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SERVICE INFORMATION

WORKING PRACTICE

All cylinder/piston maintenance and inspection can be accomplished with the engine in the frame.

SPECIAL TOOLS

Special Tools

Piston Base (4 required)	07958-2500000
Piston Ring Compressor (4 required)	07954-4220000

SPECIFICATIONS

Cylinder	I.D.		STANDARD	SERVICE LIMIT
	Warpage		—	0.10 mm (0.004 in)
Piston, piston rings and piston pin	Piston ring-to-ring groove clearance	TOP	0.015-0.045 mm (0.0006-0.0018 in)	0.09 mm (0.004 in)
		SECOND	0.015-0.045 mm (0.0006-0.0018 in)	0.09 mm (0.004 in)
	Ring end gap	TOP	0.15-0.30 mm (0.006-0.012 in)	0.5 mm (0.02 in)
		SECOND	0.15-0.30 mm (0.006-0.012 in)	0.5 mm (0.02 in)
		OIL (SIDE RAIL)	0.3-0.9 mm (0.012-0.035 in)	1.1 mm (0.04 in)
	Piston O.D.		64.47-64.49 mm (2.538-2.539 in)	64.40 mm (2.535 in)
	Piston pin bore		15.002-15.008 mm (0.5906-0.5909 in)	15.04 mm (0.592 in)
	Connecting rod small end I.D.		15.016-15.034 mm (0.5912-0.5919 in)	15.05 mm (0.592 in)
	Piston pin O.D.		14.994-15.000 mm (0.5903-0.5906 in)	14.98 mm (0.590 in)
	Piston-to-piston pin clearance		—	0.04 mm (0.002 in)
	Cylinder-to-piston clearance		—	0.10 mm (0.004 in)

TROUBLESHOOTING

Compression Too Low or Unstable

1. Worn cylinder or piston rings

Excessive Smoke

1. Worn cylinder or piston
2. Improper installation of piston rings
3. Scored or scratched piston or cylinder

Overheating

1. Excessive carbon build-up on the piston or combustion chamber.

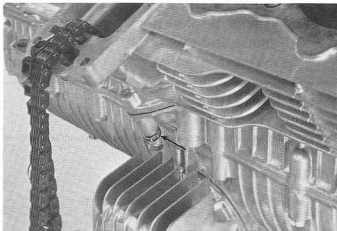
Knocking or Abnormal Noise

1. Worn piston and cylinder
2. Excessive carbon build-up

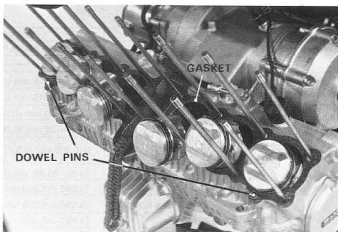


CYLINDER REMOVAL

Remove the cylinder head (Section 6).
Remove the nut at the lower front cylinder base.
Remove the cylinder.
Remove the cam chain tensioner.



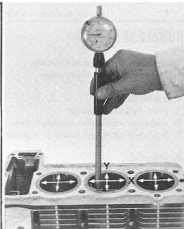
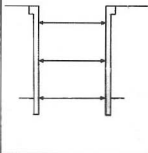
Remove the cylinder gasket and dowel pins.
Remove the cam chain guide pin.



CYLINDER INSPECTION

Inspect the cylinder bores for wear or damage.
Measure the cylinder I. D. at three levels in X and Y axis.

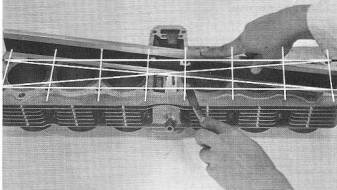
SERVICE LIMIT:
64.60 mm (2.543 in)





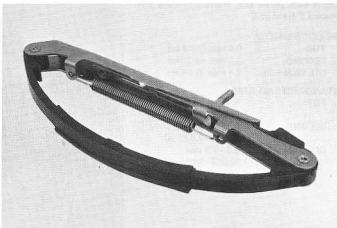
Inspect the top of the cylinders for warpage.
Check in an X pattern as shown.

WARP SERVICE LIMIT:
0.10mm (0.004in)



CAM CHAIN TENSIONER INSPECTION

Inspect the slipper of the cam chain tensioner
for damage or excessive wear.
Inspect the tension spring for weakness.



PISTON REMOVAL

Remove each piston pin clip with pliers.

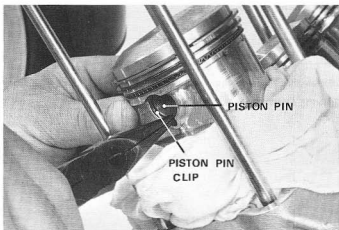
NOTE

Do not allow clips to fall into the crankcase.

Press the piston pin out of the piston.

NOTE

Mark the pistons to indicate the cylinder positions.



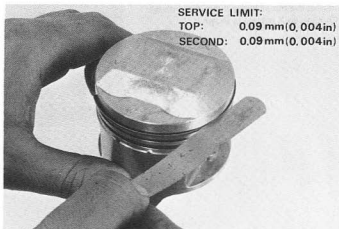
**PISTON/PISTON RING INSPECTION**

Inspect the piston ring-to-groove clearance.
Remove the piston rings.

NOTE

Mark the rings so that they can be returned to their original locations.

Inspect the pistons for damage and cracks;
ring grooves for wear.

**SERVICE LIMIT:**

TOP: 0.09 mm (0.004 in)

SECOND: 0.09 mm (0.004 in)

Insert each piston ring into the cylinder and
inspect the end gap.

SERVICE LIMITS:

TOP: 0.5 mm (0.02 in)

SECOND: 0.5 mm (0.02 in)

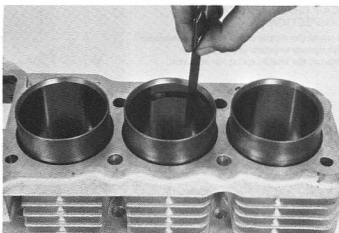
OIL (Side rail): 1.1 mm (0.04 in)

STANDARD END GAPS:

TOP: 0.15–0.30 mm
(0.006–0.012 in)

SECOND: 0.15–0.30 mm
(0.006–0.012 in)

OIL (Side rail): 0.3–0.9 mm
(0.012–0.035 in)



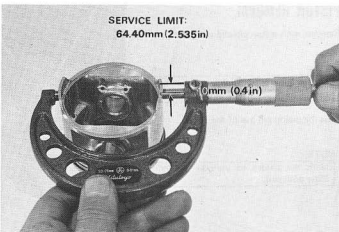
Measure the piston O. D. at the skirt.

NOTE

Measurements should be taken 10 mm
(0.4 in) from the bottom.

Calculate the cylinder-to-piston clearance.

SERVICE LIMIT: 0.1 mm (0.004 in)

**SERVICE LIMIT:**

64.40 mm (2.535 in)



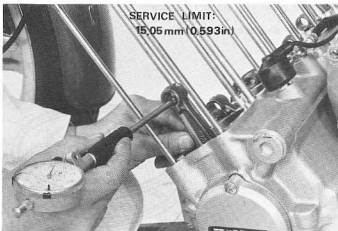
Measure the piston pin hole I. D..

SERVICE LIMIT:
15.04 mm (0.592 in)



Measure the connecting rod small end I. D..
(See Section 12 for replacement procedure)

SERVICE LIMIT:
15.05 mm (0.593 in)

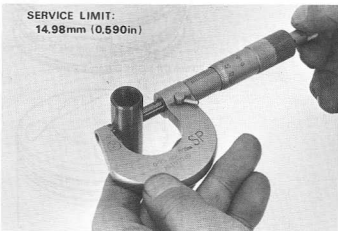


Measure the piston pin O. D..

Determine the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)

SERVICE LIMIT:
14.98 mm (0.590 in)



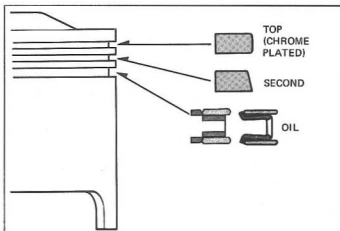


PISTON RING INSTALLATION

Install the piston rings.

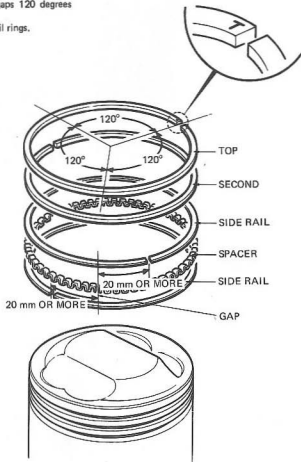
NOTE

- Avoid piston and piston ring damage during installation.
- All rings should be installed with the markings facing up.
- After installation, the rings should rotate freely.



Space the piston ring end gaps 120 degrees apart.

Do not align the gaps in the oil rings.



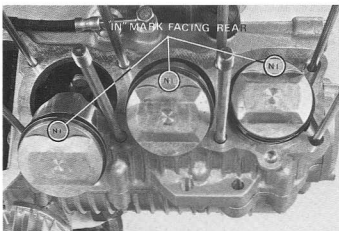


PISTON INSTALLATION

Apply molybdenum disulfide grease to the connecting rod small ends.
Install the pistons, piston pins and clips.

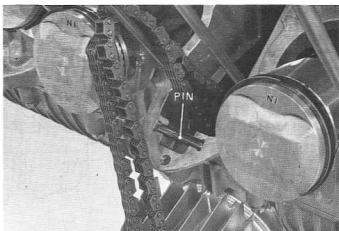
NOTE

- Position the mark "IN" on the piston to the intake side.
- Install the pistons in their original positions.
- Do not allow clips to fall into the crankcase.
- Do not damage the piston by fitting the cylinder edge.

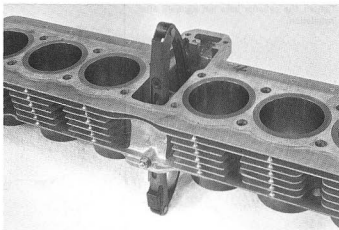


CYLINDER INSTALLATION

Install the cam chain guide pin.



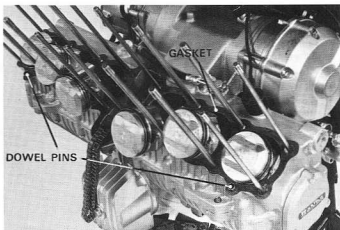
Install the cam chain tensioner.





CYLINDER/PISTON

Install the dowel pins and cylinder gasket.



Install the cylinder.

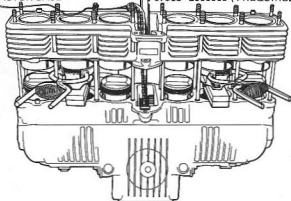
CAUTION

Avoid damaging the pistons and piston rings when installing the cylinder.

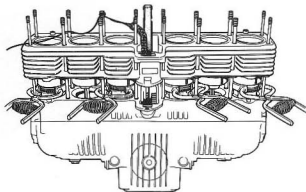
NOTE

Before using the special tools, position the No. 2 and No. 5 pistons at T. D. C. (Top Dead Center).

PISTON RING COMPRESSOR 07954-4220000 (4 REQUIRED)
PISTON BASE 07958-2500000 (4 REQUIRED)



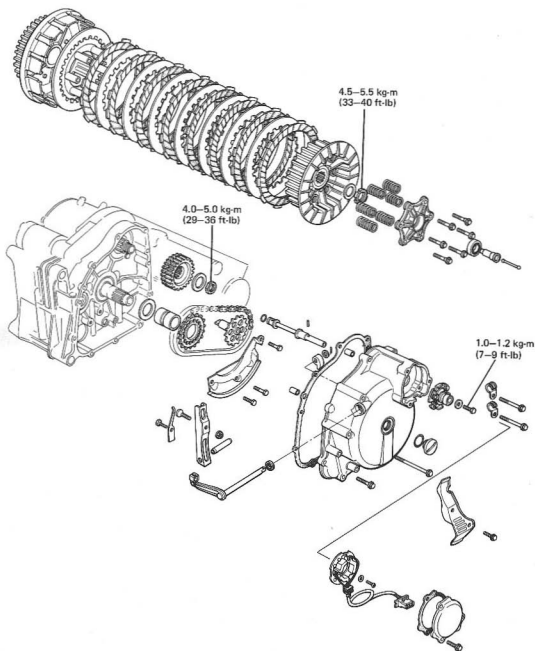
Tighten the cylinder base nut securely after installation.





HONDA
CB X

MEMO





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SERVICE INFORMATION

WORKING PRACTICE

This section covers removal and installation of the clutch, pulser generator and advancer, starting with the clutch cover. This operation can be accomplished with the engine in the frame.

SPECIAL TOOLS

Common Tools

Universal Holder
Handle

07725-0010101
07716-0020500

Special Tools

Lock Nut Wrench
Primary Gear Holder

07916-4220000
07924-4220000

TORQUE VALUES

Clutch lock nut 4.5-5.5 kg-m (33-40 ft-lb) Spark advancer 1.0-1.2 kg-m (7-9 ft-lb)
Primary drive gear lock nut 4.0-5.0 kg-m (30-36 ft-lb)

SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Clutch	Lever free play (at lever end)	10-20 mm (3/8-3/4 in)	—
	Spring free length	35.1 mm (1.38 in)	33.6 mm (1.32 in)
	Spring preload/length	18.3-20.1 kg/24.4-25.6 mm (40.34-44.31 lbs/0.96-1.01 in)	17.0 kg/24.4-25.6 mm (37.48 lbs/0.96-1.01 in)
	Disc thickness	A	3.42-3.58 mm (0.135-0.141 in)
		B	3.42-3.58 mm (0.135-0.141 in)
	Plate warpage	—	0.2 mm (0.01 in)
	Clutch outer I.D.	37.000-37.025 mm (1.4567-1.4577 in)	37.06 mm (1.459 in)
Oil pump drive system	Clutch outer guide O. D.	36.950-36.975 mm (1.4547-1.4557 in)	36.93 mm (1.454 in)
	Drive sprocket I.D.	37.000-37.021 mm (1.4567-1.4575 in)	37.1 mm (1.46 in)
	Driven sprocket shaft O.D.	12.966-12.984 mm (0.5105-0.5112 in)	12.9 mm (0.51 in)
Ignition timing	Refer to Section 3.		

TROUBLESHOOTING

Clutch

Faulty clutch operation can usually be corrected by adjusting the free play.

Clutch Slips When Accelerating

1. No free play
2. Discs worn
3. Springs weak

Motorcycle Creeps With Clutch Disengaged

1. Too much free play
2. Plates warped

Clutch Will Not Disengage

1. Too much free play
2. Plates warped

Excessive Lever Pressure

1. Clutch cable kinked, damaged or dirty
2. Lifter mechanism damaged

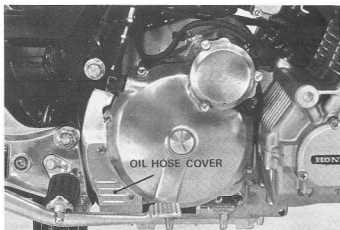
Clutch Operation Feels Rough

1. Outer drum slots rough



CLUTCH COVER REMOVAL

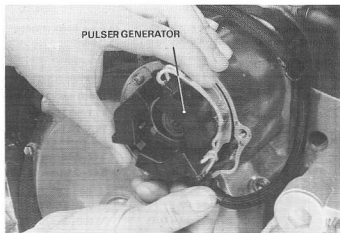
Remove the exhaust pipes.
Remove the oil hose cover.



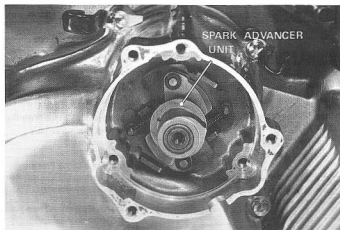
NOTE

The clutch cover can be removed without removing the pulser generator and advancer. The pulser generator and advancer removal is shown here. If removal is unnecessary, the clutch cover can be removed by removing the cover bolts.

Remove the pulser cover.
Loosen the center bolt and three screws.
Then, remove the pulser generator.

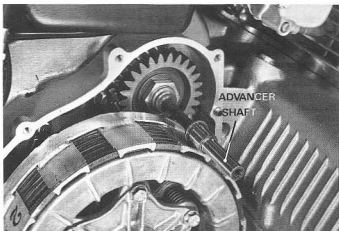


Remove the spark advancer unit.





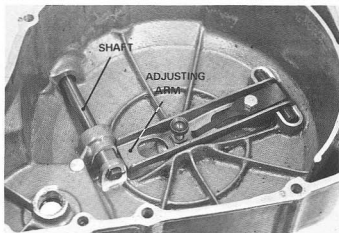
Remove the clutch cover.
Remove the advancer shaft.
Remove the gasket and dowel pins.



CLUTCH REMOVAL

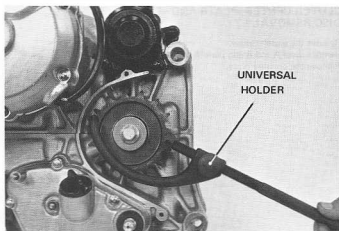
CLUTCH LIFTER REMOVAL

Remove the clutch lifter shaft and adjusting arm.



CLUTCH REMOVAL

Use the universal holder if the drive chain is removed.
Shift the transmission into gear to lock the countershaft and mainshaft.
Block the drive sprocket to prevent it from turning.

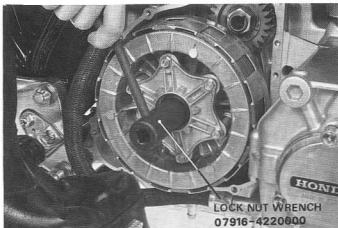




When servicing the clutch with the engine in the frame, shift the transmission into gear and press the brake pedal to lock the transmission.

Remove the clutch lifter guide.
Remove the release bearing.

Attach the lock nut wrench.
Remove the lock nut and washer.
The clutch can now be removed out as a unit.

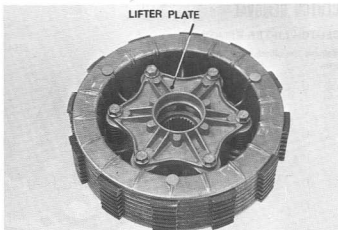


CLUTCH LIFTER PLATE REMOVAL

Remove the bolts, lifter plate and clutch springs.

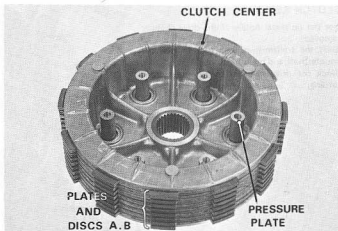
NOTE

Loosen the bolts in a crisscross pattern in 2-3 steps.



CLUTCH CENTER, PLATE AND DISC REMOVAL

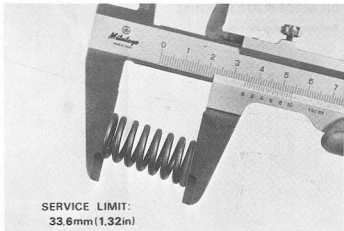
Remove the clutch center.
Remove discs A and B and plate A.
Remove the pressure plate.





CLUTCH SPRING INSPECTION

Measure the clutch spring free length.



CLUTCH DISC INSPECTION

Replace the clutch discs if they show signs of scoring or discoloration. Measure disc thickness.

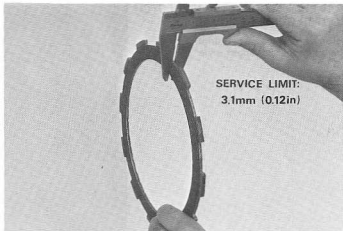
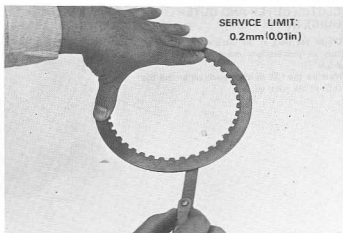


PLATE INSPECTION

Check for plate warpage on a surface plate.

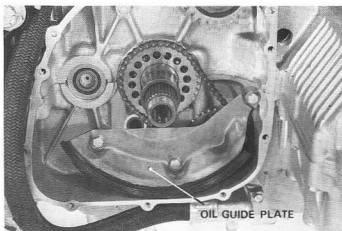




CLUTCH

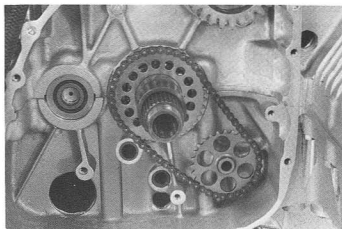
OIL GUIDE PLATE REMOVAL

Remove the oil guide plate.



**OIL PUMP SPROCKETS AND CLUTCH
OUTER GUIDE REMOVAL**

Remove the oil pump drive and driven
sprockets and clutch outer guide.



**CLUTCH OUTER AND OUTER
GUIDE INSPECTION**

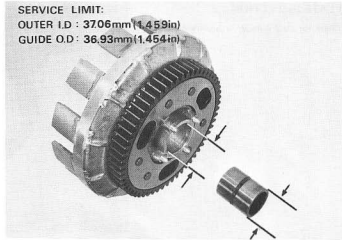
Check the slots in the outer drum for nicks,
cuts or indentations made by the friction
discs.

Measure the I.D. of the clutch outer and the
O.D. of the outer guide.

SERVICE LIMIT:

OUTER I.D : 37.06mm (1.459in)

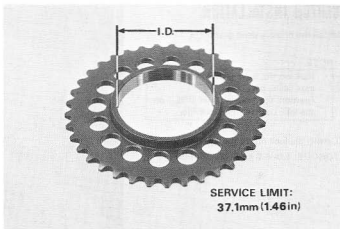
GUIDE O.D : 36.93mm (1.454in)



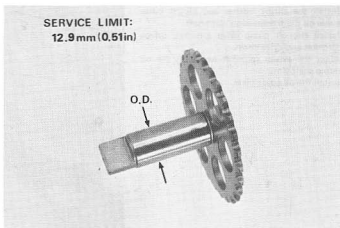


**OIL PUMP DRIVE SPROCKET AND
DRIVEN SPROCKET MEASURE-
MENT**

Measure the oil pump drive sprocket I.D..

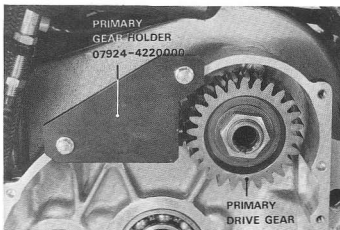


Measure the oil pump driven sprocket shaft
O.D..



**PRIMARY DRIVE GEAR
REMOVAL**

Hold the primary drive gear with the primary
gear holder as shown.
Loosen the lock nut.





CLUTCH INSTALLATION

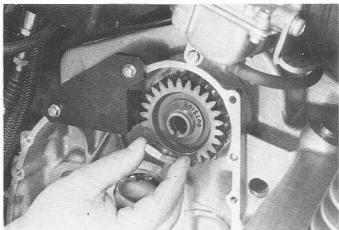
Install the primary drive gear.

NOTE

- Position the drive gear with the large gear facing out.
- Position the mark "OUTSIDE" on the lock washer on the outside.

Tighten the lock nut to the specified torque.

TORQUE: 4.0–5.0 kg-m (29-36 ft-lb)



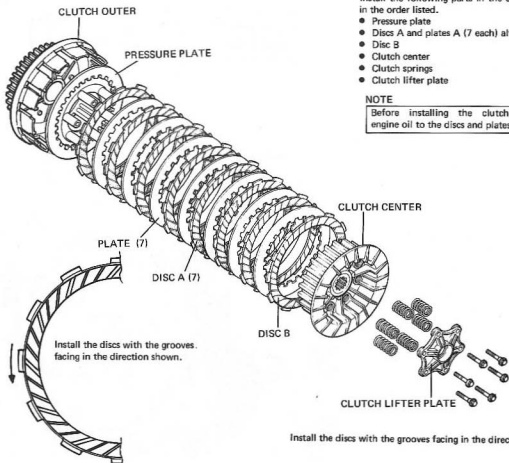
Install the thrust washer and clutch outer guide on the transmission mainshaft.

Install the oil pump drive sprocket, driven sprocket and drive chain.

Align the driven sprocket key with the oil pump shaft slot.

Install the oil guide plate.





Install the following parts in the clutch outer in the order listed.

- Pressure plate
- Discs A and plates A (7 each) alternately
- Disc B
- Clutch center
- Clutch springs
- Clutch lifter plate

NOTE

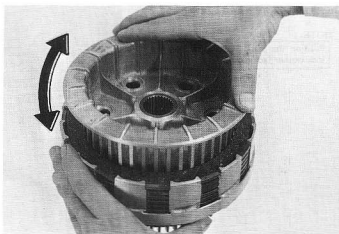
Before installing the clutch, apply engine oil to the discs and plates.

Align the splines by rotating the clutch center.
Install the clutch springs, lifter plate and lifter plate bolts.

NOTE

Tighten the bolts in two or more steps and in a criss cross pattern.

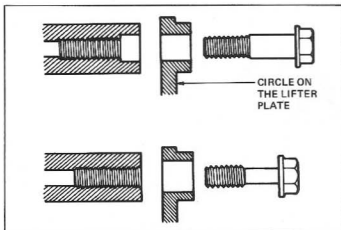
Install the discs with the grooves facing in the direction shown.





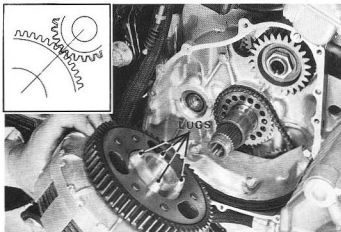
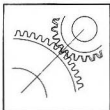
NOTE

The lifter plate bolts are two diameters.



Turning the primary drive gear, find a pair of the outer and inner gear teeth which are aligned.

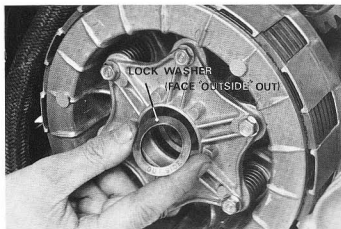
Assemble the clutch outer gear so it meshes with the aligned teeth and also connect the clutch outer to the oil pump drive sprocket by coupling the lugs and holes.



Install the lock washer and lock nut.

NOTE

Position the mark "OUTSIDE" on the lock washer facing out.



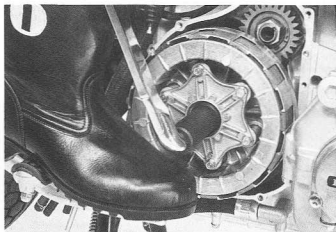


Tighten the lock nut to the specified torque.

TORQUE: 4.5–5.5 kg-m (33–40 ft-lb)

NOTE

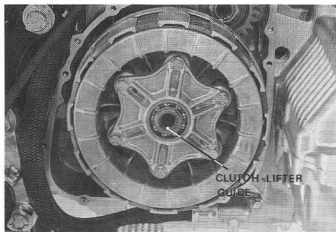
With transmission engaged, depress the rear brake pedal to lock transmission.



Install the release bearing in the lifter plate.

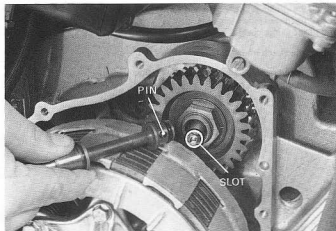
Insert the clutch lifter guide.

Install the clutch lifter pin.



Install the advancer shaft.

Make sure that the pin on the shaft is aligned with the slot in the primary shaft.





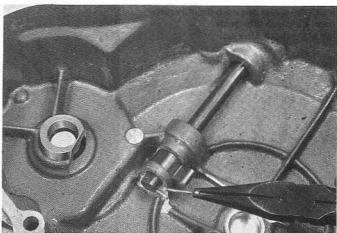
CLUTCH COVER INSTALLATION

Coat the advancer shaft oil seal with oil.
Drive the oil seal with the proper rod until the top of the oil seal is flush with the advancer side surface of the clutch cover.



Install the clutch lifter cam and shaft.
Insert the cotter pin and spread the ends.

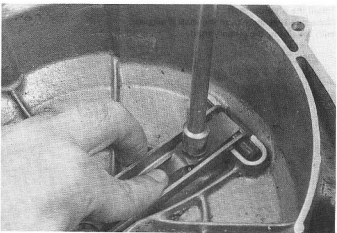
Apply molybdenum disulfide grease to the advancer shaft hole of the clutch cover.



Install the clutch adjusting arm and spring.
Install the dowel pins and gasket.
Install the clutch cover.

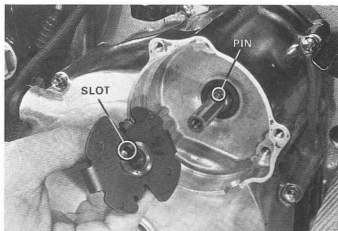
Adjust the clutch free play (Section 3).

Apply molybdenum disulfide grease to the clutch adjusting hole cap.

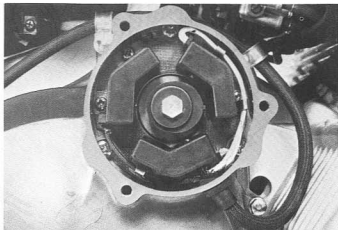


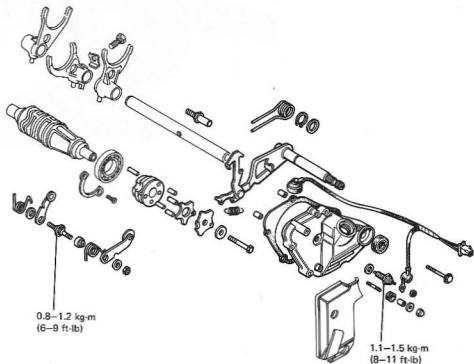
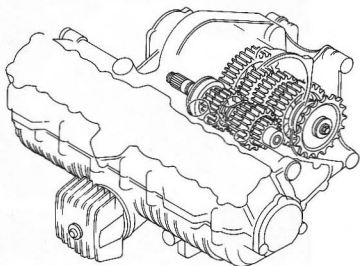


Install the advancer.
Align the slot on the spark advancer unit with
the pin on the advancer shaft.
Tighten the advancer bolt.



Install the pulser generator.
Adjust the ignition timing, if necessary
(Section 3).







SERVICE INFORMATION	9-1
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SERVICE INFORMATION

WORKING PRACTICE

The gearshift spindle and stopper arms can be serviced with the engine in the frame. The outline of the shift forks and drum can be inspected by removing the oil pan. If the shift forks, drum and transmission requires servicing, remove the engine and separate the crankcases.

TORQUE VALUES

Stopper arm shaft	0.8-1.2 kg-m (6- 9 ft-lb)
Neutral switch	1.1-1.5 kg-m (8-11 ft-lb)

TROUBLESHOOTING

Hard to Shift

1. Improper clutch adjustment; too much free play
2. Shift forks bent
3. Shift shaft bent
4. Shift claw bent
5. Shift drum cam grooves damaged

Transmission Jumps Out of Gear

1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent



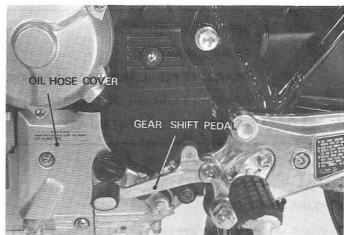
GEAR SHIFT PEDAL AND LINKAGE REMOVAL

Drain engine oil.

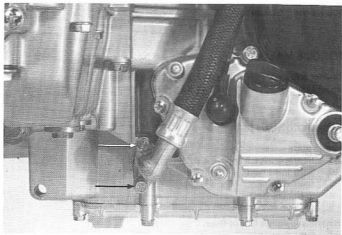
Remove the left exhaust pipes.

Remove the oil hose cover.

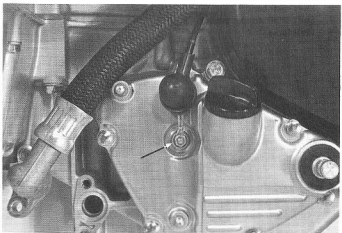
Remove the gear shift pedal linkage.



Remove the oil hose.

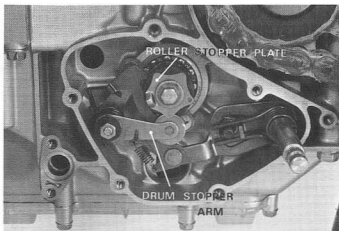


Disconnect the neutral switch lead.
Remove the drive sprocket and gear shift
linkage covers.
Remove the gasket and dowel pins.



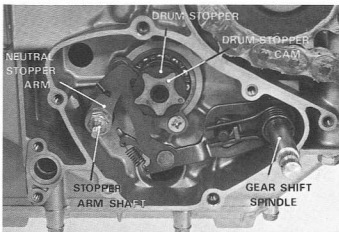


Remove the roller stopper plate bolt and plate.
Remove the drum stopper arm nut, arm and spring.



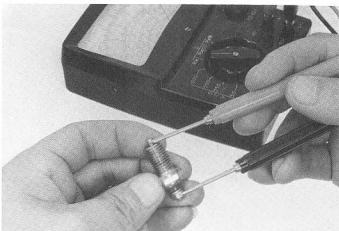
Remove the gear shift spindle assembly.
Remove the drum stopper cam and drum stopper.
Loosen the stopper arm shaft.
Remove the neutral stopper arm and spring.

If bearing removal is necessary, remove the bearing stopper plate.



NEUTRAL SWITCH INSPECTION

Check the switch operation.
Check the neutral switch for continuity between the top and bottom terminals.
The switch is normal if there is continuity.
Also check for shorts between the top terminal and any body ground.
Replace the switch if there is continuity.



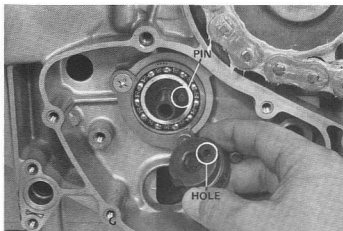


GEAR SHIFT LINKAGE INSTALLATION

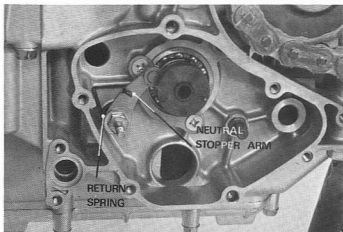
Align the hole in the drum stopper with the pin on the shift drum.

NOTE

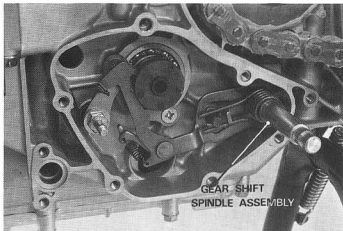
If bearing replacement is necessary, apply locking agent to the threads of the screws.



Install the stopper arm shaft, neutral stopper arm and return spring. Make sure that the roller on the neutral stopper arm is positioned correctly in the groove.

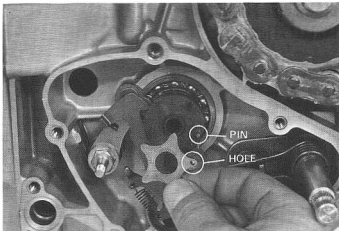


Assemble the gear shift spindle, return spring and snap ring. Install as shown.

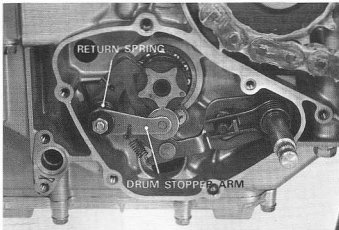




Align the hole in the drum stopper cam with the pin on the drum stopper.



Install the drum stopper arm and return spring.

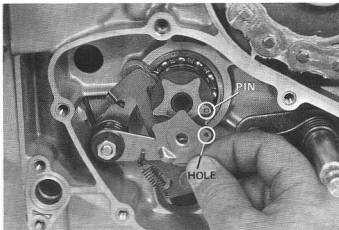


Align the hole in the roller stopper plate with the pin on the drum stopper cam.

Apply a locking agent to the bolt.
Tighten the stopper plate bolt securely.

Check the linkage for smooth operation by
rotating the gear shift spindle.

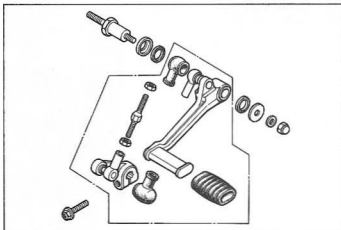
Install the covers.
Connect the neutral switch lead.





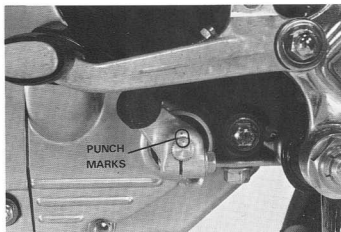
GEAR SHIFT PEDAL INSTALLATION

Install the gear shift pedal as shown.

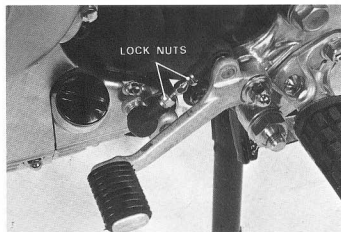


NOTE

- Coat the dust seal with the oil.
- Align the punch mark on the joint arm with the punch mark on the gear shift spindle.
- Tighten the bolt and nut securely.



Adjust by turning the adjuster after loosening the lock nuts.
Tighten the lock nuts.





HONDA
CB X

MEMO