
ENGINE

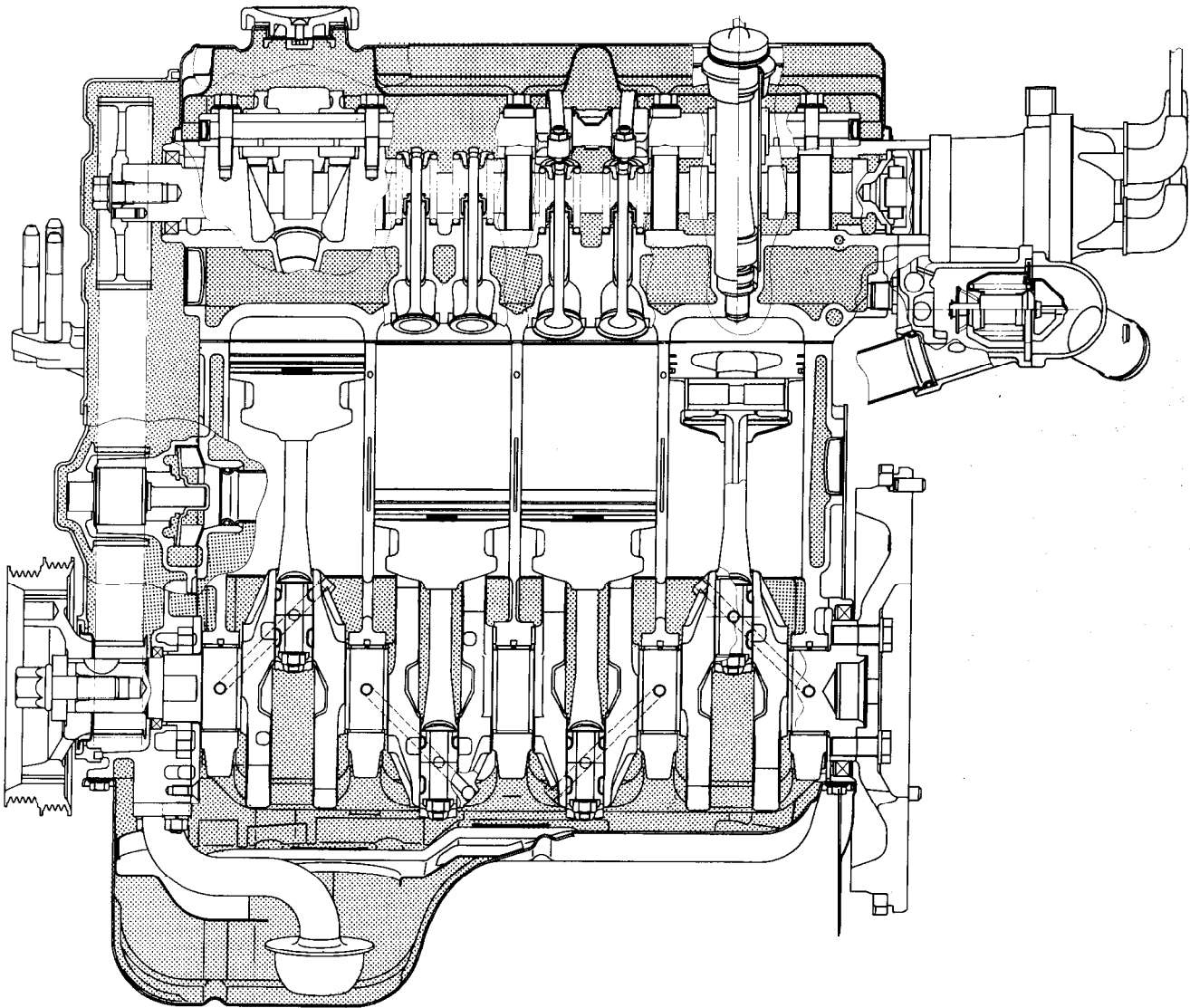
4G93

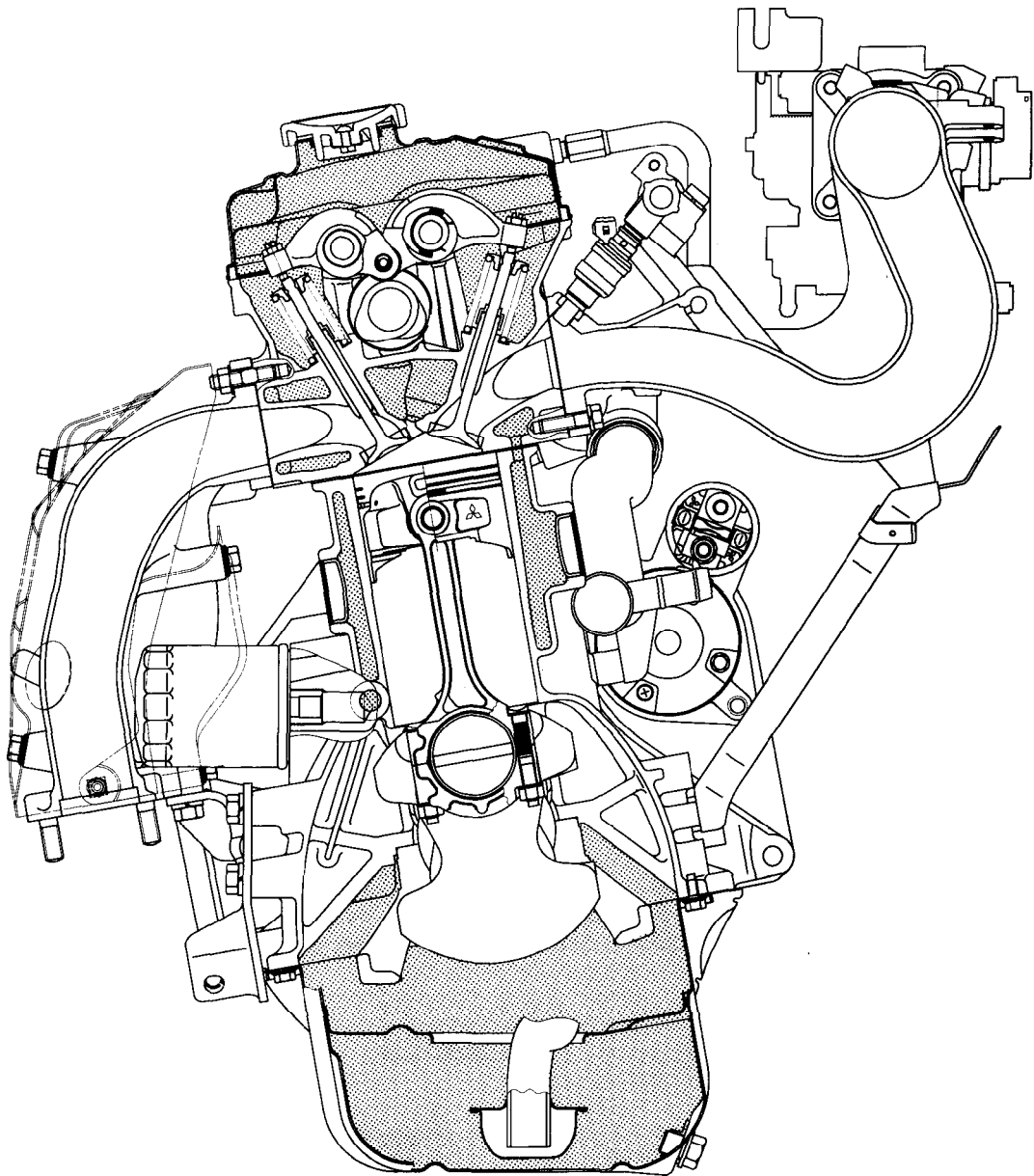
CONTENTS

CRANKSHAFT, CYLINDER BLOCK, FLYWHEEL AND DRIVE PLATE	47	PISTON AND CONNECTING ROD	40
CYLINDER HEAD AND VALVES	32	ROCKER ARMS AND CAMSHAFT	29
EXHAUST MANIFOLD	28	SEALANT	10
FRONT CASE AND OIL PUMP	36	SERVICE SPECIFICATIONS	6
FUEL AND EMISSION PARTS	20	SPECIAL TOOLS	11
GENERAL INFORMATION	2	THROTTLE BODY	22
GENERAL SPECIFICATIONS	5	TIMING BELT	16
GENERATOR AND IGNITION SYSTEM	13	TORQUE SPECIFICATIONS	9
INTAKE MANIFOLD AND WATER PUMP	25		

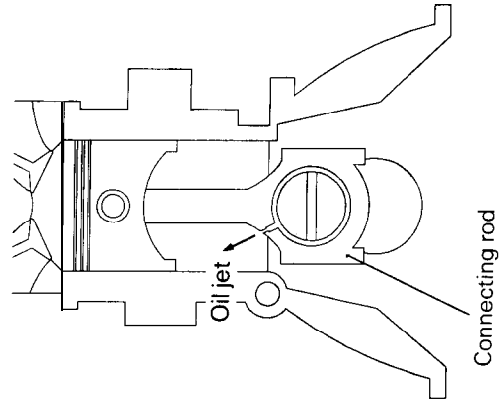
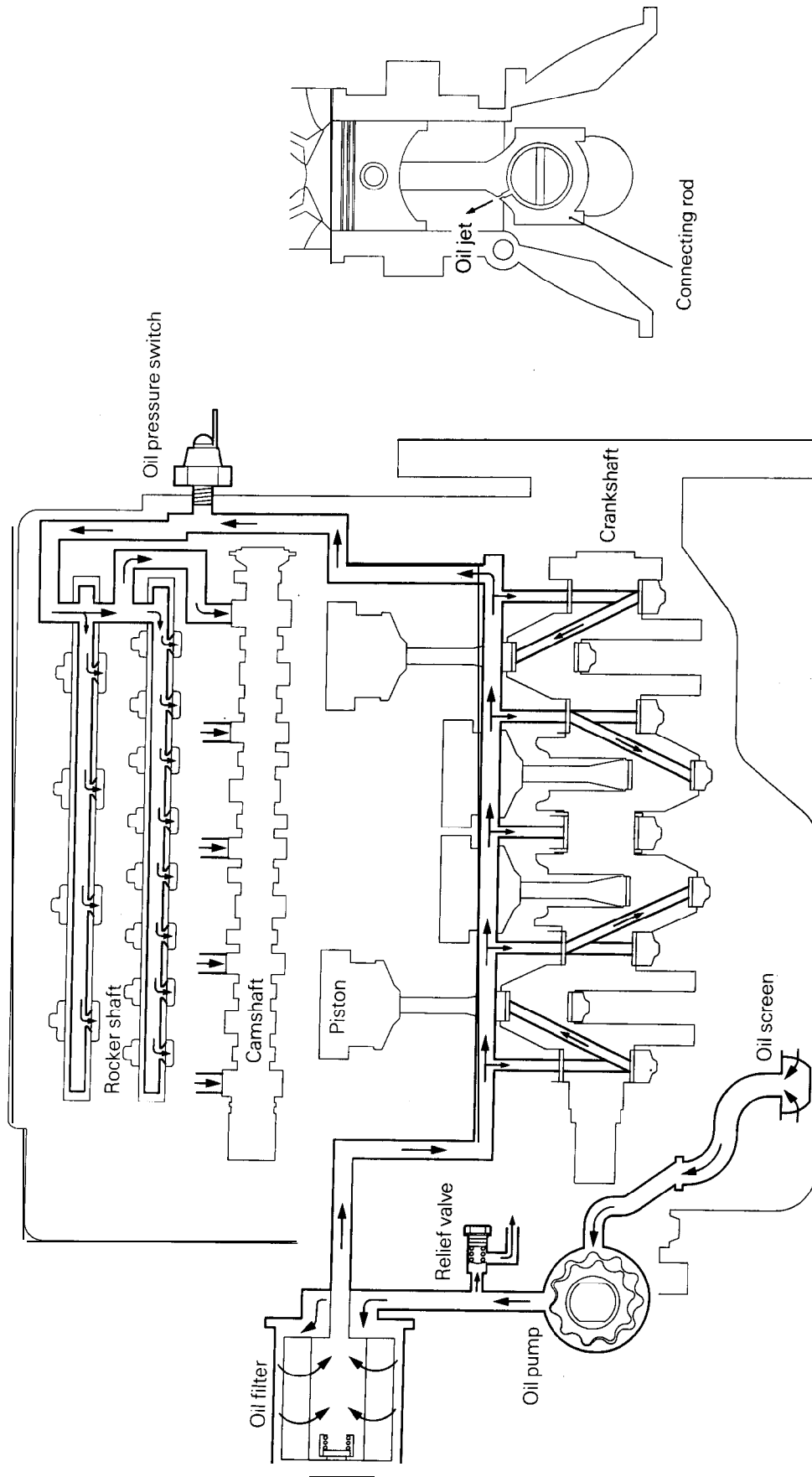
GENERAL INFORMATION

ENGINE SECTIONAL VIEW





LUBRICATION SYSTEM



GENERAL SPECIFICATIONS

Description	Specifications
Type	In-line OHV, SOHC
Number of cylinders	4
Combustion chamber	Pentroof type
Total displacement cm ³ (cu. in.)	1834 (111.9)
Cylinder bore mm (in.)	81 (3.19)
Piston stroke mm (in.)	89 (3.50)
Compression ratio	9.5
Valve timing	
(): camshaft identification mark	(1)
Intake valve	
Opens	18° BTDC
Closes	50° ATDC
Exhaust valve	
Opens	58° BBDC
Closes	10° ABDC
Lubrication system	Pressure feed, full-flow filtration
Oil pump type	Trochoid type
Cooling system	Water-cooled forced circulation
Water pump type	Centrifugal impeller type
EGR valve	Single type
Injector type and number	Electromagnetic, 4
Injector identification mark	MDH210
Fuel regulated pressure	335 (47.6)
Throttle bore	50 (1.969)
Throttle position sensor	Variable resistor type
Closed throttle position switch	Movable contact type, within throttle position sensor

SERVICE SPECIFICATIONS

mm (in.)

Items	Standard value	Limit
Cylinder head Flatness of gasket surface Grinding limit of gasket surface * Total resurfacing depth of both cylinder head and cylinder block Overall height Oversize rework dimensions of valve guide hole (both intake and exhaust) 0.05 (.002) O.S. 0.25 (.010) O.S. 0.50 (.020) O.S. Oversize rework dimensions of valve seat ring hole Intake 0.3 (.012) O.S. 0.6 (.024) O.S. Exhaust 0.3 (.012) O.S. 0.6 (.024) O.S.	0.03 (.0012) 119.9 – 120.1 (4.720 – 4.728) 11.05 – 11.07 (.4350 – .4358) 11.25 – 11.27 (.4429 – .4437) 11.50 – 11.52 (.4528 – .4535) 31.80 – 31.83 (1.2520 – 1.2531) 32.10 – 32.13 (1.2638 – 1.2650) 29.30 – 29.32 (1.1535 – 1.1543) 29.60 – 29.62 (1.1654 – 1.1661)	0.2 (.008) "0.2 (.008)
Camshaft Cam height Intake Exhaust Journal O.D. Bearing oil clearance	37.78 (1.4874) 38.09 (1.4996) 44.93 – 44.94 (1.7689 – 1.7693) 0.05 – 0.09 (.0020 – .0035)	37.28 (1.4677) 37.59 (1.4799)
Rocker arm I.D. Rocker arm-to-shaft clearance	20.02 – 20.04 (.7882 – .7890) 0.02 – 0.05 (.0008 – .0020)	0.1 (.004)
Rocker arm shaft O.D.	19.99 – 20.00 (.7870 – .7874)	
Valve Valve length Intake Exhaust Stem O.D. Intake Exhaust Face angle Thickness of valve head (margin) Intake Exhaust Valve stem-to-valve guide clearance Intake Exhaust Valve clearance Intake Exhaust	110.15 (4.3366) 113.7 (4.4764) 5.97 – 5.98 (.2350 – .2354) 5.95 – 5.97 (.2343 – .2350) 45° – 45°30' 1.0 (.039) 1.3 (.051) 0.02 – 0.04 (.0008 – .0016) 0.03 – 0.06 (.0012 – .0024) 0.09 (.004) 0.20 (.008)	0.5 (.020) 0.8 (.031) 0.10 (.0039) 0.15 (.0059)

mm (in.)

Items	Standard value	Limit
Valve spring Free height Load/installed height N/mm (lbs./in.) Out of squareness	50.9 (2.004) 220/44.2(49/1.74) Less than 2"	49.9 (1.965) 4"
Valve guide Length Intake Exhaust I.D. O.D. Service size Press-in temperature	45.5 (1.791) 50.5 (1.988) 6.00 – 6.01 (.2362 – .2366) 11.055 – 11.065 (.4350 – .4356) 0.05 (.002), 0.25 (.01), 0.50 (.02) oversize Room temperature	
Valve seat Seat angle Valve contact width Sinkage Service size	43°30' – 44 0.9 – 1.3 (.035 – .051) 0.3 (.012), 0.6 (.024) oversize	0.2 (.008)
Piston O.D. Piston-to-cylinder clearance Service size	80.98 – 80.99 (3.1882 -3.1886) 0.02 – 0.04 (.0008 – .0016) 0.25 (.01), 0.50 (.02), 0.75 (.03), 1.00 (.04) oversize	
Piston ring End gap No. 1 ring No. 2 ring Oil ring Ring-to-ring groove clearance No. 1 ring No. 2 ring Service size	0.25 – 0.40 (.0098 – .0157) 0.40 – 0.55 (.0157 – .0217) 0.20 – 0.60 (.0079 – .0236) 0.03 – 0.07 (.0012 – .0028) 0.02 – 0.06 (.0008 – .0024) 0.25 (.01), 0.50 (.02), 0.75 (.03), 1.00 (.04) oversize	0.8 (.031) 0.8 (.031) 1.0 (.039) 0.1 (.004) 0.1 (.004)
Piston pin O.D. Press-in load N (Psi) Press-in-temperature	19.002 – 19.005 (.7481 – .7482) 5,000 – 15,000 (1,102 – 3,307) Room temperature	
Connecting rod Big end center-to-small end center length Bend Twist Big end side clearance	133.4 – 133.5 (5.252 – 5.256) 0.05 (.0020) 0.1 (.004) 0.10 – 0.25 (.0039 – .0098)	0.4 (.016)

mm (in.)

Items	Standard value	Limit
Crankshaft		
End play	0.05 – 0.25 (.0020 – .0098)	0.4 (.016)
Journal O.D.	49.982 – 49.994 (1.9678 – 1.9683)	
Pin O.D.	44.980 – 44.995 (1.7709 – 1.7715)	
Out-of-roundness and taper of journal and pin	0.003 (.0001)	
Oil clearance of journal	0.02 – 0.04 (.0008 – .0016)	0.1 (.004)
Oil clearance of pin	0.02 – 0.05 (.0008 – .0020)	0.1 (.004)
Cylinder block		
I.D.	81.00 – 81.03 (3.1890 – 3.1902)	
Flatness of gasket surface	0.05 (.002)	0.1 (.004)
Grinding limit of gasket surface		*0.2 (.008)
Total resurfacing depth of both cylinder head and cylinder block		
Overall height	263.5 (10.37)	
Flywheel		
Runout		0.13 (.0051)
Oil pump		
Tip clearance	0.03 – 0.08 (.0012 – .0031)	
Side clearance	0.04 – 0.10 (.0016 – .0039)	
Body clearance	0.10 – 0.18 (.0039 – .0071)	0.35 (.0138)
Drive belt deflection		
New belt	7.0 – 8.5 (.28 – .33)	
Used belt	9.5 (.37)	
Injector		
Coil resistance Ω	13 – 16 at 20°C (68°F)	
Throttle position sensor		
Resistance Ω	3.5-6.5	
Idle air control motor		
Coil resistance Ω	5 – 35 at 20°C (68°F)	

TORQUE SPECIFICATIONS

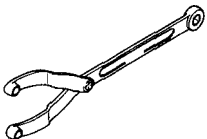
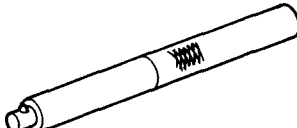

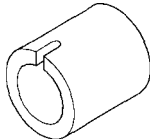

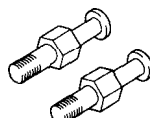
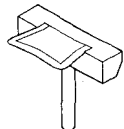
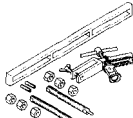
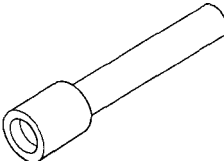
	Nm	ft.lbs.
Generator and ignition system		
Oil level gauge guide mounting bolt	11	8
Generator brace bolt	23	17
Generator brace mounting bolt	50	36
Generator pivot nut	45	33
Crankshaft bolt	185	134
Spark plug	25	18
Distributor	12	9
Timing belt		
Tensioner bolt	24	18
Tensioner spring bolt	45	33
Camshaft sprocket bolt	90	65
Fuel and emission parts		
Throttle body mounting bolt	19	14
Fuel rail mounting bolt	12	9
Fuel pressure regulator bolt	9	7
EGR valve mounting bolt (California)	13	9
EGR temperature sensor (California)	11	8
Throttle body		
Throttle position sensor mounting bolt	2	1.4
Intake manifold and water pump		
Intake manifold stay mounting bolt	31	22
Intake manifold mounting bolt and nut	20	14
Water pump mounting bolt	24	17
Timing belt cover mounting bolt	10	7
Engine support bracket left mounting bolt	50	36
Water pipe mounting bolt	14	10
Engine coolant temperature sensor	30	22
Engine coolant temperature gauge unit	11	8
Thermostat housing mounting bolt	24	17
Water outlet fitting mounting bolt	19	14
Exhaust manifold		
Oxygen sensor	45	33
Exhaust manifold cover "A" mounting bolt	M8 27	20
	M6 9	7
Exhaust manifold bracket mounting bolt	36	26
Exhaust manifold mounting nut	M10 30	22
	M8 18	13
Exhaust manifold cover "B" mounting bolt	24	17
Rocker arms and camshaft		
Rocker cover mounting bolt	3.3	2.4
Rocker arm shaft mounting bolt	32	23
Adjusting screw lock nut	9	7

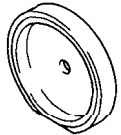
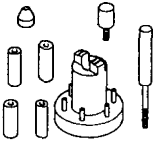
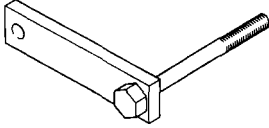
	N m	ft.lbs.
Cylinder head and valves		
Engine hanger mounting bolt	12	9
Water outlet fitting mounting bolt	14	10
Oil pressure switch	10	7
Cylinder head bolt [Tighten to 75 Nm (54 ft.lbs) and then completely loosen before finally tightening with above procedure.]	20 + 1/4 turns + 1/4 turns	14.5 + 1/4 turns + 1/4 turns
Front case and oil pump		
Drain plug	40	29
Oil pan mounting bolt	7	5
Oil screen	19	14
Relief plug	45	33
Oil pump case mounting bolt	14	10
Oil pump case cover mounting bolt	10	7
Piston and connecting rod		
Connecting rod cap nut	20 + 1/4 turns	14.5 + 1/4 turns
Crankshaft, cylinder block, flywheel and drive plate		
Flywheel bolt	100	72
Drive plate bolt	100	72
Rear plate mounting bolt	11	8
Bell housing cover mounting bolt	9	7
Oil seal case mounting bolt	11	8
Bearing cap bolt	25 + 1/4 turns	18 + 1/4 turns

SEALANT

Items	Specified sealant	Quantity
Water pump	Mitsubishi Genuine Part No. MD970389 or equivalent	As required
Thermostat housing	Mitsubishi Genuine Part No. MD970389 or equivalent	As required
Engine coolant temperature sensor	3M Nut Locking part No. 4171 or equivalent	As required
Engine coolant temperature gauge unit	3M ATD Part No. 8660 or equivalent	As required
Oil pressure switch	3M ATD Part No. 8660 or equivalent	As required
Water outlet fitting	Mitsubishi Genuine Part No. MD970389 or equivalent	As required
Oil pump case	Mitsubishi Genuine Part No. MD970389 or equivalent	As required
Oil pan	Mitsubishi Genuine Part No. MD970389 or equivalent	As required
Oil seal case	Mitsubishi Genuine Part No. MD970389 or equivalent	As required
Drive plate bolt	3M Nut Locking part No. 4171 or equivalent	As required
Flywheel bolt	3M Nut Locking part No. 4171 or equivalent	As required

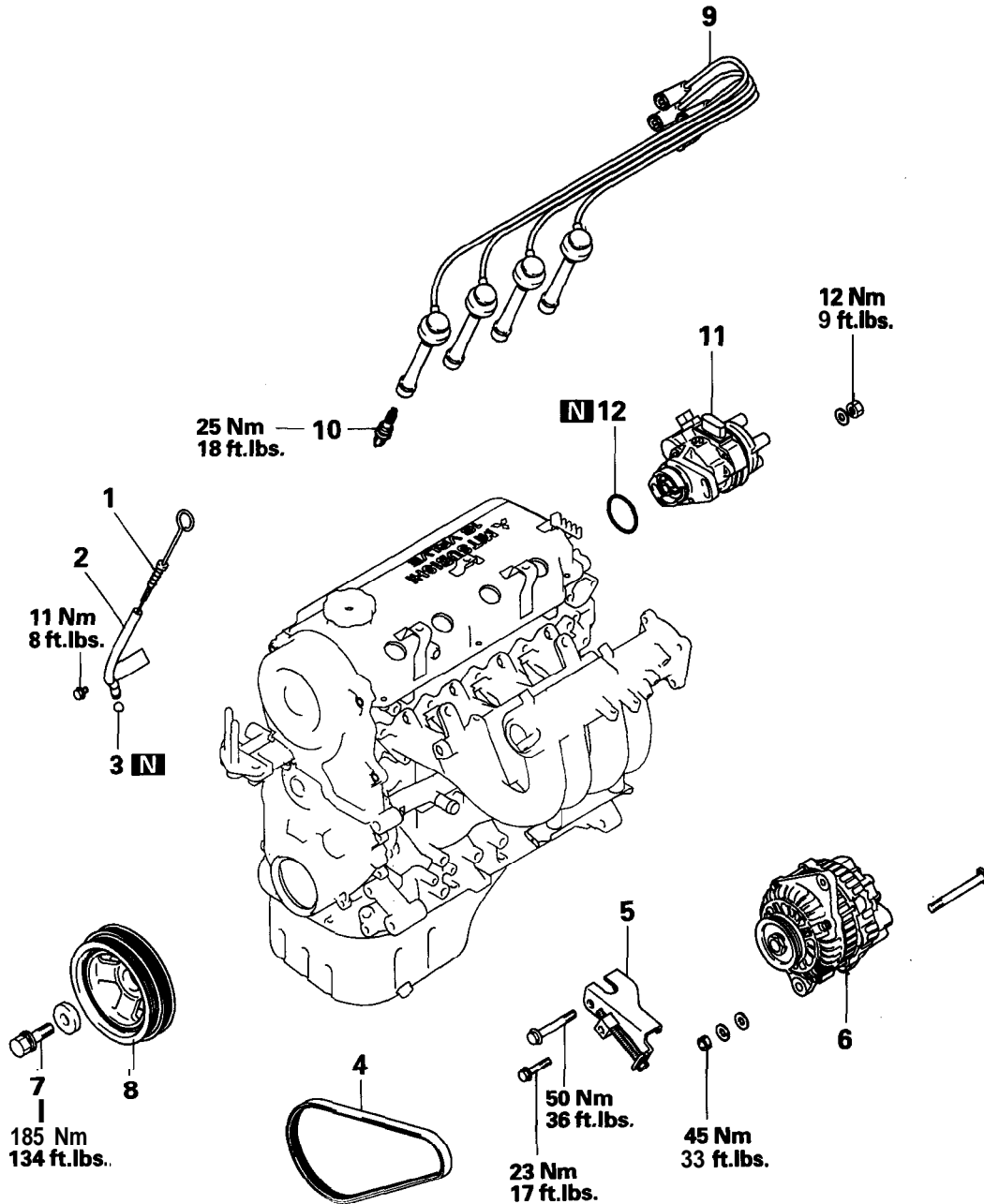
SPECIAL TOOLS

Tool	Number and tool name	Supersession	Application
	MB990767 End yoke holder Use with MD998719	MB990767-01 Use with MIT308239	Holding camshaft sprocket when loosening or torquing bolt
	MB990938 Handle	MB990938-01	Installation of crankshaft rear oil seal
	MD998713 Camshaft oil seal installer	MD998713-01	Installation of camshaft oil seal
	MD998716 Crankshaft wrench	MD998716-01	Turning crankshaft
	MD998717 Crankshaft front oil seal installer	MD998717-01	Installation of front oil seal
	MD998719 Pulley holding pins (2)	MIT308239	Holding crankshaft sprocket
	MD998727 Oil pan remover		Removal of oil pan
	MD998772 Valve spring compressor		Compressing valve spring
	MD998774 Valve stem seal installer		Installation of valve stem seal

Tool	Number	Name	Use
	MD998776 Crankshaft rear oil seal installer Use with MB990938	Use with MB990938-01	Installation of crankshaft rear oil seal
	MD998780 Piston pin setting tool	MIT216941	Removal and installation of piston pin
	MD998781 Flywheel stopper		Holding flywheel

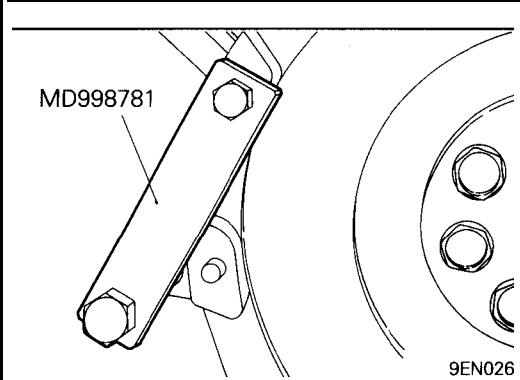
GENERATOR AND IGNITION SYSTEM

REMOVAL AND INSTALLATION

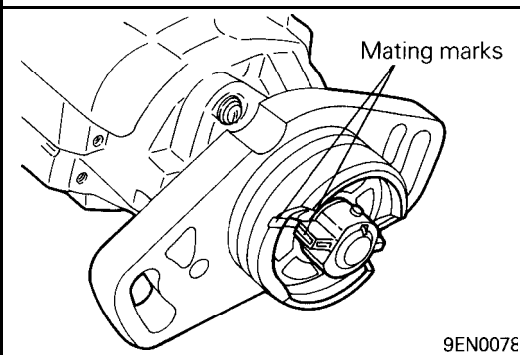


Removal steps

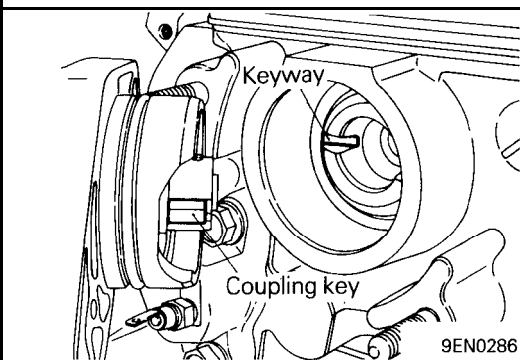
1. Oil level gauge
2. Oil level gauge guide
3. O-ring
- ▶C▶ 4. Drive belt
5. Generator brace
6. Generator
- ◀A▶ ▶B▶ 7. Crankshaft bolt
8. Crankshaft pulley
9. Spark plug cable
10. Spark plug
- ▶A▶ 11. Distributor
12. O-ring

**REMOVAL SERVICE POINT****↔A↔ CRANKSHAFT BOLT LOOSENING**

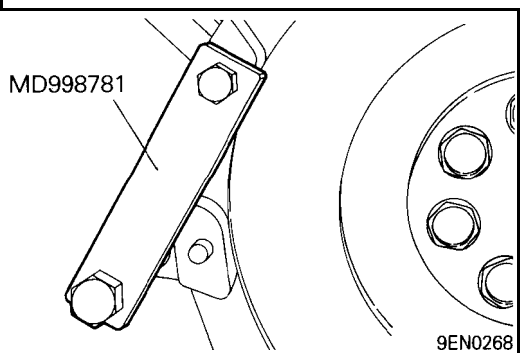
- (1) Using the special tool, hold the drive plate on flywheel.
- (2) Remove the crankshaft bolt.

**INSTALLATION SERVICE POINTS****↔A↔ DISTRIBUTOR ASSEMBLY INSTALLATION**

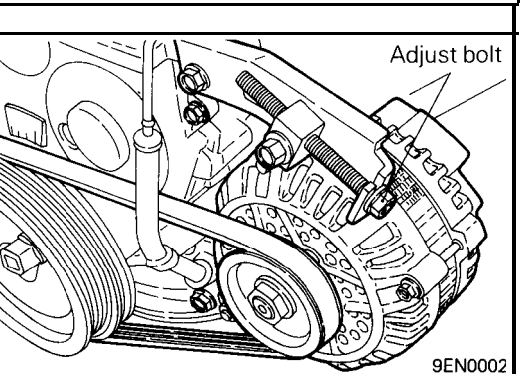
- (1) Turn the crankshaft to bring No. 1 cylinder to the top dead center on compression stroke.
- (2) Align the mating marks on the distributor housing with that of the coupling key.



- (3) Install the distributor with the coupling key fitted in the keyway at the end of camshaft.

**↔B↔ CRANKSHAFT BOLT TIGHTENING**

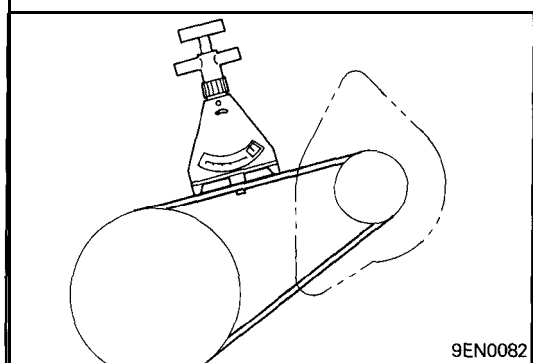
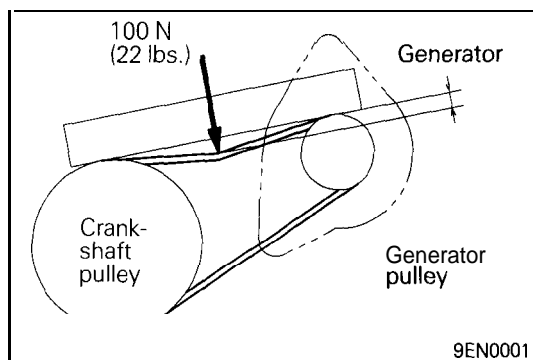
- (1) Using the special tool, hold the drive plate or flywheel.
- (2) Install the crankshaft bolt.

**↔C↔ DRIVE BELT TENSION ADJUSTMENT**

- (1) Adjust the belt deflection with the adjusting bolt to the standard value.

Standard value:

New belt	7.0 – 8.5 mm (.28 – .33 in.)
Used belt	9.5 mm (.37 in)



- (2) Or using a tension gauge, adjust the tension to the standard value.

Standard value:

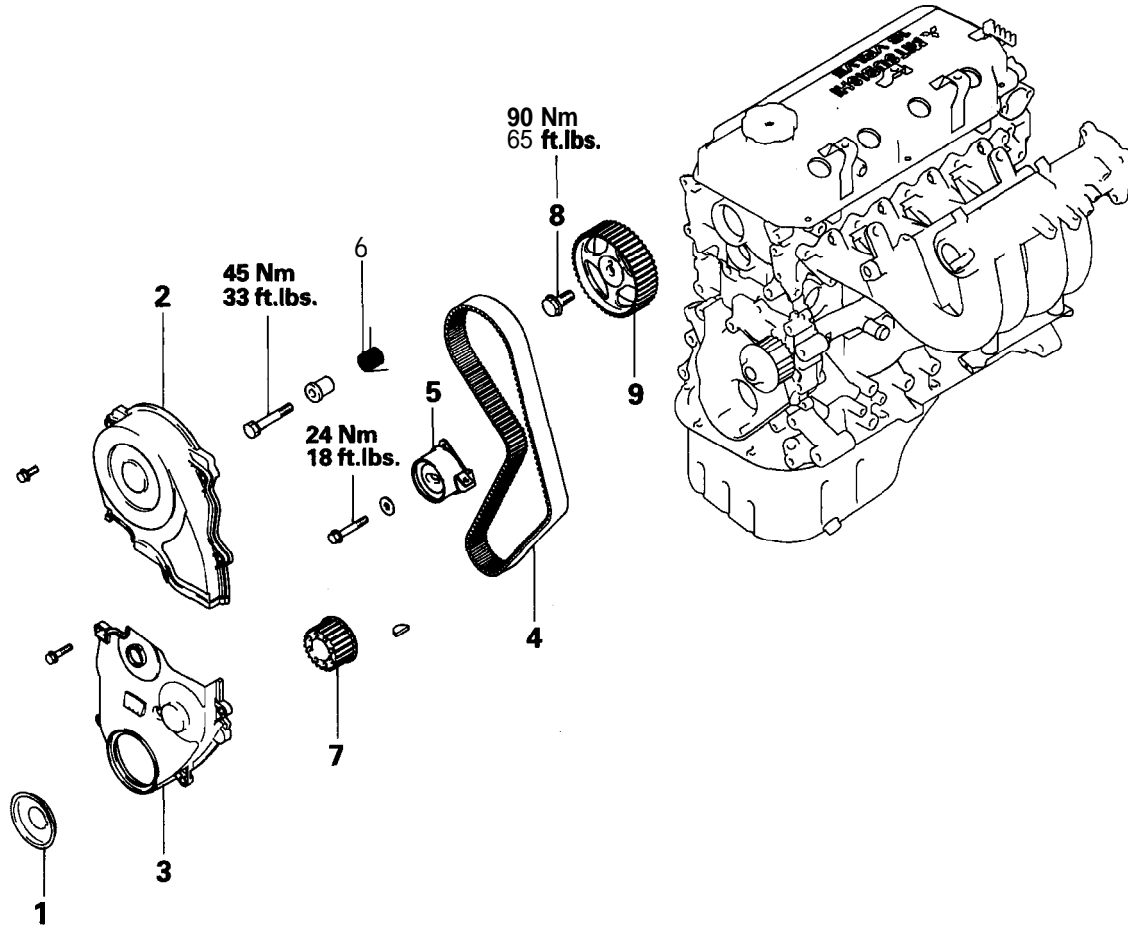
New belt 500 – 700 N (110 – 154 lbs.)

Used belt 400 N (88 lbs.)

- (3) Tighten the lock bolt to the specified torque.
(4) Tighten the nut for pivot bolt to the specified torque.

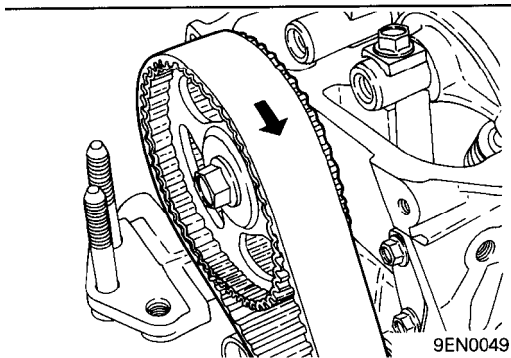
TIMING BELT

REMOVAL AND INSTALLATION



Removal steps

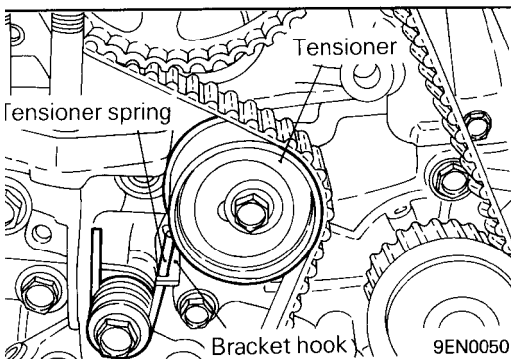
1. Flange
2. Timing belt upper cover
3. Timing belt lower cover
- ↔A↔↔C↔ 4. Timing belt
- ↔B↔ 5. Tensioner
- ↔B↔ 6. Tensioner spring
7. Crankshaft sprocket
- ↔B↔↔A↔ 8. Camshaft sprocket bolt
9. Camshaft sprocket



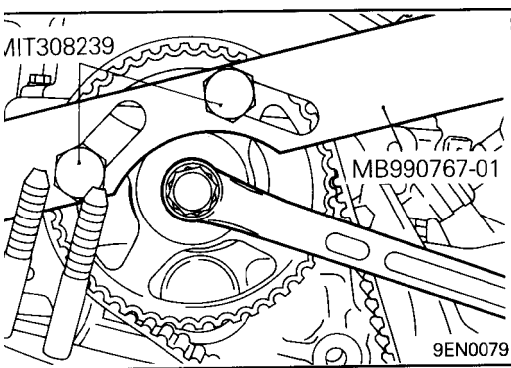
REMOVAL SERVICE POINTS

◁A▷ TIMING BELT REMOVAL

(1) Mark the belt running direction for reference in installation.



- (2) Back off the tensioner spring mounting bolt three turns.
- (3) Pinching the end of the tensioner spring on the tensioner side with pliers, unhook it from the bracket hook on the tensioner to free the tensioner spring.
- (4) Loosen the tensioner mounting bolt and remove the timing belt.



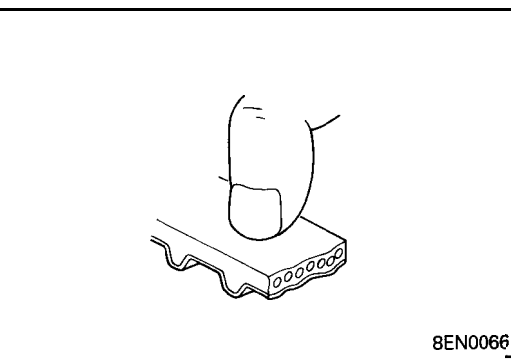
◁B▷ CAMSHAFT SPROCKET BOLT LOOSENING

INSPECTION

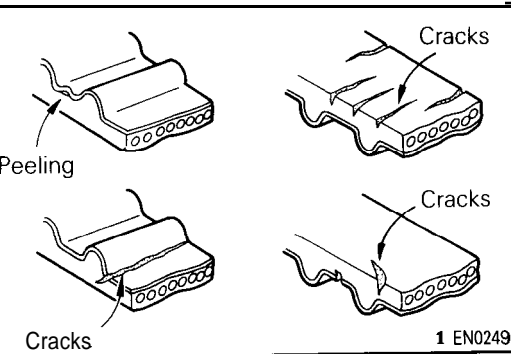
TIMING BELT

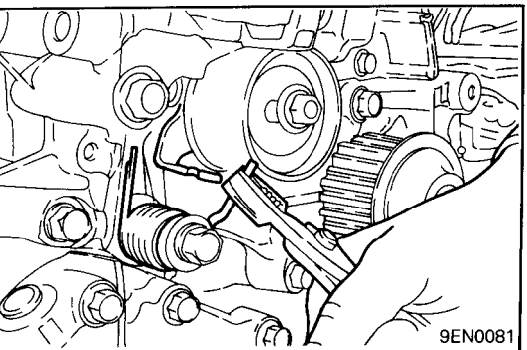
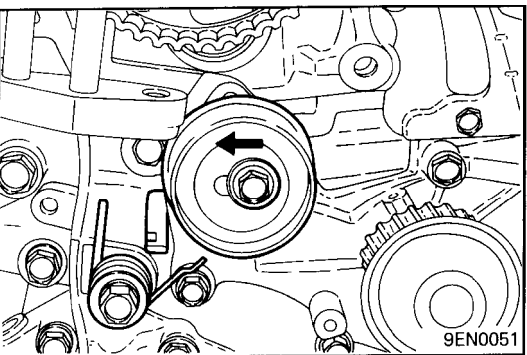
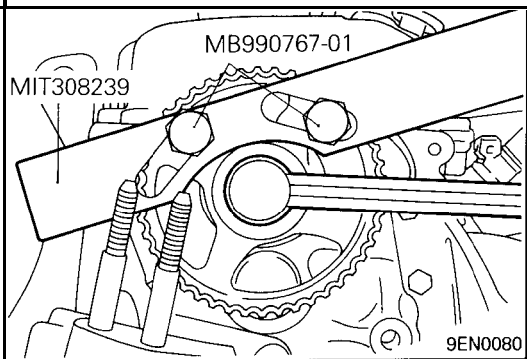
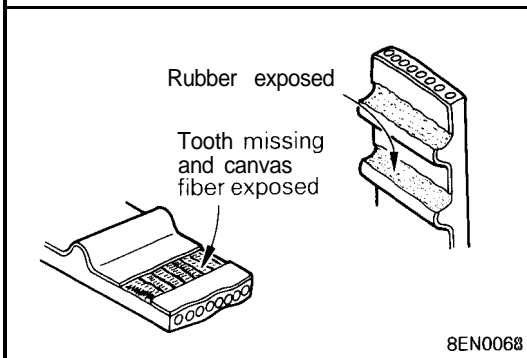
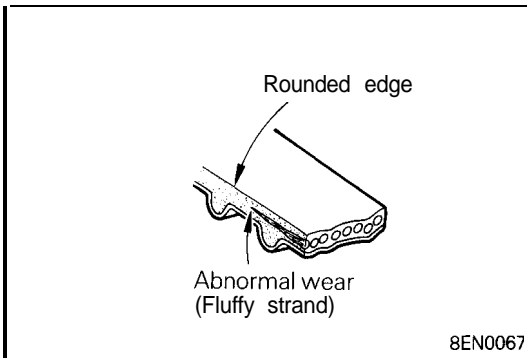
Replace belt if any of the following conditions exist.

- (1) Hardening of back rubber.
Back side is glossy without resilience and leaves no indent when pressed with fingernail.



- (2) Cracks on rubber back.
- (3) Cracks or peeling of canvas.
- (4) Cracks on tooth bottom.
- (5) Cracks on belt sides.





(6) Abnormal wear of belt sides. The sides are normal if they are sharp as if cut by a knife.

- (7) Abnormal wear on teeth.
- (8) Missing tooth.

INSTALLATION SERVICE POINTS

▶▶ CAMSHAFT SPROCKET BOLT TIGHTENING

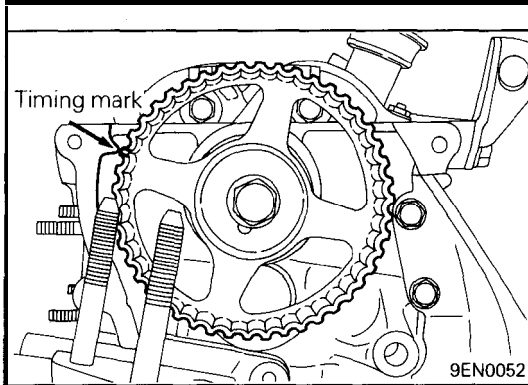
▶▶ TENSIONER SPRING / TENSIONER INSTALLATION

- (1) Install the tensioner spring and spacer. Do not fully tighten the bolt: from the tightened position, back it off three turns.
- (2) Mount the timing belt tensioner. Push the tensioner in the direction of the arrow and tighten the bolt to secure the tensioner in that position.
- (3) Pinching the front end of the tensioner spring, hook it onto the tensioner bracket hook.

Caution

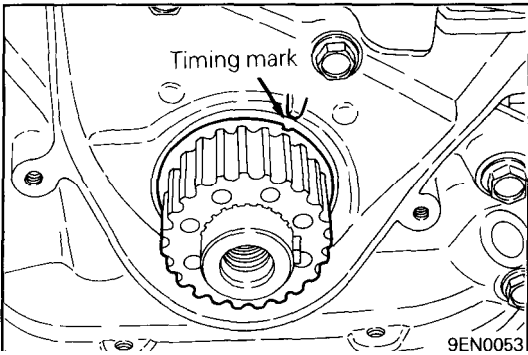
When hooking the tensioner spring, use care not to damage the tensioner pulley surfaces with the spring end or pliers.

- (4) Tighten the tensioner spring mounting bolt to the specification.

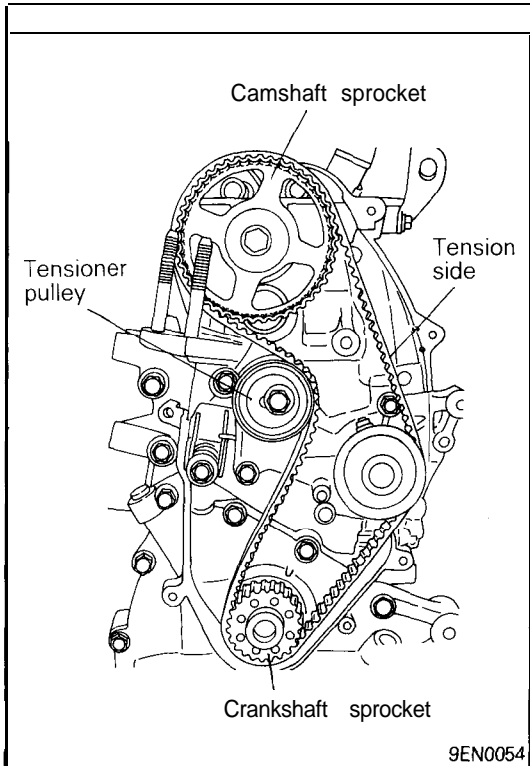


▶C▶ TIMING BELT INSTALLATION

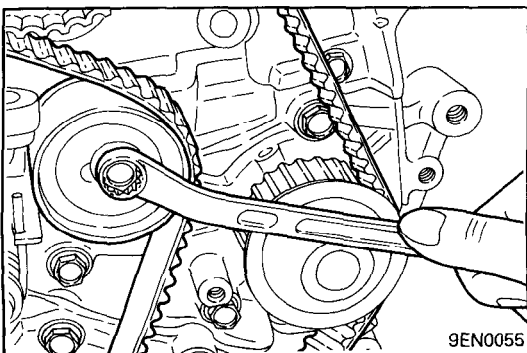
- (1) Check that the timing belt tensioner and spring have been installed in position. (See ▶B▶.)
- (2) Align the timing mark on the camshaft sprocket with that on the cylinder head.



- (3) Align the timing mark on the crankshaft sprocket with that on the front case.



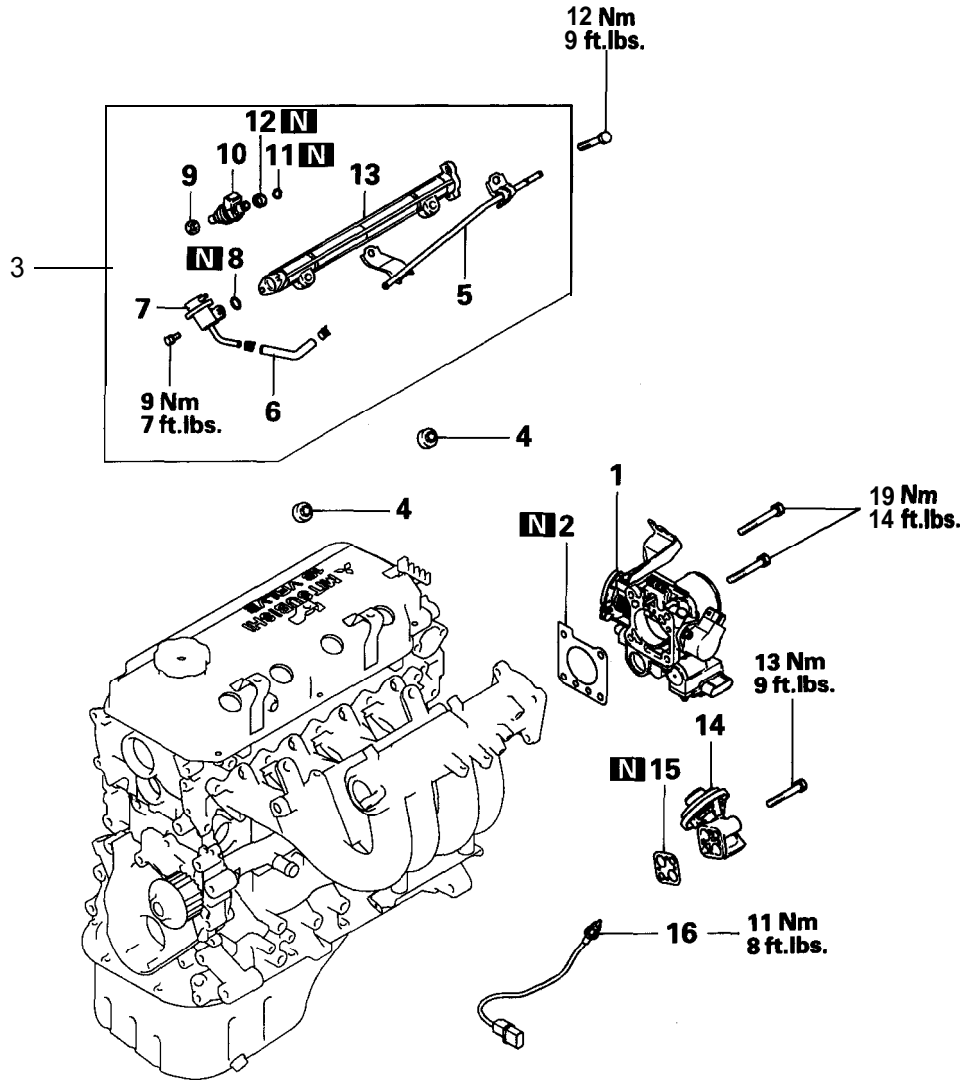
- (4) Install the timing belt first on the crankshaft sprocket and then keeping the tension side belt tight, set on the camshaft sprocket. Finally, get the belt around the tensioner pulley.



- (5) Back off one turn the tensioner pulley mounting bolt which has been temporarily tightened.

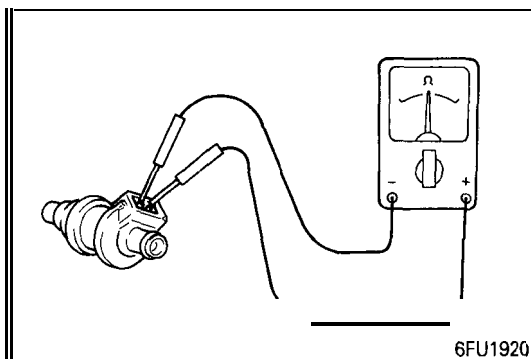
FUEL AND EMISSION PARTS

REMOVAL AND INSTALLATION



Removal steps

1. Throttle body
 2. Gasket
 3. Fuel rail and injector
 4. Insulator
 5. Fuel return pipe
 6. Fuel hose
 7. Fuel pressure regulator
 8. O-ring
 9. Insulator
 10. Injector
 11. O-ring
 12. Grommet
 13. Fuel rail
 14. EGR valve
 15. Gasket
 16. EGR temperature sensor
- } MIRAGE
- } For California

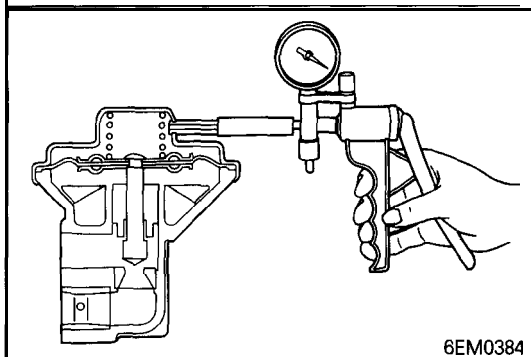


INSPECTION

INJECTORS

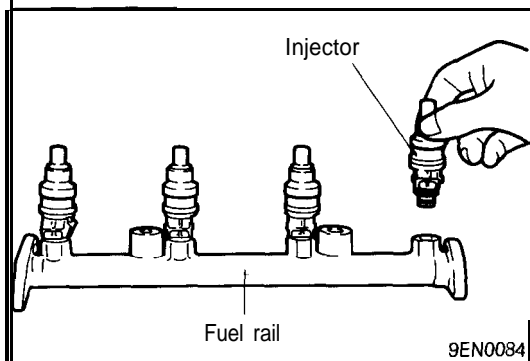
- (1) Using an ohmmeter (circuit tester), test for continuity between terminals of injectors; the circuit should be closed. If failure is detected, replace the injector.

Standard value: 13 – 16 Ω at 20°C (68°F)



EGR VALVE

- (1) Check the EGR valve for sticking or carbon deposits. If such conditions exist, clean or replace the EGR valve.
- (2) Connect a hand vacuum pump to the nipple of EGR valve and plug other nipple.
- (3) Apply a vacuum of 500 mmHg (19.7 in.Hg) to check that the vacuum is retained. If there is a leak, replace the EGR valve.
- (4) Check also that the valve opens and closes properly by applying and releasing a vacuum.



INSTALLATION SERVICE POINTS

▶▶ INJECTOR INSTALLATION

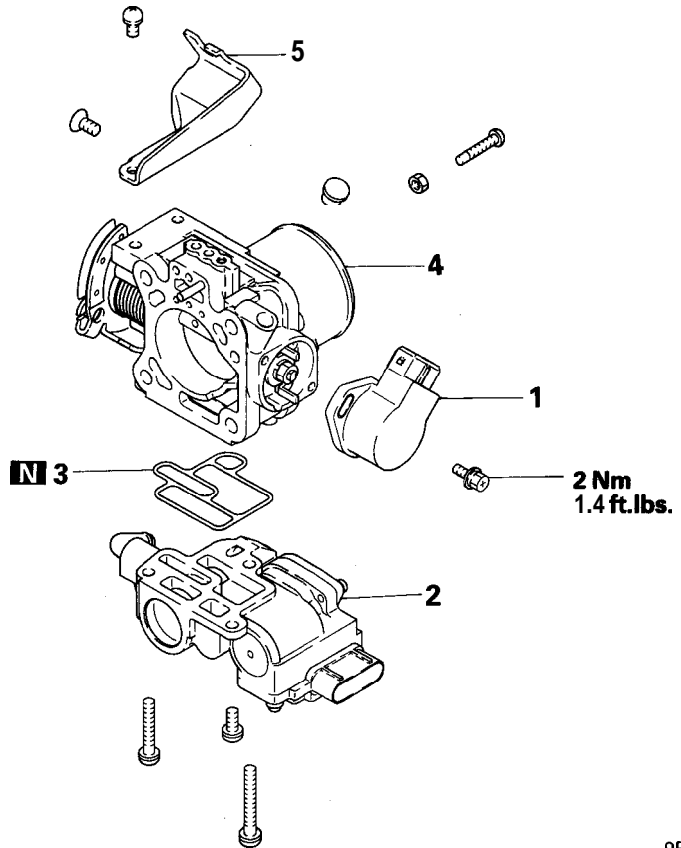
- (1) Before installing an injector, the rubber O-ring must be lubricated with a drop of clean engine oil to aid in installation.
- (2) Insert injector top end into the fuel rail. Be careful not to damage the O-ring during installation.

▶▶ FUEL PRESSURE REGULATOR INSTALLATION

- (1) Before installing the pressure regulator, the O-ring must be lubricated with a drop of clean engine oil to aid in installation.

THROTTLE BODY

DISASSEMBLY AND REASSEMBLY
EXPO

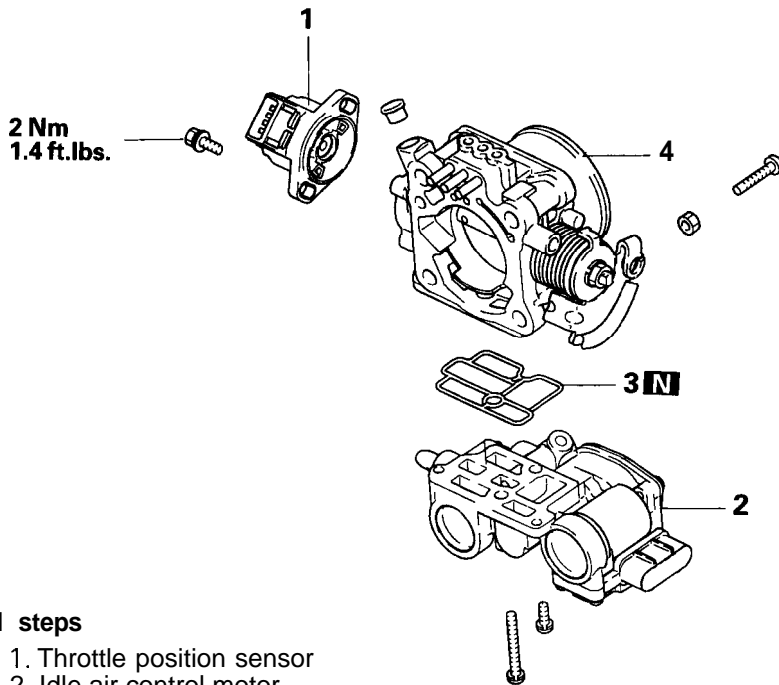


Removal steps

- ◊A◊ ◊A◊ 1. Throttle position sensor
- ◊A◊ 2. Idle air control motor
- 3. O-ring
- ◊B◊ 4. Throttle body
- 5. Accelerator cable bracket

9EN0275

MIRAGE



Removal steps

- ◊A◊ ◊A◊ 1. Throttle position sensor
- ◊A◊ 2. Idle air control motor
- 3. O-ring
- ◊B◊ 4. Throttle body

1 EN0336

DISASSEMBLY SERVICE POINTS

◊A◊ THROTTLE POSITION SENSOR AND IDLE AIR CONTROL MOTOR REMOVAL

- (1) Do not disassemble the sensor and motor.
- (2) Do not clean the sensor and motor using solvent. Clean them with shop towel.

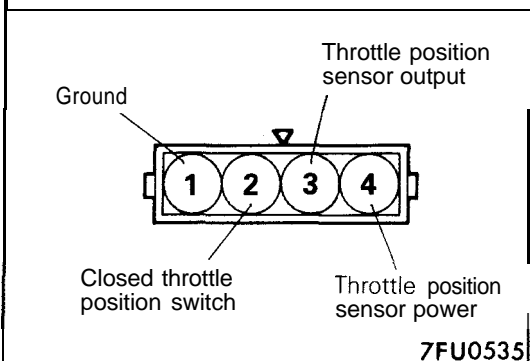
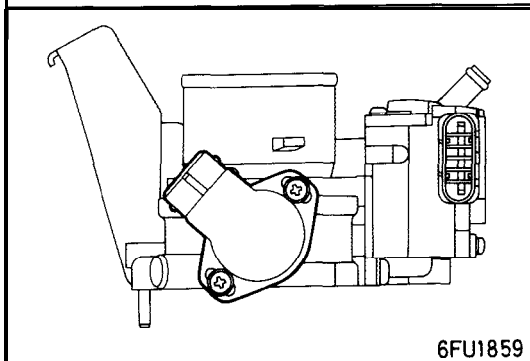
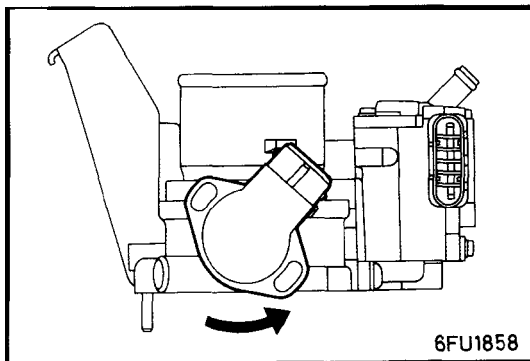
◊B◊ THROTTLE BODY REMOVAL

- (1) Do not remove the throttle valve.
- (2) Check if the vacuum port or passage is clogged. Use compressed air to clean the vacuum passage.

REASSEMBLY SERVICE POINTS

◊A◊ THROTTLE POSITION SENSOR INSTALLATION – EXPO

- (1) Install the throttle position sensor to the throttle body as shown in the illustration.

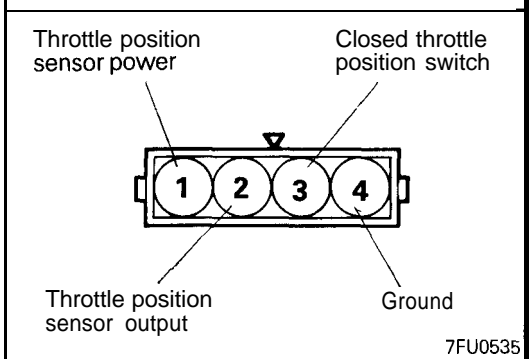
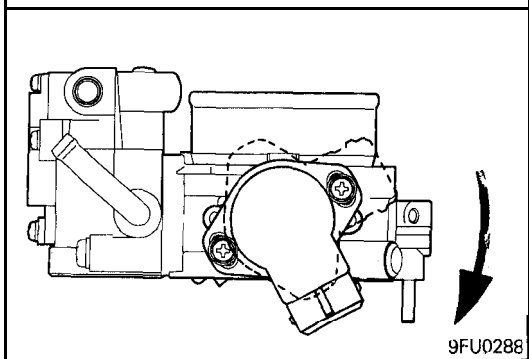
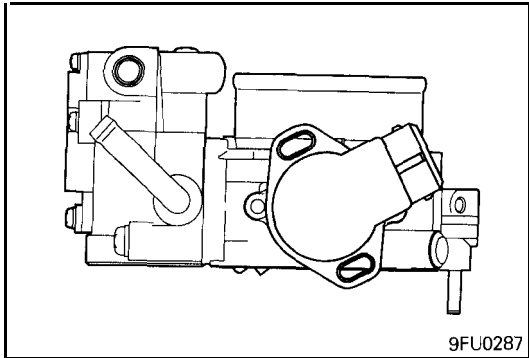


- (2) Turn the throttle position sensor 90° counterclockwise, and tighten the screws.
- (3) Connect a circuit tester between ① (ground) and ③ (output), or between ③ (output) and ④ (power). Then, make sure that the resistance changes smoothly when the throttle valve is slowly moved to the fully open position.
- (4) Check for continuity across terminals ② (Closed throttle position switch) and ① (ground) with the throttle valve both fully closed and fully open.

Throttle valve position	Continuity
Fully closed	Conductive
Fully open	Non-conductive

If there is not continuity with the throttle valve fully closed, turn the throttle position sensor in clockwise direction, and then check again.

- (5) If failure is detected, replace the throttle position sensor.



◆A◆ THROTTLE POSITION SENSOR INSTALLATION <MIRAGE>

(1) Install the throttle position sensor to the throttle body as shown in the illustration.

(2) Turn the throttle position sensor 90° clockwise, and tighten the screws.

(3) Connect a circuit tester between ④ (ground) and ② (output), or between ② (output) and ① (power). Then, make sure that the resistance changes smoothly when the throttle valve is slowly moved to the fully open position.

(4) Check for continuity across terminals ③ (Closed throttle position switch) and ④ (ground) with the throttle valve both fully closed and fully open.

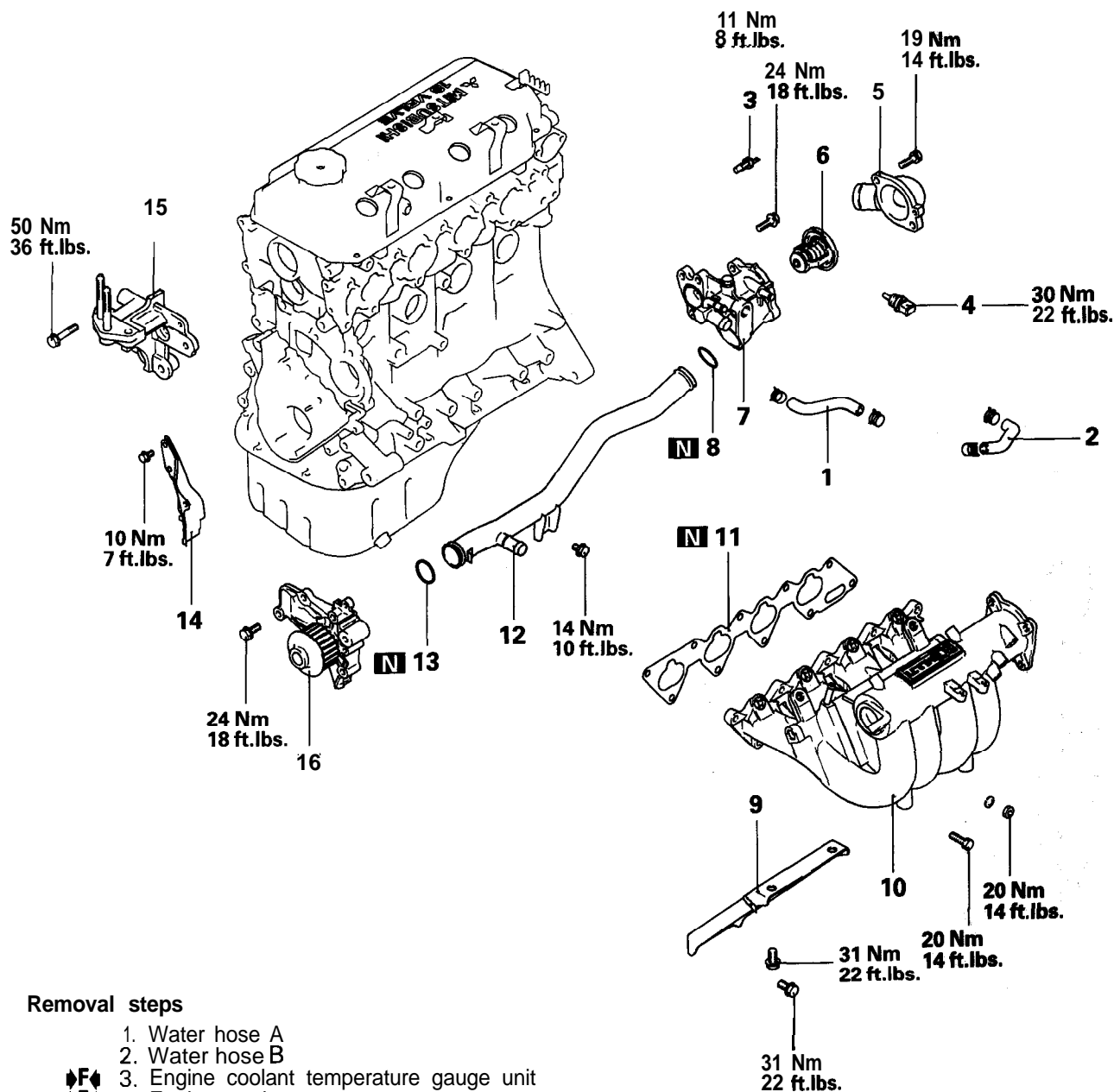
Throttle valve position	Continuity
Fully closed	Conductive
Fully open	Non-conductive

If there is not continuity with the throttle valve fully closed, turn the throttle position sensor in clockwise direction, and then check again.

(5) If failure is detected, replace the throttle position sensor.

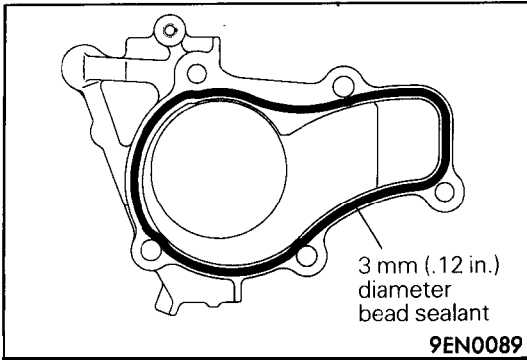
INTAKE MANIFOLD AND WATER PUMP

REMOVAL AND INSTALLATION



Removal steps

1. Water hose A
2. Water hose B
- ◆F◆ 3. Engine coolant temperature gauge unit
- ◆E◆ 4. Engine coolant temperature sensor
5. Water inlet fitting
- ◆D◆ 6. Thermostat
- ◆C◆ 7. Thermostat housing
- ◆B◆ 8. O-ring
9. Intake manifold stay
10. Intake manifold
11. Gasket
- ◆B◆ 12. Water pipe
- ◆B◆ 13. O-ring
14. Timing belt cover
15. Engine support bracket, left
- ◆A◆ 16. Water pump



INSTALLATION SERVICE POINTS

◆A◆ SEALANT APPLICATION TO WATER PUMP

Specified sealant:

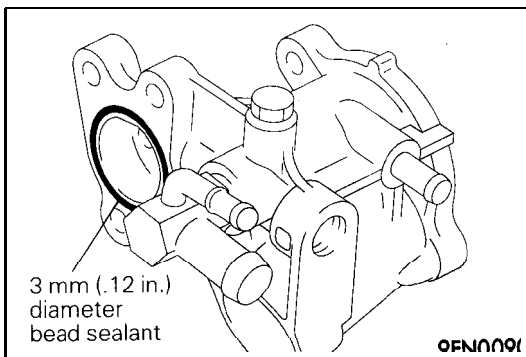
Mitsubishi Genuine Part No. **MD970389** or equivalent

◆B◆ WATER PIPE / O-RING INSTALLATION

(1) Wet the O-ring (with water) to facilitate the assembly.

Caution

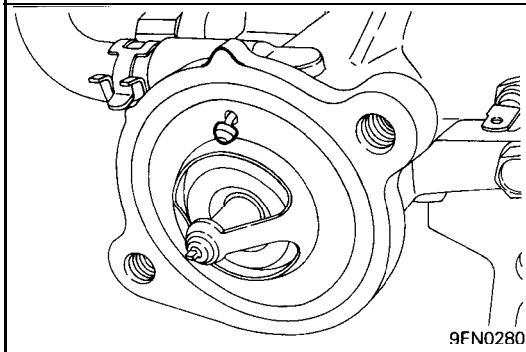
1. Keep the O-ring free of oil or grease.
2. Secure the water pipe after the thermostat housing has been installed.



◆C◆ SEALANT APPLICATION TO THERMOSTAT HOUSING

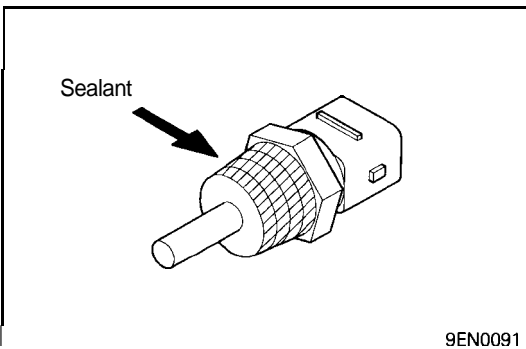
Specified sealant:

Mitsubishi Genuine Part No. **MD970389** or equivalent



◆D◆ THERMOSTAT INSTALLATION

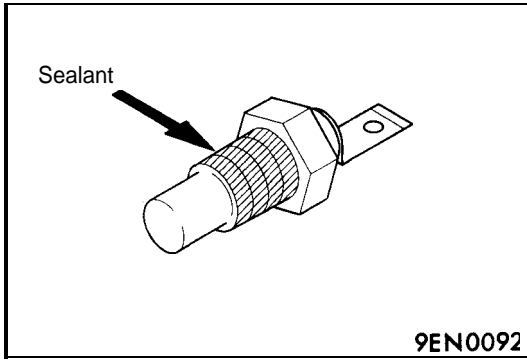
(1) Install the thermostat in the thermostat housing in such a way that the jiggle valve is located as illustrated.



◆E◆ SEALANT APPLICATION TO ENGINE COOLANT TEMPERATURE SENSOR

Specified sealant:

3M Nut Locking Part No. 4171 or equivalent

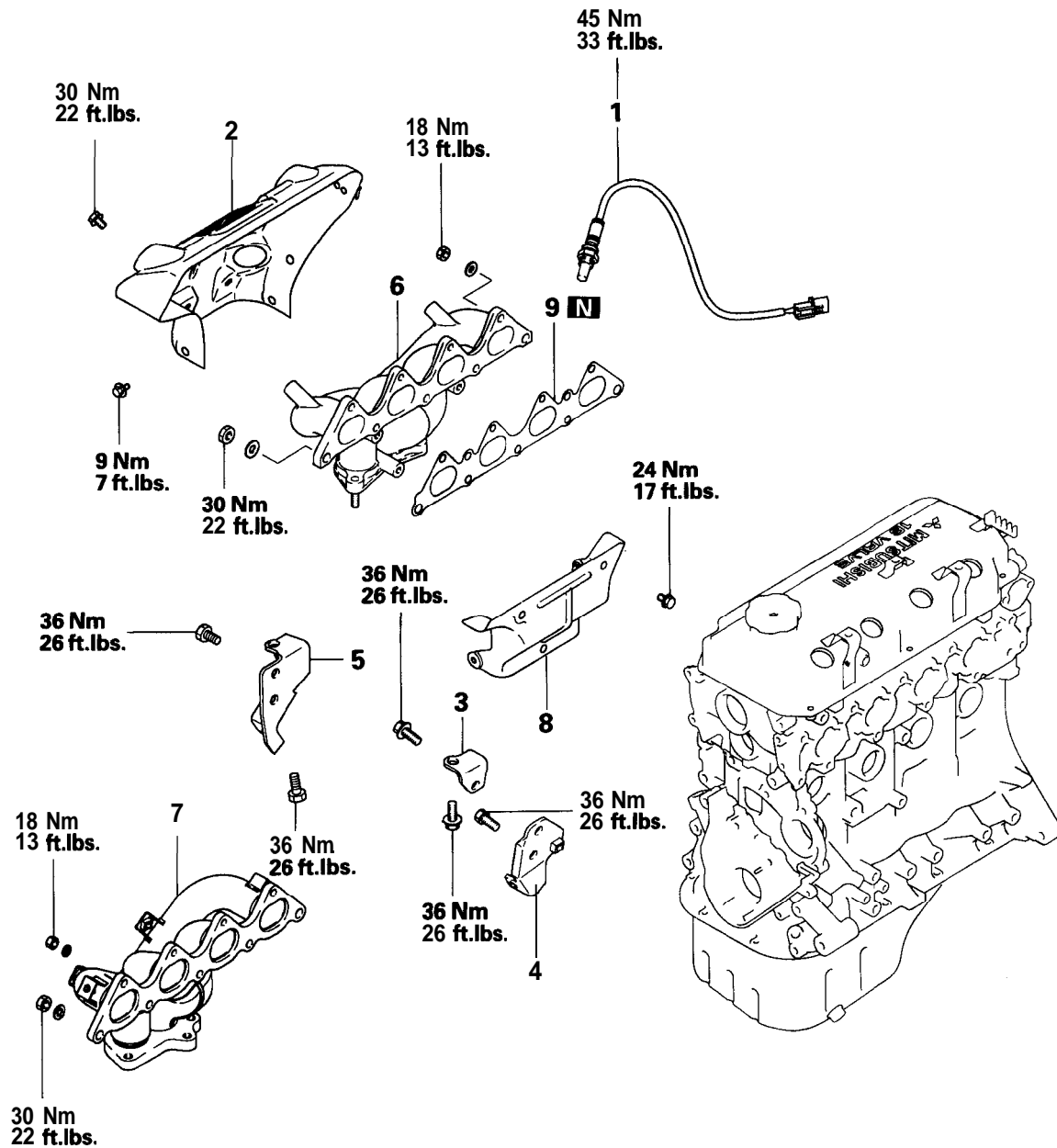


◆F◆ SEALANT APPLICATION TO ENGINE COOLANT TEMPERATURE GAUGE UNIT

Specified sealant:
3M ATD Part No. 8660 or equivalent

EXHAUST MANIFOLD

REMOVAL AND INSTALLATION

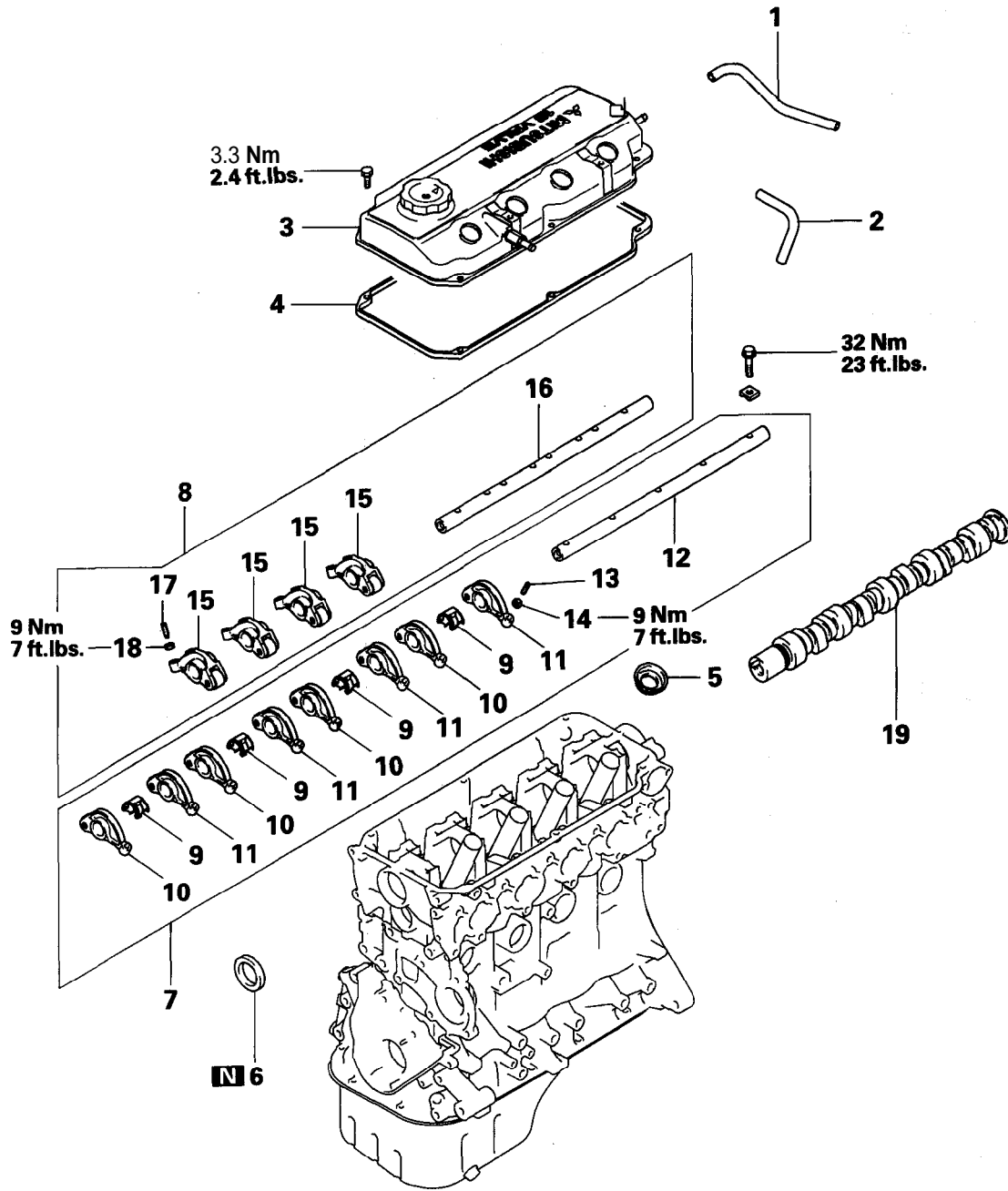


Removal steps

1. Oxygen sensor _____ 1992,1993 (Federal) models
2. Exhaust manifold cover A _____
3. Exhaust manifold bracket B } 1993 models
4. Exhaust manifold bracket A }
5. Exhaust manifold bracket _____ 1992 models
6. Exhaust manifold _____ 1992, 1993 (Federal) models
7. Exhaust manifold _____ 1993 (California) models
8. Exhaust manifold cover B _____ 1992, 1993 (Federal) models
9. Gasket

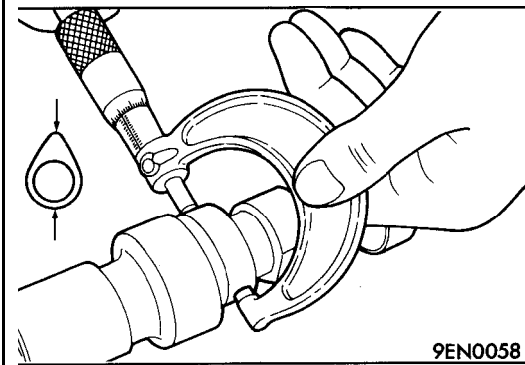
ROCKER ARMS AND CAMSHAFT

REMOVAL AND INSTALLATION



Removal steps

- | | |
|---|-------------------------------------|
| 1. Breather hose | 11. Rocker arm B |
| 2. P.C.V. hose | 12. Rocker arm shaft (Intake side) |
| 3. Rocker cover | 13. Adjusting screw |
| 4. Rocker cover gasket | 14. Nut |
| 5. Oil seal | 15. Rocker arm C |
| ▶▶▶ 6. Oil seal | 16. Rocker arm shaft (Exhaust side) |
| ▶▶▶ 7. Rocker arms and rocker arm shaft | 17. Adjusting screw |
| ▶▶▶ 8. Rocker arms and rocker arm shaft | 18. Nut |
| ▶▶▶ 9. Rocker shaft spring | 19. Camshaft |
| ▶▶▶ 10. Rocker arm A | |



9EN0058

INSPECTION**CAMSHAFT**

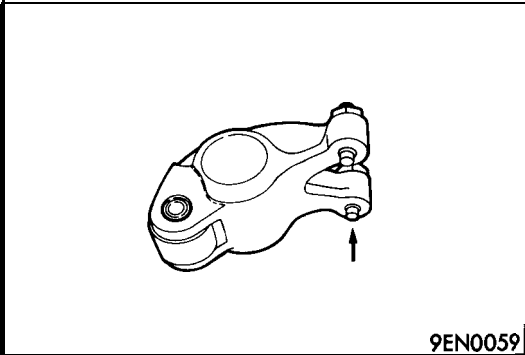
- (1) Measure the cam height

Standard value:

Intake	37.78 mm (1.4874 in.)
Exhaust	38.09 mm (1.4996 in.)

Limit:

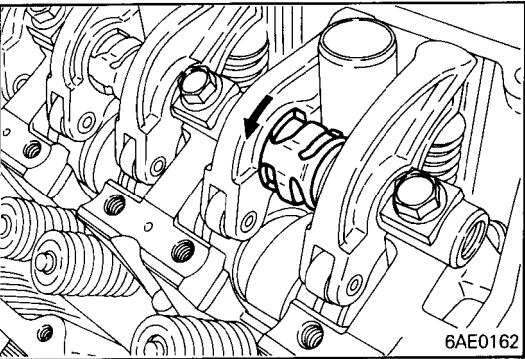
Intake	37.28 mm (1.4677 in.)
Exhaust	37.59 mm (1.4799 in.)



9EN0059

ROCKER ARM

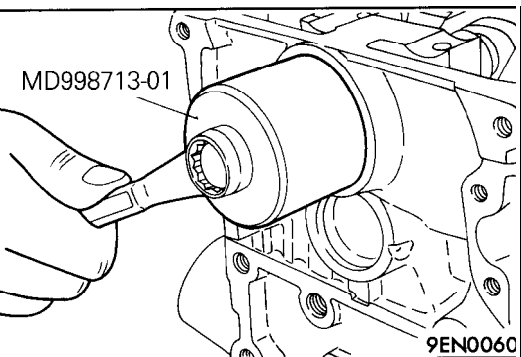
- Check the roller surface. If any dents, damage or seizure is evident, replace the rocker arm.
- Check rotation of the roller. If it does not rotate smoothly or if looseness is evident, replace the rocker arm.
- Check the inside diameter. If damage or seizure is evident, replace the rocker arm.
- Check the screw end for wear. If considerable wear is evident, replace the adjusting screw.



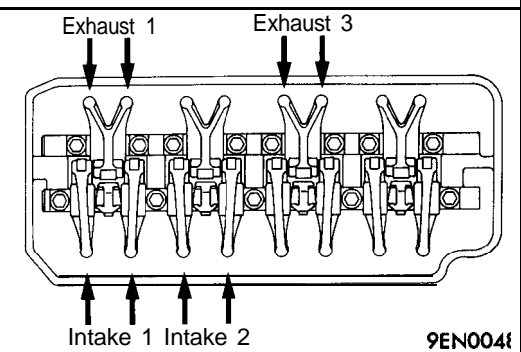
6AE0162

INSTALLATION SERVICE POINTS**▶▶ ROCKER SHAFT SPRING / ROCKER ARMS / ROCKER ARM SHAFT INSTALLATION**

- (1) Temporarily tighten the rocker shaft with the bolt so that all rocker arms on the inlet valve side do not push the valves.
- (2) Fit the rocker shaft spring from the above and position it so that it is right angles to the plug guide.
- (3) Tighten the rocker arm shaft bolt to the specification.



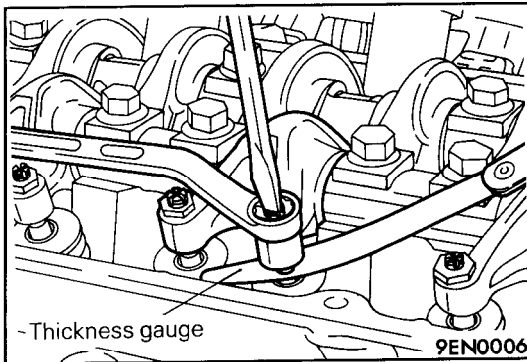
9EN0060

▶▶ OIL SEAL INSTALLATION

9EN0041

VALVE CLEARANCE ADJUSTMENT

- (1) Position the No. 1 cylinder at the top dead center on the compression stroke.
- (2) Adjust the valve clearance at the points shown in the illustration.

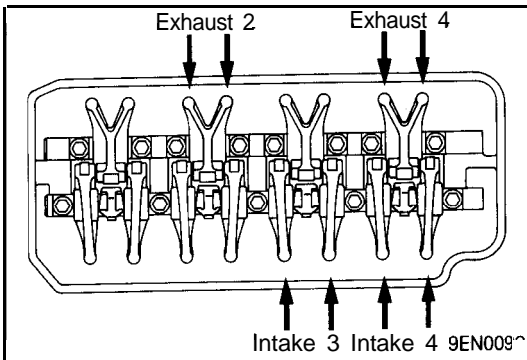


- (3) Loosen the adjusting screw locknut.
- (4) Using a feeler gauge, adjust the valve clearance by turning the adjusting screw.

Standard value:

Intake 0.09 mm (.004 in.)
 Exhaust 0.20 mm (.008 in.)

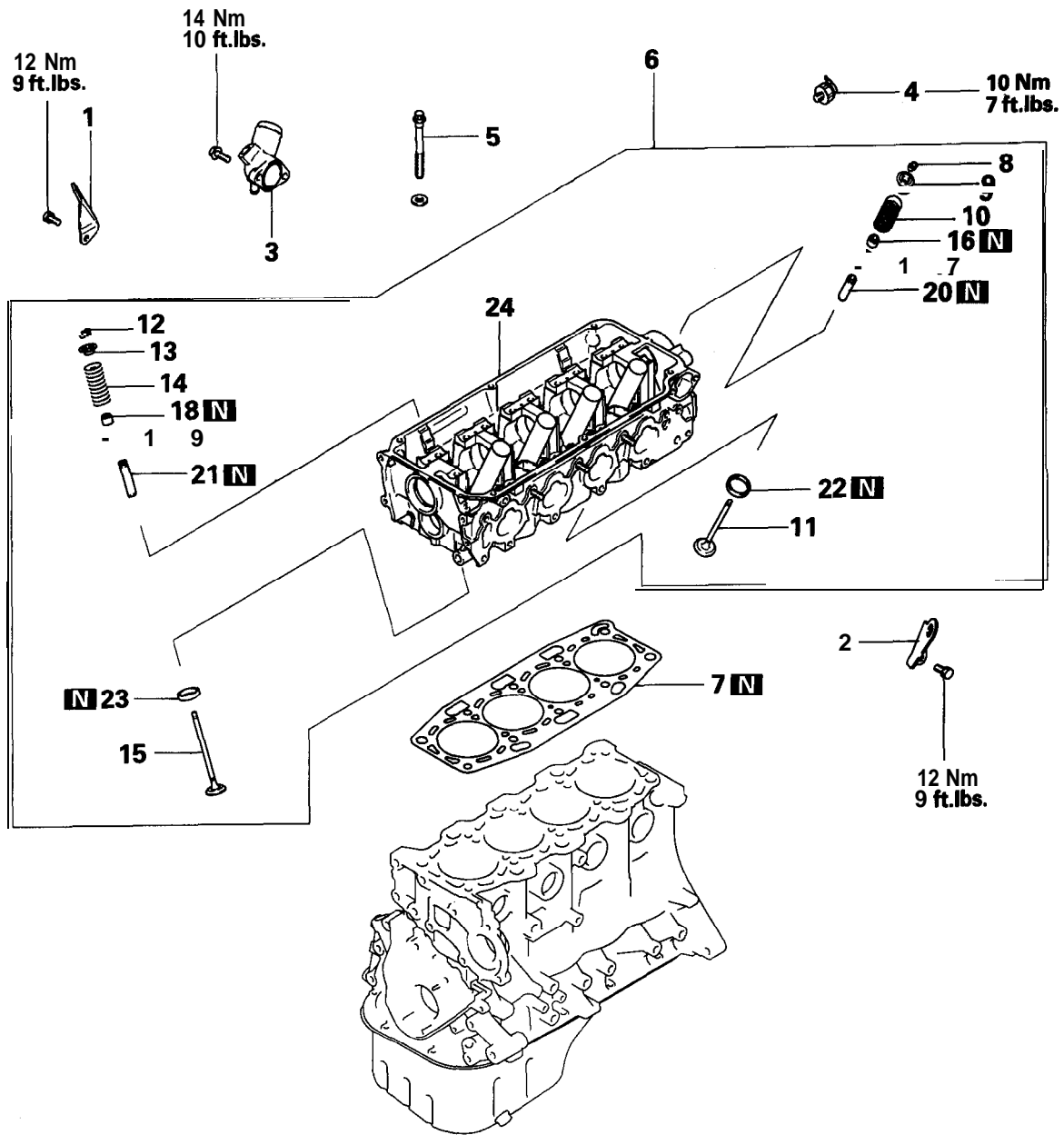
- (5) While holding the adjusting screw with a screwdriver, tighten the lock nut.



- (6) Rotate clockwise the crankshaft one complete turn.
- (7) Adjust the valve clearance at the points shown in the illustration.
- (8) Repeat steps (3) to (5) to adjust the valve clearance of remaining valves.

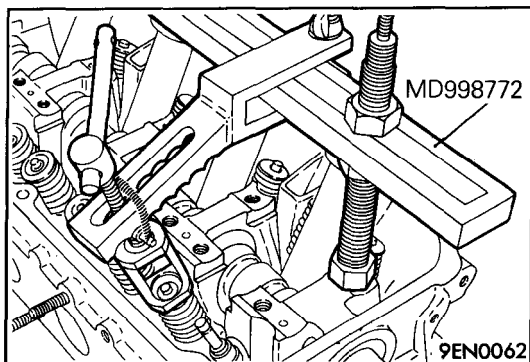
CYLINDER HEAD AND VALVES

REMOVAL AND INSTALLATION



Removal steps

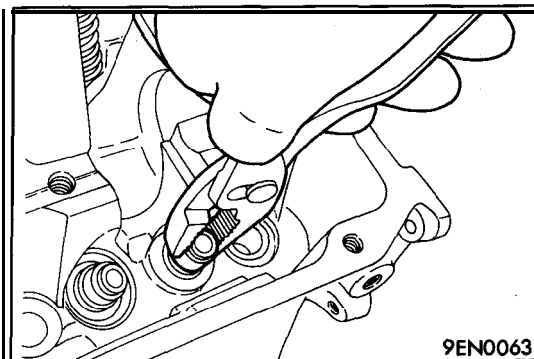
- | | |
|-----------------------------|-----------------------------|
| 1. Engine hanger | 13. Valve spring retainer |
| 2. Engine hanger | ◆B◆ 14. Valve spring |
| ◆F◆ 3. Water outlet fitting | 15. Exhaust valve |
| ◆E◆ 4. Oil pressure switch | ◆B◆ ◆A◆ 16. Valve stem seal |
| ◆D◆ 5. Cylinder head bolt | 17. Valve spring seat |
| 6. Cylinder head assembly | ◆B◆ ◆A◆ 18. Valve stem seal |
| 7. Cylinder head gasket | 19. Valve spring seat |
| ◆A◆ ◆C◆ 8. Retainer lock | 20. Intake valve guide |
| 9. Valve spring retainer | 21. Exhaust valve guide |
| ◆B◆ 10. Valve spring | 22. Intake valve seat |
| 11. Intake valve | 23. Exhaust valve seat |
| ◆A◆ ◆C◆ 12. Retainer lock | 24. Cylinder head |



REMOVAL SERVICE POINTS

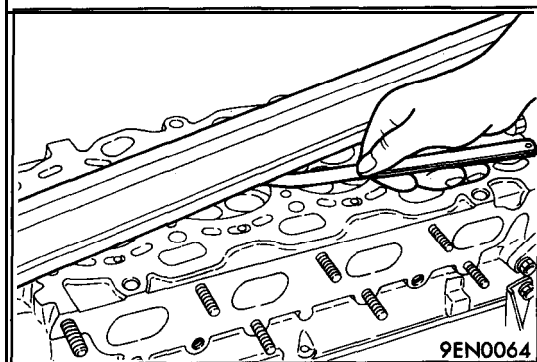
◁A▷ RETAINER LOCK REMOVAL

- (1) Store the removed valves, springs and other parts, tagged to indicate their cylinder No. and location to aid reassembly.



◁B▷ VALVE STEM SEAL REMOVAL

- (1) Do not reuse removed valve stem seals.



INSPECTION

CYLINDER HEAD

- (1) Check the cylinder head gasket surface for flatness by using a straightedge and thickness gauge.

Standard value: 0.03 mm (.0012 in.)

Limit: 0.2 mm (.008 in.)

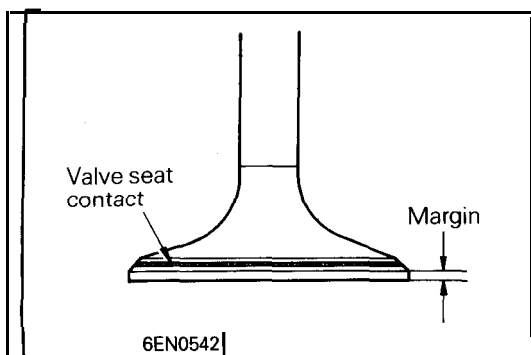
- (2) If the service limit is exceeded, correct to meet the specification.

Grinding limit: *0.2 mm (.008 in.)

* Total resurfacing depth of both cylinder head and cylinder block

Cylinder head height (Specification when new):

119.9 – 120.1 mm (4.720 – 4.728 in.)



VALVE

- (1) Check the valve face for correct contact. If incorrect, reface using a valve refacer. Valve should make a uniform contact with the seat at the center of valve face.
- (2) If the margin is smaller than the service limit, replace the valve.

Standard value:

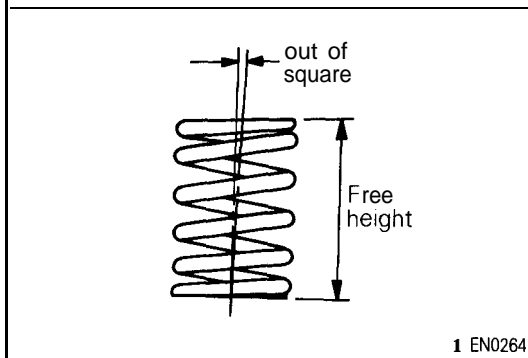
Intake 1.0 mm (.039 in.)

Exhaust 1.3 mm (.051 in.)

Limit:

Intake 0.5 mm (.020 in.)

Exhaust 0.8 mm (.031 in.)

**VALVE SPRING**

- (1) Measure the free height of the spring and, if it is smaller than the limit, replace.

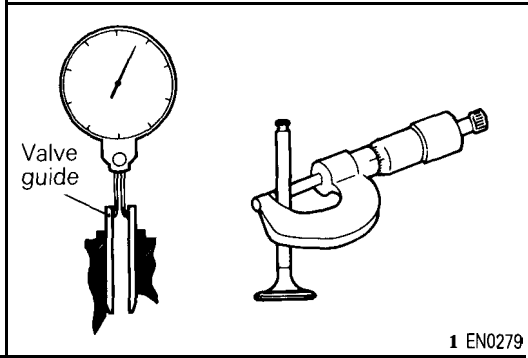
Standard value: 50.9 mm (2.004 in.)

Limit: 49.9 mm (1.965 in.)

- (2) Measure the squareness of the spring and, if the limit is exceeded, replace.

Standard value: 2° or less

Limit: 4°

**VALVE GUIDE**

- (1) Measure the clearance between the valve guide and valve stem. If the limit is exceeded, replace the valve guide or valve, or both.

Standard value:

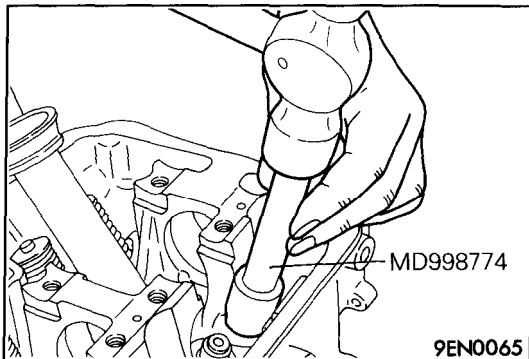
Intake 0.02 – 0.04 mm (.0008 – .0016 in.)

Exhaust 0.03 – 0.06 mm (.0012 – .0024 in.)

Limit:

Intake 0.10 mm (.0039 in.)

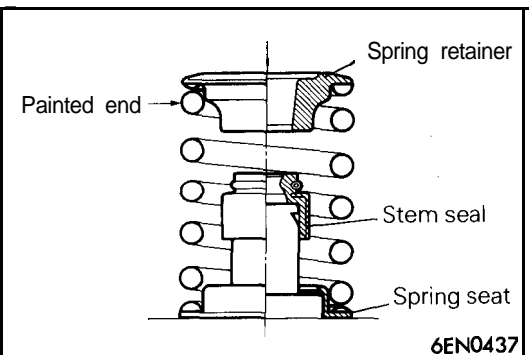
Exhaust 0.15 mm (.0059 in.)

**REASSEMBLY SERVICE POINTS****▶▶ VALVE STEM SEAL INSTALLATION**

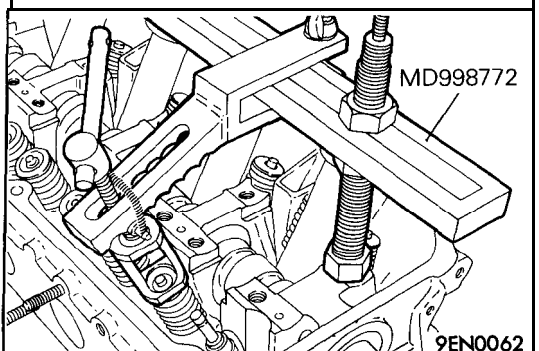
- (1) Install the valve spring seat.
- (2) The special tool must be used to install the valve stem seal. Improper installation could result in oil leaking past the valve guide.

Caution

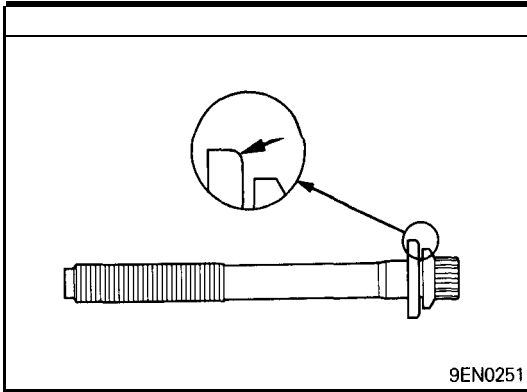
Do not reuse removed valve stem seals.

**▶▶ VALVE SPRING INSTALLATION**

- (1) Install the valve spring with the painted end on the rocker arm side.

**▶▶ RETAINER LOCK INSTALLATION**

- (1) The valve spring, if excessively compressed, causes the bottom end of retainer to be in contact with, and damage, the stem seal.



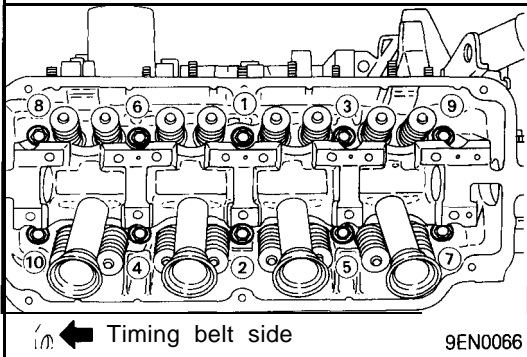
9EN0251

◆D◆ CYLINDER HEAD BOLT INSTALLATION

- (1) When installing the cylinder head bolts, check that the shank length of each bolt meets the limit. If the limit is exceeded, replace the bolt.

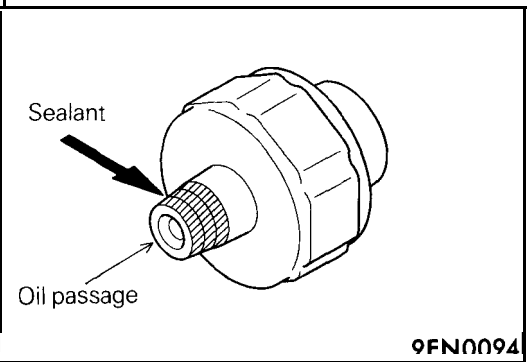
Limit: Max. 96.4 mm (3.79 in.)

- (2) Install the washers as illustrated.
- (3) Apply engine oil to the bolt threads and washers.



9EN0066

- (4) According to the tightening sequence, tighten the bolts to 75 Nm (54 ft.lbs.).
- (5) Loosen the bolts completely.
- (6) Torque the bolts to 20 Nm (14.5 ft.lbs.)
- (7) Tighten the bolts 1/4 turns (90°) more.
- (8) Tighten the bolts 1/4 turns (90°) additionally.



9FN0094

◆E◆ SEALANT APPLICATION TO OIL PRESSURE SWITCH

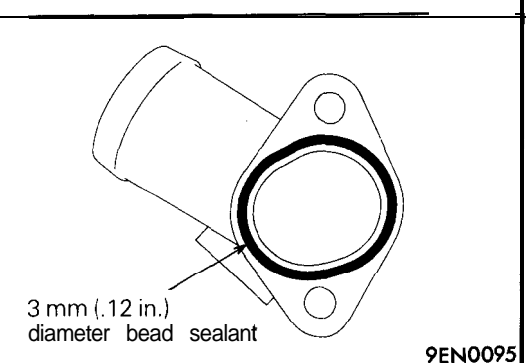
- (1) Apply sealant to the threads of the switch.

Specified sealant:

3M ATD Part No. 8660 or equivalent

Caution

Use care not to allow the sealant to plug the oil passage.



9EN0095

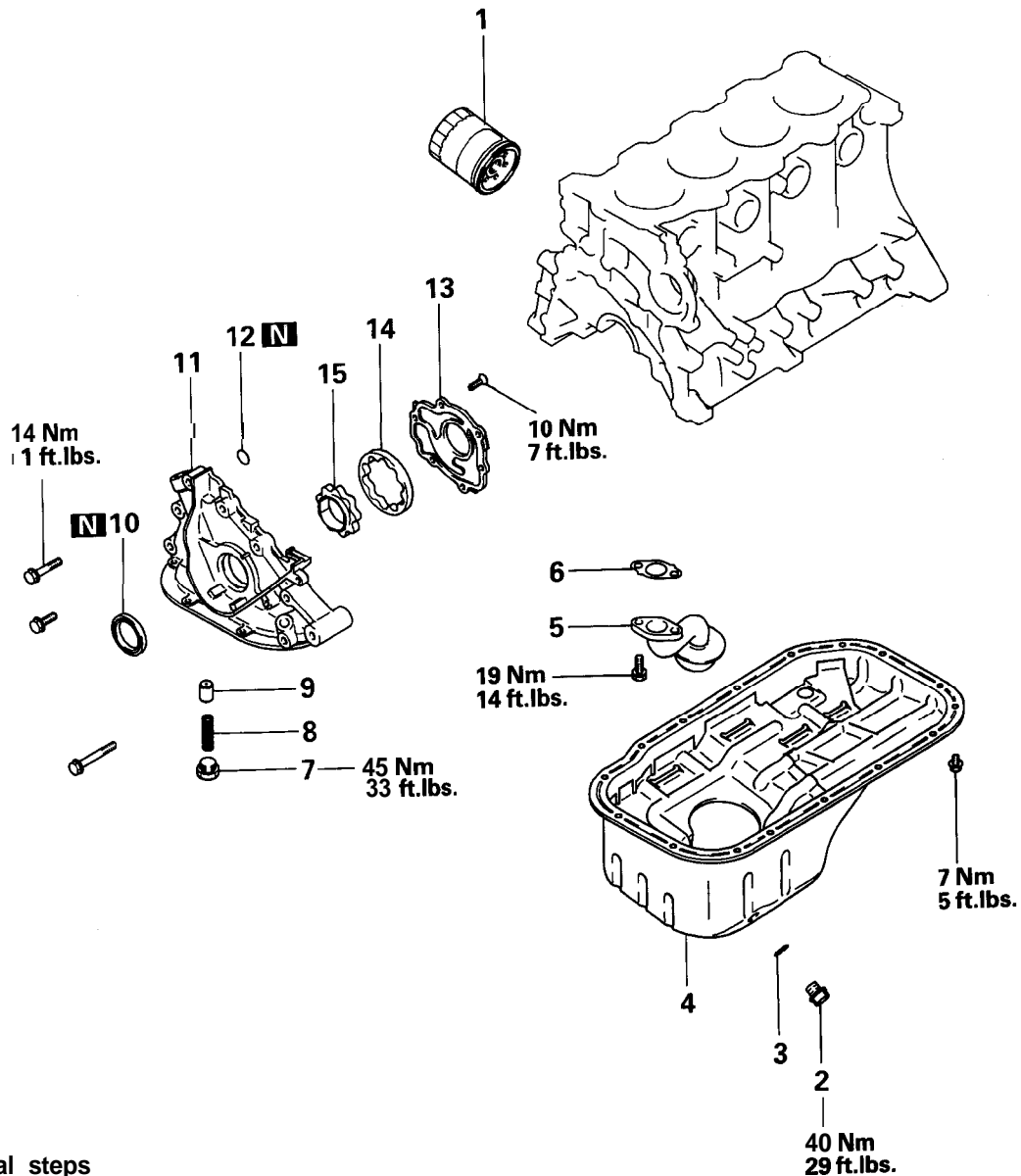
◆F◆ SEALANT APPLICATION TO WATER OUTLET FITTING

Specified sealant:

Mitsubishi Genuine Part No. MD970389 or equivalent

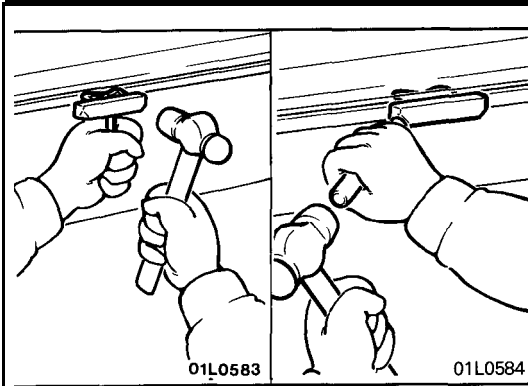
FRONT CASE AND OIL PUMP

REMOVAL AND INSTALLATION

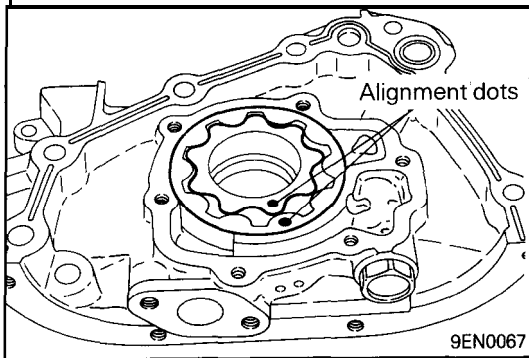


Removal steps

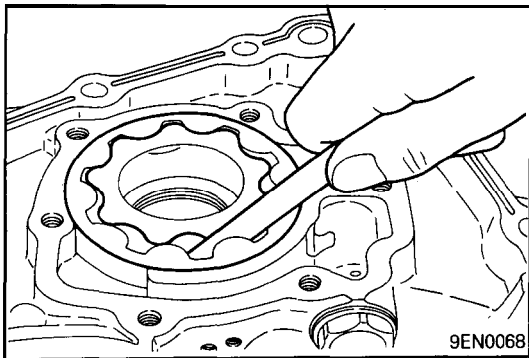
- ◆E◆ 1 Oil filter
- 2 Drain plug
- 3 Drain plug gasket
- ◇A◇◆D◆ 4 Oil pan
- 5 Oil screen
- 6 Oil screen gasket
- 7 Relief plug
- 8 Relief spring
- 9 Relief plunger
- ◆C◆ 10 Oil seal
- ◆B◆ 11 Oil pump case
- 12 O-ring
- 13 Oil pump case cover
- ◇B◇◆A◆ 14 Outer rotor
- ◇B◇◆A◆ 15 Inner rotor

**REMOVAL SERVICE POINTS****◀A▶ OIL PAN REMOVAL**

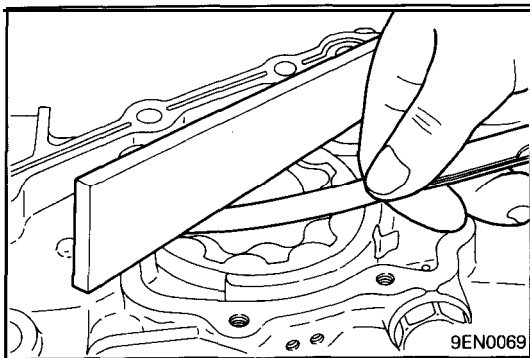
- (1) Knock in the special tool deeply between the oil pan and the cylinder block.
- (2) Hitting the side of the special tool, slide the special tool along the oil pan to remove the oil pan.

**◀B▶ OUTER ROTOR / INNER ROTOR REMOVAL**

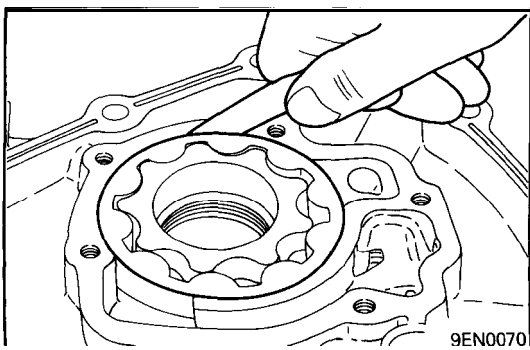
- (1) Make alignment dots on the outer and inner rotors for reference in reassembly.

**INSPECTION****OIL PUMP**

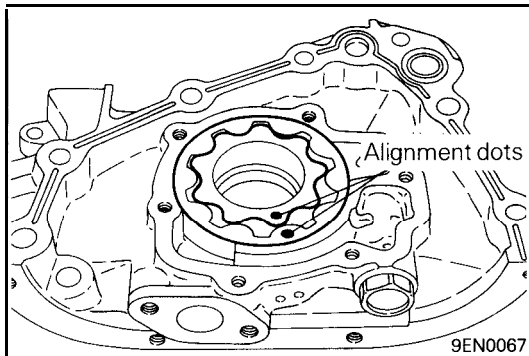
- (1) Check the tip clearance.
Standard value: **0.03 – 0.08 mm (.0012 – .0031 in.)**



- (2) Check the side clearance.
Standard value: **0.04 – 0.10 mm (.0016 – .0039 in.)**



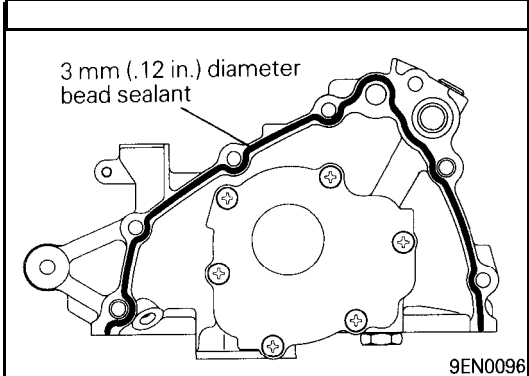
- (3) Check the body clearance.
Standard value: **0.10 – 0.18 mm (.0039 – .0071 in.)**
Limit: **0.35 mm (.0138 in.)**



INSTALLATION SERVICE POINTS

▶A◀ INNER ROTOR / OUTER ROTOR INSTALLATION

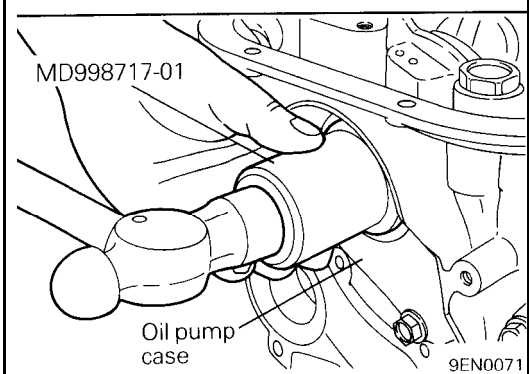
- (1) Apply engine oil to the rotors. Then, install the rotors ensuring that the alignment dots made at disassembly are properly aligned.



▶B◀ SEALANT APPLICATION TO OIL PUMP CASE

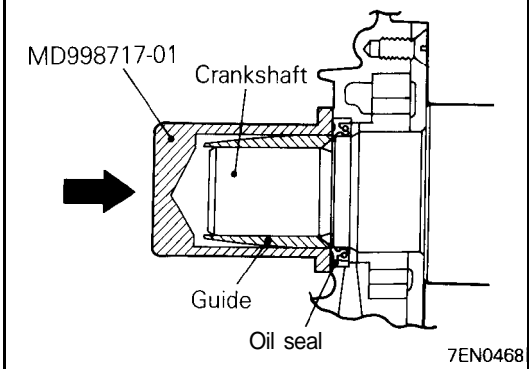
Specified sealant:

Mitsubishi Genuine Part No. MD970389 or equivalent



▶C◀ CRANKSHAFT FRONT OIL SEAL INSTALLATION

Using the special tool, top the oil seal into the oil pump case.



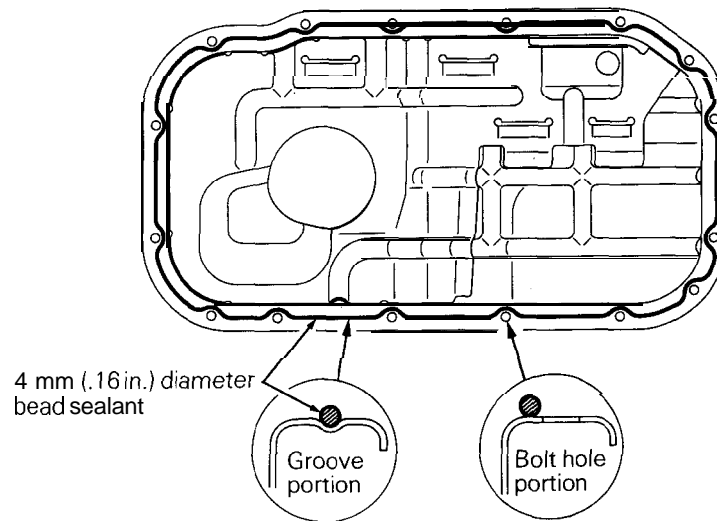
◆D◆ OIL PAN INSTALLATION

- (1) Remove all the remaining gasket from the mating surfaces using a scraper or a wire brush.
- (2) Apply a 4 mm (.16 in.) diameter bead of sealant to the oil pan flange.
See "Form In-Place Gasket" in introduction.

Specified sealant:

Mitsubishi Genuine Part No. MD970389 or equivalent

- (3) The oil pan should be installed within 15 minutes after the application of sealant.



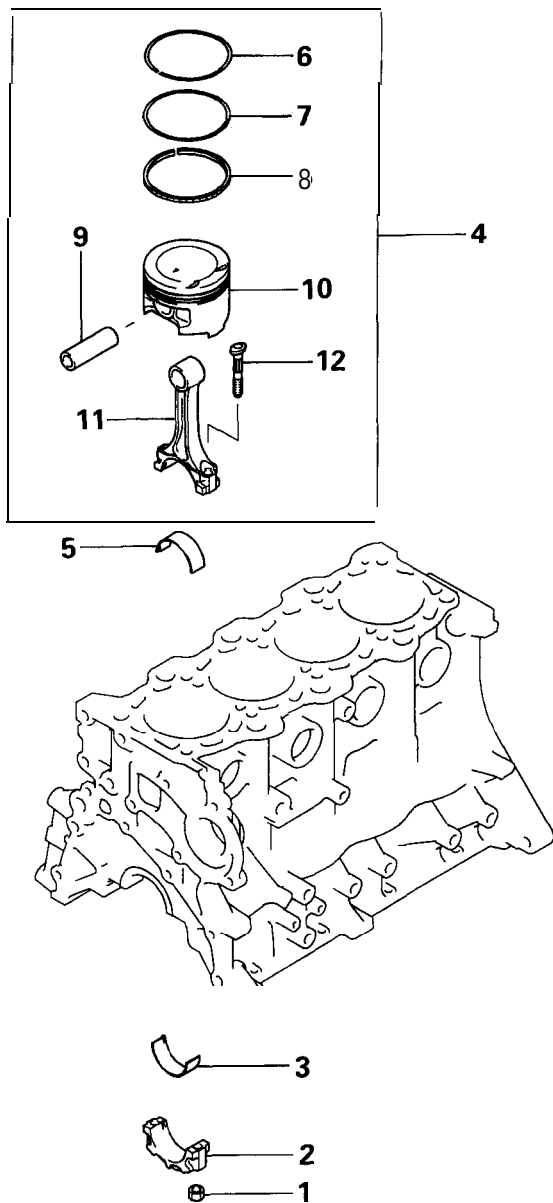
9EN0097

◆E◆ OIL FILTER INSTALLATION

- (1) Clean the filter installation surface of the filter bracket.
- (2) Apply engine oil to the O-ring of the oil filter.
- (3) Screw in the oil filter until its O-ring contacts the base. Then tighten one more turn.

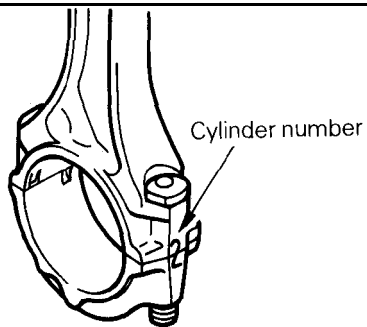
PISTON AND CONNECTING ROD

REMOVAL AND INSTALLATION



Removal steps

- ◆G◆ 1. Nut
- ◁A◇ ◆F◆ 2. Connecting rod cap
- ◆E◆ 3. Connecting rod bearing
- ◆D◆ 4. Piston and connecting rod
- ◆E◆ 5. Connecting rod bearing
- ◆C◆ 6. Piston ring No. 1
- ◆C◆ 7. Piston ring No. 2
- ◆B◆ 8. Oil ring
- ◁B◇ ◆A◆ 9. Piston pin
- 10. Piston
- 11. Connecting rod
- 12. Bolt



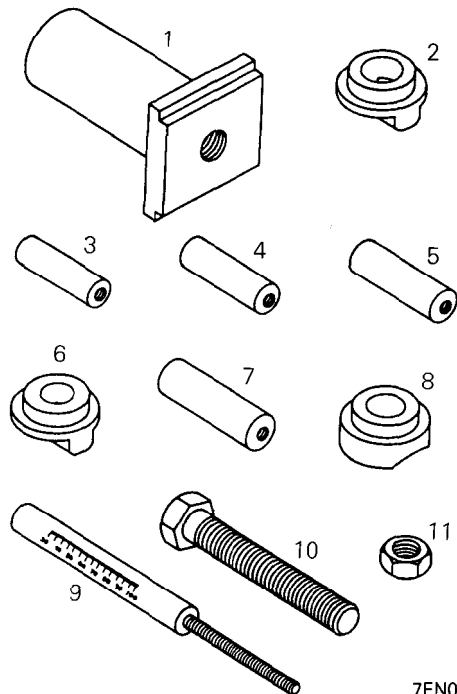
DEN0050

DISASSEMBLY SERVICE POINTS

◁A▷ CONNECTING ROD CAP REMOVAL

- (1) Mark the cylinder number on the side of the connecting rod big end for correct reassembly.

Piston pin setting tool MIT21 6941



7EN0425

◁B▷ PISTON PIN REMOVAL

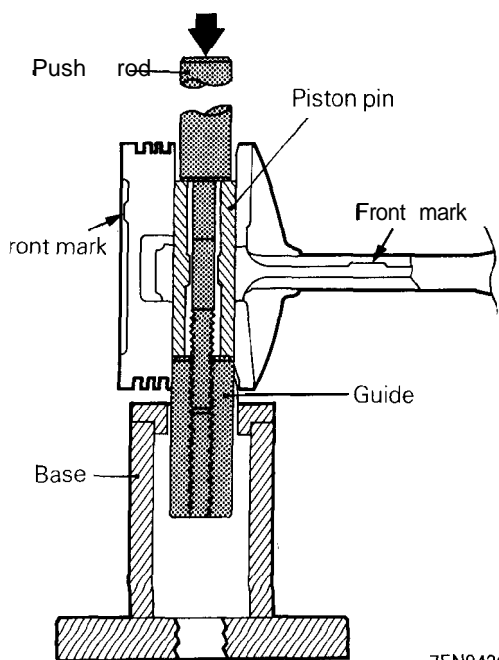
Item No.	Part No.	Description
1	MIT310134	Base
2	MIT310136	Piston Support
3	MIT310137	Connecting Rod Guide Pin
4	MIT310138	Connecting Rod Guide Pin
5	MIT310139	Connecting Rod Guide Pin
6	MIT31 0140	Piston Support
7	MIT310141	Connecting Rod Guide Pin
8	MIT310142	Piston Support
9	MIT481 43	Press Pin
10	216943	Stop Screw
11	10396	Nut

- (2) Select the correct piston support for your application. (See above.) Fit the piston support onto the base. Place the base on the press support blocks.
- (3) Insert the press pin through the piston pin hole. Select the correct connecting rod guide pin. (See Above.) Thread the guide pin onto the threaded portion of the press pin.
- (4) Position the piston assembly on the piston support in the press. With the press pin up as shown in the illustration, insert the guide pin through the hole in the piston and through the hole in the piston support.
- (5) Press the piston pin out of the assembly.

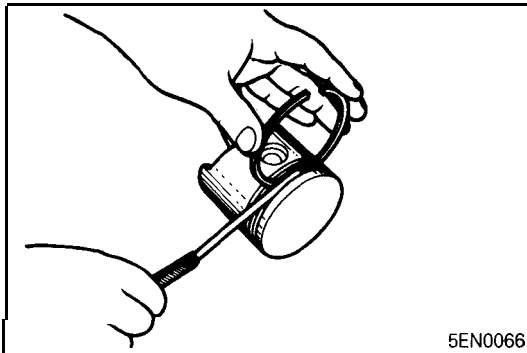
IMPORTANT: To avoid piston damage

- The piston support must seat squarely against the piston.
- Verify that the piston pin will slide through the hole in the piston support

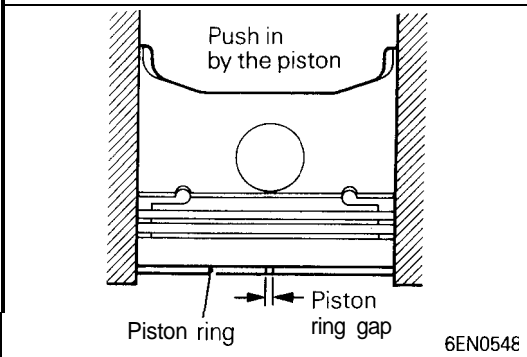
- (6) Remove the piston pin from the press pin.



7FN0426



5EN0066



6EN054E

INSPECTION

PISTON RING

- (1) Check the side clearance between the piston ring and ring groove. If the limit is exceeded, replace the ring or piston, or both.

Standard value:

No. 1 0.03 – 0.07 mm (.0012 – .0028 in.)

No. 2 0.02 – 0.06 mm (.0008 – .0024 in.)

Limit:

No. 1 0.1 mm (.004 in.)

No. 2 0.1 mm (.004 in.)

Install the piston ring into the cylinder bore. Force the ring down with a piston, the piston crown being in contact with the ring, to correctly position it at right angles to the cylinder wall. Then, measure the end gap with a feeler gauge. If the ring gap is excessive, replace the piston ring.

Standard value:

No. 1 0.25 – 0.40 mm (.0098 – .0157 in.)

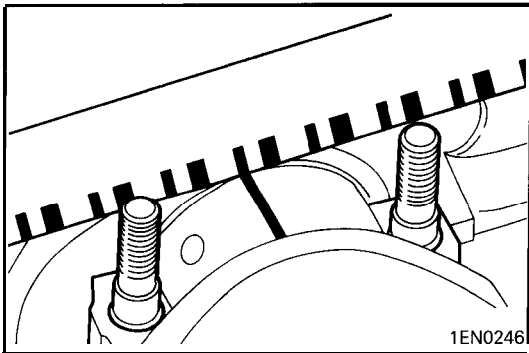
No. 2 0.40 – 0.55 mm (.0157 – .0217 in.)

Oil 0.20 – 0.60 mm (.0079 – .0236 in.)

Limit:

No. 1, No. 2 0.8 mm (.031 in.)

Oil 1.0 mm (.039 in.)



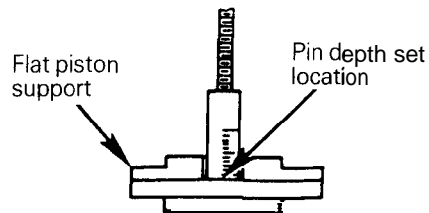
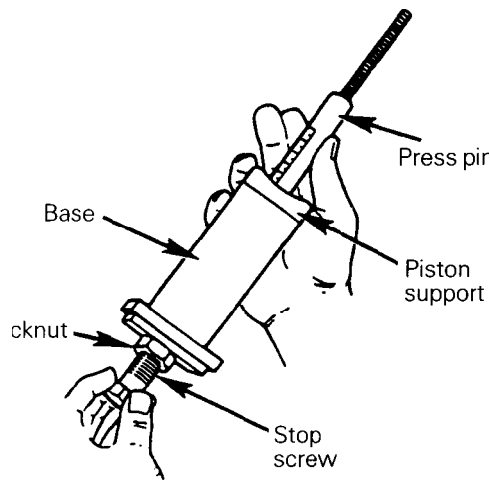
1EN0246

CRANKSHAFT PIN OIL CLEARANCE (PLASTIC GAUGE METHOD)

- (1) Remove oil from crankshaft pin and connecting rod bearing.
- (2) Cut the plastic gauge to the same length as the width of bearing and place it on crankshaft pin in parallel with its axis.
- (3) Install the connecting rod cap carefully and tighten the bolts to specified torque.
- (4) Carefully remove the connecting rod cap.
- (5) Measure the width of the plastic gauge at its widest part by using a scale printed on the plastic gauge package.

Standard value: 0.02 – 0.05 mm (.0008 – .0020 in.)

Limit: 0.1 mm (.004 in.)



7EN0428

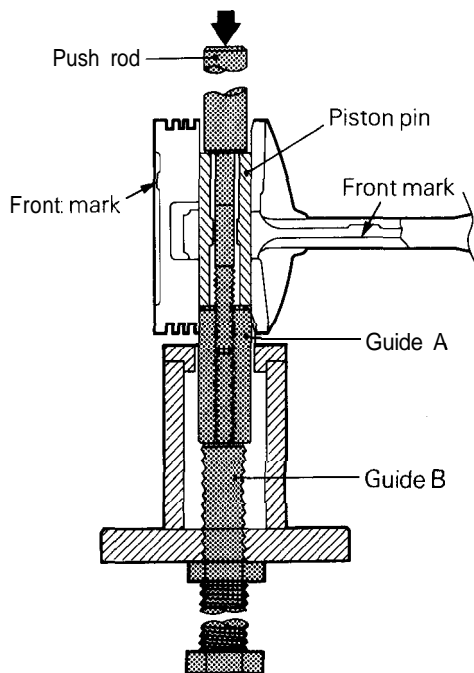
INSTALLATION SERVICE POINTS

◆A◆ PISTON PIN INSTALLATION

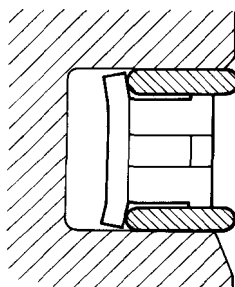
- (1) Thread the stop screw and lock nut assembly into the base. Fit the correct piston support on the top of the base. Insert the press pin, threaded end up, into the hole in the piston support until the press pin touches the stop screw.
- (2) Using the graduations on the press pin, adjust the stop screw to the correct depth of 50 mm (1.97 in.)
- (3) Place the base on the press support blocks.
- (4) Slide the piston pin over the threaded end of the press pin, and thread the correct guide pin up against it.
- (5) Coat the piston pin with oil, and with the connecting rod held in position, slide the guide pin through the piston and the connecting rod.
- (6) Press the piston pin through the connecting rod until the guide pin contacts the stop screw.
- (7) Remove the piston assembly from the base. Remove the guide pin and the press pin from the assembly.

IMPORTANT:

Due to production tolerance variations, it is necessary to visually inspect the piston pin depth after installation to verify that the piston pin is centered. Adjust if necessary.



7EN0429



6EN0585

◆B◆ OIL RING INSTALLATION

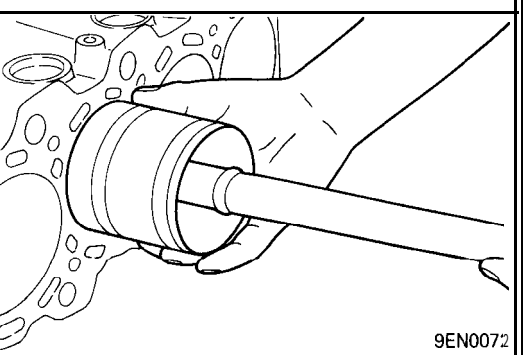
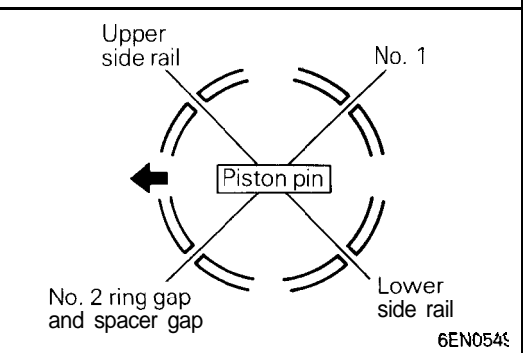
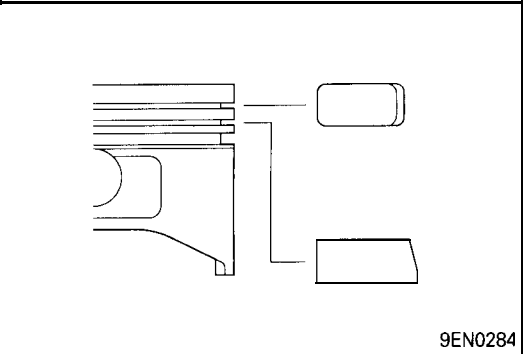
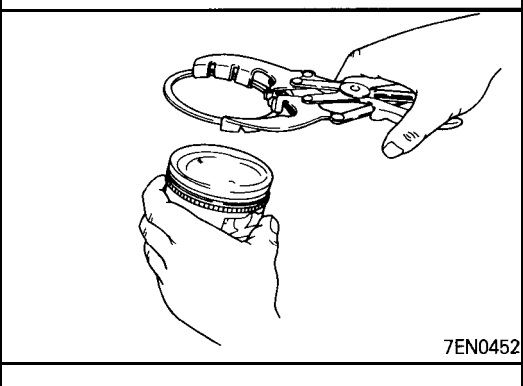
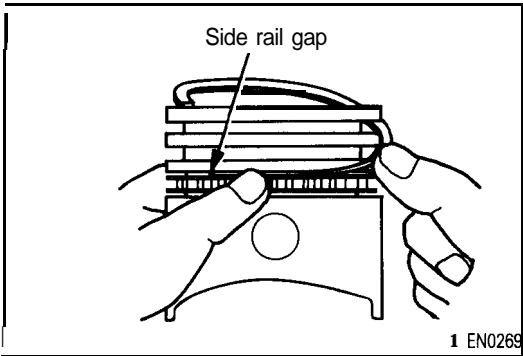
- (1) Fit the oil ring spacer into the piston ring groove.

NOTE

The side rails and spacer may be installed in either direction.

- (2) Install the upper side rail.

To install the side rail, first fit one end of the rail into the piston groove, then press the remaining portion into position by finger. See the illustration.



NOTE

Do not use any piston ring expander when installing the side rail.

Use of a ring expander to expand the side rail end gap can break the side rail, unlike other piston rings.

- (3) Install the lower side rail in the same procedure as described in step (2).
- (4) Make sure that the side rails move smoothly in either direction.

❖C❖ PISTON RING No. 2 / PISTON RING No. 1 INSTALLATION

- (1) Using a piston ring expander, fit No. 2 and then No. 1 piston ring into position.

NOTE

1. Note the difference in shape between No. 1 and No. 2 piston rings.
2. Install piston rings No. 1 and No. 2 with their side having marks facing up (on the piston crown side).

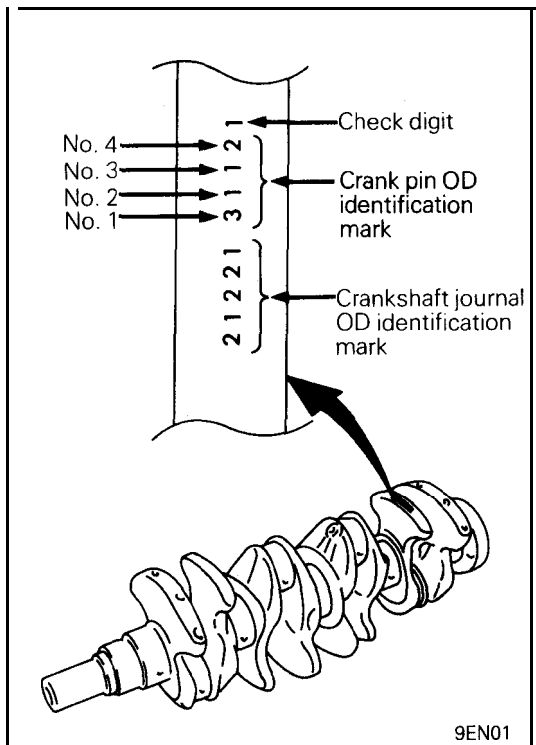
❖D❖ PISTON AND CONNECTING ROD INSTALLATION

- (1) Liberally coat engine oil on the circumference of the piston, piston ring, and oil ring.
- (2) Arrange the piston ring and oil ring gaps (side rail and spacer) as shown in the illustration.
- (3) Rotate crankshaft so that the crank pin is on center of the cylinder bore.

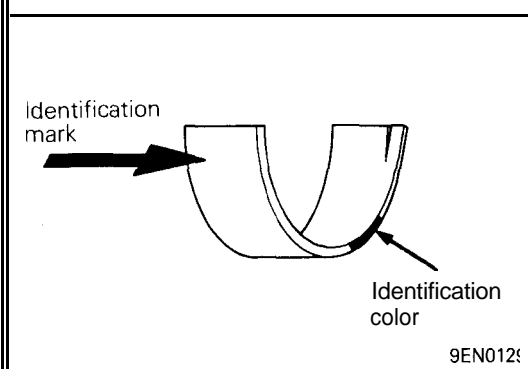
- (4) Use suitable thread protectors on the connecting rod bolts before inserting the piston and connecting rod assembly into the cylinder block. Care must be taken not to nick the crank pin.
- (5) Using a suitable the piston ring compressor tool, install the piston and connecting rod assembly into the cylinder block.

Caution

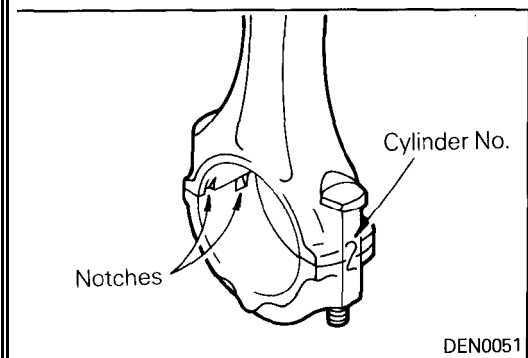
Insert the piston and connecting rod assembly so that the front mark (arrow) on the top of the piston faces the engine front (timing belt side).



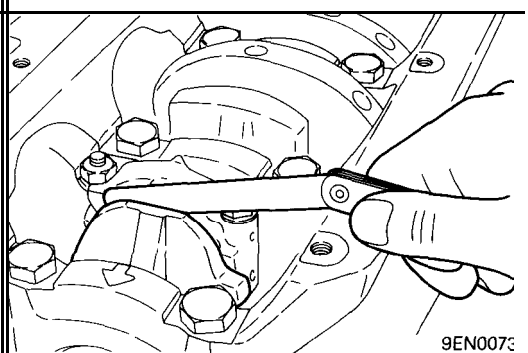
9EN01



9EN012



DEN0051



9EN007

◆E◆ CONNECTING ROD BEARING INSTALLATION

- (1) When the bearings are to be replaced, select correct ones and install them in the correct positions according to the identification marks stamped in the crankshaft.

Crank pin OD identification mark	Connecting rod bearing	
	Identification mark	Identification color
1	S1	Brown
2	S2	Black 1
3	S3	Green

◆F◆ CONNECTING ROD CAP INSTALLATION

- (1) Mate the correct bearing cap with the correct connecting rod by checking with the alignment marks marked during disassembly. If a new connecting rod is used which has no alignment mark, position the notches for locking the bearing on the same side.

- (2) Check if the thrust clearance in the connecting rod big end is correct.

Standard value: 0.10 – 0.25 mm (.0039 – .0098 in.)
Limit: 0.4 mm (.016 in.)

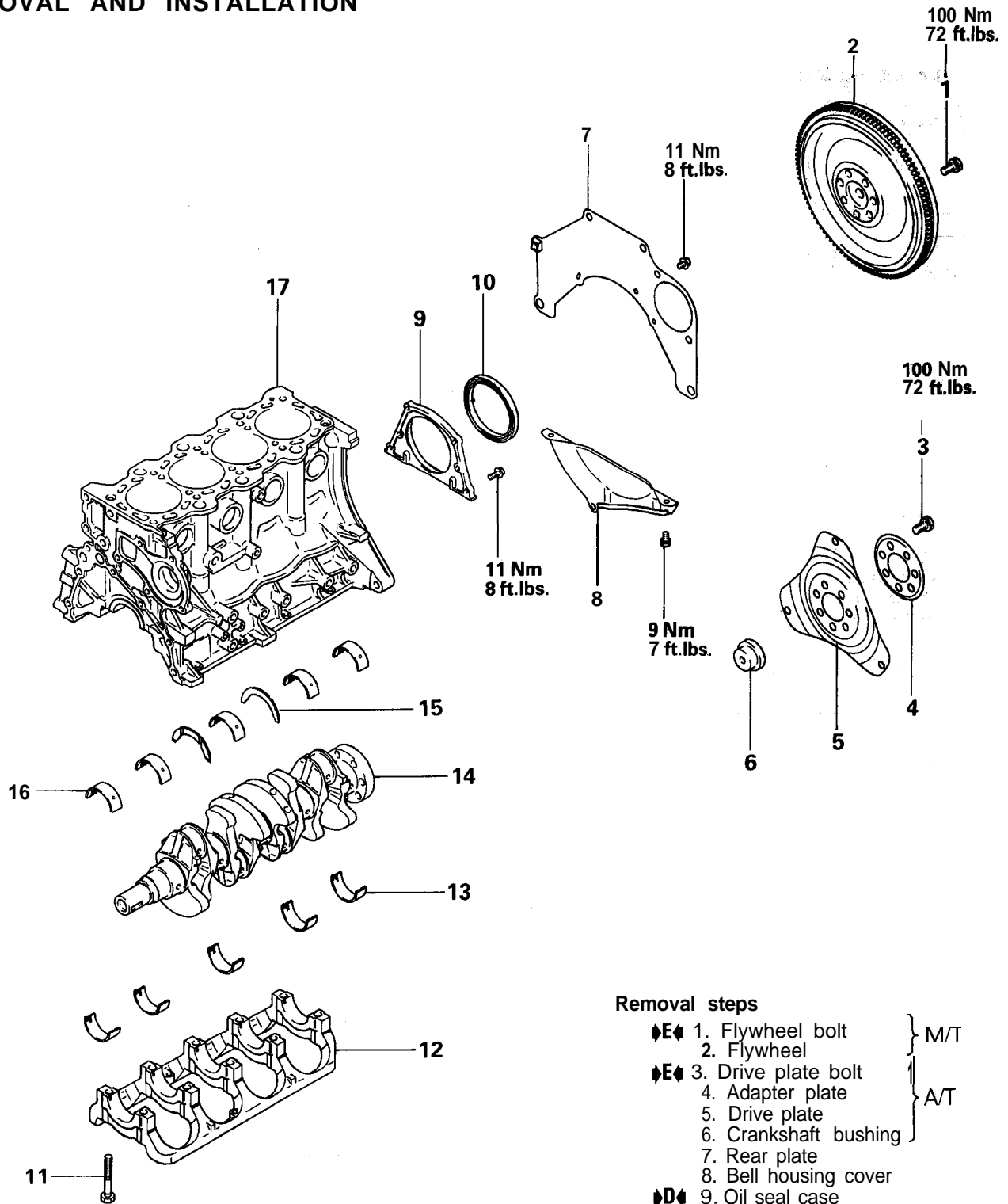
◆G◆ CONNECTING ROD CAP NUT INSTALLATION

- (1) Since the connecting rod cap bolts and nuts are torqued using a new procedure, they should be examined BEFORE reuse. If the bolt threads are “necked down”, the bolts should be replaced.

Necking can be checked by running a nut with fingers to the full length of the bolt’s thread. If the nut does not run down smoothly, the bolt should be replaced.

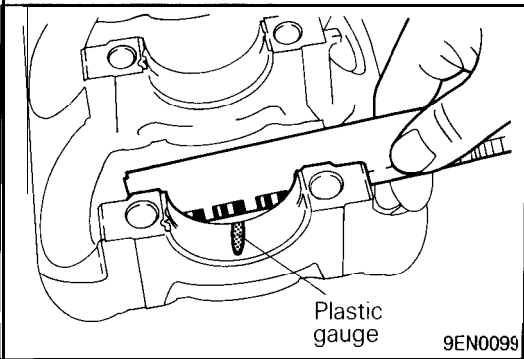
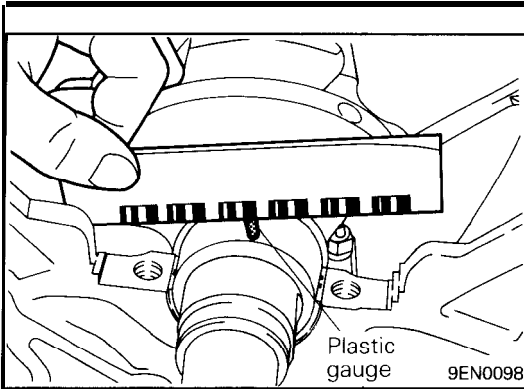
- (2) Install the connecting rod cap on the big end of the connecting rod.
- (3) Before installing the nuts, the threads should be oiled with engine oil.
- (4) Install both nuts on each bolt finger tight, then alternately torque each nut to assemble the cap properly.
- (5) Tighten the nuts to 20 Nm (14.5 ft.lbs.) and plus 1/4 (90°) turn.

CRANKSHAFT, CYLINDER BLOCK, FLYWHEEL AND DRIVE PLATE REMOVAL AND INSTALLATION



Removal steps

- ◆E◆ 1. Flywheel bolt } M/T
- 2. Flywheel
- ◆E◆ 3. Drive plate bolt } A/T
- 4. Adapter plate
- 5. Drive plate
- 6. Crankshaft bushing
- 7. Rear plate
- 8. Bell housing cover
- ◆D◆ 9. Oil seal case
- ◆C◆ 10. Oil seal
- ◆B◆ 11. Bearing cap bolt
- ◆B◆ 12. Bearing cap
- ◆A◆ 13. Crankshaft bearing, lower
- 14. Crankshaft
- ◆A◆ 15. Thrust bearing
- ◆A◆ 16. Crankshaft bearing, upper
- 17. Cylinder block



INSPECTION

CRANKSHAFT OIL CLEARANCE (PLASTIC GAUGE METHOD)

- (1) Remove oil from the crankshaft journal and the crankshaft bearing.
- (2) Install the crankshaft.
- (3) Cut the plastic gauge to the same length as the width of bearing and place it on the journal in parallel with its axis.
- (4) Install the crankshaft bearing cap carefully and tighten the bolts to the specified torque.
- (5) Carefully remove the crankshaft bearing cap.
- (6) Measure the width of the plastic gauge at its widest part by using a scale printed on the plastic gauge package.

Standard value: 0.02 – 0.04 mm (.0008 – .0016 in.)

Limit: 0.1 mm (.004 in.)

CYLINDER BLOCK

- (1) Using a straightedge and feeler gauge, check the block top surface for warpage. Make sure that the surface is free from gasket chips and other foreign matter.

Standard value: 0.05 mm (.0020 in.) or less

Limit: 0.1 mm (.0040 in.)

- (2) If the distortion is excessive, correct within the allowable limit or replace.

Grinding limit: 0.2 mm (.008 in.)

The total thickness of the stock allowed to be removed from cylinder block and mating cylinder head is 0.2 mm (.008 in.) at maximum.

Cylinder block height (when new): 243.5 mm (9.587 in.)

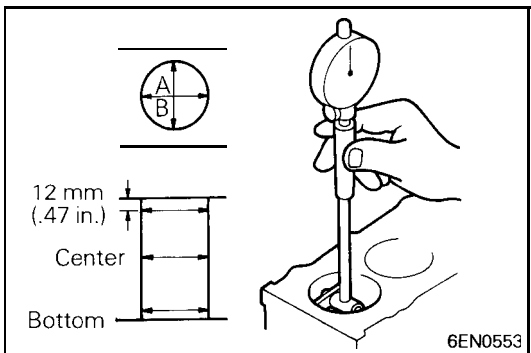
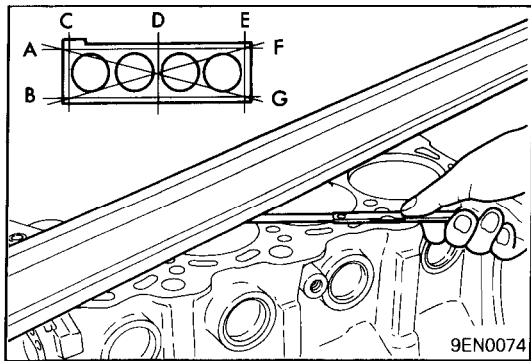
- (3) Check the cylinder walls for scratches and seizure. If defects are evident, correct (bored to oversize) or replace.
- (4) Using a cylinder gauge, measure the cylinder bore and cylindricity. If worn badly, correct the cylinder to an oversize and replace the piston and piston rings. Measure at the points shown in illustration.

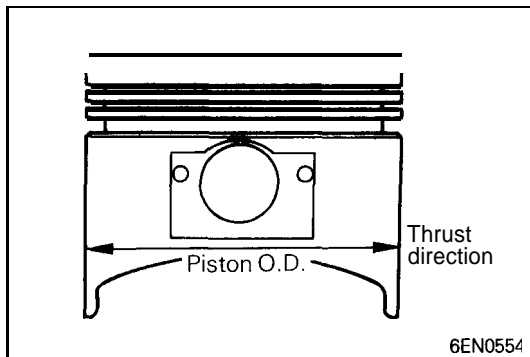
Standard value:

Cylinder I.D.: 81.00 – 81.03 mm (3.1890 – 3.1902 in.)

Out-of-roundness and taper of cylinder bore:

0.01 mm (.0004 in.) or less





BORING CYLINDER

- (1) Oversize pistons to be used should be determined on the basis of the largest bore cylinder.

Piston size identification

Size	Identification mark
0.25 mm (.01 in.) O.S.	0.25
0.50 mm (.02 in.) O.S.	0.50
0.75 mm (.03 in.) O.S.	0.75
1.00 mm (.04 in.) O.S.	1.00

NOTE

Size mark is stamped on the piston top.

- (2) Measure outside diameter of piston to be used. Measure it in thrust direction as shown.
 (3) Based on the measured piston O.D., calculate the boring finish dimension.

Boring finish dimension = Piston O.D. + (Clearance between piston O.D. and cylinder) – 0.02 mm (.0008 in.) (honing margin)

- (4) Bore all cylinders to the calculated boring finish dimension.

Caution

To prevent distortion that may result from temperature rise during honing, bore cylinders, in the order of No. 2, No. 4, No. 1 and No. 3.

- (5) Hone to the final finish dimension (piston O.D. + clearance between piston O.D. and cylinder.)
 (6) Check the clearance between piston and cylinder.

Clearance between piston and cylinder:

0.02 – 0.04 mm (.0008 – .0016 in.)

NOTE

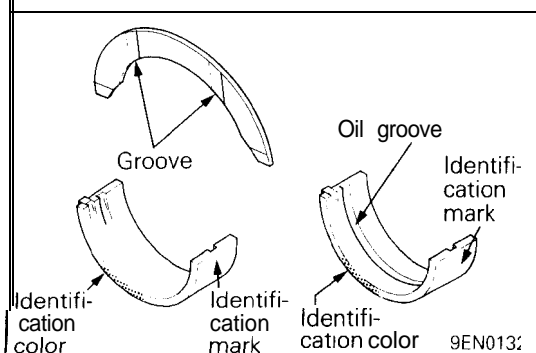
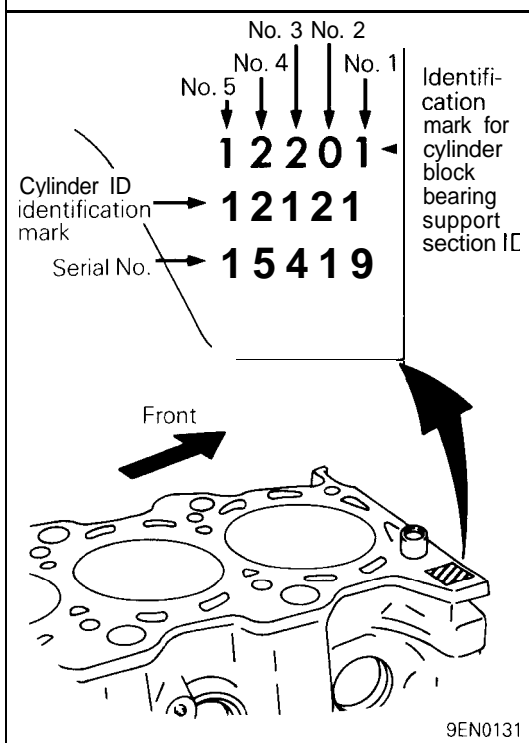
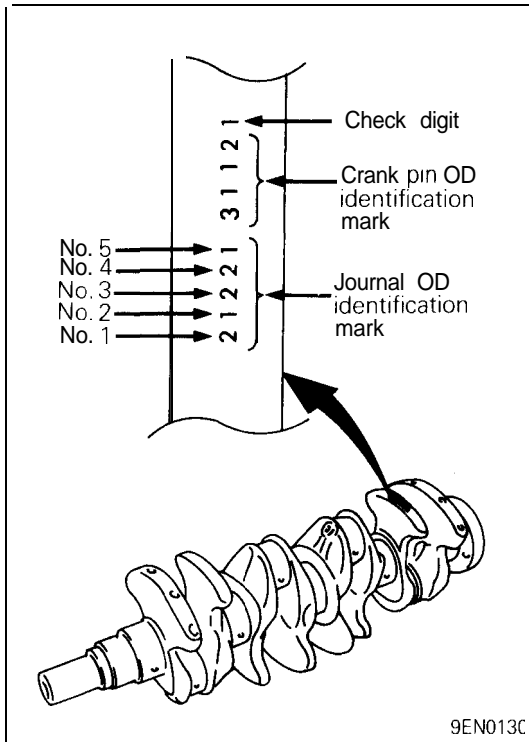
When boring cylinders, finish all of four cylinders to the same oversize. Do not bore only one cylinder to an oversize.

REASSEMBLY SERVICE POINTS

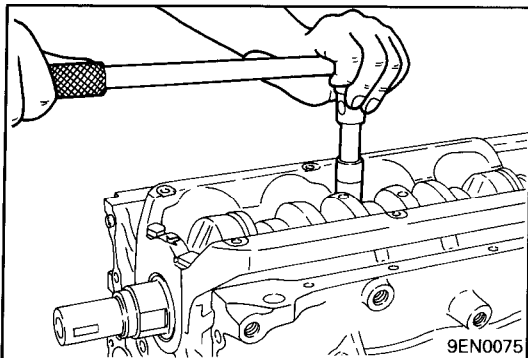
▶▶ CRANKSHAFT BEARING INSTALLATION

(1) When the bearings are to be replaced, select correct ones and install them in the correct positions according to the identification marks stamped on the crankshaft and the top surface of the cylinder block.

Journal OD identification mark	Identification mark for cylinder block bearing support section ID	Crankshaft bearing	
		Identification mark	Identification color
1	0	S1	Brown
	1	S2	Black
	2	S3	Green
2	0	S2	Black
	1	S3	Green
	2	S4	Yellow
3	0	S3	Green
	1	S4	Yellow
	2	S5	Red



- (2) Install the bearings having an oil groove to the cylinder block.
- (3) Install the bearings having no oil groove on the bearing caps.
- (4) Install the thrust bearings at the No. 3 upper bearing with the grooved side toward the crank web.



◆B◆ BEARING CAP / BEARING CAP BOLT INSTALLATION

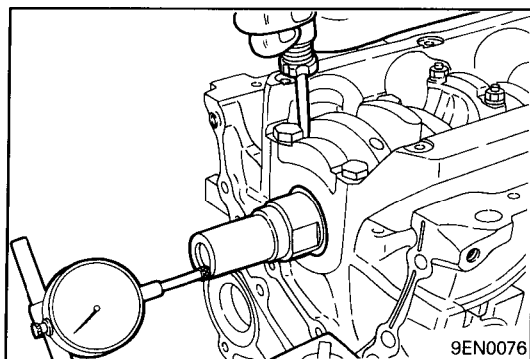
- (1) Install the bearing caps so that their arrows are positioned on the timing belt side.
- (2) When installing the bearing cap bolts, check that the shank length of each bolt meet the limit. If the limit is exceeded, replace the bolt.

Limit: Max. 71.1 mm (2.79 in.)

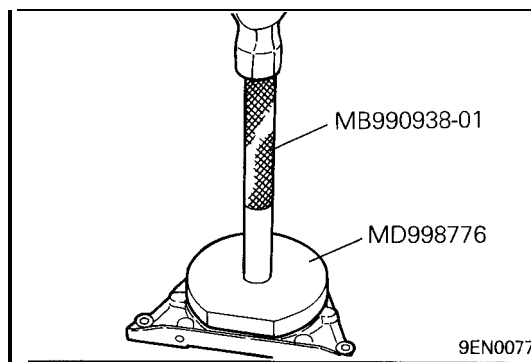
- (3) Torque the bearing cap bolts to 25 Nm (18 ft.lbs.) and, from that position, retighten them further 1/4 (90°) turns.
- (4) After installing the bearing caps, make sure that the crankshaft turns smoothly and the end play is correct. If the end play exceeds the limit, replace the crankshaft bearings.

Standard value: 0.05 – 0.25 mm (.0020 – .0098 in.)

Limit: 0.4 mm (.016 in.)



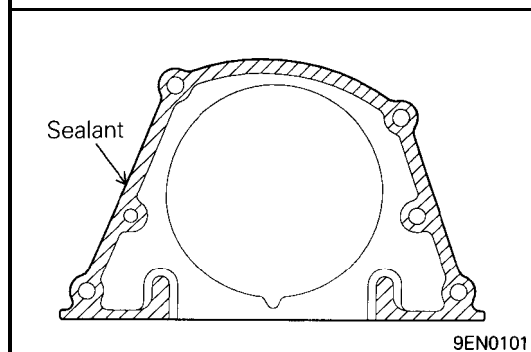
◆C◆ OIL SEAL INSTALLATION



◆D◆ SEALANT APPLICATION TO OIL SEAL CASE

Specified sealant:

Mitsubishi Genuine Part No. MD970389 or equivalent



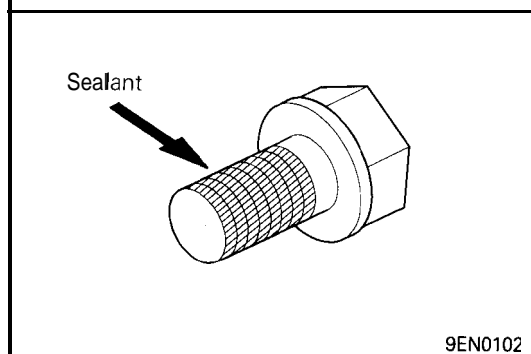
◆E◆ DRIVE PLATE BOLT / FLYWHEEL BOLT INSTALLATION

- (1) Remove all the remaining sealant from the bolts and the thread holes of the crankshaft.
- (2) Apply engine oil to the flange of the bolt.
- (3) Apply engine oil to the threaded holes of the crankshaft.
- (4) Apply specified sealant to the thread of the bolts.

Specified sealant:

3M Nut Locking Part No. 4171 or equivalent

- (5) Tighten the bolts to the specified torque.



NOTES