TOYOTA

REPAIR MANUAL

15Z ENGINE

CE673

MidWestTech | Toyota 15Z Engine Service Manual | Publication CE673

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HIGH FUEL CONSUMPTION

Before beginning troubleshooting, ask the following questions and as necessary.

1. When did it start? (Since the vehicle was new, recently, since it has become colder etc.)
2. High fuel consumption compared with what? (Since the vehicle was new, recently, since it has become colder etc.)
3. What is the lift being used for? (Stacking and unloading cargo, carrying, in a small space, traveling distance etc.)
4. Others. (Fuel, tires, additional specifications, operating time, change in load, change of operator etc.)

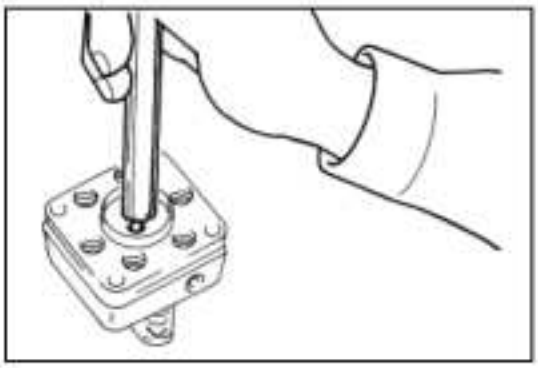
Causes of high fuel consumption	1. Engine structure (compression ratio, improved fuel during, cooling loss, mechanical efficiency, etc.)
	2. Vehicle structure (vehicle weight, tires, drivetrain system transmission efficiency, gear ratio, etc.)
	3. Conditions in the usage environment (weather, traveling environment, loading environment, operation method, altitude, etc.)
	4. Maintenance status of the engine and vehicle (injection timing, compression pressure, etc.)
	5. Specification, differences in attachments (mast height, attachments, air conditioning)

Places for inspection and adjustment when fuel consumption has become greater than previously

Classification	Main inspection or adjustment
Fuel	1. Injection pump
	2. Fuel system leak
	3. Injection timing
Compression	1. Valve
	2. Piston ring
	3. Piston
	4. Cylinder
Drivetrain	1. Slipping of the manual clutch
	2. Slipping of the torque converter one-way clutch
Braking	1. Braking dragging
	2. Brake automatic adjustment mechanism
	3. Brake shoe return mechanism
Cooling	1. Thermostat
	2. Coolant temperature **[Point 1]**

[Point 1]
If the temperature of the engine coolant becomes to high or too low, optimal fuel combustion cannot be achieved and fuel consumption increases. In particular, when repeated traveling and loading is carried out when the engine is cold, combustion is incomplete and the engine power output decreases.

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(3) Plunger spring shim selection
Measure dimension KF for free plunger spring length and obtain the plunger spring shim thickness by the following equation.

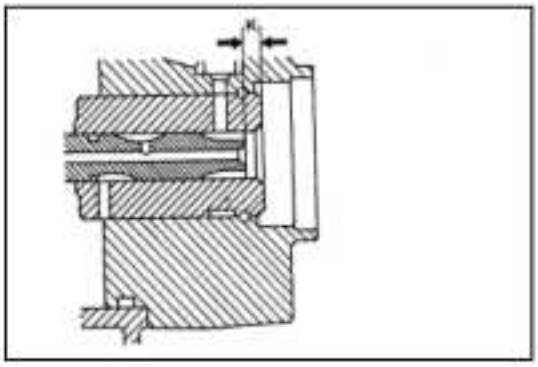
Shim thickness mm (in.)=5.8 (0.028) - dimension KF

Caution:

- **Use the plunger spring shims of the same thickness on both sides. (Use two identical shims for one pimp.)**
- **If the shim exactly as thick as the calculated value is not available, select the one whose thickness is nearest to the calculated value on the greater side.**
- **When replacing the plunger spring, replace the left and right springs as a pair.**

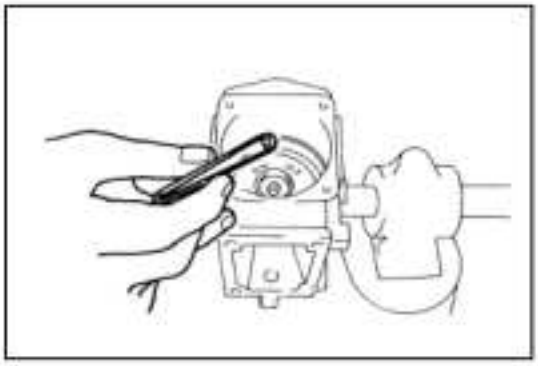
Plunger spring shim KF:

Thickness mm (in.)
0.5 (0.020)
0.8 (0.031)
1.0 (0.039)
1.1 (0.043)
1.2 (0.047)
1.3 (0.051)
1.4 (0.055)
1.5 (0.059)
1.8 (0.071)
2.0 (0.079)



11. Plunger shim adjustment (measurement do dimension)

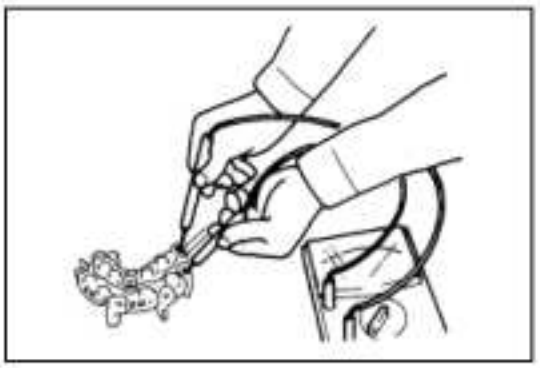
(1) Dimension K is the distance between end surface of the distributor cylinder in installed state and the end surface of the plunger head at the plunger BDC. Dimension K shall be adjusted by changing the thickness of the plunger adjusting shim (selective use).



(2) Insert a plunger shim of an arbitrary thickness and install the plunger so that the cam plate drive pin enters the plunger groove.

Caution:
Do not coat grease on the plunger shim.

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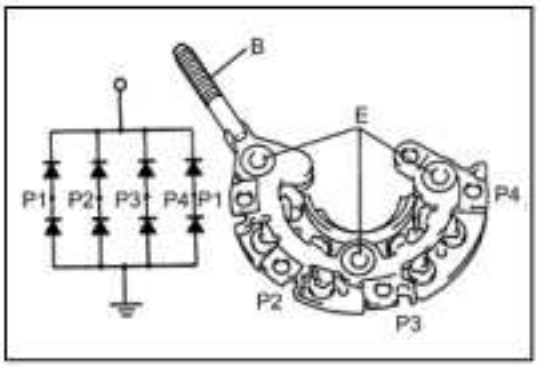
[Point 3]

Inspection:

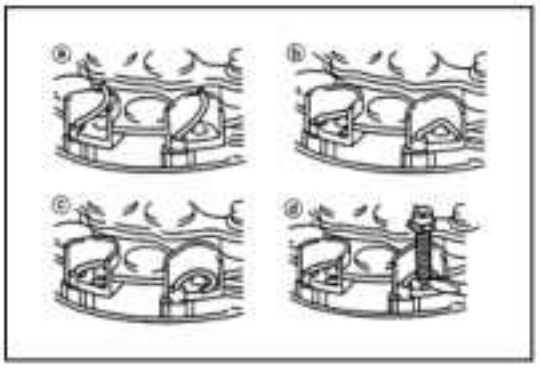
Rectifier inspection

1. Use the kΩ range of a muiltimeter to test conduction.

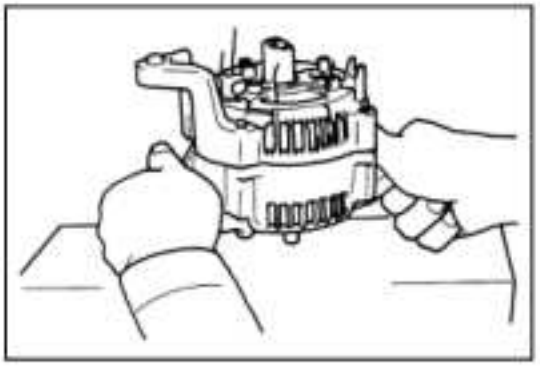
   Standard:
   Conduction in one direction and no conduction in the reverse direction when tested by changing polarities.



2. Set the illustration at right for the rectifier circuit. The rectifier quality cannot be judged on the basis of the resistance in the forward direction since the forward current depends greatly on the source voltage. The multimeter reading varies with the multimeter type and resistance range. The rectifier can be judged acceptable if the difference in the forward and reverse resistances is great. Never use a 500 V megger because it may damage the rectifier.



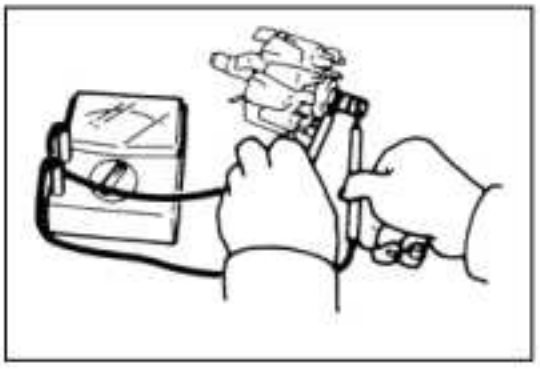
[Point 4]



Disassembly:

While holding the rectifier end frame, apply a shock to the tip end of the rotor shaft to separate the drive end frame and rectifier end frame.

[Point 5]



Inspection:

Measure the resistance between two slip rings.

Standard: 3.0 Ω or less

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