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Product: TRUCK ENGINE
Model: C15 TRUCK ENGINE MXS12321
Configuration: C15 On-Highway Truck MXS00001-UP

Disassembly and Assembly C15 On-highway Engines

Media Number -REN9403-13

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Gear Group (Front) - Install

SMCS - 1206-012

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-0510	Driver Gp	1
B	8T-2998	Lubricant	-
C	-	Loctite 5900	-
D	-	Loctite 243	-

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Do not turn the crankshaft or the camshaft while the camshaft gear is removed. If the front gear group is not correctly timed during installation, interference can occur between the pistons and the valves, resulting in damage to the engine.

1. Thoroughly clean the gasket material from the cylinder block and both sides of the plate.
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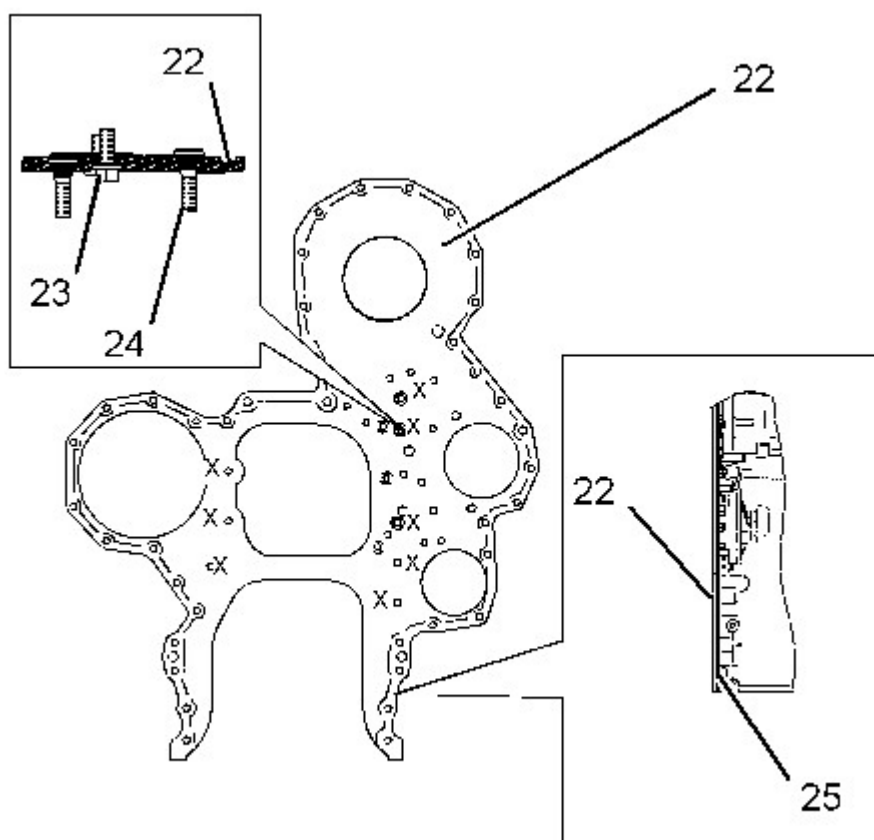


Illustration 1

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2. If studs (24) are loose or the threads are damaged, install new studs (24) in the front plate. Apply Tooling (D) to the serrations of studs (24). Install studs (24) in the front plate.
3. Install integral seal (25) on the dowel pins on the cylinder block.

Note: Apply Tooling (C) to the bottom of integral seal (25) in order to fill the space at the cylinder block, the front housing, and the engine oil pan.

4. Install plate (22) on the dowel pins on the cylinder block. Install new locking bolts (23) (Marked "X") in order to fasten the front plate to the cylinder block. Tighten locking bolts (23) to a torque of 55 N·m (41 lb ft).

Note: Clean the old sealant from the bolts and apply Tooling (D) to the bolts.

5. Tighten locking bolts (23) again to a torque of 55 N·m (41 lb ft).

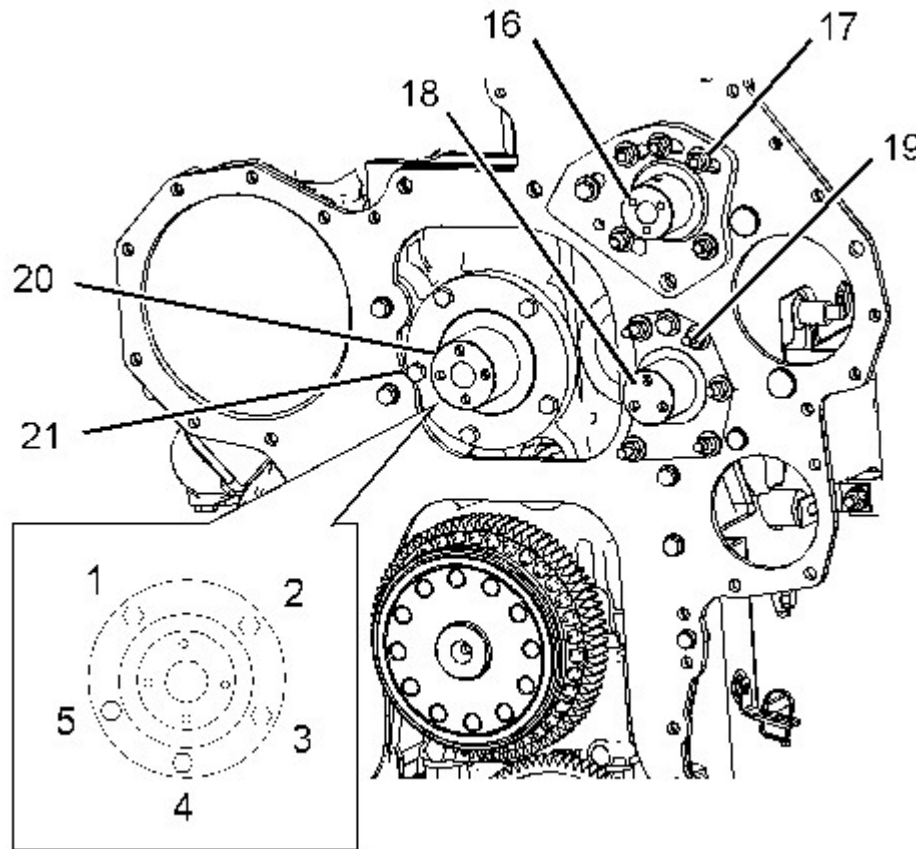


Illustration 2

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6. Install stub shaft (18). Apply Tooling (D) to the studs and the bolt for stub shaft (18). Tighten nuts (19) and the bolt to a torque of 55 ± 10 N·m (41 ± 7 lb ft).
7. Install stub shaft assembly (16). Apply Tooling (D) to the studs and the bolt for stub shaft assembly (16). Do not tighten nuts (17) and the bolt for stub shaft assembly (16) at this time. Nuts (17) and the bolt for stub shaft assembly (16) will need to be tightened when the backlash is adjusted.
8. Adjust the backlash between the camshaft gear and the adjustable idler gear assembly. The backlash should be 0.3556 ± 0.254 mm (0.014 ± 0.010 inch). Refer to Testing and Adjusting, "Gear Group (Front) - Time" for the backlash adjustment procedure. Tighten nuts (17) and the bolt to a torque of 55 ± 10 N·m (41 ± 7 lb ft).

9. Install stub shaft (20). Apply Tooling (D) to bolts (21). Install bolts (21) and tighten in a numeric sequence 1, 3, 4, 5, 2, 1, 2, 3, 4, 5, 1 to a torque of $55 \pm 10 \text{ N}\cdot\text{m}$ ($41 \pm 7 \text{ lb ft}$).
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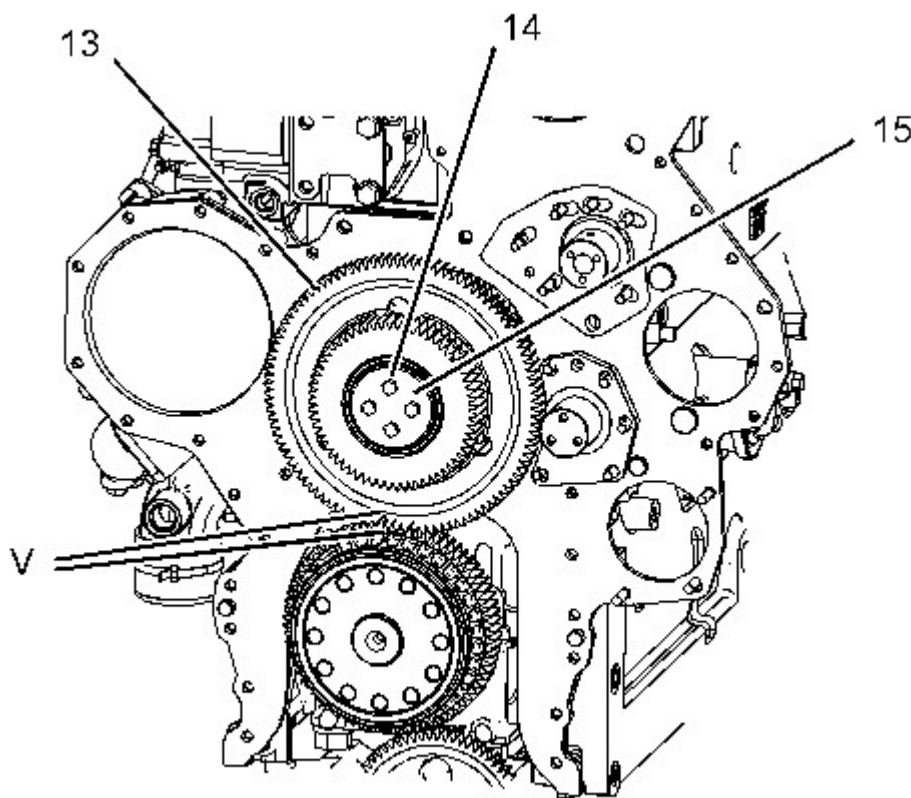


Illustration 3

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10. Use Tooling (A) to install the sleeve bearing in cluster gear assembly (13).
 11. Put cluster gear assembly (13) on the stub shaft. Ensure that Timing Marks (V) are aligned on the cluster gear assembly and the crankshaft gear.
 12. Position plate (15) with the oil groove toward the face of the gear. Apply Tooling (D) to bolts (14). Install bolts (14). Tighten bolts (14) to a torque of $30 \pm 7 \text{ N}\cdot\text{m}$ ($22 \pm 5 \text{ lb ft}$).
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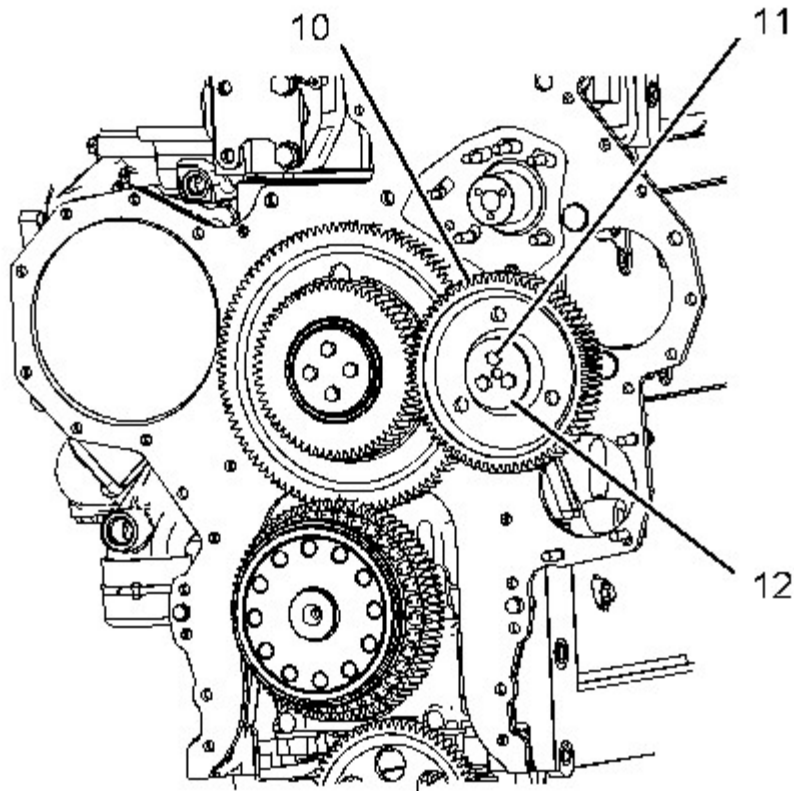


Illustration 4

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13. Use Tooling (A) to install the sleeve in idler gear assembly (10).
14. Put idler gear assembly (10) on the stub shaft. Install plate (12) with the oil groove toward the gear face. Apply Tooling (D) to bolts (11). Install bolts (11). Tighten bolts (11) to a torque of $30 \pm 7 \text{ N}\cdot\text{m}$ ($22 \pm 5 \text{ lb ft}$).

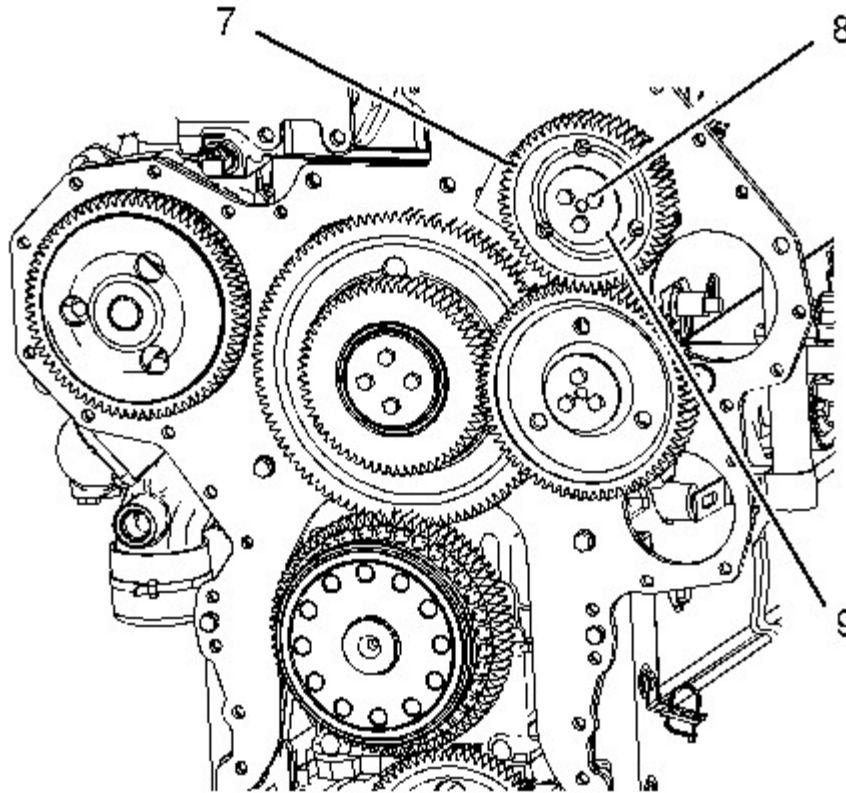


Illustration 5

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15. Use Tooling (A) to install the sleeve bearing in adjustable idler gear assembly (7).

Note: Align the oil hole in the bearing with the oil hole in the adjustable idler gear assembly.

16. Put adjustable idler gear assembly (7) on the stub shaft assembly. Position plate (9) with the oil groove toward the face of the gear. Apply Tooling (D) to bolts (8). Install bolts (8). Tighten bolts (8) to a torque of 30 ± 7 N·m (22 ± 5 lb ft).

Note: Check the backlash for the camshaft gear and the adjustable idler gear assembly. The camshaft gear must be installed and the adjustable idler gear assembly must be removed in order to perform the backlash adjustment procedure. Refer to Testing and Adjusting, "Gear Group (Front) - Time".

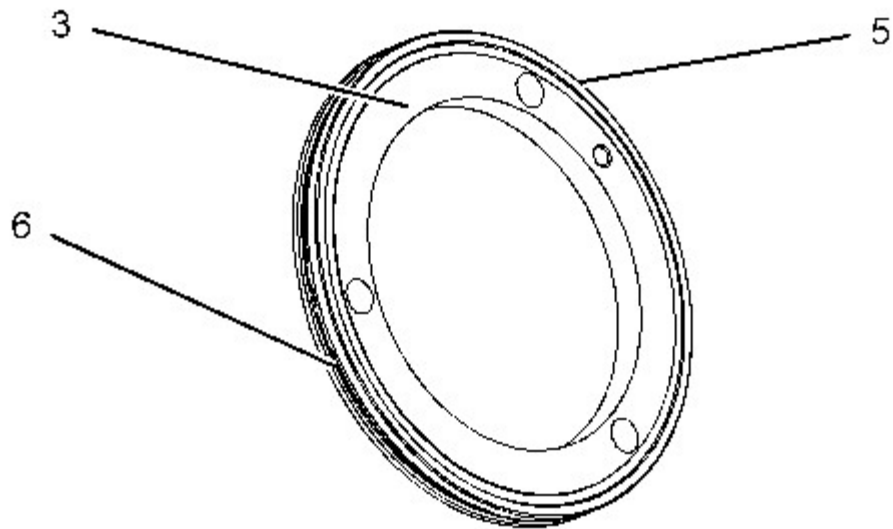


Illustration 6

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17. Install O-ring seal (5) and O-ring seal (6) in sealing plate (3). Lubricate O-ring seal (6) with a 50/50 mixture of Tooling (B) and clean engine oil.

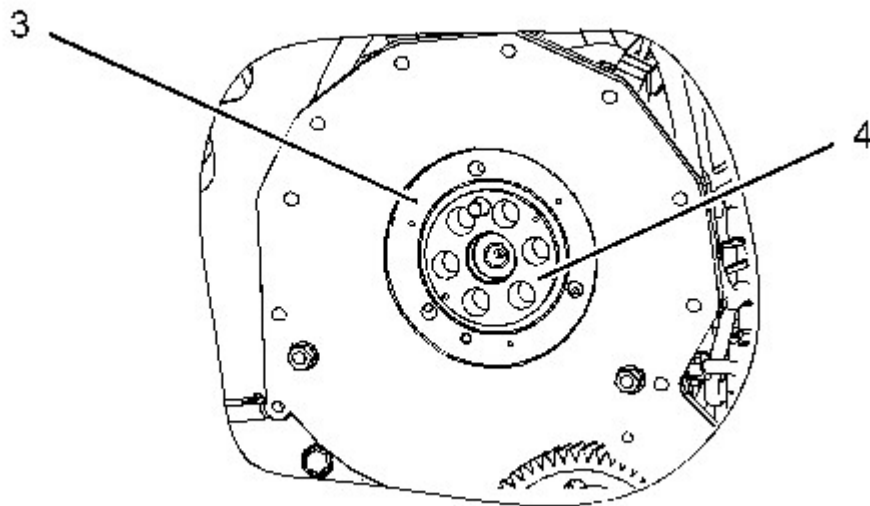


Illustration 7

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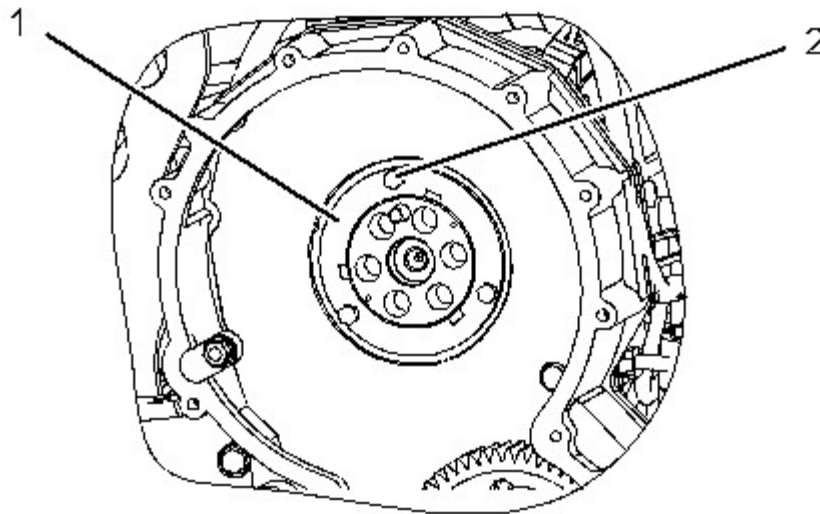


Illustration 8

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18. Install adapter (4). Ensure that the dowel in the adapter engages the hole in the camshaft.
19. Install sealing plate (3) and thrust plate (1). Ensure that the dowel in the adapter engages the hole in the thrust plate. Apply Tooling (D) to bolts (2). Install bolts (2). Evenly tighten bolts (2) in order to ensure that sealing plate (3) and O-ring seal (5) are seated against the cylinder head.
20. Adjust the backlash for the camshaft gear and the adjustable idler gear, if necessary. Refer to Testing and Adjusting, "Gear Group (Front) - Time".

Note: The camshaft gear must be installed and the adjustable idler gear must be removed in order to perform the backlash adjustment procedure.

End By:

- a. Install the fuel transfer pump, if necessary. Refer to Disassembly and Assembly, "Fuel Transfer Pump - Install".
- b. Install the auxiliary water pump, if necessary. Refer to Disassembly and Assembly, "Auxiliary Water Pump - Install".
- c. Install the water pump, if necessary. Refer to Disassembly and Assembly, "Water Pump - Install".
- d. Install the air compressor, if necessary. Refer to Disassembly and Assembly, "Air Compressor - Remove and Install".
- e. Install the front housing. Refer to Disassembly and Assembly, "Housing (Front) - Install".

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