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Testing and Adjusting

3054 and 3056 Industrial and Generator Set Engines

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Finding Top Center Position for No. 1 Piston

SMCS - 1105-531

Set The Top Center Compression Position By Reverse Pin Timing For No. 1 Piston

Table 1

Required Tools		
Part Number	Part Description	Qty
150-3992	Timing Pin (Bosch)	1
150-3993	Timing Pin (Stanadyne and Delphi)	1

The timing position that was set at the factory is used to set the engine at the top center on the No. 1 cylinder of the compression stroke before the fuel injection pump is removed.

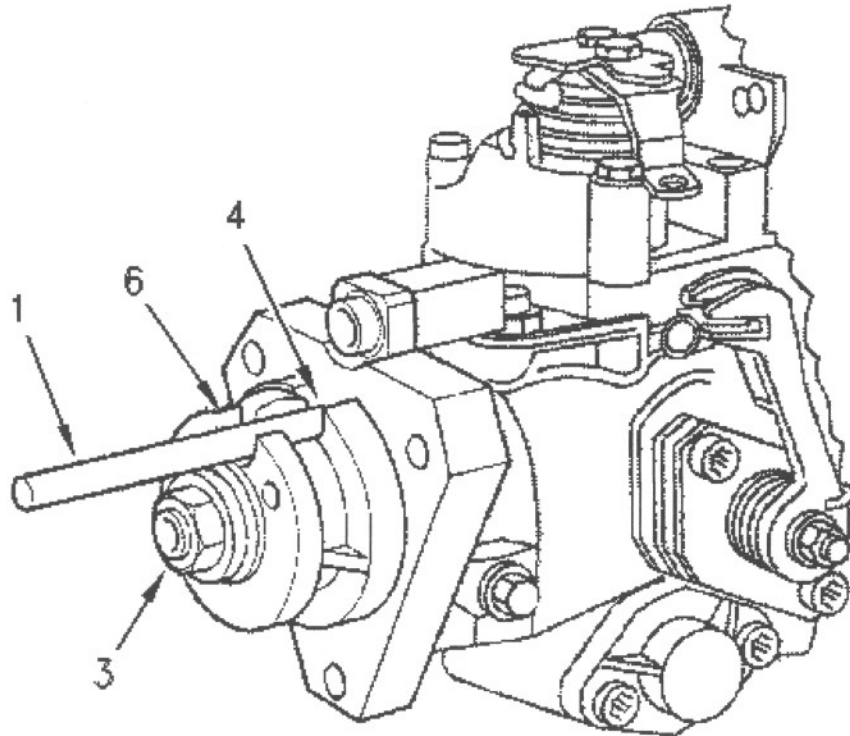


Illustration 1
Fuel injection pump with timing pin (typical example)

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- (1) Timing pin
 - (3) Hub nut
 - (4) Hole in the pump body
 - (6) Slot in the hub
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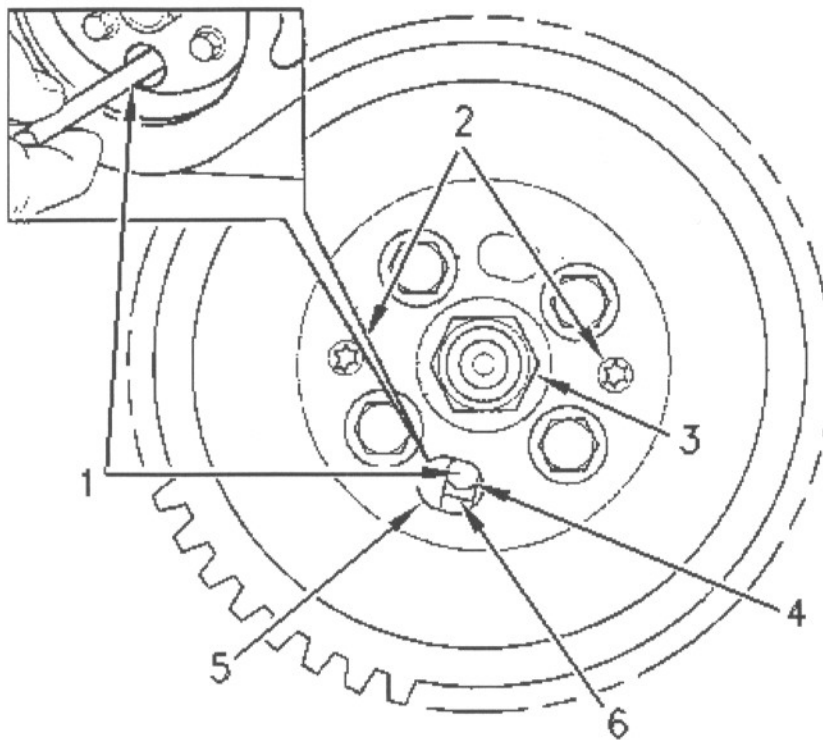


Illustration 2

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Timing gear and hub of the fuel injection pump (Stanadyne)

- (1) Timing pin
- (2) Torx screws
- (3) Hub nut
- (4) Hole in the pump body
- (5) Slot for the timing gear
- (6) Slot in the hub

Note: Do not remove hub nut (3) from the shaft of the fuel injection pump. The hub of the fuel pump is installed on the shaft of the pump in the factory in order to ensure that the fuel pump is in the correct position for timing. If the hub is removed, the hub will need to be accurately installed to the shaft of the pump by the use of special equipment at a Caterpillar Dealer.

Note: Do not release torx screws (2). If the torx screws are released and the timing plate is moved, the timing position that is set at the factory will be lost. If the torx screws are released, the engine must be set to top center of the No. 1 cylinder on the compression stroke before the torx screws are tightened.

1. Remove the fuel injection nozzles, the water pump, and the cover for the gear of the fuel injection pump.
2. Rotate the crankshaft in a clockwise direction until the inlet valve on the No. 1 cylinder closes. Slowly rotate the crankshaft until the slot for timing gear (5) and the slot in hub (6) are aligned with the hole in pump body (4) .

Note: The position of the slot is on the bottom for the Stanadyne fuel injection pump. The position of the slot is on the top for the Bosch fuel injection pump. The slot is for inserting the timing pin.

3. Insert timing pin (1) through the timing gear and the slot in the hub. Push the timing pin into the hole in the pump body as far as possible. When the pin is inserted all the way, the engine is at the top center of the No. 1 cylinder on the compression stroke. No resistance should be felt when the timing pin is inserted into the hole in pump body (4). The pin should be inserted all the way into the hole of the pump body.

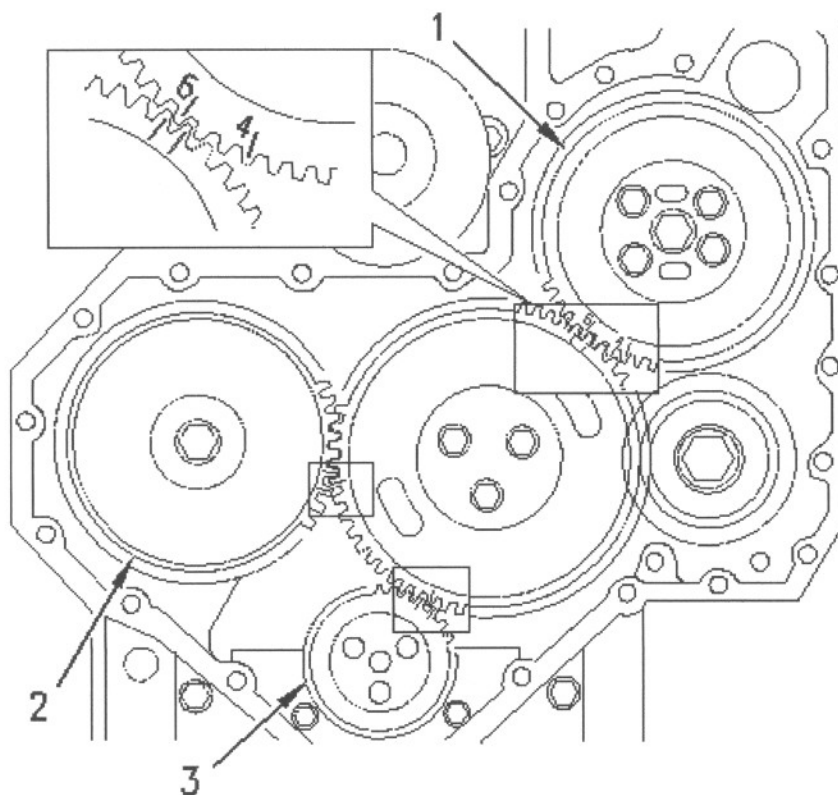


Illustration 3

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Engine timing gears

- (1) Timing gear for the fuel injection pump
- (2) Timing gear for the camshaft
- (3) Timing gear for the crankshaft

NOTICE

The No. 1 cylinder must be at the top center position on the compression stroke before the fuel injection pump is installed. If the crankshaft needs to be rotated, the fuel injection pump must be mounted temporarily or the loose gear could cause damage to the front housing.

Note: After the fuel injection pump has been removed and the crankshaft has been rotated, the timing case cover is removed. After the timing case cover is removed, check that the timing marks on the face of the timing gears are aligned. Aligning the timing marks of all the timing gears will set the top center of the No. 1 cylinder on the compression stroke. Then, the timing pin can be inserted.

Set The Top Center Compression Position For No. 1 Piston (Alternate Method)

Table 2

Required Tools		
Part Number	Part Description	Qty
150-3992	Timing Pin (Bosch)	1
150-3993	Timing Pin (Stanadyne and Delphi)	1
-	Temporary Pointer	1
6V-3075	Dial Indicator	1

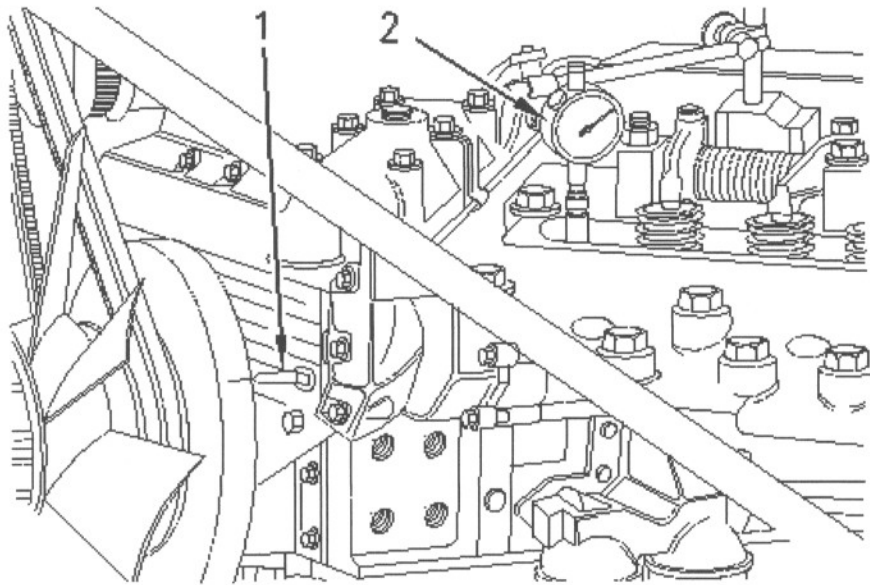


Illustration 4

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The engine that is shown may not reflect your application.

Setting top center compression position

(1) Temporary pointer

(2) Dial indicator

1. Fasten a temporary pointer (1) to the front of the front cover. Put the tip of the pointer close to the edge of the damper on the crankshaft or close to the edge of the pulley.
2. Remove the fuel injection nozzles and the valve mechanism cover. Refer to Disassembly and Assembly Manual, "Fuel Injection Nozzles - Remove" and Disassembly and Assembly Manual, "Valve Mechanism Cover - Remove and Install".
3. Rotate the crankshaft clockwise when you face the front of the engine. Rotate the crankshaft until the pushrod for the inlet valve of the rear cylinder begins to tighten.

Note: Be careful when you rotate the crankshaft. The No. 1 inlet valve will be held in position on top of the piston. If the crankshaft is not positioned properly, the valve may fall from the cylinder head.

4. Rotate the crankshaft further by 1/8 of a turn in a clockwise direction. Insert a suitable lever between the rocker lever and the valve spring cap of the No. 1 inlet valve. Open the inlet valve. Put a spacer that is approximately 5 mm (0.2 inch) thick between the valve stem and the rocker lever.
5. Slowly rotate the crankshaft in a counterclockwise direction until the piston makes contact with the open valve. Make a temporary mark on the damper or the pulley in order to align accurately with the tip of the pointer.

6. Rotate the crankshaft in a clockwise direction by one or two degrees. Remove the spacer that is between the valve stem and the rocker lever. Rotate the crankshaft by 1/4 of a turn in a counterclockwise direction. Put a spacer that is approximately 5 mm (0.2 inch) thick between the valve stem and the rocker lever.
7. Slowly rotate the crankshaft clockwise until the piston makes contact with the open valve. Make another temporary mark on the damper or the pulley in order to align accurately with the tip of the pointer.
8. Make a temporary mark at the center point between the two marks on the damper or the pulley. Remove the other two marks. Rotate the crankshaft by 1/8 of a turn in a counterclockwise direction. Remove the spacer between the valve stem and the rocker lever.
9. Slowly rotate the crankshaft in a clockwise direction until the mark on the damper or the pulley, which was made in Step 8, aligns with the tip of the pointer. The No. 1 piston is now at the top center on the compression stroke.
10. Install the valve mechanism cover and the fuel injection nozzles.
11. Remove the temporary pointer (1) from the front of the front cover.