

11. Crankcase/Piston/Crankshaft

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Service Information

CAUTION

- Improper installation of bearing inserts may block the oil holes, causing insufficient lubrication and eventual engine seizure.

- Remove the engine and separate the crankcases to inspect the crankshaft, connecting rod and starter clutch.
- Mark and store the connecting rod and crankshaft bearing inserts so they can be installed in their original locations for reassembly.
- Prior to assembling the crankcase halves, apply a sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- Mark and store the disassembled parts to ensure that they are reinstalled in their original locations.

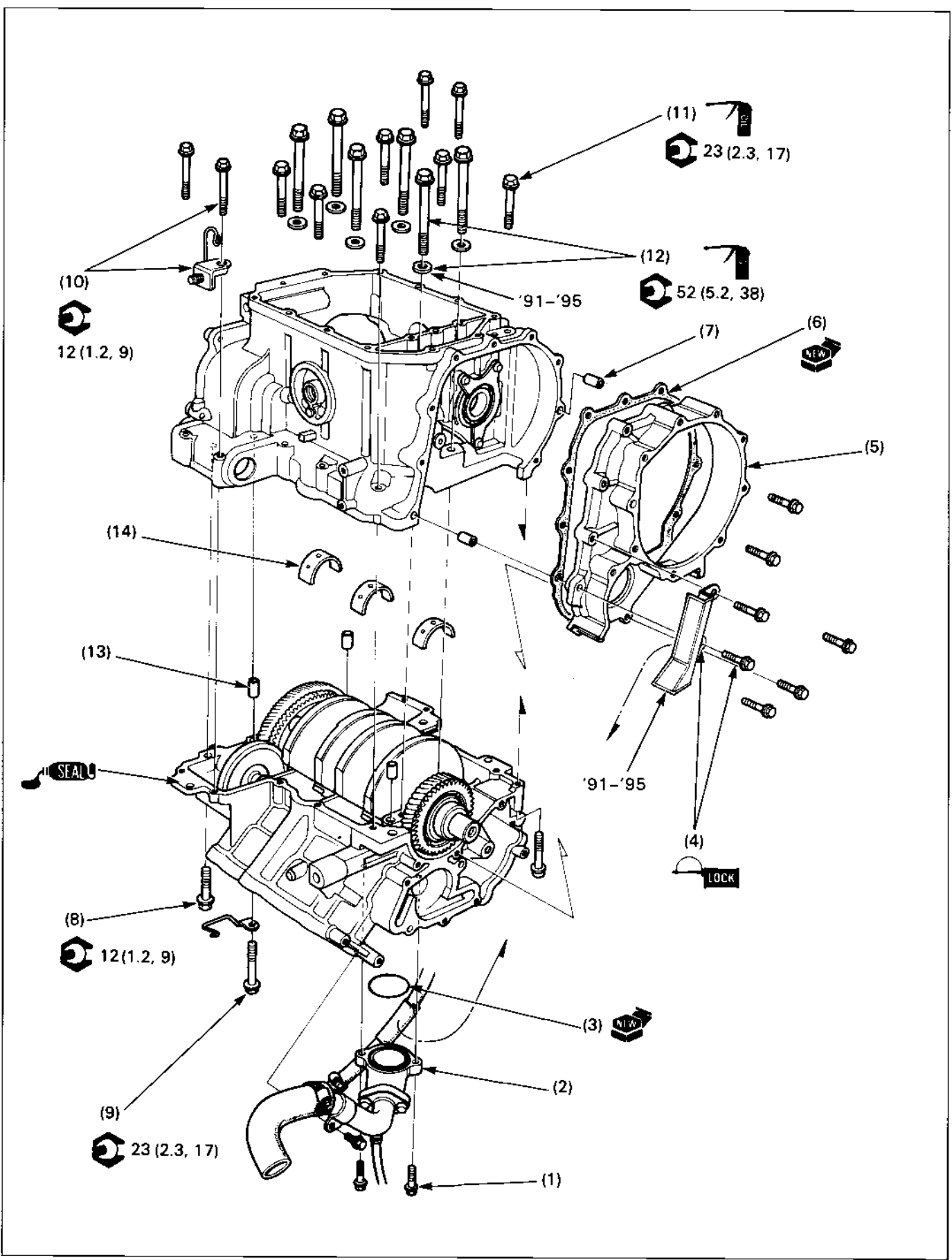
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Troubleshooting

Excessive noise

- Worn connecting rod bearings
- Bent connecting rod
- Worn crankshaft main journal bearing

Crankcase Separation/Assembly



CAUTION

- Improper installation of bearing inserts may block the oil holes causing insufficient lubrication and eventual engine seizure.

NOTE

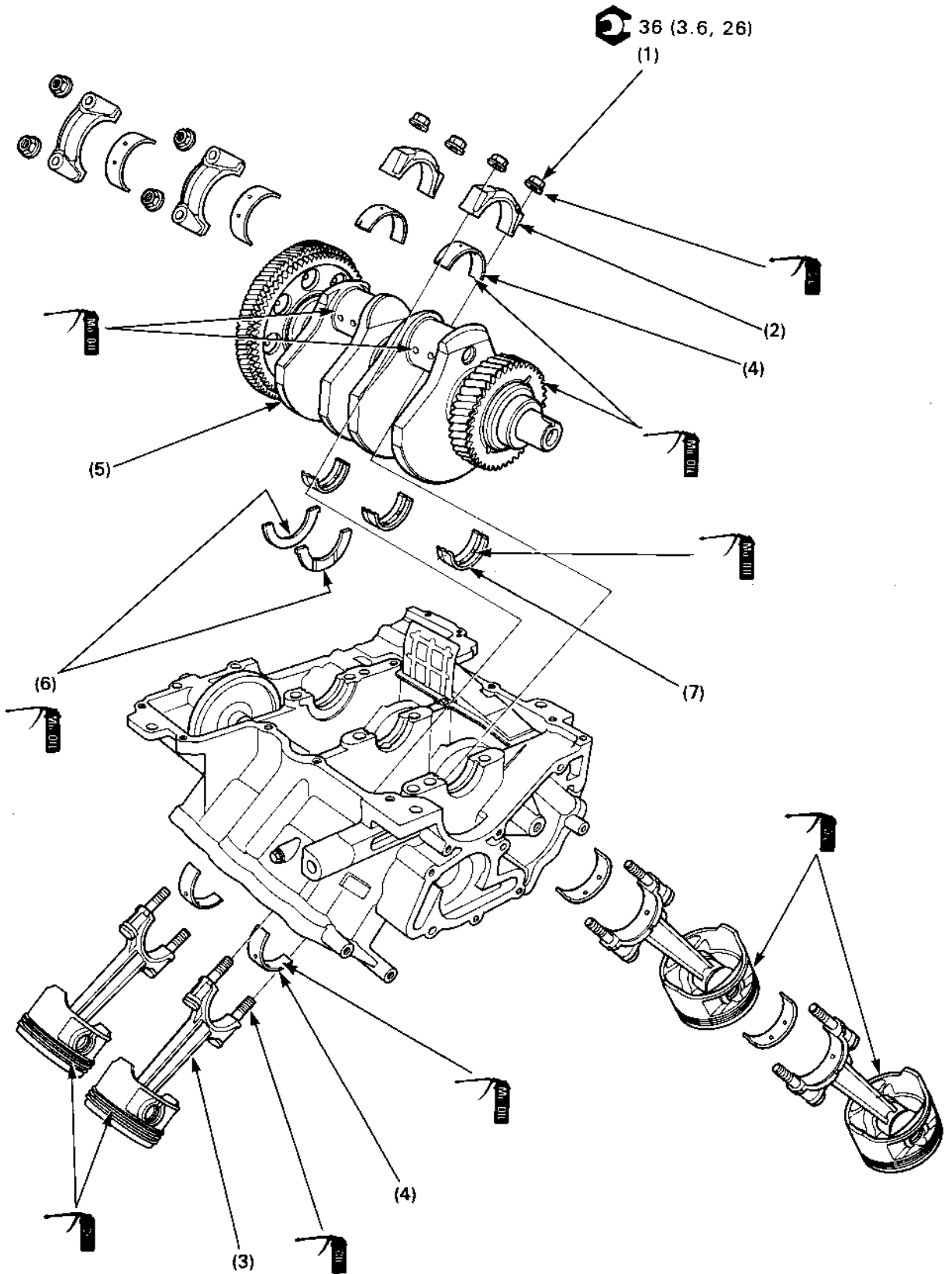
- Mark all parts during disassembly so they can be replaced in their original position.
- All bearing inserts are select fitted and are identified by color code. Select replacement bearings from the selection tables (pages 11-6 and 11-7).

Requisite Service

- Engine removal/installation (page 7-2)
- Cylinder head removal/installation (page 8-2)
- Oil cooler removal/installation (page 4-4)
- Alternator removal/installation (page 17-18)
- Starter motor removal/installation (page 20-6)
- Water pump removal/installation (page 6-7)
- Transmission/primary damper shaft removal/installation (page 10-4)
- Timing pulley removal/installation (page 8-10)
- Ignition pulse generator (page 18-9)

Procedure	Q'ty	Remarks
Separation Order		Assembly is in the reverse order of disassembly.
(1) Bolt	3	
(2) Water cover/pipe	1	
(3) O-ring	1	
(4) Bolt/cooler hose guard	7/1	Hose guard: '91-'95 only
(5) Clutch cover base	1	
(6) Gasket	1	
(7) Dowel pin	2	
(8) Upper crankcase bolt 6 mm	2	
(9) 8 mm	1	
(10) Lower crankcase bolt 6 mm/stay	4/1	
(11) 8 mm	6	
(12) 10 mm/washer	6/6	Washer: '91-'95 only
(13) Dowel pin	3	
(14) Crankshaft main journal bearing	3	Selection (page 11-6). See CAUTION above.

Crankshaft/Connecting Rod Removal/Installation



CAUTION

- Improper installation of bearing inserts may block the oil holes causing insufficient lubrication and eventual engine seizure.

NOTE

- Mark all parts during disassembly so they can be replaced in their original position.
- All bearing inserts are select fitted and are identified by color code. Select replacement bearings from the selection tables (pages 11-6 and 11-7).

Requisite Service

- Crankcase separation/assembly (page 11-2)

	Procedure	Q'ty	Remarks
	Removal Order		Installation is in the reverse order of removal.
(1)	Connecting rod bearing cap nut	8	
(2)	Connecting rod bearing cap	4	
(3)	Connecting rod/piston assembly	4	Piston removal/installation (page 11-8)
(4)	Connecting rod bearing	8	Selection (page 11-6). See CAUTION above.
(5)	Crankshaft	1	
(6)	Crankshaft thrust bearing	2	At installation, align the tab with the groove in the case.
(7)	Crankshaft journal bearing	3	Selection (page 11-6). See CAUTION above.

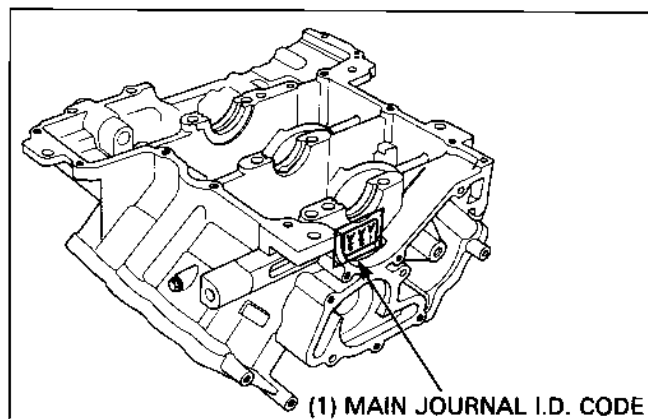
Crankcase/Piston/Crankshaft

Main Journal Bearing Selection

Record the crankcase I.D. code letters on the front side of the upper crankcase.

NOTE

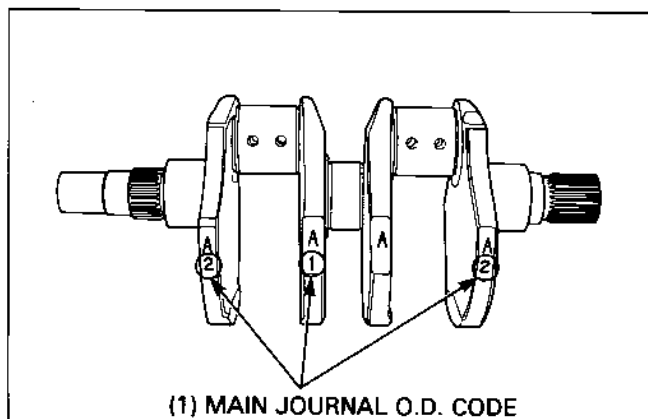
- Letter A, B or C is the code for the main journal I.D.
- The numerals 1, 2 and 3 stand for the crankshaft main journals, as viewed from the front.



Record the main journal O.D. code numbers on the crank weights.

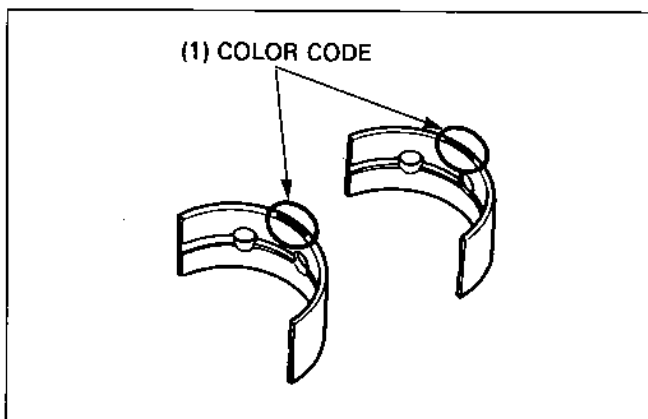
NOTE

- Number 1, 2 or 3 is the code for the main journal O.D.



Cross reference the case and journal codes to determine the replacement bearing color code.

		Crankcase I.D. code	A	B	C
			43.000—43.006 mm (1.6929—1.6931 in)	43.006—43.012 mm (1.6931—1.6933 in)	43.012—43.018 mm (1.6933—1.6936 in)
1	39.994—40.000 mm (1.5746—1.5748 in)	Yellow	Green	Brown	
2	39.988—39.994 mm (1.5743—1.5746 in)	Green	Brown	Black	
3	39.982—39.988 mm (1.5741—1.5743 in)	Brown	Black	Blue	



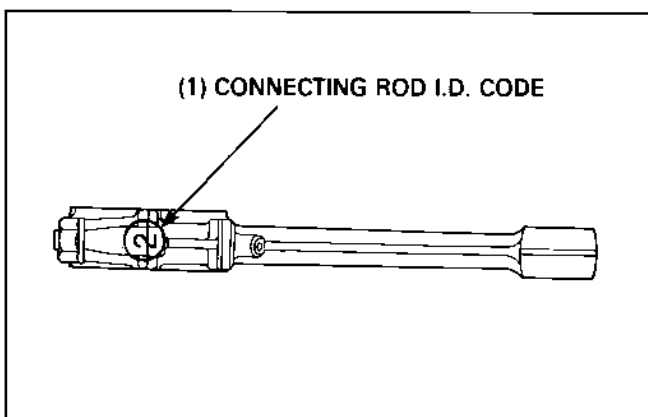
See section 14 of the Common Service Manual for crankshaft main bearing oil clearance inspection.

Connecting Rod Bearing Selection

Record the connecting rod I.D. code number on the connecting rod.

NOTE

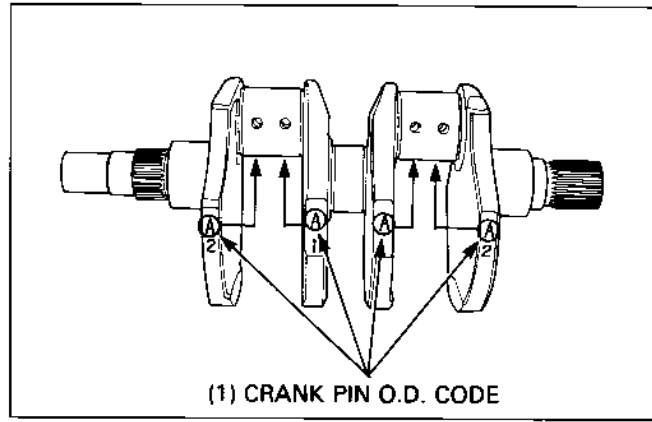
- Number 1, 2 or 3 is the code for the connecting rod I.D. code.



Record the crankpin O.D. code letters on the crank weights.

NOTE

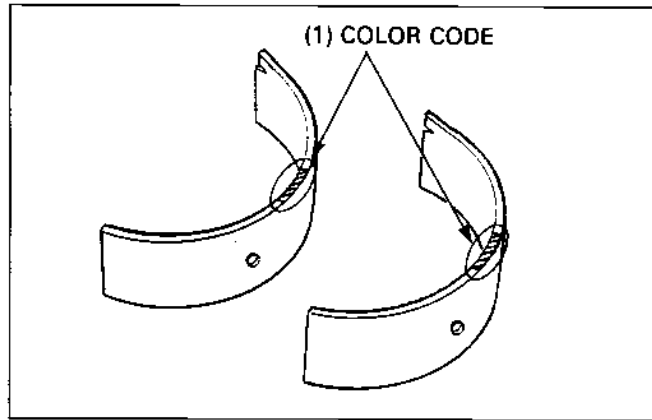
Letter A, B or C is the code for the crank pin O.D.



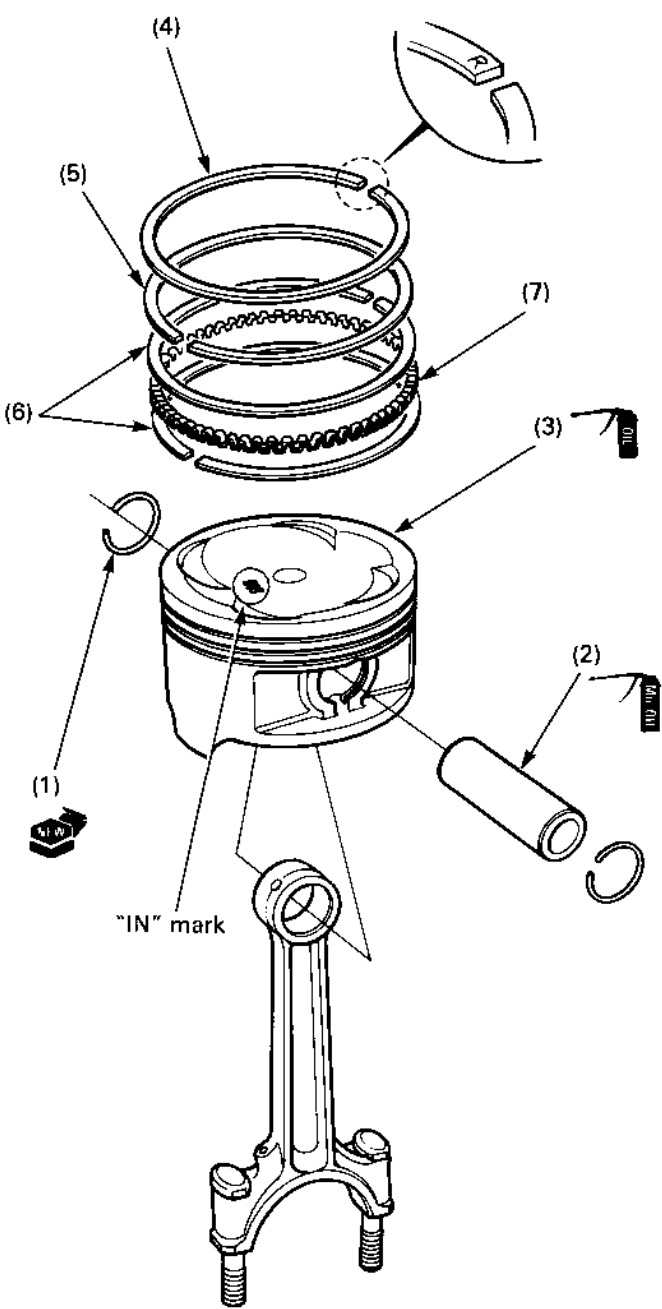
Cross reference the connecting rod and crankpin codes to determine the replacement bearing color code.

Connecting rod I.D. code		1	2	3
		Crank pin O.D. code	43.000— 43.006 mm (1.6929— 1.6931 in)	43.006— 43.012 mm (1.6931— 1.6933 in)
A	39.994—40.000 mm (1.5746—1.5748 in)	Yellow	Green	Brown
B	39.988—39.994 mm (1.5743—1.5746 in)	Green	Brown	Black
C	39.982—39.988 (1.5741—1.5743 in)	Brown	Black	Blue

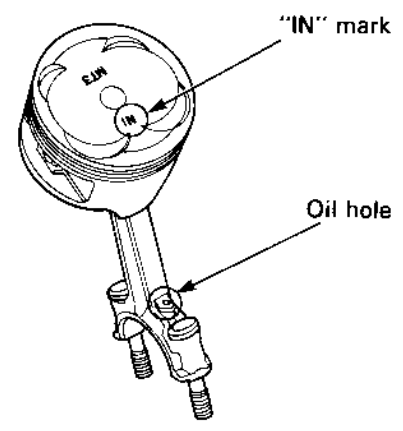
See section 14 of the Common Service Manual for connecting rod bearing oil clearance inspection.



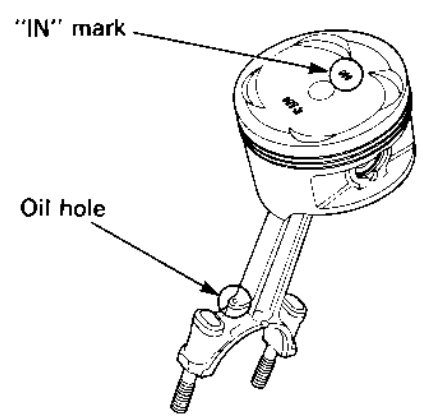
Piston Removal/Installation



Left cylinder piston



Right cylinder piston

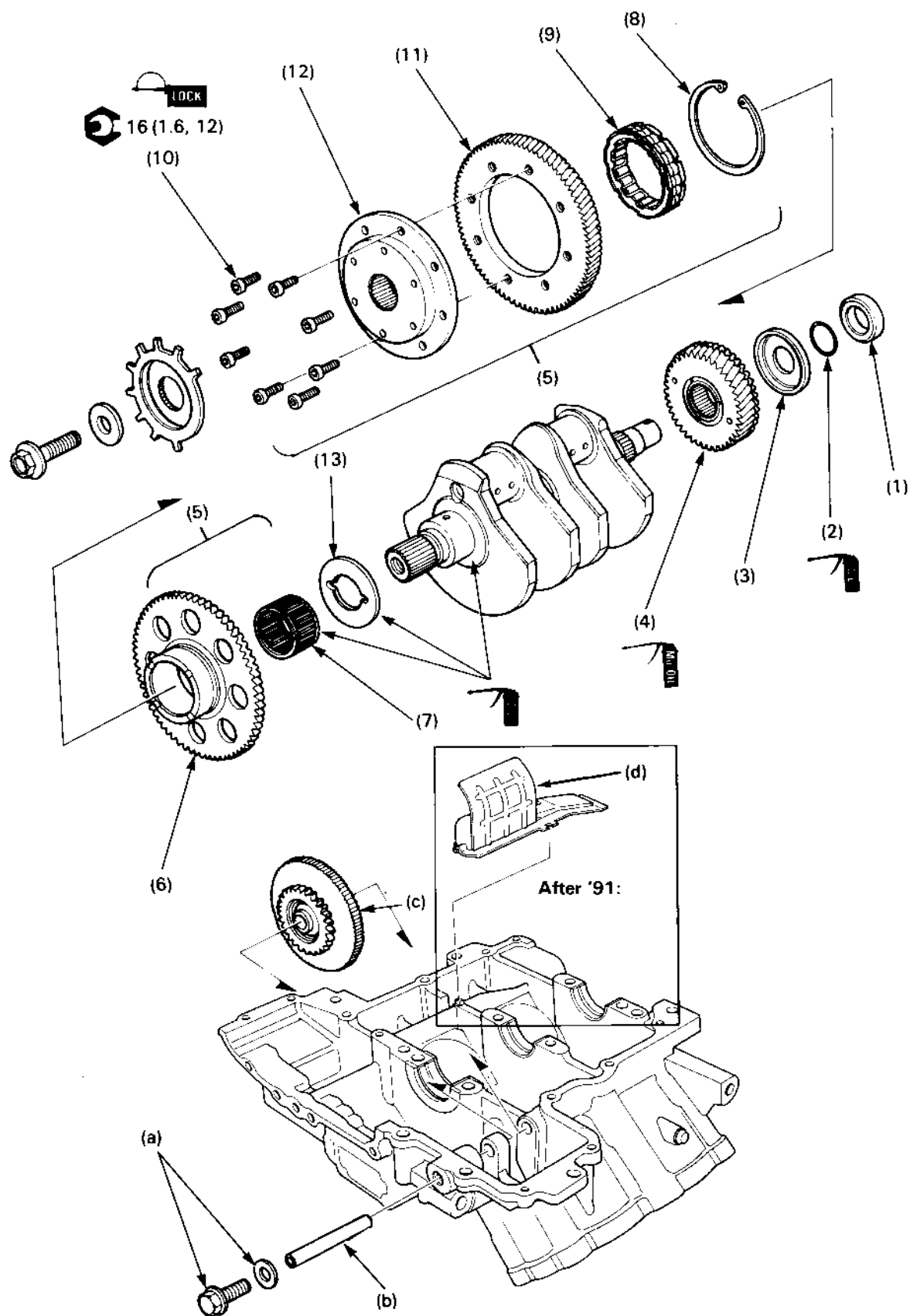


Requisite Service

- Connecting rod removal/installation (page 11-4)

Procedure		Q'ty	Remarks
	Removal Order		
(1)	Piston pin clip	2	Installation is in the reverse order of removal.
(2)	Piston pin	1	
(3)	Piston	1	
			Install the left cylinder piston so that the "IN" mark is facing the same direction as the oil hole in the connecting rod as shown.
			Install the right cylinder piston so that the "IN" mark is facing the opposite direction as the oil hole in the connecting rod as shown.
(4)	Piston top ring	1	Install with the marking facing up.
(5)	Piston second ring	1	Stagger position of ring end gaps as shown.
(6)	Side rail	2	
(7)	Spacer	1	

Primary Drive Gear/Starter Clutch Removal/Installation



NOTE

- The starter idle gear can be removed without removing the crankshaft.















Requisite Service

- Crankshaft removal/installation (page 11-4)

Procedure		Q'ty	Remarks
Removal Order			Installation is in the reverse order of removal.
(1)	Collar	1	
(2)	O-ring	1	
(3)	Stopper circlip	1	
(4)	Primary drive gear	1	Install with the "OUT" mark facing out.
(5)	Starter clutch assembly	1	At installation, align the wide groove in the starter clutch outer with the wide tooth on the crankshaft.
(6)	— Starter driven gear	1	
(7)	— Needle bearing	1	
(8)	— Snap ring	1	
(9)	— Starter clutch	1	
(10)	— Bolt	8	
(11)	— Alternator drive gear	1	
(12)	— Starter clutch outer	1	
(13)	Washer	1	
(a)	Bolt/washer	1	
(b)	Starter idle gear shaft	1	
(c)	Starter idle gear	1	
(d)	Oil separate plate After '91	1	Install in position shown at assembly.

Symbols

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

	<p>Replace the part(s) with new one(s) before assembly.</p>
	<p>Use special tool</p>
	<p>Use optional tool. Use the same procedure you use to order parts.</p>
 <p>10 (1.0, 7.2)</p>	<p>Torque specification. 10 N·m (1.0 kg-m, 7.2 ft-lb)</p>
	<p>Use recommended engine oil, unless otherwise specified.</p>
	<p>Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1 : 1).</p>
	<p>Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent)</p>
	<p>Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent) Example: Molykote® BR-2 plus manufactured by Dow Corning, U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil Japan</p>
	<p>Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent) Example: Molykote® G-n Paste manufactured by Dow Corning, U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan</p>
	<p>Use silicone grease</p>
	<p>Apply a locking agent. Use a middle strength locking agent unless otherwise specified.</p>
	<p>Apply sealant</p>
	<p>Use brake fluid, DOT 3 or DOT 4. Use the recommended brake fluid, unless otherwise specified.</p>
	<p>Use Fork or Suspension Fluid.</p>