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MANUAL PREVIEW

New Idea Service Manual

No. 702
Power Unit

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Service Manual

NI-S-702PU

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No. 702 Uni-System Power Unit — GMC V6 Engine

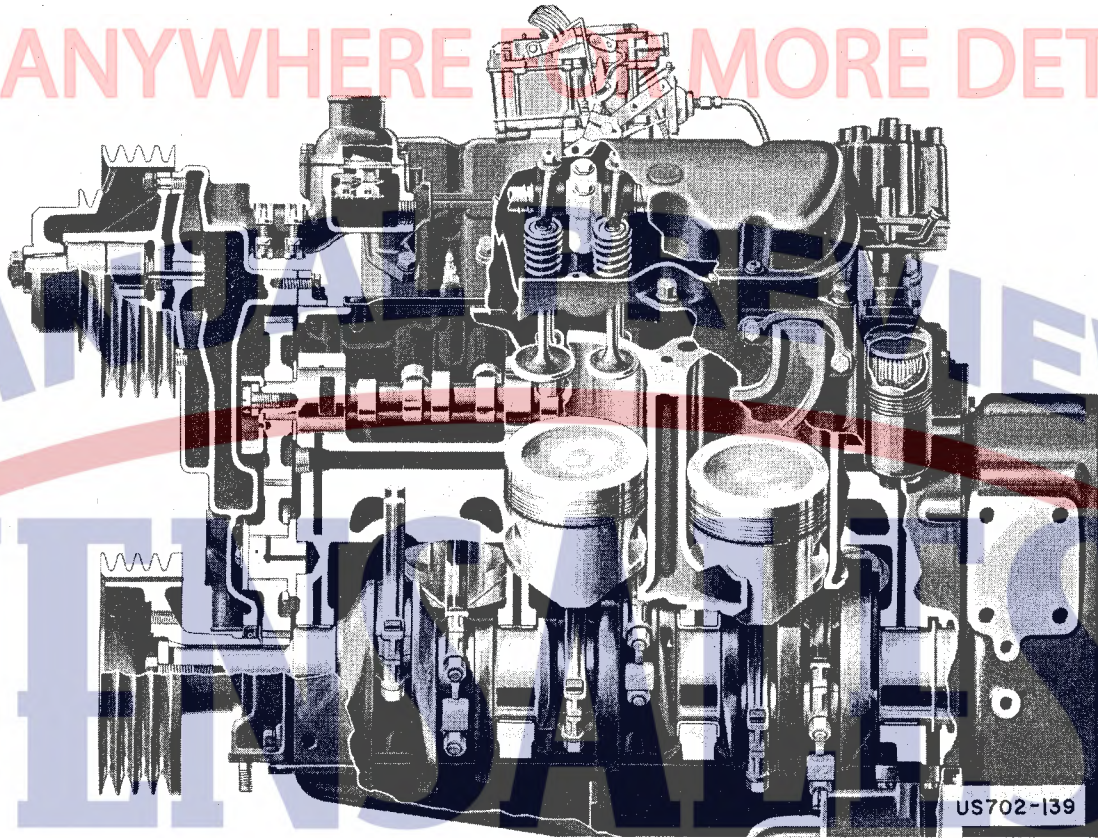


Figure 1 - Longitudinal Break-Away View of V6 Engine

Introduction

Covered in this section of the manual are overhaul procedures for the GMC 401 cu. in. V6 engine used in New Idea Uni-System No. 702 Power Units. The procedures are presented in logical sequence showing those engine components which can be overhauled with the engine remaining in the Power Unit chassis, those for which engine removal is necessary and explaining required accessory removal.

The terms "front" and "rear" as used herein will refer to the position of the engine as mounted in a conventional vehicle; i.e., the front end is toward the cooling fan and the rear end is the flywheel end. The terms "right, (R.H.)" and "left, (L.H.)" are applied to the engine as viewed from the flywheel end.

General Information

The engine is a 60-degree V-type with overhead valve type cylinder heads. Valves are actuated by solid lifters.

Cylinder numbers are cast onto the intake manifold and are numbered front to rear with odd numbers at the L.H. bank and even numbers at R.H. bank.

The camshaft is chain driven on engines used in

Power Unit Lot Numbers US 46 and later and is gear driven on all earlier lots.

The engine oil filter is full-flow type with a replaceable element and has a capacity of 2 quarts.

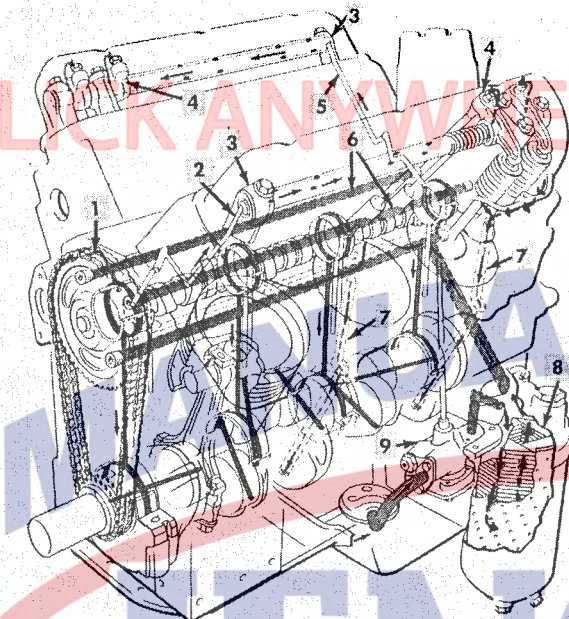
Lubrication of engine parts is provided by a rotor type pump supplying oil through galleries and passages as schematically shown in Figs. 2 and 3.

Pre-Overhaul Diagnosis

Prior to beginning any engine overhaul operation, carefully diagnose the trouble to determine accurately the cause and exact location of the malfunction. Do not assume that overhaul of internal engine components is necessary until a careful check of external components (fuel system, ignition system, air induction system, engine-driven accessories, etc) clearly indicates internal overhaul is required.

Careful use of engine test equipment, i.e., vacuum gauge, ignition tester, compression tester, exhaust analyzer, etc., will be helpful in diagnosing the exact cause and location of engine trouble, external or internal. Correct external problems first then make final tests to determine if internal overhaul is needed.

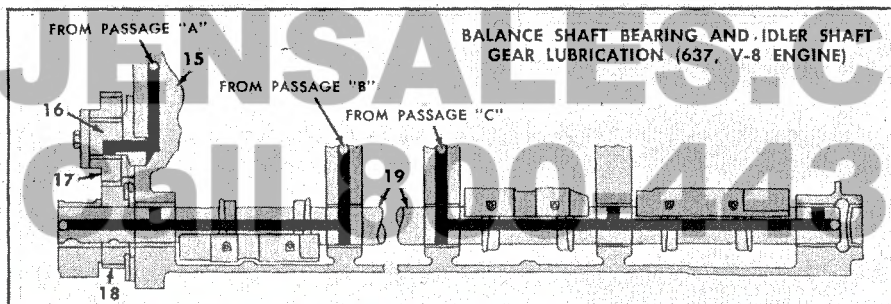
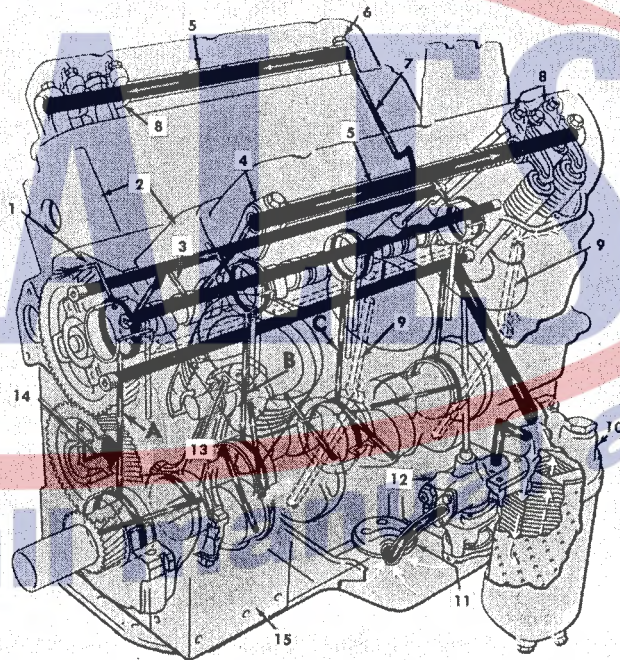
Accurate pre-overhaul diagnosis will save valuable time and money for the dealership and the customer.



- | | |
|-----------------------------------|----------------------------------|
| 1 To Timing Chain and Sprocket | 5 Oil From Camshaft Rear Bearing |
| 2 Oil From Camshaft Front Bearing | 6 Oil Galleries |
| 3 Rocker Arm Shaft Bracket | 7 Oil Drain-Back Holes |
| 4 Rocker Arms | 8 Oil Filter |
| | 9 Engine Oil Pump |

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Figure 2- Engine Lubrication Schematic Diagram for Chain-Driven Camshaft Models



- | | | |
|-----------------------------------|----------------------------------|-----------------------------------|
| 1 To Timing Gears | 6 Rocker Arm Shaft Rear Bracket | 12 Oil Pump |
| 2 Cylinder Heads | 7 Oil From Camshaft Rear Bearing | 13 Piston Pin Splash Lubricated |
| 3 Oil From Camshaft Front Bearing | 8 Rocker Arms | 14 Timing Idler Gear Shaft |
| 4 Rocker Arm Shaft Front Bracket | 9 Oil Drain Back Holes | 15 Cylinder Block |
| 5 Rocker Arm Shafts | 10 Oil Filter | 16 Balance Shaft Idler Gear Shaft |
| | 11 Oil Pump Inlet Screen | 17 Balance Shaft Idler Gear |
| | | 18 Balance Shaft Gear |
| | | 19 Balance Shaft |

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Figure 3- Engine Lubrication Schematic Diagram for Engines with Gear Driven Camshaft

ENGINE OVERHAUL PROCEDURES (Cont'd)

Top Engine Overhaul Procedures

The engine need not be removed from the Power Unit chassis for overhaul of manifolds, valve operating mechanism and/or cylinder head assemblies.

The following procedures are recommended if cylinder head assemblies are to be removed from the cylinder block for repair of cylinder head components.

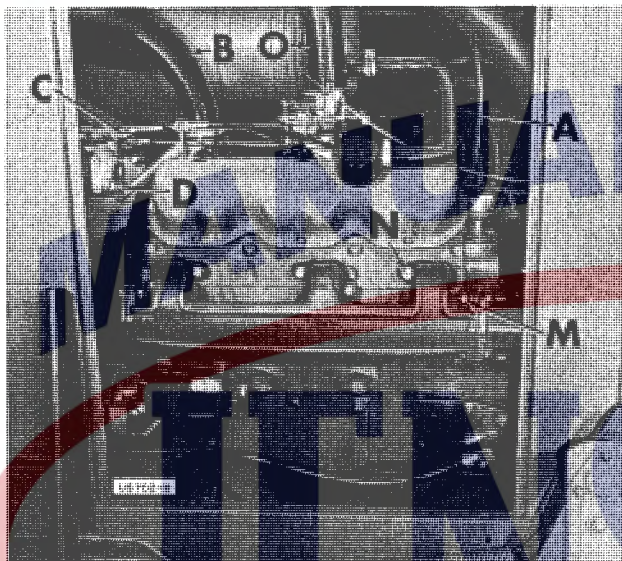


Fig. 4

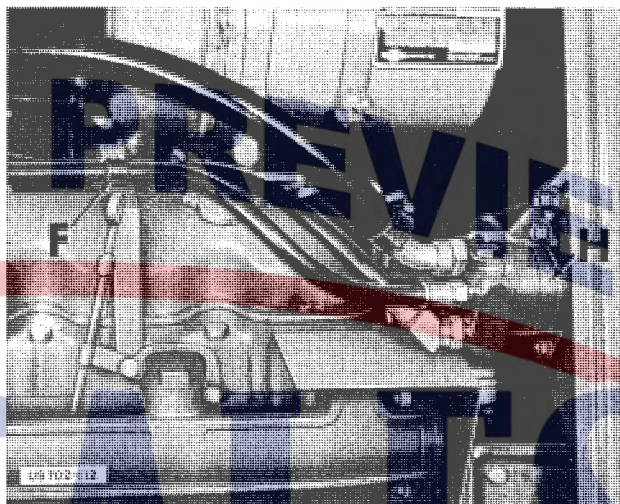


Fig. 5

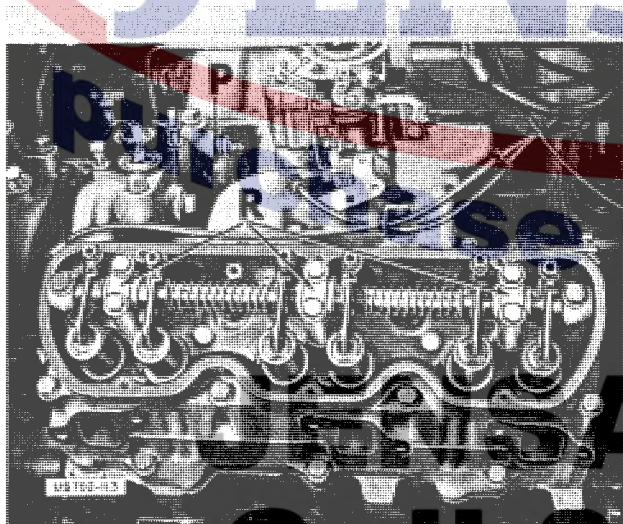


Fig. 6

Accessory Removal and Engine Preparation

1. Remove the doors from the top deck of the Power Unit.
2. Detach the battery ground cable from the L.H. cylinder head "A", Fig. 4; and also positive cable from battery.

3. Drain coolant from radiator and cylinder block (drain block at both sides).
4. Detach upper radiator hose from water manifold "B", Fig. 4.
5. Remove the dry air cleaner assembly "O", Fig. 4 by detaching the air intake tube from the top of the carburetor then removing the four bolts which attach the air cleaner mounting bands to the brackets. Detach the precleaner hose and remove the assembly through the top door.
6. Detach governor-to-throttle control rod at both ends and remove "C", Fig. 4.
7. Detach throttle cable from governor arm and from governor bracket "C", Fig. 4.
8. Loosen the governor drive belt and remove the governor mounting bracket "D", Fig. 4. The governor may remain with the bracket.
9. Remove the hydraulic pump bracket with pump attached as follows: "H", Fig. 5.

- a. Detach the hydraulic pump belt tensioning bar from the bracket and remove the belts from the hydraulic pump pulley.
- b. Detach the hydraulic hoses from the support bracket above the valve rocker arm cover. "F", Fig. 5.

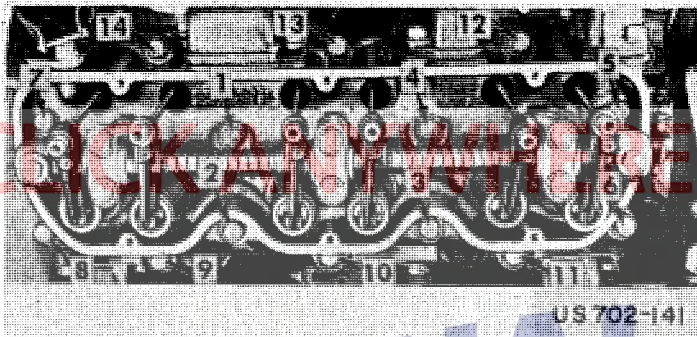


Figure 7 - Cylinder Head Bolt Tightening Sequence

Inspection Of Manifolds, Cylinder Heads, Valve Operating Mechanism and Cylinder Block

Manifold Inspection

1. Make visual inspection of intake and exhaust manifolds for cracks, and for broken flanges.
2. Use straightedge and feeler gauge in manner typically illustrated in Fig. 8 to check alignment of flange surfaces. If misalignment is slight, a surface grinder may be used to face off surface to same plane.
3. Inspect intake manifolds (Fig. 9). Inspect for carbon deposits in exhaust passages which supply heat to the carburetor area.

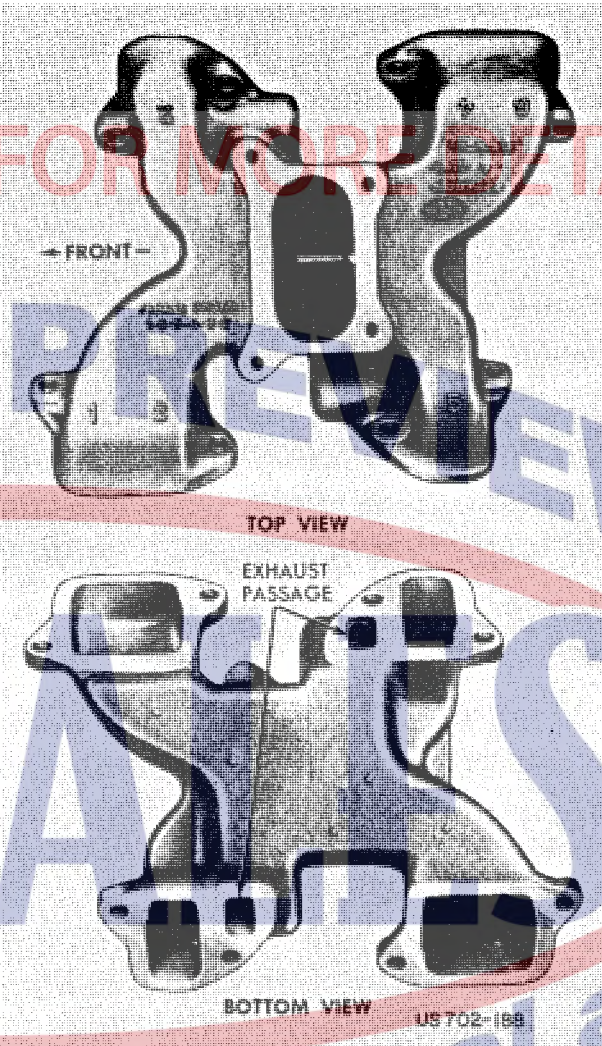


Figure 9 - Intake Manifold

valve heads using care not to damage machined surfaces.

3. Observe valve heads for uniform appearance of surfaces. If areas have a burnt appearance, the adjacent seat may be burned, indicating possible failure of rotator. Deposits in valve ports may indicate worn valve guides or defective seals on intake valves.
4. Check for clogged oil passage and oil drain-back passages. Check water passages for scale deposits.

NOTE: Valves, springs and attaching parts require further inspection if cylinder head components are disassembled for grinding valves and seats.

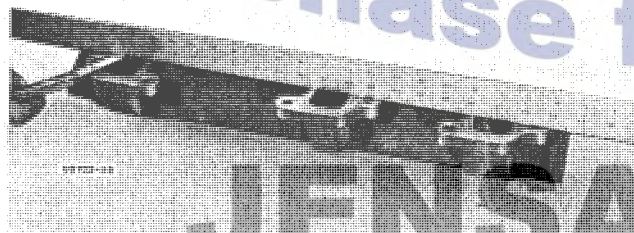


Figure 8 - Checking Manifold for Warpage with Straightedge and Feeler Gauge

Cylinder Head Assembly Inspection

(Before Disassembly)

1. Use solvent and stiff brush to clean exterior surfaces of cylinder head.
2. Use rotary motorized wire brush to remove carbon deposits from combustion areas and