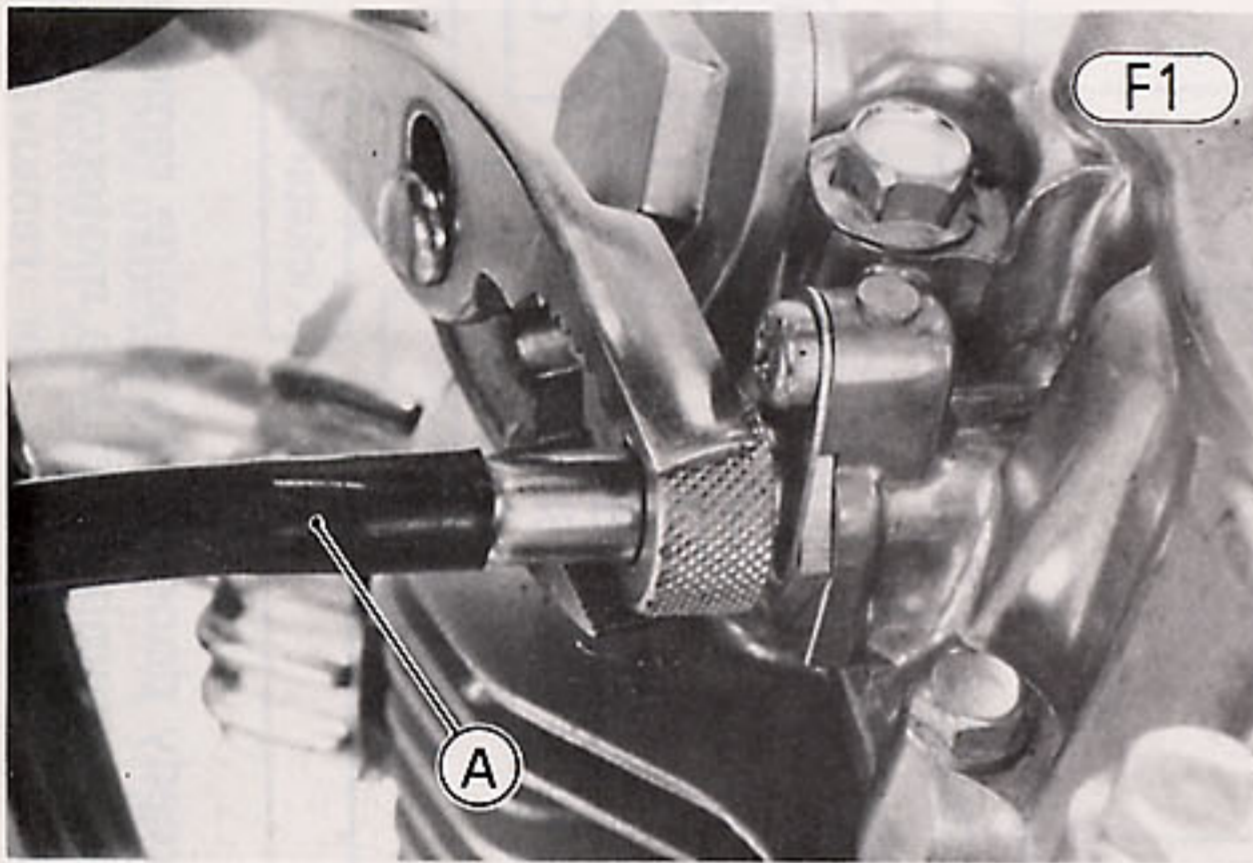


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ENGINE REMOVAL

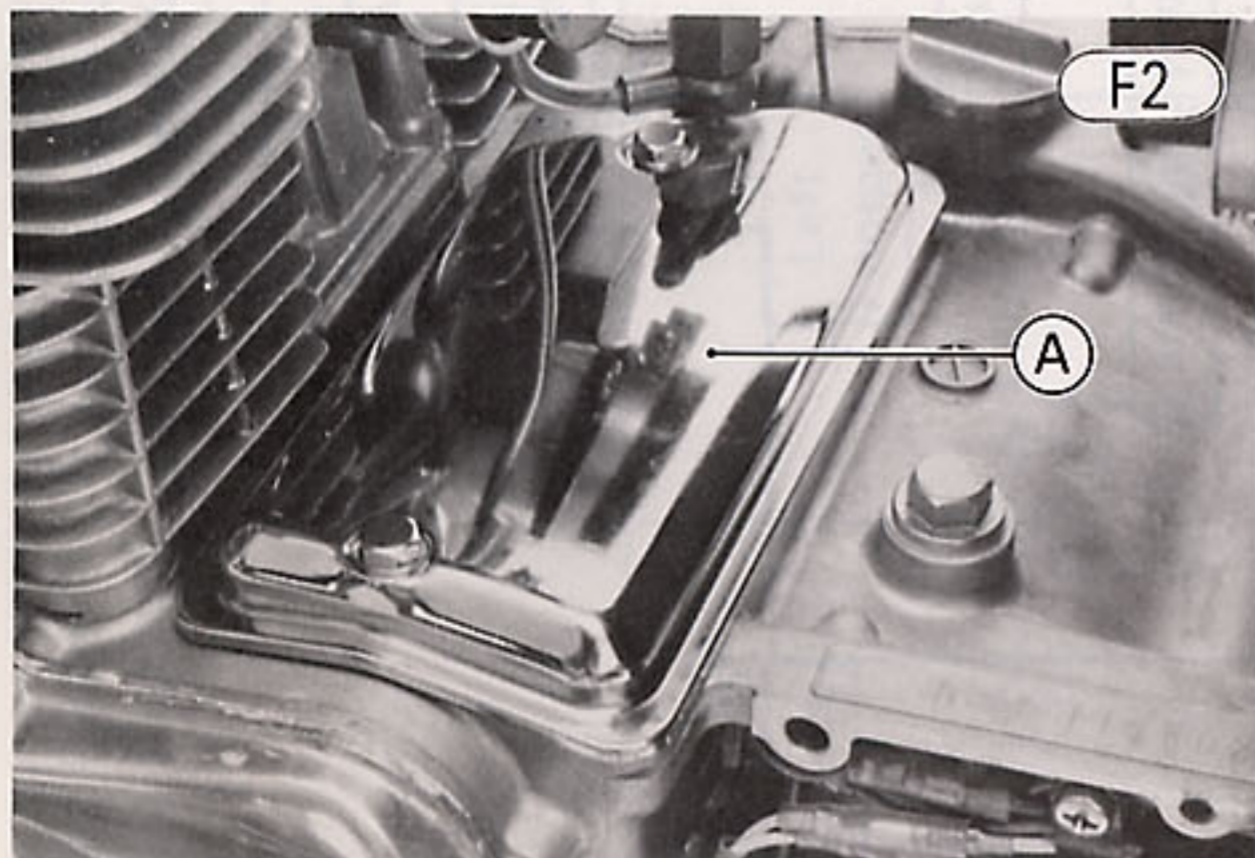
Removal:

- Situate the motorcycle so that it is perpendicular to the ground, place an oil pan beneath the engine, and remove the engine oil drain plug and oil filter to drain out the oil.
- After draining the oil, install the drain plug with its aluminum gasket and tighten the plug to 3.0 kg-m (22 ft-lbs) of torque and install the oil filter, tighten its bolt to 2.0 kg-m (14.5 ft-lbs) of torque. Replace the aluminum gasket with a new one if it is damaged.
- Remove the fuel tank (Pg. 43).
- Take off the right and left side covers.
- Pull the spark plug leads off the plugs, and disconnect the ignition coil leads.
- Remove the bolts (2), and take the ignition coil off the frame together with its mounting bracket.
- Remove the carburetors (Pg. 45) as explained in carburetors removal. The throttle cables do not require removal from the carburetors.
- Cover the carburetors with a clean cloth to keep dirt out of the carburetors, and set them on the workbench to avoid damaging the throttle cables and carburetors.
- Disconnect the tachometer cable lower end with pliers (KZ400-B).



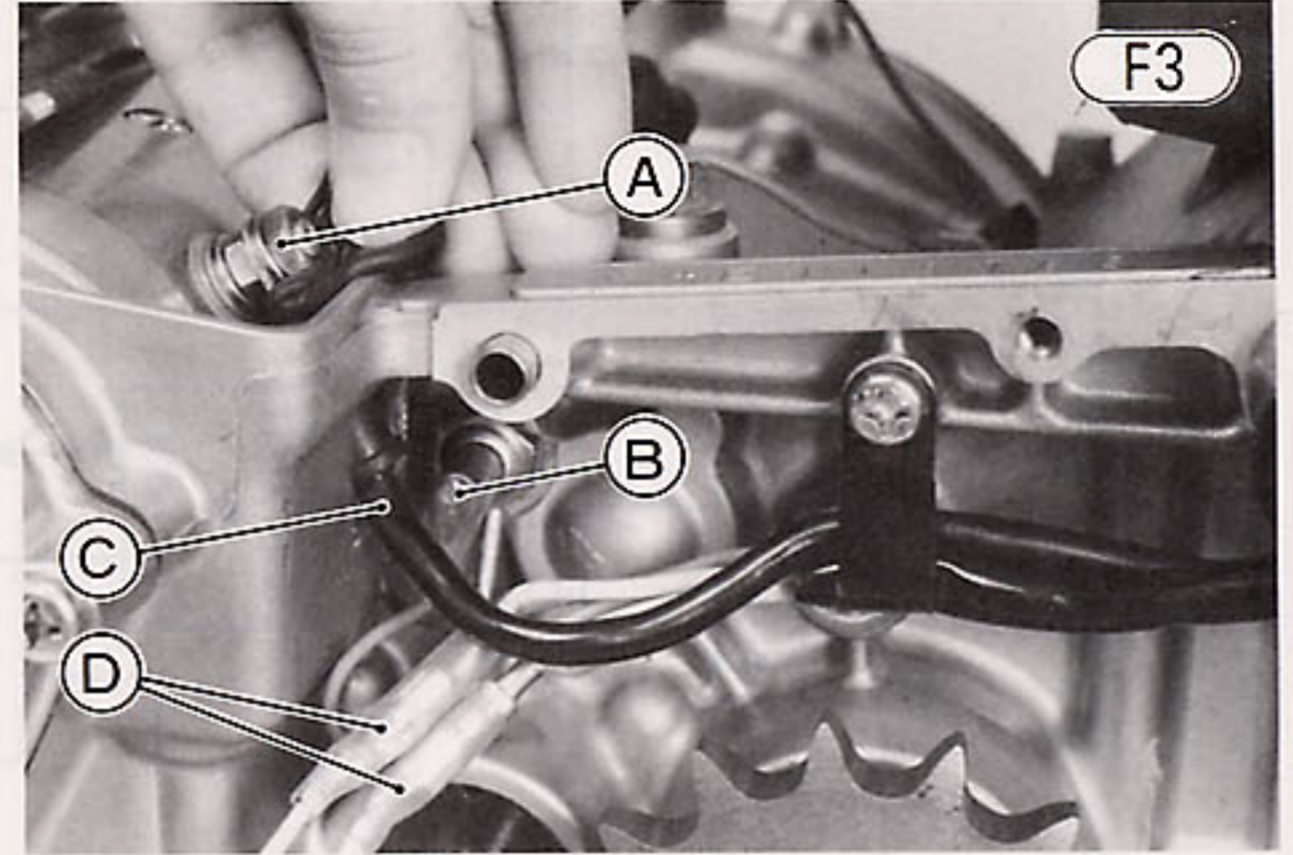
A. Tachometer Cable

- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable does not require removal from the clutch release.
- Remove the drive chain (Pg. 119).
- Remove the starter motor cover bolts and flat washers (2 ea), and take off the cover and gasket (KZ400-B).



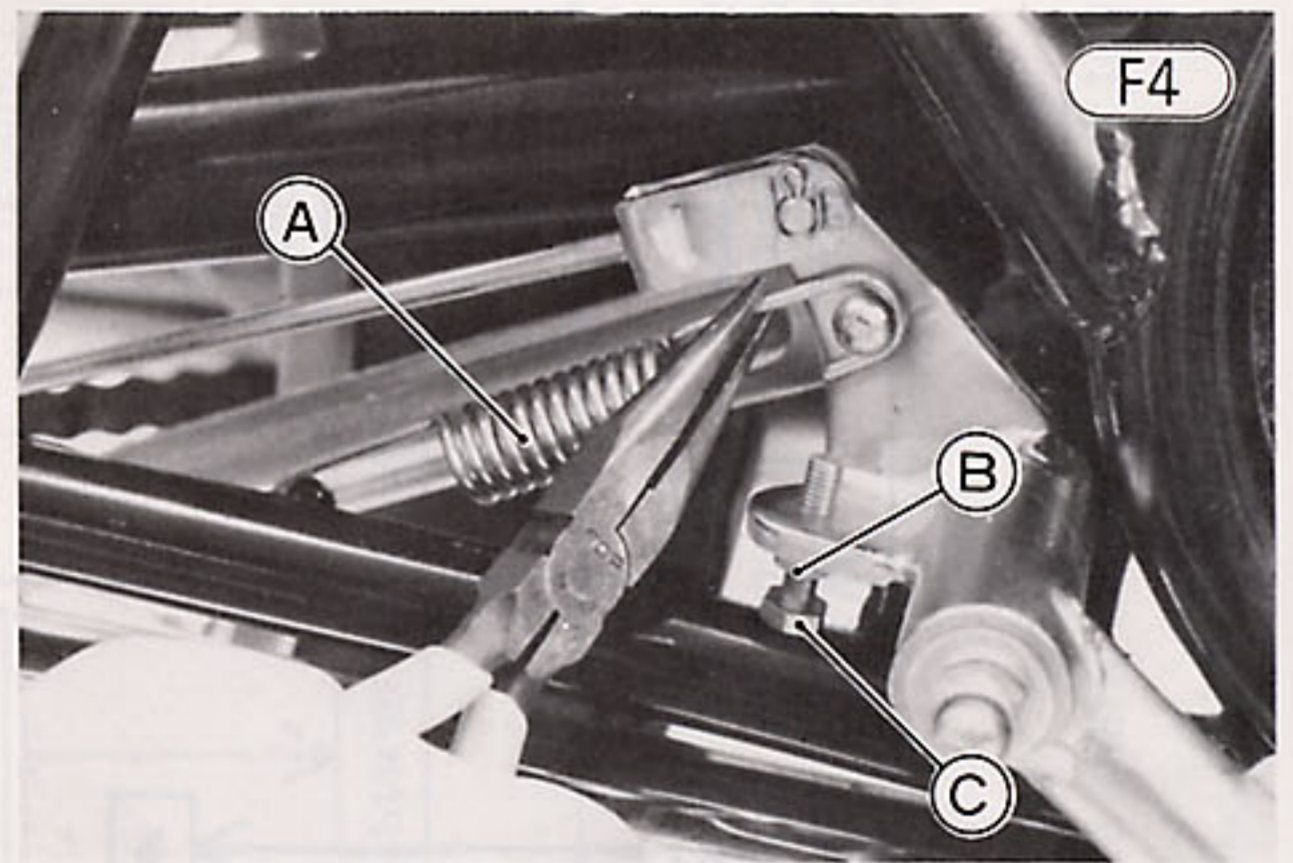
A. Starter Motor Cover

- Disconnect the oil pressure switch lead from the switch (KZ400-B).
- Slide the rubber cap out of place, remove the nut and lockwasher, and free the starter motor lead from the starter motor terminal (KZ400-B).



A. Nut
B. Neutral Switch Lead
C. Starter Motor Lead
D. Dynamo Armature Leads

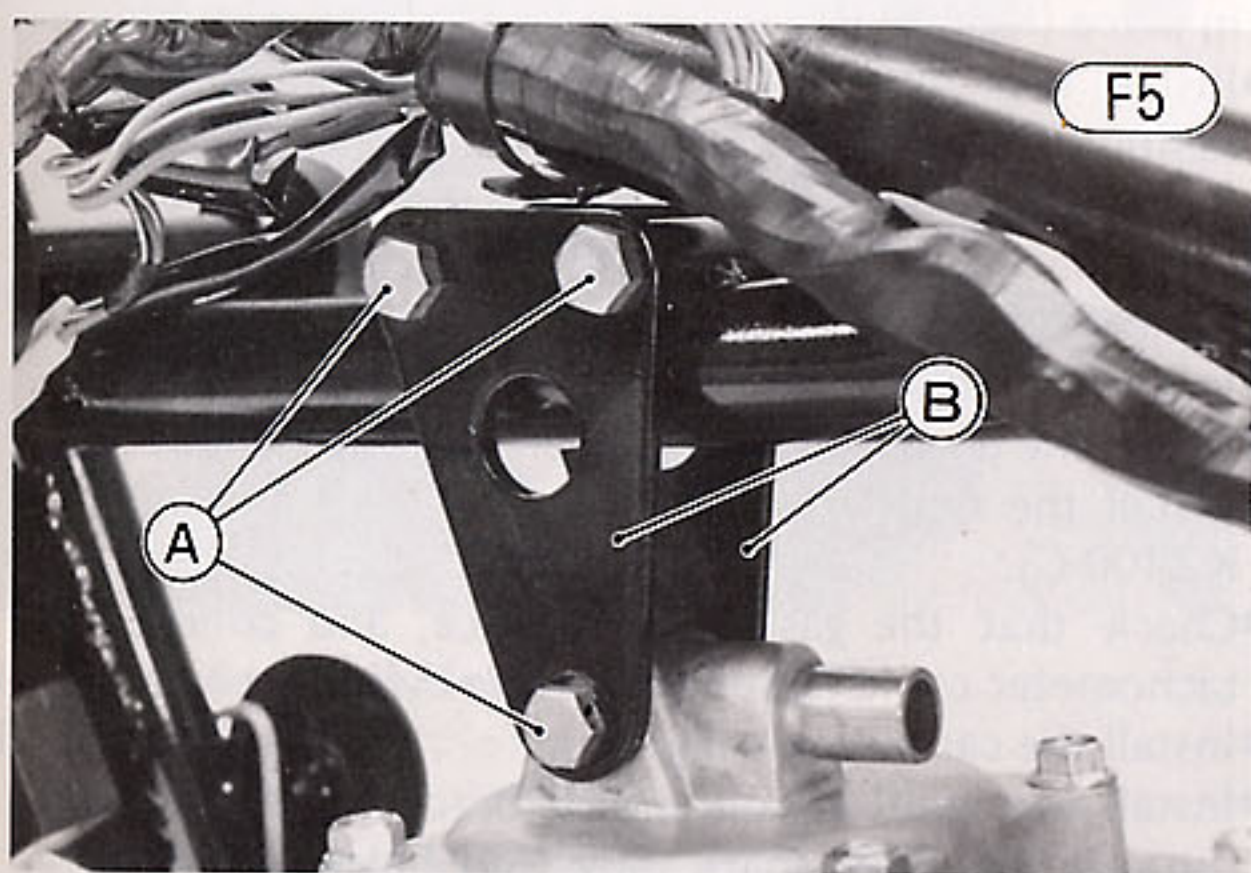
- Disconnect the neutral switch lead from the switch.
- Disconnect the dynamo armature yellow leads (2).
- Remove the lead clamp screw, and take off the clamp.
- Remove the right footpeg mounting bolt and lockwasher, and take off the footpeg.
- Remove rear brake light switch (Pg. 134).
- Remove the rear brake pedal return spring.



A. Brake Pedal Return Spring **C. Adjusting Bolt**
B. Locknut

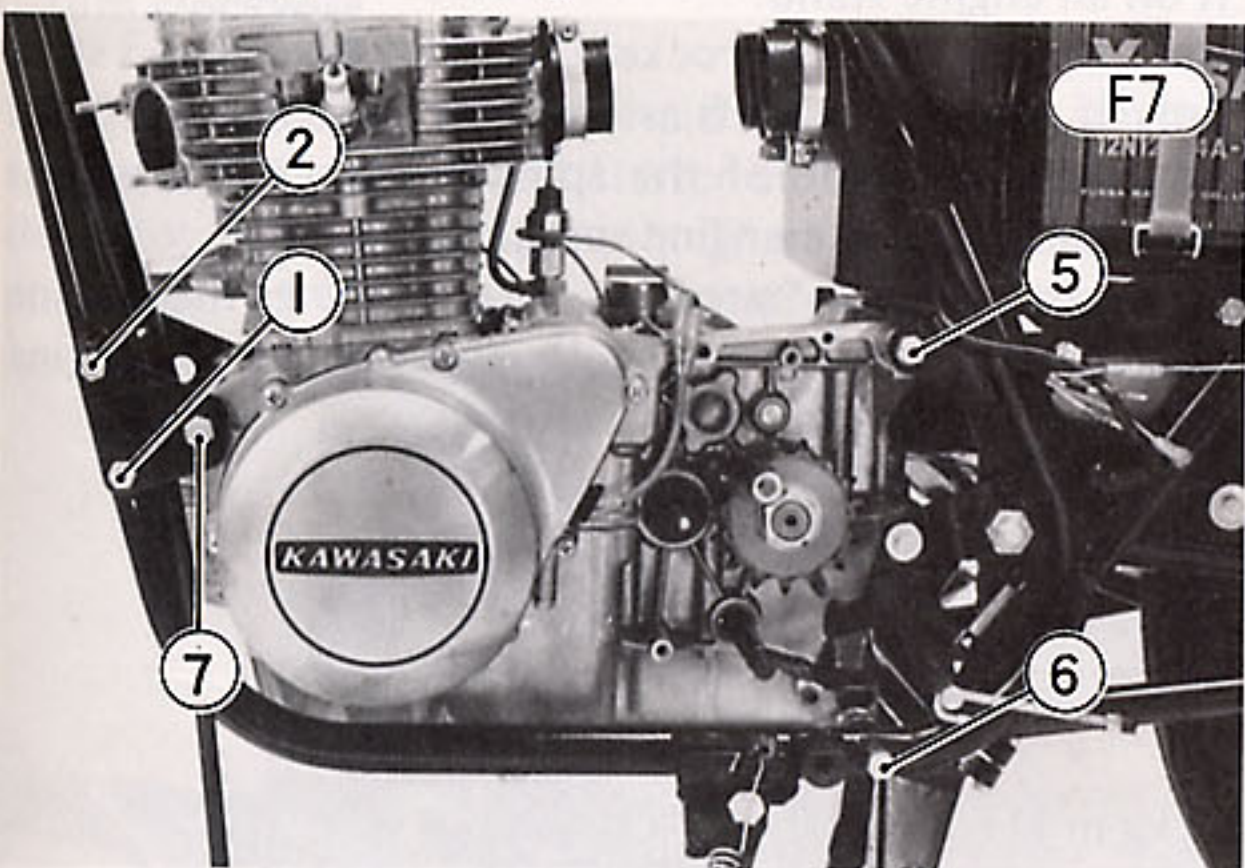
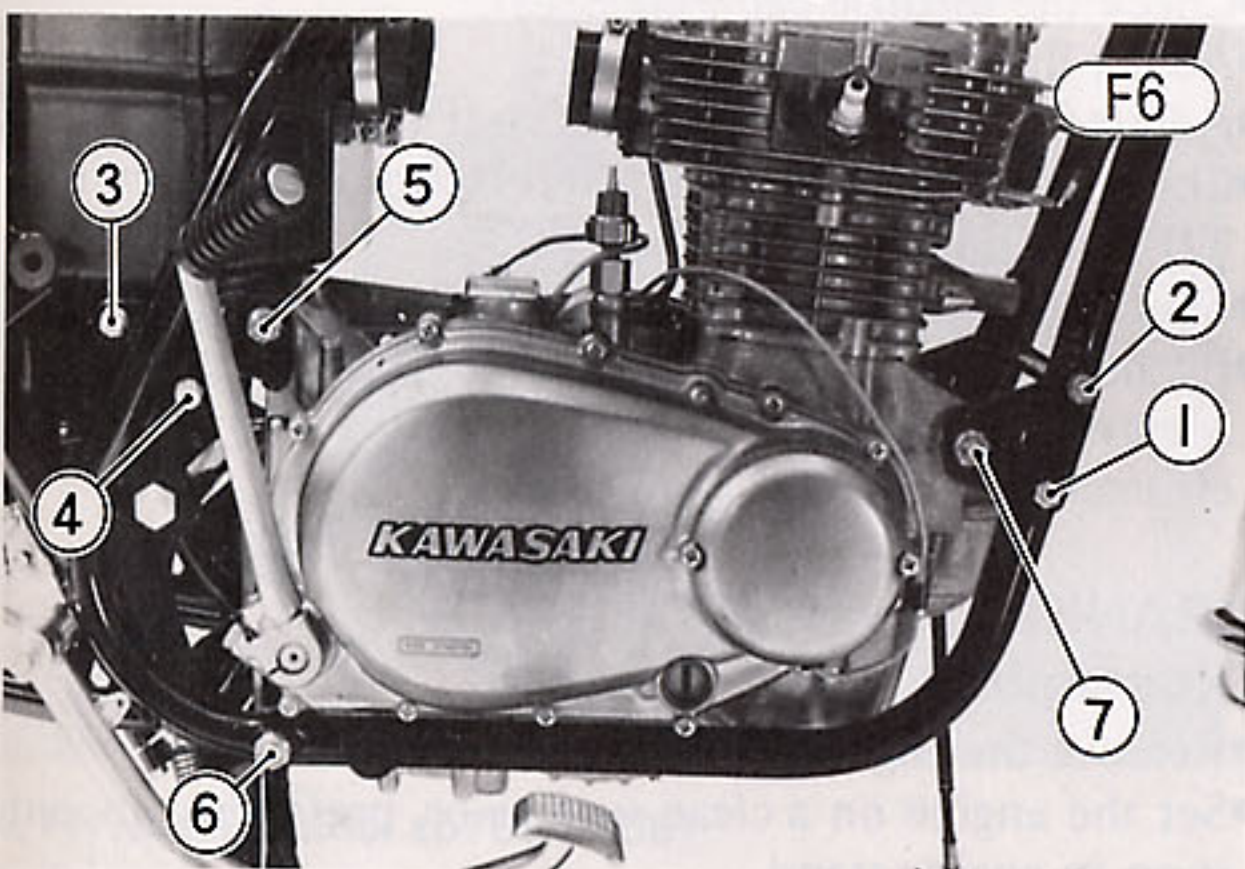
- Back the rear brake adjusting nut off to the end of the brake rod to give the pedal play. Loosen the brake pedal adjusting bolt locknut, and back out the adjusting bolt until the pedal is held down out of the way.
- Remove the mufflers (Pg. 50 for KZ400-B or Pg. 50 for KZ400-C).
- Make sure that the following cables and leads are free, and properly positioned on the engine and frame so that they will not get damaged during engine removal: starter lead, clutch cable, tachometer cable, contact breaker lead, dynamo armature wiring, and throttle cables (with carburetors).
- Jack or lever the engine up slightly to take the weight off the engine mounting bolts.

- Remove the upper engine mounting bracket bolts (3), and take off the brackets. Each bolt has a lockwasher and nut.



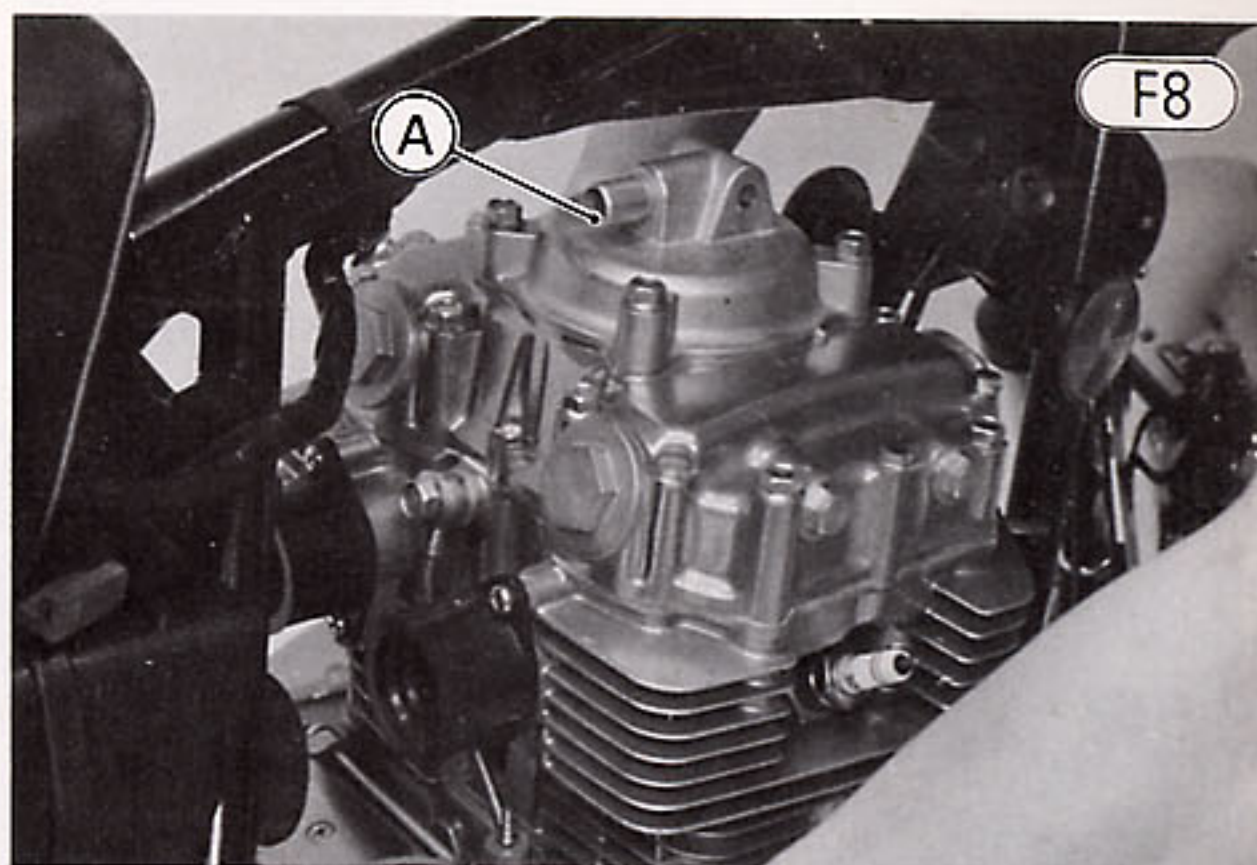
A. Bolts B. Brackets

- Remove the front engine mounting bracket short bolts ① and lockwashers on each side, and remove the long bolt ②. The long bolt has a self-locking nut, lockwasher and spacer.
- Remove the rear right upper mounting bracket bolts ③, ④ and lockwashers.
- Remove the self-locking nuts and lockwashers (4 ea) off the engine mounting bolts ⑤, ⑥, ⑦.



1. Front Mounting Bracket Short Bolt
2. Front Mounting Bracket Long Bolt
3. Rear Right Upper Mounting Bracket Bolt
4. Rear Right Upper Mounting Bracket Bolt
5. Rear Upper Mounting Bolt
6. Rear Lower Mounting Bolt
7. Front Mounting Bolt

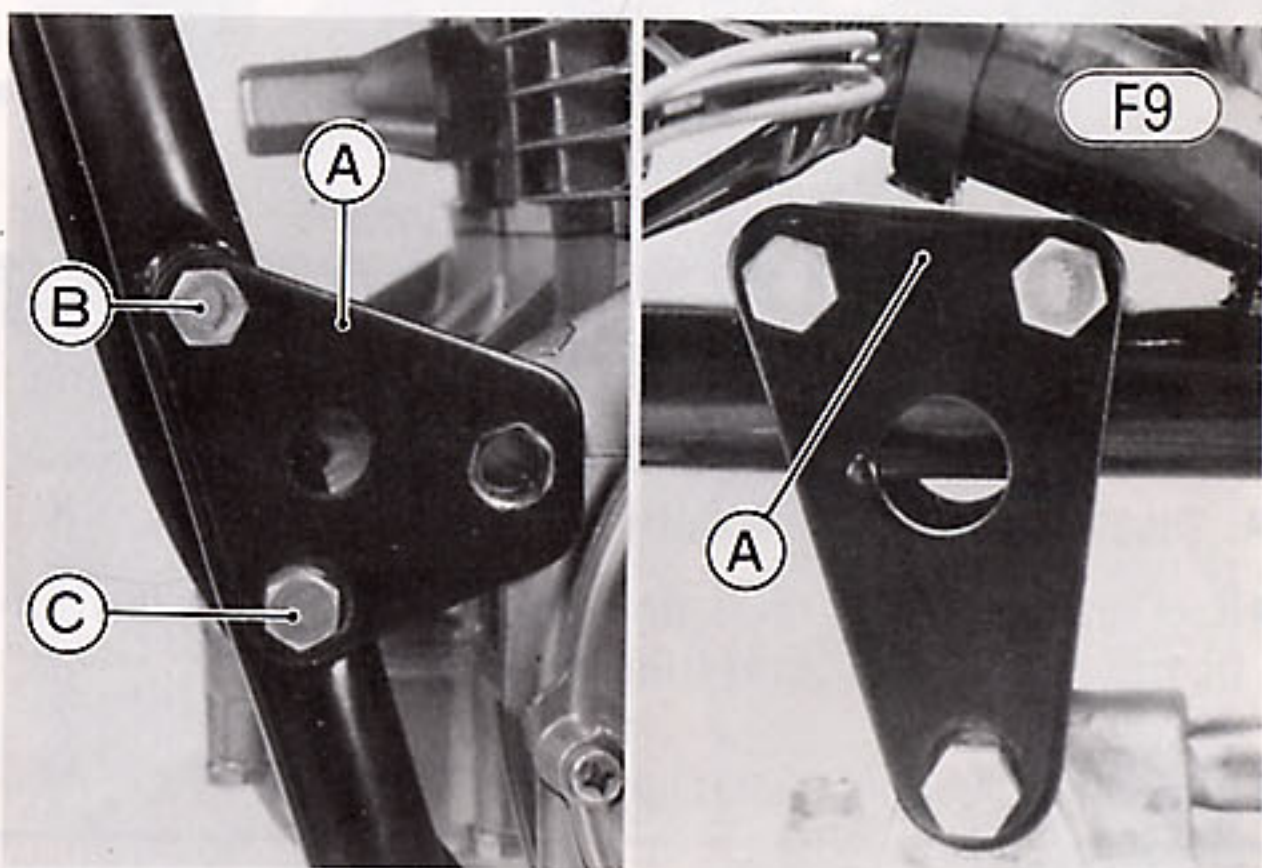
- Pull off the engine mounting bolts ⑤, ⑥, ⑦. Be careful not to damage the threads upon removal. The rear upper mounting bolt has a spacer and bracket, and the rear lower mounting bolt has a spacer.
- Lift up on the front of the engine until its breather cover stops just under the frame top tube, move it to the right so that the bottom of the engine clears the frame, and pull the engine out of the frame, top first and rear last.



A. Breather Cover

Installation:

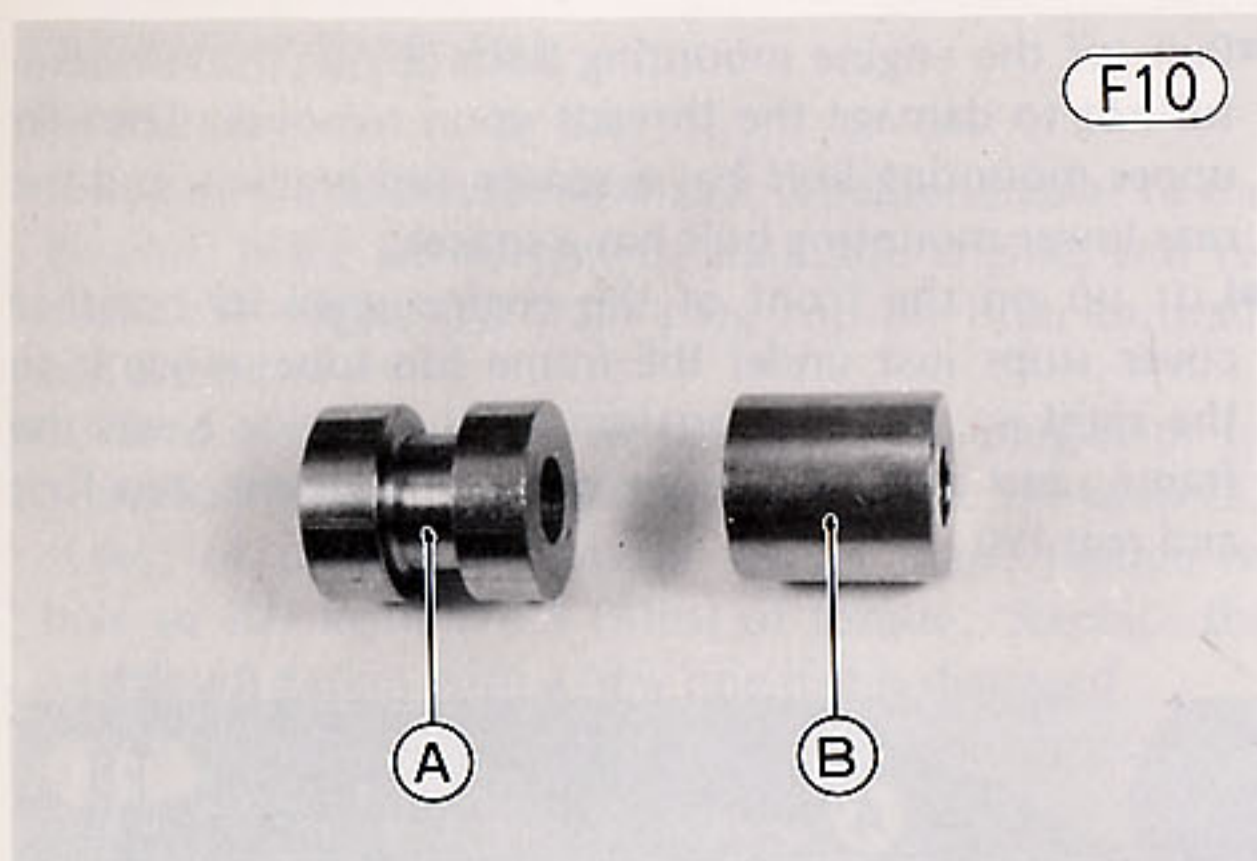
- Place the engine in the frame in the reverse of its removal.
- Loosely mount the engine mounting brackets as shown. See Table F1 for bolt identification. Each bracket bolt has a lockwasher. The front mounting bracket long bolt has a spacer, lockwasher, and self-locking nut.



A. Mounting Bracket B. Long Bolt C. Short Bolt

- Lifting the engine as necessary so that the engine mounting bolt threads do not get damaged, insert the engine mounting bolts to the left side of the engine, and install the lockwashers and self-locking nuts finger tight. Each rear upper and lower mounting bolt has a spacer. The spacer for the lower mounting bolt has a groove (Fig. F10).

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F10

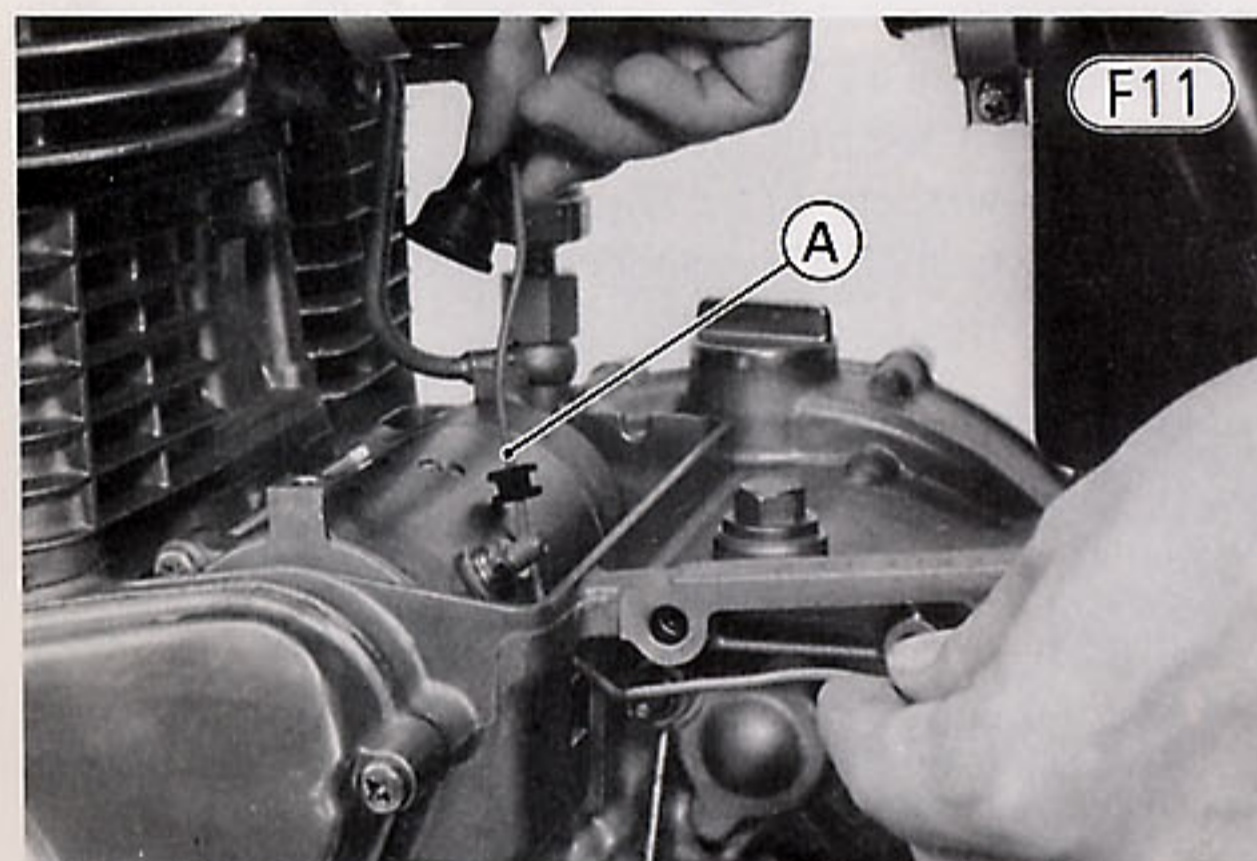
A. Lower Spacer

B. Upper Spacer

•After engine mounting bolt insertion, first tighten the bracket mounting bolts, and then the engine mounting bolts to the torque specified in Table F1.

NOTE: Some machines have one or more shims added to the lower spacer. After the nuts are tightened to the proper torque, check to see whether or not the spacer takes up all the space. If not, add one or more shims.

- Turn in the rear brake pedal adjusting bolt, and install the rear brake pedal return spring.
- Install the rear brake light switch (Pg. 134).
- Install the right footpeg and lockwasher, and tighten the footpeg bolt.
- Run the oil pressure switch lead through the crankcase hole, and connect the lead to the oil pressure switch (KZ400-B).



F11

A. Oil Pressure Switch Lead

- Run the wiring harness and the starter motor lead in front of the upper mounting bolt spacer.

- Run the starter motor lead through the crankcase hole, fit the lead to the starter motor terminal, and tighten the nut with the lockwasher. Slide the rubber cap back in place (KZ400-B).
- Install the starter motor cover with the gasket, and tighten the cover bolts (2) (KZ400-B). Each bolt has a flat washer.
- Connect the neutral switch lead to the switch.
- Connect the dynamo armature yellow leads (2).
- Install the drive chain (Pg. 119).
- Install the engine sprocket cover (Pg. 62).
- Install the muffler (Pg. 50 for KZ400-B or Pg. 51 for KZ400-C).
- Check that the gasket is in place, and connect the tachometer cable lower end to the cylinder head cover.
- Install the carburetors (Pg. 46).
- Install the ignition coil and its bracket with the bolts, running the right spark plug lead between the upper brackets.
- Connect the ignition coil leads.
- Connect the spark plug lead on each spark plug.
- Install the fuel tank (Pg. 43).
- Install the left and right side covers.
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Check the drive chain (Pg. 24).
- Check the clutch (Pg. 19).
- Check the throttle cables (Pg. 15).
- Adjust the rear brake (Pg. 27).
- Adjust the rear brake light switch (Pg. 28).
- Check the automatic side stand return mechanism (Pg. 31), and adjust if necessary.
- Check the carburetors (Pg. 16).
- If the crankshaft or front camshaft chain guide was removed, adjust the camshaft chain (Pg. 14) and valve clearance (Pg. 14).

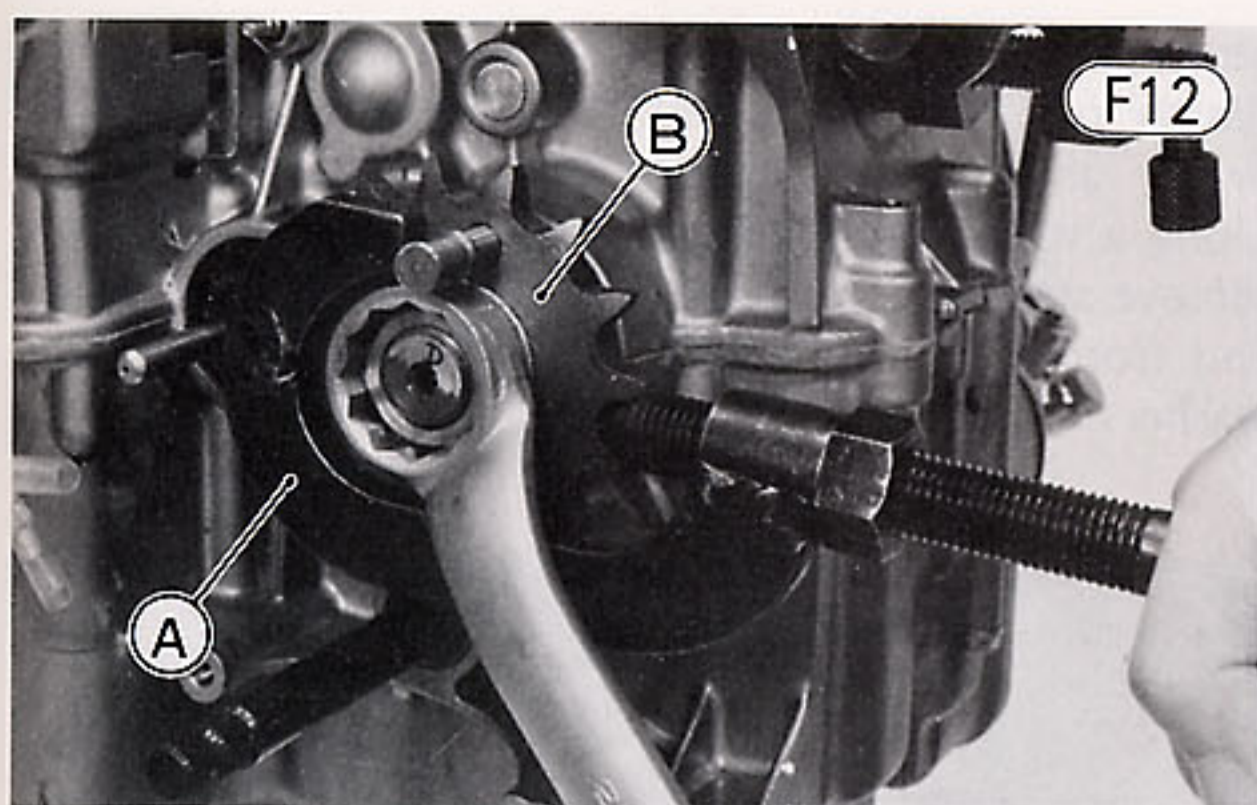
CRANKCASE SPLIT

Disassembly:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Remove the engine sprocket using the following 3 steps only if the output shaft assembly is to be disassembled.
 - Straighten the side of the splined washer that is bent over the side of the engine sprocket nut.
 - Hold the engine sprocket steady using the engine sprocket holder (special tool), and remove the engine sprocket nut and splined washer.

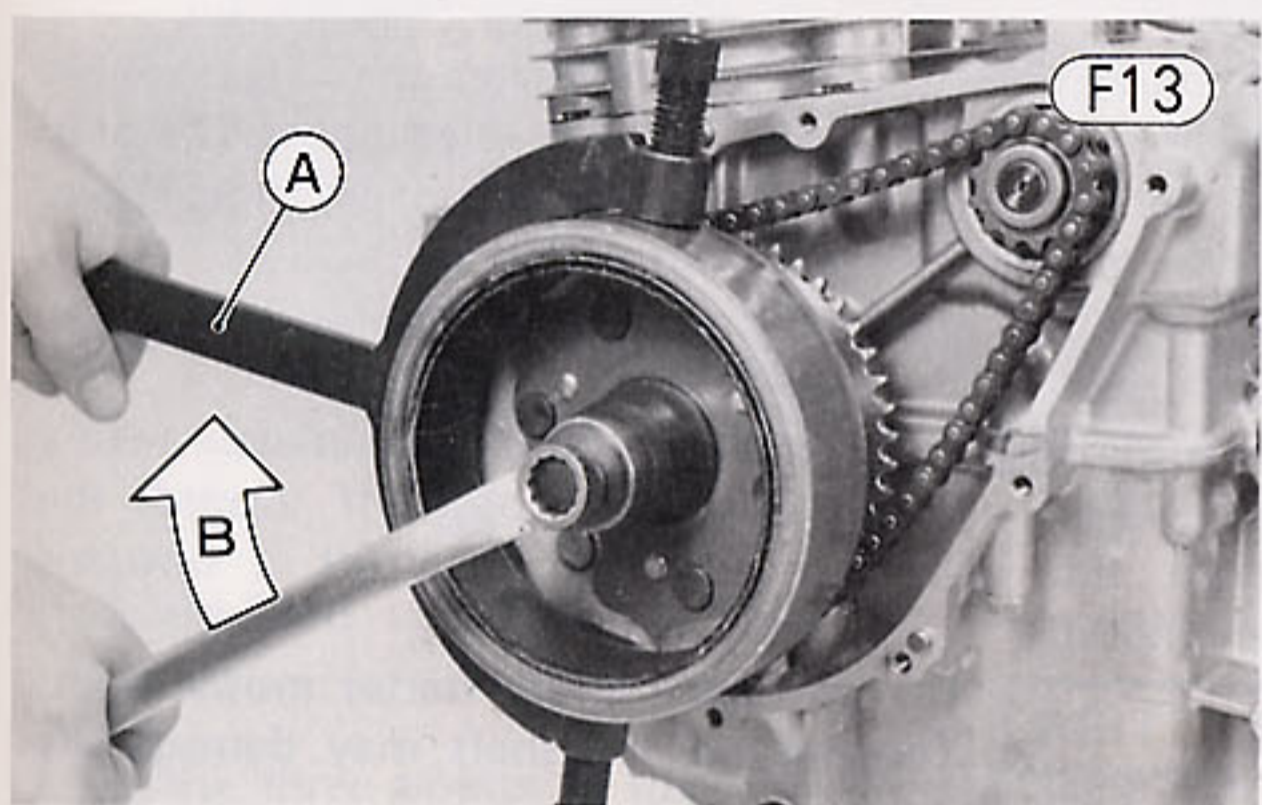
Table F1 Engine Bolt Tightening Torque

Bolt		Length	Torque
Front Bracket Bolts	Lower ① (2)	60 mm	2.4 kg-m (17.5 ft-lbs)
	Upper ②	253 mm	
Rear Right Upper Bracket Bolts	Rear ③	40 mm	
	Front ④	25 mm	
Upper Bracket Bolts (3)		55 mm	1.8 kg-m (13.0 ft-lbs)
Engine Mounting Bolts	Rear Upper ⑤	220 mm	4.0 kg-m (29 ft-lbs)
	Rear Lower ⑥	292 mm	
	Front ⑦ (2)	50 mm	



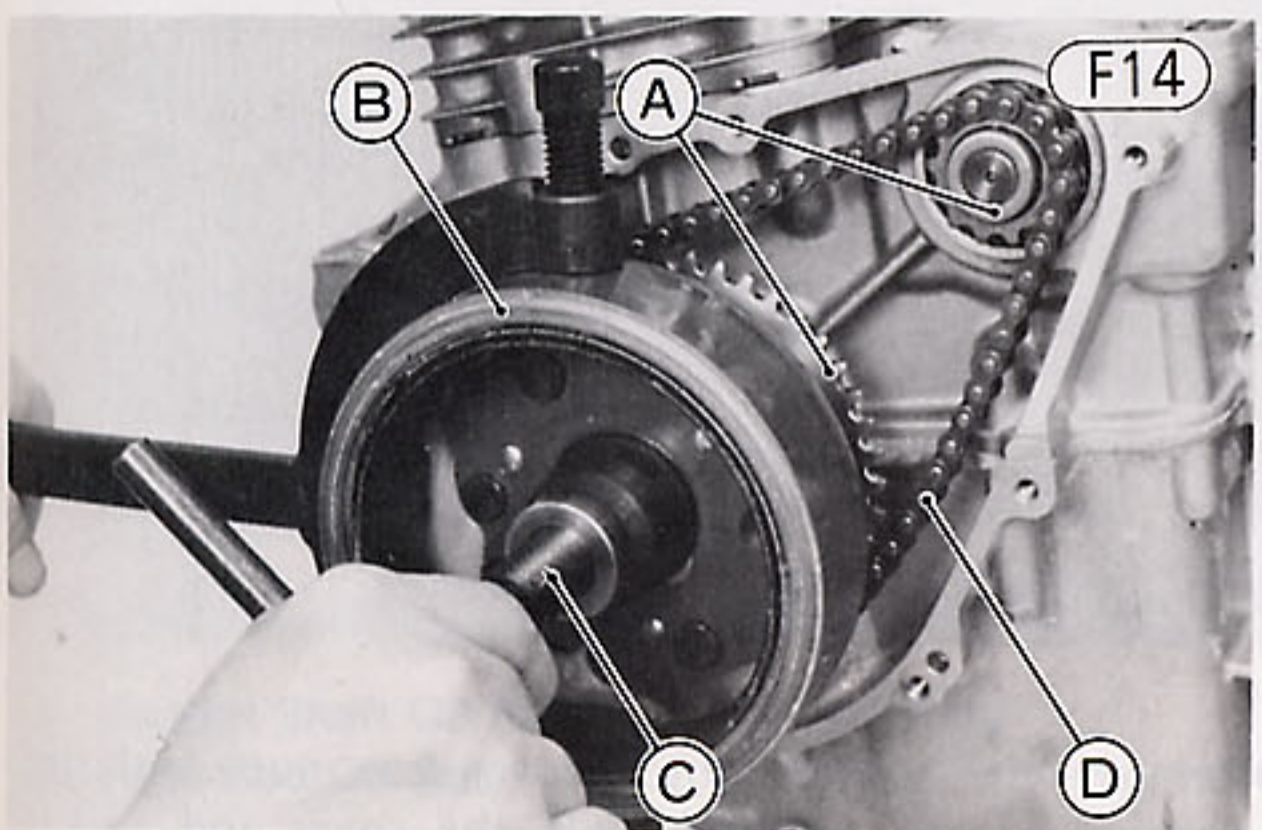
A. Engine Sprocket Holder (57001-307)
B. Engine Sprocket

- Pull off the engine sprocket and output shaft collar, and take off the O ring.
- Remove the dynamo cover screws (9), and pull off the dynamo cover, gasket, and knock pins (2).
- Remove the dynamo flywheel using the following 4 steps only if the crankshaft is to be removed.
- Hold the dynamo flywheel steady with the flywheel holder (special tool), and remove the left hand thread bolt. The bolt must be turned clockwise for removal.



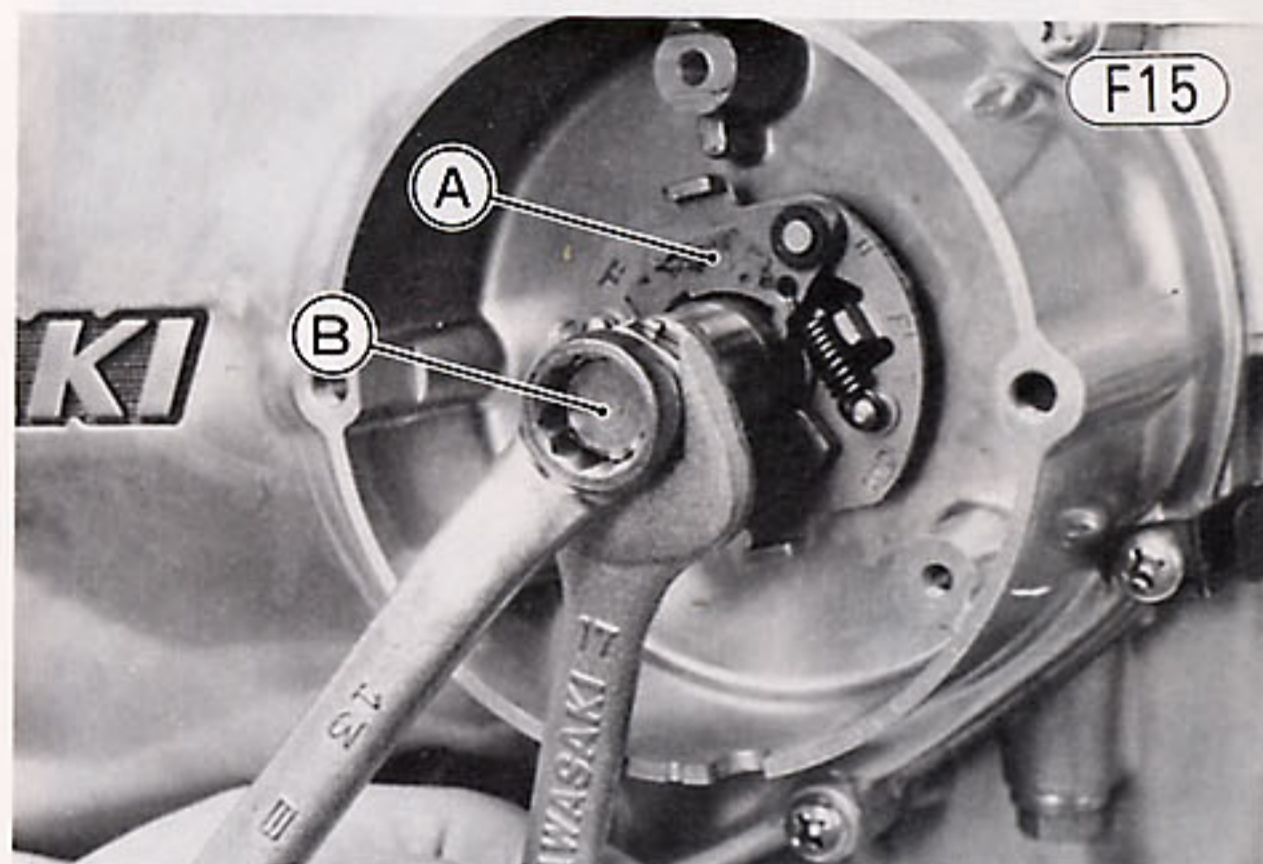
A. Flywheel Holder (57001-308)
B. Turn clockwise

- Using the special tool to hold the flywheel steady, remove the flywheel and starter clutch assembly with the rotor puller (special tool). There is a thrust washer at the rear of the flywheel and starter clutch assembly.



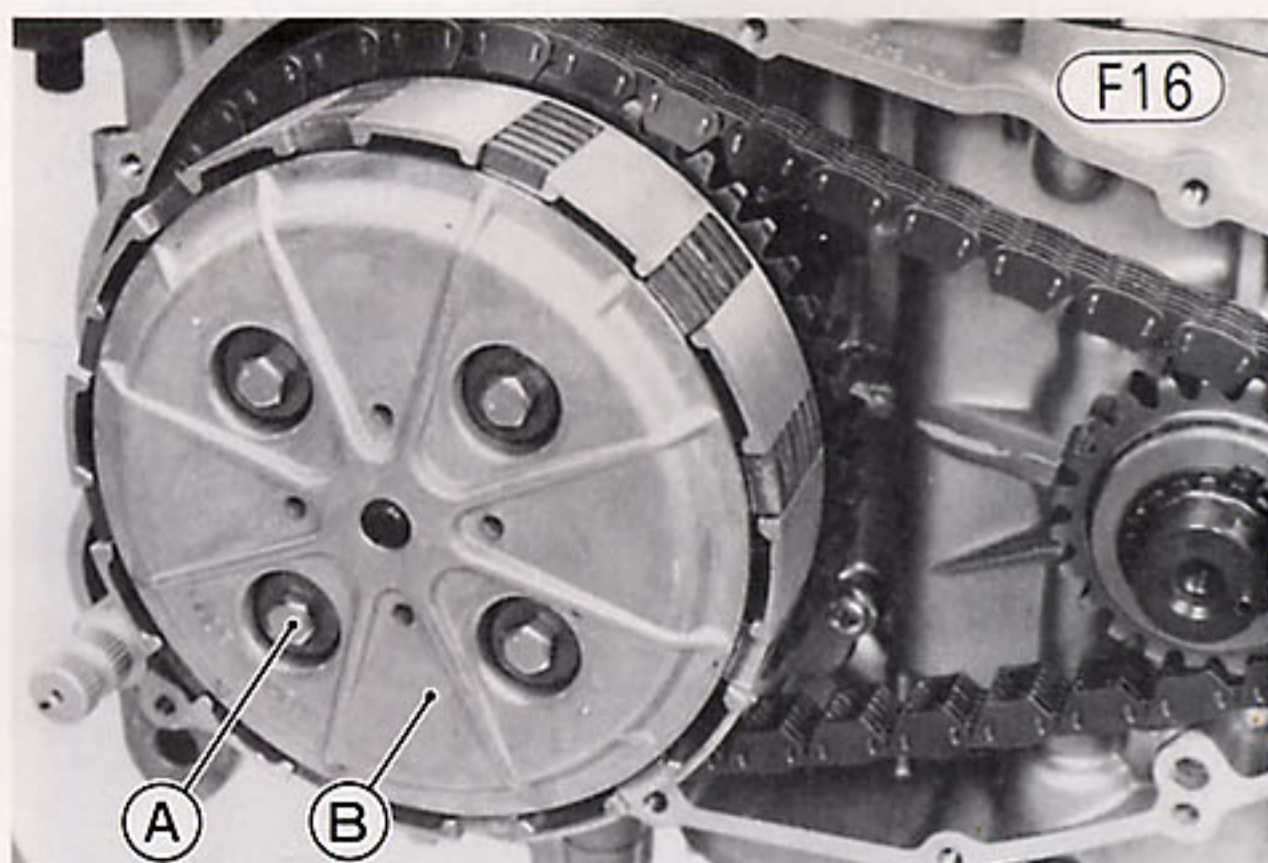
A. Sprockets
B. Flywheel
C. Rotor Puller (57001-254)
D. Starter Motor Chain

- Pull off the starter motor sprockets and chain (KZ400-B).
- Pull the collar off of the crankshaft (KZ400-C).
- Remove the contact breaker cover screws (2), and take off the cover and gasket.
- Take out the contact breaker mounting plate screws (3), and remove the plate.
- With a 17 mm wrench on the crankshaft rotation nut to keep the shaft from turning, remove the timing advancer mounting bolt, crankshaft rotation nut, and timing advancer.



A. Timing Advancer
B. Mounting Bolt

- Mark the position of the kickstarter pedal so that it can later be installed on the kick shaft in the same position.
- Take out the kickstarter pedal bolt, widen the gap in the kickstarter pedal slightly with a screwdriver, and then pull off the kickstarter pedal.
- Remove the right engine cover screws (12), and take off the cover, gasket, and knock pins (2).
- Remove the clutch spring bolts and springs (4 ea).

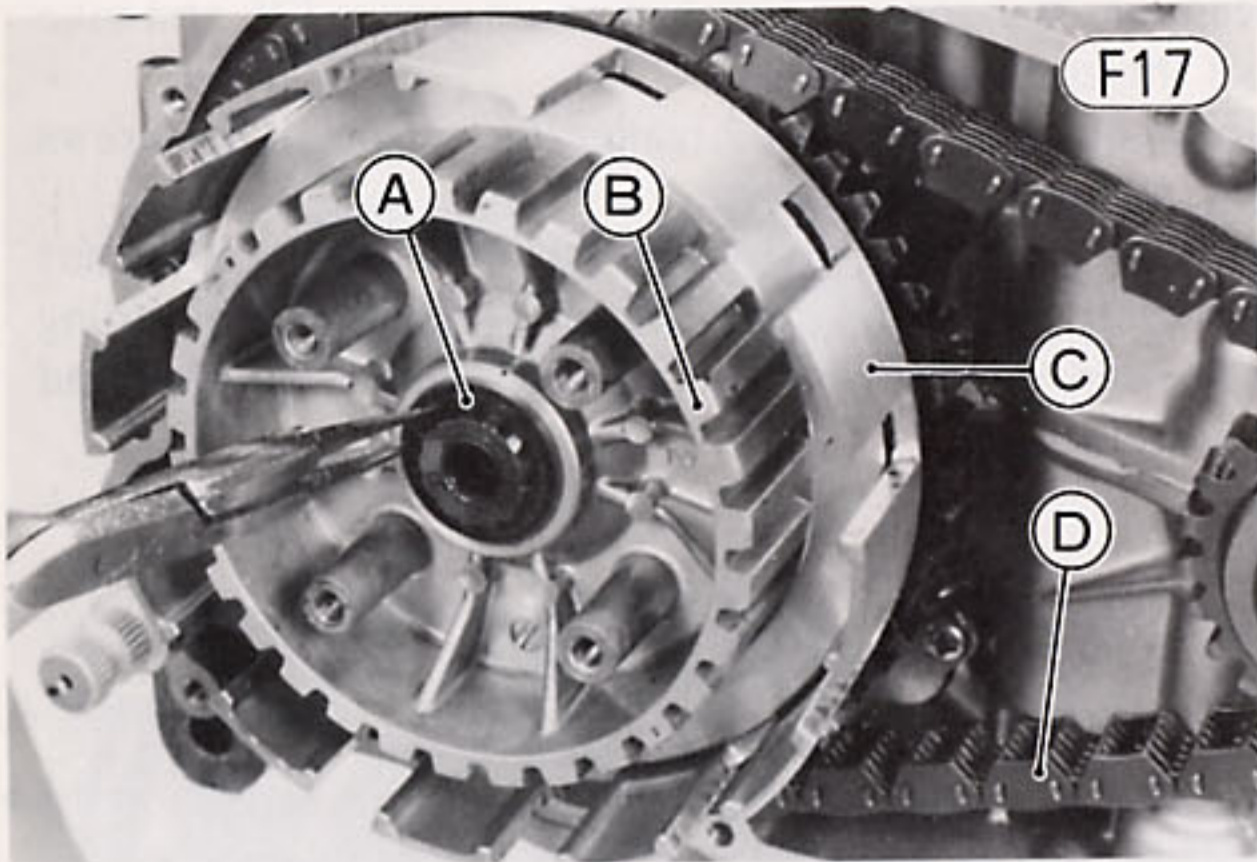


A. Clutch Spring Bolts
B. Spring Plate

- Pull off the spring plate and spring plate pusher.
- Push in on the push rod to remove the steel ball, and pull out the push rod.
- Remove the friction plates (6) and steel plates (5).

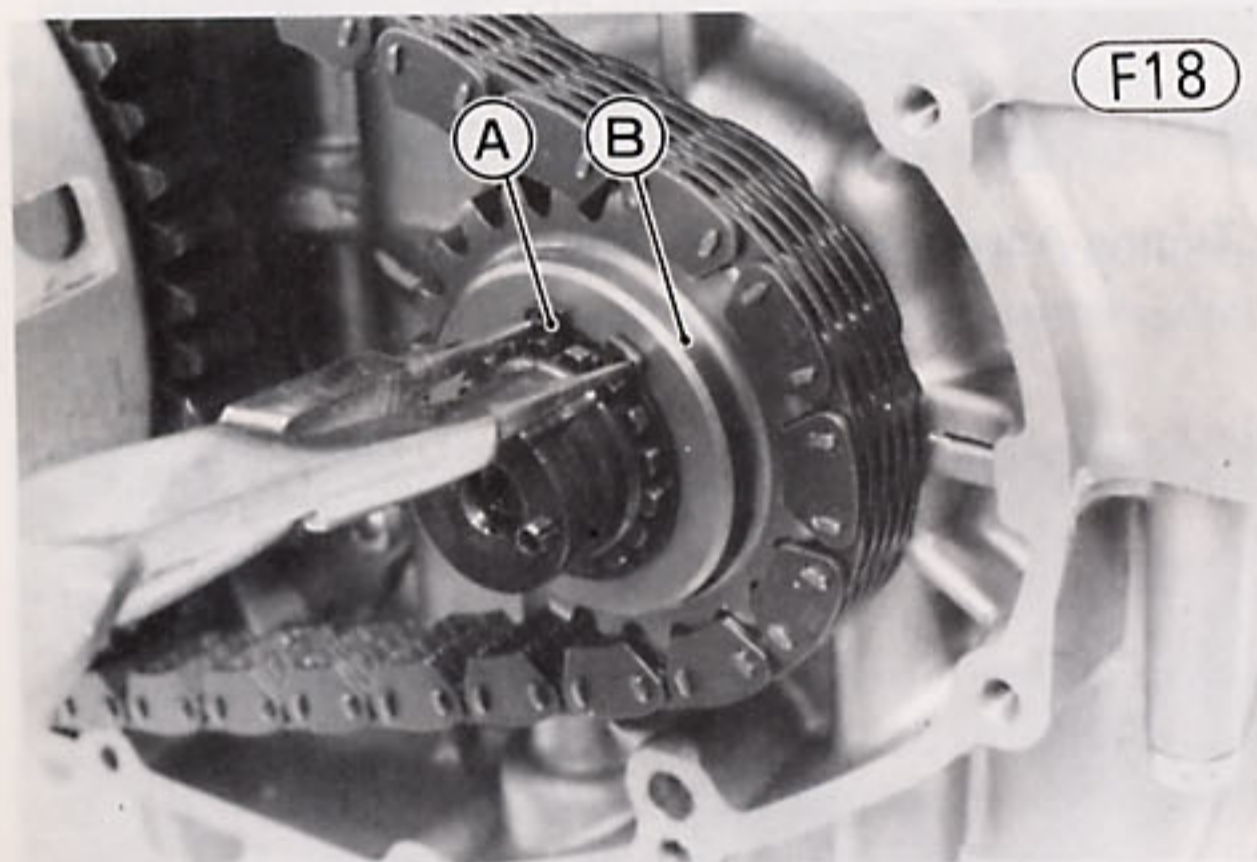
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- Remove the circlip and shim(s), and pull off the clutch hub and thrust washer.



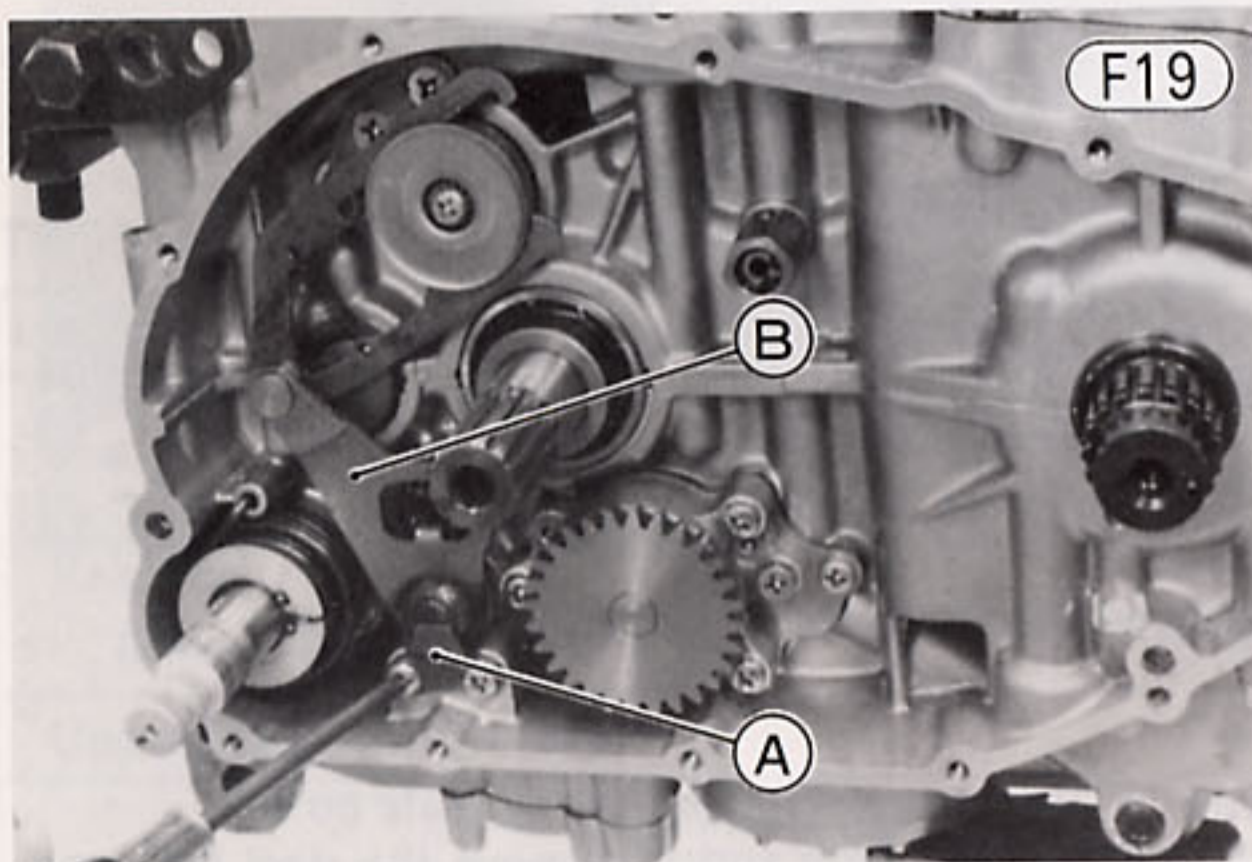
A. Circlip C. Clutch Housing
B. Clutch Hub D. Primary Chain

- Remove the primary sprocket circlip.



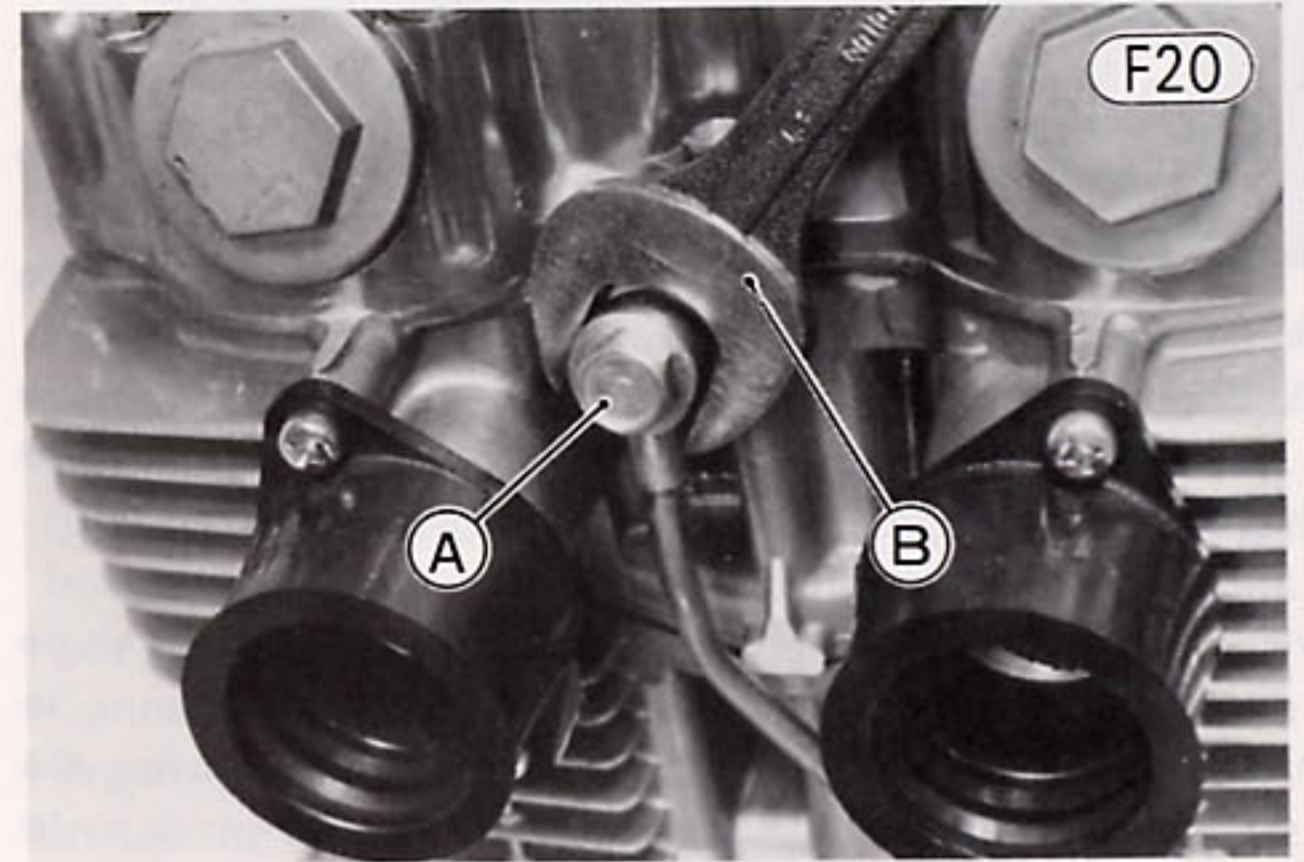
A. Circlip B. Primary Sprocket

- Pull off the clutch housing, primary sprocket, and primary chain together.
- Remove the external shift mechanism stop screws (2), and take off the stop.



A. Shift Mechanism Stop
B. External Shift Mechanism

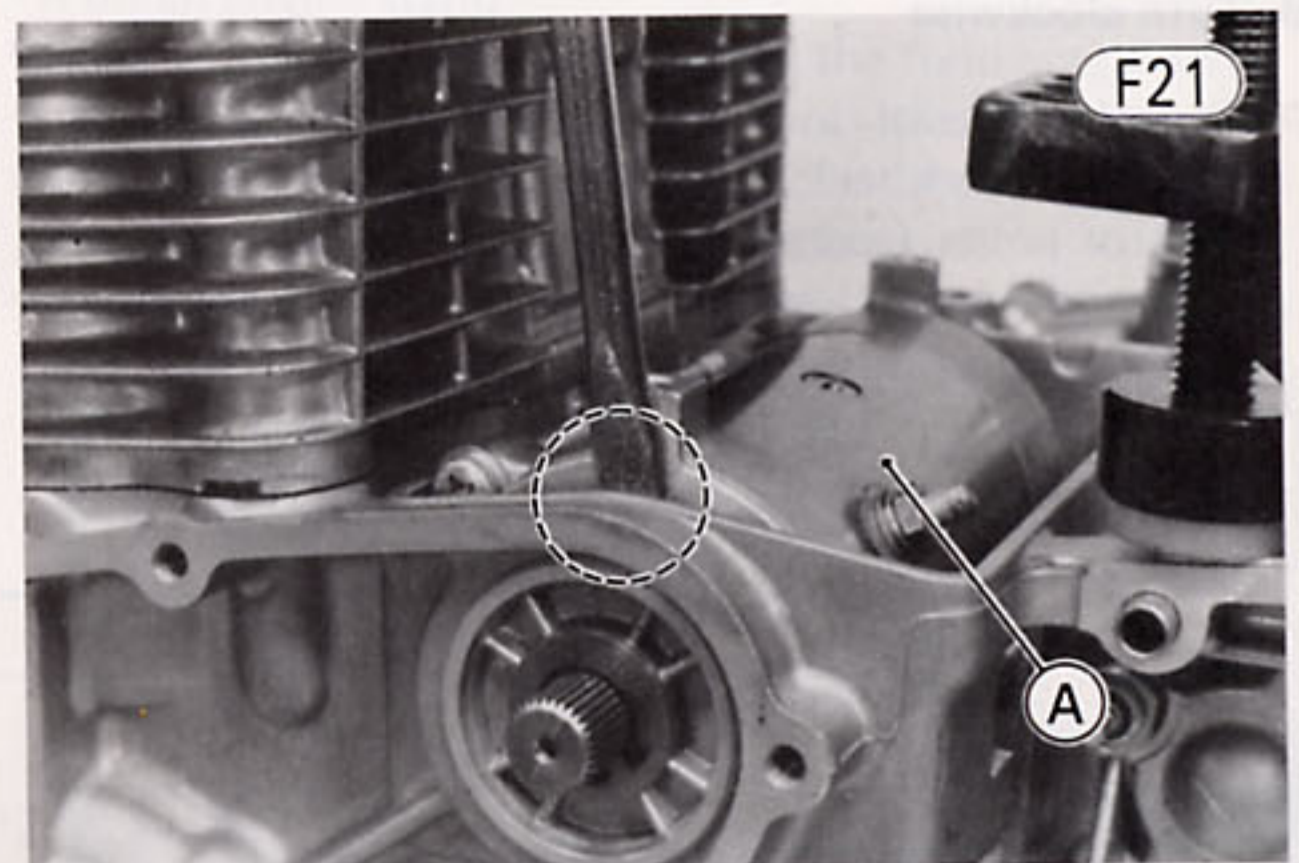
- Move the external shift mechanism arm and overshift limiter out of their positions on the end of the shift drum, and pull out the external shift mechanism.
- Using a wrench to hold the upper end of the oil pipe, remove the banjo bolt to disconnect the oil pipe upper end from the cylinder head. The banjo bolt has two washers.



A. Banjo Bolt B. Wrench

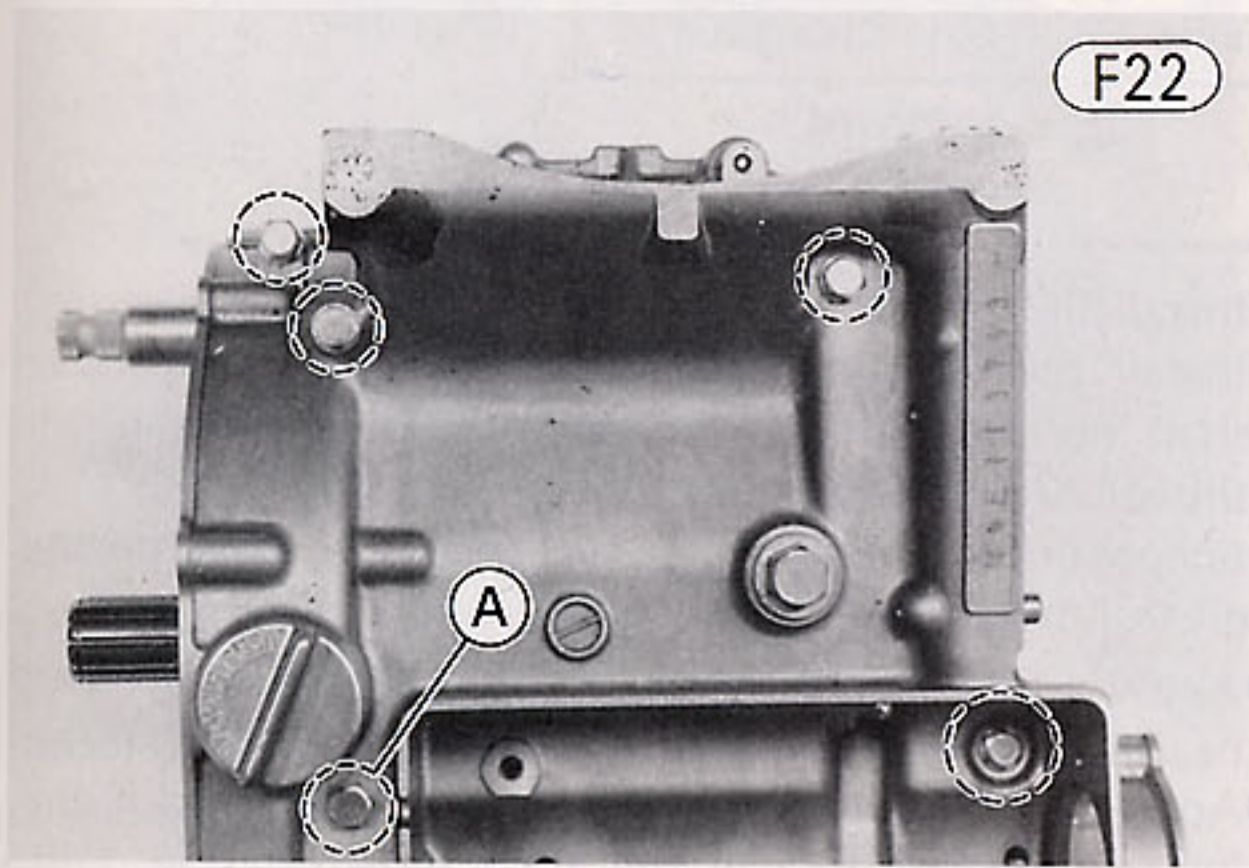
- Remove the oil pressure switch from the long-hex-head bolt, and unscrew the long-hex-head bolt (KZ400-B) or banjo bolt (KZ400-C), and take off oil pipe. There is a washer on each side of the fitting.
- Remove the starter motor retaining bolts (2) (KZ400-B).
- Pry the starter motor loose from the crankcase with a screwdriver, slide the starter motor off towards the right side of the engine, and then lift it upwards (KZ400-B).

CAUTION Do not tap on the starter motor shaft. Tapping on the shaft may damage the motor.



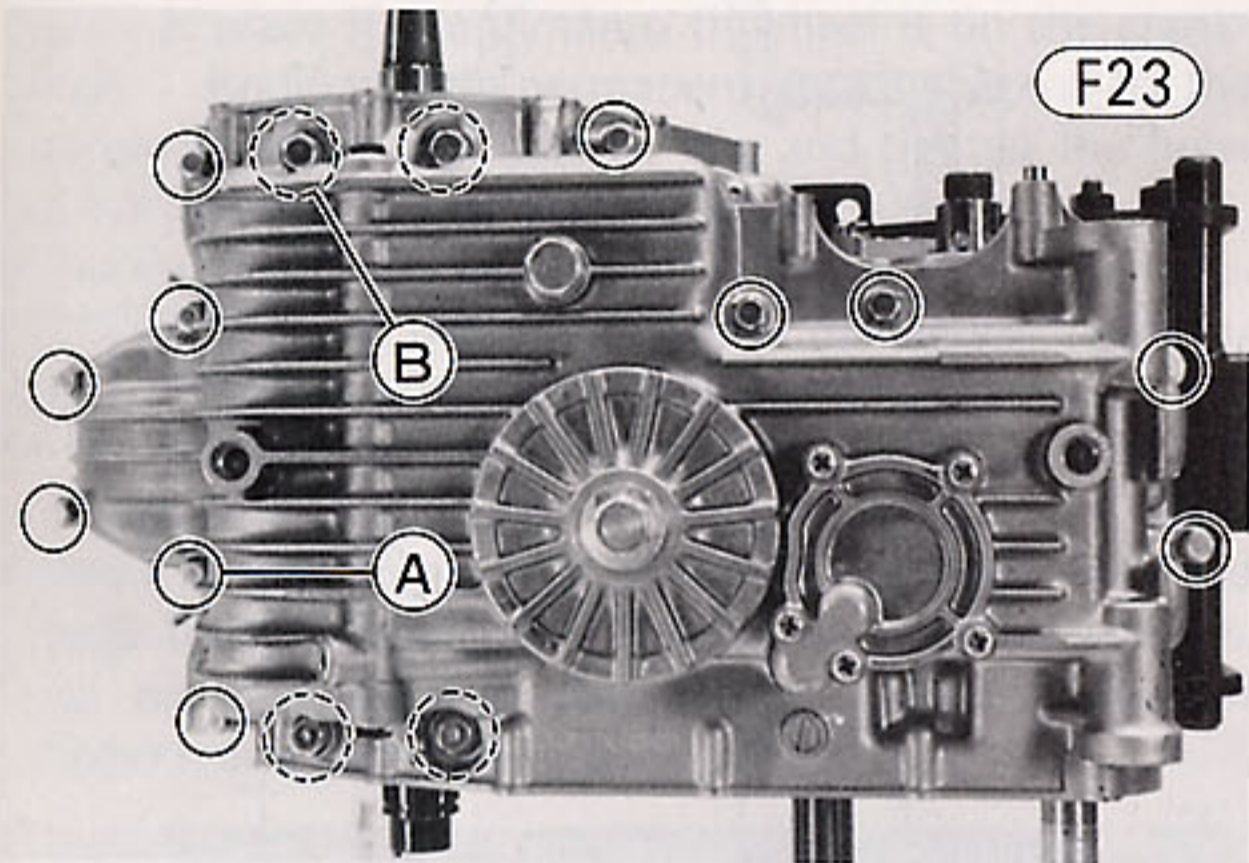
A. Starter Motor

- Remove the starter motor cover cap nuts and flat washers (2 ea), and take off the cover and gasket (KZ400-C).
- Remove the upper crankcase half bolts (5).



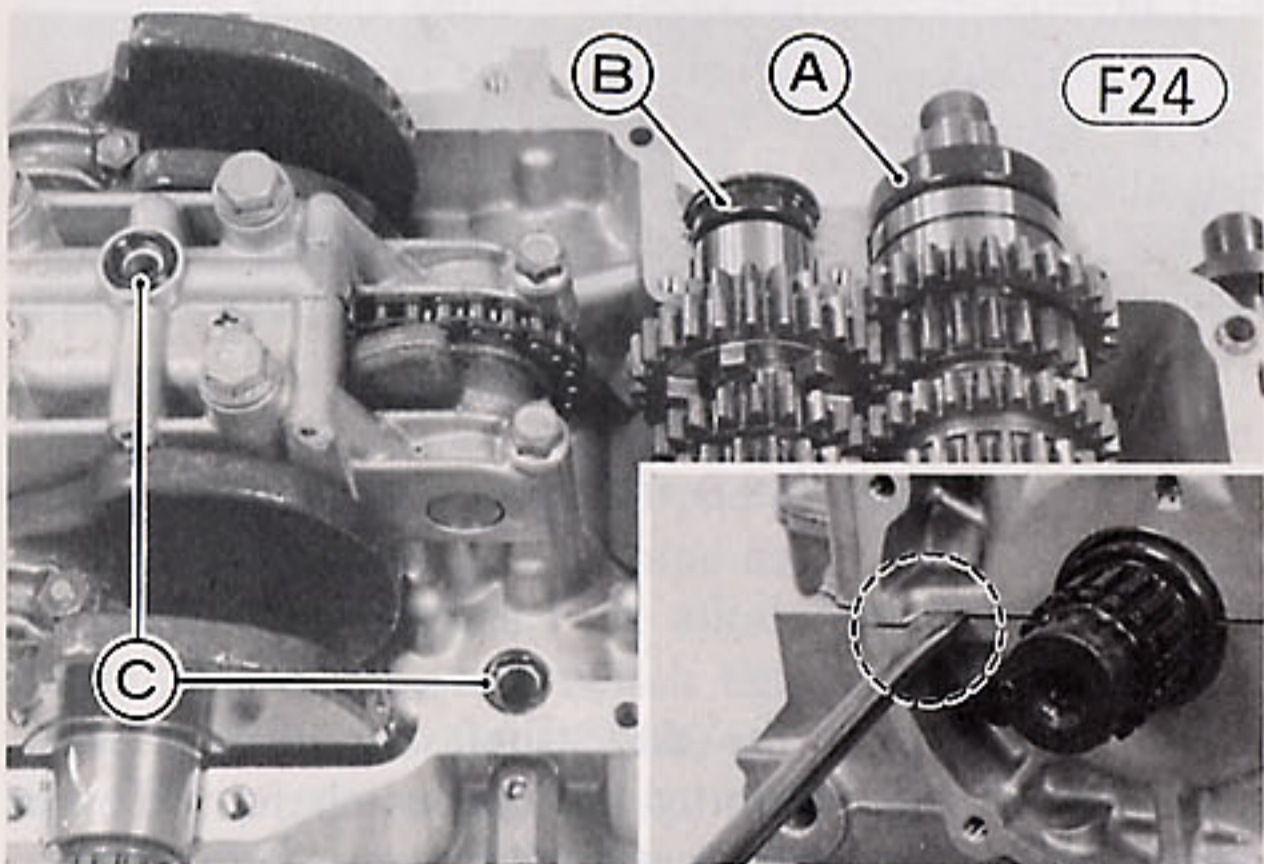
A. Upper Crankcase Half Bolts

- Turn the engine upside down.
- Remove the 6 mm lower crankcase half bolts (11) and the 8 mm bolts (4).



A. 6 mm Bolts B. 8 mm Bolts

- Pry the three points to split the two crankcase halves apart, and lift off the lower crankcase half.
- Remove the circlip, oil seals (2), and oil passage O rings (2).



A. Output Shaft Oil Seal C. "O" Ring
B. Push Rod Oil Seal

- Remove the drive shaft and output shaft assembly.

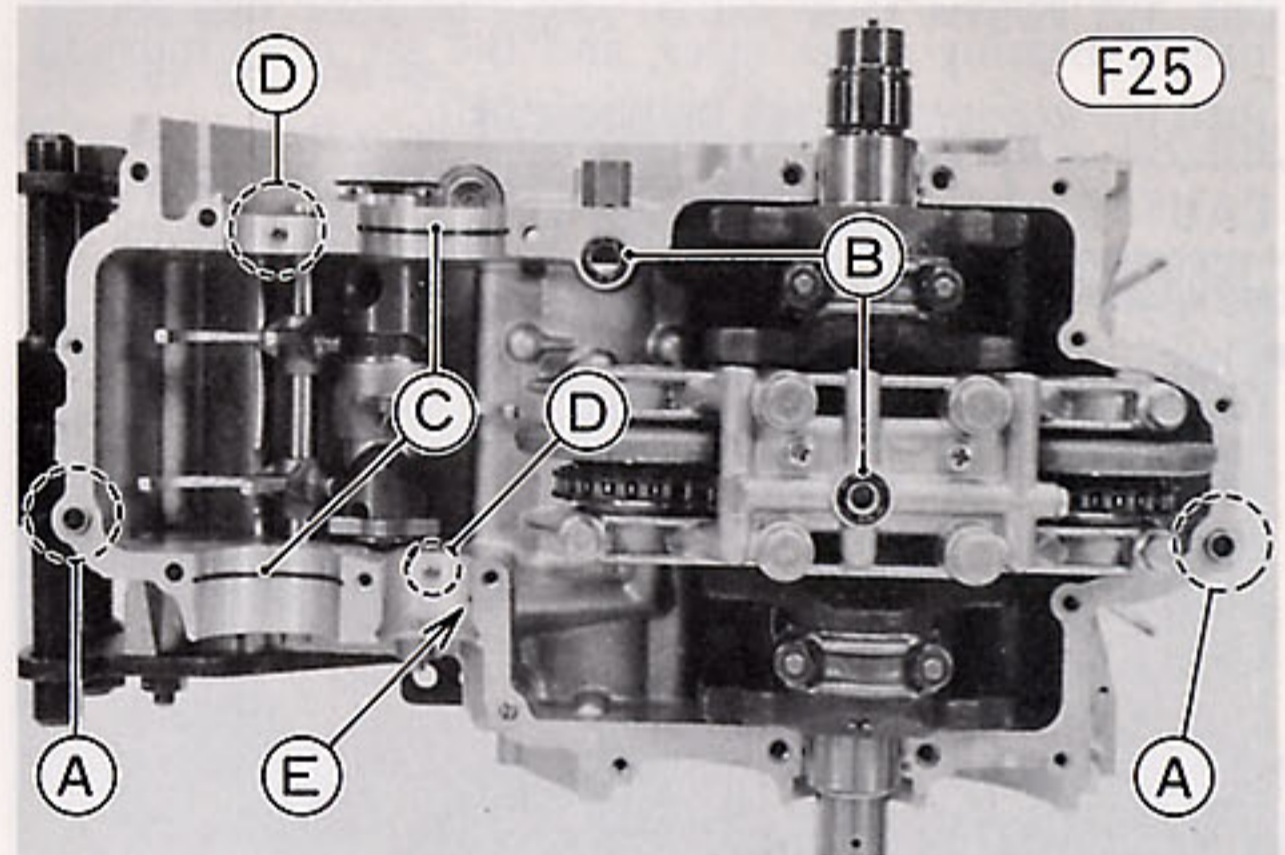
Assembly:

NOTE: The upper crankcase half, the lower crankcase half, and the crankshaft main bearing cap are machined at the factory in the assembled state, so the crankcase halves and main bearing cap must be replaced together as a set.

- With a high flash-point solvent, clean off the mating surfaces of the crankcases halves and wipe dry.
- Check to see that the following parts are in place on both the upper crankcase half and the lower crankcase half, and blow the oil passages clean with compressed air. Check that the drive and output shaft set pins (2) protrude 1.7 ~ 2.5 mm from their bearing housings. The flat side of each oil passage O ring must face to the upper crankcase half or main bearing cap.

Upper crankcase half:

Knock pins (2); oil passage O rings (2) (use a new one if deteriorated or damaged); oil passage nozzle; drive shaft and output shaft set rings (2); and drive shaft and output shaft set pins (2).

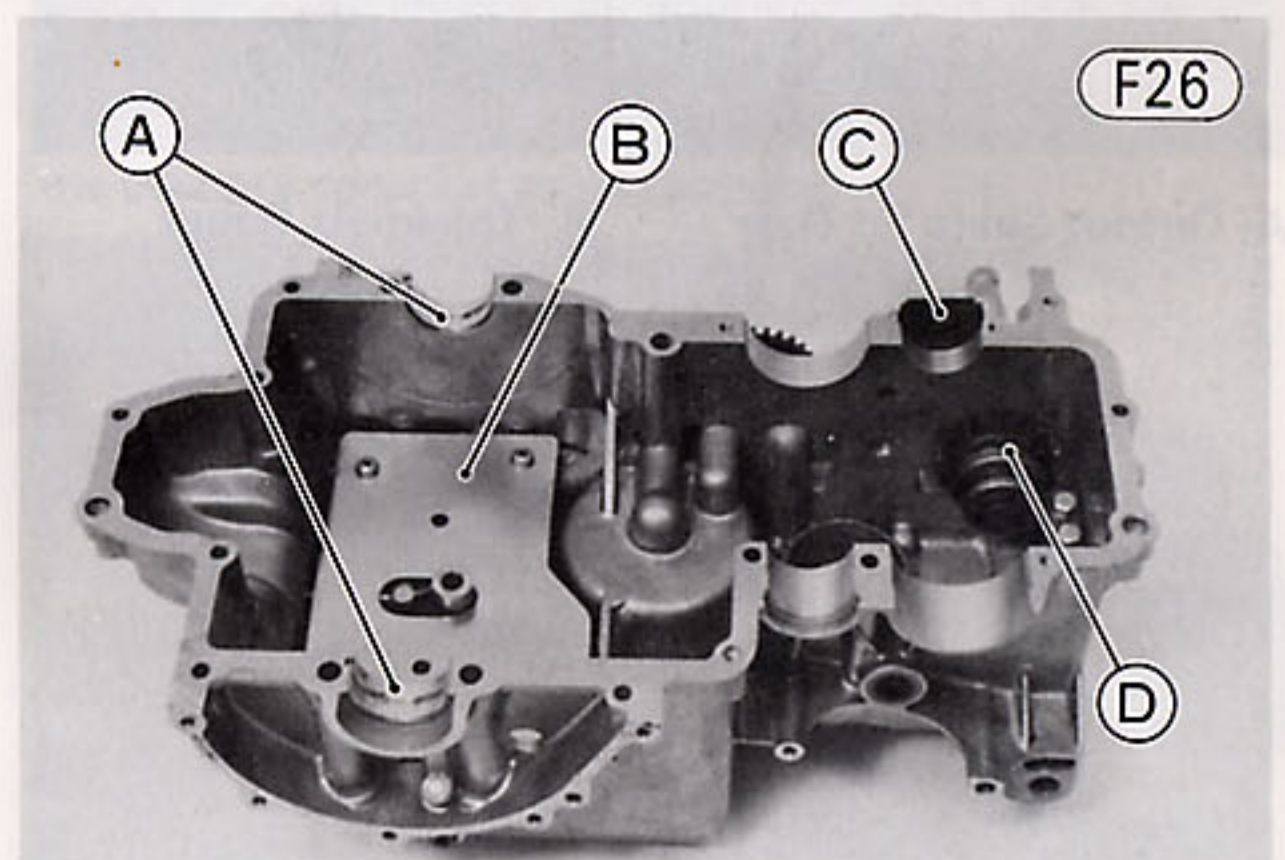


A. Knock Pin C. Set Rings E. Nozzle
B. "O" Rings D. Set Pin

Lower crankcase half:

Crankshaft bearing inserts (2); output shaft oil receiver; kick shaft assembly; and sump plate.

NOTE: When installing the sump plate, apply a non-permanent locking agent to the sump plate screws.

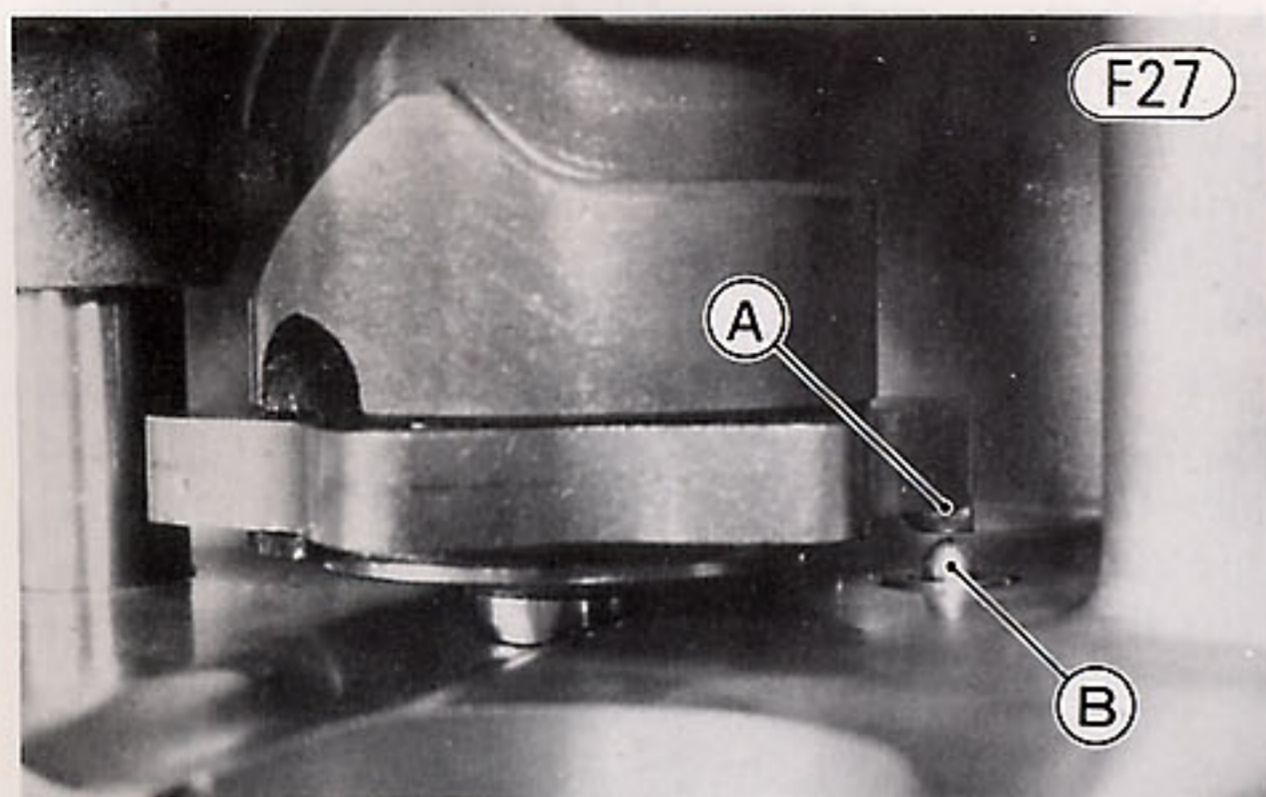


A. Bearing Inserts C. Oil Receiver
B. Sump Plate D. Kick Shaft Assembly

- Check that the crankshaft main bearing cap is tightened to the correct amount of torque (Pg. 37).

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- To set the shift drum in neutral position, turn the shift drum so that the projection on the operating plate contacts with the neutral switch pin (Fig. F27).

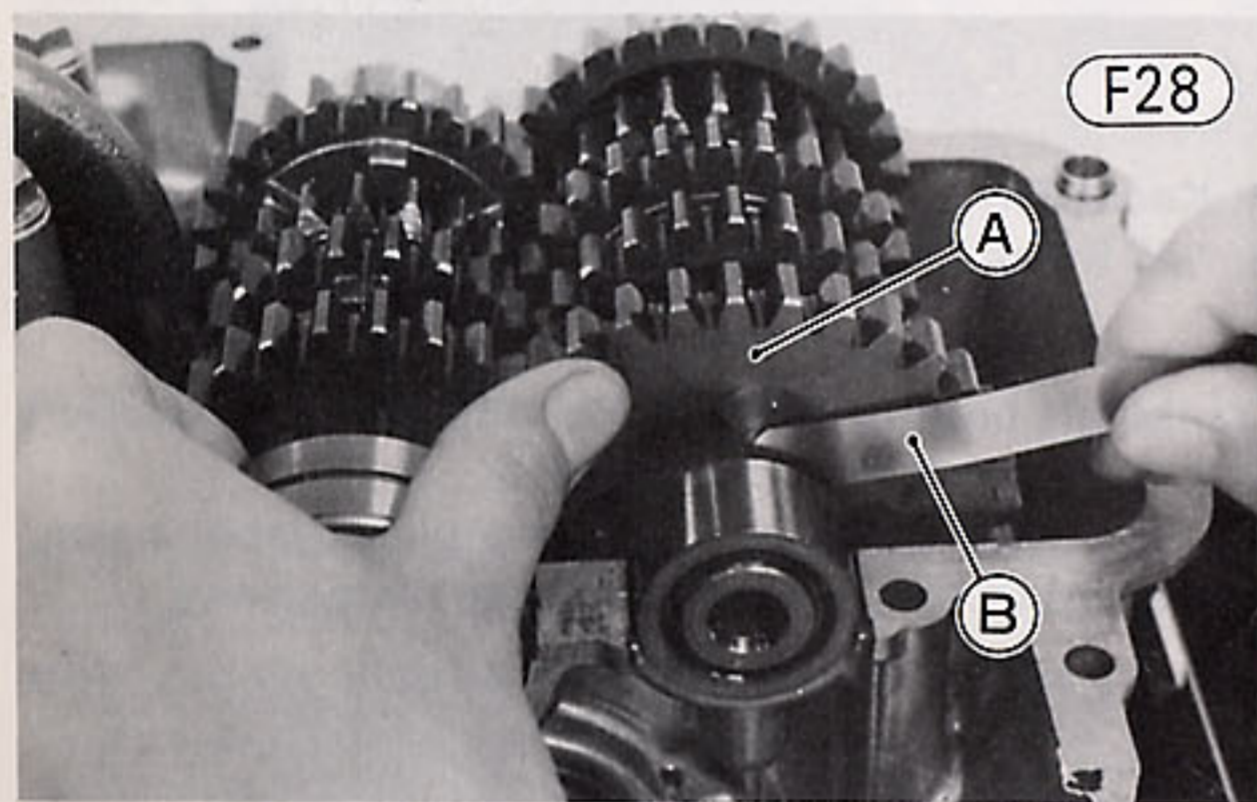


A. Projection B. Neutral Switch Pin

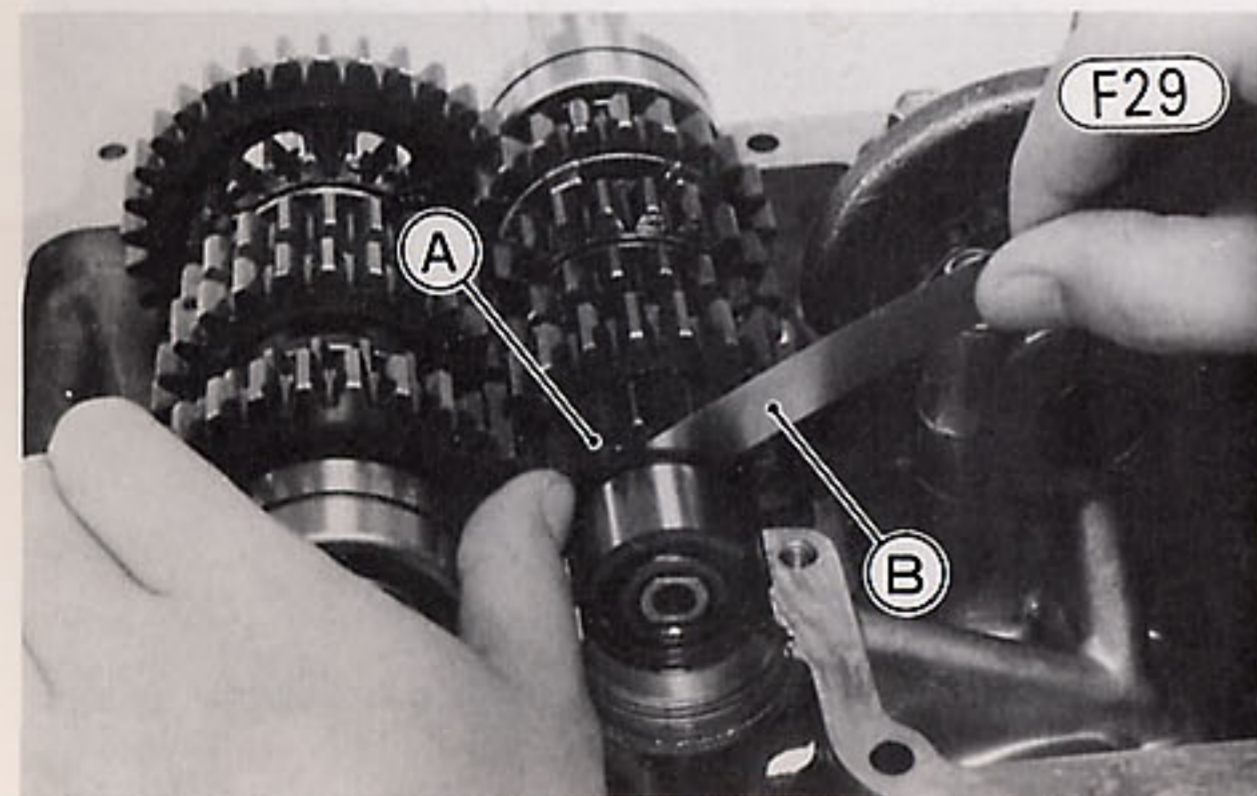
- Fit the output and drive shaft assemblies on the upper crankcase half. When installing output and drive shafts, the crankcase set pins must go into the holes in the needle bearing outer races, and the set rings must fit into the grooves in each ball bearing.

CAUTION Make sure the crankcase set pins are properly aligned to avoid damage to the crankcases upon installation.

- Check that the side clearance of the output shaft 1st gear and side clearance of the drive shaft 2nd gear are within the standard value. If the clearance exceeds the standard value, add the washer (0.5 mm thickness). Side clearance for the output shaft 1st gear of KZ400-C need not be adjusted.



A. Output Shaft 1st Gear B. Thickness Gauge



A. Drive Shaft 2nd Gear B. Thickness Gauge

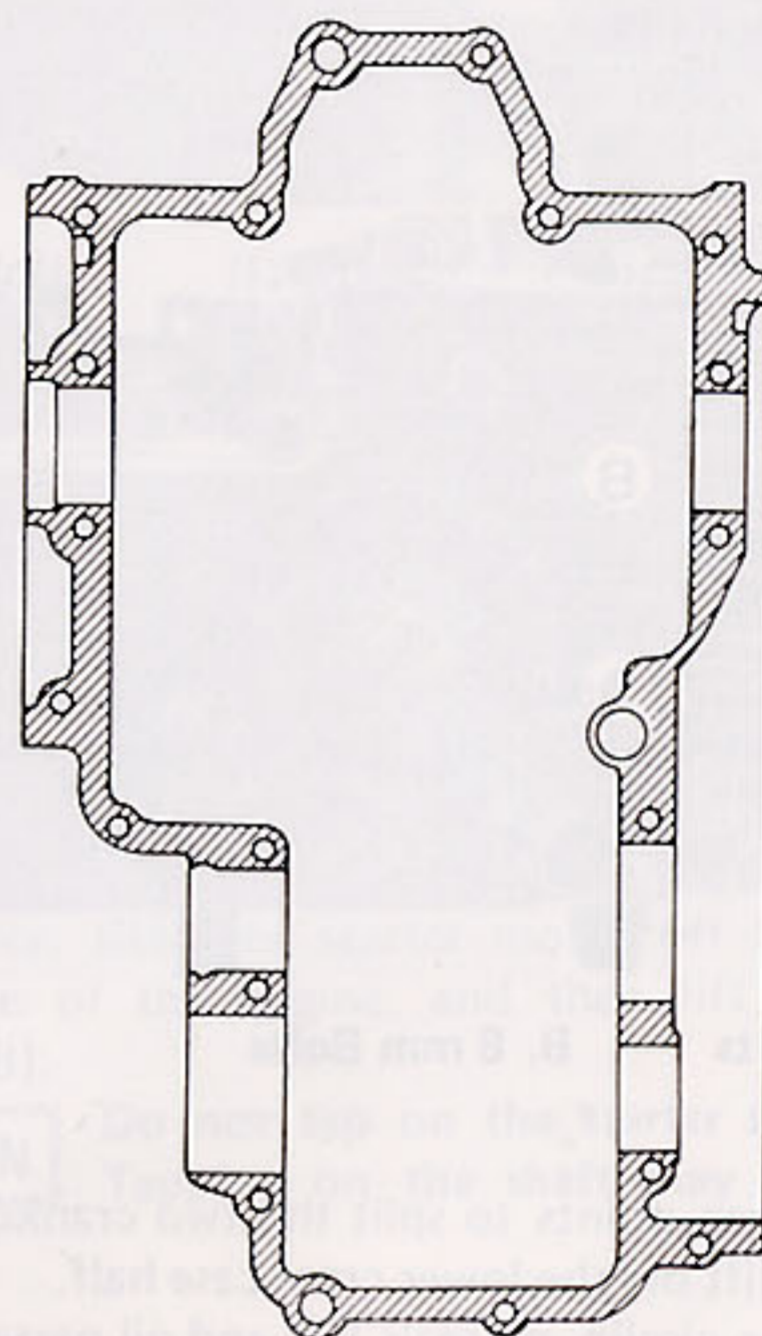
Table F2 Side Clearance

Standard
under 0.5 mm

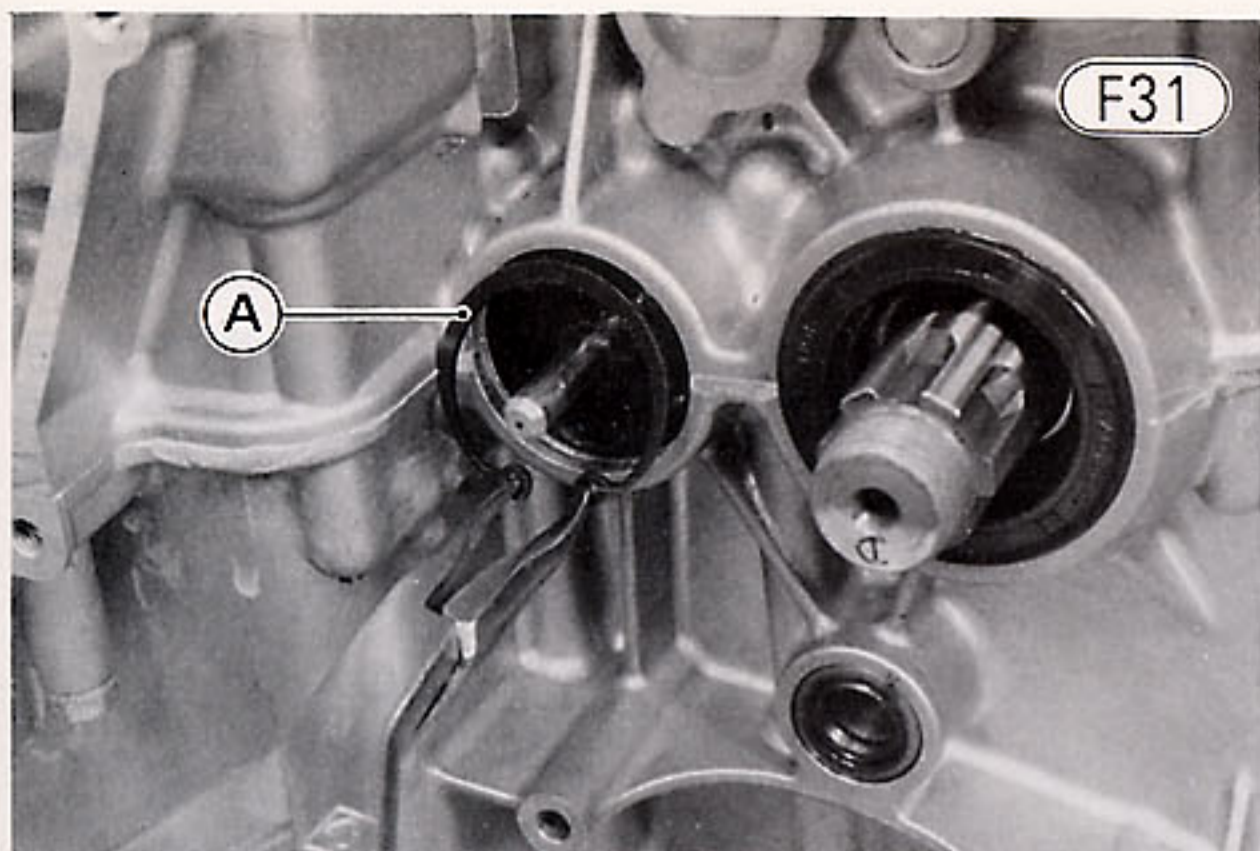
- Install the oil seal next to the output shaft ball bearing.
- Install the clutch push rod oil seal next to the drive shaft needle bearing, and insert the push rod through the oil seal and into the drive shaft, applying a high temperature grease to the push rod. The ridge on the oil seal must fit in its crankcase groove.
- Apply a little engine oil to the transmission gears, ball bearings, crankshaft bearing inserts, and shift forks.
- Apply a liquid gasket to the mating surface of the lower crankcase half in the areas shown in Fig. F30.

CAUTION If liquid gasket adheres to any areas not indicated, the engine oil passages may be obstructed, causing engine seizure.

Liquid Gasket Applied Area



- Fit the lower crankcase half on the upper crankcase half. Be careful that the oil seals do not slip out of place.
- Install and lightly tighten the lower crankcase half 8 mm bolts (4) and 6 mm bolts (11).
- Tighten the 8 mm bolts first about 1.5 kg-m (11.0 ft-lbs) of torque, following the tightening sequence numbers on the lower crankcase half, and then tighten them to 2.5 kg-m (18.0 ft-lbs) of torque in the same sequence.
- Tighten the 6 mm bolts to 1.0 kg-m (87 in-lbs) of torque.
- Check to see that the drive shaft and output shaft turn freely, and, spinning the output shaft, shift the transmission through all gears to make certain there is no binding and that all gears shift properly.
- Turn the engine upside down.
- Tighten the upper crankcase half bolts (5) to 1.0 kg-m (87 in-lbs) of torque.
- Install the circlip next to the push rod oil seal.

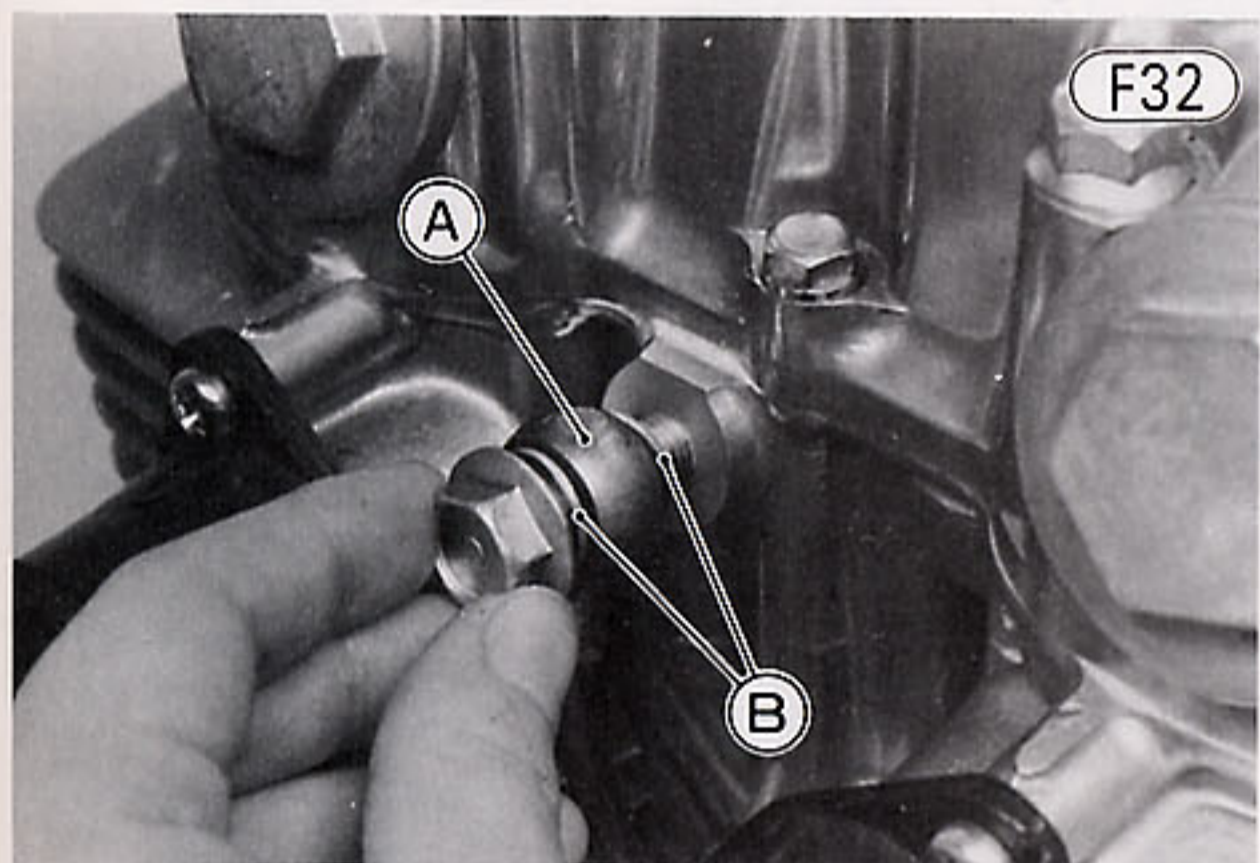


A. Circlip

- Install the starter motor cover and gasket, and tighten the cover cap nuts with the flat washers (2 ea) (KZ400-C).
- Clean the starter motor lugs and crankcase where the starter motor is ground (KZ400-B).
- Apply a little oil to the O ring and install the starter motor, fitting the shaft through the sprocket with the chain in place if the dynamo flywheel is on the crankshaft. Apply a non-permanent locking agent to the starter motor retaining bolts (2), and tighten the bolts to 1.0 kg-m (87 in-lbs) of torque (KZ400-B).
- Check the oil pipe, and replace it if it is bent or damaged.

CAUTION Do not use a bent or damaged oil pipe, as it may cause serious engine damage.

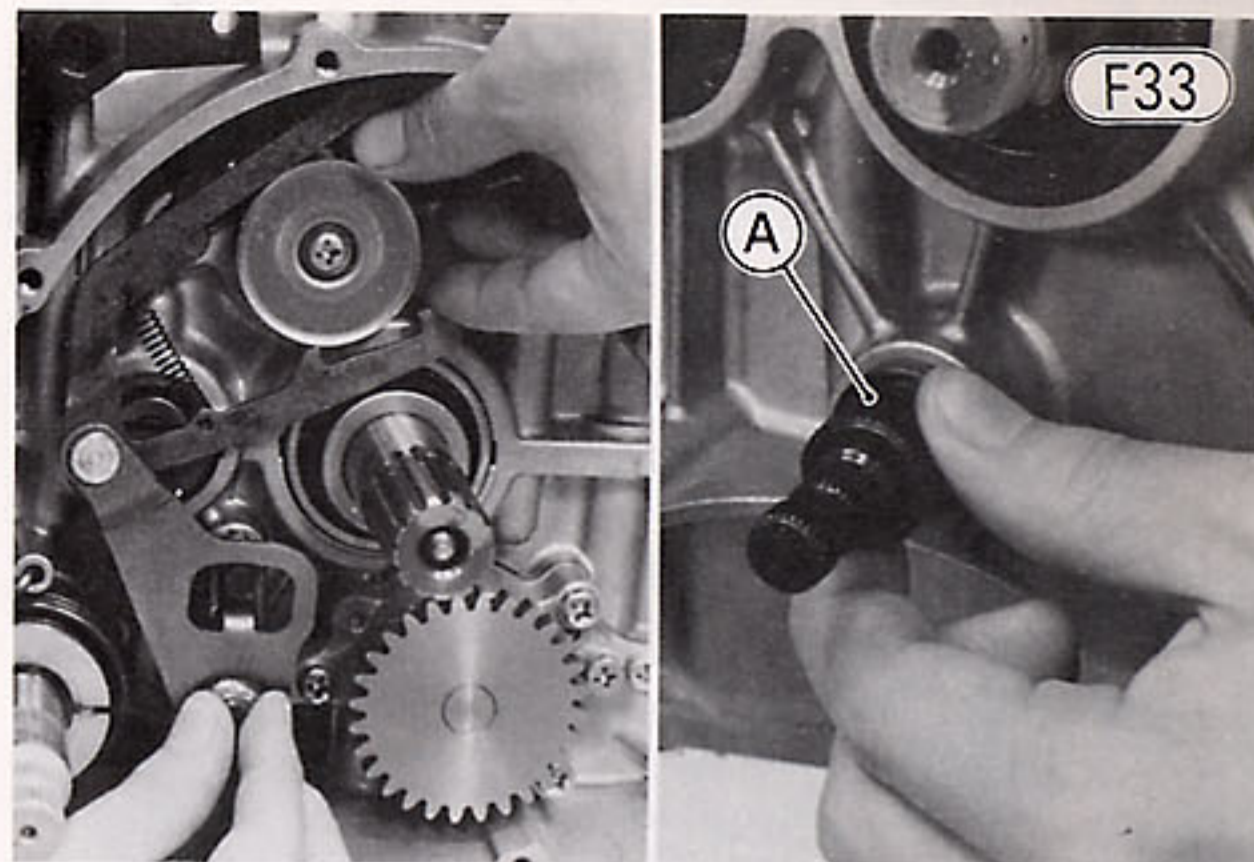
- With compressed air, blow out the oil passage to remove dirt or particles which may obstruct oil flow.
- Install the oil pipe with the long-hex-head bolt and banjo bolt(s) finger tight. Each bolt has two washers, one on each side of the fitting. Discard the old washers, and use new washers.



A. Fitting B. New Washers

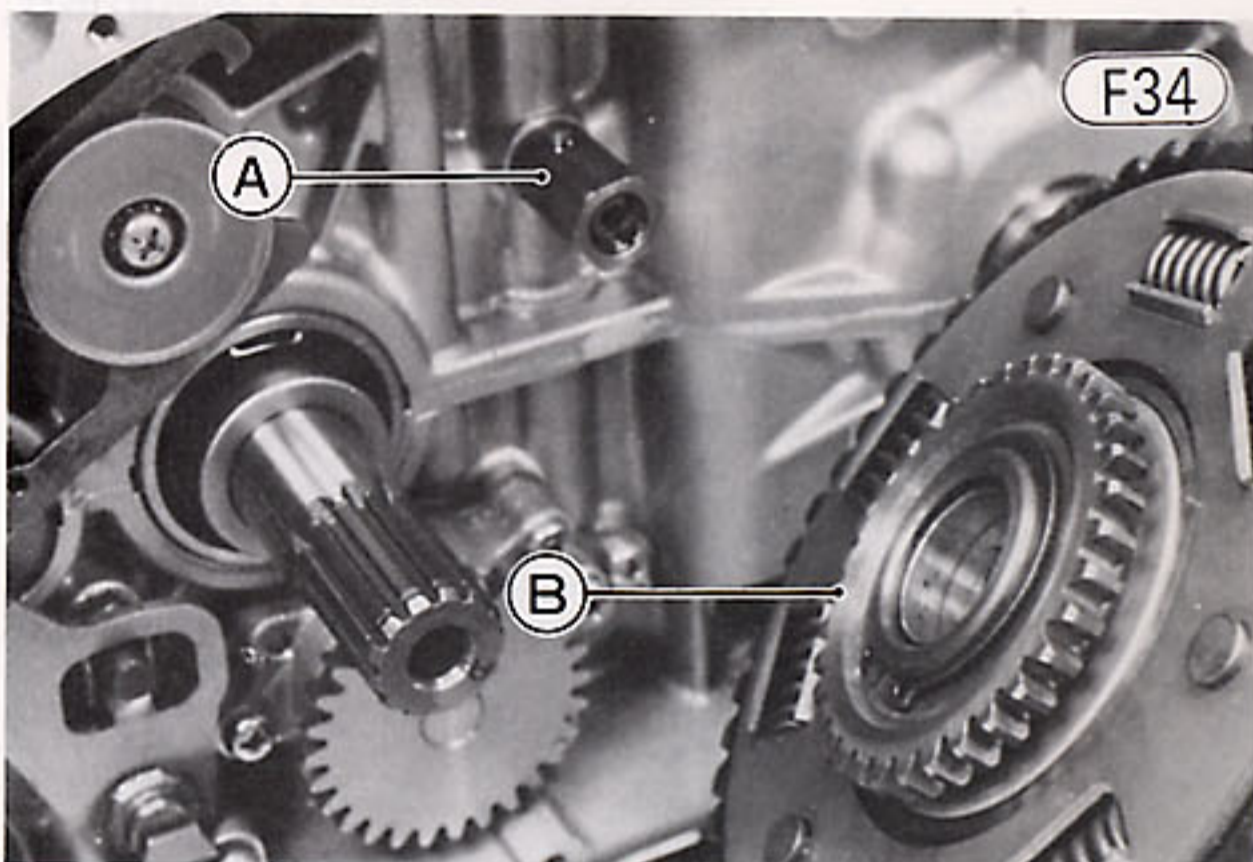
- Using a wrench to hold the end of the oil pipe, tighten the long-hex-head and oil pipe banjo bolts to 2.0 kg-m (14.5 ft-lbs) of torque.
- Install the oil pressure switch tightening it to 1.5 kg-m (11.0 ft-lbs) of torque (KZ400-B).
- Check that the external shift mechanism return spring pin is not loose. If it is loose, remove it, apply non-permanent locking agent to the threads, and tighten the pin.
- Check that the return spring is properly fitted on the shaft (Fig. E133 on Pg. 76) and that the pawl spring is on the two arms.

- Insert the shift shaft oil seal guide (special tool) in crankcase oil seal. Install the external shift mechanism, and place the shift mechanism arm and overshift limiter on the shift drum pins.

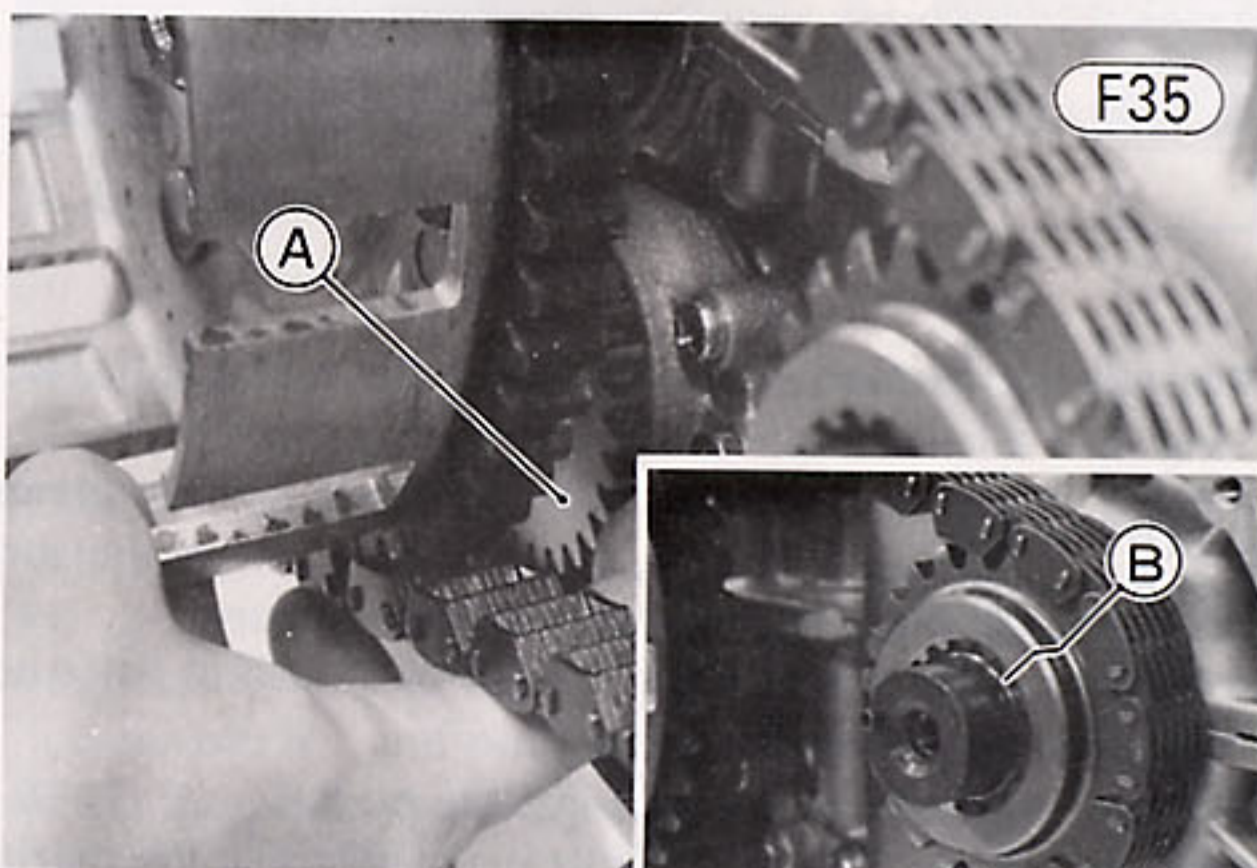


A. Shift Shaft Oil Seal Guide (57001-264)

- Install the external shift mechanism stop. Apply a non-permanent locking agent to the stop screws (2), and tighten the screws.
- Check that the oil pump drive gear is installed, and the oil pressure relief valve is installed.

A. Oil Pressure Relief Valve
B. Oil Pump Drive Gear

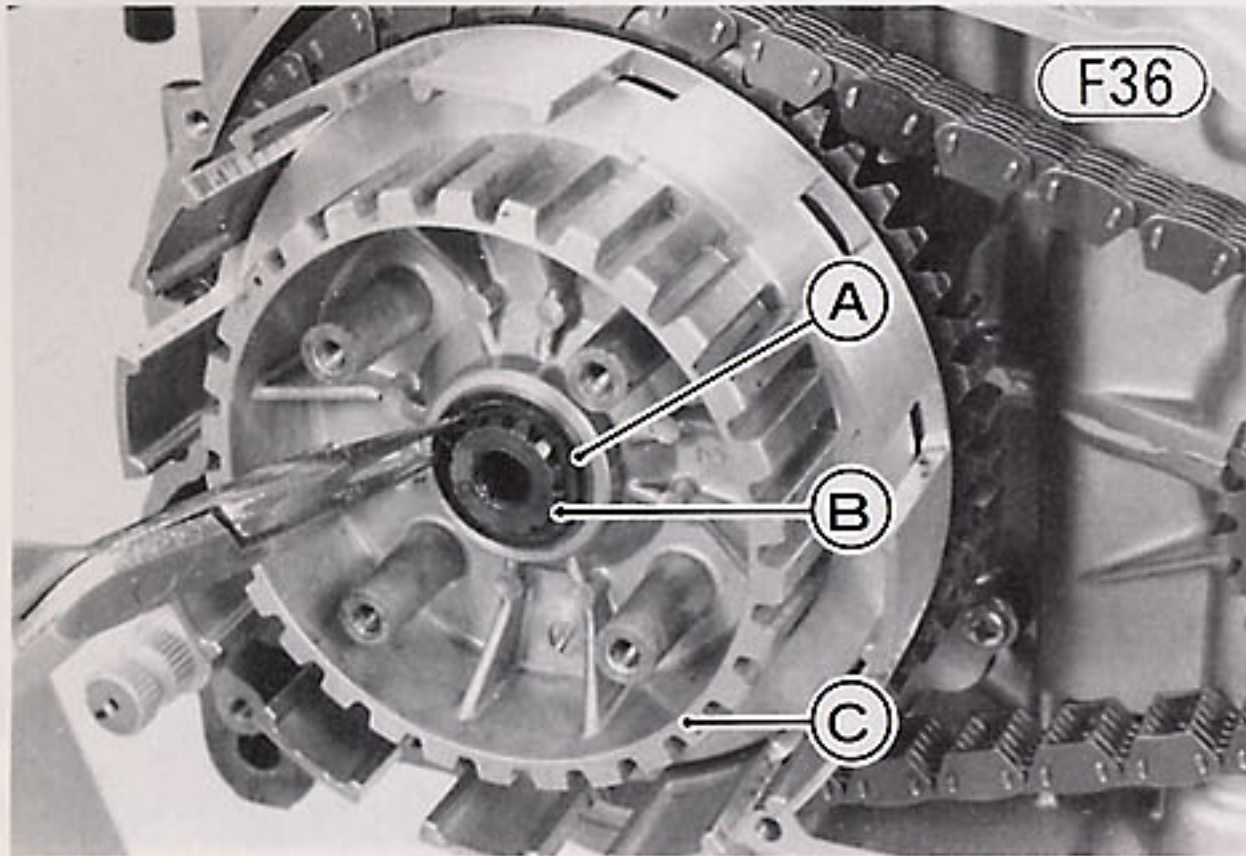
- Assemble the clutch housing, primary sprocket, and primary chain, and install them while turning the oil pump gear by hand so that the oil pump gear will mesh with the oil pump drive gear. The protruding side of the primary sprocket must face out.



A. Oil Pump Gear B. Protruding Side

90 DISASSEMBLY—ENGINE REMOVED

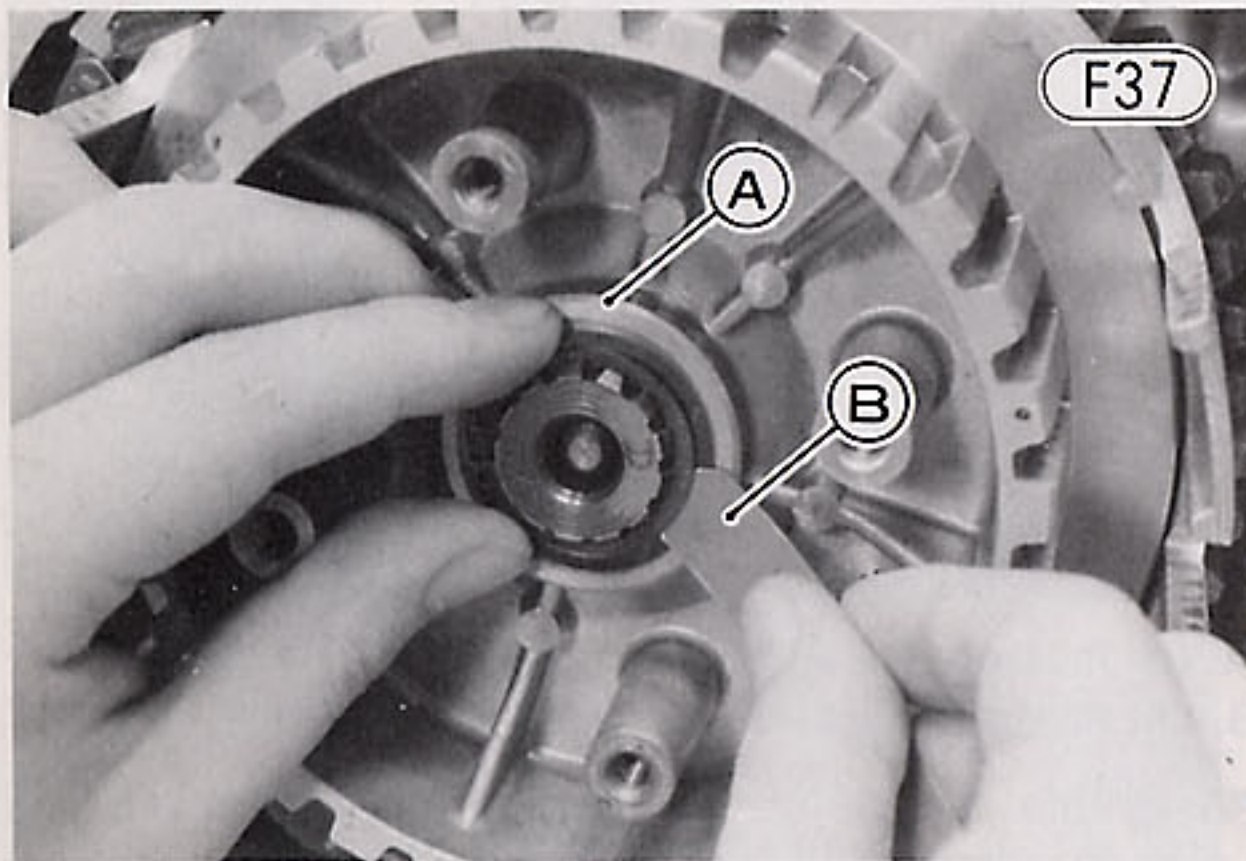
- Install the primary sprocket circlip.
- Install the thrust washer, clutch hub, shim(s), and circlip.



A. Shim(s) B. Circlip C. Clutch Hub

- Insert a thickness gauge between the circlip and the shim, and measure the side clearance of the clutch hub. If the clearance is incorrect, replace the present shim(s) with new one(s) and/or add more shim(s) to give the proper clearance.

NOTE: Shims are available in 0.3 and 0.5 mm sizes.



A. Clutch Hub B. Thickness Gauge

Table F3 Clutch Hub Side Clearance

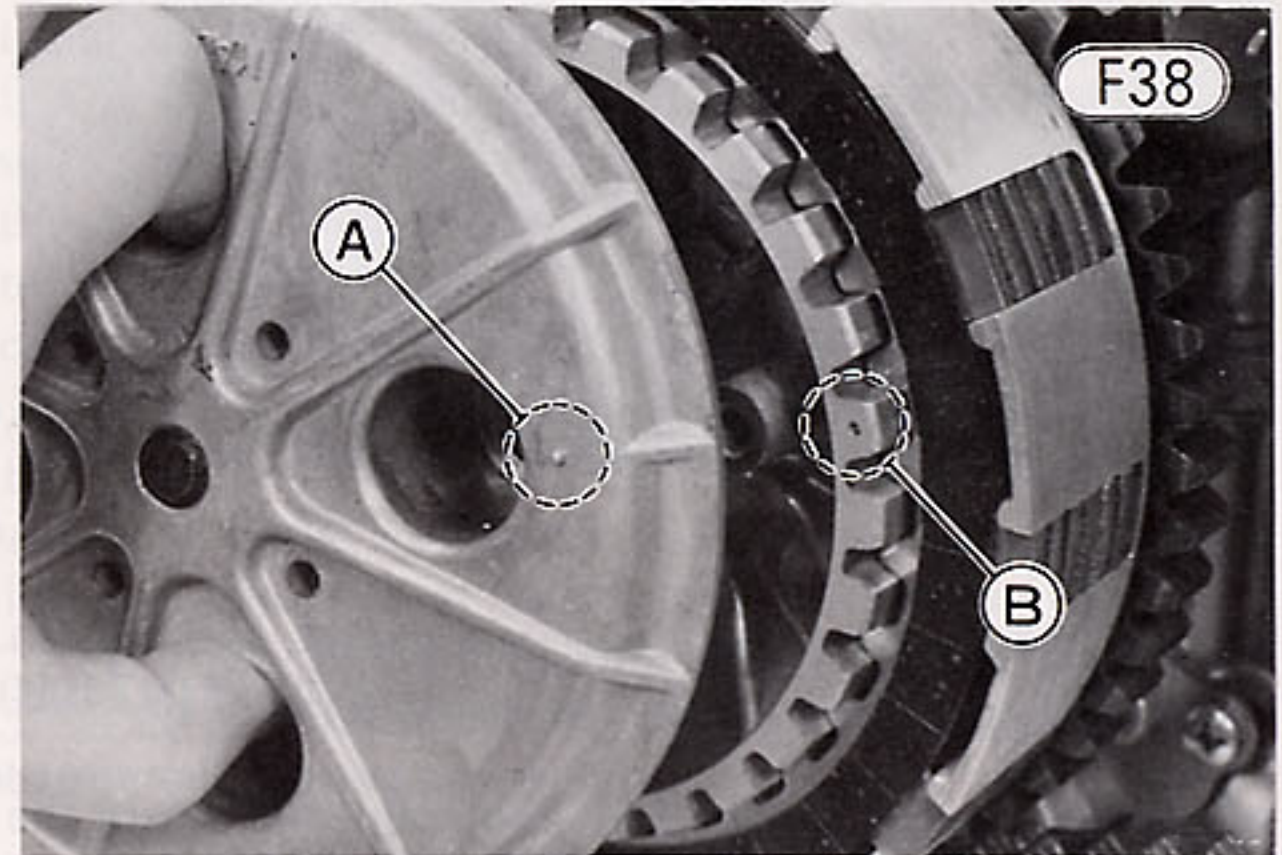
Standard
under 0.3 mm

- Install the friction plates (6) and steel plates (5), starting with a friction plate and alternating them.

CAUTION If new dry steel plates and friction plates are installed, apply engine oil on the surfaces of each plate to avoid clutch plate seizure.

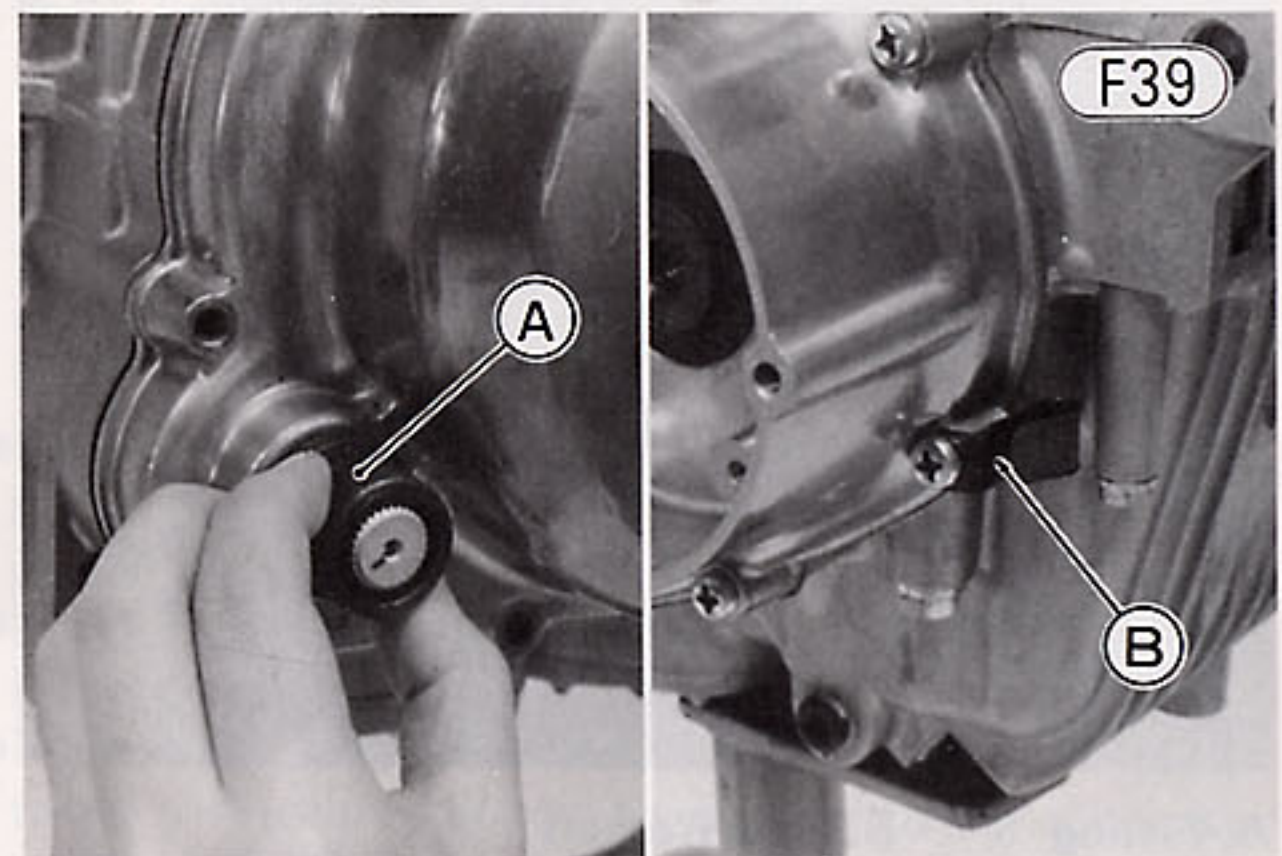
- Apply a high temperature grease to the steel ball and spring plate pusher surfaces.
- Insert the steel ball and spring plate pusher.
- Fit the spring plate back into place, aligning the marks on the plate with the marks on the clutch hub.

CAUTION Misalignment of the spring plate can cause clutch drag (when it is disengaged), or clutch slipping.



A. Raised Mark B. Punch Mark

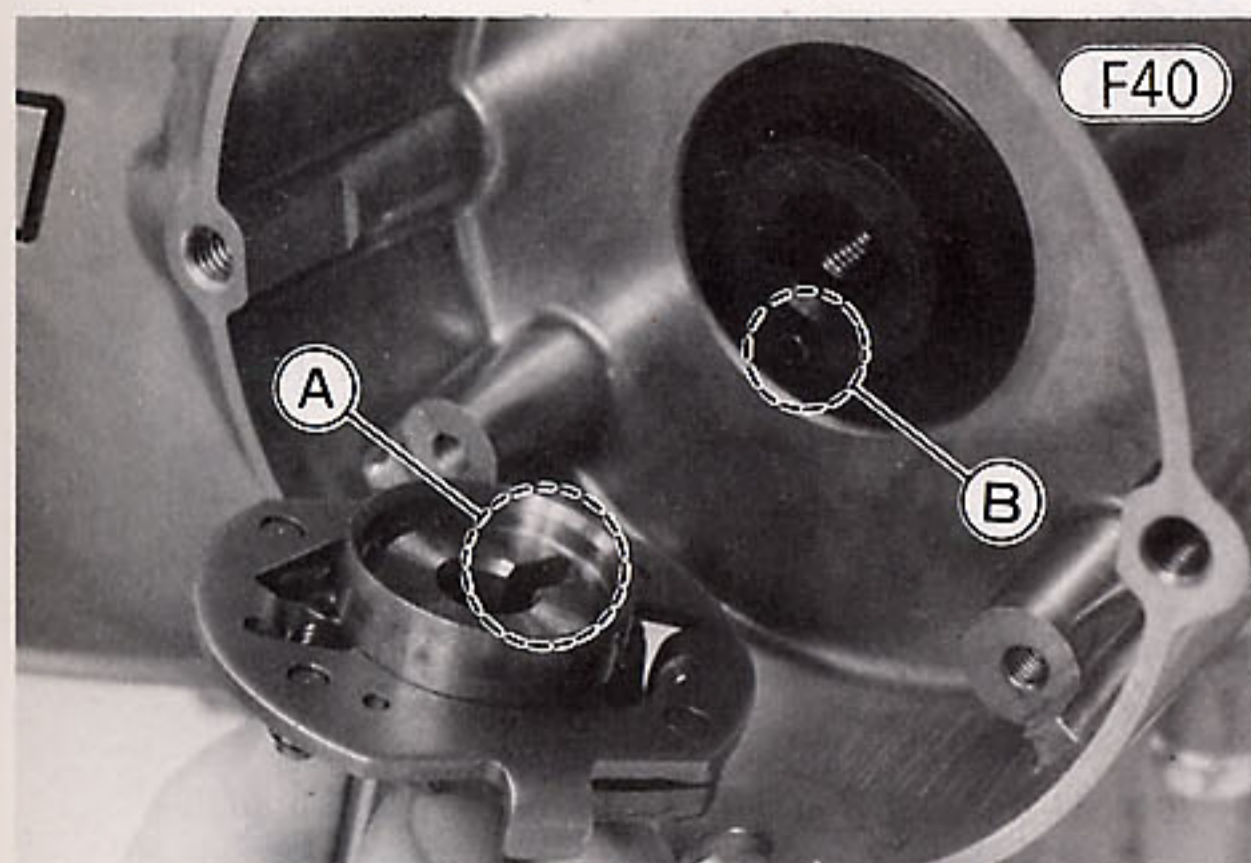
- Install the springs and spring bolts (4 ea). Cross tighten the bolts evenly to 0.9 kg-m (78 in-lbs) of torque.
- Install the knock pins (2), apply a liquid gasket to the portions on a new right engine cover gasket where they contact the crankcase mating surface, and then fit it on the crankcase.
- Check that the spring in the right engine cover crankshaft oil seal has not slipped out of its proper position and apply a high temperature grease to the oil seal lip. If the oil seal is damaged, replace it with a new one.
- Insert the kick shaft oil seal guide (special tool) in the right engine cover oil seal, and fit the cover onto the crankcase. Tighten its screws (12). Be sure to include the contact breaker lead clamp with the right engine cover front screw.



A. Kick Shaft Oil Seal Guide (57001-265)
B. Lead Clamp

- Install the kickstarter pedal in its original position on the kick shaft, and tighten the bolt.
- Fit the timing advancer onto the crankshaft matching its notch with the pin in the end of the crankshaft. Install the crankshaft rotation nut and the advancer mounting bolt. The notches in the nut fit the projection on the timing advancer. Using a 17 mm wrench on the crankshaft rotation nut to keep the shaft from

turning, tighten the bolt to 2.5 kg-m (18.0 ft-lbs) of torque.

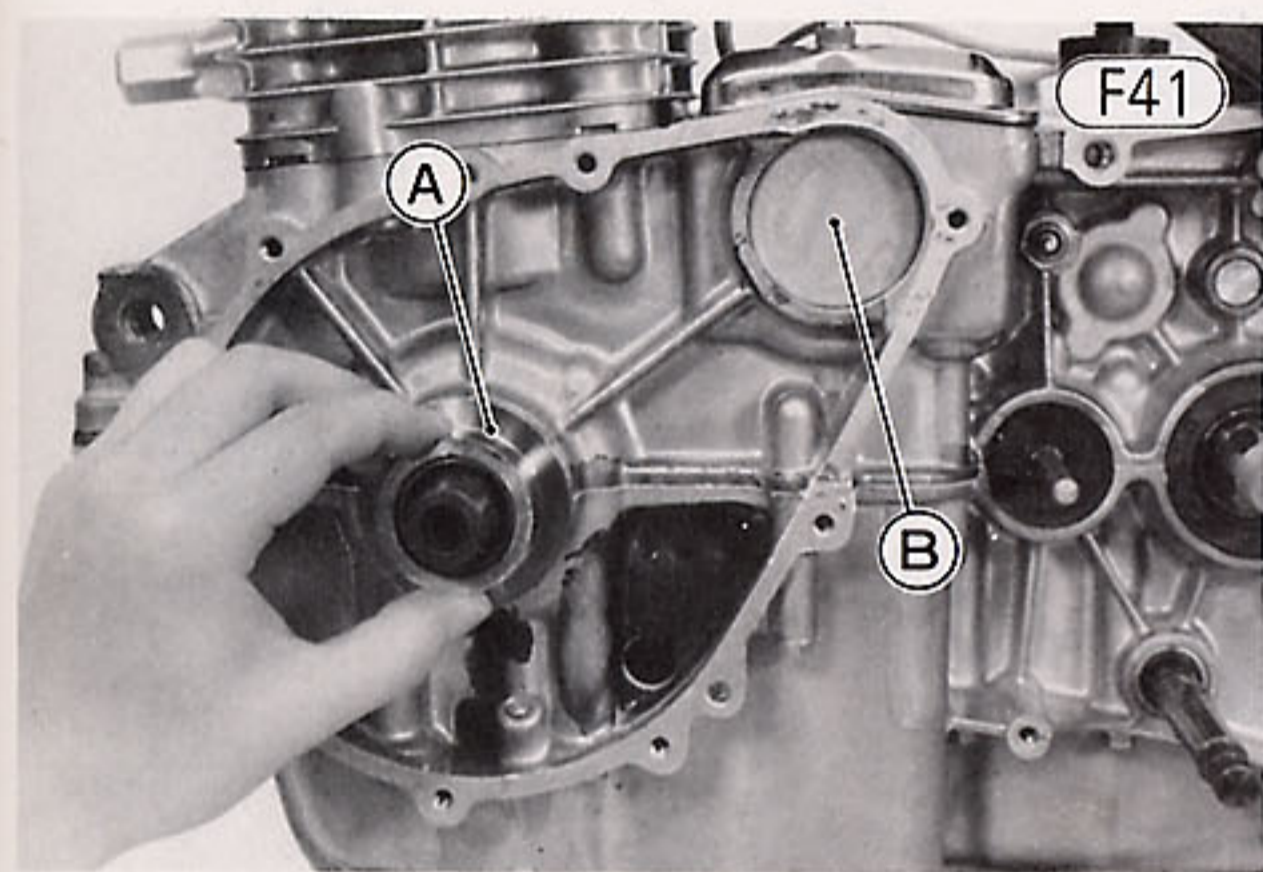


A. Notch B. Pin

- Mount the contact breaker mounting plate, and tighten its screws (3) loosely. Fit the contact breaker lead with the clamp at the right engine cover front screw.

NOTE: These screws will be tightened securely during ignition timing adjustment.

- Install the contact breaker cover and gasket, and tighten its screws (2).
- Assemble the starter motor chain and sprockets, and install them (KZ400-B).
- Install the collar on the crankshaft (KZ400-C)



A. Collar B. Plug

- Using a high flash-point solvent, clean off any oil or dirt that may be on the crankshaft taper or flywheel hub.

- Check to see that the thrust washer (KZ400-B) is at the rear of the flywheel, and place the flywheel and starter motor clutch assembly back onto the crankshaft.

- Tighten the dynamo flywheel bolt to 7.0 kg-m (51 ft-lbs) of torque while holding the flywheel steady with the flywheel holder (special tool).

- Check that the plug and O ring are fitted as shown in Fig. F41 (KZ400-C).

- Install the knock pins (2), fit the dynamo cover with a new gasket, and tighten its screws (9). Before installing

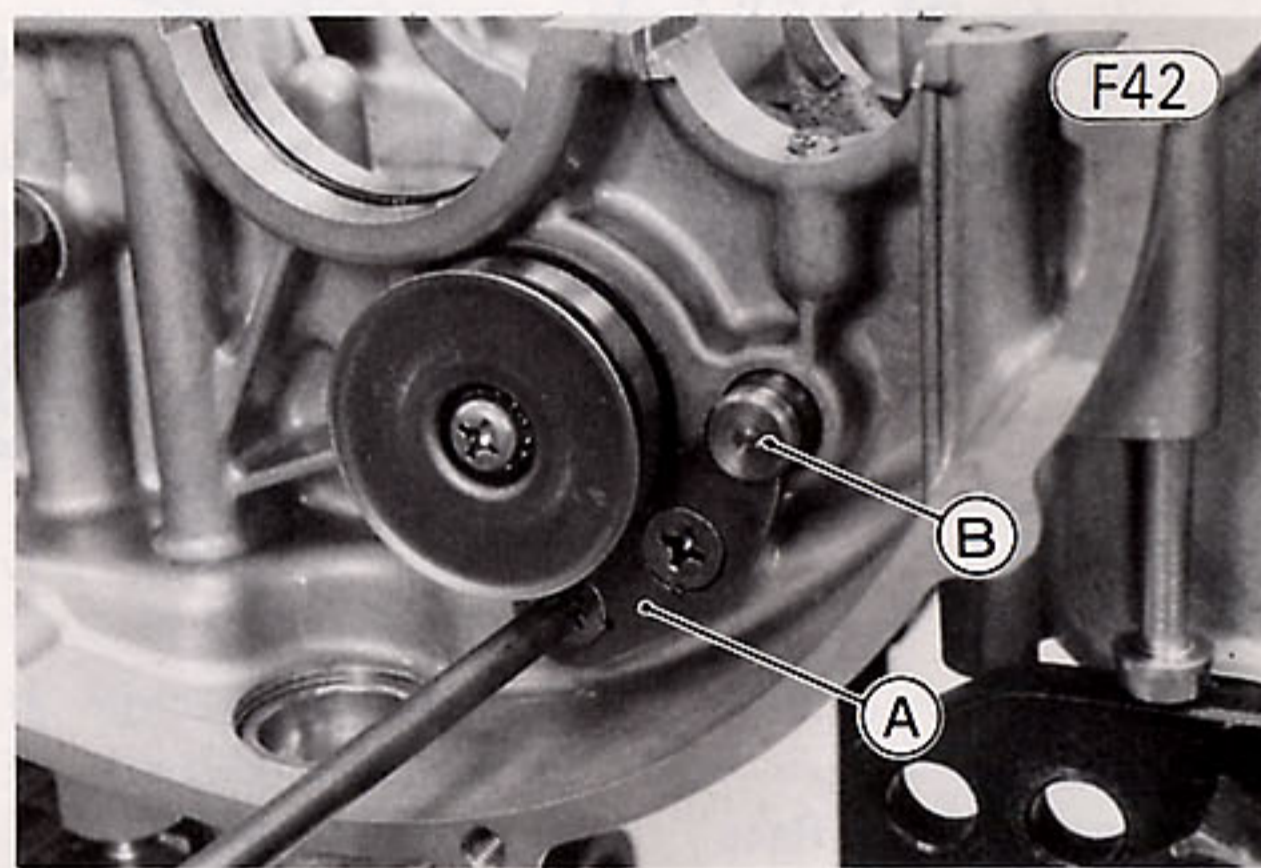
the cover gasket apply a liquid gasket to the portions on it where they contact the crankcase mating surface.

- Replace the output shaft O ring with a new one if it is damaged, and install it next to the ball bearing inner race.
- Install the output shaft collar, engine sprocket, and splined washer.
- Install the engine sprocket nut, and tighten the nut to 8.0 kg-m (58 ft-lbs) of torque while using the engine sprocket holder to keep the sprocket steady.
- Bend one side of the splined washer over the side of the nut.
- Install the engine (Pg. 83).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Carry out the adjustment procedures listed at the end of the engine installation section (Pg. 84).

TRANSMISSION

Removal:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Split the crankcase (Pg. 84).
- Remove the shift drum positioning bolt 20, aluminum washer 21, spring 22, and pin 23.
- Remove the screws (2) 39, and take off the shift drum guide plate 38.



A. Guide Plate B. Shift Rod

- Pull out the shift rod 37, and remove the two shift forks 35, 36.

- Remove the operating plate circlip 32 and operating plate 33.

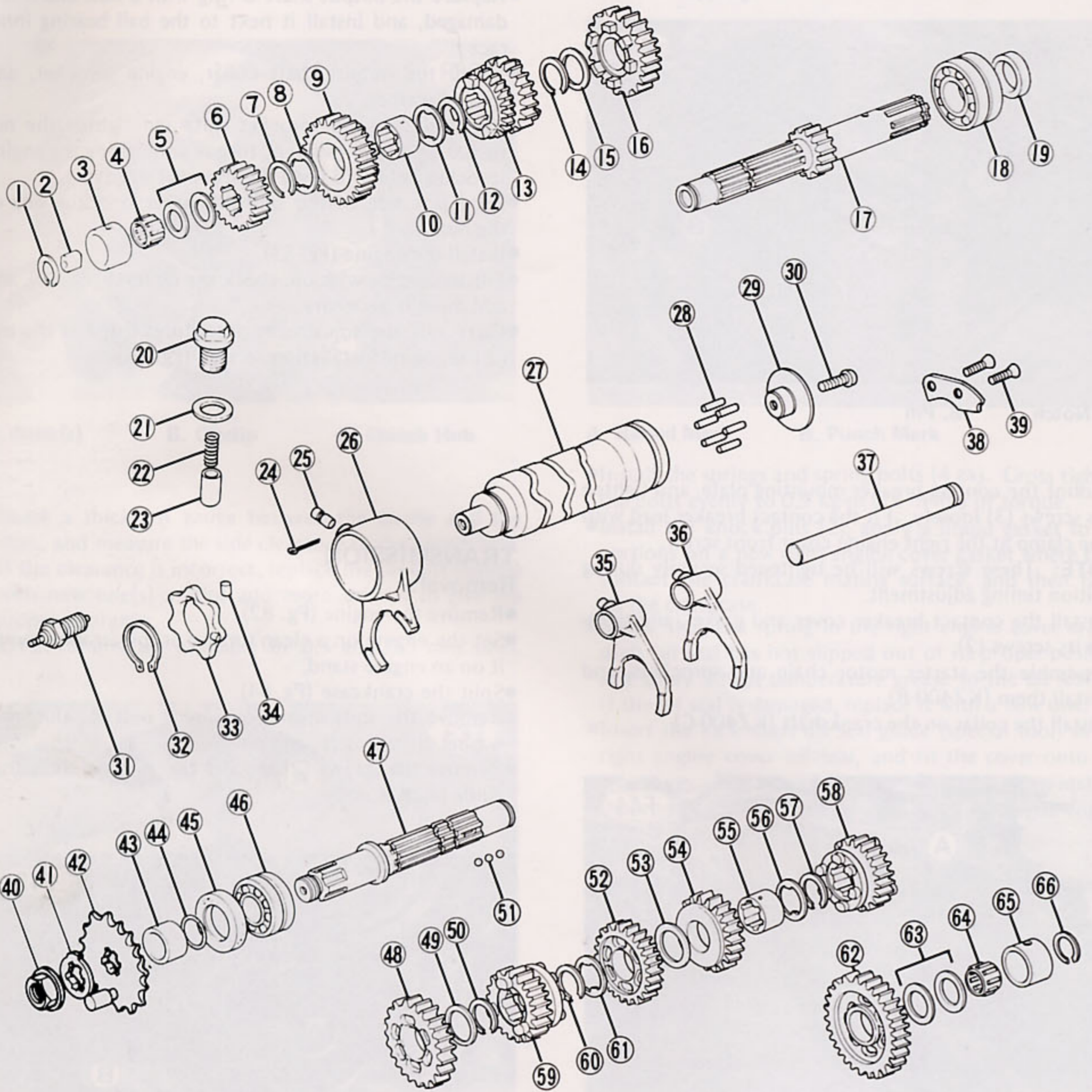
- Drop out the operating plate pin 34.

- Remove the 3rd/4th (KZ400-C: 3rd) gear shift fork cotter pin 24, and pull out the shift fork guide pin 25.

- Pull the shift drum 27 out of the crankcase and the 3rd/4th (KZ400-C: 3rd) gear shift fork 26 will come out.

92 DISASSEMBLY—ENGINE REMOVED

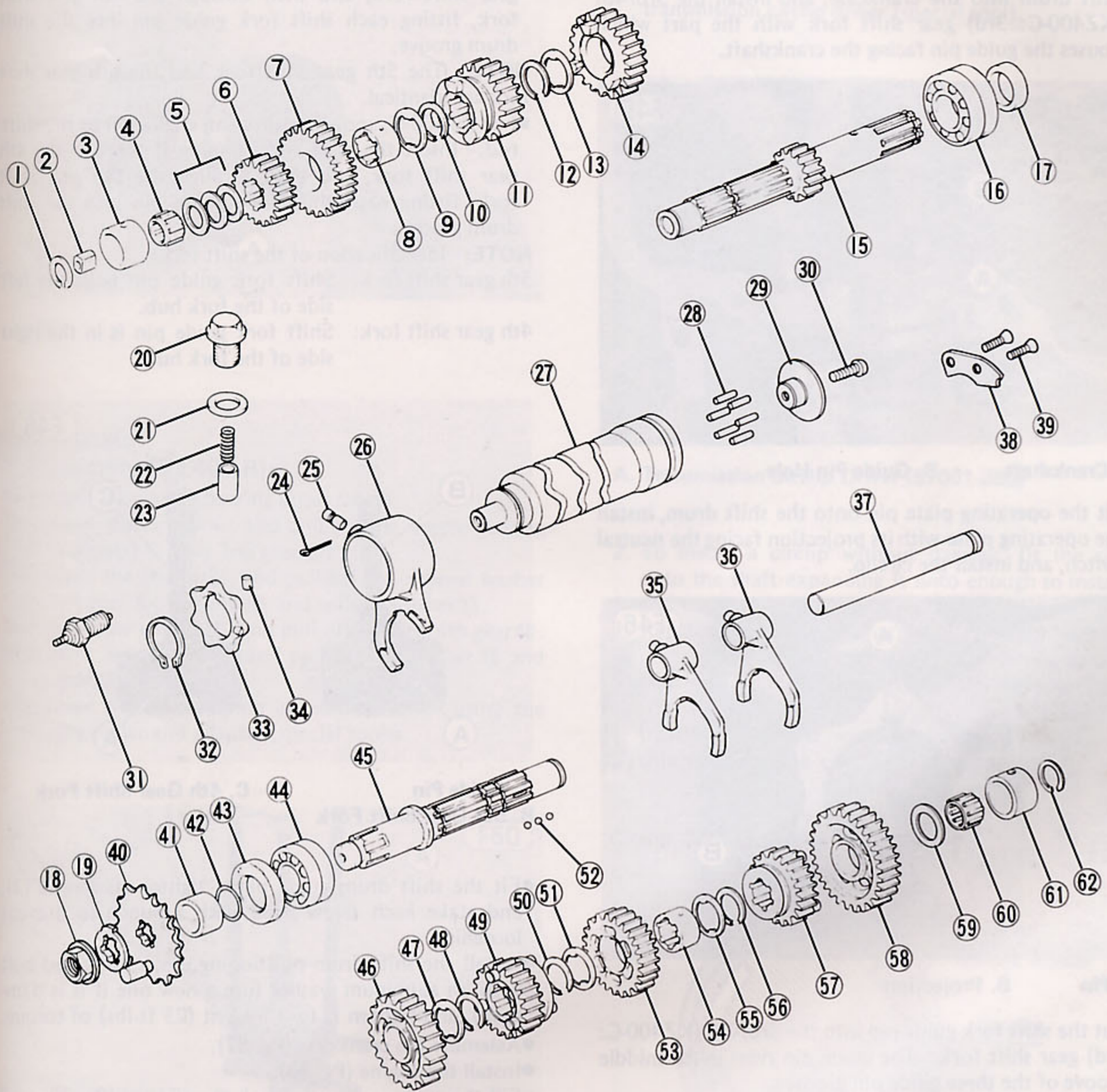
Shift Drum, Drive Shaft, Output Shaft (KZ400-B)



- | | | | |
|-----------------------|-----------------------------|----------------------------|------------------------|
| 1. Circlip | 18. Ball Bearing | 34. Pin | 51. Steel Balls |
| 2. Bushing | 19. Collar | 35. Shift Fork (6th) | 52. 3rd Gear (O) |
| 3. Bearing Outer Race | 20. Positioning Bolt | 36. Shift Fork (5th) | 53. Washer |
| 4. Needle Bearing | 21. Aluminum Washer | 37. Shift Rod | 54. 4th Gear (O) |
| 5. Washer(s) | 22. Spring | 38. Shift Drum Guide Plate | 55. Bushing |
| 6. 2nd Gear (D) | 23. Pin | 39. Screw | 56. Splined Washer |
| 7. Circlip | 24. Cotter Pin | 40. Nut | 57. Circlip |
| 8. Splined Washer | 25. Shift Fork Guide Pin | *41. Splined Washer | 58. 5th Gear (O) |
| 9. 6th Gear (D) | 26. 3rd/4th Gear Shift Fork | 42. Engine Sprocket | 59. 6th Gear (O) |
| 10. Bushing | 27. Shift Drum | 43. Collar | 60. Circlip |
| 11. Splined Washer | 28. Shift Drum Pin | 44. O Ring | 61. Splined Washer |
| 12. Circlip | 29. Shift Drum Pin Plate | 45. Oil Seal | 62. 1st Gear (O) |
| 13. 3rd/4th Gear (D) | 30. Screw | 46. Ball Bearing | 63. Washer(s) |
| 14. Circlip | 31. Neutral Switch | 47. Output Shaft | 64. Needle Bearing |
| 15. Washer | 32. Circlip | 48. 2nd Gear (O) | 65. Bearing Outer Race |
| 16. 5th Gear (D) | 33. Operating Plate | 49. Washer | 66. Circlip |
| 17. Drive Shaft | | 50. Circlip | |

Shift Drum, Drive Shaft, Output Shaft (KZ400-C)

F44



- | | | | |
|-----------------------|--------------------------|----------------------------|------------------------|
| 1. Circlip | 18. Nut | 35. 5th Gear Shift Fork | 52. Steel Ball |
| 2. Bushing | *19. Splined Washer | 36. 4th Gear Shift Fork | 53. 3rd Gear (O) |
| 3. Bearing Outer Race | 20. Positioning Bolt | 37. Shift Rod | 54. Bushing |
| 4. Needle Bearing | 21. Aluminum Washer | 38. Shift Drum Guide Plate | 55. Splined Washer |
| 5. Washer(s) | 22. Spring | 39. Screw | 56. Circlip |
| 6. 2nd Gear (D) | 23. Pin | 40. Engine Sprocket | 57. 5th Gear (O) |
| 7. 5th Gear (D) | 24. Cotter Pin | 41. Collar | 58. 1st Gear (O) |
| 8. Bushing | 25. Shift Fork Guide Pin | 42. O Ring | 59. Washer |
| 9. Splined Washer | 26. 3rd Gear Shift Fork | 43. Oil Seal | 60. Needle Bearing |
| 10. Circlip | 27. Shift Drum | 44. Ball Bearing | 61. Bearing Outer Race |
| 11. 3rd Gear (D) | 28. Shift Drum Pin | 45. Output Shaft | 62. Circlip |
| 12. Circlip | 29. Shift Drum Pin Plate | 46. 2nd Gear (O) | |
| 13. Splined Washer | 30. Screw | 47. Splined Washer | |
| 14. 4th Gear (D) | 31. Neutral Switch | 48. Circlip | |
| 15. Drive Shaft | 32. Circlip | 49. 5th Gear (O) | |
| 16. Ball Bearing | 33. Operating Plate | 50. Circlip | |
| 17. Collar | 34. Pin | 51. Splined Washer | |

BALANCER MECHANISM, MAIN BEARING CAP

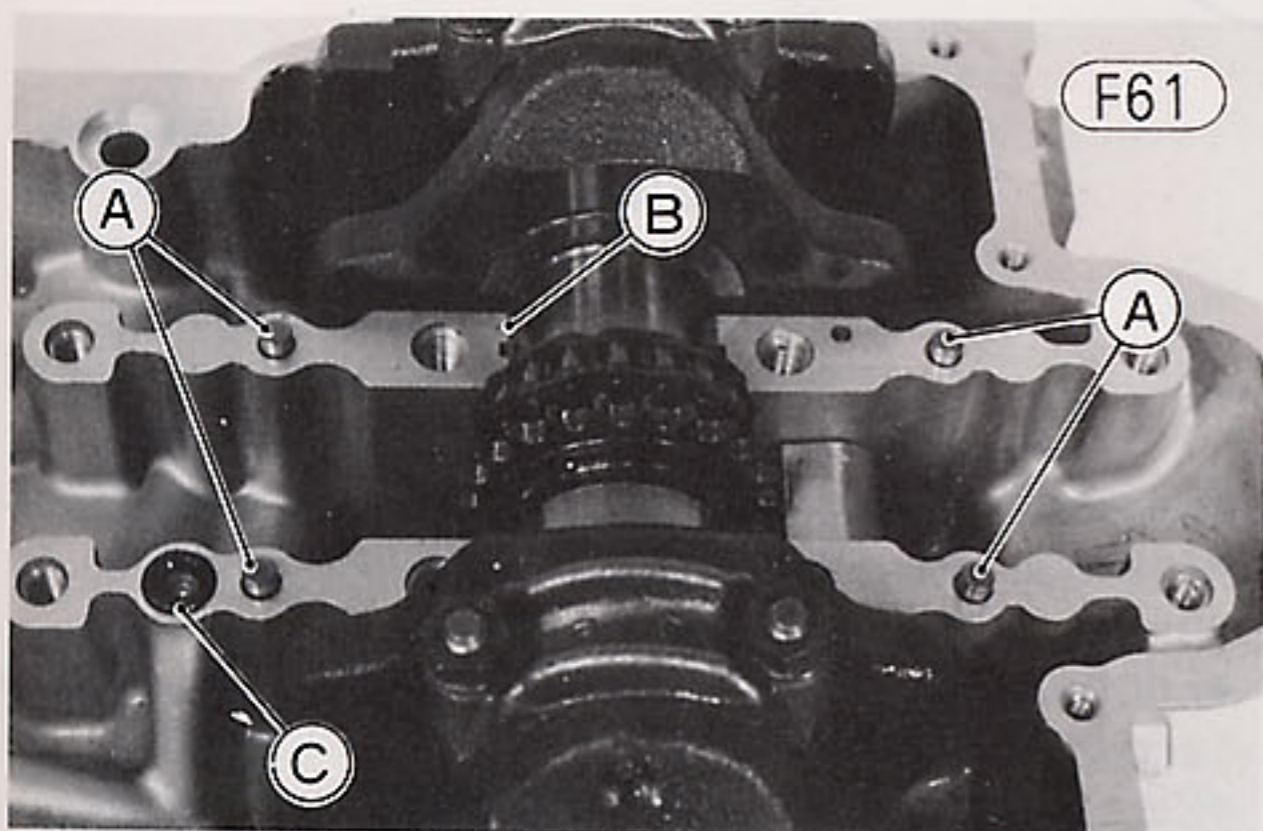
Removal:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Split the crankcase (Pg. 84).
- Remove the main bearing cap 10 mm bolts (4) and 8 mm bolts (4), and take off the main bearing cap and balancer mechanism.

Installation:

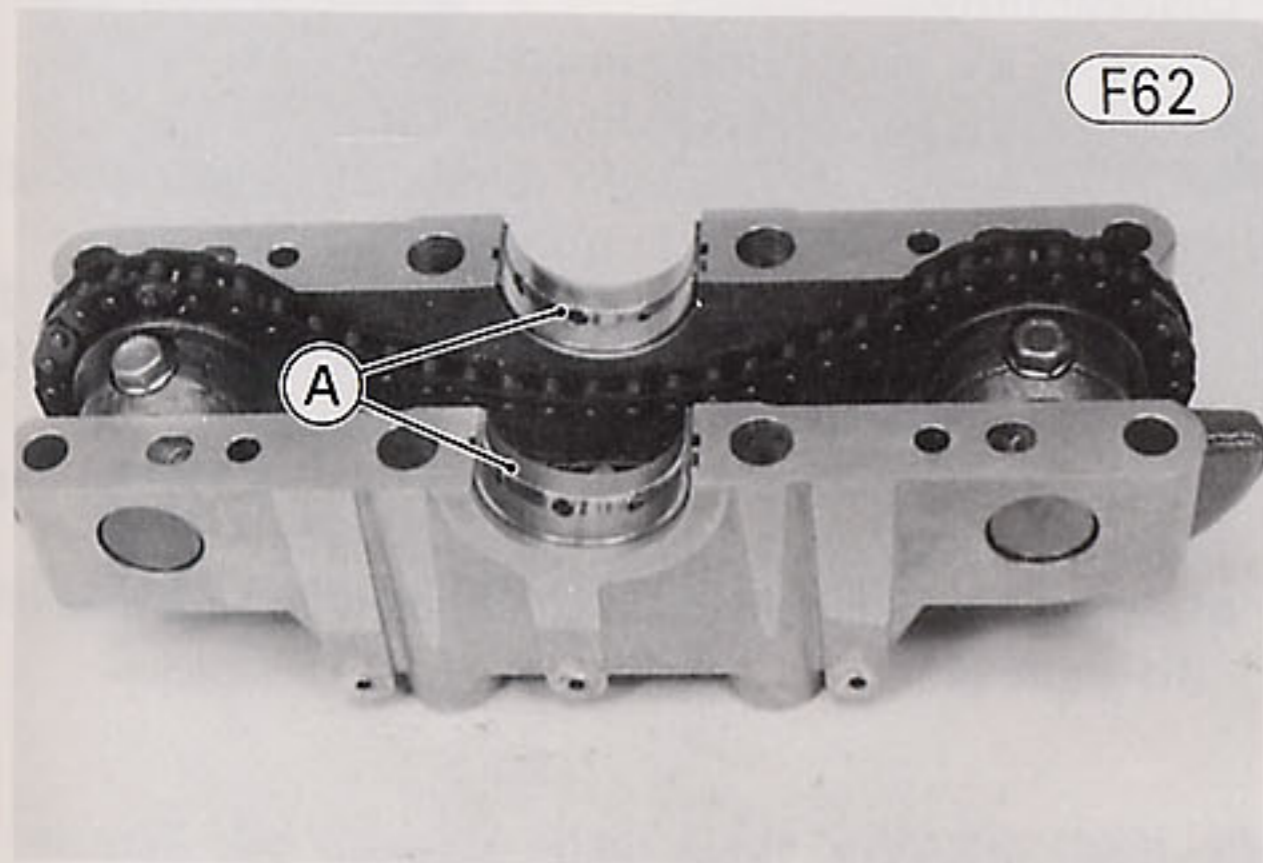
NOTE: The upper crankcase half, the lower crankcase half, and the crankshaft main bearing cap are machined at the factory in the assembled state, so the crankcase halves and the main bearing cap must be replaced together as a set.

- With a high flash-point solvent, clean off the mating surfaces of the upper crankcase half and main bearing cap, and wipe dry.
- Check that the knock pins (4), main bearing inserts (2), and O ring are in place. If the O ring is damaged or deteriorated, replace it with a new one.



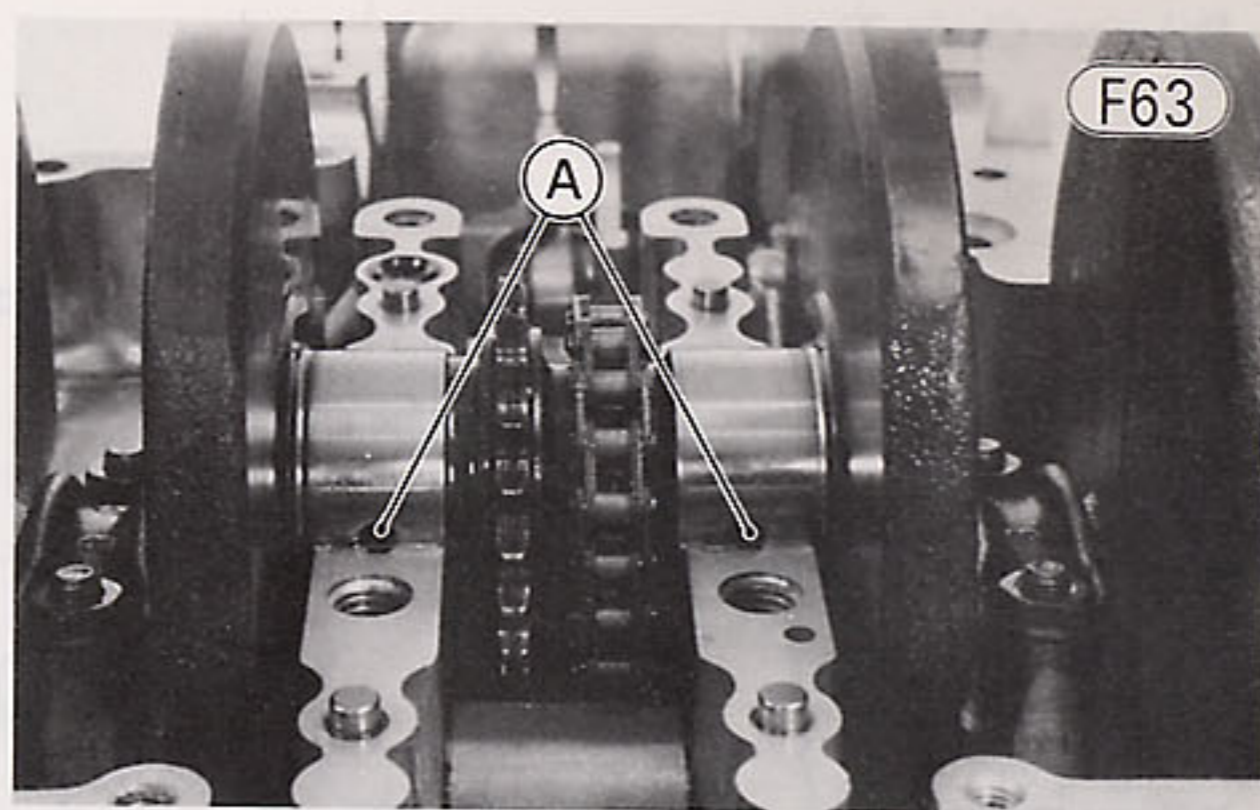
A. Knock Pins C. "O" Ring
B. Bearing Inserts

- Check that the main bearing inserts (2) are in place.



A. Bearing Inserts

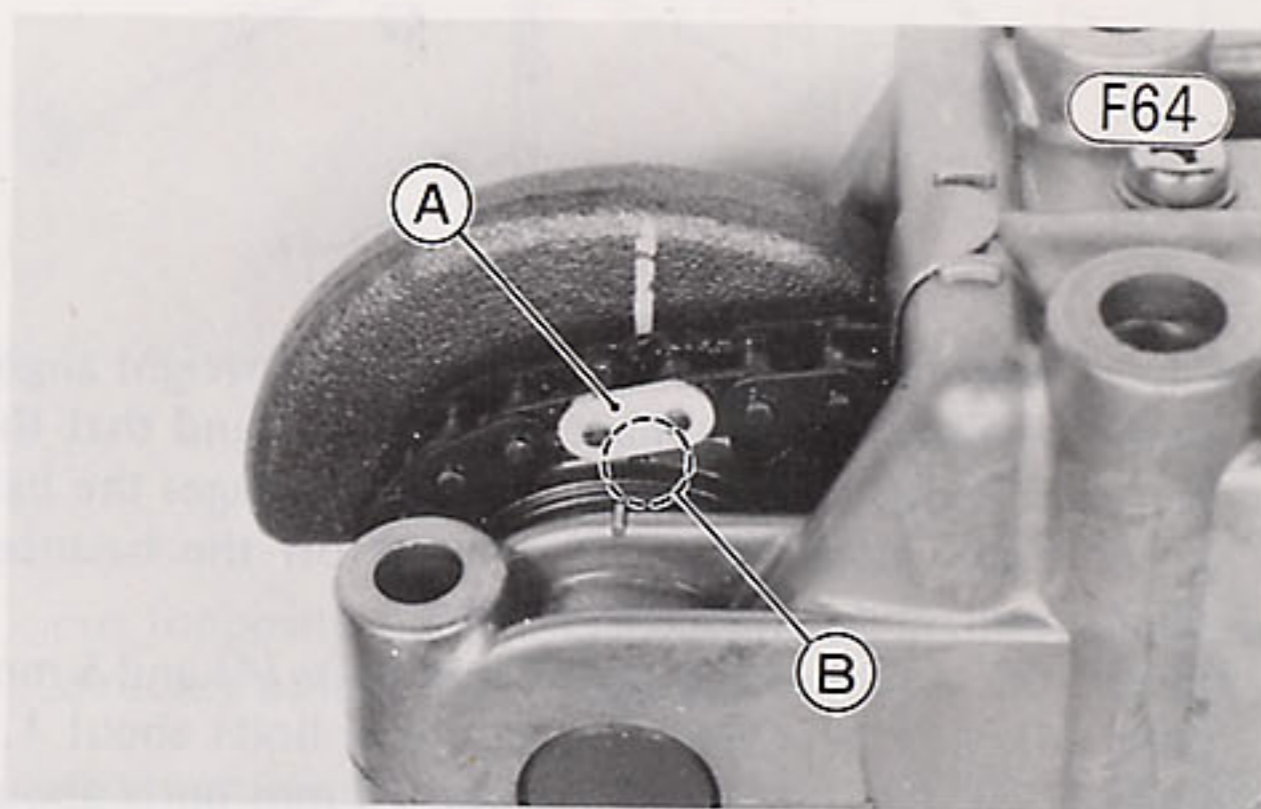
- Temporarily install the timing advancer, and, with a 17 mm wrench, turn the crankshaft so that the crankshaft oil holes are even with the upper crankcase half surface, with flywheels positioned up.



A. Oil Holes

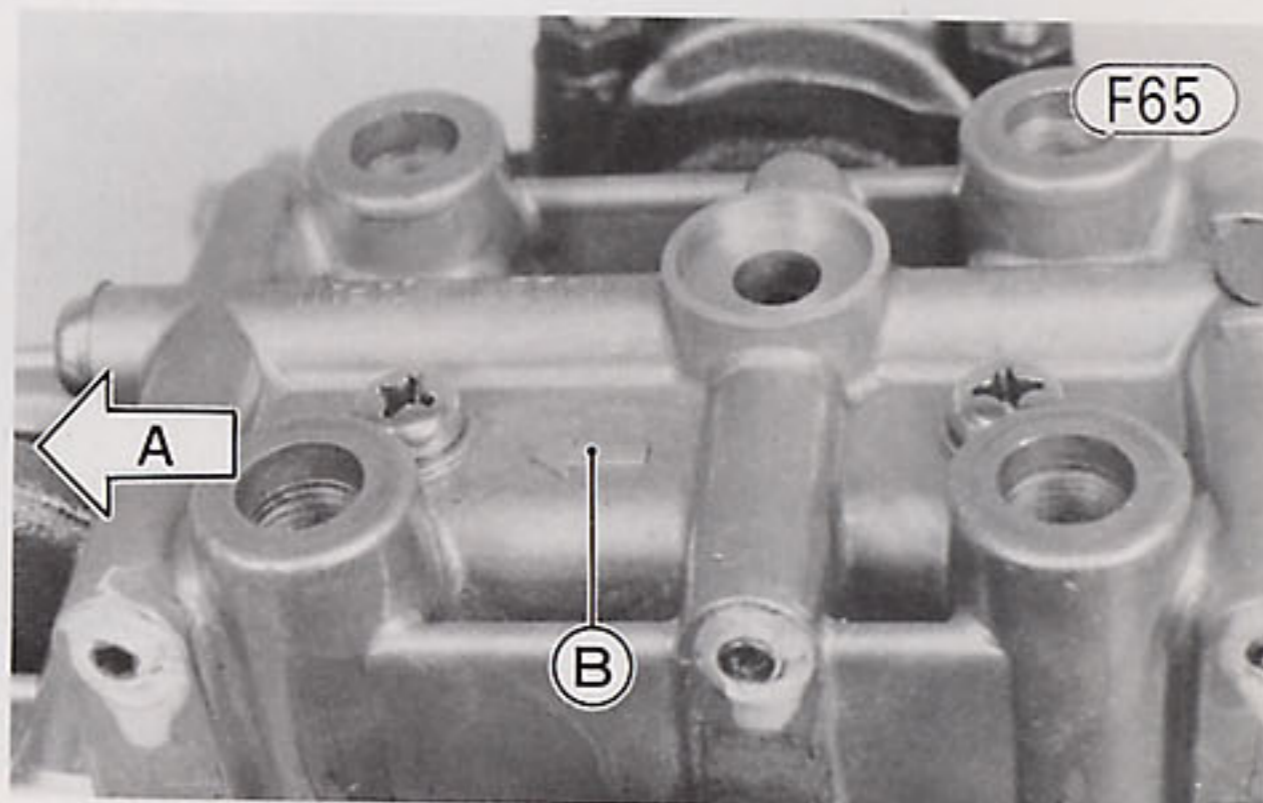
- Check to see that the balancer chain and balancer sprockets are properly fitted. For the front sprocket, the plated link must fit on the sprocket tooth with the punch mark. For the rear sprocket, the 4th plated link counted from the front must fit on the sprocket tooth with the punch mark.

NOTE: There are four plated links, and, with the chain in the position mentioned above, the 2nd and 3rd plated links counted from the front will be located on the main bearing cap mating surface side (Fig. F66).



A. Plated Link B. Punch Mark

- Fit the main bearing cap on the upper crankcase half with the arrow on the main bearing cap pointing forward, engaging the middle link between the 2nd plated link and the 3rd plated link with the top tooth of the sprocket on the crankshaft.

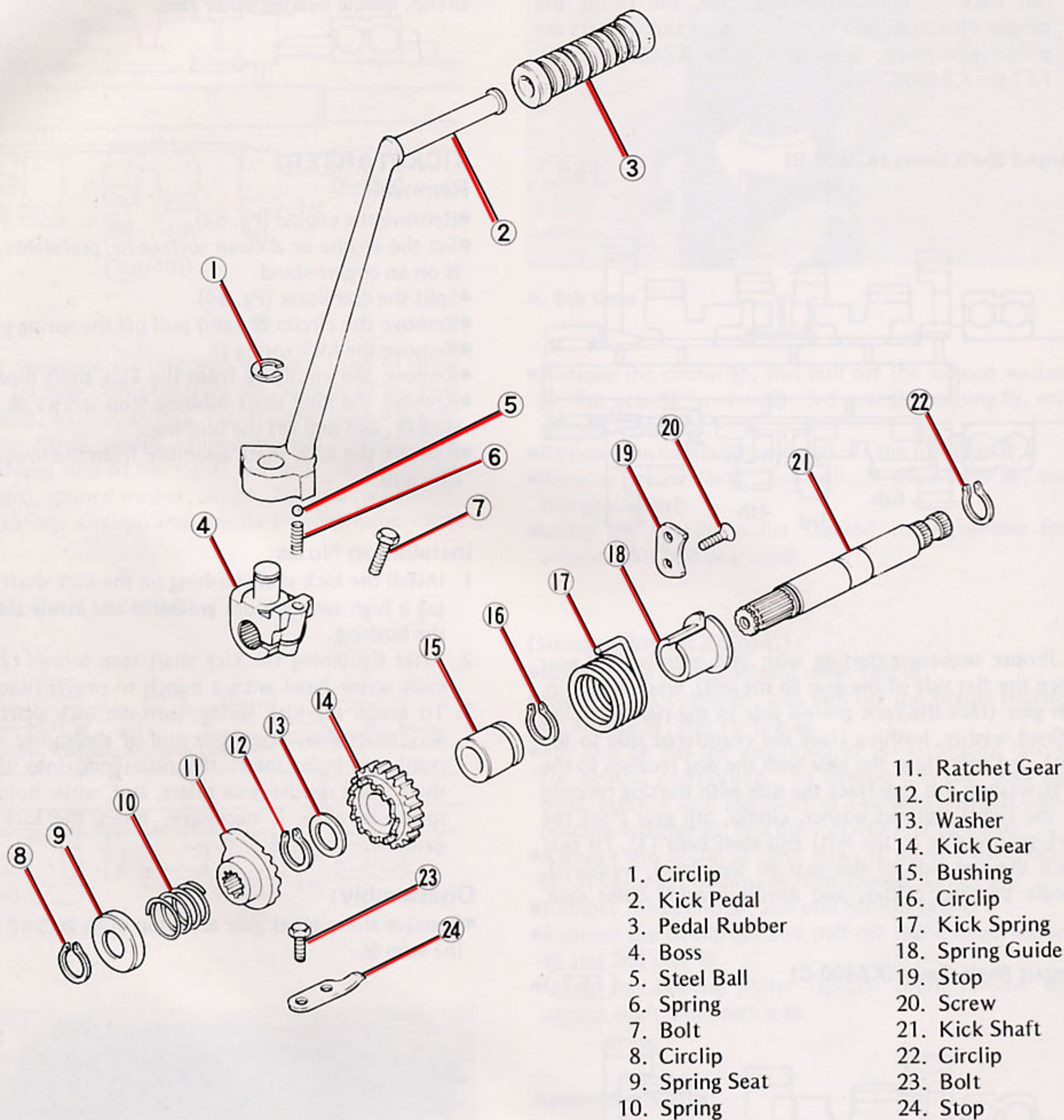


A. Front B. Arrow

98 DISASSEMBLY—ENGINE REMOVED

Kickstarter

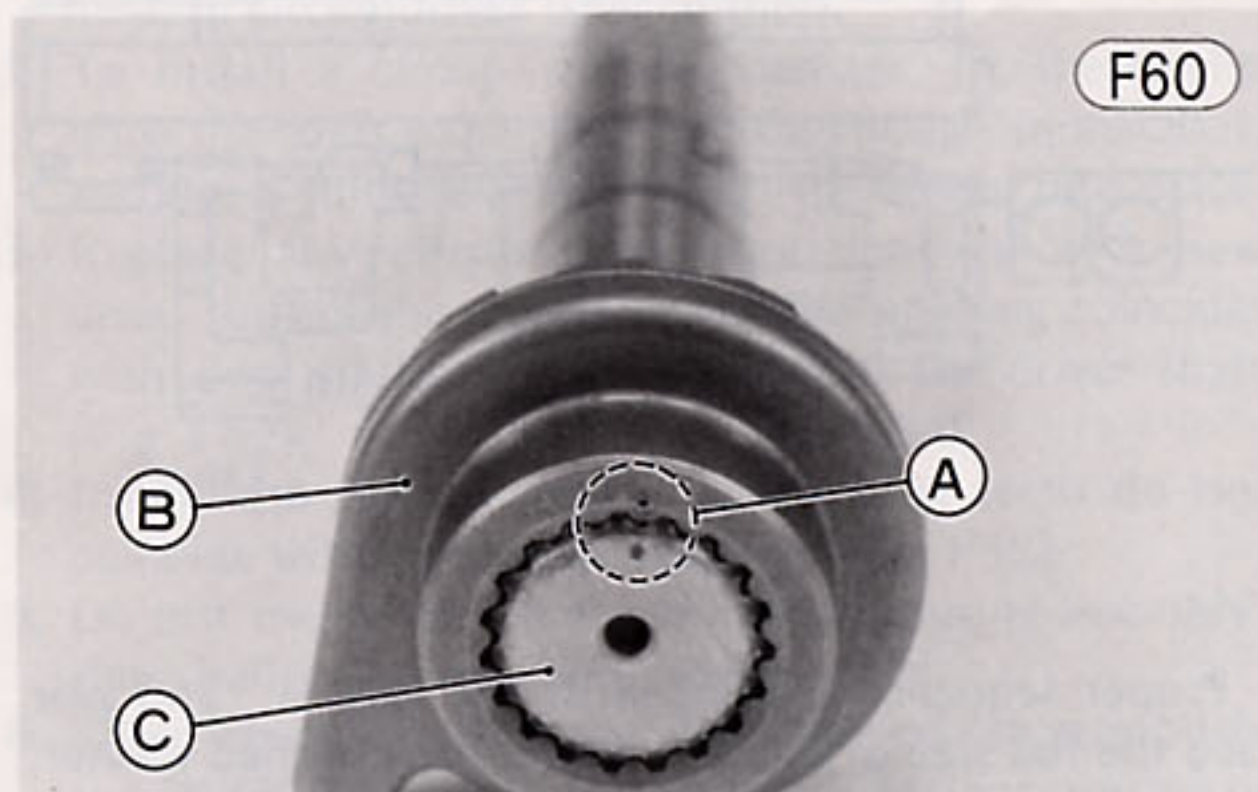
F59



Assembly Notes:

1. Fit the ratchet gear arm stop as shown in Fig. F58. Apply a non-permanent locking agent to the ratchet gear arm stop bolts (2), and tighten them.
2. Apply a little engine oil to the inside of the kick gear and ratchet gear, and apply a high temperature grease to the inside of the bushing before installation.
3. When installing the ratchet gear, align the ratchet gear punch mark with the punch mark on the kick shaft.

CAUTION Misalignment of the ratchet gear changes the kick spring preload. If the kick spring preload is too light, partial mesh of the kick gear and the ratchet gear could cause kick mechanism noise. If the kick spring preload is too heavy, the kick spring could weaken or break.



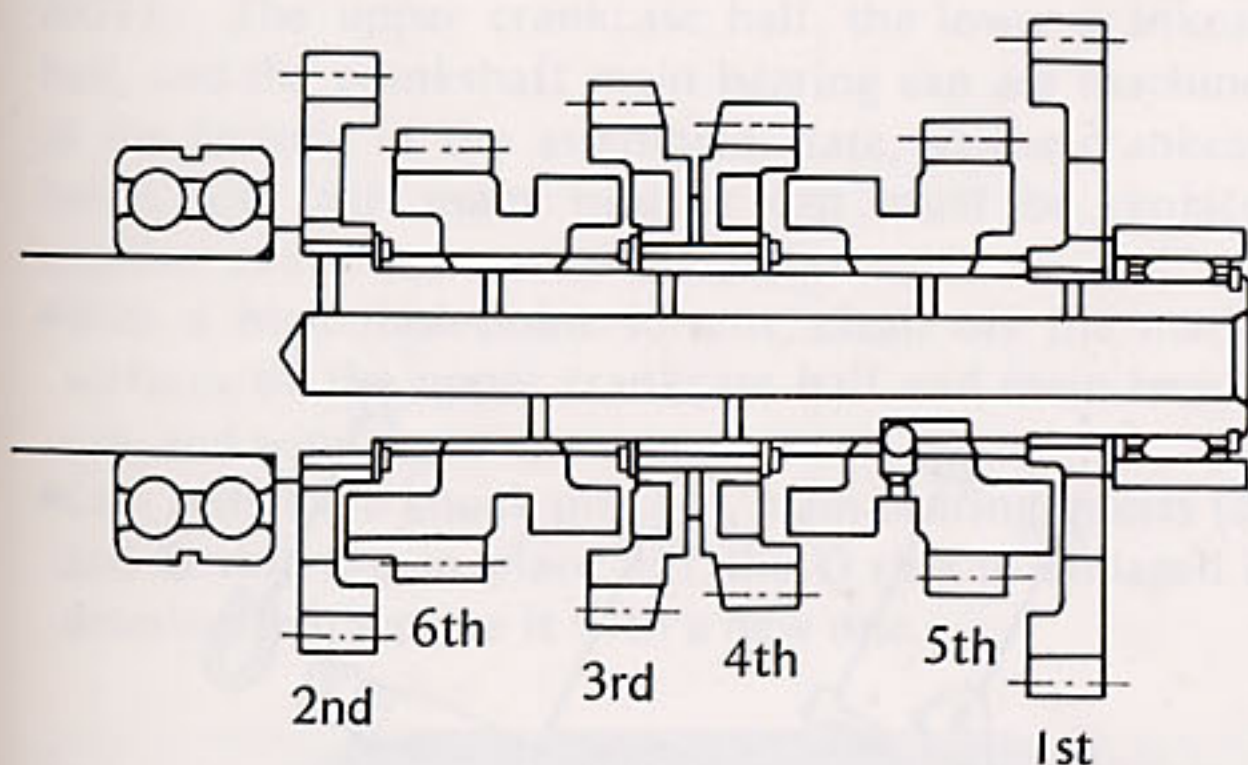
A. Align the marks
 B. Ratchet Gear
 C. Kick Shaft

F60

7. The output shaft gear sizes are opposite from those of the drive shaft gears, the largest being 1st gear and the smallest being top gear. Be sure that all parts are put back in the correct sequence, and facing the proper direction, and that all circlips and washers are properly in place. See Fig. F56 for KZ400-B or Fig. F57 for KZ400-C.

Output Shaft Gears (KZ400-B)

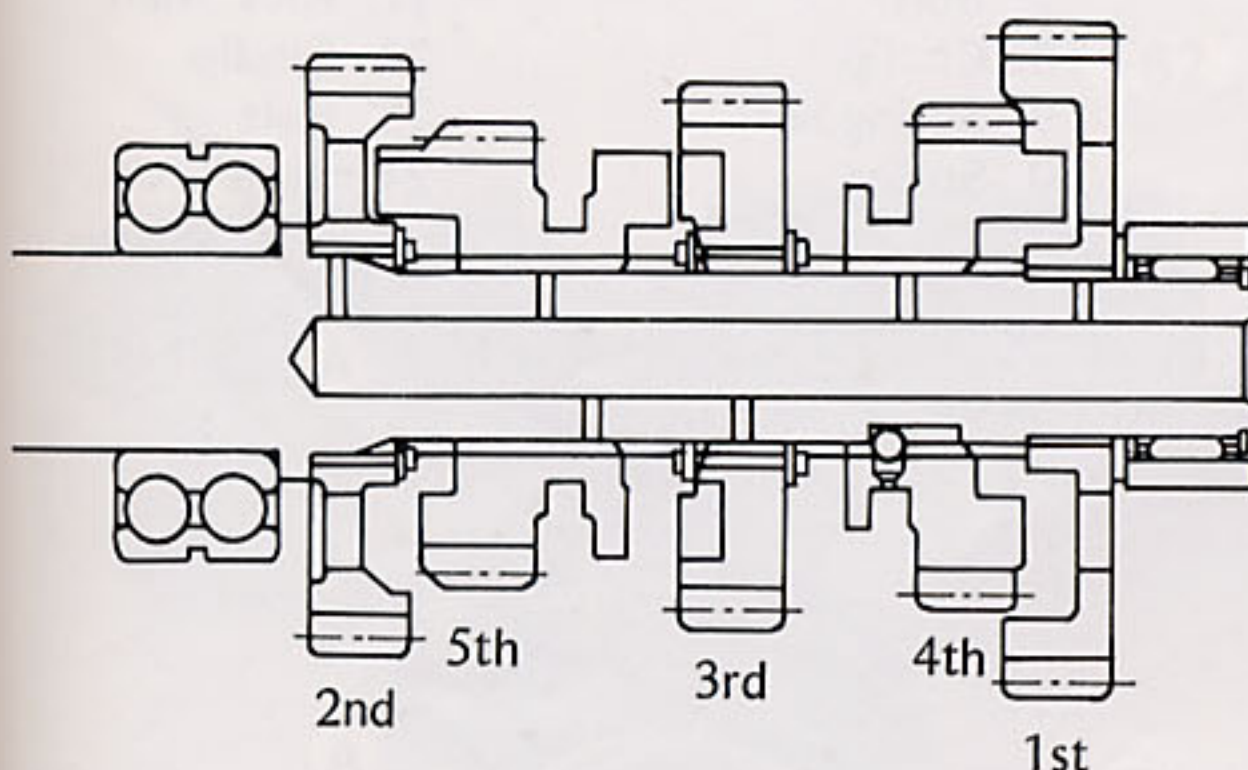
F56



Proper sequence starting with 2nd gear is: 2nd gear (face the flat side of the gear to the left), washer, circlip, 6th gear (face the fork groove side to the right), circlip, splined washer, bushing (face the chamfered side to the left), 3rd gear (face the side with the dog recesses to the left), washer, 4th gear (face the side with the dog recesses to the right), splined washer, circlip, 5th gear (face the fork groove side to the left) and steel balls (3), 1st gear (face the flat side of the gear to the right), washer(s), needle bearing, circlip, and needle bearing outer race.

Output Shaft Gears (KZ400-C)

F57



Proper sequence starting with 2nd gear is: 2nd gear (face the flat side of the gear to the left), splined washer, circlip, 5th gear (face the fork groove side to the right), circlip, splined washer, bushing (face the chamfered side to the left), 3rd gear (face the flat side of the gear

to the right), splined washer, circlip, 4th gear (face the dogs to the right) and steel balls (3), 1st gear (face the flat side of the gear to the right), washer, needle bearing, circlip, needle bearing outer race.

KICKSTARTER

Removal:

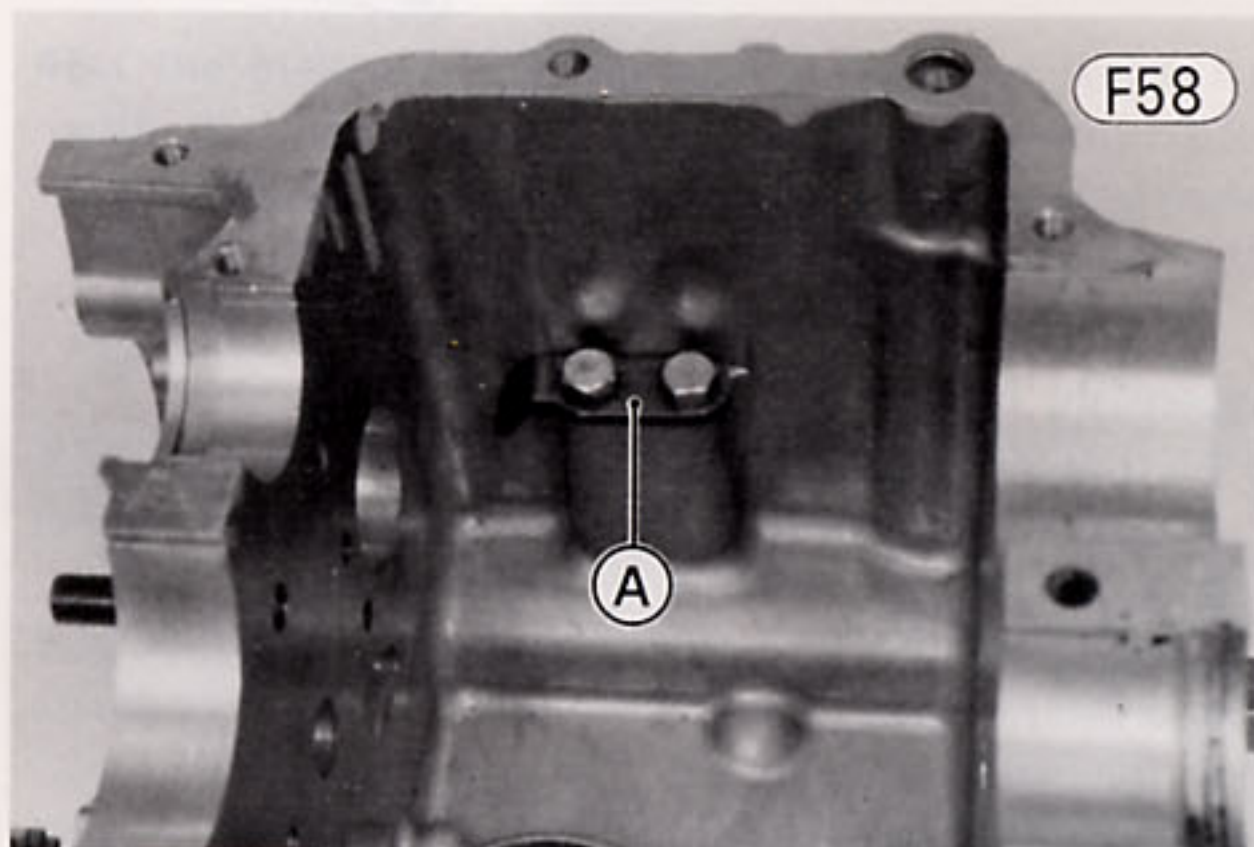
- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Split the crankcase (Pg. 84).
- Remove the circlip 22, and pull off the spring guide 18.
- Remove the kick spring 17.
- Remove the circlip 16 from the kick shaft bushing 15.
- Remove the kick shaft bushing stop screws 20 (2) and stop 19, and pull off the bushing.
- Remove the kick shaft assembly from the lower crankcase half.

Installation Notes:

1. Install the kick shaft bushing on the kick shaft, applying a high temperature grease to the inside surface of the bushing.
2. After tightening the kick shaft stop screws (2), stake each screw head with a punch to prevent loosening.
3. To install the kick spring, turn the kick shaft all the way clockwise, insert one end of the spring into the crankcase hole, insert the other end into the kick shaft using needle nose pliers, and, while holding the spring in place if necessary, insert the kick spring guide.

Disassembly:

- Remove the ratchet gear arm stop bolts 23, and remove the stop 24.



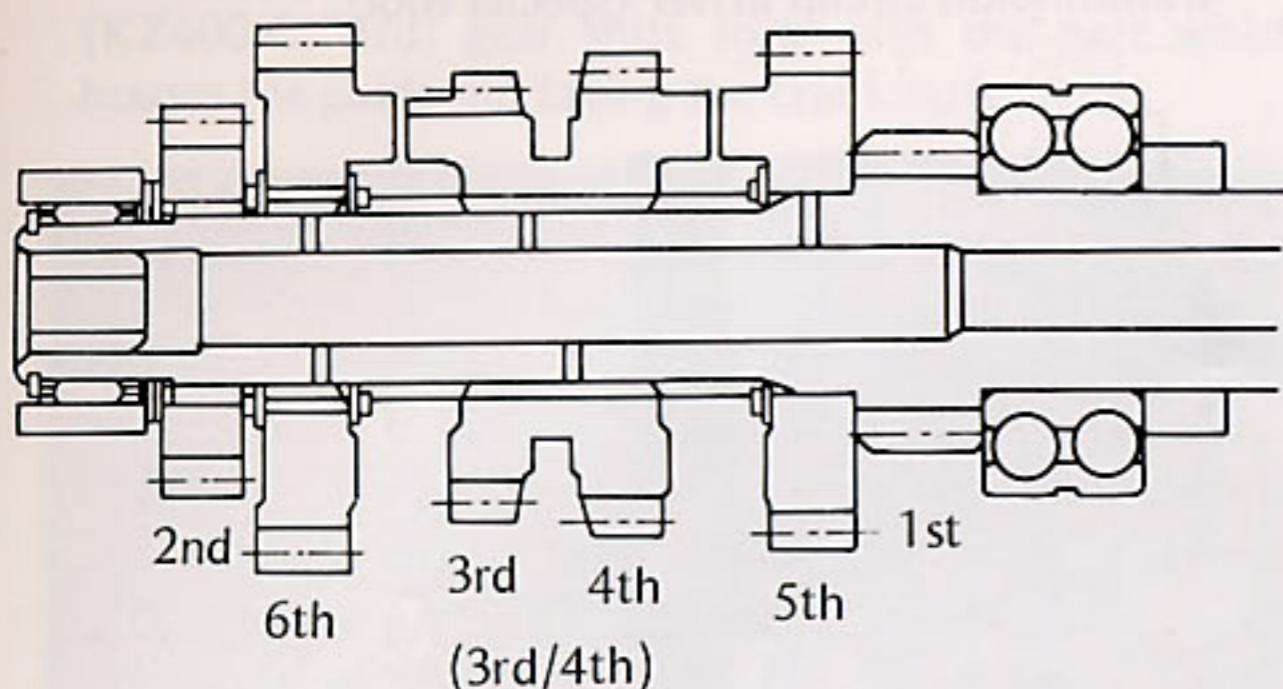
A. Ratchet Gear Arm Stop

- Remove the circlip 8 on the kick shaft end, and take off the spring seat 9, spring 10, and ratchet gear 11.
- Remove the circlip 12, and pull off the washer 13 and kick gear 14.

96 DISASSEMBLY—ENGINE REMOVED

Drive Shaft Gears (KZ400-B)

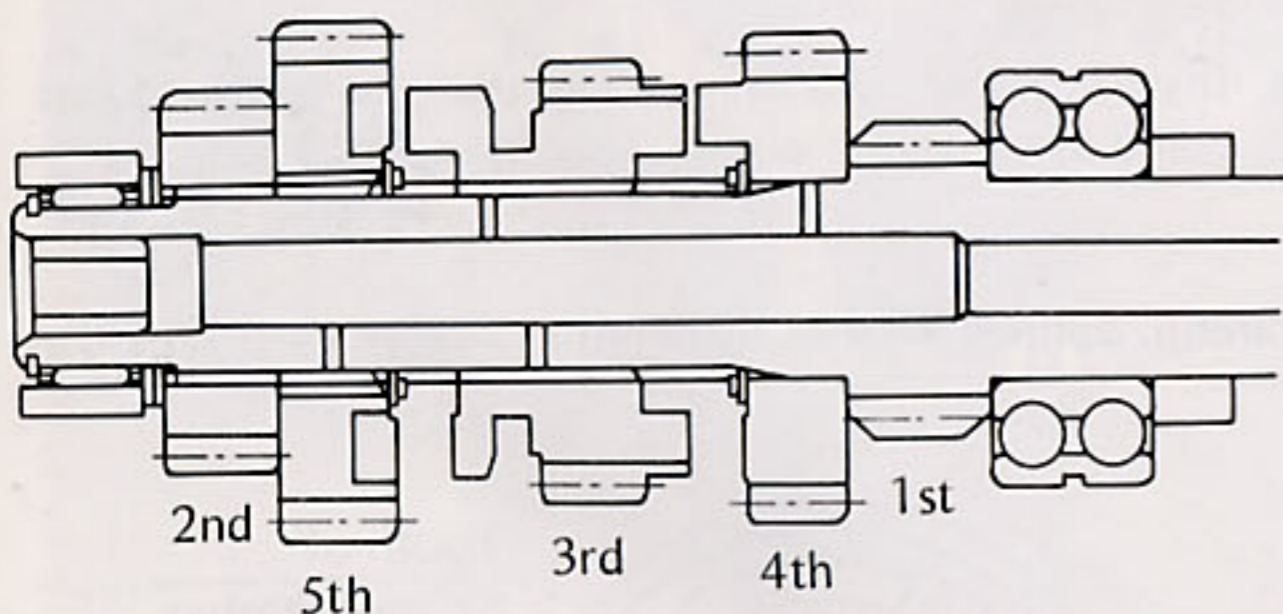
F53



Proper sequence starting with 1st gear (part of drive shaft) is: 1st gear, 5th gear (face the flat side of the gear to the right), washer, circlip, 3rd/4th gear (face 4th gear side to the right), circlip, splined washer, bushing (face the chamfered side to the right), 6th gear (face the dogs to the right), splined washer, circlip, 2nd gear, washer(s), needle bearing, circlip, and needle bearing outer race.

Drive Shaft Gears (KZ400-C)

F54

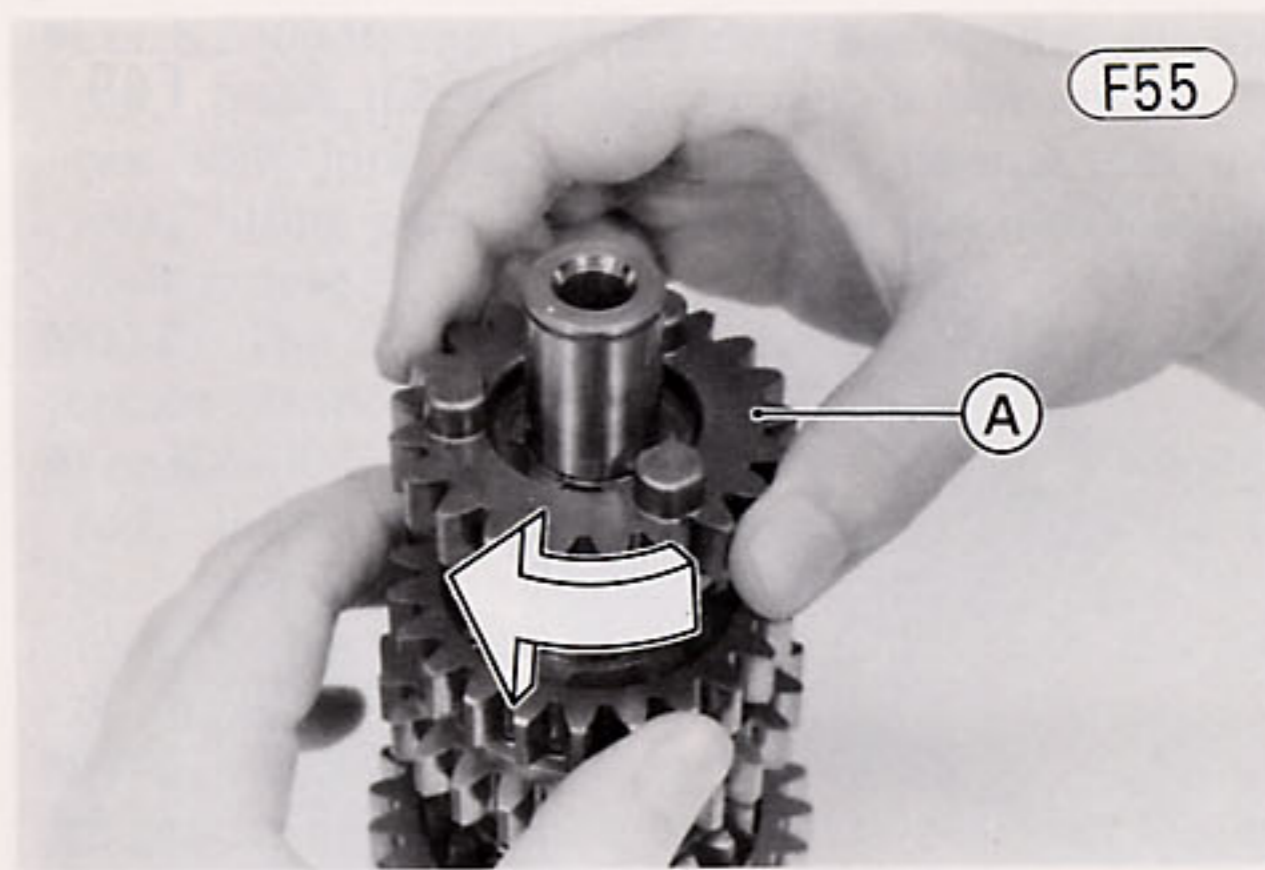


Proper sequence starting with 1st gear (part of the drive shaft) is: 1st gear, 4th gear (face the dogs to the left), splined washer, circlip, 3rd gear (face the fork groove side to the left), circlip, splined washer, bushing (face the chamfered side to the right), 5th gear (face the side with the dog recesses to the right), 2nd gear (face the chamfered side to the right), washer(s), needle bearing, circlip, and needle bearing outer race.

Output Shaft

Disassembly (KZ400-B):

- Pull off the needle bearing outer race 65.
- Remove the circlip 66, and pull off the needle bearing 64, washer(s) 63, and 1st gear 62.
- 5th gear 58 has three steel balls 51 (3) assembled into it for neutral positioning. To remove this gear with the balls, quickly spin the shaft in a vertical position while holding 3rd gear 52 or 4th gear, and pull off 5th gear upwards.



F55

A. 5th Gear

- Remove the circlip 57, and pull off the splined washer 56, 4th gear 54, washer 53, 3rd gear 52, bushing 55, and splined washer 61.
- Remove the circlip 60, and pull off the 6th gear 59.
- Remove the circlip 50, and pull off the washer 40, and 2nd gear 48.
- Using the bearing puller (special tool), remove the output shaft ball bearing 46.

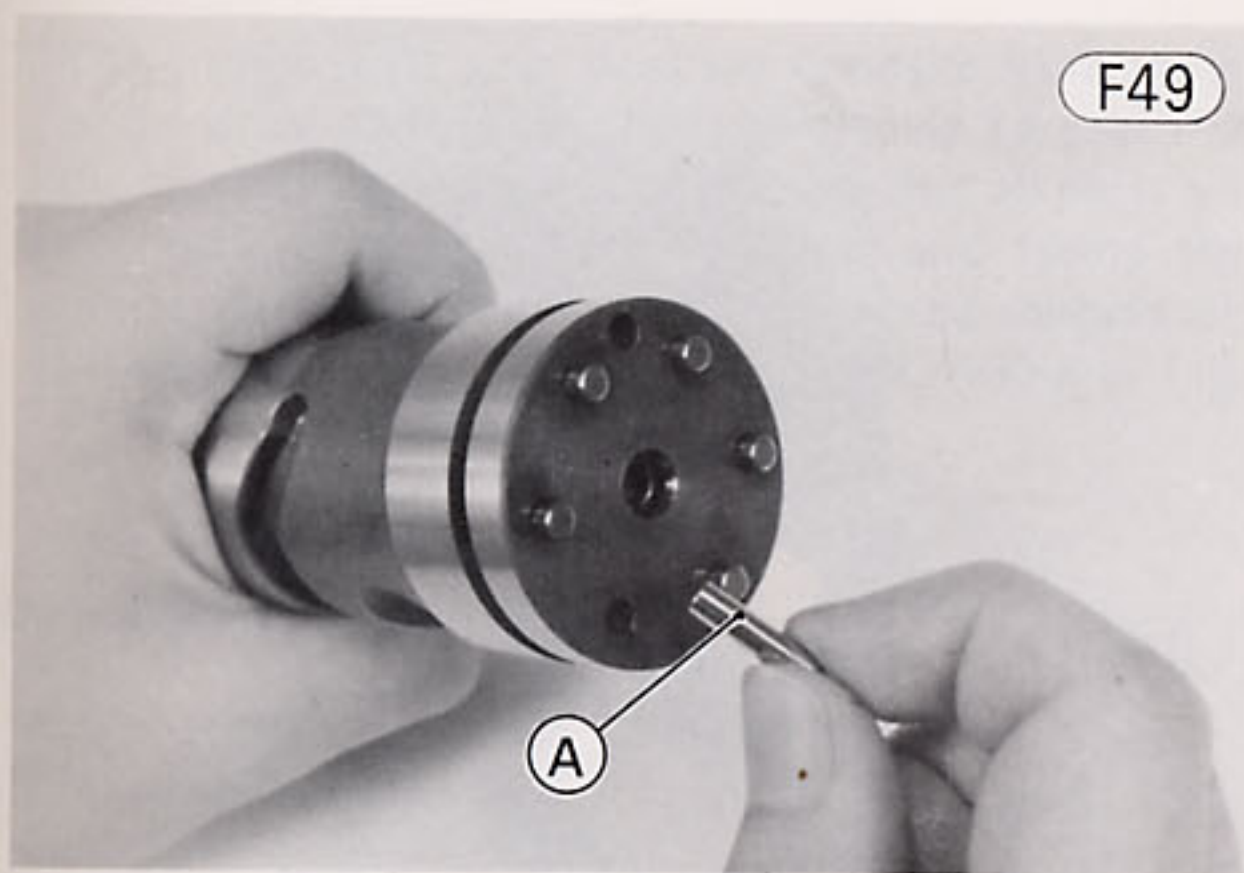
Disassembly (KZ400-C):

- Remove the needle bearing outer race 61.
- Remove the circlip 62, and pull off the needle bearing 60, washer 59, and 1st gear 58.
- 4th gear 57 has the steel balls 52 (3) assembled into it for neutral positioning. To remove this gear with the balls, quickly spin the shaft in a vertical position while holding 3rd gear 53, and pull off 4th gear upwards.
- Remove the circlip 56, and pull off the splined washer 55, 3rd gear 53, bushing 54, and splined washer 51.
- Remove the circlip 50, and pull off 5th gear 49.
- Remove the circlip 48, and pull off the splined washer 47 and 2nd gear 46.
- Using the bearing puller (special tool), remove the output shaft ball bearing 44.

Assembly Notes:

1. Install the output shaft ball bearing using the transmission circlip driver (special tool).
2. To install a circlip without damage, fit the circlip onto the shaft expanding it only enough to install it, and use a suitable gear to push the circlip into place.
3. Replace any circlips that were removed with new ones. Install the circlip so that the opening coincides with one of the splined grooves in the driver shaft (Fig. F52).
4. Install the splined washer so that its teeth do not coincide with the circlip opening (Fig. F52).
5. Do not use grease on the three balls during assembly; these balls must be able to move freely.
6. When assembling 6th gear and the 3rd-4th gear bushing (KZ400-C: 5th gear and the 3rd gear bushing) to the output shaft, align the oil holes with the holes in the shaft.

F49



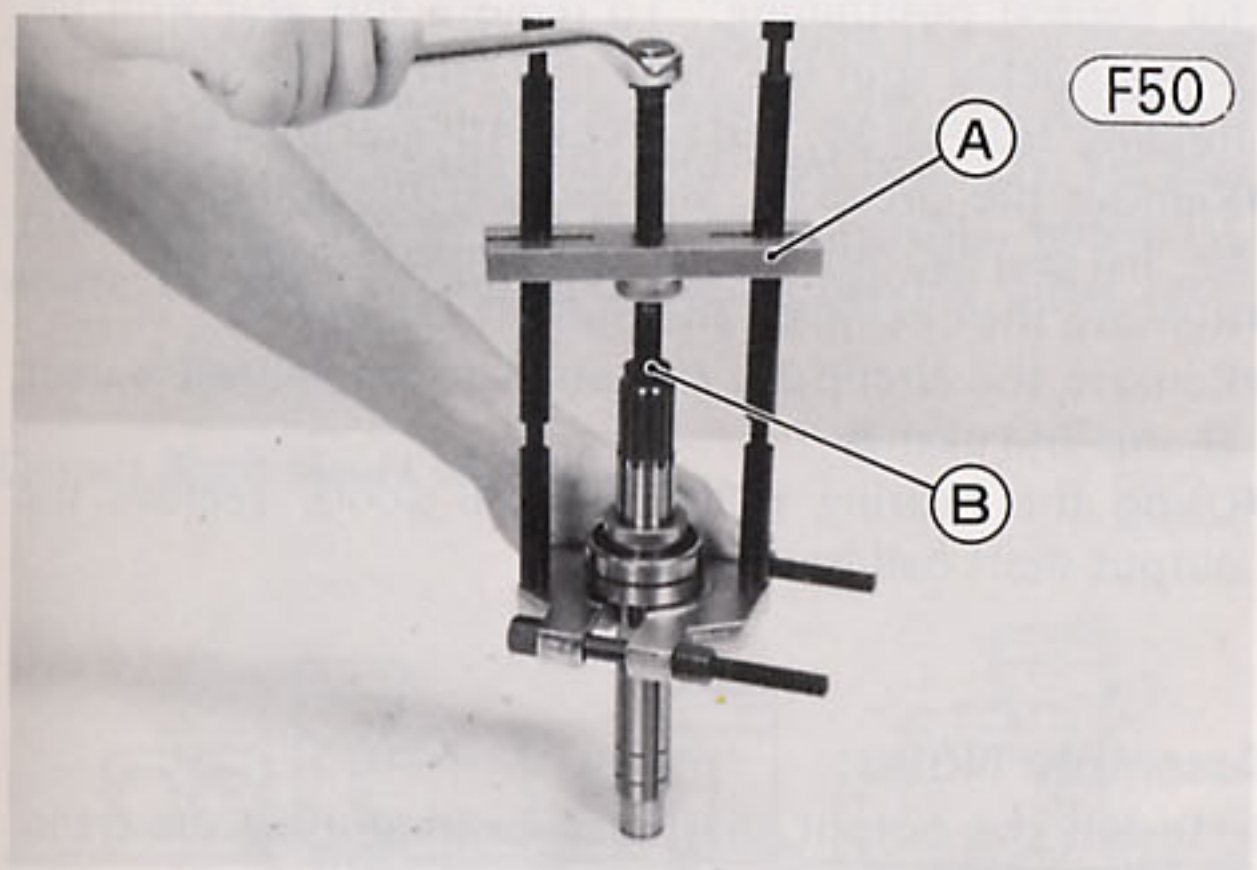
A. Pins

Drive Shaft

Disassembly (KZ400-B):

- Remove the needle bearing outer race ③.
- Remove the circlip ①, and pull off the needle bearing ④, washer(s) ⑤, and 2nd gear ⑥.
- Remove the circlip ⑦, and pull off the splined washer ⑧, 6th gear ⑨, bushing ⑩, and splined washer ⑪.
- Remove the circlip ⑫, and pull off the 3rd/4th gear ⑬.
- Remove the circlip ⑭, and pull off the washer ⑮ and 5th gear ⑯.
- Remove the ball bearing ⑰ and collar ⑱ using the bearing puller and adapter (special tools).

F50



A. Bearing Puller (57001-135)
B. Adapter (57001-317)

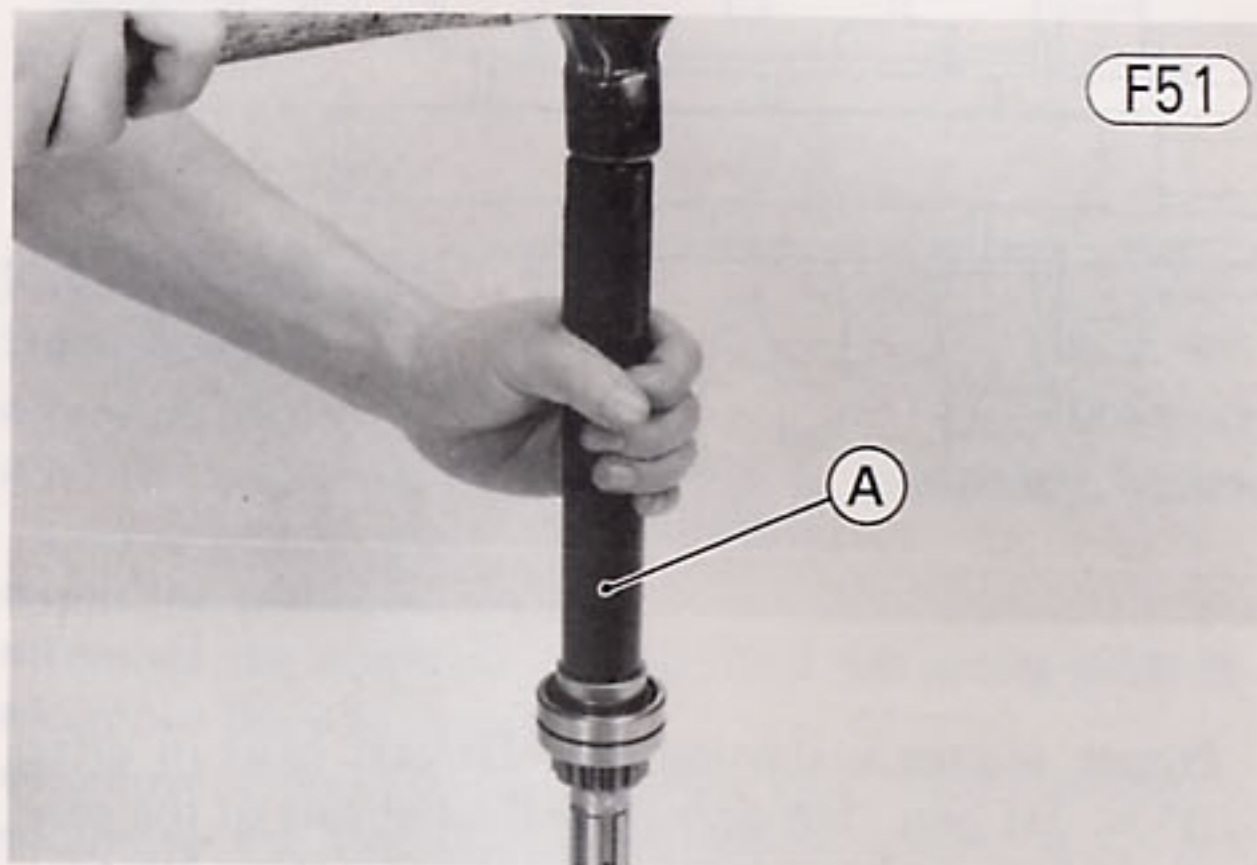
Disassembly (KZ400-C):

- Remove the needle bearing outer race ③
- Remove the circlip ①, and pull off the needle bearing ④, washer(s) ⑤, 2nd gear ⑥, 5th gear ⑦, bushing ⑧, and splined washer ⑨.
- Remove the circlip ⑩, and pull off the 3rd gear ⑪.
- Remove the circlip ⑫, and pull off the splined washer ⑬ and 4th gear ⑭.
- Remove the ball bearing ⑯ and collar ⑰ using the bearing puller and adapter (special tools).

Assembly Notes:

1. Install the drive shaft ball bearing and collar using the transmission circlip driver (special tool).

F51

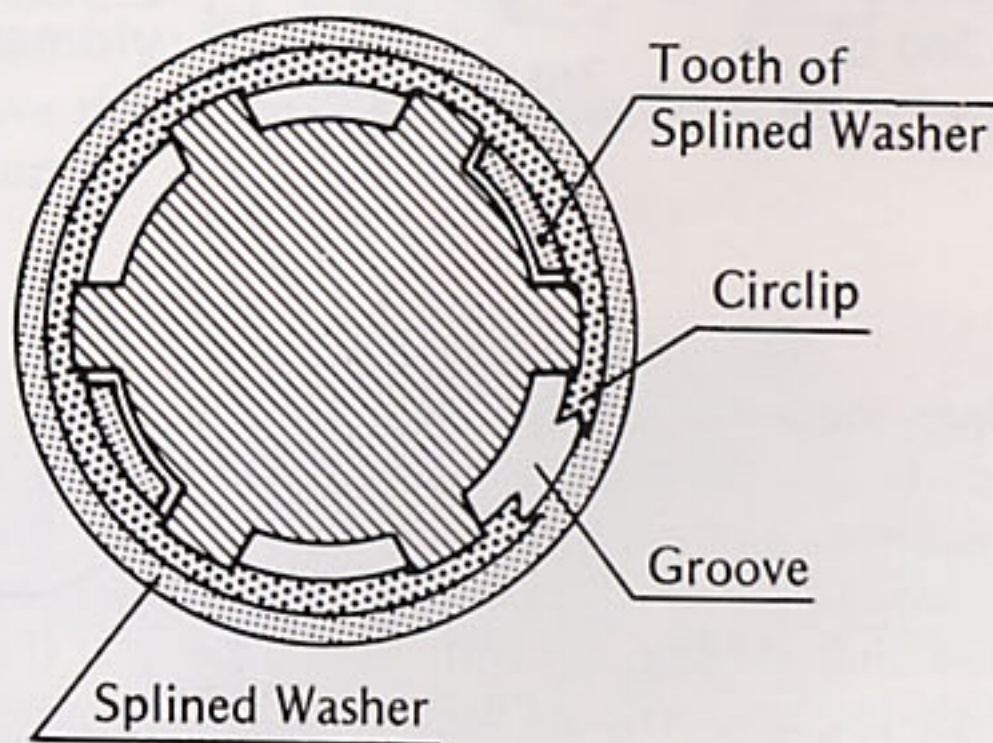


A. Transmission Circlip Driver (57001-380)

2. To install a circlip without damage, fit the circlip onto the shaft expanding it onto enough to install it, and use a suitable gear to push the circlip into place.
3. Replace any circlips that were removed with new ones. Install the circlip so that the opening coincides with one of the splined grooves in the output shaft (Fig. F52).
4. Install the splined washer so that its teeth do not coincide with the circlip opening (Fig. F52).

Circlip, Splined Washer Installation

F52

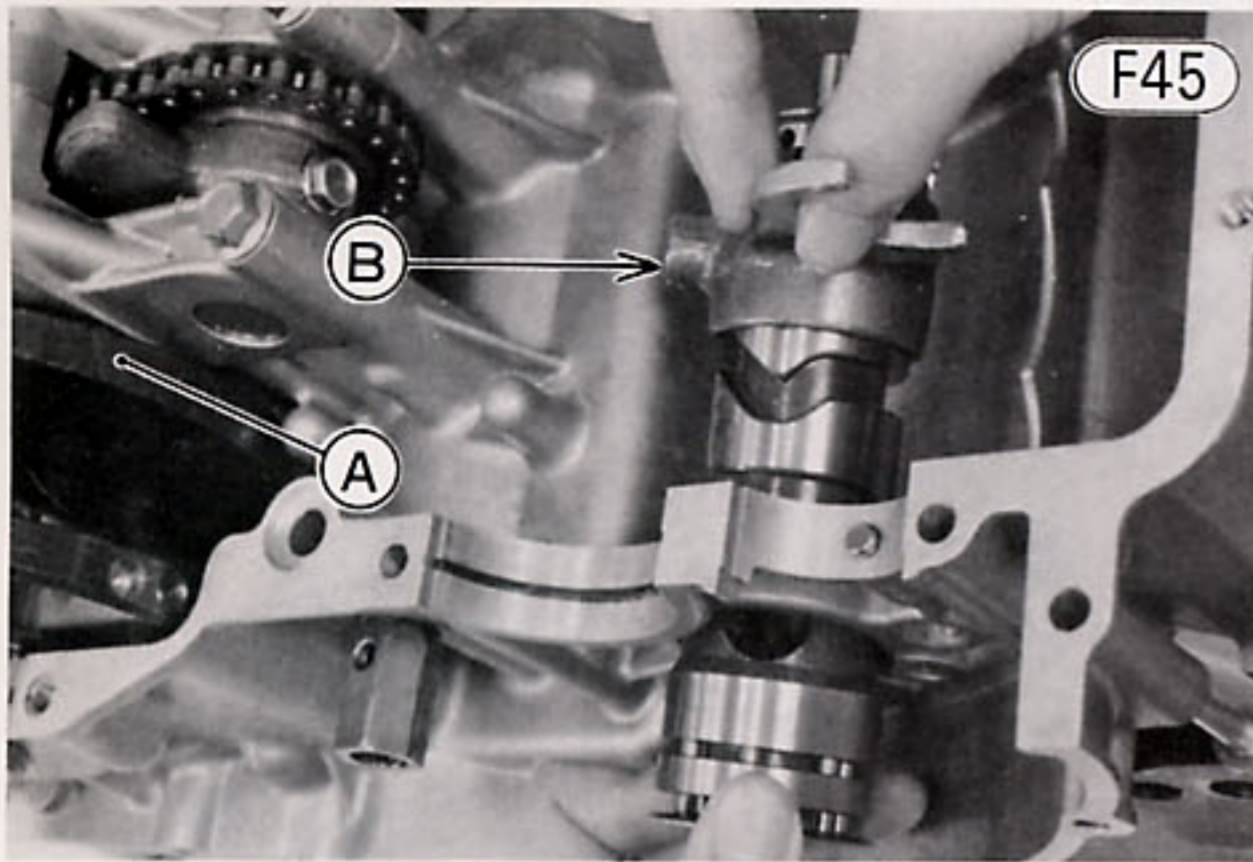


5. When assembling 3rd/4th gear and the 6th gear bushing (KZ400C: 3rd gear and the 5th gear bushing) to the drive shaft, align the oil holes with the holes in the shaft.
6. The drive shaft gears can be recognized by size, the gear with smallest diameter being 1st gear, and the largest one being top gear. Be sure that all parts are put back in the correct sequence, facing the proper direction, and all circlips and washers are properly in place. See Fig. F53 for KZ400-B or Fig. F54 for KZ400-C.

94 DISASSEMBLY—ENGINE REMOVED

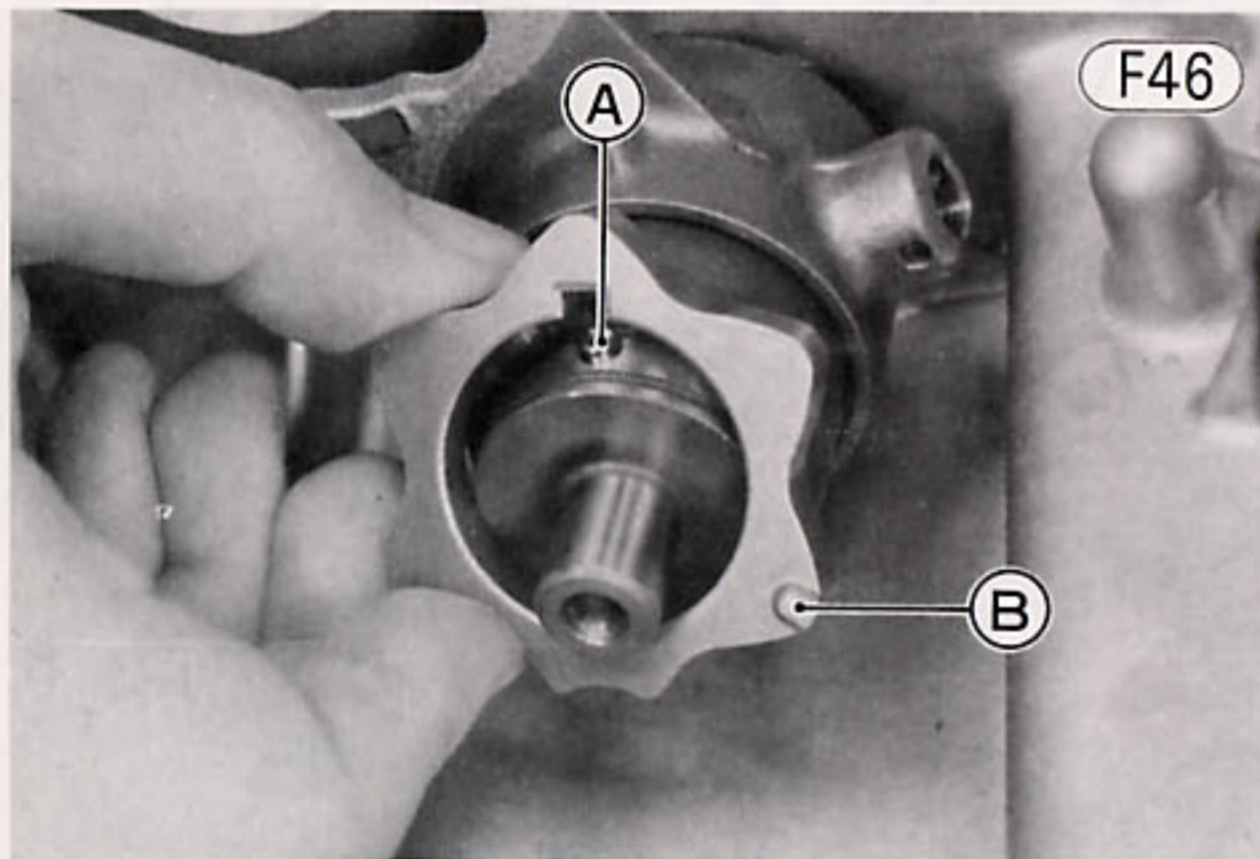
Installation:

- Apply a little engine oil to the shift drum. Insert the shift drum into the crankcase, and install the 3rd/4th (KZ400-C: 3rd) gear shift fork with the part which houses the guide pin facing the crankshaft.



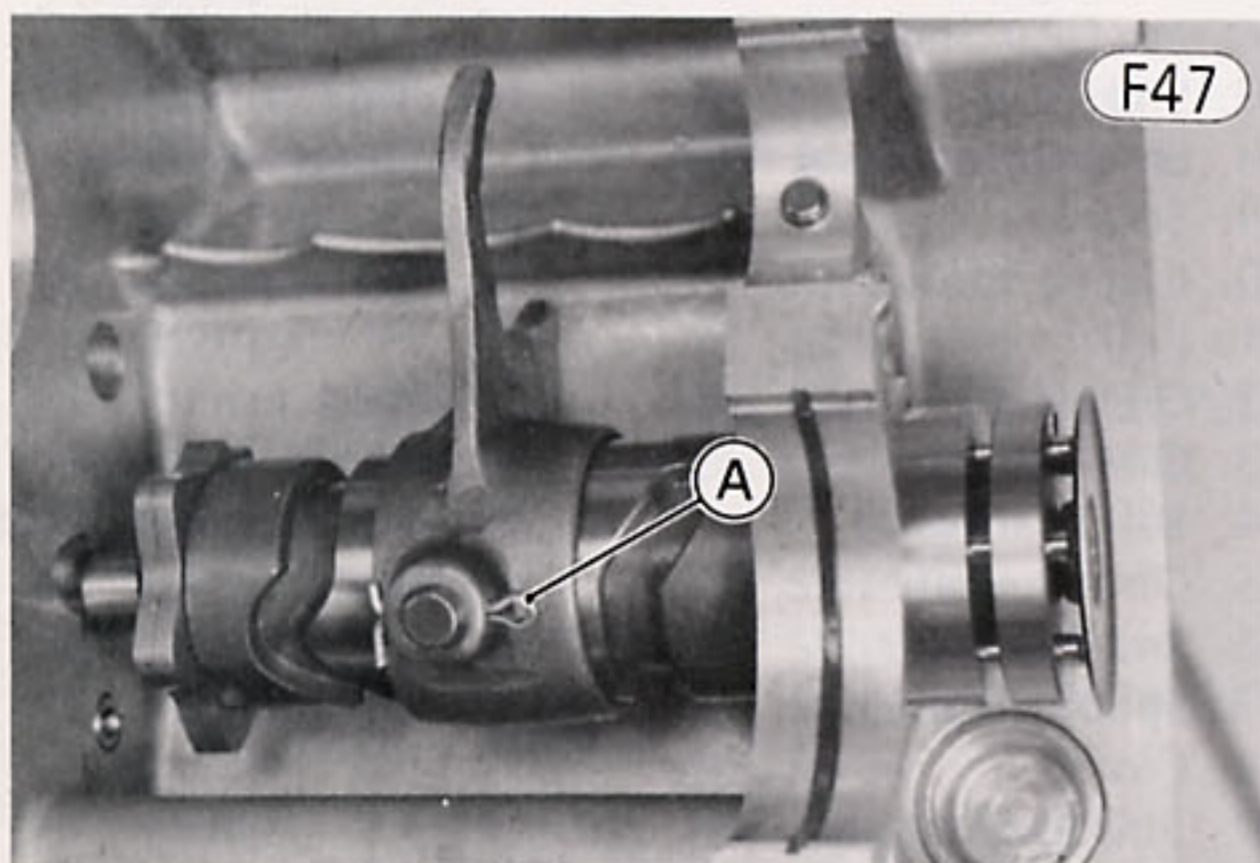
A. Crankshaft B. Guide Pin Hole

- Fit the operating plate pin onto the shift drum, install the operating plate with its projection facing the neutral switch, and install the circlip.



A. Pin B. Projection

- Put the shift fork guide pin into the 3rd/4th (KZ400-C: 3rd) gear shift fork. The guide pin rides in the middle groove of the three guide pin grooves.
- Insert a new cotter pin through the shift fork and guide pin, and spread its ends.



A. Cotter Pin

- For KZ400-B, apply a little clean engine oil to the shift rod. Insert the shift rod, running it through the 5th gear shift fork, and then through the 6th gear shift fork, fitting each shift fork guide pin into the shift drum groove.

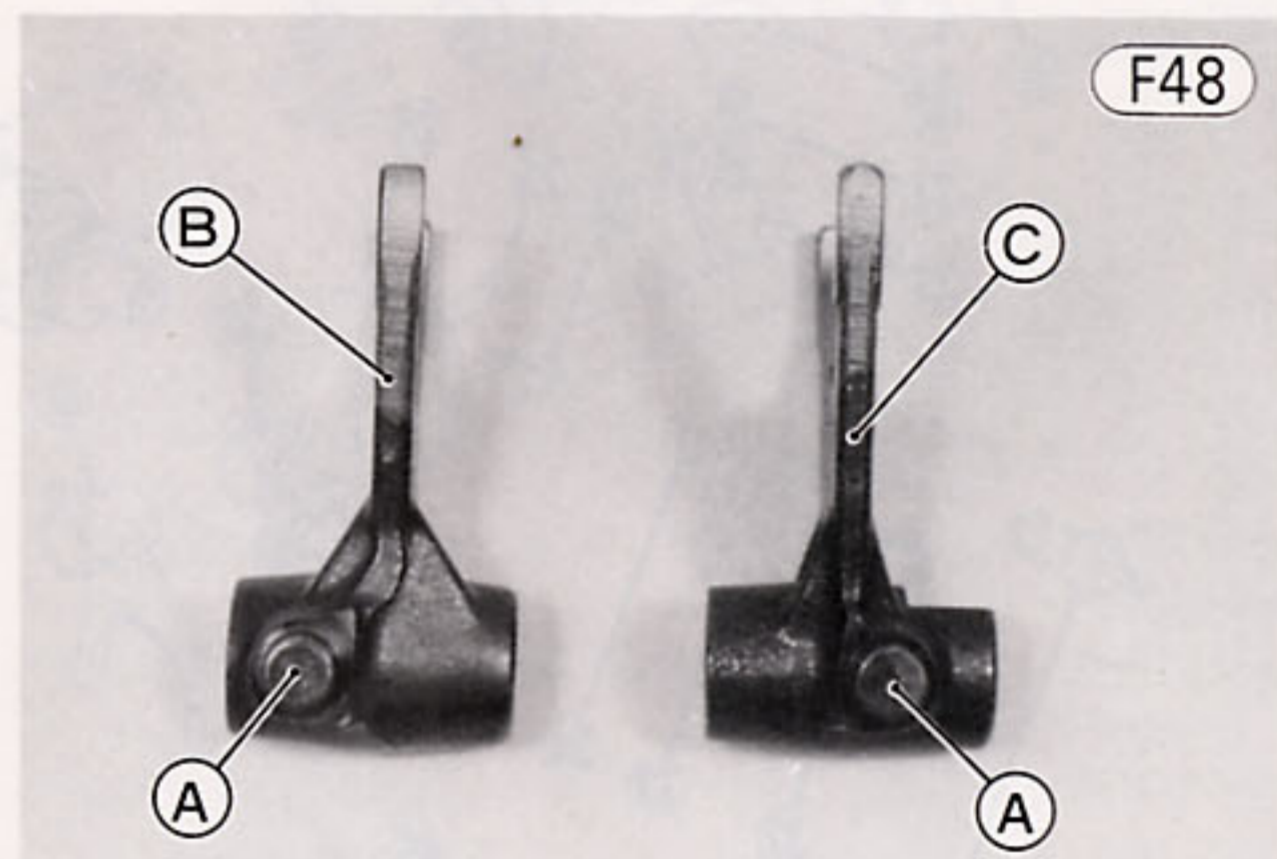
NOTE: The 5th gear shift fork and the 6th gear shift fork are identical.

- For KZ400-C, apply a little clean engine oil to the shift rod. Insert the shift rod, running it through the 4th gear shift fork, and then through the 5th gear shift fork, fitting each shift fork guide pin into the shift drum groove.

NOTE: Identification of the shift forks.

5th gear shift fork: Shift fork guide pin is in the left side of the fork hub.

4th gear shift fork: Shift fork guide pin is in the right side of the fork hub.



A. Guide Pin C. 4th Gear Shift Fork
B. 5th Gear Shift Fork

- Fit the shift drum guide plate, tighten its screws (2), and stake each screw head with a punch to prevent loosening.
- Install the shift drum positioning pin, spring, and bolt with an aluminum washer (use a new one if it is damaged), and tighten it to 3.5 kg-m (25 ft-lbs) of torque.
- Assemble the crankcase (Pg. 87).
- Install the engine (Pg. 83).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Carry out the adjustment procedures listed at the end of the engine installation section (Pg. 84).

Shift Drum

Disassembly:

- Remove the screw (30) and the shift drum pin plate (29).
- Pull out the pins (28) (6).

Assembly Note:

- Install the shift drum needle bearings from the right side of the crankcase using a suitable driver. Press them into place until the bearing right end is even with the end of the hole.