F4GE9454H
F4GE9454J
F4GE9484D
F4HE9484A
F4HE9484C
Engines

Service Manual

87630273

CASE CONSTRUCTION

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ENGINE REPAIR MANUAL

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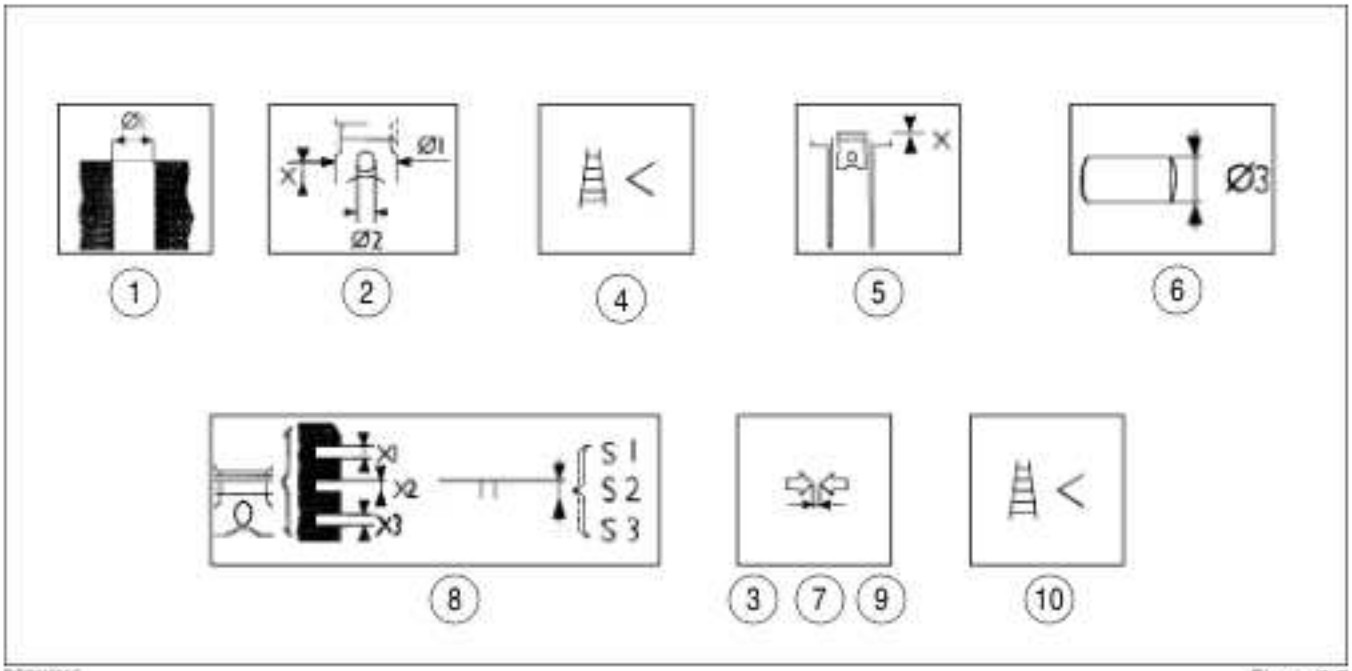
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CRANK GEAR COMPONENTS AND CYLINDER ASSEMBLY



BS06K015

Figure 2-7

REF. NO.	ENGINE TYPE	F4GE9454H		F4GE9454J		F4GE9484D		F4HE9484A	F4HE9484C
		J601	J602	J600	J601	J601	J602	J101	J101 / J102
1	Cylinder bore.	104.000 to 104.024 mm. (4.0945 to 4.0954 in.)							
2	Pistons:								
	Measurement dimension.	X = 55.90 mm. (2.20 in.)							
	Outer diameter.	Ø1= 103.714 to 103.732 mm. (4.0832 to 4.0839 in.)							
	Pin seat.	Ø2= 38.010 to 38.016 mm. (1.4965 to 1.4967 in.)							
3	Piston - cylinder liners.	0.252 to 0.294 mm. (0.0099 to 0.0116 in.)							
4	Piston diameter.	Ø= 0.4 mm. (0.0157 in.)							
5	Protrusion of pistons from crankcase.	0.28 to 0.52 mm (0.01102 to 0.02047 in.)							
6	Piston pin.	Ø3= 37.994 to 38.000 mm. (1.4958 to 1.4961 in.)							
7	Piston pin-Pin seat.	0.01 to 0.022 mm. (0.0004 to 0.0009 in.)							
8	Piston ring grooves (measured on Ø of 99.0mm 3.898 in.)	X1= 2.705 to 2.735 mm. (0.1065 to 0.1077 in.)							
		X2= 2.44 to 2.46 mm. (0.0961 to 0.0969 in.)							
		X3= 4.03 to 4.05 mm. (0.1587 to 0.1594 in.)							
	Piston rings (measured 1.5 mm 0.05905 in. away from external Ø).	S1= 2.560 to 2.605 mm. (0.1008 to 0.1026 in.)							
		S2= 2.350 to 2.380 mm. (0.0925 to 0.0937 in.)							
		S3= 3.970 to 3.990 mm. (0.1563 to 0.1571 in.)							
9	Piston rings - Slots.	1= 0.100 to 0.175 mm. (0.0039 to 0.0069 in.)							
		2= 0.060 to 0.110 mm. (0.0024 to 0.0043 in.)							
		3= 0.040 to 0.080 mm. (0.0016 to 0.0031 in.)							
10	Piston rings.	0.40 mm. (0.0157 in.)							

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To troubleshoot the system:

1. With the engine temperature below 50° C (122° F), and the key switch on, battery voltage should be present at both solenoids on the injection pump. If battery voltage is not present, troubleshoot the temperature switch circuit.

To check the temperature switch:

2. With the engine temperature is below 50° C (122° F), battery voltage should be present at both terminals. Warm the engine to 60 to 66° C (140 to 151° F). Battery voltage should be present at only one terminal of the temperature switch when engine is warmed to 71° C (160° F) or higher.
3. Disconnect the connector at the temperature switch. Short across the two terminals of the connector with a jumper wire and start engine. After a short time, remove the jumper wire the engine should change sound and run smoother as the injection pump time is retarded. This signifies that the cold starting advance system is operating properly.

FUEL SYSTEM TEST FOR RESTRICTION OR AIR INFILTRATION - F4GE ENGINES

NOTE: *If possible, test the fuel system as described before removing the Bosch VE fuel injection pump for repair. If leakage is too severe, complete the test procedure following the pump repair or replacement. Failure to test the system may result in continued pump leakage.*

To determine if the low pressure fuel supply is restricted, or if air is entering the system, follow these steps.:

STEP 1

Install a clear poly-vinyl tube between the outlet of the fuel filter and the inlet of the Bosch VE fuel injection pump. Tee the connector into the test line a pressure gauge which can read both 0 to 762 mm (0 to 30 inches) of Hg vacuum and 0 to 2.07 bar (0 to 30 psi) positive pressure. See figure 2-59 on page 2-57

NOTE: *For more information, see further procedures in this section which describe how to build test lines, and describe normal system operating observations.*

STEP 2

Run the engine to purge all possible air from the system which was caused by test line installation.

STEP 3

When air is no longer visible in the clear test line, measure and record the operating pressures, while continually observing for air in the fuel, under the following conditions:

- Low idle- apply no load to the engine.
- High idle- apply no load to the engine.
- High idle- apply load to the engine using hydraulics over relief, hydrostatic stall or converter stall, depending upon the unit being tested. Load the engine to its rated engine operating rpm.
- Run multiple tests while observing fuel pressure and looking for air in the fuel.

STEP 4

If the fuel pressure is below 0.276 bar (4.0 psi) at any time during the previous Step 3, check the following, and replace as needed:

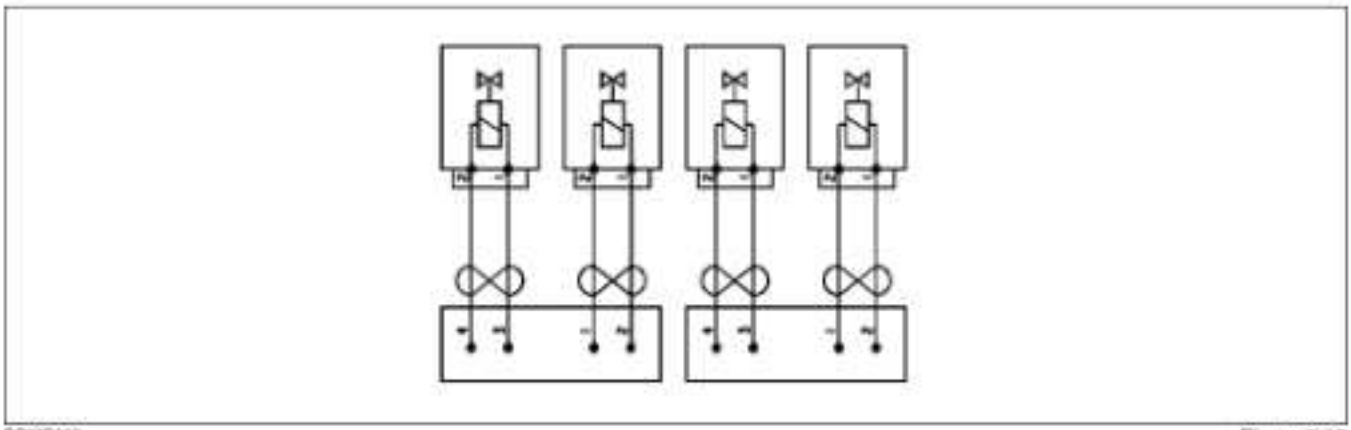
- The fuel pre-filter (replace).

NOTE: *some applications do not use a fuel pre-filter.*

- The primary fuel filter.
- The lines and connections from the fuel supply pump inlet back to the fuel tank, checking for damaged lines (kinks and rub marks) and leakage at the Voss o-ring fittings.

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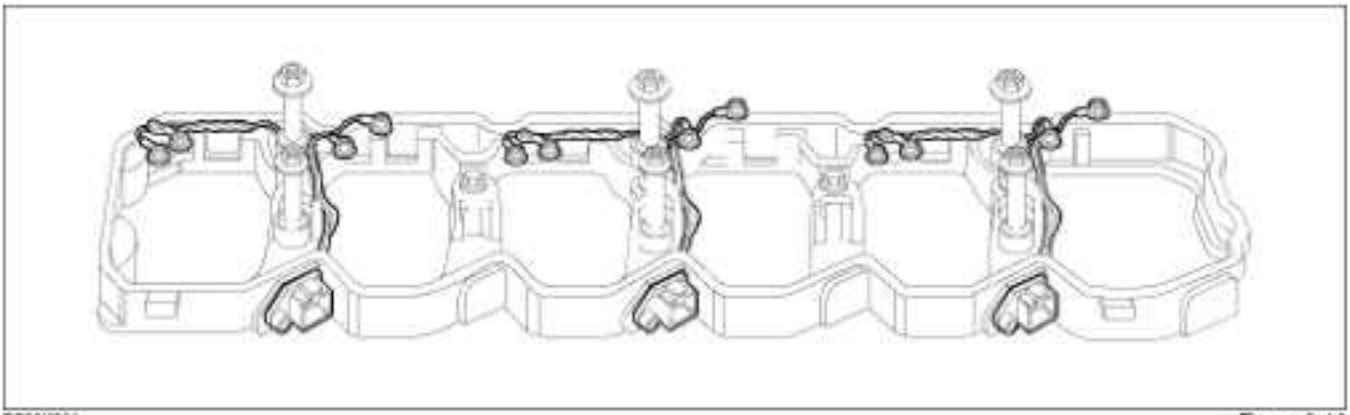
ELECTRO-INJECTORS



BS07D158

Figure 3-15

INJECTOR WIRE HARNESS LAYOUT



BS06K081

Figure 3-16

INJECTOR WIRE HARNESS (NOTE 6 CYLINDER HARNESS SHOWN)

The electro-injectors are a normally Closed (N.C.) solenoid valve.

Each injector is connected to the EDC7UC31 control unit on connector A.

The impedance of the coil of each injector is 0.56 - 0.57 Ohms.

Reference		Description	EDC7UC31 control unit pin
CONNECTOR 1	1	Cylinder 2 injector	11A
	2	Cylinder 2 injector	6A
	3	Cylinder 1 injector	13A
	4	Cylinder 1 injector	4A
CONNECTOR 2	1	Cylinder 4 injector	14A
	2	Cylinder 4 injector	3A
	3	Cylinder 3injector	12A
	4	Cylinder 3 injector	5A

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