

## SECTION 11A

# ENGINE

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### 4G6 ENGINE

#### General

The servicing information specified below accompanies changes to the 4G63-MPI-T/C engine installed on the new Lancer Evolution VIII. Other servicing information remains the same.

- The crank angle sensor and O<sub>2</sub> sensor connector have been changed
- The timing belt front cover is now split into 2

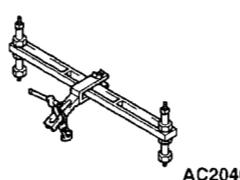
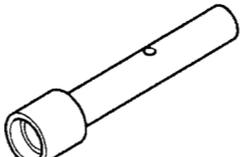
#### Sealants

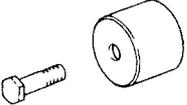
Location	Name
Rocker cover	Semi-dry sealant: Three Bond 1207D (MZ100168) (contains 150g)
Rocker cover gasket	
Cylinder head	
Camshaft end seal	Semi-dry sealant: Three Bond 1211 (MZ100057) (contains 100g)
Camshaft position sensor support	Semi-dry sealant: Three Bond 1207F (MZ100191) (contains 150g)

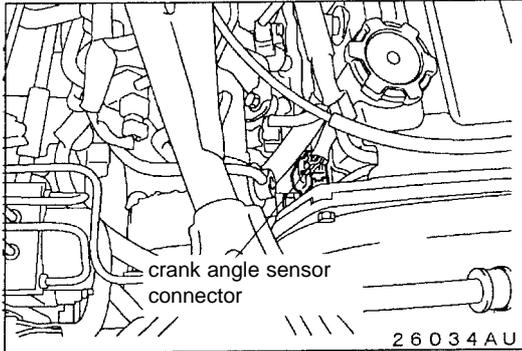
#### Note

( ) are original products

#### Special Tools

Tool	Number	Name	Function
 AC204024	MD998772	Valve spring compressor	Valve spring compression
	MD998737	Valve stem seal installer	Valve seal stem installation

Tool	Number	Name	Function
	MD998713	Camshaft Oil seal Installer	Camshaft oil seal insertion



## ENGINE ADJUSTMENT

### 1. Checking compression pressure

The crank angle sensor connector position has been changed.

## CAMSHAFT, VALVE STEM SEAL

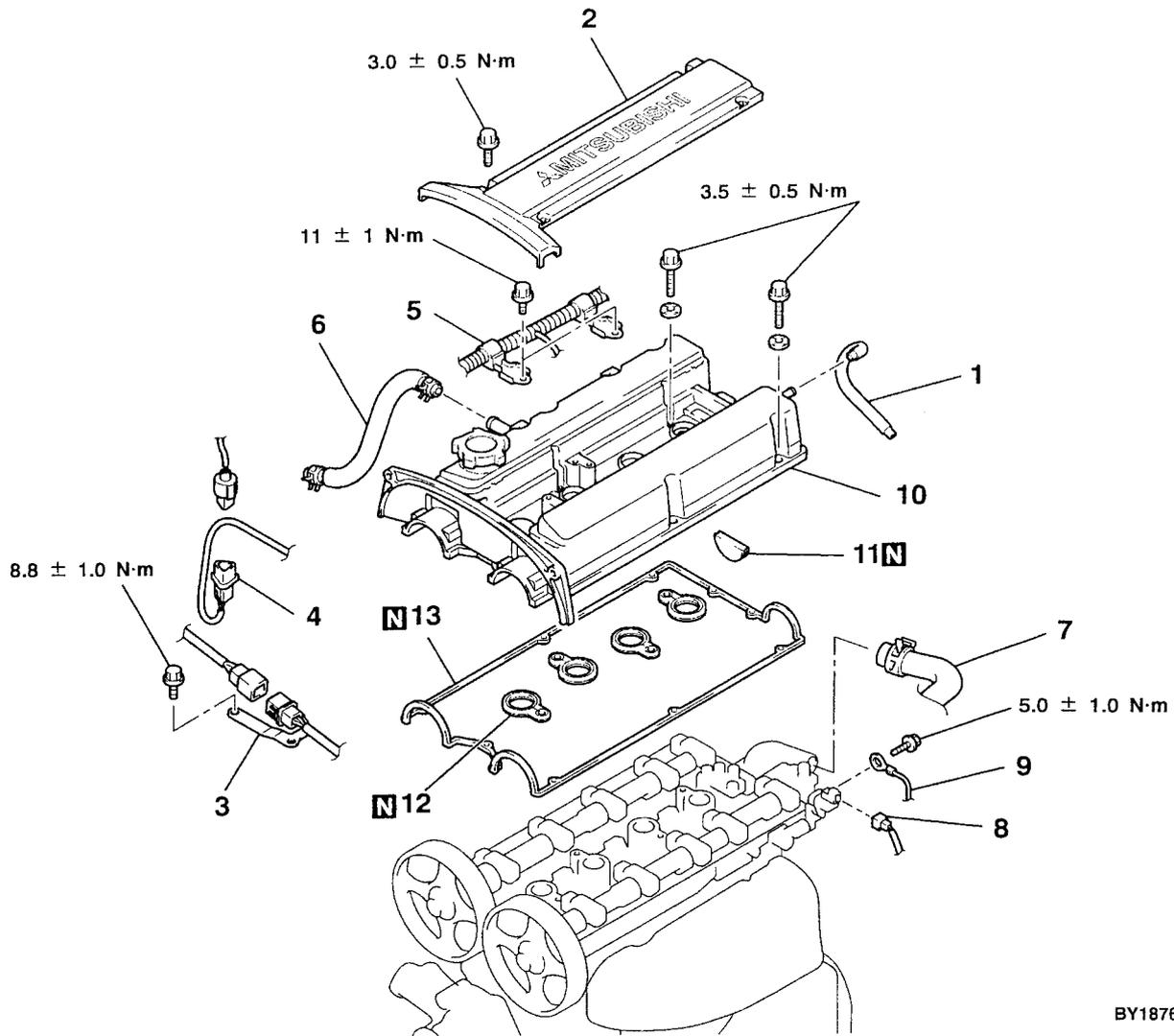
### Removal and Fitting

#### Caution

1. When Brembo brake callipers are used, there is concern over paint peeling off, so when doing servicing work, make sure they are not scratched by other components and tools. Furthermore, if any brake fluid gets onto the calipers, it should be wiped off immediately.
2. The fitting and removal of parts marked with an \* should be carried out for each cylinder.

#### Jobs to do before removal and after fitting

- Removal and fitting of undercover (refer to Chapter 51 Front Bumper)
- Checking drive belt tension <only after fitting>
- Draining and filling of coolant
- Removal and fitting of air duct
- Removal and fitting of air pipe C (refer to Chapter 15 Intercooler)
- Removal and fitting of timing belt (refer to P.11A-12)

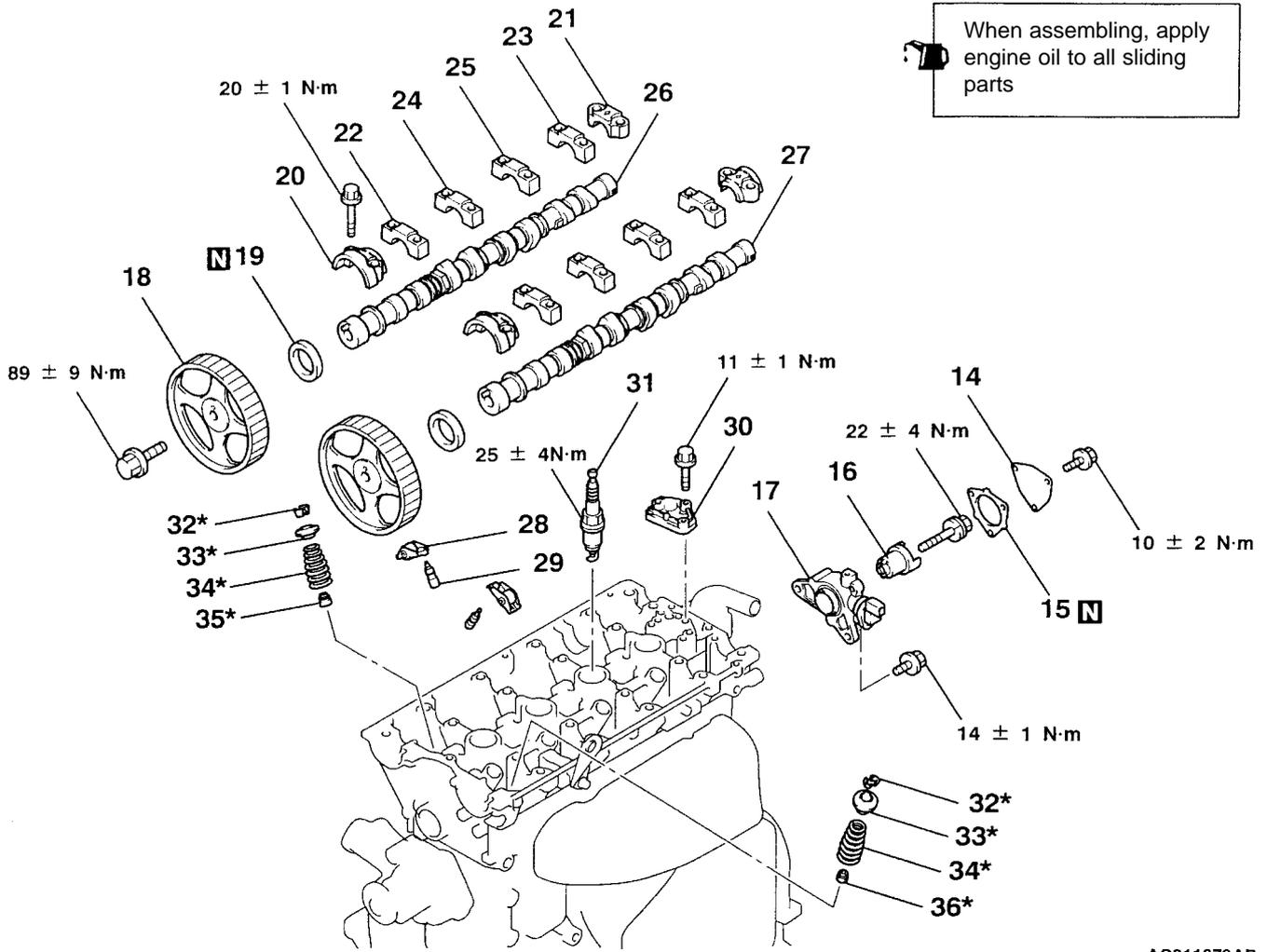


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Removal procedure

- |  |   |   |
|--|---|---|
| <p>1. Breather hose<br/>                 • Air bag ASSY<br/>                 (refer to Chapter 15-2 Secondary Air Control System)</p> <p>2. Centre cover<br/>                 • Ignition coil<br/>                 (refer to Chapter 16 Ignition Equipment)</p> <p>3. O<sub>2</sub> sensor connector</p> <p>4. Crank angle sensor connector</p> <p>5. Connecting the control harness</p> | <p>◀ A ▶ ▶ N ◀</p> <p>▶ M ◀ ▶ L ◀ ▶ K ◀</p> | <p>6. PCV hose</p> <p>7. Radiator upper hose</p> <p>8. Camshaft position sensor connector</p> <p>9. Connecting earth cable</p> <p>10. Rocker cover ASSY</p> <p>11. Camshaft end seal</p> <p>12. Spark plug hole gasket</p> <p>13. Rocker cover gasket</p> |
|--|---|---|

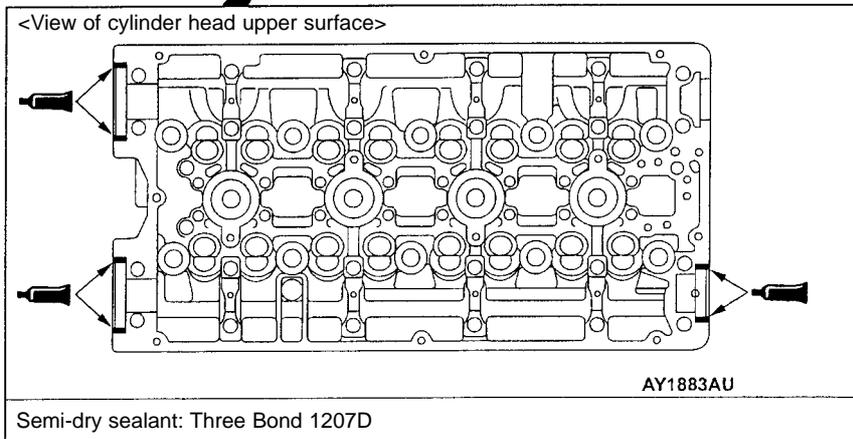
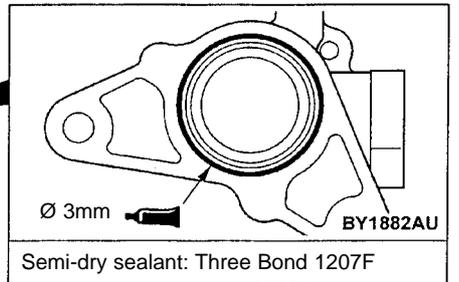
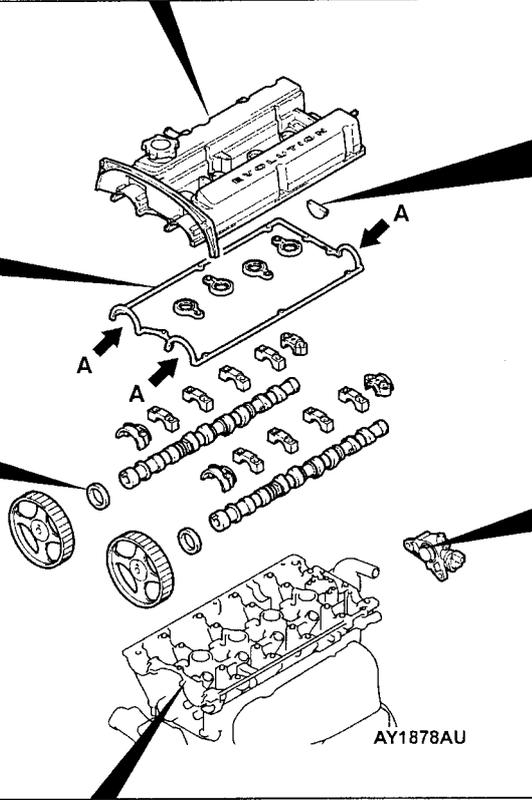
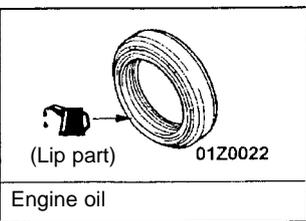
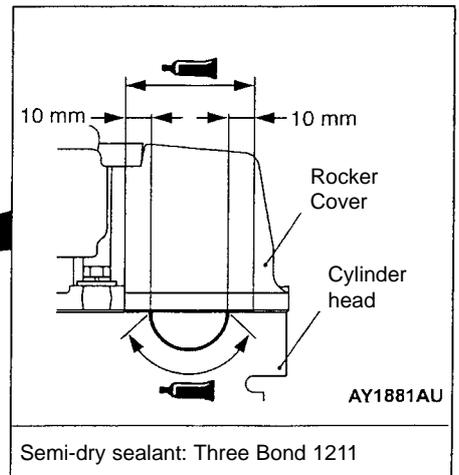
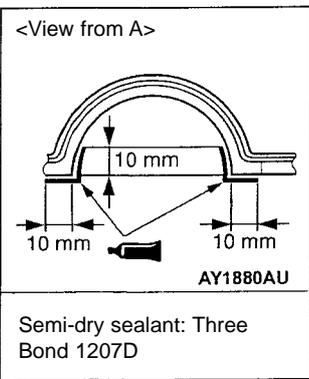
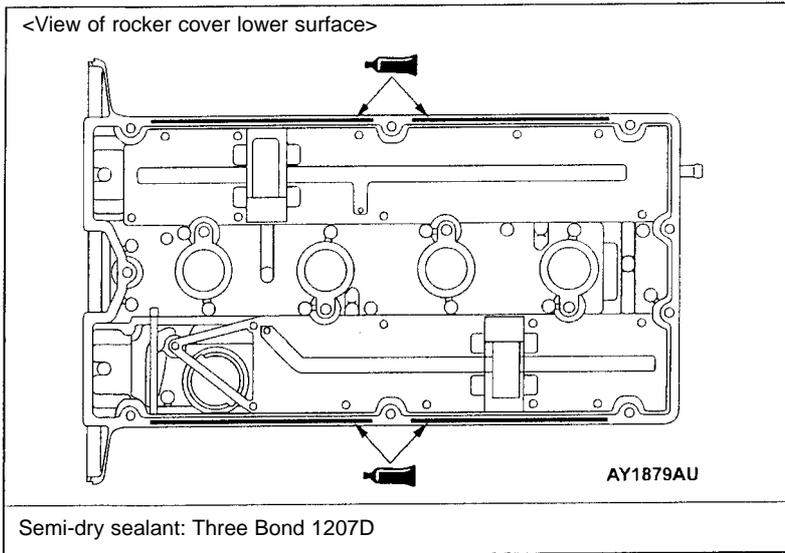
When assembling, apply engine oil to all sliding parts

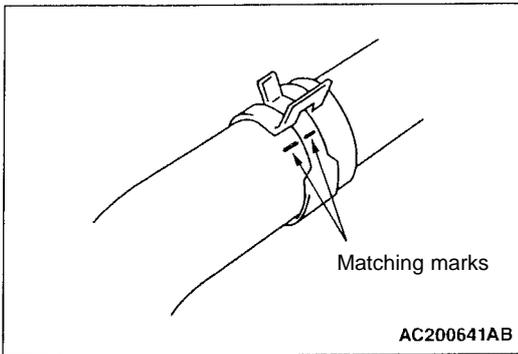


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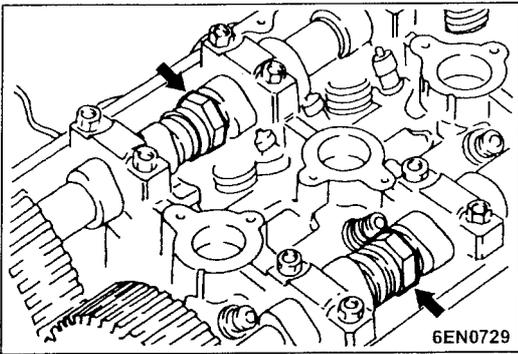
- |       |   |       |                                |
|-------|---|-------|--------------------------------|
|       | 14. Camshaft position sensor support cover        | ▶ F ◀ | 23. Camshaft bearing cap No.5  |
|       | 15. Camshaft position sensor support cover gasket | ▶ F ◀ | 24. Camshaft bearing cap No.3  |
| ▶ J ◀ | 16. Camshaft position sensing cylinder            | ▶ F ◀ | 25. Camshaft bearing cap No.4  |
| ▶ I ◀ | 17. Camshaft position sensor support              | ▶ E ◀ | 26. Inlet camshaft             |
| ◀ B ▶ | ▶ H ◀ 18. Camshaft sprocket                       | ▶ E ◀ | 27. Exhaust camshaft           |
|       | ▶ G ◀ 19. Camshaft oil seal                       | ▶ D ◀ | 28. Rocker arm                 |
|       | ▶ F ◀ 20. Camshaft bearing cap front              |       | 29. Lash adjuster              |
|       | ▶ F ◀ 21. Camshaft bearing cap rear               | ◀ C ▶ | 30. Oil delivery body          |
|       | ▶ F ◀ 22. Camshaft bearing cap No.2               | ▶ C ◀ | 31. Spark plug                 |
|       |   | ▶ B ◀ | 32. Valve spring retainer lock |
|       |   | ▶ A ◀ | 33. Valve spring retainer      |
|       |   | ▶ B ◀ | 34. Valve spring               |
|       |   | ▶ A ◀ | 35. Inlet valve stem seal      |
|       |   | ▶ A ◀ | 36. Exhaust valve stem seal    |

Lubricant and seal application locations

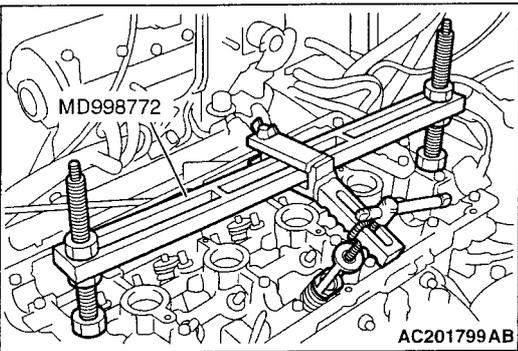


**MAIN POINTS REGARDING REMOVAL****◀ A ▶ DETACHING RADIATOR UPPER HOSE**

Align the matching marks on radiator upper hose and hose clamp, then detach radiator upper hose.

**◀ B ▶ REMOVING CAMSHAFT SPROCKETS**

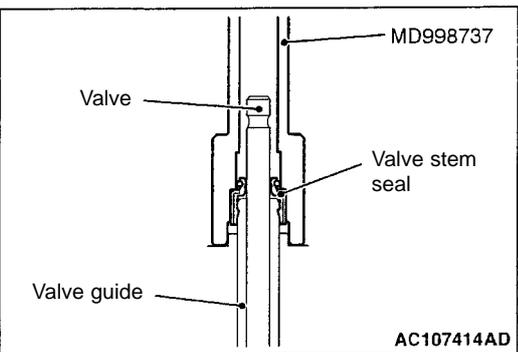
Hold camshaft hexagonal part with a wrench, loosen mounting bolt, and remove camshaft sprocket.

**◀ C ▶ REMOVING VALVE SPRING RETAINER LOCK**

Compress valve spring using the special valve spring compressor tool (MD998772), and remove valve spring retainer lock.

**CAUTION**

When removing the valve spring retainer lock, all cylinder pistons should be in the top dead centre position. If pistons are not in the top dead centre position, valves could fall into the cylinders.

**ASSEMBLY - MAIN POINTS****▶ A ◀ Fitting exhaust valve stem seals/inlet valve stem seals**

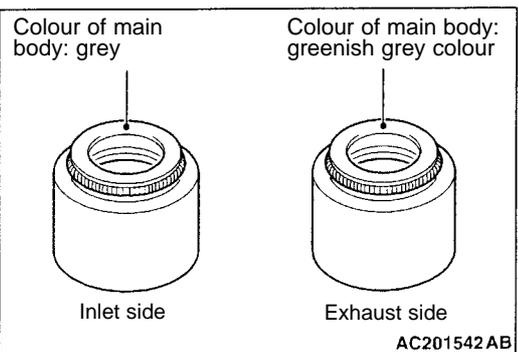
1. Apply a small quantity of engine oil to valve stem seals
2. Place the valve stem into the guides, then insert a new valve stem seal into the valve guide using the special valve stem seal installer (MD998737).

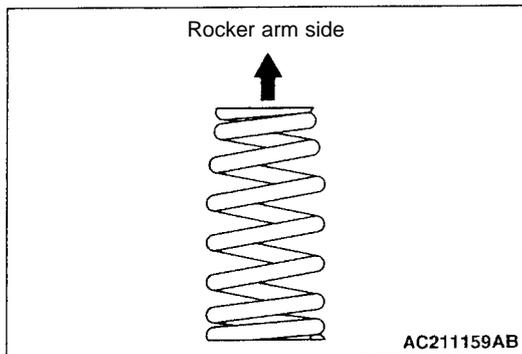
**CAUTION**

- (1) Valve stem seals cannot be re-used.
- (2) If valve stem seals are not fitted correctly, it could lead to oil leaking down, so the special valve stem seal installer tool (MD998737) should be used for fitting.

**Note**

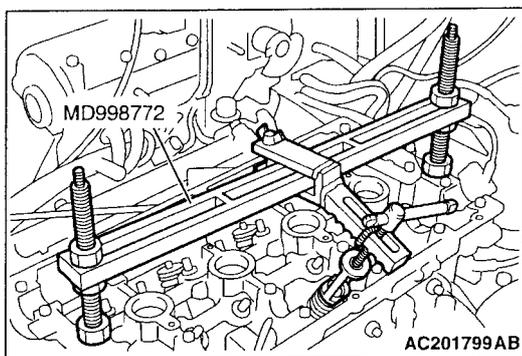
Check the colours on the rubber parts to identify inlet valve stem seals and exhaust valve stem seals.





▶ B ◀ FITTING VALVE SPRING

Fit so that the valve spring small radius end is on the rocker arm side.



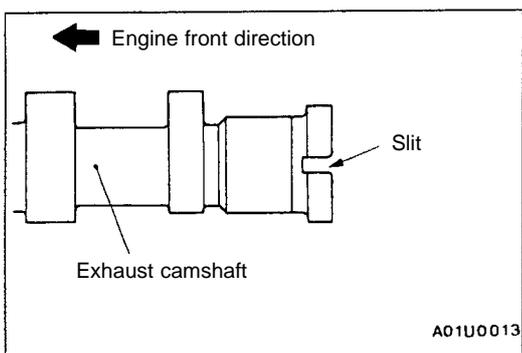
▶ C ◀ FITTING VALVE SPRING RETAINER LOCK

Compress the valve spring using the same valve spring compressor tool (MD998772) as the one used for removal and fit the valve spring retainer lock.

▶ D ◀ FITTING LASH ADJUSTER

CAUTION

When re-using lash adjuster, without fail wash and check before fitting. (Refer to Engine Workshop Manual)

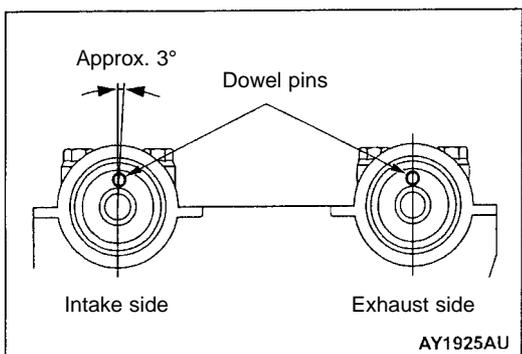


▶ E ◀ FITTING EXHAUST CAMSHAFT / INLET CAMSHAFT

1. Remove any sealant adhering to the cylinder head.
2. Apply engine oil to camshaft cams and journals.
3. Fit camshaft to cylinder head.

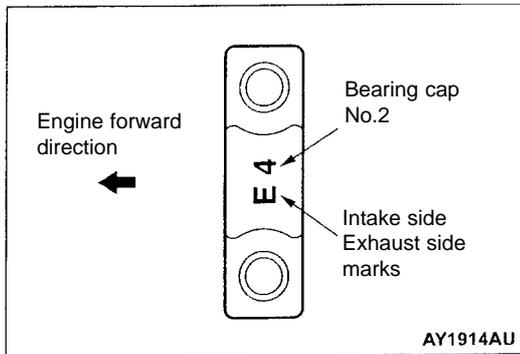
CAUTION

Do not get intake and exhaust sides the wrong way round. The exhaust camshaft has a slit on the rear end.



▶ F ◀ FITTING CAMSHAFT BEARING CAP No.4/ FITTING CAMSHAFT BEARING CAP No.3/ FITTING CAMSHAFT BEARING CAP No.5/ FITTING CAMSHAFT BEARING CAP No.2/ FITTING CAMSHAFT BEARING CAP REAR/ FITTING CAMSHAFT BEARING CAP FRONT

1. Set the camshaft dowel pins in the position shown in the diagram.

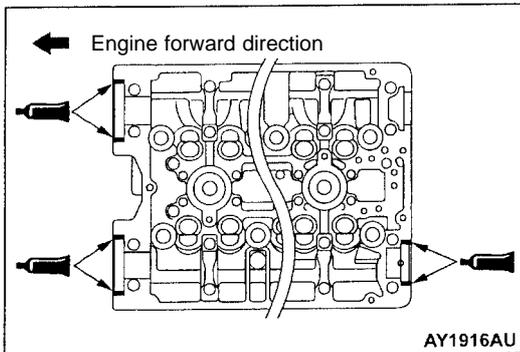


2. The camshaft bearing caps No.2-5 are the same shape, so check the identification marks before fitting in the direction shown in the diagram, in order to avoid getting bearing cap number, and intake and exhaust sides, mixed up.

Identification marks (stamped on front and on bearing caps No.2-5)

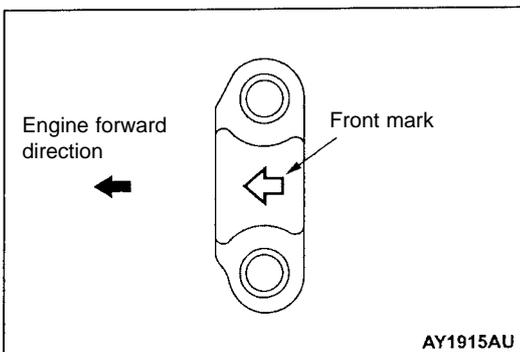
I: Intake side

E: Exhaust side



3. Apply sealant to the 6 positions indicated in the diagram on the upper surface of the cylinder head.

**Semi-dry sealant: Three Bond 1207D**



4. Fit camshaft bearing caps so that front marks are in the direction indicated.

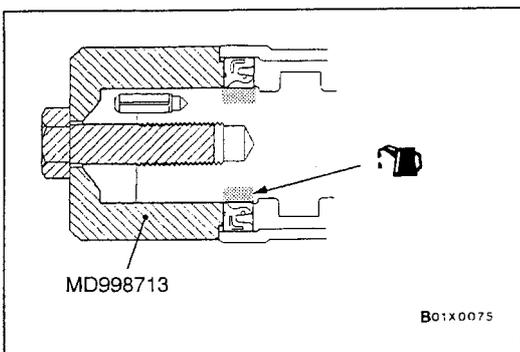
5. Check the identification marks on the camshaft bearing cap fronts, so that, as with bearing caps No.2-5, there are no mistakes over intake and exhaust sides.

6. Gradually tighten the bearing cap mounting bolts, 2-3 turns at a time, to the specified torque.

**Tightening torque:  $20 \pm 1$  N·M**

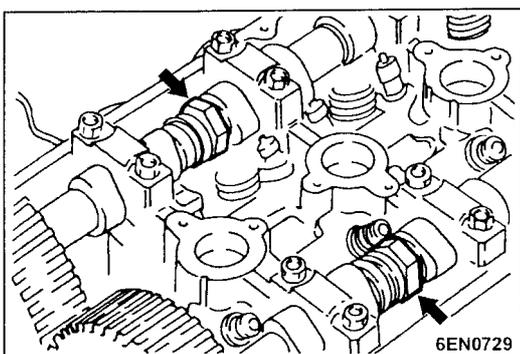
7. Check that the rocker arm is fitted correctly.

NB. Wipe away any traces of sealant squeezed out.



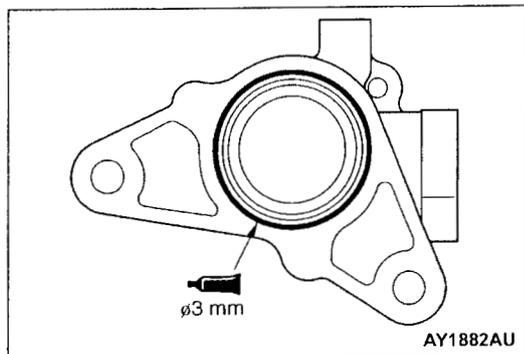
#### ► G ◀ FITTING CAMSHAFT OIL SEAL

1. Apply engine oil around the entire circumference of the oil seal lip.
2. Insert oil seal using the special camshaft oil seal installer tool (MD998713), as shown in the diagram.



- H ◀ As when removing, hold the camshaft hexagonal part with a wrench, then tighten the mounting bolts to the torque specified.

**Tightening torque:  $89 \pm 9$  N·M**



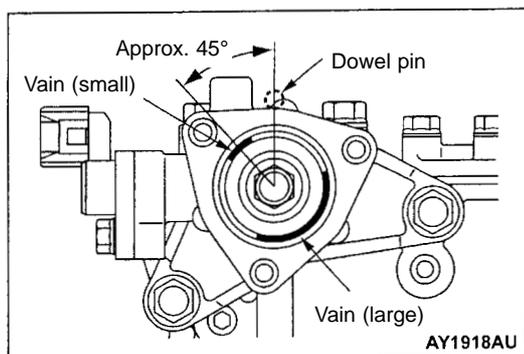
#### ► I ◀ FITTING CAMSHAFT POSITION SENSOR SUPPORT

1. Remove any sealant on the camshaft position sensor support.
2. Apply sealant to the camshaft position sensor support flange, as shown in the diagram, then fit to the cylinder head.

**Semi-dry sealant: Three Bond 1207F**

3. Tighten camshaft position sensor support mounting bolts to the torque specified.

**Tightening torque: 14 ± 1 N·M**



#### ► J ◀ FITTING CAMSHAFT POSITION SENSING CYLINDER

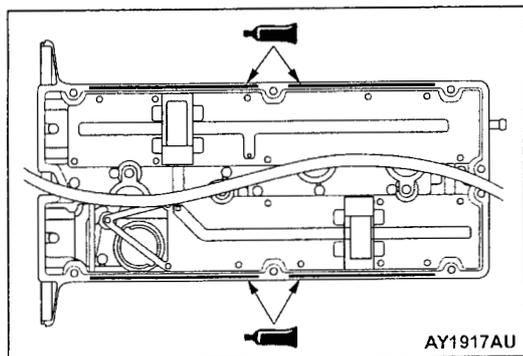
1. Set the exhaust camshaft dowel pin in the position shown in the diagram (No.1 cylinder compression top dead centre)

**Note**

It will turn slightly in a counter-clockwise direction, under pressure from the exhaust valve spring.

2. As shown in the diagram, fit the camshaft position sensing cylinder vain (small), so that it is approximately 45° relative to the exhaust camshaft dowel pin.
3. Tighten the camshaft position sensing cylinder mounting bolts to the torque specified.

**Tightening torque: 22 ± 4 N·M**

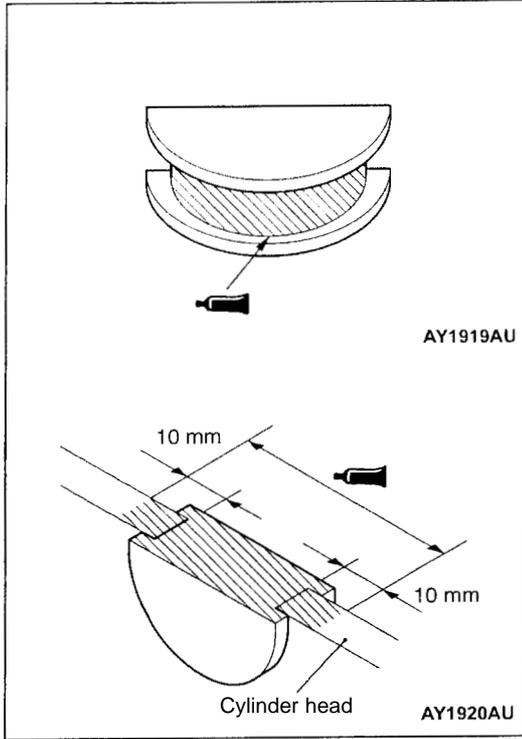


#### ► K ◀ FITTING ROCKER COVER GASKET

1. Remove any sealant on the rocker cover gasket.
2. Apply sealant to 4 locations on the rocker cover lower surface, as shown in the diagram.

**Semi-dry sealant: Three Bond 1207D**

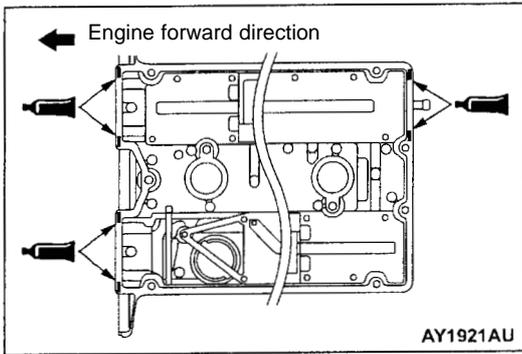
3. Fit the rocker cover gasket to the rocker cover.



▶ L ◀ FITTING CAMSHAFT END SEALS

Apply sealant to the locations on the camshaft end seal, as shown in the diagram, then fit to the cylinder head.

**Semi-dry sealant: Three Bond 1211**

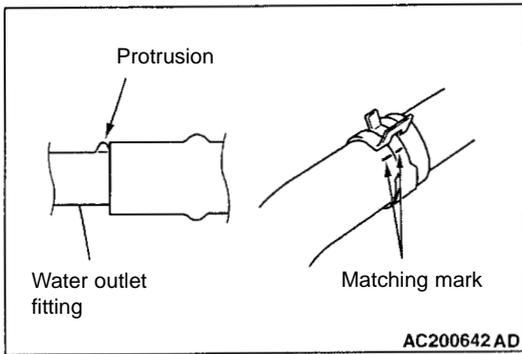


▶ M ◀ FITTING ROCKER COVER ASSY

1. Apply sealant to the 6 locations on the rocker cover gasket, as shown in the diagram.

**Semi-dry sealant: Three Bond 1207D**

2. Fit the rocker cover ASSY to the cylinder head.



▶ N ◀ CONNECTING RADIATOR UPPER HOSE

1. Insert radiator upper hose as far as the protrusion on the water outlet fitting.

2. Align the radiator upper hose and hose clamp matching marks to fit the radiator upper hose.

**TIMING BELT and TIMING BELT B**

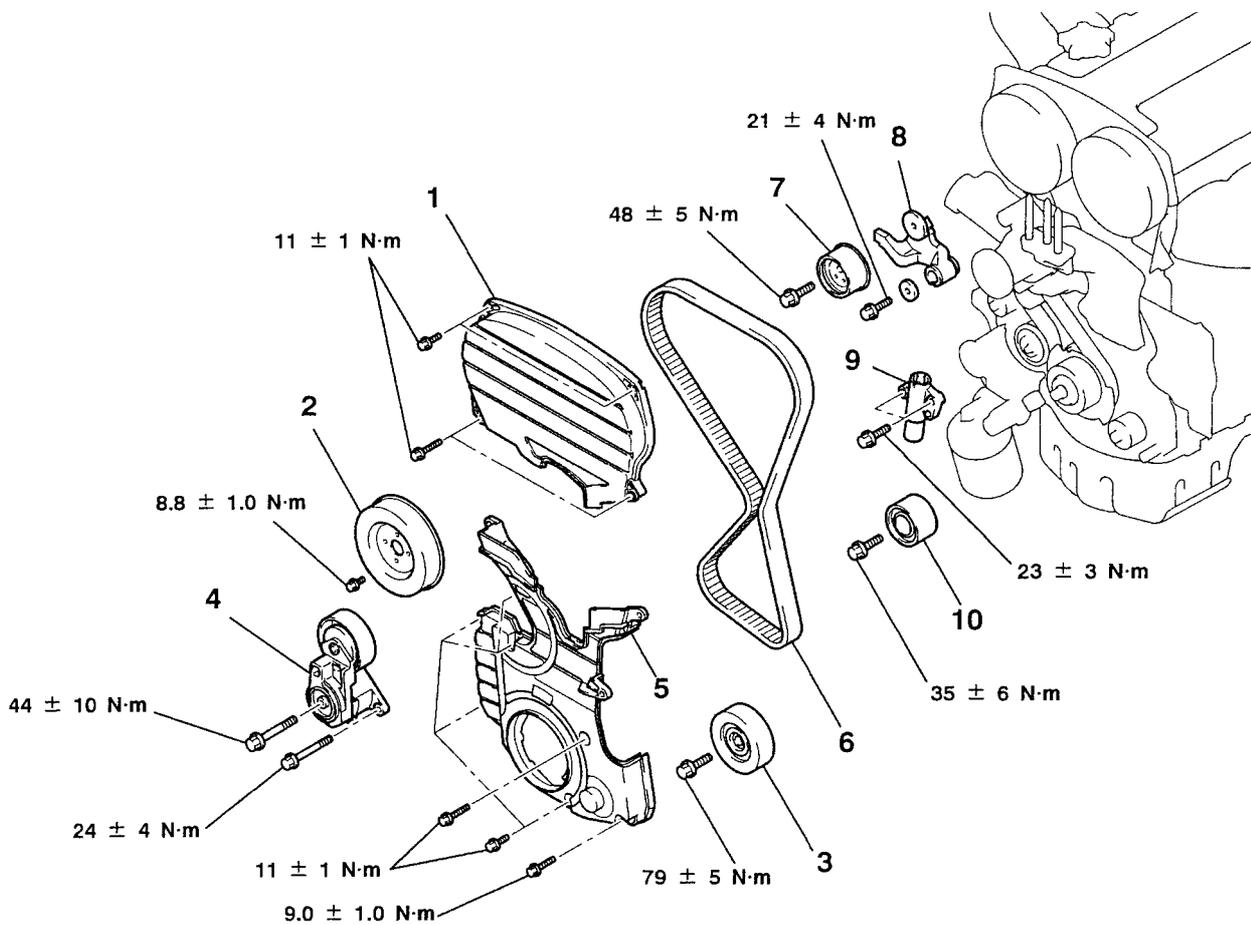
**Removal and Fitting**

**Caution**

When Brembo brake callipers are used, there is concern over paint peeling off, so when doing servicing work, make sure they are not scratched by other components and tools. Furthermore, if any brake fluid gets onto the calipers, it should be wiped off immediately.

**Jobs to do before removal and after fitting**

- Removal and fitting of undercover (refer to Chapter 51 Front Bumper)
- Removal and fitting of LH side cover
- Checking drive belt tension <only after fitting>
- Removal and fitting of crank shaft pulley
- Removal and fitting cross member bar
- Removal and fitting of front exhaust pipe

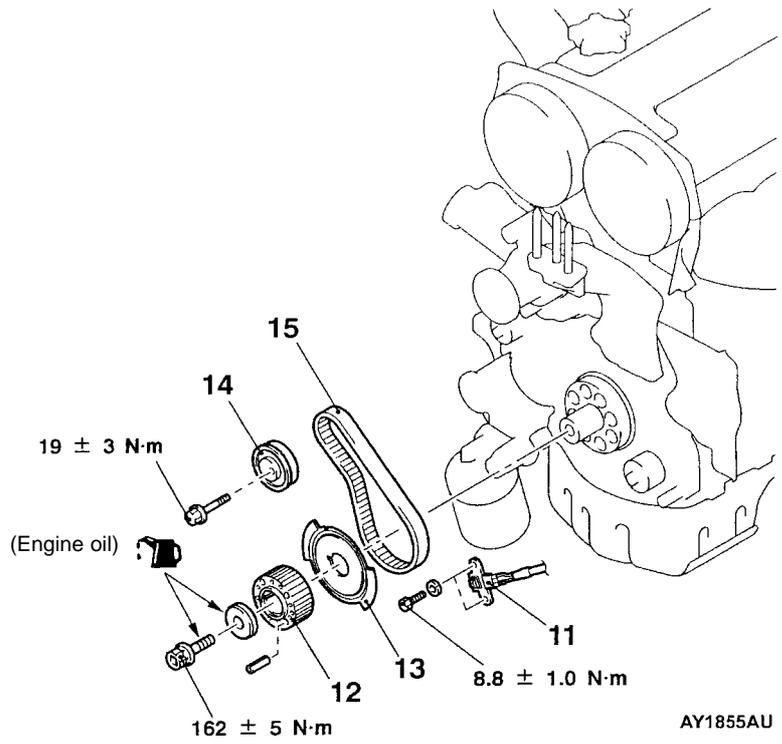


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**Removal procedure**

1. Timing belt front upper cover
2. Water pump pulley
3. Idler pulley
4. Drive belt auto-tensioner
5. Timing belt front lower cover

- ▶ G ◀ • Timing belt tension adjustment
- ◀ A ▶ ▶ F ◀ 6. Timing belt
- ▶ E ◀ 7. Tensioner pulley
- ▶ D ◀ 8. Connecting earth cable
- ▶ D ◀ 9. Auto-tensioner
- ▶ D ◀ 10. Idler pulley



- ▶ A ◀ 11. Crank angle sensor
- ◀ B ▶ ▶ C ◀ 12. Crank shaft sprocket
- ▶ C ◀ 13. Crank shaft sensing blade
- ▶ B ◀ • Timing belt B tension adjustment

- ▶ A ◀ 14. Timing belt B tensioner
- ◀ C ▶ ▶ A ◀ 15. Timing belt B

Note  
 Carry out removal and fitting in accordance with existing instructions