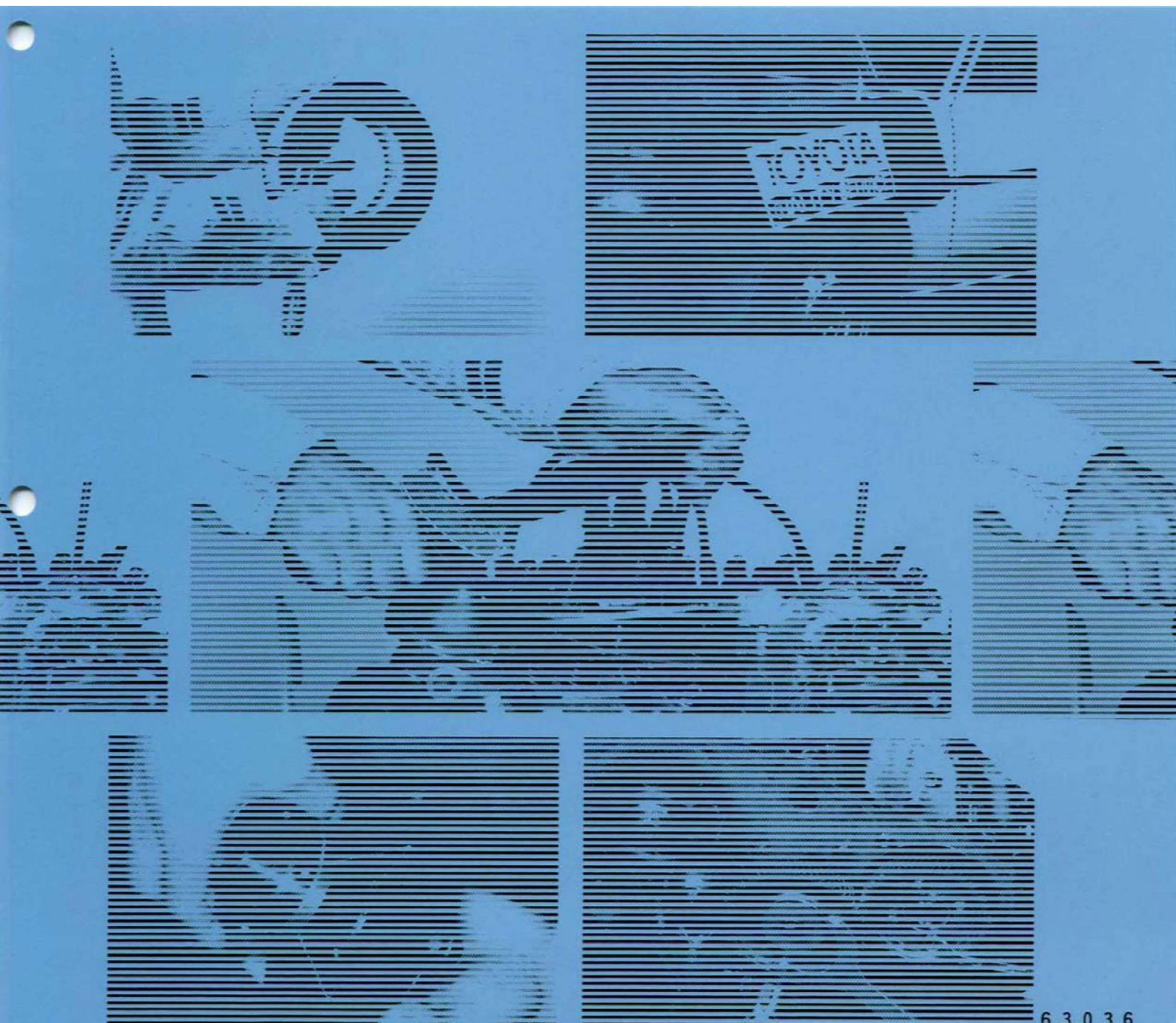




# 1JZ-GE 1JZ-GTE 2JZ-GE 2JZ-GTE

## ENGINE REPAIR MANUAL

December 1992



This repair demand as for procurement desired one, store of nearby  
Toyota car or on the Toyota part joint sales bottom, attaching price,  
please apply.

November 11, 1992 Printing

December 12, 1992 Issue

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**1JZ-GE**  
**Toyota 1JZ-GTE Engine Manual**  
**2JZ-GE**  
**2JZ-GTE**

1,500 Yen (plus tax)

Compiled by Toyota Motor Company, service issue section  
23-22, Spring 1-Chome  
East-Ku, Nagoya-City

|                            |          |
|----------------------------|----------|
| <b>Introduction</b>        | <b>0</b> |
| <b>Engine Mechanical</b>   | <b>1</b> |
| <b>Lubrication System</b>  | <b>2</b> |
| <b>Cooling System</b>      | <b>3</b> |
| <b>Starting System</b>     | <b>4</b> |
| <b>Charging System</b>     | <b>5</b> |
| <b>Turbocharger System</b> | <b>6</b> |

## FOREWORD

This manual explains the main service points of the 1JZ-GE, 1JZ-GTE, 2JZ-GE and 2JZ-GTE engines. Please utilize as a guide in order to execute quick and accurate service of this engine. This book explains the engine installed in October 1992 present production vehicles. For vehicles manufactured at a later date, the installed engine may differ from the contents of this manual. Consent the engine specifications before every repair.

**TOYOTA MOTOR CORPORATION**



# INTRODUCTION

- Overview .....0 – 2
  - Scope of Repair .....0 – 2
  - Explanations.....0 – 2
  - Definitions.....0 – 3
- Abbreviations .....0 – 3
- Disassembly Notes .....0 – 4
- Model Constitution List.....0 – 5
- Standard Bolt/Nut Tightening Torque .....0 – 8
  - Method of Torquing .....0 – 8
  - Bolt Grade Identification.....0 – 8
  - Torque Chart .....0 – 9
  - Coating Bolts with Thread Sealant.....0 – 10
- Toyota Standard Bolt Tightening Torque .....0 – 10
  - Tightening Plastic Stretch Bolts .....0 – 10

# OVERVIEW

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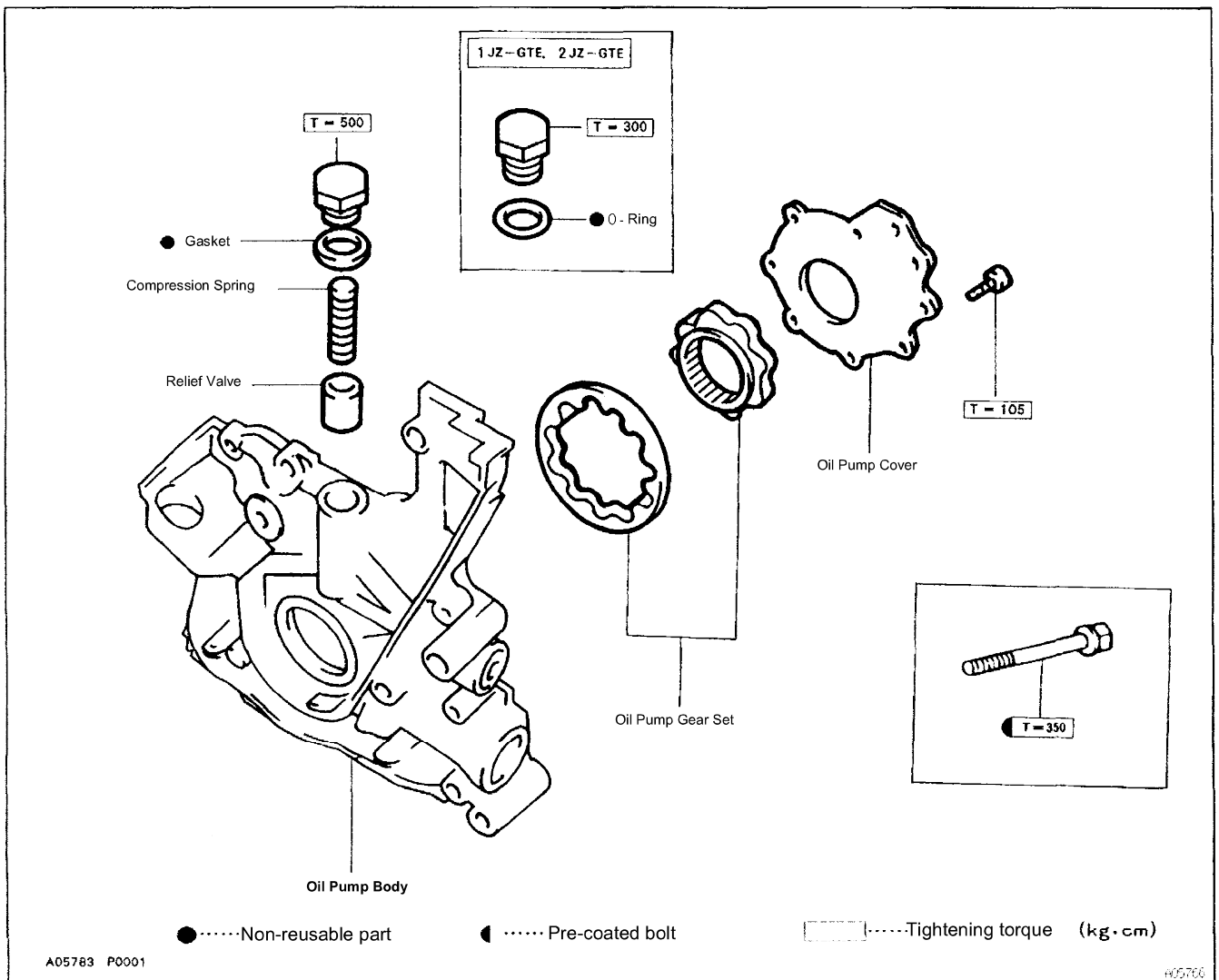
## SCOPE OF REPAIR

This manual covers the repair of the engine and accessories (starter, etc) including disassembly, inspection, and adjustment. It does not cover removal and installation of the engine from/to the vehicle or adjustments on the vehicle.

## NOTES REGARDING CONTENTS

- 1 Notice
  - 1) Please read and understand notices pertaining to the job before you begin.
- 2 Tool/Material Information
  - 1) Before beginning each job, the required Toyota SST (Special Service Tool), meters, oil and grease etc should be acquired. Specific details regarding these items are omitted under the assumption that they are provided in the Toyota maintenance shop.
- 3 Block Diagrams
  - 1) Non-reusable part, pre-coated bolt, and tightening torque information is noted in the block diagrams.

## BLOCK DIAGRAM EXAMPLE



(2) The illustration shows what to do and where to do it, the task heading tells what to do, and the detailed text tells how to perform the task and gives other information such as specifications and warnings.

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## JOB ILLUSTRATION EXAMPLE

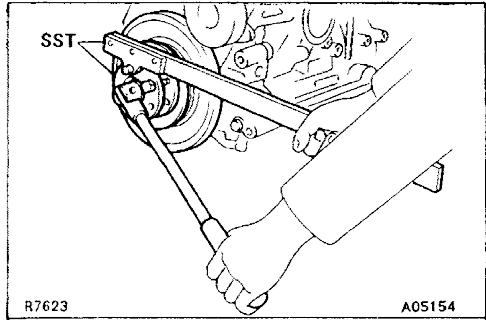


Illustration: what to do and where

**Crankshaft Pulley Removal and Installation** ← Task Heading

1 Crankshaft Pulley Installation ← Job Item

(1) The crankshaft pulley is installed on the crankshaft.  
 (2) Use SST to lock crankshaft pulley. Install and tighten the bolt.

S S T    09213-54015 (Set Part Number)    90915-08076

09330-00021 ← Part Number

T = 2500kg·cm ← Specification

Detailed Text: how to do the task

The contents which are abbreviated in this book

(1) The instruction of each job is abbreviated in this book, but please execute when performing the actual job:

- ① Cleaning of part upon removal
- ② Visual inspection

## DEFINITION OF TERMINOLOGY

| Reference level      | ..... | The desired value when inspecting or adjusting  |
|----------------------|-------|---|
| Limit                | ..... | The lowest or highest value not to exceed when inspecting or adjusting  |
| Turn thought value   | ..... | Because measuring method in order to know reference level to be considerable it is difficult the reference level in the simple measurement method when really there is no possibility of upper trouble occurrence is displayed. |
| position chapter one | ..... | Prohibition job and the like, you do not have to go, it publishes concerning thing and is. In addition it publishes the item which especially should note in job manner and is.   |
| <Turn you think>     | ..... | supplemental explanation in order to make job easy from the descriptive text, it publishes and is.  |

(1)

## ABBREVIATION EXPLANATION

| ABBR | Explanation                                |
|------|--|
| ASSY | Assembly                                   |
| EX   | Exhaust                                    |
| FIPG | Fix-In-Place Gasket (Liquid Molded Gasket) |
| IN   | Intake                                     |
| O/S  | Oversize                                   |
| SST  | Special Service Tool                       |
| STD  | Standard                                   |
| T=   | Tightening Torque                          |
| U/S  | Undersize                                  |

## NOTE OF DISSASSEMBLY/ASSEMBLY

Job notes are explained at the beginning of each section.

Published are the minimum necessary notices for disassembly and assembly.

**1 About the prevention of foreign material mixture**

- (1) When foreign material such as dust, sand and metal pieces mix inside the engine, they can cause damage.

① Note: Before disassembling

- The sand and the mud etc which have come in contact outside the engine are dropped sufficiently.

② Note: When disassembling and assembling

- Cover disassembled parts with a vinyl cover or similar to protect them from dust.

**2 Preventing damage to mating surfaces**

- (1) If a mating or bearing surface or becomes gouged, it can cause an oil leak or overheating.

① Note: When disassembling and assembling

- Use a rubber or plastic mallet when disassembling mating faces, unless otherwise noted.
- Use aluminum or plastic vice jaws whenever holding a mating surface in a vise.

**3 About washing of the part**

- (1) Before attaching each part, wash it sufficiently and air dry or dry with compressed air.

① Note: Washing prohibited with alkaline chemicals

- Aluminum parts and rubber parts (valve cover gasket or similar)

② Note: Washing prohibited with part washing oil (kerosene and gasoline, etc)

- Rubber parts (valve cover gasket or similar)

**4 Attachment position, about directivity**

- (1) Each part attaches in the same position as before the disassembly.

① Note: When disassembling and assembling

- If before disassembling, the alignment mark or the direction mark is within context, be sure to follow that indication when re-assembling.
- Reassemble parts in the same order arrangement as they were in before being disassembled.
- Be sure to attach with in context, and when there is an indication of position and direction, follow that indication.

## ■ Crown

| Engine type | Vehicle Type | Automatic Transmission Types |       |       |
|-------------|--------------|------------------------------|-------|-------|
|             |              | A340E                        | A341E | A350E |
| 1JZ-GE      | E- JZ8131    | AESJF                        |       |       |
|             |              | AESQF                        |       |       |
|             |              | AEPJF                        |       |       |
|             |              | AEPQF                        |       |       |
|             | E-JZS130G    |                              | AWPJF |       |
|             |              |                              | AW8QF |       |
|             |              |                              | AWPQF |       |
|             | E- 1ZS141    | ATPSF                        |       |       |
|             |              | ATP1F                        |       |       |
|             |              | ATPQF                        |       |       |
| 2JZ-GE      | E-JZS133     | AESQF                        |       |       |
|             |              | AEPQF                        |       |       |
|             | E- 1ZS135    | AESUF                        |       |       |
|             |              | AEPUF                        |       |       |
|             | E- 1Z8143    | ATPQF                        |       | ATAXF |
|             | E- JZ8145    | ATPVF                        |       |       |

## ■ Crown Patrol Car

| Engine Type | Vehicle Type | Manual transmission type       |
|-------------|--------------|--------------------------------|
|             |              | W58                            |
| 2JZ-GE      | E- JZS133Z   | AEMRF (Restriction Patrol Car) |
|             |              | AEMKF (Mask Patrol Car)        |

## ■ Crown Road Round Car (A1)

| Engine Type | Vehicle Type | Manual transmission type |
|-------------|--------------|--------------------------|
|             |              | W58                      |
| 2JZ-GE      | E- JZ51332   | AEMCF                    |



## ■ Crown Majesty

| Engine Type | Vehicle Type | Automatic Transmission Type |
|-------------|--------------|-----------------------------|
|             |              | A340E                       |
| 2JZ-GE      | E-JZS149     | ATPQF                       |
|             |              | ATPVF                       |

## ■ Aristo

| Engine Type | Vehicle Type | Automatic Transmission Type |
|-------------|--------------|-----------------------------|
|             |              | A340E                       |
| 2JZ-GE      | E- JZS147    | BEPQF                       |
| 2JZ-GTE     |              | BEPVZ                       |

## ■ Mark II

| Engine Type | Vehicle Type | Automatic Transmission Type |       | Manual Transmission Type |
|-------------|--------------|-----------------------------|-------|--------------------------|
|             |              | A340E                       | A341E |                          |
| 1JZ-GE      | E-JZX90      | ATPZF                       |       |                          |
|             |              | ATPQF                       |       |                          |
| 1JZ-GTE     |              |                             | ATPVZ | ATMVZ                    |
| 2JZ-GE      | E-JZX91      |                             | ATPZF |                          |
|             |              |                             | ATPQF |                          |

## ■ Chaser

| Engine Type | Vehicle Type | Automatic Transmission Type |       | Manual Transmission Type |
|-------------|--------------|-----------------------------|-------|--------------------------|
|             |              | A340E                       | A341E |                          |
| 1JZ-GE      | E-JZX90      | BTPZF                       |       |                          |
|             |              | BTPQF                       |       |                          |
| 1JZ-GTE     |              |                             | BTPVZ | BTMVZ                    |
| 2JZ-GE      | E- JZX91     |                             | BTPZF |                          |
|             |              |                             | BTPQF |                          |

## ■ Cresta

| Engine Type | Vehicle Type | Automatic Transmission Type |       | Manual Transmission Type |
|-------------|--------------|-----------------------------|-------|--------------------------|
|             |              | A340E                       | A341E |                          |
| 1JZ-GE      | E- JZX90     | CEPZF                       |       |                          |
|             |              | CEPQF                       |       |                          |
| 1JZ-GTE     |              |                             | CEPVZ | CEMVZ                    |
| 2JZ-GE      | E-JZX91      |                             | CEPZF |                          |
|             |              |                             | CEPQF |                          |

## ■ Supra

| Engine Type | Vehicle Type | Automatic Transmission Type | Manual Transmission Type |
|-------------|--------------|-----------------------------|--------------------------|
|             |              | A342E                       | R154                     |
| 1JZ-GTE     | E-JZA70      | BLPVZ                       | BLMVZ                    |
|             |              | BJPVZ                       | BJMVZ                    |
|             |              | BLPQZ                       | BLMQZ                    |
|             |              | BLPZZ                       | BLMZZ                    |
|             |              | B1PZZ                       | B1MZZ                    |






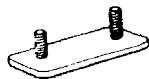



## ■ Soarer

| Engine Type | Vehicle Type | Automatic Transmission Type | Manual Transmission Type |
|-------------|--------------|-----------------------------|--------------------------|
|             |              | A340E                       | R154                     |
| 1JZ-GTE     | E-JZZ30      | ACPVZ                       | ACMVZ                    |
|             |              | ACPZZ                       | ACMZZ                    |

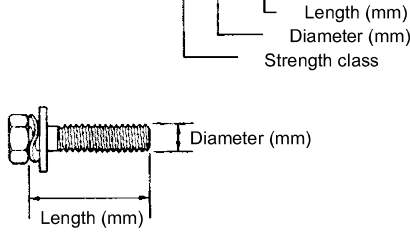
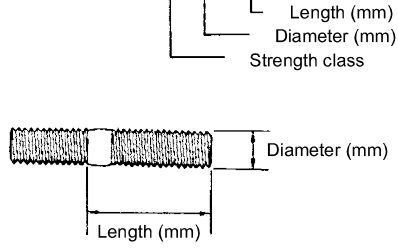
For cases when a specific torque is not listed, use the chart below along with the torque chart on the following page to determine the desired torque.

If torquing a nut to a bolt, use the torque value corresponding to the mating bolt.

#### HOW TO DETERMINE BOLT TORQUE


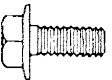
|                     | Mark   |                    | Class                                |           | Mark   |   | Class |
|---------------------|--|--------------------|--------------------------------------|-----------|--|---|-------|
| Hexagon head bolt   |   | Bolt head numbered | 4 = 4T<br>5 = 5T<br>6 = 6T<br>7 = 7T | Stud bolt |  | No mark   | 4T    |
|                     |   | No mark            | 4T                                   |           |  | Grooved   | 6T    |
| Hexagon flange bolt |   | No mark            | 4T                                   |           | Welded bolt  |  |       |
| Hexagon head bolt   |   | 2 protruding lines | 5T                                   |           |  |   |       |
| Hexagon flange bolt |   | 2 protruding lines | 6T                                   |           |  |   |       |
| Hexagon head bolt   |  | 3 protruding lines | 7T                                   |           |  |   |       |

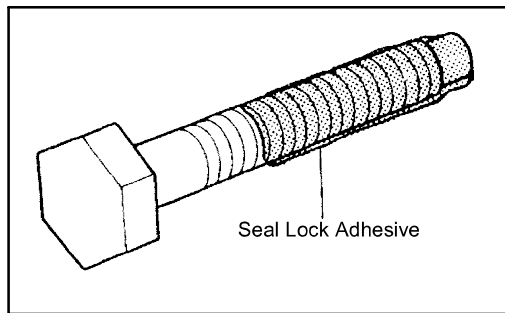
## IDENTIFICATION BY PART NUMBER

|   |   |
|---|---|
| <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;">Hex head bolt</div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">Part</div> <div style="font-size: 1.2em; font-weight: bold;">91111-40620</div> </div> <div style="margin-top: 10px;">  </div> | <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;">Stud bolt</div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">Part</div> <div style="font-size: 1.2em; font-weight: bold;">92132-40620</div> </div> <div style="margin-top: 10px;">  </div> |
|---|---|

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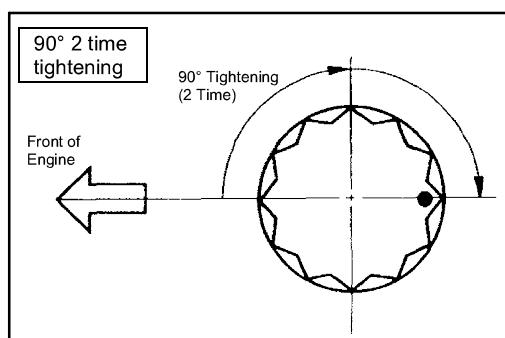
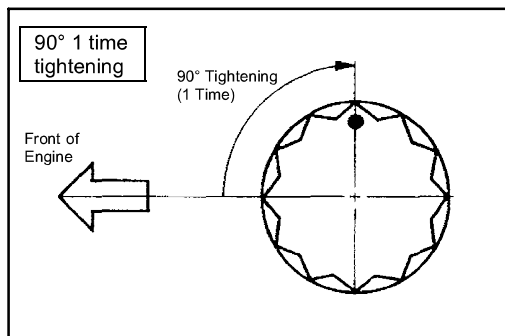
## TORQUE CHART

| STRENGTH CLASS | DIAMETER (mm) | THREAD PITCH (mm) | STANDARD TORQUE (kg/cm)   |   |
|----------------|---------------|-------------------|---|---|
|                |               |                   | Hexagon head bolt  | Hexagon flange bolt  |
| 4T             | 6             | 1.0               | 55  | 60  |
|                | 8             | 1.25              | 130   | 145   |
|                | 10            | 1.25              | 260   | 290   |
|                | 12            | 1.25              | 480   | 540   |
|                | 14            | 1.5               | 760   | 850   |
|                | 16            | 1.5               | 1,150   | --  |
| 5T             | 6             | 1.0               | 65  | --  |
|                | 8             | 1.25              | 160   | --  |
|                | 10            | 1.25              | 330   | --  |
|                | 12            | 1.25              | 600   | --  |
|                | 14            | 1.5               | 930   | --  |
|                | 16            | 1.5               | 1,400   | --  |
| 6T             | 6             | 1.0               | 80  | 90  |
|                | 8             | 1.25              | 195   | 210   |
|                | 10            | 1.25              | 400   | 440   |
|                | 12            | 1.25              | 730   | 810   |
|                | 14            | 1.5               | 1,100   | 1,250   |
| 7T             | 6             | 1.0               | 110   | 120   |
|                | 8             | 1.25              | 260   | 290   |
|                | 10            | 1.25              | 530   | 590   |
|                | 12            | 1.25              | 970   | 1,050   |
|                | 14            | 1.5               | 1,500   | 1,700   |
|                | 16            | 1.5               | 2,300   | --  |



## PRECOATED BOLTS

1. Precoated bolts are bolts that are coated with a seal lock adhesive at the factory.
  - (a) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.
  - (b) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the threads.



## TIGHTENING PLASTIC (STRETCH) BOLTS

1. Instructions
  - There are bolts on the engine that are plastic (stretch) type bolts. The tightening procedure is different than that of normal bolts, so please follow these instructions for tightening.
2. Stretch Bolt Locations
  - Cylinder head bolt
  - Crankshaft bearing clamp bolt
  - Connecting rod bearing clamp bolt
3. After tightening to the specified torque value
  - Tighten all fasteners in sequence 90 degrees, and then tighten another 90 degrees in sequence.

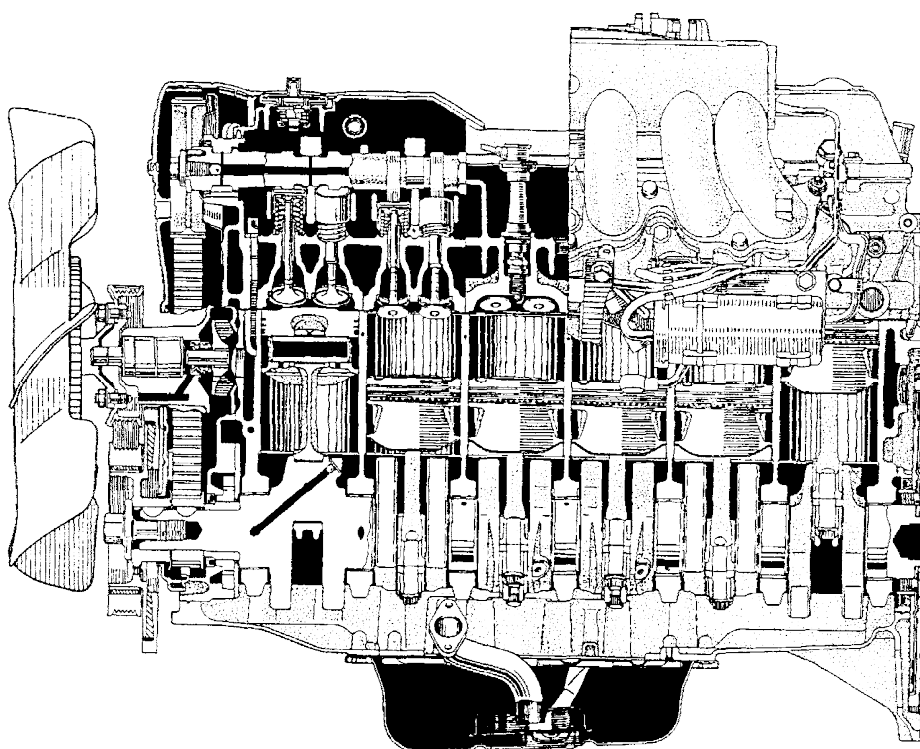
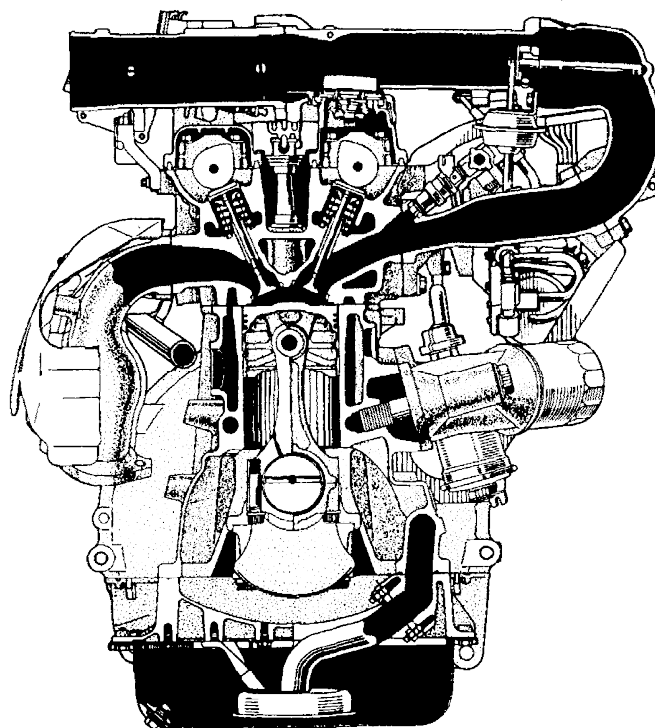


# 1 ENGINE MECHANICAL

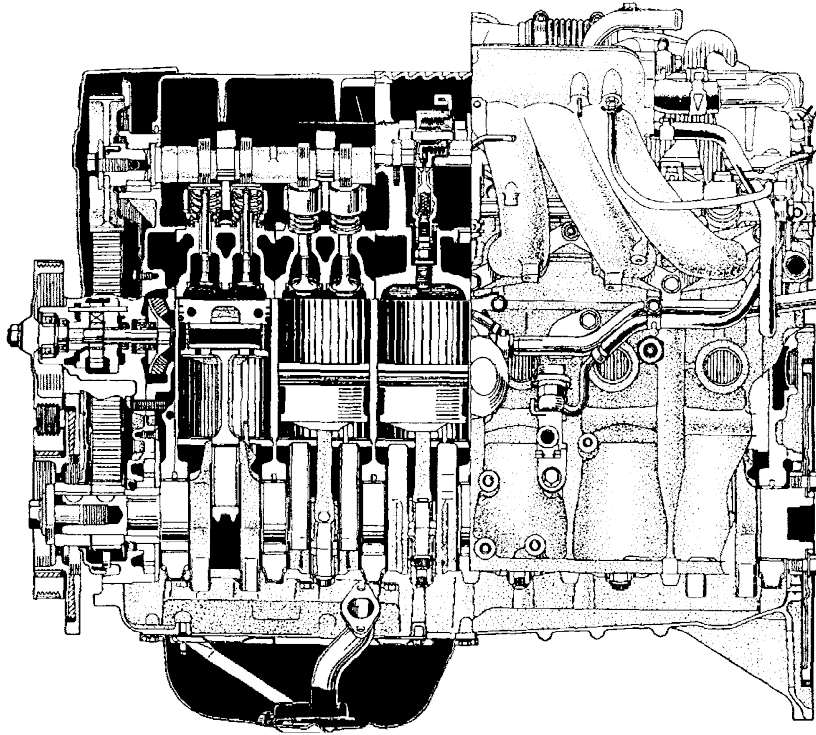
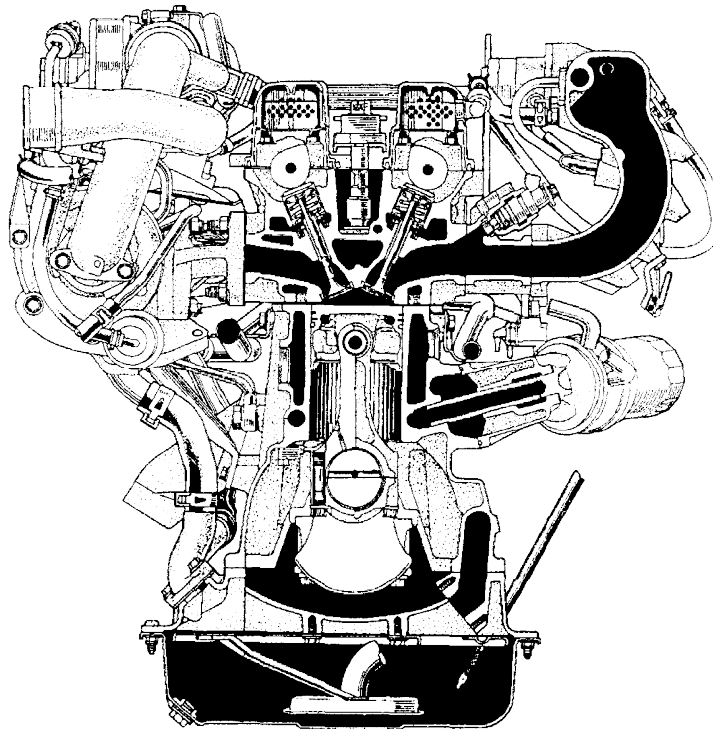
|   |               |
|---|---------------|
| Engine Section .....  | 1 – 2         |
| FIPG (liquefied molded gasket) Handling .....   | 1 – 6         |
| FIPG Application Place .....  | 1 – 7         |
| Quasi-Fixture .....   | 1 – 8         |
| Notice .....  | 1 – 12        |
| <b>Partial Engine .....</b>   | <b>1 – 13</b> |
| Disassembly Block Diagram .....   | 1 – 13        |
| Engine Disassembly .....  | 1 – 19        |
| Timing Belt Removal .....   | 1 – 19        |
| Camshaft Removal .....  | 1 – 22        |
| Cylinder Head Removal .....   | 1 – 22        |
| Water Pump Removal<br>(1JZ-GE, 1JZ-GTE (JZZ30), 2JZ-GE) .....                                     | 1 – 23        |
| Hydraulic Fan Vane Pump W/ Water Pump Removal<br>(1JZ-GTE (Excluding JZZ30), 2JZ-GTE) .....       | 1 – 23        |
| Oil Pump Removal .....  | 1 – 24        |
| Rear Oil Seal Retainer Removal .....  | 1 – 25        |
| Cylinder Head Disassembly .....   | 1 – 26        |
| Cylinder Block Disassembly .....  | 1 – 26        |
| Component Inspection .....  | 1 – 30        |
| Cylinder Head Component Inspection and Repair .....   | 1 – 30        |
| Cylinder Head Inspection and Repair .....   | 1 – 36        |
| Cylinder Block Component Inspection and Repair .....  | 1 – 36        |
| Cylinder Block Inspection and Repair .....  | 1 – 44        |
| Engine Assembly .....   | 1 – 45        |
| Cylinder Block Component Installation .....   | 1 – 45        |
| Cylinder Head Component Installation .....  | 1 – 49        |
| Rear Oil Seal Retainer Installation .....   | 1 – 49        |
| Oil Pump Installation .....   | 1 – 50        |
| Water Pump Installation<br>(1JZ-GE, 1JZ-GTE (JZZ30) , 2JZ-GE) .....                               | 1 – 51        |
| Hydraulic Fan Vane Pump W/ Water Pump Installation<br>(1JZ-GTE (Excluding JZZ30) , 2JZ-GTE) ..... | 1 – 52        |
| Cylinder Head Installation .....  | 1 – 53        |
| Camshaft Installation .....   | 1 – 54        |
| Timing Belt Installation .....  | 1 – 58        |
| Valve Clearance Inspection and Adjustment .....   | 1 – 61        |

## ENGINE SECTION

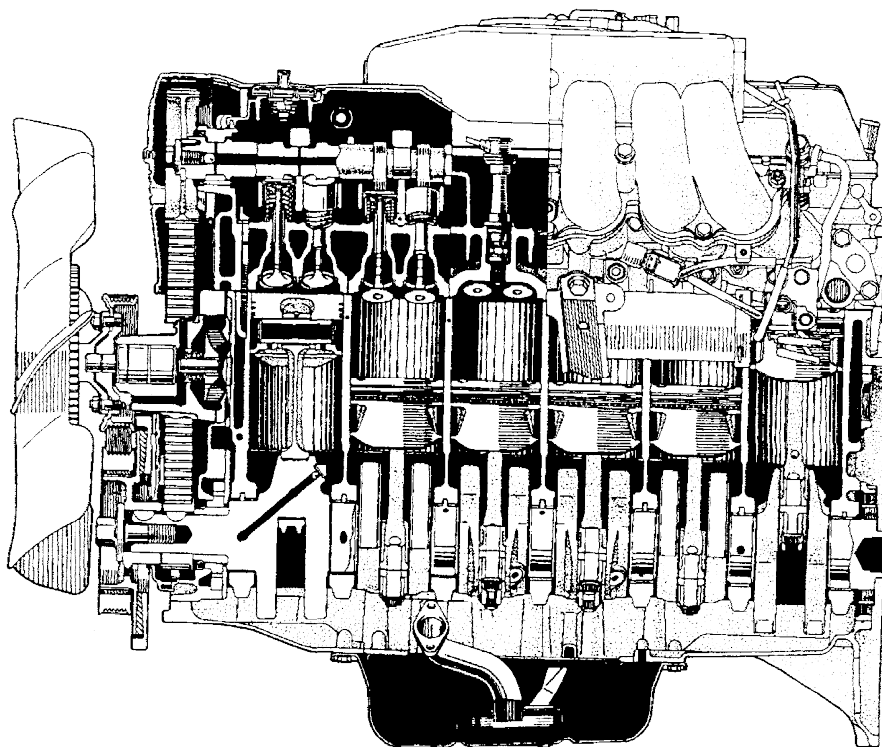
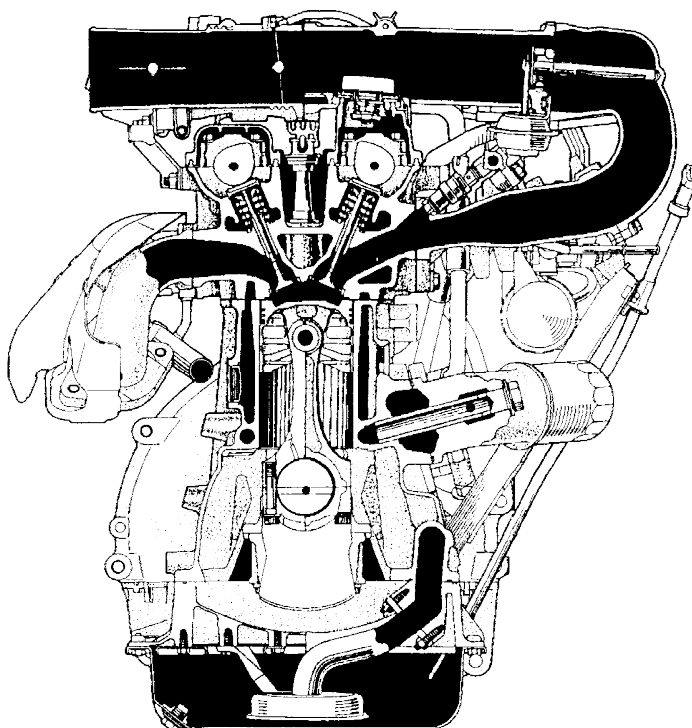
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SECTION

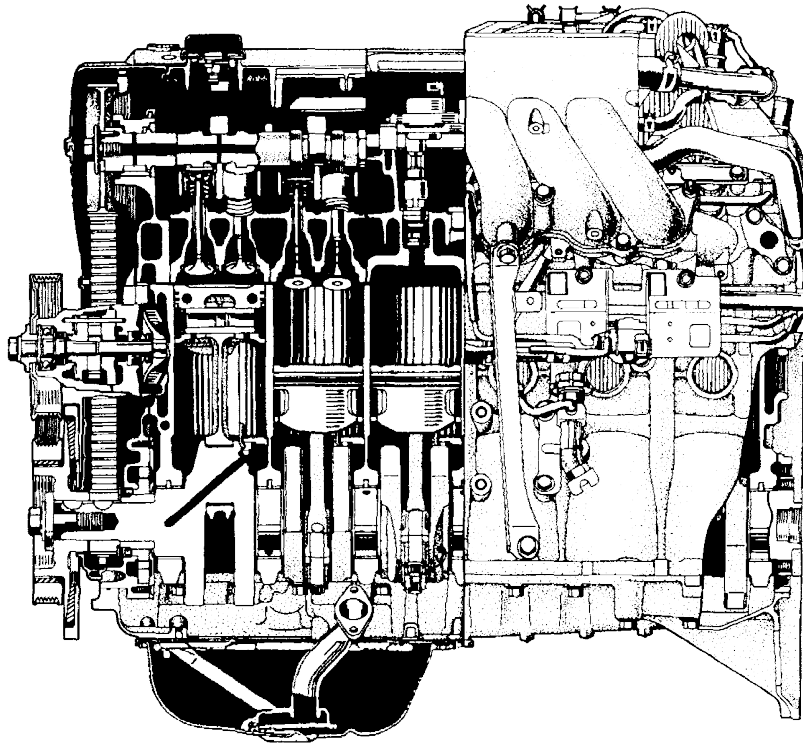
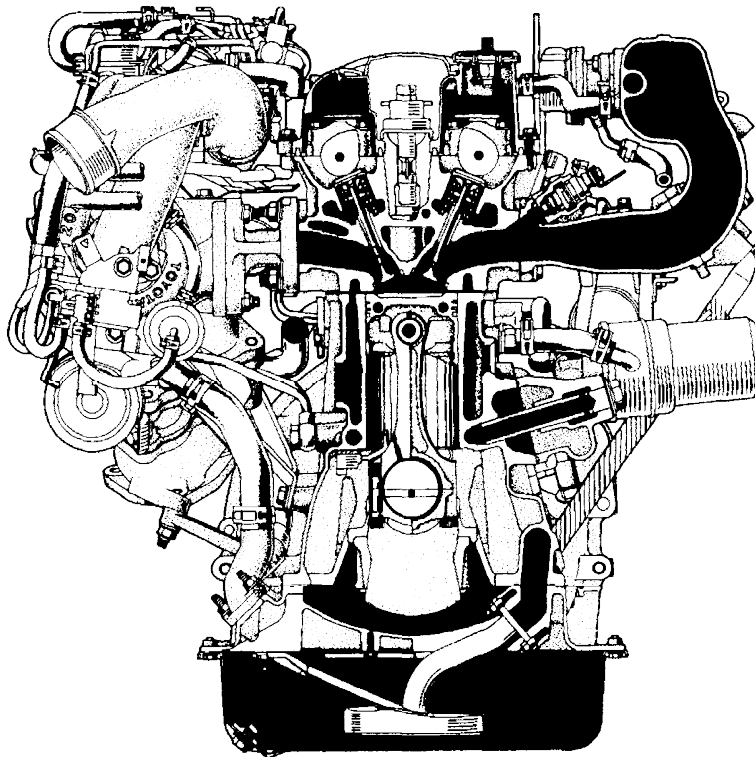
ZS131 (1JZ-GE)

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JZX90 (1JZ-GTE)

LONGITUDINAL  
SECTIONCROSS  
SECTION

JZS133 (2JZ-GE)

LONGITUDINAL  
SECTIONCROSS  
SECTION

JZS147 (2JZ-GTE)



## FIPG (MOLDED LIQUID GASKET) HANDLING

### 1 APPLICATION METHOD AND LOCATION

**CAUTION:** When removing old gasket material, be sure that debris does not contaminate the inside of the engine.

- (1) Clean each part of oil, water, debris, etc before applying.
- (2) FIPG is applied only to the part mating surface.
- (3) Be sure to apply sufficient gasket to coat the entire mating surface, but do not use an excessive amount. Use the correct gasket type according to the table below.
- (4) After positioning the parts, be careful not to move them as the gasket dries.
- (5) Position parts within 5 minutes of gasket application.
- (6) Allow sufficient time for the gasket to cure before exposing it to engine fluids or running the engine.

### 2 APPLICATIONS, FIPG TYPE, AND DRYING TIME

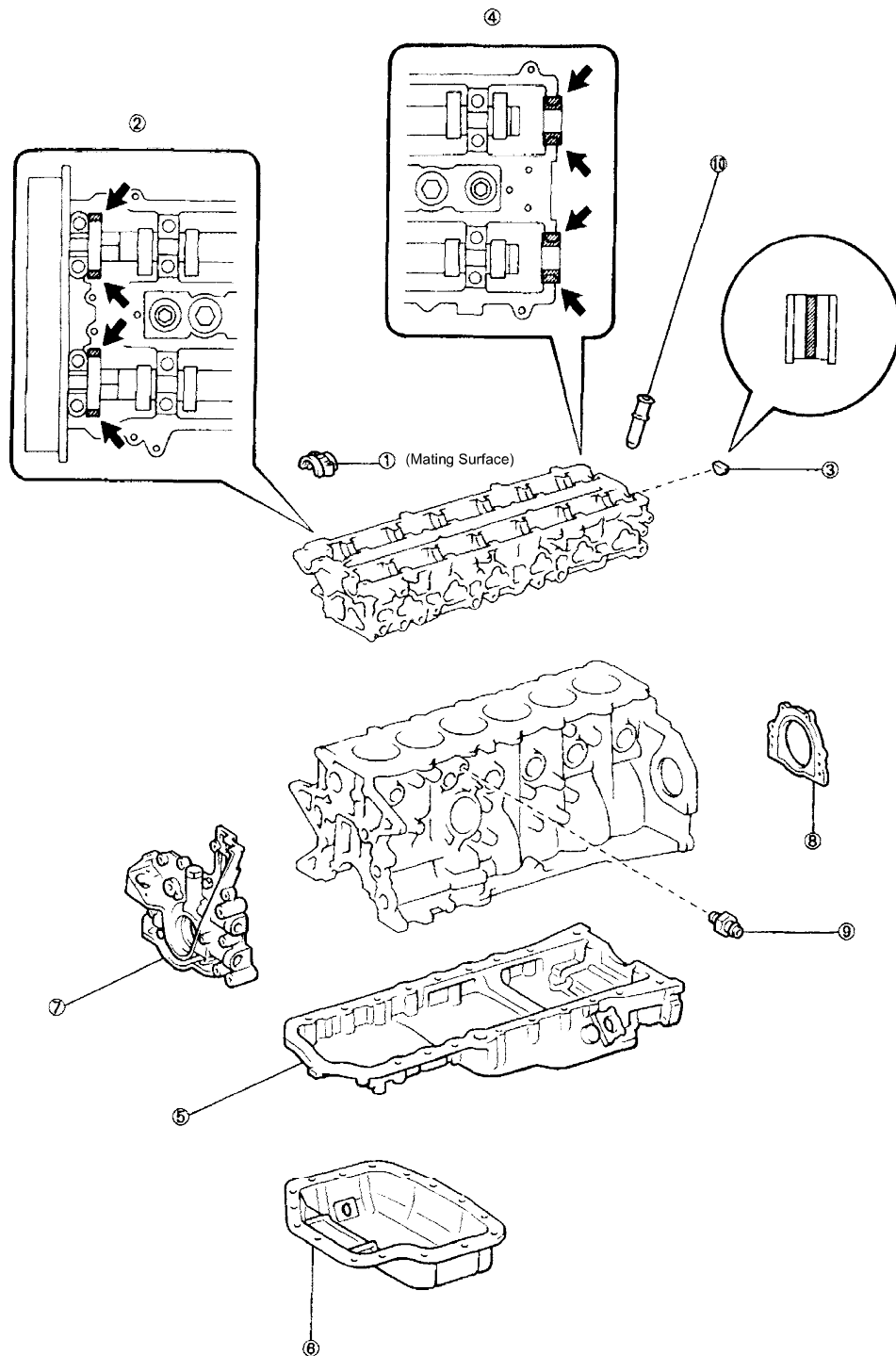
| Fig No. | FIPG Application   | Use FIPG           | Drying Time |
|---------|--|--------------------|-------------|
| ①       | Camshaft Bearing Cap No. 1 X Cylinder Head                     | Seal Packing Black | 2 Hours     |
| ②       | Camshaft Bearing Cap No. 1 Corner X Cylinder Head Cover Gasket |                    |             |
| ③       | Semi-Circular Plug* X Cylinder Head                            |                    |             |
| ④       | Semi-Circular Plug Junction* X Cylinder Head Cover Gasket      |                    |             |
| ⑤       | Oil Pan No. 1 X Cylinder Block                                 |                    |             |
| ⑥       | Oil Pan No. 2 X Oil Pan No. 1                                  |                    |             |
| ⑦       | Oil Pump X Cylinder Block                                      |                    |             |
| ⑧       | Rear Oil Seal Retainer X Cylinder Block                        | Adhesive 1324      | 1 Hour      |
| ⑨       | Union (For Oil Cooler Hose) * X Cylinder Block                 |                    |             |
| ⑩       | Heater Union** X Cylinder Head                                 |                    |             |

\* ..... 1JZ-GTE

\*\* ..... Except 1 JZ-GTE

## FIPG APPLICATIONS

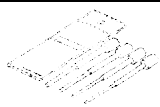
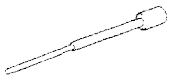
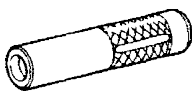
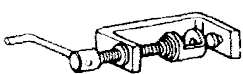
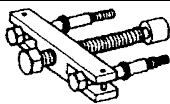

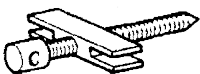


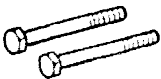



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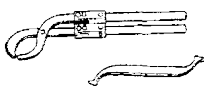

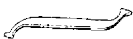
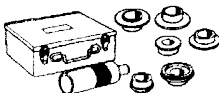
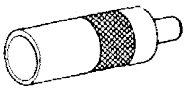



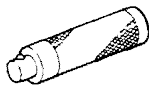


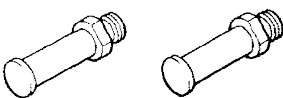
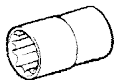




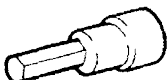
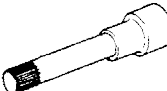




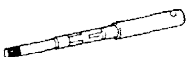

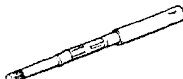


## PREPARATION ITEM

## SST

1

|   |               |  |   |
|---|---------------|--|---|
|    | 09201-10000   | Valve Guide Bushing Remover And Replacer Set |   |
|    | (09201-01060) | Valve Guide Bushing Remover And Replacer 6   | For valve guide bushing removal and installation    |
|    | 09201-41020   | Valve Stem Oil Seal Replacer                 | For valve stem oil seal installation                |
|    | 09202-70010   | Valve Spring Compressor                      | For valve removal and installation                  |
|    | 09213-31021   | Crankshaft Pulley Puller                     | For crankshaft pulley removal                       |
|    | 09213-60017   | Crankshaft Pulley And Gear Puller            |   |
|  | (09213-00020) | Body With Bolt                               | For crankshaft timing pulley removal                |
|  | (09213-00030) | Handle                                       | For crankshaft timing pulley removal                |
|  | (09213-00040) | Attachment Set                               | For crankshaft timing pulley removal                |
|  | (09213-00050) | Bolt Set                                     | For crankshaft timing pulley removal                |
|  | 09213-70010   | Crankshaft Pulley Holding Tool               |   |
|  | (90105-08076) | Bolt   | For crankshaft pulley fixing                        |
|  | 09222-30010   | Connecting Rod Bushing Remover And Replacer  | For connecting rod bushing removal and installation |

|   |               |  |   |
|---|---------------|--|---|
|    | 09223-15030   | Oil Seal And Bearing Press                 | For engine rear oil seal installation   |
|    | 09248-55040   | Valve Lifter Press And Stopper             |   |
|    | (09248-05410) | Valve Lifter Press                         | For valve clearance adjustment  |
|    | (09248-05420) | Valve Lifter Stopper                       | For valve clearance adjustment  |
|    | 09316-60010   | Transmission And Transfer Bearing Replacer |   |
|    | (09316-00010) | Replacer Pipe                              | For camshaft oil seal and crankshaft front oil seal installation  |
|    | (09316-00050) | Replacer D                                 | For camshaft oil seal installation  |
|  | 09330-00021   | Companion Flange Holding Tool              | For holding crankshaft pulley   |
|  | 09608-30022   | Freon Hub Replacer Set                     |   |
|  | (09608-05010) | Handle                                     | For valve guide bushing removal and installation<br>For crankshaft rear oil seal installation<br>※ (length 100mm) |
|  | 09960-10010   | Variable Pin Wrench Set                    |   |
|  | (09962-01000) | Variable Pin Wrench Arm ASSY               | For hydraulic motor vane pump pulley removal and re-installation (1JZ-GTE, 2JZ-GTE)                               |
|  | (09963-01000) | Pin 10                                     | For hydraulic motor vane pump pulley other version (1JZ-GTE, 2JZ-GTE)   |
| TOOL  |               |  |   |
|  | 09011-38121   | Socket Wrench (12mm)                       | For connecting rod bolt removal and installation  |

|   |               |   |   |
|---|---------------|---|---|
|    | 09032-00100   | Gasket Seal Cutter                                    | For oil pan No. 2 removal                       |
|    | 09040-00010   | Hexagon Wrench Set                                    |   |
|    | (09043-20100) | Socket Hexagon Wrench 10                              | For timing belt idler removal and installation  |
|    | 09043-50100   | Double Hexagon 10 Wrench                              | For cylinder head bolt removal and installation |
|    | Z-202         | Piston Ring Tool<br>(Handling) Banzai Treatment       | For piston ring removal and installation        |
|    | RC-25         | Piston Ring Compressor<br>(Handling) Banzai Treatment | For piston installation                         |
|   | TB-524        | Valve Seat Cutter Set<br>(Handling) Banzai Treatment  |   |
|  | (N-230)       | Cutter Head 30° X 45°<br>(Handling) Banzai Treatment  | For intake and exhaust valve seat repair        |
|  | (N-150-6.0)   | Pilot Stem<br>(Handling) Banzai Treatment             | For intake and exhaust valve seat repair        |
|  | (N-125)       | Cutter Head 75°<br>(Handling) Banzai Treatment        | For intake and exhaust valve seat repair        |
|  | (N-120-6.0)   | Pilot Stem<br>(Handling) Banzai Treatment             | For intake and exhaust valve seat repair        |
|  | (N-505)       | T Type Wrench<br>(Handling) Banzai Treatment          | For intake and exhaust valve seat repair        |
|  | (N-503-1)     | T Type Wrench Adapter<br>(Handling) Banzai Treatment  | For intake and exhaust valve seat repair        |
| Hexagon stick wrench (5mm)  |               |   | For part removal and installation               |
| Hexagon stick wrench (1.27mm)   |               |   | For timing belt tensioner installation          |



## METER

|   |  |
|---|--|
| Straight Edge Ruler                       | For distortion measurement               |
| Square                                    | For compression spring check             |
| Micrometer (0-25, 25-50, 50-75, 75-100mm) | For part measurement                     |
| Caliper Gauge                             | For part measurement                     |
| Dial Gauge                                | For part measurement                     |
| Pressure Gauge                            | For oil clearance measurement            |
| Cylinder Gauge (75-100mm)                 | For cylinder inside diameter measurement |

## OIL AND GREASE ETC

|   |   |
|---|---|
| Black Seal Packing                                | For part application                                      |
| Adhesive 1324                                     | For part application                                      |
| Engine Oil  | For part lubrication<br>For part application              |
| CASL And MP Grease No. 2                          | For part lubrication                                      |
| Red Lead Primer                                   | For valve inspection                                      |
| Dyeing Permeable Flaw Detection Agent (Red Check) | For checking for cylinder head cracks                     |
| Paint   | For plastic (stretch) bolt marking                        |
| Piston Heater                                     | For piston removal and installation                       |
| Compound (Extra Fine Detail)                      | For valve seat adjustment                                 |
| Chalk   | For timing belt rotation direction entry                  |
| Piece of Wood                                     | For heater union installation<br>For oil seal replacement |

## ※.....AVAILABLE SHAPED HANDLE SST

| Part Number (Handle) | Parent Part Number | Length (mm) | Part Number (Handle) | Parent Part Number | Length (mm) |
|----------------------|--------------------|-------------|----------------------|--------------------|-------------|
| 09252•10010          | 09250•10011        | 88          | 09608-06020          | 09608-35014        | 158         |
| 09252-10010          | 09550•10012        | 88          | 09550-05020          | 09550•55010        | 208         |
| 09550-00020          | 09550•22011        | 158         | 09608•03020          | 09608•20012        | 208         |
| 09552-10010          | 09550•10012        | 158         | 09631-00020          | 09620-30010        | 208         |
| 09608•00020          | 09608-12010        | 158         | 09631•00020          | 09630-00012        | 208         |
| 09608-04020          | 09608-30012        | 158         | 09631•12020          | --                 | 358         |

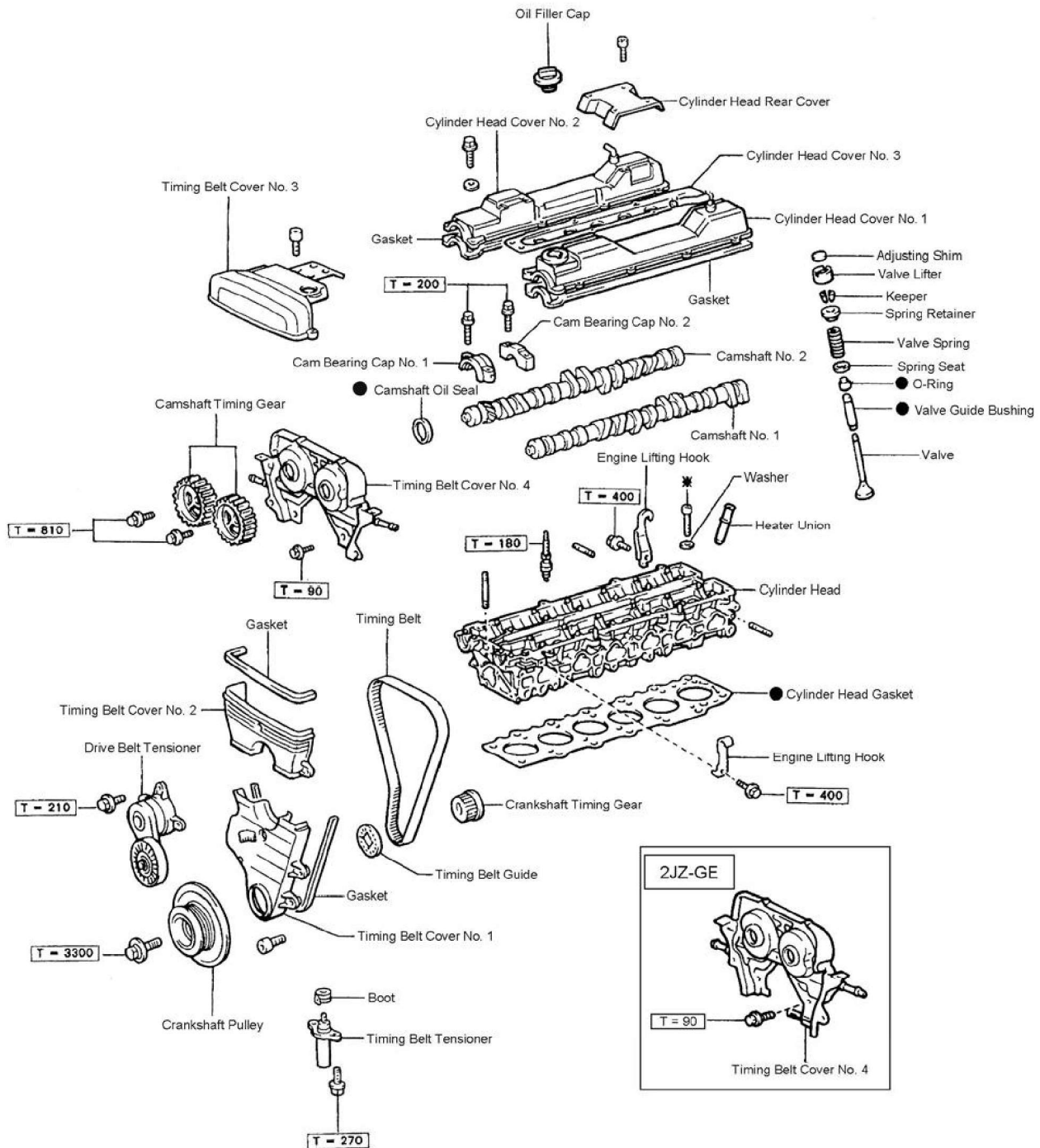
## NOTES

- 1 Engine overhaul is performed after attaching the engine to an engine work stand.
- 2 The removed parts are arranged and tidied up in the order of removal.
- 3 Each part should be sufficiently cleaned before installation.
- 4 During assembly, apply motor oil to moving parts.
- 5 Replace non-reusable parts such as gaskets and seals with new ones.
- 6 Before applying gasket maker, use a solvent to wash the area.

# PARTIAL ENGINE ASSEMBLY BLOCK DIAGRAM

1JZ-GE, 2JZ-GE

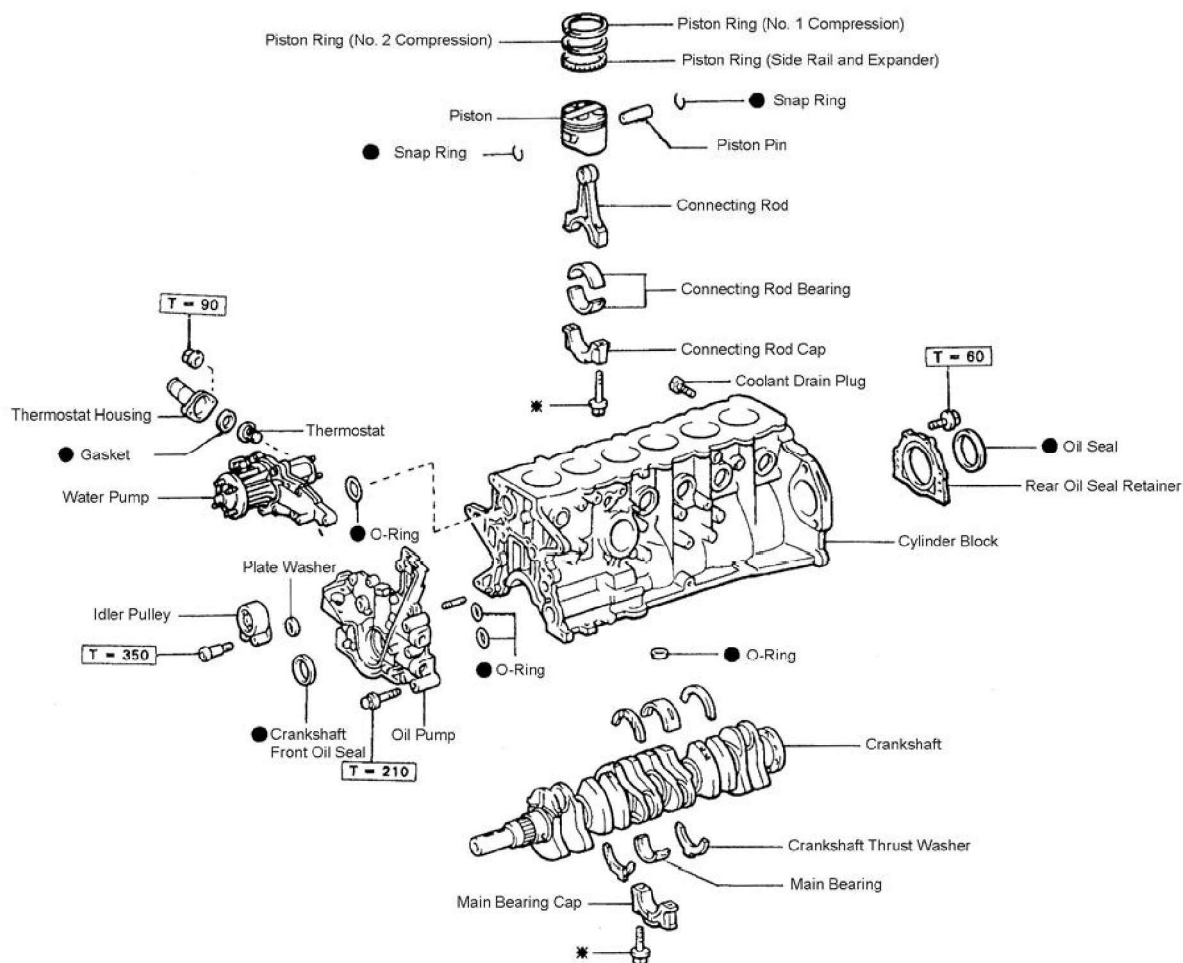
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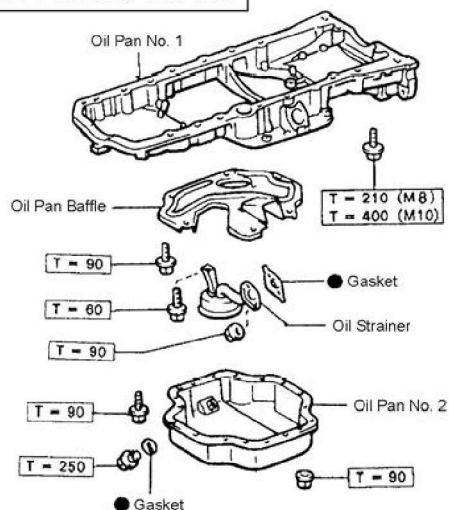
※.....Plastic Bolt

●.....Non-Reusable Part

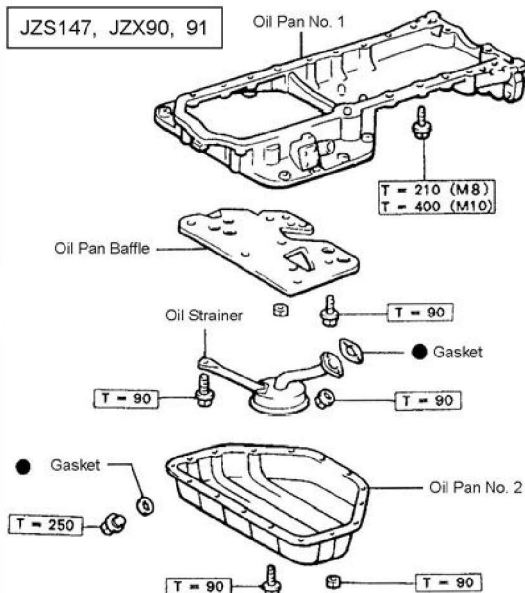
.....Torque Specification (kg \* cm)



JZS130G, 131, 141, 143, 145, 149



JZS147, JZX90, 91



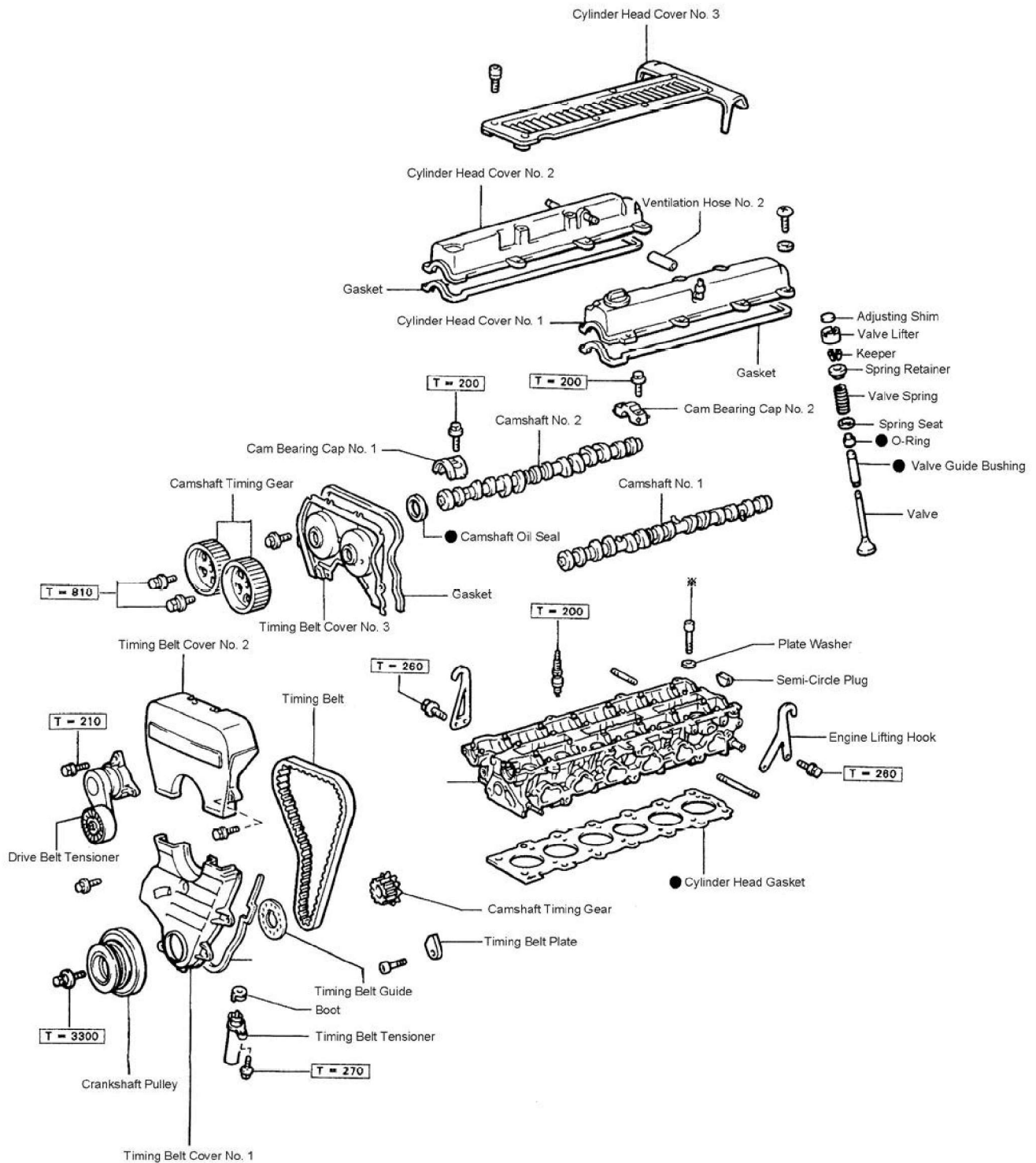
※.....Plastic Bolt

●.....Non-Reusable Part

..... Torque Specification (kg \* cm)

1JZ-GTE

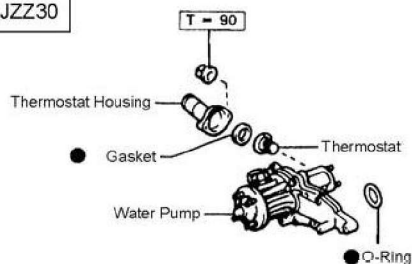
1



※..... Plastic Bolt

●..... Non-Reusable Part ..... Torque Specification (kg \* cm)

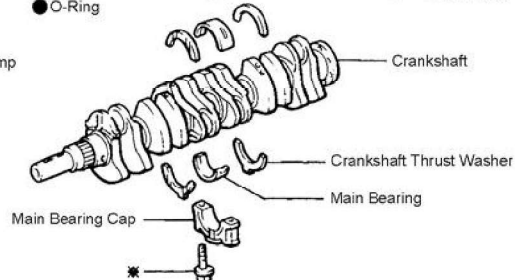
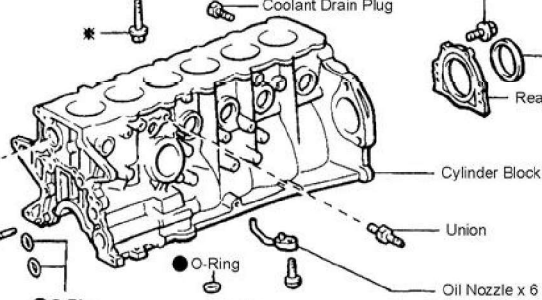
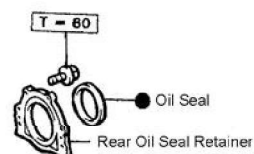
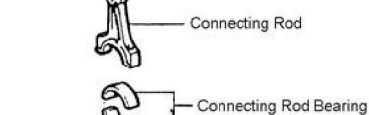
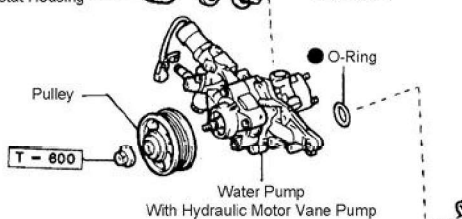
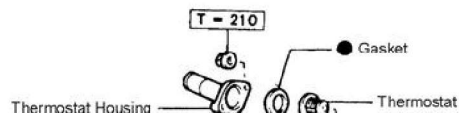
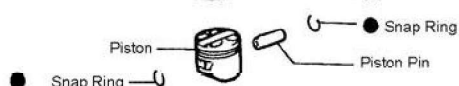
JZZ30



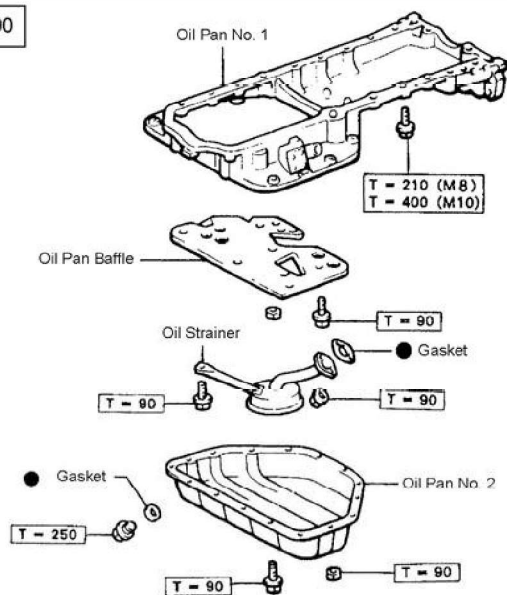
Piston Ring (No. 2 Compression)

Piston Ring (No. 1 Compression)

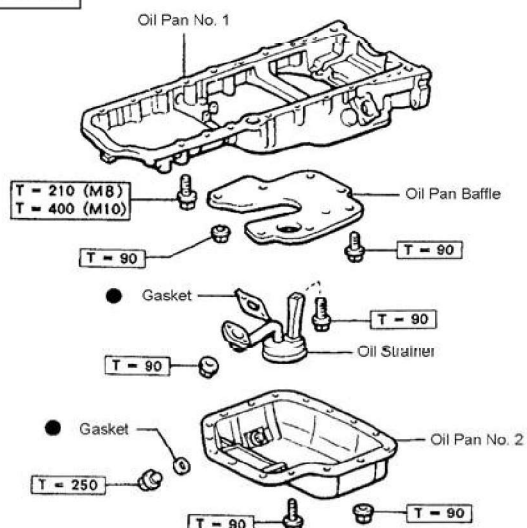
Piston Ring (Side Rail and Expander)



JZX90



JZA70, JZZ30



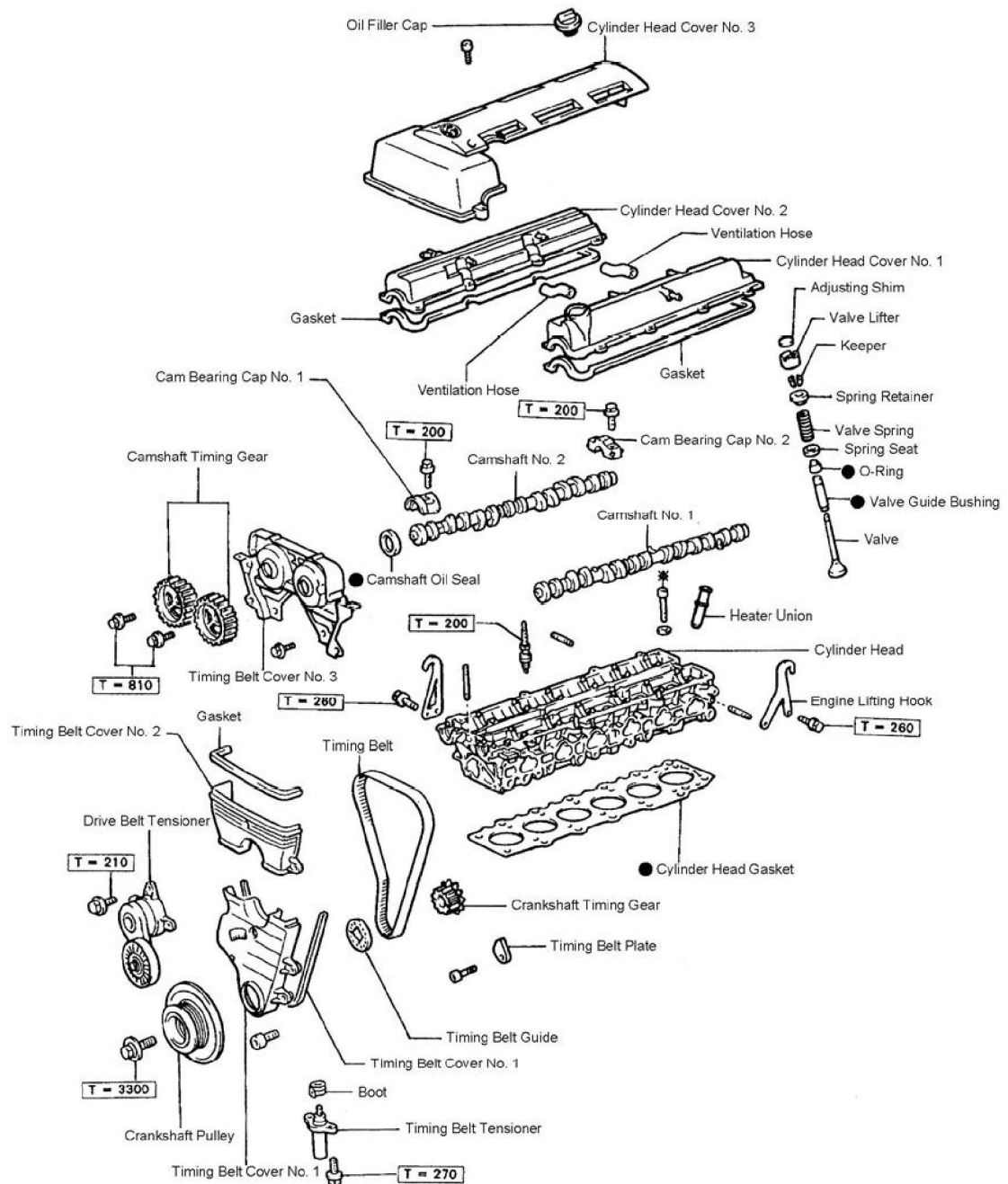
※.....Plastic Bolt

●.....Non-Reusable Part

.....Torque Specification (kg \* cm)

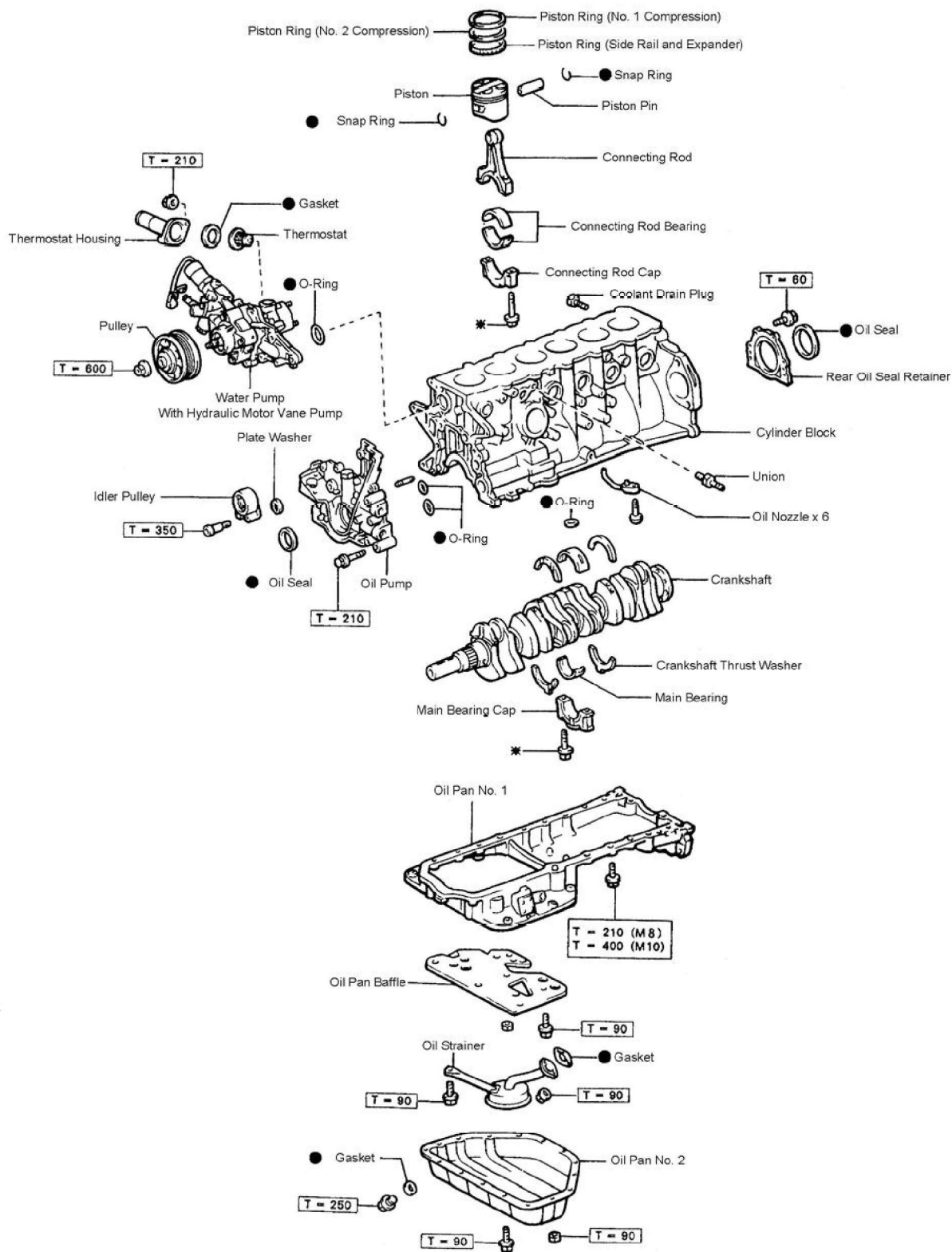
2JZ-GTE

1



※.....Plastic Bolt

●.....Non-Reusable Part  .....Torque Specification (kg \* cm)



※.....Plastic Bolt

●.....Non-Reusable Part

.....Torque Specification (kg \* cm)



## ENGINE DISASSEMBLY

### TIMING BELT REMOVAL

#### 1 REMOVE TIMING BELT COVER NO. 3

1JZ-GE, 2JZ-GE

- (1) Remove the Oil Filler Cap.
- (2) Remove the six bolts using a 5mm hexagon wrench. Remove Timing Belt Cover No. 3.

1JZ-GTE

- (1) Remove the eight bolts using a 5mm hexagon wrench. Remove Cylinder Head Cover No. 3

2JZ-GTE

- (1) Remove the Oil Filler Cap.
- (2) Remove the ten bolts using a 5mm hexagon wrench. Remove Timing Belt Cover No. 3.

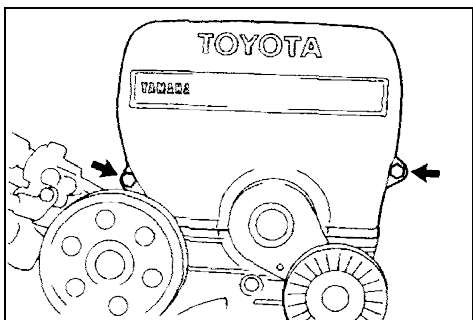
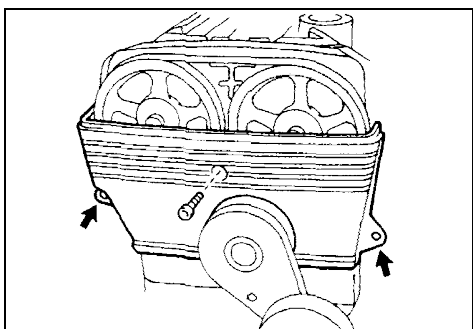
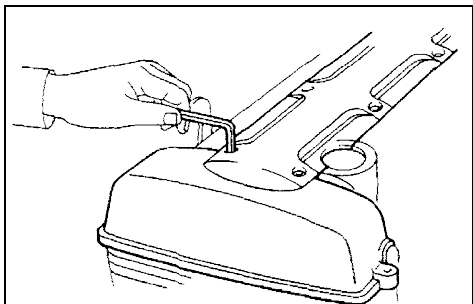
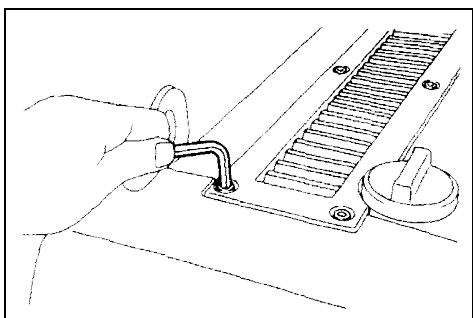
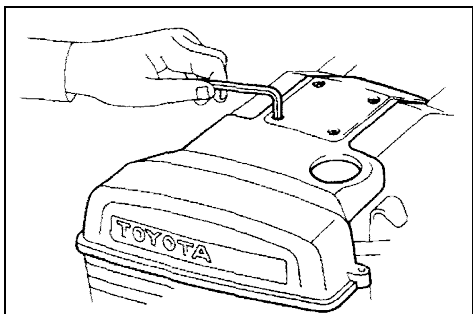
#### 2 REMOVE TIMING BELT COVER NO. 2

1JZ-GE, 2JZ-GE, 2JZ-GTE

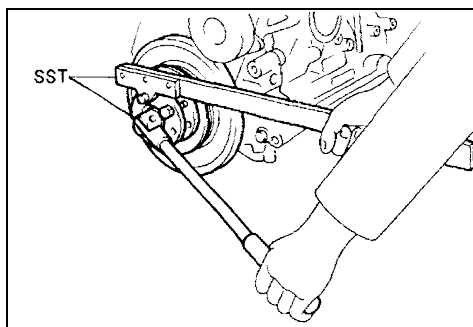
- (1) Remove the three bolts using a 5mm hexagon wrench. Removing Timing Belt Cover No. 2.

1JZ-GTE

- (1) Remove the two bolts. Remove Timing Belt Cover No. 2.



1

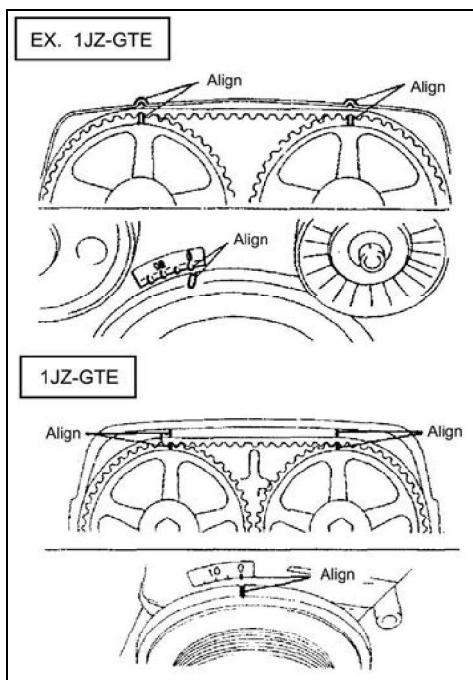


### 3 REMOVE CRANKSHAFT PULLEY

- (1) Using the SST, loosen the crankshaft pulley bolt.

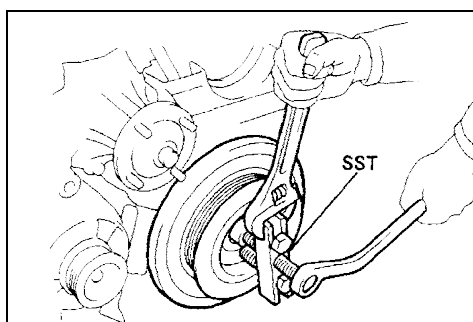
SST 09213-70010 09330-00021 90105-08076

HINT: Since the bolt torque is large, a steel pipe etc may need to be used to loosen the bolt.



- (2) Rotate the crankshaft until the No. 1 cylinder is at compression top dead center.

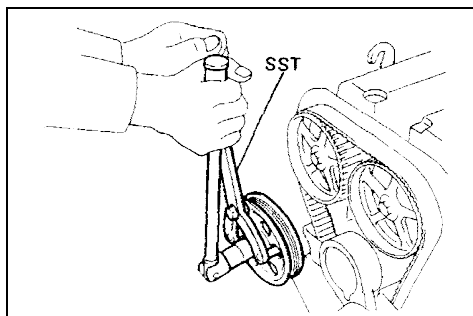
- (3) Remove SST and crankshaft pulley bolt.



- (4) Remove the crankshaft pulley by hand.

HINT: Use the SST if the pulley cannot be removed by hand.

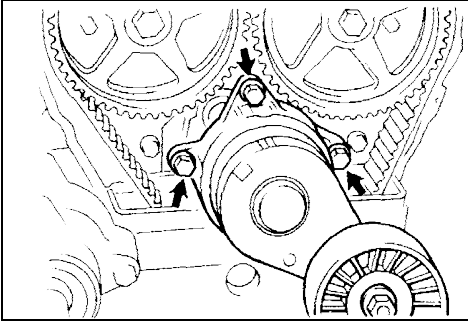
SST 09213-31021



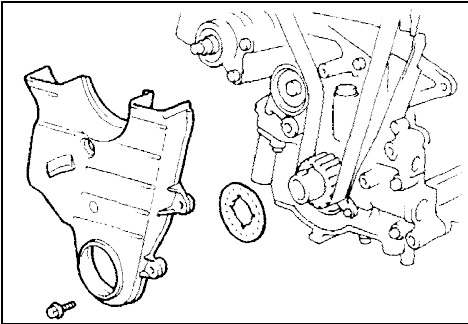
### 4 REMOVE HYDRAULIC VANE PUMP PULLEY (1JZ-GTE (EX. JZZ30), 2JZ-GTE)

- (1) Using the SST, remove the pulley from the vane pump.

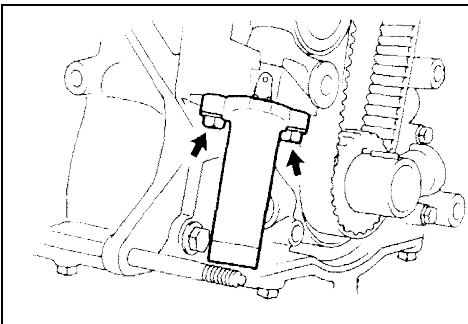
SST 09962-01000 09963-01000

**5 REMOVE DRIVE BELT TENSIONER**

- (1) Remove the three bolts holding the tensioner to the cylinder head. Remove the tensioner.

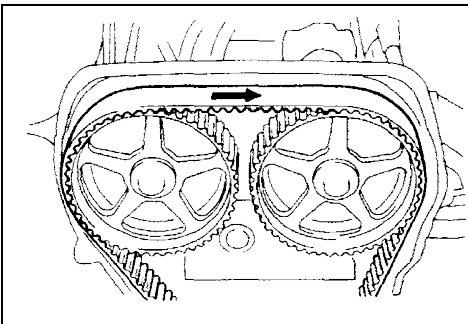
**6 REMOVE TIMING BELT COVER NO. 1**

- (1) Remove the five bolts holding the cover to the oil pump. Remove Timing Belt Cover No. 1.

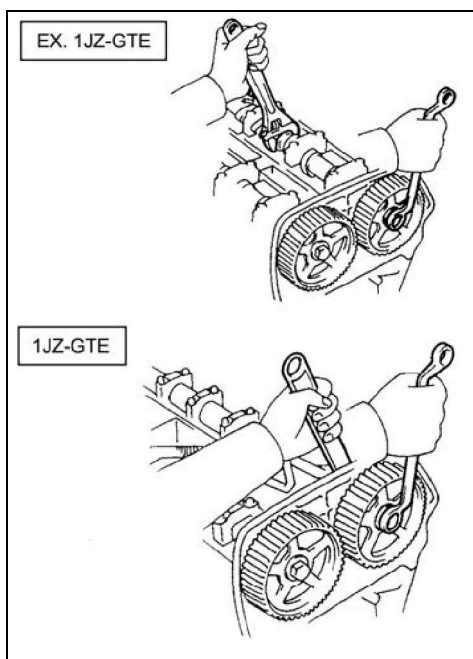
**7 REMOVE TIMING BELT GUIDE****8 REMOVE TIMING BELT TENSIONER**

- (1) Alternately loosen the two bolts. Remove the tensioner.

NOTICE: Do not install the tensioner with the rod extended.

**9 REMOVE TIMING BELT**

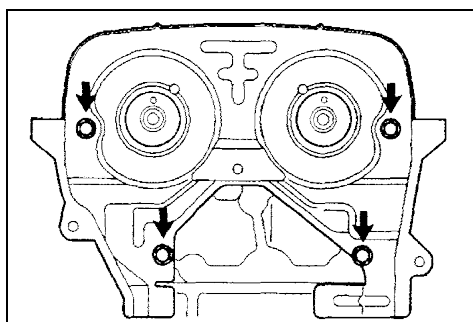
- (1) If re-using the belt, mark the back of the belt with chalk to ensure that the belt is re-installed in the same direction.
- (2) Remove the belt from the pulleys.



## 1 REMOVE CYLINDER HEAD COVER AND GASKET

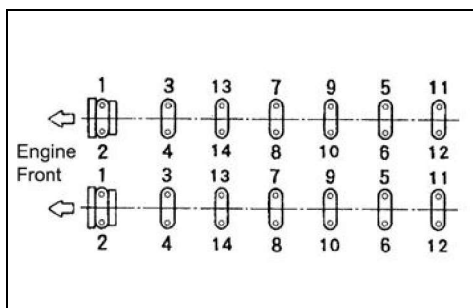
## 2 REMOVE CAMSHAFT TIMING PULLEY

- (1) Using an adjustable hexagon wrench, hold the camshaft from turning. Remove the camshaft pulley bolt.
- (2) Remove the camshaft pulley.



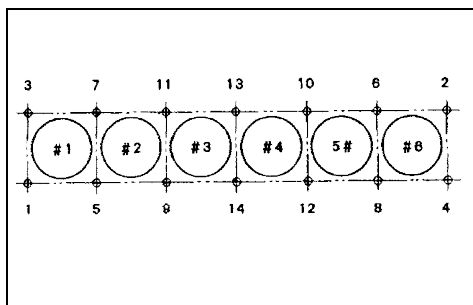
## 3 TIMING BELT COVER NO. 4 REMOVAL (EX. 1JZ-GTE) TIMING BELT COVER NO. 3 REMOVAL (1JZ-GTE)

- (1) Remove the four bolts holding the cover to the cylinder head. Remove the cover.



## 4 REMOVE CAMSHAFT

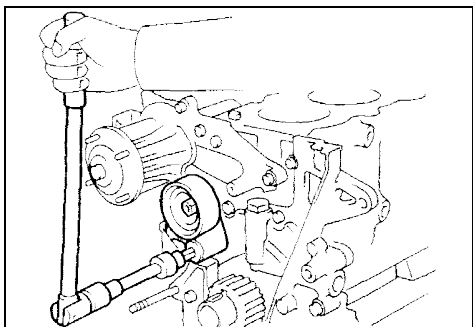
- (1) Alternately loosen the bolts on each side of the cam bearing caps in the order shown in the figure.
- (2) Remove the cam bearing caps.
- (3) Remove the camshafts and oil seals.



## CYLINDER HEAD REMOVAL

## 1 REMOVE CYLINDER HEAD

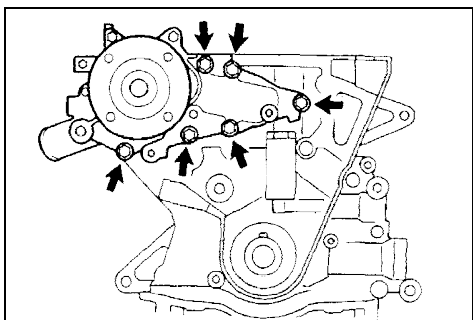
- (1) Using a double hexagon 10 wrench, alternately loosen the head bolts in the order shown in the figure.
- (2) Remove the head bolts and plate washers.
- (3) Remove the cylinder head.

**WATER PUMP REMOVAL**

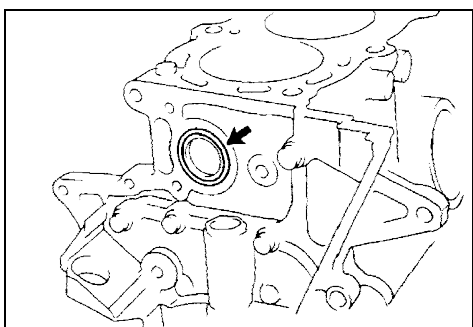
(1JZ-GE, 1JZ-GTE (JZZ30), 2JZ-GE)

**1 REMOVE TIMING BELT IDLER**

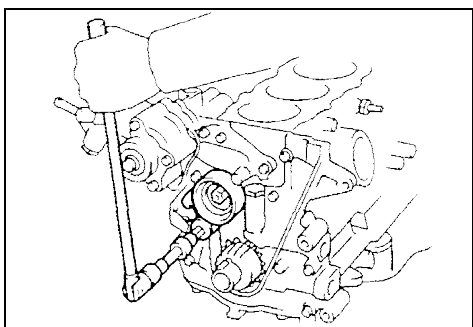
- (1) Remove the bolt using hexagon wrench 10, and remove the idler and plate washer.

**2 REMOVE WATER PUMP**

- (1) Remove the six bolts holding the water pump to the cylinder block. Remove the water pump.



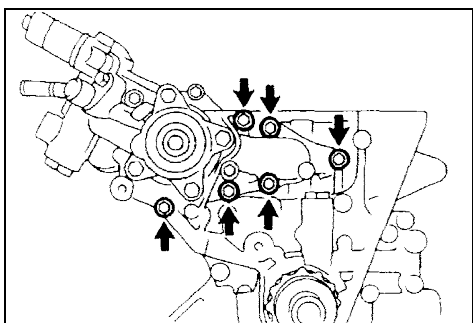
- (2) Remove the O-Ring from the cylinder block.

**WATER PUMP W/ HYDRAULIC VANE PUMP REMOVAL**

(1JZ-GTE (EX. JZZ30), 2JZ-GTE)

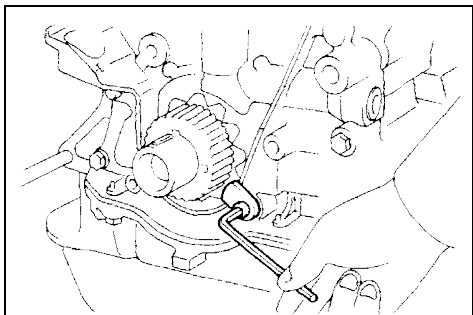
**1 REMOVE TIMING BELT IDLER**

- (1) Remove the bolt using hexagon wrench 10, and remove the idler and plate washer.

**2 REMOVE WATER PUMP W/ HYDRAULIC VANE PUMP**

- (1) Remove the six bolts holding the water pump to the cylinder block. Remove the water pump.

1

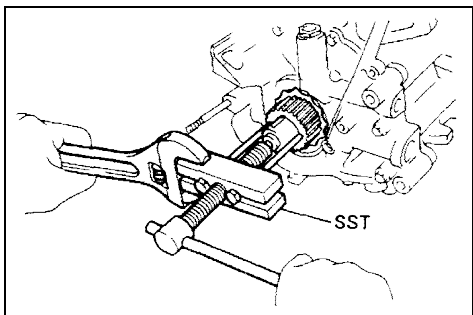


## OIL PUMP REMOVAL

## 1 REMOVE TIMING BELT PLATE

(1JZ-GTE, 2JZ-GTE)

- (1) Remove the bolt using a 5mm hexagon wrench. Remove the timing belt plate.

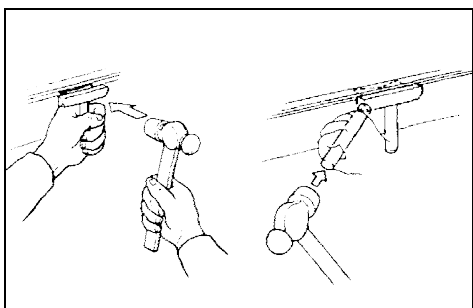


## 2 REMOVE CRANKSHAFT TIMING PULLEY

- (1) Remove the crankshaft timing pulley by hand.

HINT: If the pulley cannot be removed by hand, use the SST.

|     |             |             |             |
|-----|-------------|-------------|-------------|
| SST | 09213-00020 | 09213-00030 | 09213-00040 |
|     | 09213-00050 |             |             |

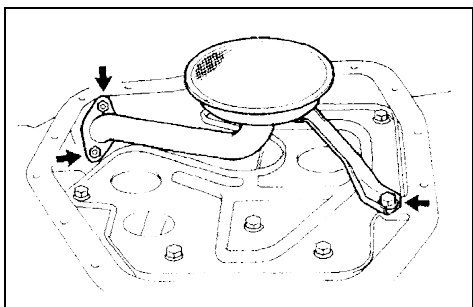


## 3 REMOVE OIL PAN NO. 2

- (1) Remove 16 bolts and two nuts (EX JZA70, JZZ30) or 14 bolts and two nuts (JZA70, JZZ30).
- (2) Use a gasket cutter and push bar to remove Oil Pan No. 2.

**NOTICE:**

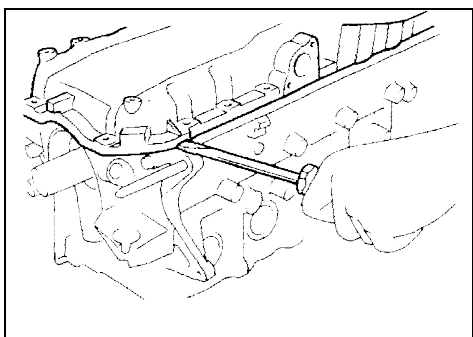
- Be careful not to damage the No. 2 oil pan contact surface of the No. 1 oil pan.
- Be careful not to damage the oil pan flange.



## 4 REMOVE OIL STRAINER

- (1) Remove the bolt and two nuts. Remove the oil strainer.
- (2) Remove the gasket.

## 5 REMOVE OIL PAN BAFFLE

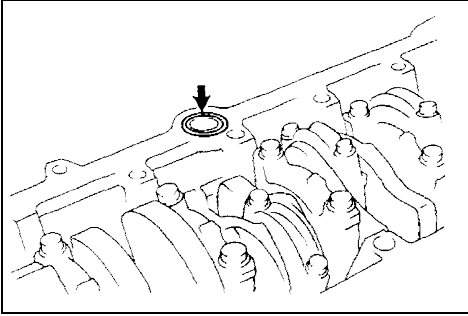


## 6 REMOVE OIL PAN NO. 1

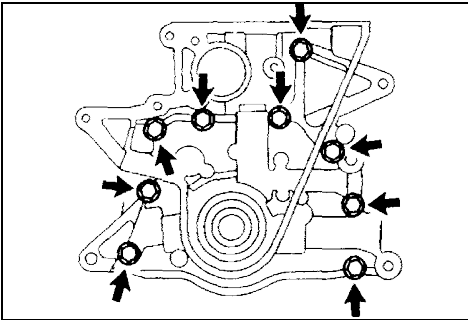
- (1) Remove the 22 bolts.
- (2) Remove the No.1 oil pan by prying the portions between the cylinder block and No.1 oil pan with a screwdriver.

**NOTICE:**

- Be careful not to damage the contact surfaces of the cylinder block and No.1 oil pan.

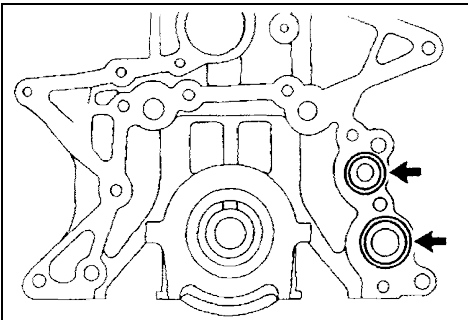


- (3) Remove the O-Ring from the cylinder block.

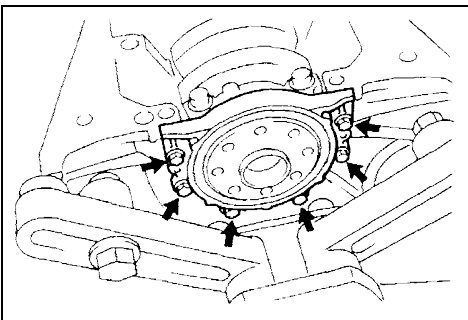


## 7 REMOVE OIL PUMP

- (1) Remove the nine bolts holding the oil pump to the cylinder block.  
Remove the oil pump.



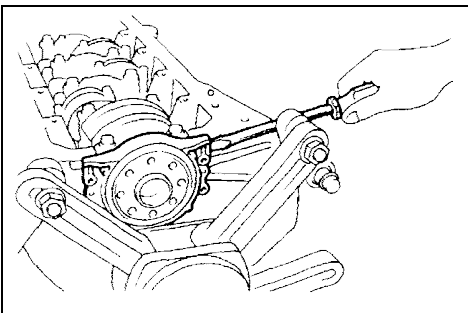
- (2) Remove the two O-Rings from the cylinder block.



## REAR OIL SEAL RETAINER REMOVAL

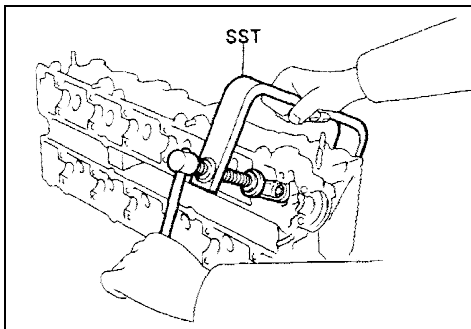
### 1 REMOVE REAR OIL SEAL RETAINER

- (1) Remove the six bolts.



- (2) Remove the rear oil seal retainer by prying in the notches between the retainer and cylinder block with a screwdriver.

1



## CYLINDER HEAD DISASSEMBLY

## 1 REMOVE ENGINE LIFTING HOOKS

## 2 REMOVE VALVE LIFTERS AND ADJUSTING SHIMS

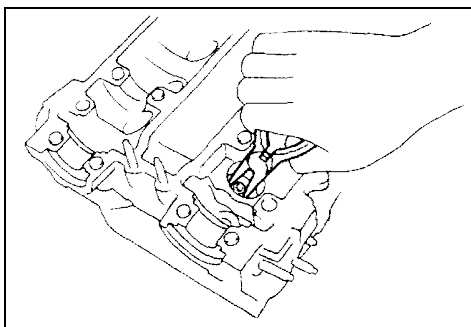
## 3 REMOVE VALVES

- (1) Using SST, compress the valve spring and remove the 2 keepers.

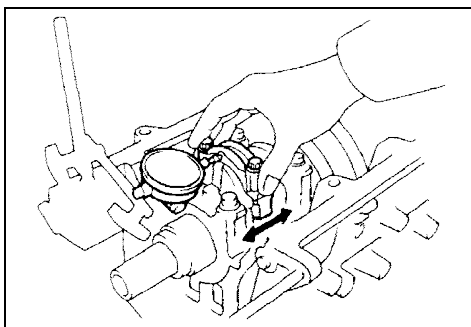
SST

09202-70020

- (2) Remove the spring retainer, valve spring, valve and spring seat.



## 4 REMOVE VALVE STEM OIL SEALS



## CYLINDER BLOCK DISASSEMBLY

## 1 CHECK CONNECTING ROD THRUST CLEARANCE

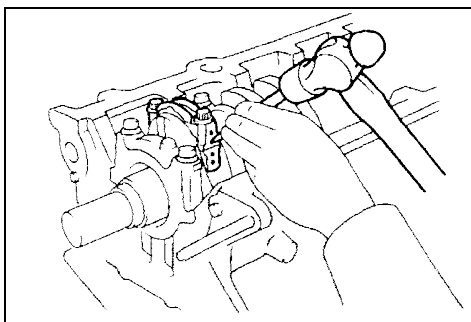
- (1) Using a dial indicator, measure the thrust clearance while moving the connecting rods back and forth.

**Standard thrust clearance: 0.250 – 0.402 mm**

**Maximum thrust clearance: 0.50 mm**

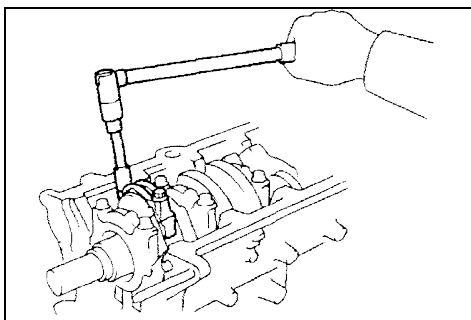
If the thrust clearance is greater than maximum, replace the connecting rod assembly(s). If necessary, replace the crankshaft.

**Connecting rod thickness: 25.898 – 25.950 mm**



## 2 CHECK CONNECTING ROD BEARING OIL CLEARANCE

- (1) If matchmarks are not present on rod and cap, mark each rod and cap with the cylinder No. using a center punch.



- (2) Use a 12mm socket wrench to remove the two connecting rod bolts.