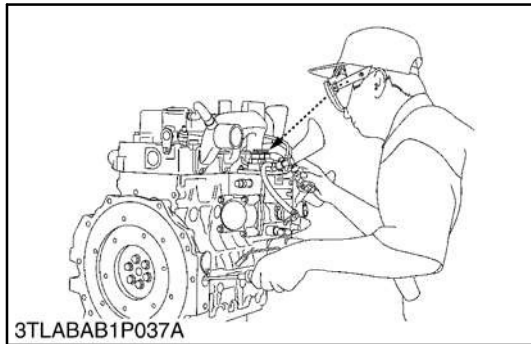


## SECTION 5

### FUEL SYSTEM

#### 5.1 CHECKING AND ADJUSTING



##### 5.1.1 Injection Timing

1. Remove the injection pipes from the injection pump.
2. Move the speed control lever to the maximum speed position.
3. Turn the flywheel counterclockwise (facing the flywheel) until the fuel fills up the hole of the delivery valve holder for #1 cylinder.
4. Turn the flywheel further and stop turning when the fuel begins to flow over.
5. Open the view port on the flywheel bell housing and read the number on the flywheel. The number indicated is the timing value for the engine. (The flywheel has a mark '1TC' and marks every 5° of engine timing to 25° total).

Timing 26-00118-00	Factory Specification	0.06 to 0.08 rad. 3.25° to 4.75° B.T.D.C.
Timing 26-00119-00	Factory Specification	0.09 to 0.12 rad. 5.25° to 6.75° B.T.D.C.
Timing 26-00119-03	Factory Specification	0.06 to 0.05 rad. 3.75° to 5.25° B.T.D.C.
Timing 26-00119-02	Factory Specification	0.10 to 0.13 rad. 5.75° to 7.25° B.T.D.C.
Timing 26-00120-00	Factory Specification	0.16 to 0.19 rad. 9.00° to 11.00° B.T.D.C.
Timing 26-00120-01	Factory Specification	0.09 to 0.12 rad. 5.25° to 6.75° B.T.D.C.

#### NOTE

Injection timing adjustment is accomplished by adding or removing shims under the injection pump.

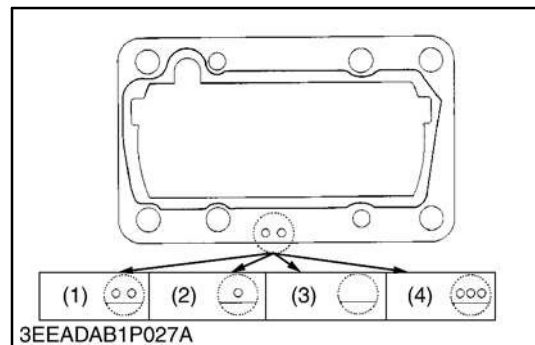
The timing advances by removing one shim and retards timing by adding the same shim.

The addition or removal of 0.05 mm (0.0020 in.) of shim, changes the injection timing by approximately 0.0087 rad. (0.5°).

The sealant should be applied to both sides of the soft metal gasket shim.

##### 5.1.2 Shim Identification

Shims are available in thicknesses of 0.20 mm, 0.25 mm, 0.30 mm, and 0.35mm. Combine shims for adjustments.



- |                          |                          |
|--------------------------|--------------------------|
| 1. 2-Holes: 0.20 mm shim | 3. 0-Holes: 0.30 mm shim |
| 2. 1-Hole: 0.25 mm shim  | 4. 3-Holes: 0.35 mm shim |

##### 5.1.3 Delivery Valves Fuel Seal

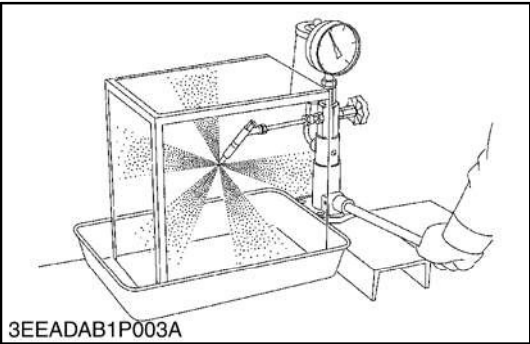
1. Remove the injection pipes, glow plugs, and the intake manifold, and install a compression gauge.
2. With the speed control lever set at the full throttle position, turn the crankshaft counterclockwise until the fuel pressure is built up.
3. Release the pressure in the delivery chamber by rotating the crankshaft to bottom dead center. (turn the crankshaft 1.57 rad. (90°) clockwise from fuel timing set point)
4. If the pressure drop for 5 seconds exceeds the allowable limit, replace the delivery valve or pump assembly.
5. If the pressure does not build up, replace the pump element with a new one and test again.

Delivery Valve Fuel Tightness	Factory Specification	less than 981 kPa(10 kgf/cm <sup>2</sup> , 142 psi pressure drop from injection pressure for 10 seconds
	Allowable Limit	981 kPa(10 kgf/cm <sup>2</sup> , 142 psi pressure drop from injection pressure for 5 seconds

5.2 INJECTION NOZZLE

**WARNING**

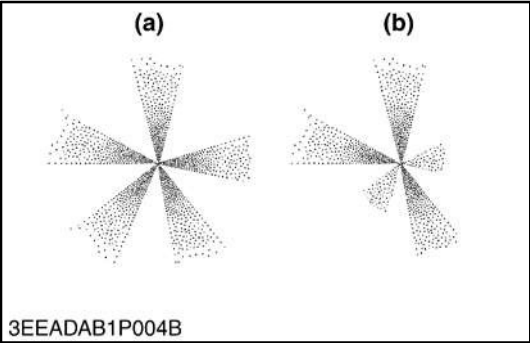
Check the injection nozzle only after confirming that nobody is near the spray. If the spray from the nozzle contacts the human body, cells may be destroyed and blood poisoning may result.



5.2.1 Nozzle Injection Pressure

- 1. Set the injection nozzle in a nozzle tester.
- 2. Slowly move the tester handle to measure the pressure at which fuel begins jetting out from the nozzle.
- 3. If the measurement is not within factory specifications, replace the nozzle assembly.

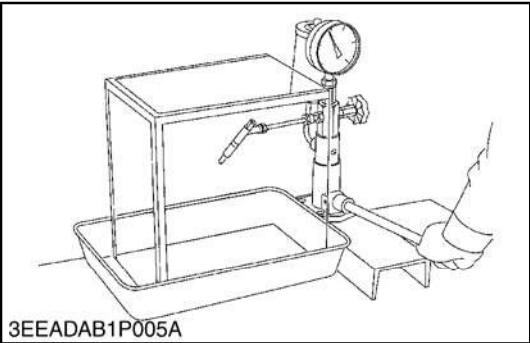
Fuel Injection Pressure 1st Stage	Factory Specification	18.6 to 20.1 MPa 190 to 205 kgf/cm <sup>2</sup> 2702 to 2916 psi
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(a) GOOD (b) BAD

5.2.2 Nozzle Spraying Condition

- 1. Set the injection nozzle in a nozzle tester and check the nozzle spraying condition.
- 2. If the spraying condition is defective, replace the injection nozzle assembly.



5.2.3 Valve Seat Tightness

- 1. Set the injection nozzle in a nozzle tester.
- 2. Raise the fuel pressure, and maintain 12.7MPa (130 kgf/cm<sup>2</sup>, 1850 psi) for 10 seconds.
- 3. If any fuel leak is found, replace the injection nozzle assembly.

Valve Seat Tightness	Factory Specification	No fuel leak at 16.67MPa 170 kgf/cm <sup>2</sup> 2418 psi
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