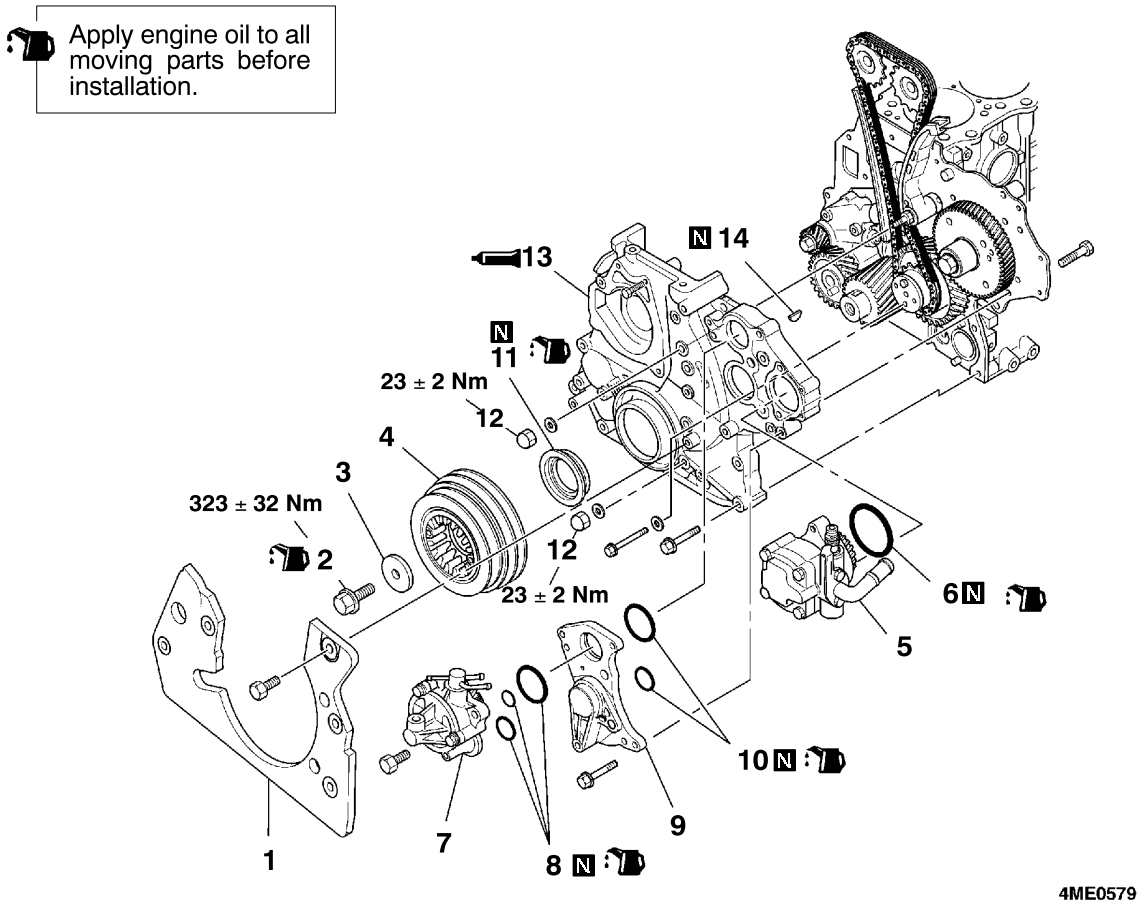
18. TIMING GEAR CASE

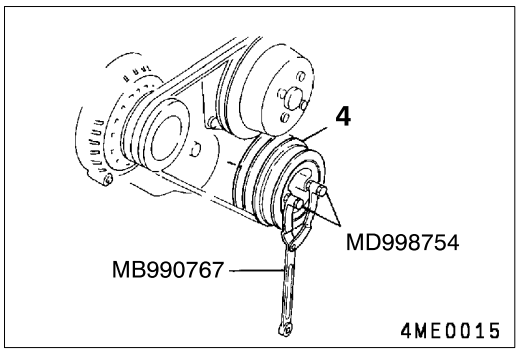
REMOVAL AND INSTALLATION



Removal steps

1. Timing gear lower cover
2. Bolt
3. Washer
◀A▶ 4. Crankshaft pulley
5. Power steering pump assembly
6. O-ring
7. Vacuum pump assembly
8. O-ring
9. Bearing block
10. O-ring
▶B◀ 11. Front oil seal
12. Cap nut
▶A◀ 13. Timing gear case
14. Key

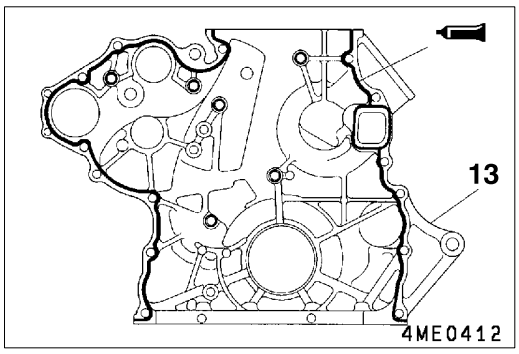
Caution
Do not remove the front oil seal unless absolutely necessary.



REMOVAL SERVICE POINT

◀A▶ CRANKSHAFT PULLY REMOVAL

Holding the crankshaft pulley **4** with the special tool, remove the bolt **2**.



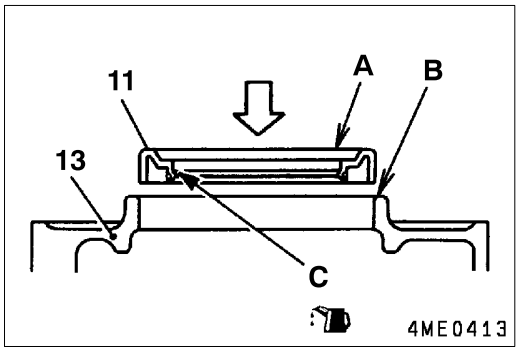
INSTALLATION SERVICE POINTS

▶A◀ TIMING GEAR CASE INSTALLATION

Apply an even bead of sealant to the entire joint surface of the timing gear case **13** as shown. Bead diameter: 3.5 mm.

Specified sealant:
Mitsubishi Genuine Part No. MD970389 or equivalent

Caution
Squeeze out the sealant uniformly without excess and discontinuity.



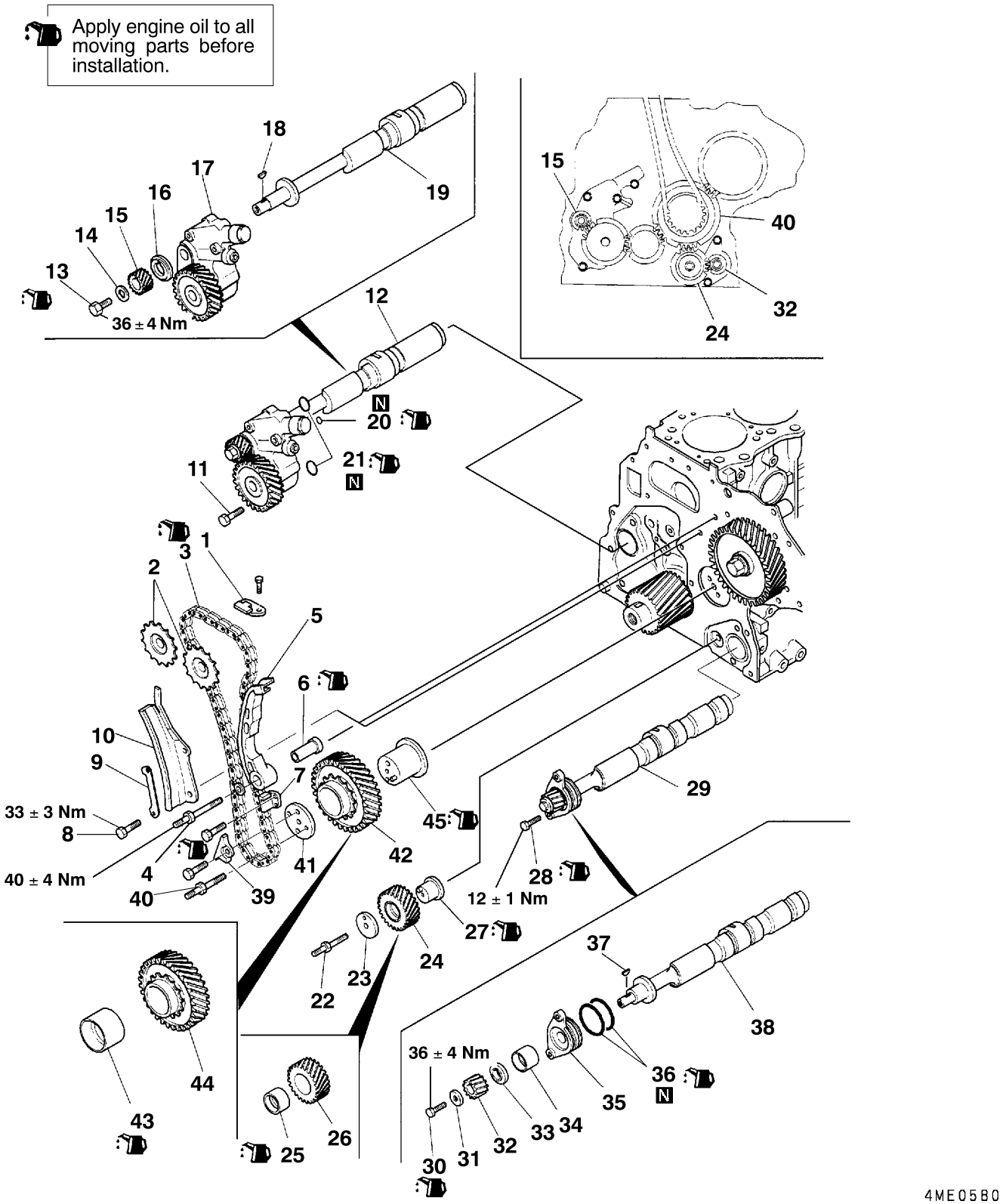
▶B◀ FRONT OIL SEAL INSTALLATION

Apply a thin coat of engine oil to the lip **C**, and install the front oil seal **11** in the timing gear case **13** with the lip directed as shown until its end surface **A** becomes flush with the end surface **B** of the case.

A: End surface (front oil seal)
B: End surface (timing gear case)
C: Lip

19. TIMING GEAR AND BALANCE SHAFT

REMOVAL AND INSTALLATION

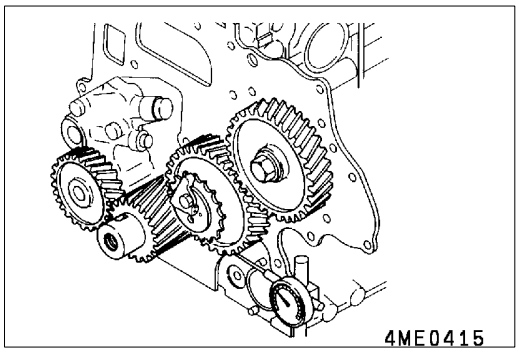


4ME0580

Removal steps

1. Upper guide plate
2. Cam sprocket
▶G◀ 3. Timing chain
4. Bolt
5. Tension lever
6. Tension lever shaft
7. Lower guide plate
8. Bolt
9. Guide plate washer
10. Guide plate
11. Bolt
▶F◀ 12. Balance shaft assembly RH
13. Bolt
14. Washer
15. Balance shaft gear RH
16. Thrust spacer
17. Oil pump assembly
18. Key
19. Balance shaft RH
20. O-ring
21. O-ring
22. Bolt
23. Idler washer
▶E◀ 24. Idler gear assembly LH
◀A▶ ▶D◀ 25. Idler gear bush LH
26. Idler gear LH
27. Idler shaft
28. Bolt
▶C◀ 29. Balance shaft assembly LH
30. Bolt
31. Washer
32. Balance shaft gear LH
33. Thrust spacer
34. Bush
35. Thrust plate
36. O-ring
37. Key
38. Balance shaft LH
39. Oil jet assembly
40. Bolt
41. Idler washer
▶B◀ 42. Idler gear and sprocket assembly
◀B▶ ▶A◀ 43. Idler sprocket bush
44. Idler gear and sprocket
45. Idler shaft

Caution
After installing the bolt 4, check that the tension lever 5 moves smoothly.



PRE-REMOVAL INSPECTION

1. BACKLASH

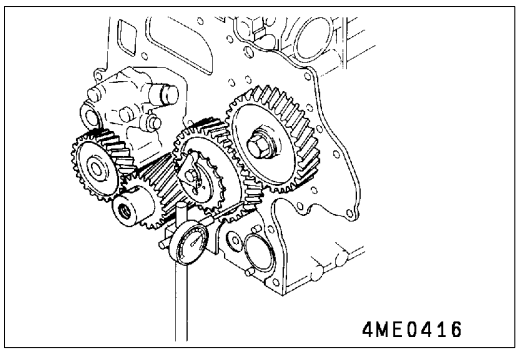
Measure backlash between gears, pair by pair, at three or more points. If the reading exceeds the specified service limit, replace defective part.

Standard value:

Balance shaft gear RH and oil pump gear	**0.04 - 0.19 mm**
Oil pump gear and crankshaft gear	**0.04 - 0.18 mm**
Crankshaft gear and idler gear	**0.04 - 0.18 mm**
Idler gear and idler gear LH	**0.04 - 0.19 mm**
Idler gear LH and balance shaft gear LH	**0.04 - 0.22 mm**
Idler gear and injection pump gear	**0.04 - 0.21 mm**

Limit:

Balance shaft gear RH and oil pump gear	**0.3 mm**
Oil pump gear and crankshaft gear	**0.3 mm**
Crankshaft gear and idler gear	**0.3 mm**
Idler gear and idler gear LH	**0.3 mm**
Idler gear LH and balance shaft gear LH	**0.4 mm**
Idler gear and injection pump gear	**0.4 mm**



2. END PLAY

If the reading exceeds the specified service limit, replace defective part.

Standard value:

Balance shaft LH, RH	**0.09 - 0.24 mm**
Idler gear and sprocket assembly	**0.05 - 0.20 mm**
Idler gear LH assembly	**0.05 - 0.20 mm**

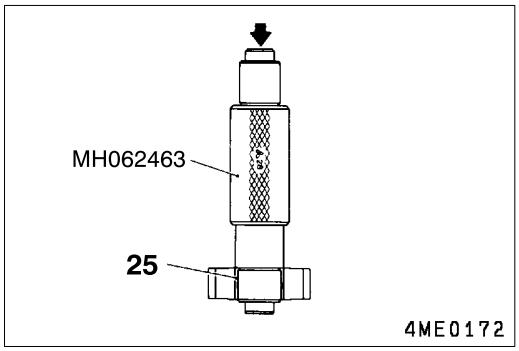
Limit:

Balance shaft LH, RH	**0.3 mm**
Idler gear and sprocket assembly	**0.3 mm**
Idler gear LH assembly	**0.3 mm**

REMOVAL SERVICE POINTS

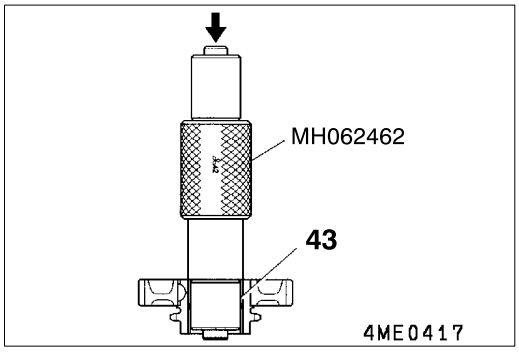
◀A▶ IDLER GEAR BUSH LH REMOVAL

Using the special tool, remove the idler gear bush **25**.



◀B▶ IDLER SPROCKET BUSH REMOVAL

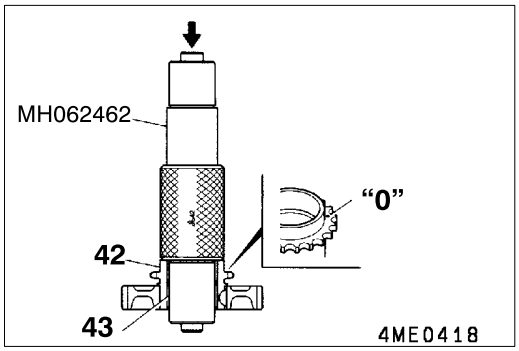
Using the special tool, remove the idler sprocket bush **43**.



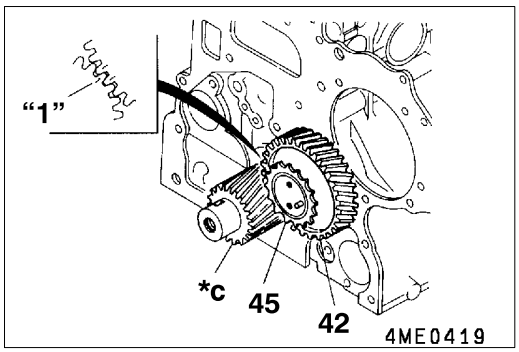
INSTALLATION SERVICE POINTS

▶A◀ IDLER SPROCKET BUSH INSTALLATION

Using the special tool, press-fit the idler sprocket bush **43** into the idler gear and sprocket **42** from the side showing the match mark "**0**".

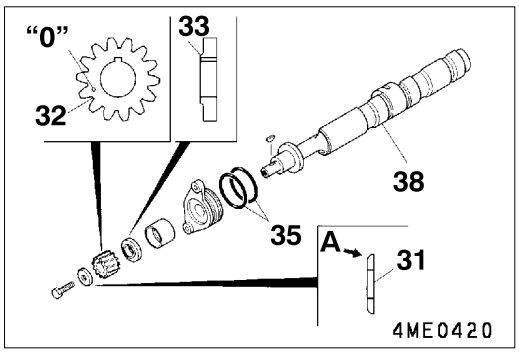


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▶B◀ IDLER GEAR AND SPROCKET ASSEMBLY INSTALLATION

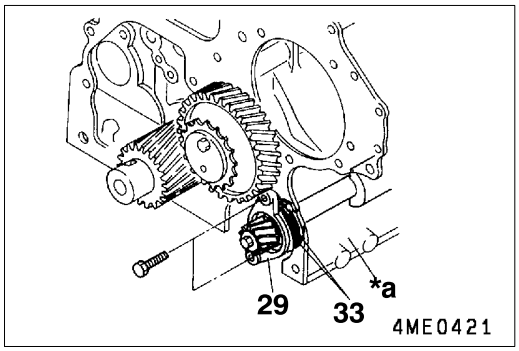
Install the idler gear and sprocket assembly **42** onto the idler shaft **45** while aligning the mark "**1**" with that on the crankshaft gear ***c**.



▶C◀ BALANCE SHAFT LH ASSEMBLY INSTALLATION

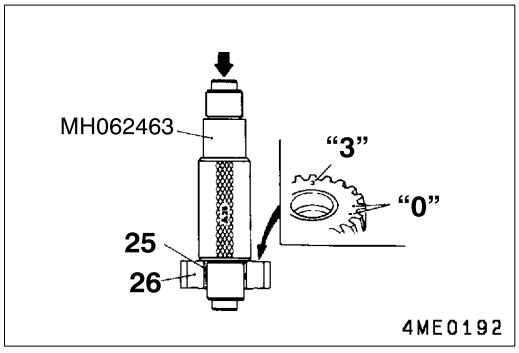
(1) Assemble the parts shown in the illustration to the balance shaft LH **38.**
Be sure that the washer **31** and thrust spacer **33** face in correct direction as shown. Install the balance shaft gear LH **32** with the side showing the match mark **"0"** outward.

A: Shear droop side



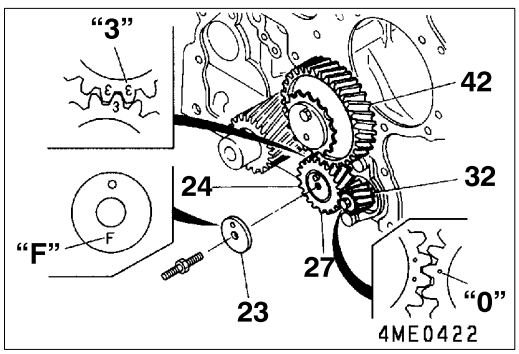
(2) Insert the completed balance shaft LH assembly **29** into the crankcase assembly ***a** and set it in position with the dowel pin on the crankcase assembly.

Caution
1. **Do not rotate the balance shaft LH assembly 29 during insertion into the crankcase assembly *a. This may cause the O-ring 35 to be slipped out of place.**
2. **Insert the balance shaft LH assembly 29 using care not to damage the inner surface of the balance shaft bush in the crankcase.**



▶D◀ IDLER GEAR BUSH LH INSTALLATION

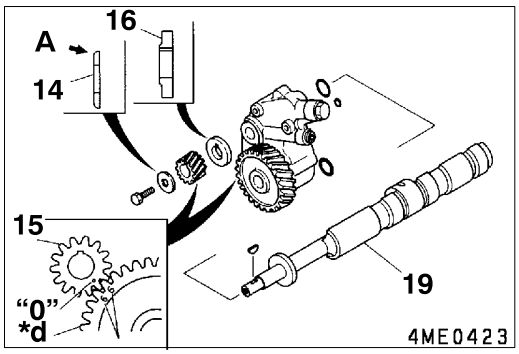
Using the special tool, press-fit the idler gear bush LH **25** into the idler gear LH **26** from the side showing the match marks "**3**" and **"0"**.



▶E◀ IDLER GEAR LH ASSEMBLY INSTALLATION

(1) Install the idler gear LH assembly **24** onto the idler shaft **27**. At this time, be sure to align the match marks "**3**" and **"0"** on the idler gear with the corresponding match marks on the idler gear and sprocket assembly **42** and the balance shaft gear LH **32**.
(2) Then, install the idler washer **23** to the idler gear LH assembly with its front mark "**F**" facing outward.

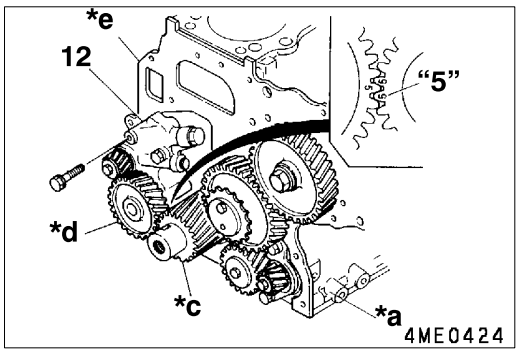
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▶F◀ BALANCE SHAFT RH ASSEMBLY INSTALLATION

(1) Assemble the parts shown in the illustration to the balance shaft RH **19.**
Be sure to install the washer **14** and thrust spacer **16** in the direction shown in the illustration, and install the balance shaft gear RH **15** with its mating mark **"0"** aligned with the mating mark "**6**" on the oil pump gear ***d**.

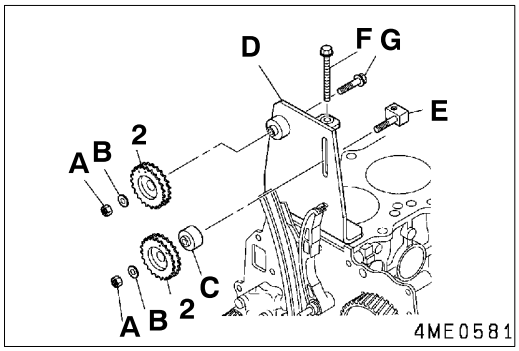
A: Shear droop side



(2) Insert the completed balance shaft RH assembly **12** into the crankcase assembly while aligning the mating marks "**5**" on the oil pump gear ***d** and the crankshaft gear ***c**, and set the shaft assembly in position with the dowel pin on the crankcase assembly ***a.**

Caution
Insert the balance shaft RH assembly using care not to damage the inner surface of the balance shaft bush in the crankcase.

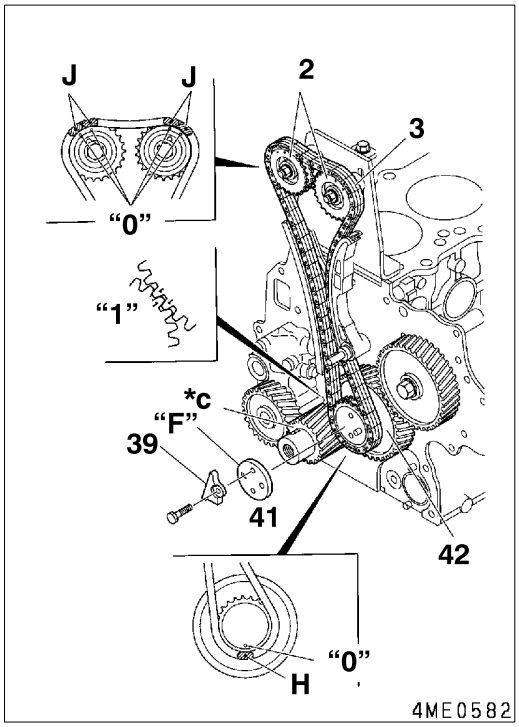
(3) After the timing gears are installed in position, check that all the rotary parts smoothly rotate.



▶G◀TIMING CHAIN INSTALLATION

(1) Hold the camshaft sprocket **2** using the special tool.

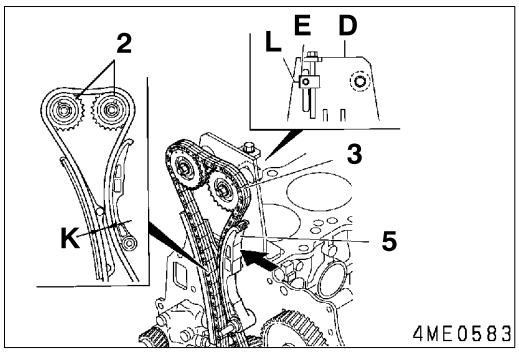
Component Parts of Special Tool MH063490 - Cam Sprocket Holder Kit
A: Nut
B: Washer
C: Spacer
D: Adjusting plate
E: Nut
G: Bolt



(2) Check that the match mark "**1**" on the idler gear and sprocket assembly **42** is in alignment with that on the crankshaft gear ***c**.
(3) Align the match mark **"0"** on the idler gear and sprocket assembly **42** with the mark link plate **H** of the timing chain **3**.

Caution
The timing chain 3 has the match mark provided at two places: one bright white link plate H at one place and a pair of bright white link plates J at the other.

(4) Place the timing chain **3** around the camshaft sprockets **2** while aligning the timing mark **"0"** on the camshaft sprockets with the mark link plate **J** on the timing chain.
(5) After installing the timing chain **3**, attach the idler washer **41** with the front mark "**F**" facing outward.



INSPECTION

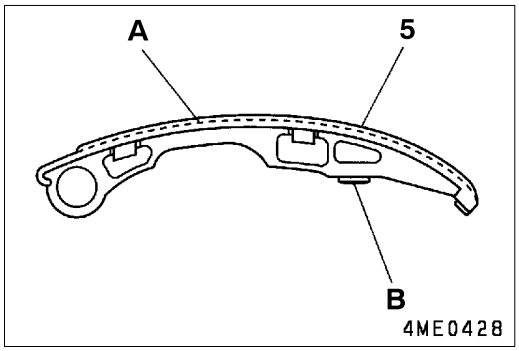
1. TIMING CHAIN

(1) Aligning the stamped lines **L** on the adjusting plate **D** and nut **E**, set the camshaft sprocket **2** in position.

(2) Push the tension lever **5** by hand to take up the slack of the timing chain **3**. Measure the minimum clearance **K** between the chain spans facing each other. If the reading deviates from the specified limit, replace the timing chain.

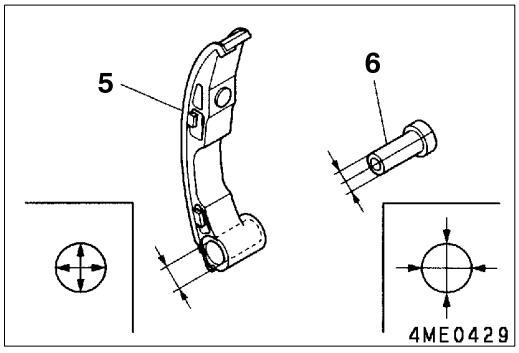
Standard value: 16.5 mm

Limit: 9 mm



2. TENSION LEVER AND TENSION LEVER SHAFT

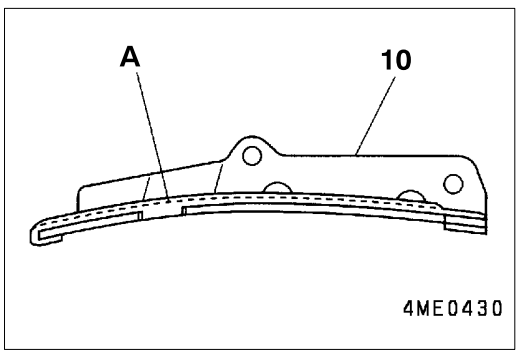
(1) Replace the tensioner lever **5** if it shows any cracks or flakes on the surface **A** that makes sliding contact with the timing chain and the tensioner contact surface **B**.



(2) If the tensioner lever **5** to tension lever shaft **6** clearance exceeds the specified limit, replace the defective part.

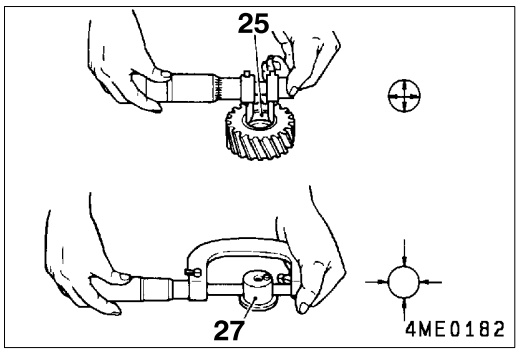
Standard value: 0.06 - 0.18 mm

Limit: 0.3 mm



3. GUIDE PLATE

Replace the guide plate **10** if it shows any cracks or flakes on the surface **A** that makes sliding contact with the timing chain.

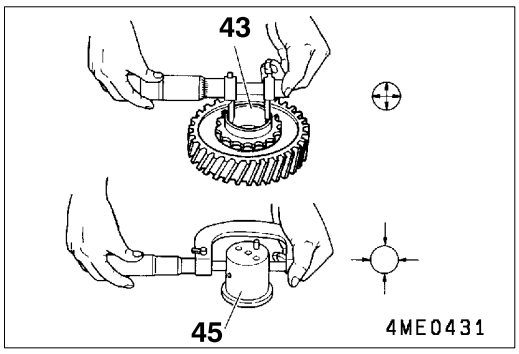


4. IDLER GEAR BUSH LH AND IDLER SHAFT

If the idler gear bush **25** to idler shaft **27** clearance exceeds the specified limit, replace the defective part.

Standard value: 0.02 - 0.05 mm

Limit: 0.1 mm



5. IDLER SPROCKET BUSH AND IDLER SHAFT

If the idler sprocket bush **43** to idler shaft **45** clearance exceeds the specified limit, replace the defective parts.

Standard value: 0.02 - 0.06 mm

Limit: 0.1 mm