

# 10. Crankshaft/Transmission

<b>Service Information</b>	10-1	<b>Transmission Removal/Installation</b>	10-9
<b>Troubleshooting</b>	10-1	<b>Mainshaft Disassembly/Assembly</b>	10-10
<b>Balancer Weight Removal/Installation</b>	10-2	<b>Countershaft Disassembly/Assembly</b>	10-12
<b>Crankcase Separation</b>	10-4	<b>Alternator Shaft Removal/Installation</b>	10-14
<b>Crankcase Assembly</b>	10-6	<b>Crankshaft Removal/Installation</b>	10-16
<b>Shift Fork, Shift Drum Removal/Installation</b>	10-8	<b>Crankshaft Bearing Replacement</b>	10-18

## Service Information

- The crankcase halves must be separated to service the crankshaft, transmission (including the shift fork and shift drum) and alternator shaft. To service these parts, the engine must be removed from the frame.
- Be careful not to damage the crankcase mating surfaces when servicing.
- Mark and store the connecting rod bearings to be sure of their correct locations. If the connecting rod bearings are improperly installed they will block the oil holes, causing insufficient lubrication and eventual engine seizure.
- Be careful not to damage the main journal bearing inserts during crankshaft removal and installation.
- All bearing inserts are select fitted and are identified by color code. Select replacement bearings from the code tables. Check the oil clearance using a plastigauge after replacing the bearing inserts. Refer to section 14 for oil clearance inspection.
- Store the piston components in the same order they were removed so they can be reinstalled in their original locations.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.

10

## Troubleshooting

### Excessive Noise

- Worn crankshaft main journal bearings
- Worn connecting rod bearings
- Worn chain slider
- Bent connecting rod
- Worn, seized or chipped transmission gear
- Worn or damaged transmission bearing

### Excessive Noise While Engine Starting

- Damaged balancer damper

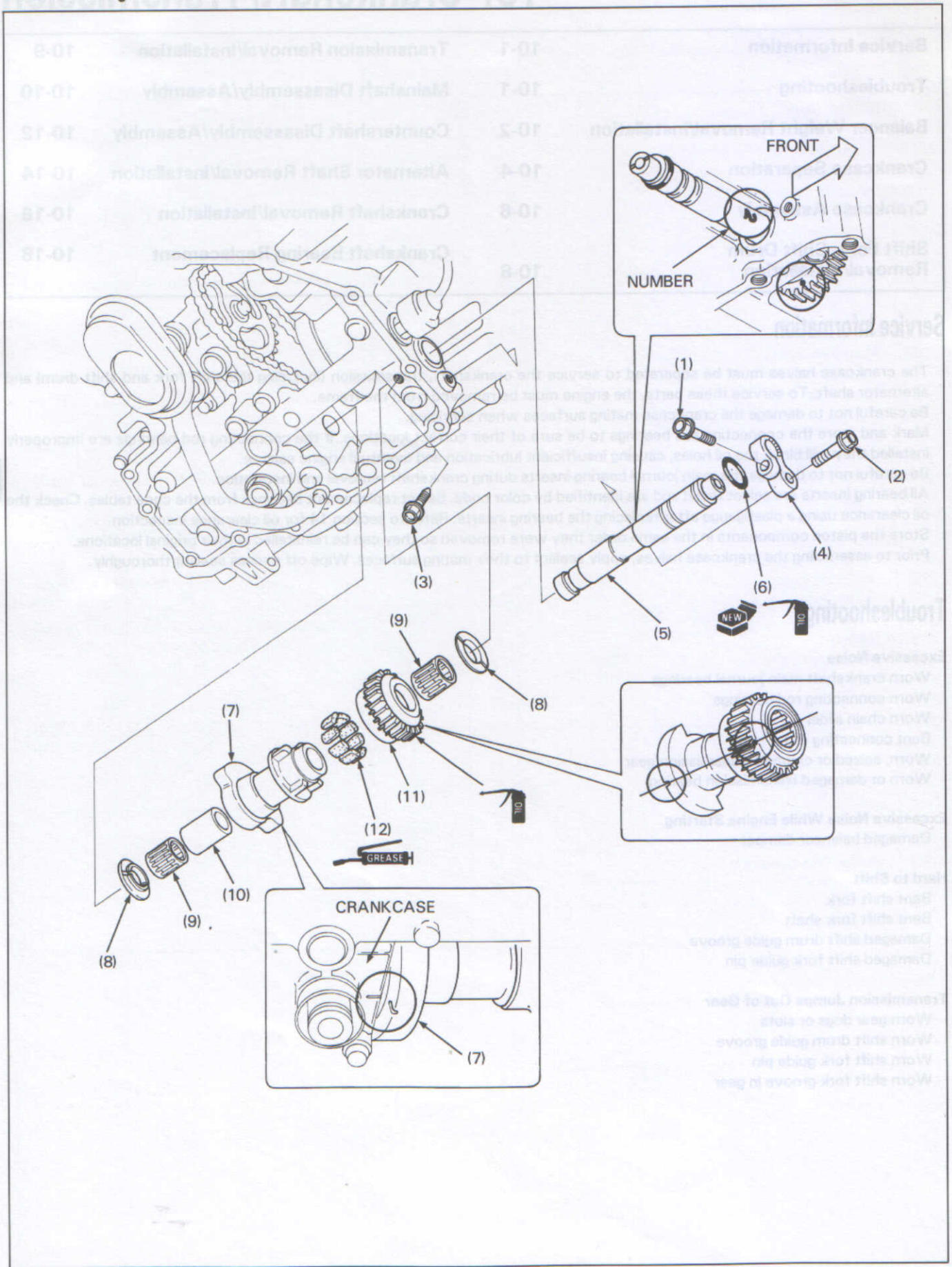
### Hard to Shift

- Bent shift fork
- Bent shift fork shaft
- Damaged shift drum guide groove
- Damaged shift fork guide pin

### Transmission Jumps Out of Gear

- Worn gear dogs or slots
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn shift fork groove in gear

# Balancer Weight Removal/Installation





**CAUTION:**

- Replace the balancer weight, shaft and needle bearings as a set.
- Adjust backlash after installing the balancer weight assembly.

**Requisite Service**

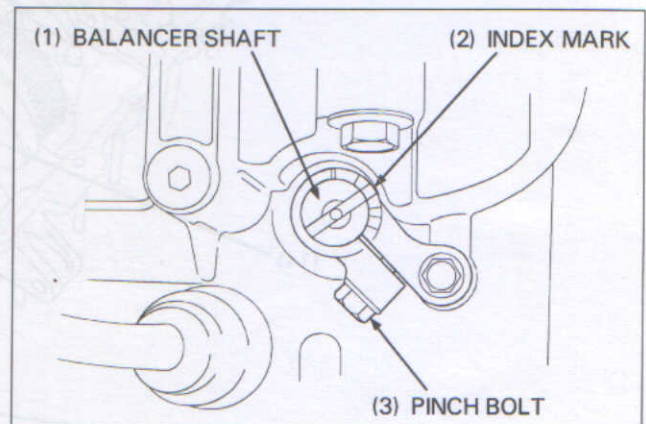
- Oil pan removal/installation (page 4-3)

Procedure		Q'ty	Remarks
<b>Removal Order</b>			Installation is in the reverse order of removal.
(1)	Pinch bolt	1	<b>NOTE:</b> · Install the balancer shaft with the code number on the shaft facing forward, and with the punch mark on the balancer gear facing down.
(2)	Holder bolt	1	
(3)	Shaft stopper bolt	1	
(4)	Shaft holder	1	
(5)	Balancer shaft	1	
(6)	O-ring	1	<b>NOTE:</b> · Rotate the balancer assembly until it comes out easily; do not force it out. · Before installation, align the index mark on the pulse generator rotor with the T mark on the crankcase (page 3-6) · Align the index lines on the weight and crankcase when installing.
(7)	Balancer weight assembly	1	
(8)	Washer	2	<b>NOTE:</b> · Align the punch mark on the gear with the index line on the weight when installing.
(9)	Needle bearing	2	
(10)	Collar	1	
(11)	Balancer gear	1	
(12)	Damper	8	

**Backlash Adjustment****NOTE:**

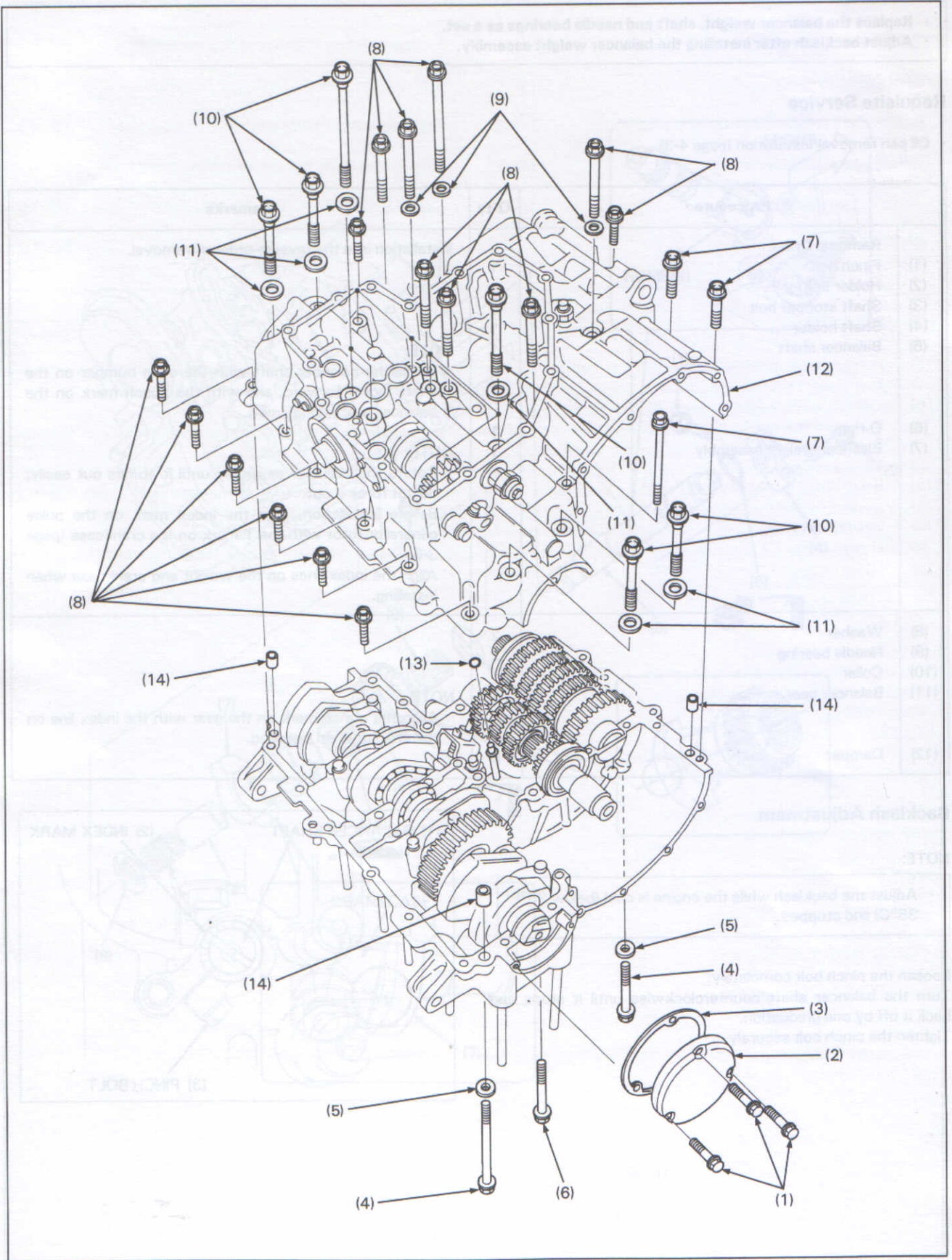
- Adjust the backlash while the engine is cold (below 95°F/35°C) and stopped.

Loosen the pinch bolt completely.  
 Turn the balancer shaft counterclockwise until it stops and back it off by one graduation.  
 Tighten the pinch bolt securely.





# Crankcase Separation



## NOTE:

- After separating the crankcase, clean the mating surfaces thoroughly.

## Requisite Service

- Engine removal (page 7-2)
- Cylinder head, cylinder, piston removal (section 8)
- Gearshift linkage removal (page 9-8)
- Starter motor removal (page 16-5)
- Water pump removal (page 5-7)
- Clutch removal (page 9-6)
- Ignition pulse generator removal (page 15-9)

Procedure		Q'ty	Remarks
<b>Separation Order</b>			
(1)	Right crankcase cover bolt	3	
(2)	Right crankcase cover	1	
(3)	Gasket	1	
(4)	8 mm upper crankcase bolt	2	
(5)	Sealing washer	2	
(6)	10 mm upper crankcase bolt	1	
(7)	6 mm lower crankcase bolt	3	
(8)	8 mm lower crankcase bolt	15	
(9)	Sealing washer	3	
(10)	9 mm lower crankcase bolt (UBS)	12	
(11)	Sealing washer	12	
(12)	Lower crankcase	1	
(13)	O-ring	1	
(14)	Dowel pin	3	