

# Inspection and Repair Procedure for Engine Oil Maintenance Program

As referenced in the Engine Oil Maintenance - Special Policy Adjustment (SPA) documentation this is not a Special Service Campaign. Begin inspections and / or repairs only after verification of oil gelling symptoms identified by (1) smoke from the vehicle tailpipe and / or consumption or (3) malfunction indicator lamp (MIL) on due to one of the above.

## Step 1: Remove Valve Cover

- Remove the Rear Bank Valve Cover (1MZ) or Valve Cover (5S)
- Inspect for presence of excessive oil gelling in the valve cover and cylinder head valve train area

Is excessive oil gelling present?

NO

Follow Normal Repair Diagnostics / Process for Problem Symptoms

YES

## Step 2: Inspect Compression

- Perform cylinder compression pressure test on ALL cylinders following the procedure outlined in the Repair Manual

NOTE: You must document all compression readings results on the Repair Order for Region / Area review and approval.

Is compression within specification?

YES

**Repair: Following the Repair Manual procedures:**

- Clean Cylinder Head and valve train area of gelled oil deposits
- Replace Valve Stem Seals, Valve Cover(s) and PCV Valve
- Remove Oil Pan and Oil Pump pick-up tube to inspect and clean

NO

**Step 3: "Wet" Compression Test**

- Pour or squirt a small amount engine oil into the cylinder through each spark plug hole and perform a "Wet" compression test

NO

1MZ-FE Engine

**Repair: Following the Repair Manual procedures:**

- Remove Cylinder Heads for disassembly, cleaning and inspection for worn or damaged parts
- If adding oil did not increase the compression, the piston rings and cylinder still need to be inspected according to the **Cylinder Bore Inspection** procedure at right.
- If the piston rings are not simply stuck or worn and / or the cylinder bore damage / wear is excessive, proceed as follows:
- Replace Short Block Assembly (Regional / Area Approval Required), Valve Stem Seals, Valve Covers and PCV Valve
- Inspect and clean Oil Pan and Oil Pump pick-up tube

5S-FE Engine

**Repair: Following the Repair Manual procedures:**

- Remove Cylinder Head for disassembly, cleaning and inspection for worn or damaged parts
- If adding oil did not increase the compression, the piston rings and cylinder still need to be inspected according to the **Cylinder Bore Inspection** procedure at right.
- If the piston rings are not simply stuck or worn and / or the cylinder bore damage / wear is excessive, proceed as follows:
- Rebore all 4 cylinders and replace all 4 pistons
- Replace Valve Stem Seals, Valve Cover and PCV Valve
- Inspect and clean Oil Pan and Oil Pump pick-up tube

Is "Wet" compression within specification?

NO

**Repair: Following the Repair Manual procedures:**

- Remove the cylinder head(s), disassemble, clean and inspect for worn or damaged parts
- If adding oil increases the compression, the piston rings and / or cylinder bore may be worn or damaged and further inspection is necessary according to the **Cylinder Bore Inspection** procedure at right. Repair lower end according to the **Cylinder Bore Inspection** results.
- Replace Valve Stem Seals, Valve Cover(s) and PCV Valve.
- Inspect and clean Oil Pan and Oil Pump pick-up tube

YES

## Cylinder Bore Inspection Procedure

### 1MZ-FE Cylinder Bore Inspection

Visually check the cylinder bore for the presence of crosshatch and / or vertical scratches. If vertical scratches are present and can be felt with a fingernail, or if the crosshatch is not visible, rebore all 4 cylinders and replace all 4 pistons following Repair Manual procedures for boring and lower end inspection. If the cylinder bore has visible crosshatch and no vertical scratches, replace the piston rings following Repair Manual procedures for piston ring replacement and lower end inspection.

### 5S-FE Cylinder Bore Inspection

Visually check the cylinder bore for the presence of crosshatch and / or vertical scratches. If vertical scratches are present and can be felt with a fingernail, or if the crosshatch is not visible, rebore all 4 cylinders and replace all 4 pistons following Repair Manual procedures for boring and lower end inspection. If the cylinder bore has visible crosshatch and no vertical scratches, replace the piston rings following Repair Manual procedures for piston ring replacement and lower end inspection.

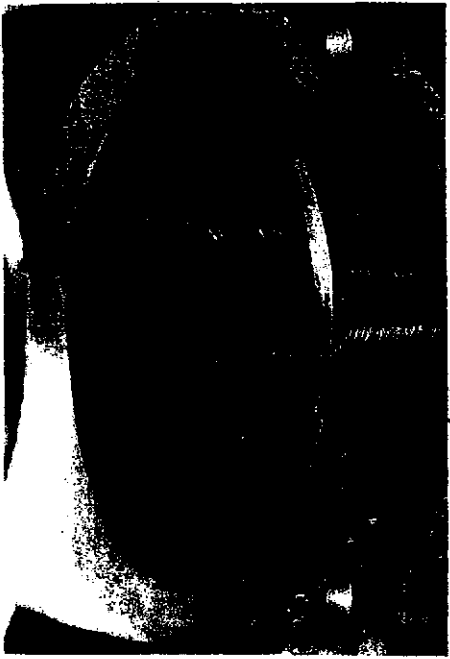


Illustration of Crosshatch in Cylinder Bore

### Compression Specifications

- 5S-FE Engine**  
Acceptable range:  
142 - 178 psi or more  
Maximum difference between cylinders:  
14 psi or less
- 1MZ-FE Engine**  
Acceptable range:  
145 - 218 psi or more  
Maximum difference between cylinders:  
15 psi or less