 THD for oil cooler hose, use connector part number 12554978

**Replaces:** 12457644 **Replaced By:**

## INSTALLATION INSTRUCTIONS

No special installation instructions are necessary. Please refer to the general installation procedure section of this book.

# PART NUMBER INDEX

| Part Number | Liter | CID | Section | Page |
|---|---|---|---|---|
| 10054502 | 2.8 | 173 | VII | 37 |
| 10067353 | 5.7 | 350 | VII | 86 |
| 12339193 | 7.4 | 454 | VII | 102 |
| 12339194 | 7.4 | 454 | VII | 102 |
| 12339196 | 7.0 | 427 | VII | 100 |
| 12339198 | 6.0 | 366 | VII | 95 |
| 12351901 | 2.5 | 151 | VII | 13 |
| 12351904 | 2.5 | 151 | VII | 14 |
| 12351905 | 2.5 | 151 | VII | 15 |
| 12351906 | 2.5 | 151 | VII | 16 |
| 12351907 | 2.5 | 151 | VII | 17 |
| 12351909 | 2.5 | 151 | VII | 18 |
| 12351910 | 2.5 | 151 | VII | 19 |
| 12351911 | 2.5 | 151 | VII | 20 |
| 12351912 | 2.5 | 151 | VII | 21 |
| 12351913 | 2.5 | 151 | VII | 22 |
| 12351914 | 2.5 | 151 | VII | 23 |
| 12351915 | 2.5 | 151 | VII | 24 |
| 12351917 | 2.5 | 151 | VII | 25 |
| 12351918 | 2.5 | 151 | VII | 26 |
| 12351919 | 2.5 | 151 | VII | 27 |
| 12351920 | 2.5 | 151 | VII | 28 |
| 12351921 | 2.5 | 151 | VII | 29 |
| 12351923 | 2.5 | 151 | VII | 30 |
| 12351924 | 2.5 | 151 | VII | 31 |
| 12353125 | 7.4 | 454 | VII | 102 |
| 12356519 | 3.3 | 204 | VII | 43 |
| 12356520 | 3.3 | 204 | VII | 43 |
| 12356521 | 3.3 | 204 | VII | 43 |
| 12356522 | 3.3 | 204 | VII | 44 |
| 12356523 | 3.3 | 204 | VII | 44 |
| 12360021 | 3.8 | 231 | VII | 50 |
| 12360022 | 3.8 | 231 | VII | 50 |
| 12360023 | 3.8 | 231 | VII | 51 |
| 12360467 | 2.4 | 146 | VII | 12 |
| 12360619 | 2.3 | 138 | VII | 6 |
| 12360620 | 2.3 | 138 | VII | 6 |
| 12360623 | 2.3 | 138 | VII | 7 |
| 12360624 | 2.3 | 138 | VII | 7 |
| 12360625 | 2.3 | 138 | VII | 8 |
| 12360626 | 2.3 | 138 | VII | 8 |
| 12360627 | 2.3 | 138 | VII | 9 |
| 12360686 | 3.8 | 231 | VII | 51 |
| 12360687 | 3.8 | 231 | VII | 51 |
| 12361241 | 4.3 | 262 | VII | 59 |
| 12361243 | 4.3 | 262 | VII | 60 |
| 12361247 | 4.3 | 262 | VII | 61 |
| 12361248 | 4.3 | 262 | VII | 61 |
| 12361249 | 4.3 | 262 | VII | 62 |

# PART NUMBER INDEX

| Part Number | Liter | CID | Section | Page |
|---|---|---|---|---|
| 12361251 | 4.3 | 262 | VII | 62 |
| 12361252 | 4.3 | 262 | VII | 63 |
| 12361253 | 4.3 | 262 | VII | 63 |
| 12361504 | 2.3 | 138 | VII | 9 |
| 12362213 | 3.8 | 231 | VII | 52 |
| 12362214 | 3.8 | 231 | VII | 52 |
| 12362215 | 3.8 | 231 | VII | 53 |
| 12362216 | 3.8 | 231 | VII | 53 |
| 12362217 | 3.8 | 231 | VII | 54 |
| 12362218 | 3.8 | 231 | VII | 54 |
| 12362219 | 3.8 | 231 | VII | 54 |
| 12362220 | 3.8 | 231 | VII | 55 |
| 12362221 | 3.8 | 231 | VII | 55 |
| 12363193 | 2.2 | 133 | VII | 2 |
| 12363194 | 2.2 | 133 | VII | 2 |
| 12363195 | 2.2 | 133 | VII | 2 |
| 12363728 | 4.3 | 262 | VII | 64 |
| 12363729 | 4.3 | 262 | VII | 64 |
| 12363730 | 4.3 | 262 | VII | 65 |
| 12366016 | 4.3 | 262 | VII | 65 |
| 12366017 | 4.3 | 262 | VII | 66 |
| 12369214 | 4.3 | 262 | VII | 66 |
| 12369568 | 4.6 | 280 | VII | 79 |
| 12371987 | 3.1 | 191 | VII | 39 |
| 12455109 | 5.7 | 350 | VII | 86 |
| 12457636 | 6.5 | 395 | VII | 108 |
| 12457637 | 6.5 | 395 | VII | 108 |
| 12457660 | 5.7 | 350 | VII | 87 |
| 12457703 | 4.8 | 292 | VII | 82 |
| 12457704 | 4.8 | 292 | VII | 82 |
| 12457705 | 5.3 | 323 | VII | 85 |
| 12457706 | 6.0 | 366 | VII | 95 |
| 12458123 | 3.5 | 214 | VII | 48 |
| 12458124 | 3.5 | 214 | VII | 48 |
| 12462258 | 2.4 | 146 | VII | 12 |
| 12465229 | 6.0 | 366 | VII | 96 |
| 12465411 | 2.2 | 133 | VII | 3 |
| 12465434 | 2.2 | 133 | VII | 3 |
| 12465435 | 2.2 | 133 | VII | 3 |
| 12465447 | 2.2 | 133 | VII | 3 |
| 12465498 | 2.4 | 146 | VII | 12 |
| 12480240 | 3.1 | 191 | VII | 39 |
| 12480242 | 3.1 | 191 | VII | 39 |
| 12481315 | 3.8 | 231 | VII | 56 |
| 12482057 | 3.8 | 231 | VII | 56 |
| 12507648 | 2.8 | 173 | VII | 37 |
| 12513151 | 5.7 | 350 | VII | 87 |
| 12513152 | 3.1 | 191 | VII | 39 |
| 12513153 | 3.1 | 191 | VII | 40 |

# PART NUMBER INDEX

| Part Number | Liter | CID | Section | Page |
|---|---|---|---|---|
| 12515469 | 4.3 | 262 | VII | 67 |
| 12518296 | 5.0 | 305 | VII | 83 |
| 12518298 | 5.0 | 305 | VII | 83 |
| 12520270 | 5.7 | 350 | VII | 88 |
| 12522927 | 3.1 | 191 | VII | 40 |
| 12522928 | 3.1 | 191 | VII | 41 |
| 12523277 | 2.8 | 173 | VII | 38 |
| 12523279 | 2.8 | 173 | VII | 38 |
| 12530282 | 5.7 | 350 | VII | 88 |
| 12530283 | 5.7 | 350 | VII | 88 |
| 12530284 | 5.0 | 305 | VII | 84 |
| 12530427 | 7.0 | 427 | VII | 100 |
| 12532427 | 7.0 | 427 | VII | 101 |
| 12534776 | 5.7 | 350 | VII | 89 |
| 12537812 | 3.4 | 207 | VII | 45 |
| 12539087 | 3.1 | 191 | VII | 41 |
| 12567312 | 4.0 | 244 | VII | 77 |
| 12567313 | 4.6 | 280 | VII | 79 |
| 12567314 | 4.6 | 280 | VII | 79 |
| 12567316 | 4.6 | 280 | VII | 80 |
| 12568758 | 5.7 | 350 | VII | 89 |
| 12568759 | 5.7 | 350 | VII | 89 |
| 12569010 | 5.7 | 350 | VII | 89 |
| 12569068 | 5.7 | 350 | VII | 90 |
| 12585215 | 2.8 | 173 | VII | 33 |
| 12585341 | 3.5 | 214 | VII | 35 |
| 12585342 | 3.5 | 214 | VII | 35 |
| 12593224 | 2.2 | 133 | VII | 4 |
| 12593292 | 2.2 | 133 | VII | 4 |
| 12593699 | 3.6 | 214 | VII | 49 |
| 12593700 | 3.6 | 214 | VII | 49 |
| 12595157 | 3.6 | 214 | VII | 49 |
| 22538277 | 5.0 | 305 | VII | 84 |
| 24571996 | 2.3 | 138 | VII | 10 |
| 24573746 | 2.3 | 138 | VII | 10 |
| 24575362 | 2.3 | 138 | VII | 11 |
| 88890529 | 7.4 | 454 | VII | 103 |
| 88890530 | 7.4 | 454 | VII | 104 |
| 88890531 | 7.4 | 454 | VII | 104 |
| 88890532 | 7.4 | 454 | VII | 104 |
| 88890535 | 6.0 | 366 | VII | 97 |
| 88893272 | 4.3 | 262 | VII | 68 |
| 88893274 | 4.3 | 262 | VII | 69 |
| 88893275 | 4.3 | 262 | VII | 70 |
| 88893276 | 4.3 | 262 | VII | 70 |
| 88893286 | 5.7 | 350 | VII | 90 |
| 88893287 | 5.7 | 350 | VII | 90 |
| 88893289 | 4.8 | 292 | VII | 82 |
| 88893290 | 4.8 | 292 | VII | 82 |

# PART NUMBER INDEX

| Part Number | Liter | CID | Section | Page |
|---|---|---|---|---|
| 88893291 | 5.3 | 323 | VII | 85 |
| 88894033 | 3.4 | 207 | VII | 45 |
| 88894034 | 3.4 | 207 | VII | 45 |
| 88894086 | 5.7 | 350 | VII | 90 |
| 88894110 | 3.1 | 191 | VII | 41 |
| 88894112 | 3.1 | 191 | VII | 42 |
| 88894118 | 4.3 | 262 | VII | 71 |
| 88894125 | 6.5 | 395 | VII | 108 |
| 88894126 | 6.5 | 395 | VII | 108 |
| 88894128 | 6.5 | 395 | VII | 108 |
| 88894130 | 6.5 | 395 | VII | 109 |
| 88894131 | 6.5 | 395 | VII | 109 |
| 88894132 | 6.5 | 395 | VII | 109 |
| 88894133 | 6.5 | 395 | VII | 109 |
| 88894187 | 2.2 | 134 | VII | 4 |
| 88894189 | 2.2 | 134 | VII | 4 |
| 88894191 | 4.3 | 262 | VII | 78 |
| 88894192 | 4.3 | 262 | VII | 78 |
| 88894193 | 5.7 | 350 | VII | 90 |
| 88894194 | 5.7 | 350 | VII | 91 |
| 88894195 | 5.7 | 350 | VII | 91 |
| 88894196 | 5.7 | 350 | VII | 92 |
| 88894197 | 5.7 | 350 | VII | 92 |
| 88894238 | 4.0 | 244 | VII | 77 |
| 88894239 | 4.6 | 280 | VII | 80 |
| 88894240 | 4.6 | 280 | VII | 80 |
| 88894249 | 4.6 | 280 | VII | 80 |
| 88894250 | 4.6 | 280 | VII | 80 |
| 88894384 | 5.7 | 350 | VII | 93 |
| 88984238 | 4.2 | 256 | VII | 75 |
| 88984244 | 2.2 | 134 | VII | 5 |
| 88984251 | 3.4 | 207 | VII | 46 |
| 88984253 | 4.6 | 280 | VII | 81 |
| 88984254 | 4.6 | 280 | VII | 81 |
| 88984255 | 4.0 | 244 | VII | 77 |
| 88984287 | 3.4 | 207 | VII | 46 |
| 88984288 | 3.4 | 207 | VII | 46 |
| 89017263 | 8.1 | 496 | VII | 105 |
| 89017265 | 8.1 | 496 | VII | 105 |
| 89017321 | 4.3 | 262 | VII | 71 |
| 89017323 | 4.3 | 262 | VII | 72 |
| 89017324 | 4.3 | 262 | VII | 72 |
| 89017325 | 4.3 | 262 | VII | 72 |
| 89017331 | 4.3 | 262 | VII | 73 |
| 89017349 | 5.7 | 350 | VII | 93 |
| 89017352 | 5.7 | 350 | VII | 93 |
| 89017353 | 4.8 | 292 | VII | 82 |
| 89017354 | 5.3 | 323 | VII | 85 |
| 89017355 | 5.3 | 323 | VII | 85 |

# PART NUMBER INDEX

| Part Number | Liter | CID | Section | Page |
|---|---|---|---|---|
| 89017356 | 6.0 | 366 | VII | 98 |
| 89017357 | 6.0 | 366 | VII | 98 |
| 89017358 | 6.0 | 366 | VII | 98 |
| 89017359 | 6.0 | 366 | VII | 98 |
| 89017411 | 4.6 | 280 | VII | 81 |
| 89017416 | 3.8 | 231 | VII | 57 |
| 89017426 | 8.1 | 496 | VII | 105 |
| 89017444 | 3.4 | 207 | VII | 46 |
| 89017445 | 3.4 | 207 | VII | 47 |
| 89017446 | 4.6 | 280 | VII | 81 |
| 89017447 | 4.6 | 280 | VII | 81 |
| 89017454 | 3.1 | 191 | VII | 42 |
| 89017487 | 8.1 | 496 | VII | 105 |
| 89017488 | 8.1 | 496 | VII | 106 |
| 89017548 | 5.7 | 350 | VII | 93 |
| 89017653 | 5.7 | 350 | VII | 94 |
| 89017654 | 6.0 | 366 | VII | 99 |
| 89017667 | 3.8 | 231 | VII | 57 |
| 89017669 | 3.8 | 231 | VII | 58 |
| 89017670 | 3.8 | 231 | VII | 58 |
| 89037576 | 3.1 | 191 | VII | 42 |
| 89038378 | 3.1 | 191 | VII | 42 |
| 89038381 | 3.4 | 207 | VII | 47 |
| 89038382 | 3.4 | 207 | VII | 47 |
| 89038385 | 3.4 | 207 | VII | 47 |

# COMMENTS & FEEDBACK

**We welcome your comments and feedback about this guide.**
**Please complete this form and fax to the number below.**

**Date:** _____ **From:** _____

**To:** **Goodwrench Engines** **Dealer:** _____

**Fax:** **(810) 606-3250** **Phone:** _____

**Re:** **2004 Goodwrench Engine Reference Guide**

**Comments / Feedback:**

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

☐ **Please contact me.**