

FUEL INJECTION PUMP (Cont'd)

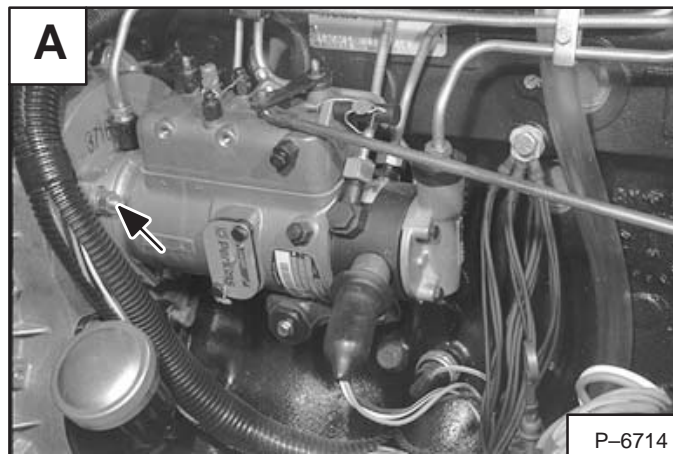
Removal and Installation (Cont'd)

Remove the nuts and washers [A].

Installation: Before tightening the nuts, make sure the timing marks are in correct alignment.

Remove the injection pump.

Installation: After injection pump is installed the air must be removed from the fuel system. (See Page 7–8 for the correct procedure.)



ENGINE TIMING TO INJECTION PUMP

Procedure

The tools listed will be needed to do the following procedure:

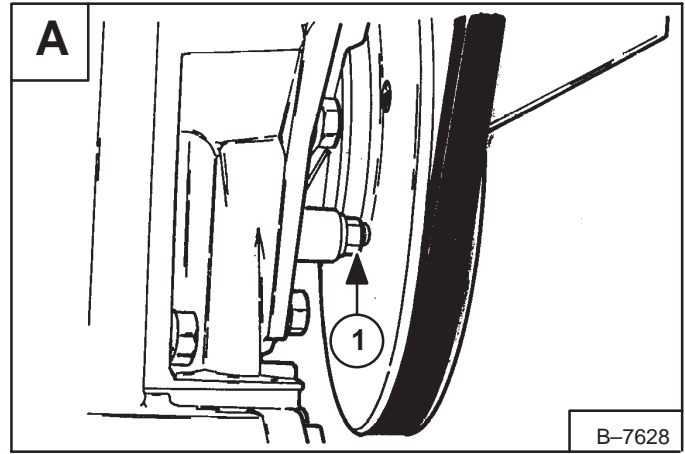
MEL1056 – Timing Tool

Remove the valve cover.

Turn the engine until No. 1 cylinder is at TDC, compression stroke (both rocker arms are moving at No. 4 cylinder).

Align the TDC bolt (Item 1) [A] with the mark in the front pulley.

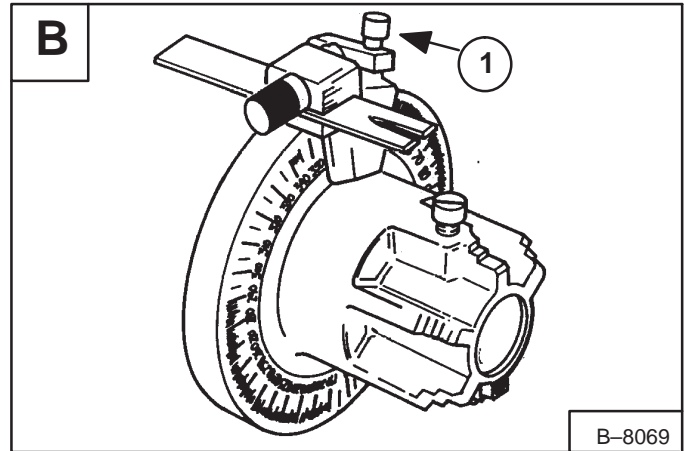
Remove the fuel injection pump. (See Page 7–9.)



B-7628

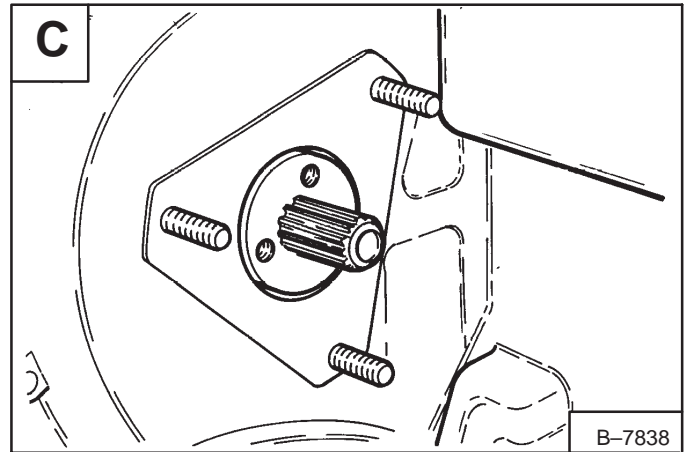
ENGINE AND INJECTION PUMP TIMING MARKS			
Injection Pump Code	Engine Checking Angle	Injection Pump Marking Angle	Static Timing (BTDC Degrees)
LS61	284-1/2	296	23
PT	280-1/2	291	21
RT	279-1/2	291	23

Loosen the screw (Item 1) [B] on the timing tool. Set the correct angle at the gauge according to Injection Pump Code in the chart as listed.



B-8069

Install the adapter into gear [C]. Make sure the dowel pin is in correct alignment. Install the three bolts and tighten.



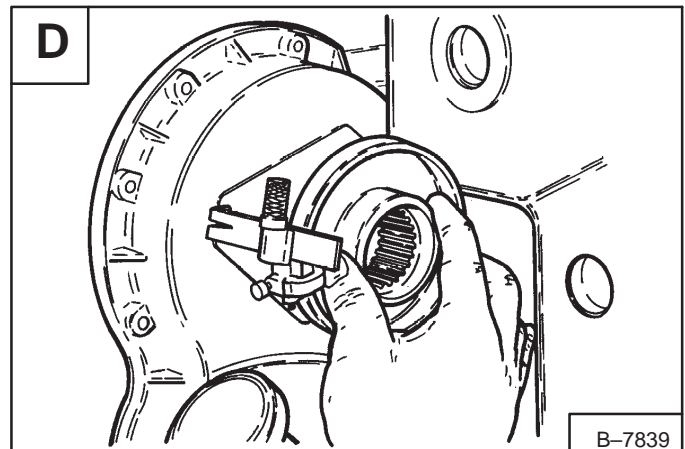
B-7838

Move the plate (with V-notch) over engine mounting flange [D].

Turn the timing tool in opposite direction of engine rotation to remove any gear play.

The engine flange timing mark must be in alignment in the notch on the timing tool plate.

NOTE: If the markers are 180° apart, the No. 1 cylinder is not at TDC.



B-7839

IMPORTANT

Make sure to turn the TDC bolt out of the front pulley after timing procedure is done.

I-2078-0995

CHECKING TIMING MARK ON INJECTION PUMP FLANGE

Procedure:

Loosen the screw (Item 1) [A] and install the shaft (Item 2) [A] into the timing tool.

Loosen the screw (Item 3) [A] and turn the plate in the opposite direction.

Loosen the screw (Item 4) [A] and set the gauge to the correct angle according to Injection Pump Code as listed in the chart. (See Page 7–12.)

Locate and mark the No. 1 port at the injection pump. Install the timing tool on the injection pump.

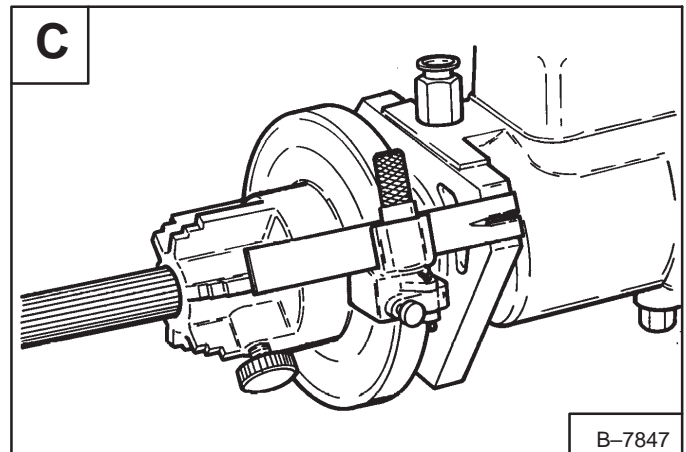
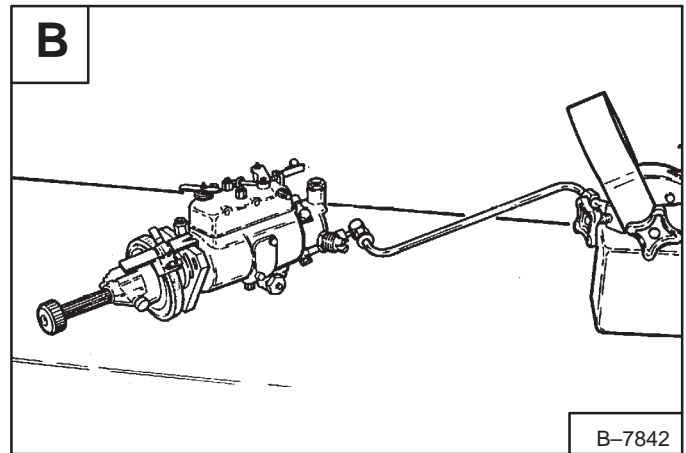
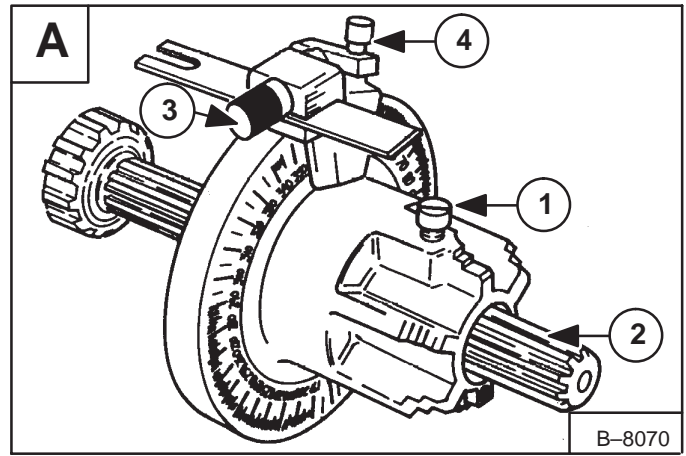
Connect a test pump to the No. 1 port [B].

Operate the test pump until the pressure is at 440 PSI (3033 kPa) maximum.

Turn the tool in the normal rotation of the pump. When the pump reaches the No. 1 port there will be resistance or will not turn.

Move the plate over the mounting flange [C].

NOTE: The mark on the mounting flange is put on at the factory. The mark will almost always be correct. If it is not, you must grind the old mark off and make a new mark.



FUEL INJECTOR NOZZLES



WARNING

Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes causing serious injury. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention.

W-2074-1285

Some problems caused by faulty injector nozzles.

The engine is hard to start or will not start.

Rough engine operation and idle.

The engine will not have full power.

The engine exhaust smoke is black, white or blue.

Removal and Installation

Remove the high pressure tubelines (Item 1) [A].

IMPORTANT

Do not bend the high pressure fuel injection tubes when removing or installing them.

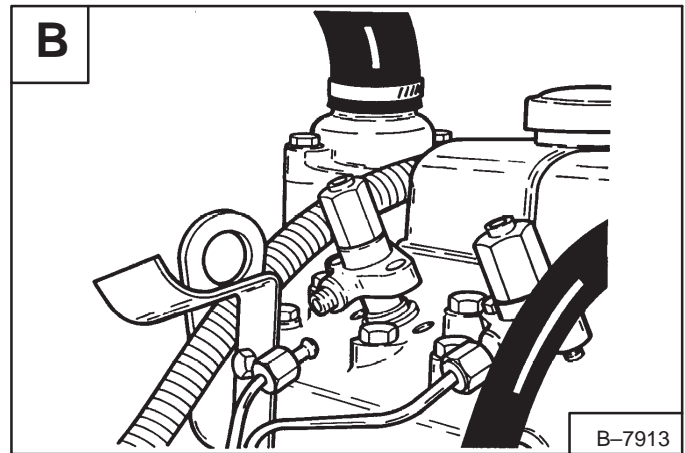
I-2029-0289

Remove the fuel return tubelines (Item 2) [A].

Remove the nuts from the mounting flange (Item 3) [A].

Installation: Tighten the nuts to 12 ft.-lbs. (16 Nm) torque.

Remove the fuel injector nozzle from the cylinder head [B].



FUEL INJECTOR NOZZLES (Cont'd)

Removal and Installation (Cont'd)

When installing the fuel injector nozzles always replace the copper washer (Item 1) [A] with a new copper washer.

Checking

IMPORTANT

Do not disassemble or test the fuel injector nozzles unless you have the correct service and testing tools.

I-2027-0284

The tools listed will be needed to do the following procedure:

MEL10018 – Injection Nozzle Tester
MEL10019 – Accessory Set

Connect the nozzle to a test pump, in a down position [B].

Operate the test pump until the nozzle valve opens:

Setting Pressure – 2572 PSI (17733 kPa)
Working Pressure – 2498 PSI (17223 kPa)

If pressure is not correct, replace or clean nozzle.

Check for inside leakage:

Operate test pump to almost opening pressure. Record pressure, and check pressure decrease for six seconds. The nozzle has a defect if the pressure decreases more than 740 PSI (5162 kPa).

⚠ WARNING

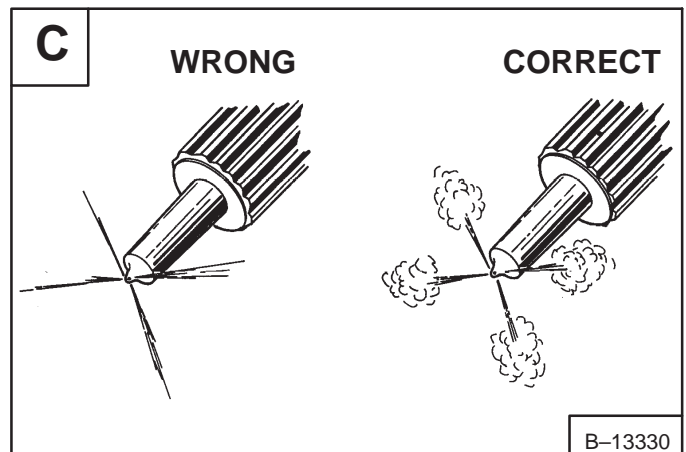
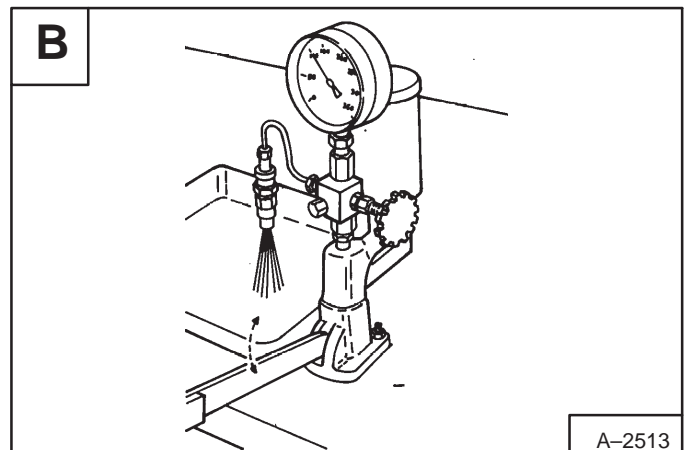
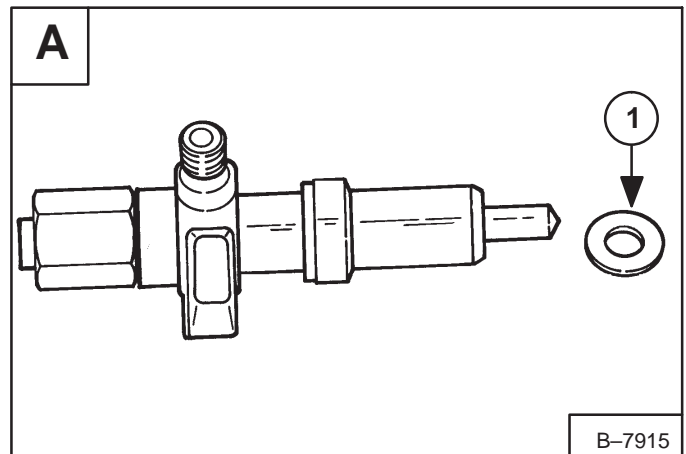
Keep away from fuel under pressure in injector system. It may not be visible. Wear safety goggles. Fuel under pressure can penetrate skin or eyes causing serious injury. If fluid enters skin or eyes, get immediate medical attention.

W-2072-1285

Checking nozzles spray pattern [C]:

Does not come out the side of the nozzle.
Does not have drops coming from nozzle.
Does not have a solid stream coming from nozzle.

Any of the above conditions show a defect or dirty injector nozzle. Clean or replace any injector nozzle that does not operate correctly.



ENGINE

Removal and Installation

Raise the lift arms and install the lift arm safety device.

Raise the operator cab. (See Page 1-1.)

Drain the hydraulic reservoir. (See Page 2-1.)

Remove the battery. (See Page 6-1.)

Remove the coolant from the engine and radiator.

Disconnect the radiator hoses (Item 1) **[A]** from the engine.

