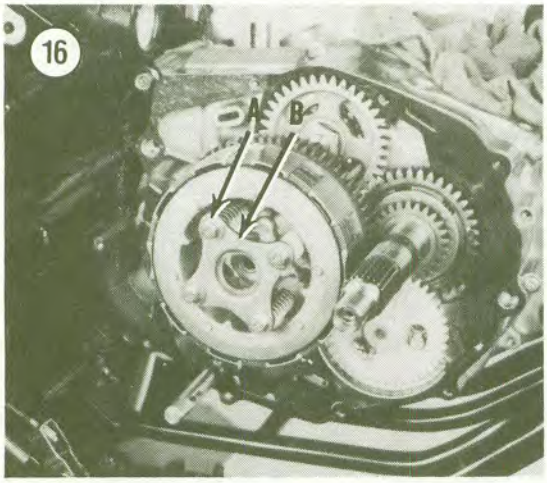
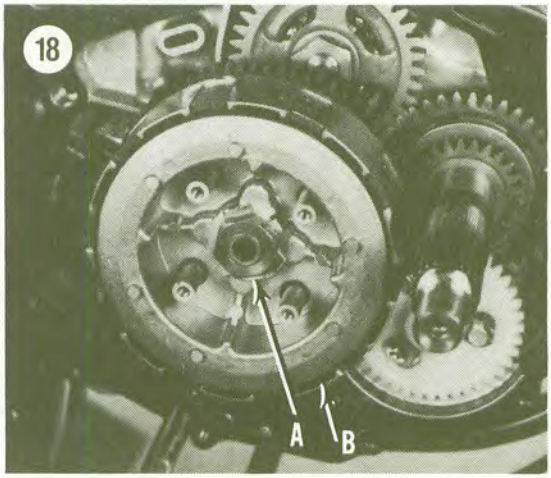
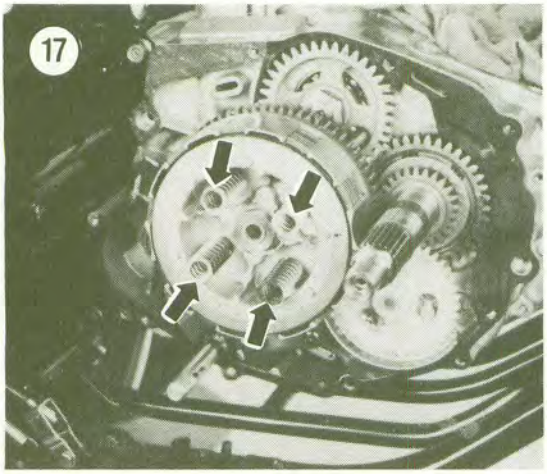
13. Refer to **Figure 16**. Remove the 4 spring plate bolts (A) and remove the spring plate (B).
14. Remove the 4 clutch springs (**Figure 17**).
15. Using a large bladed screwdriver or chisel, carefully pry the lockwasher tab away from the clutch nut (A, **Figure 18**).
16. Secure the secondary clutch assembly with a universal holding tool and remove the clutch nut and washer.
17. Remove the pressure plate and clutch plates (B, **Figure 18**).
18. Remove the washer (**Figure 19**).
19. Remove the clutch housing (**Figure 20**).

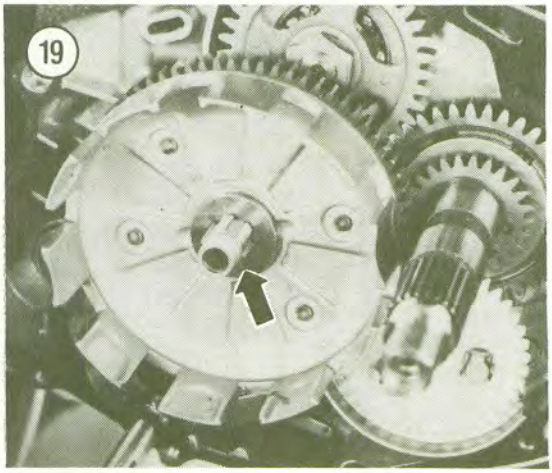
Primary Clutch Inspection

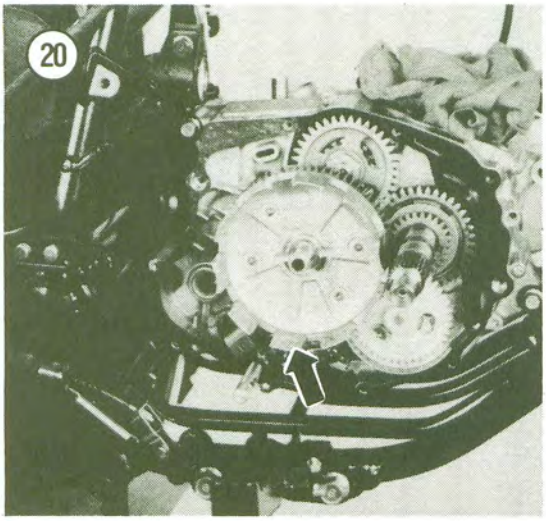
1. Clean all parts in a petroleum-based solvent such as kerosene, and thoroughly dry with compressed air.
2. Rotate the one-way clutch inner race (**Figure 21**). It should only rotate *clockwise*. If if will rotate counterclockwise, even the slightest amount, it is defective and must be replaced by removing the one-way clutch assembly as a set. See **Figure 22**.
3. Inspect the inside contact surfaces of the outer drum (**Figure 23**) for scratches, scoring or heat damage (bluish tint). If there are deep grooves (deep enough to catch a fingernail) the outer drum should be replaced. If there are indications of heat damage, the outer drum may be distorted and must be replaced.
4. Inspect the teeth on the outer drum primary drive gear (**Figure 24**). Remove any small nicks on the gear teeth with an oilstone. If damage is severe, the outer drum must be replaced. Also check the drive teeth on the secondary clutch outer housing; it may need servicing or replacement.
5. Inspect the primary clutch shoe linings (**Figure 25**) for uneven wear, cracks, discoloration or







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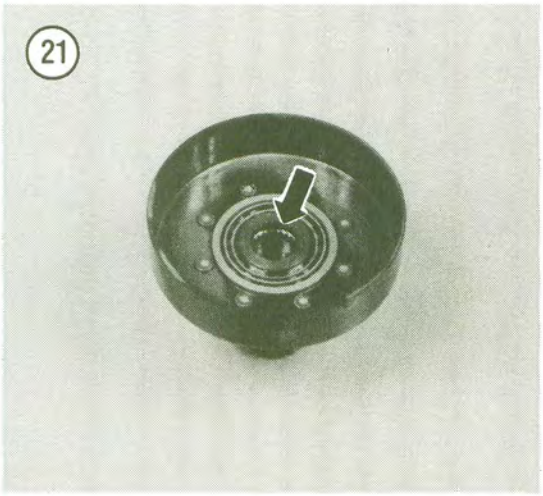
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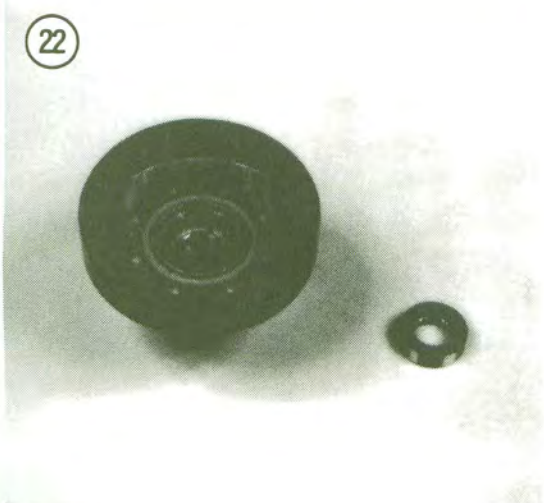
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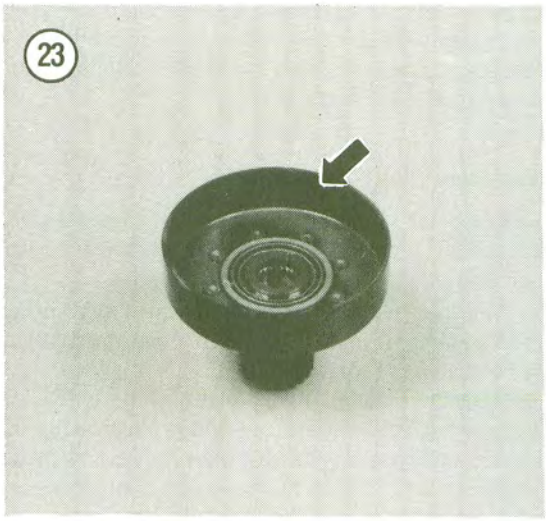
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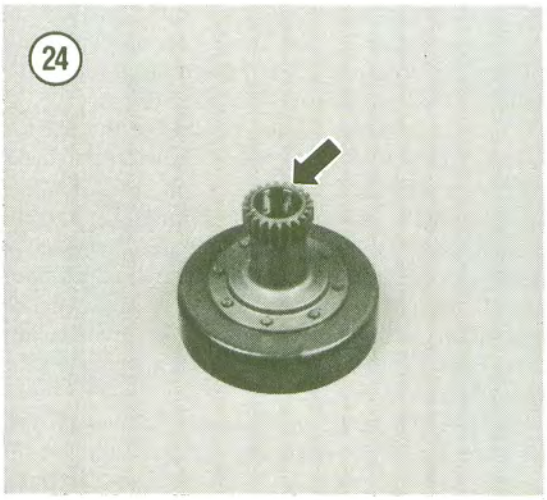
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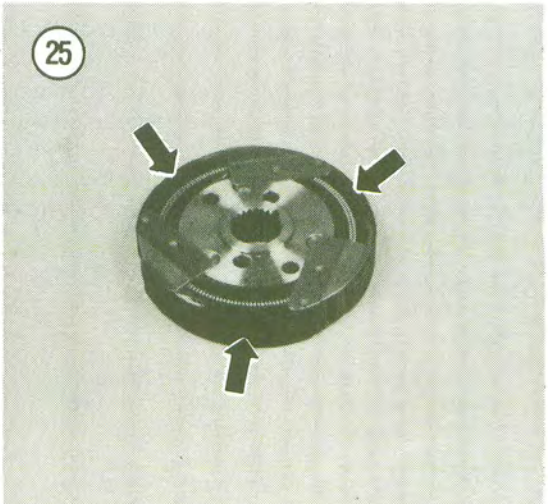
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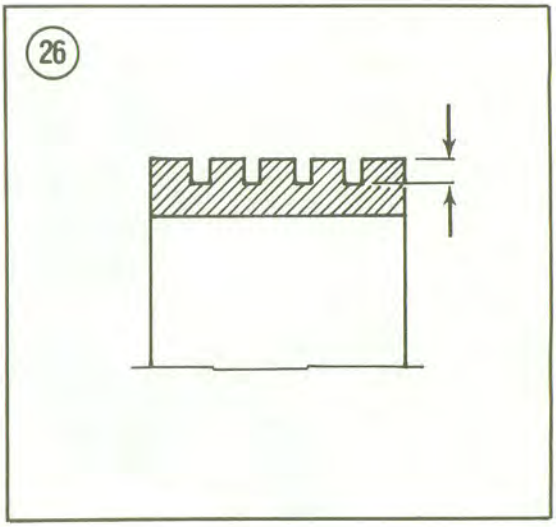
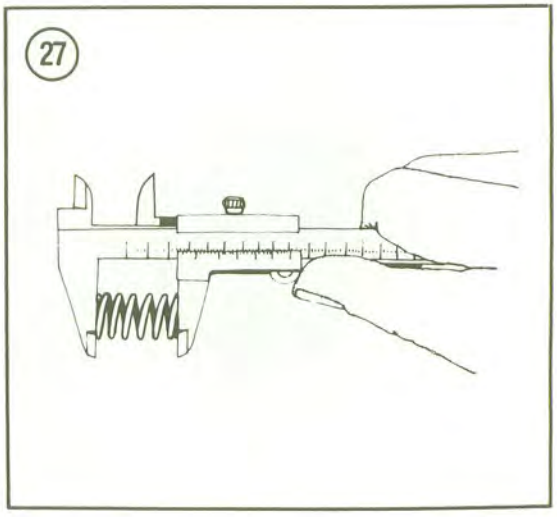
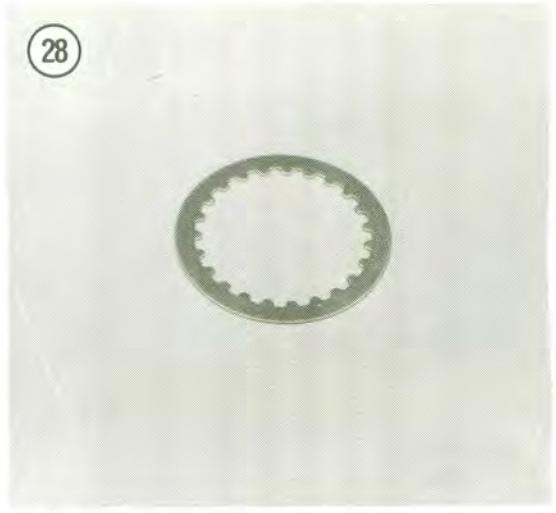
damaged friction material. Also measure the shoe lining depth (**Figure 26**) with a vernier caliper and compare to specifications in **Table 1**. Replace the shoe assembly if necessary.



Secondary Clutch Inspection

1. Clean all clutch parts in a petroleum-based solvent such as kerosene, and thoroughly dry with compressed air.
2. Measure the free length of each clutch spring with a caliper (**Figure 27**). Replace any springs that are too short (**Table 1**).
3. Check the clutch metal plates (**Figure 28**) for warpage using a flat surface and a feeler gauge as shown in **Figure 29**. If any plate is warped more than specified (**Table 1**), replace the entire set of plates. Do not replace only one or 2 plates.
4. Measure the thickness of each friction disc (**Figure 30**) at several places around the disc as shown in **Figure 31**. See **Table 1** for specifications. Replace all friction discs if any one is found too thin. Do not replace only one or 2 discs.
5. Check the tangs on the outside of the friction discs (**Figure 30**). If any plate is worn or damaged, the discs must be replaced as a set.
6. Inspect the clutch housing (**Figure 32**) and the clutch boss assembly (**Figure 33**) for cracks or galling in the grooves where the clutch plates slide. They must be smooth for consistent clutch operation. If damage is only minor, remove any small burrs with a fine cut file; if damage is severe, replace the component.
7. Check the teeth on the clutch housing gear (**Figure 34**). If the teeth are damaged, replace the clutch housing assembly. Also check the teeth on the outer drum primary drive gear; it may also need replacing.
8. Check the pressure plate screw studs (**Figure 35**) for cracks or damage. Check the threads for stripping or other damage. Thread damage may be cleaned with a M6×1.25 tap. Replace the pressure plate if necessary.
9. Check the clutch spring plate push rod and bearing for wear or damage. Replace worn or damaged parts as necessary.





Assembly/Installation

NOTE

If either or both friction discs and clutch plates have been replaced with new ones, apply new engine oil to all surfaces to avoid having the clutch plates wear prematurely when used for the first time.

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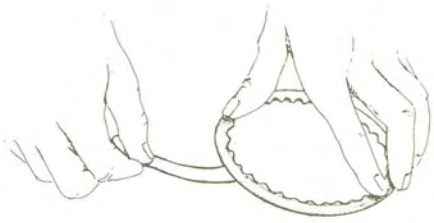

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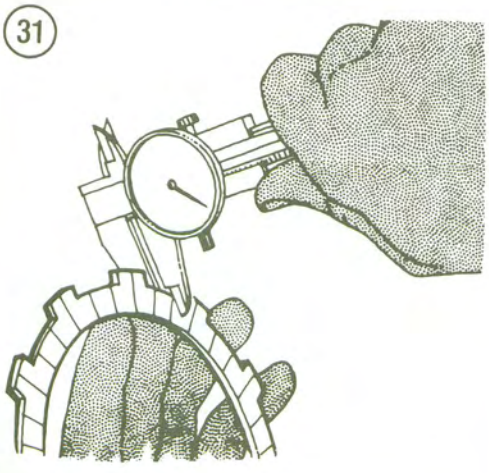

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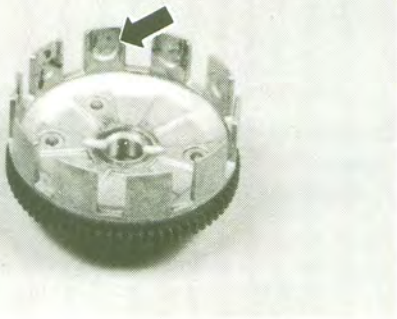

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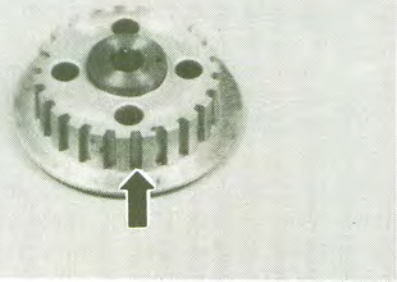

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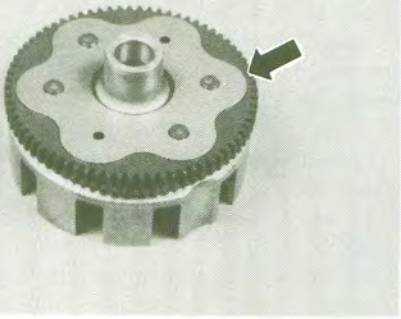

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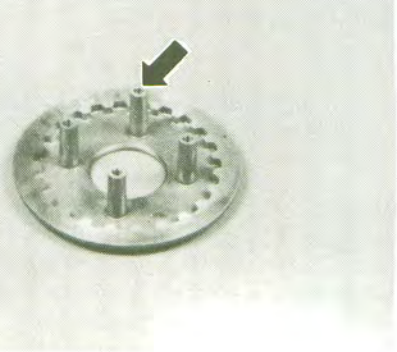


1. Lubricate all bearing surfaces with clutch/transmission oil.

NOTE
Steps 2-12 describe installation of the secondary (manual) clutch assembly.

2. Slide the clutch housing (**Figure 20**) onto the mainshaft.
3. Install the thrust washer (**Figure 19**).

NOTE
The clutch housing must be partially assembled before installation.

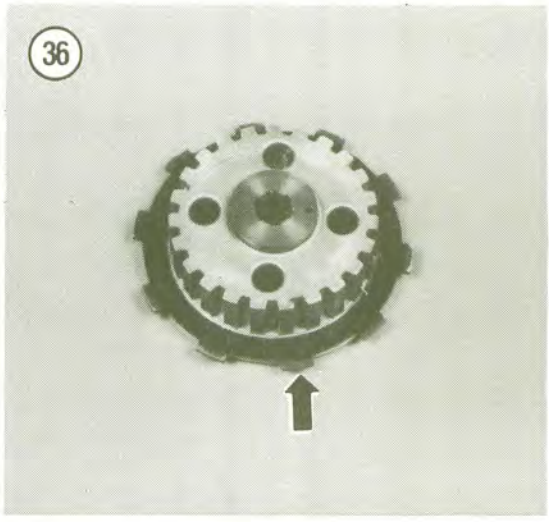
4. Place the clutch boss on the workbench so that back side faces up (**Figure 33**).

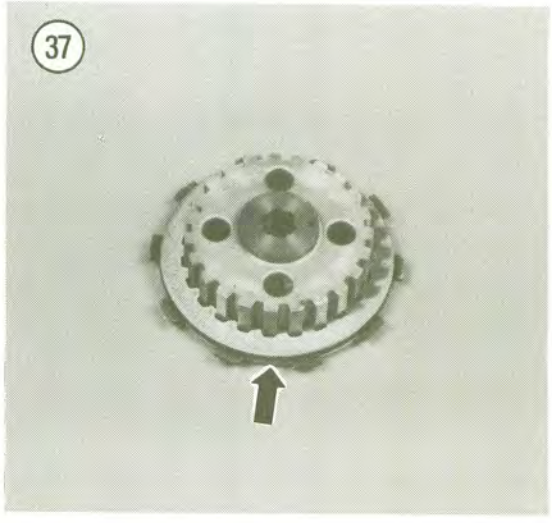
CAUTION
If either or both friction and/or clutch plates have been replaced with new ones or if they were cleaned, apply new clutch/transmission oil to all plate surfaces. This will prevent the plates from burning up when used for the first time.

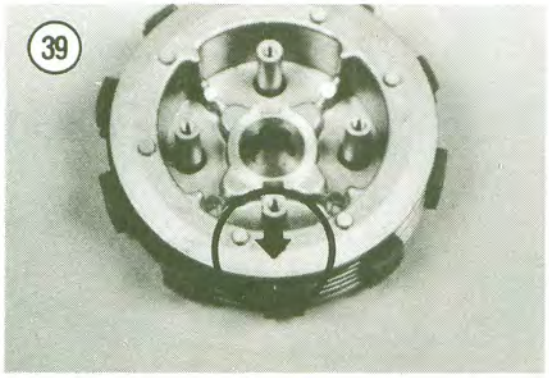
5. Install a friction plate (**Figure 36**) and a steel clutch plate (**Figure 37**). Alternate until all plates are installed (**Figure 38**). The last plate installed should be a friction plate.
6. Align the arrow on the clutch boss (**Figure 39**) with the arrow or round mark on the pressure plate (**Figure 40**) and install the pressure plate. See **Figure 41**.
7. Install a spring, washer and bolt into the pressure plate to lock the sub-assembly together. See **Figure 42**.
8. Align the subassembly with the clutch housing and install it onto the transmission main shaft. See **Figure 43**.
9. Remove the bolt, washer and clutch spring installed in Step 6. Then install the secondary clutch lockwasher and clutch nut. Hold the clutch assembly with the same tool used during disassembly and tighten the clutch nut to specifications in **Table 2**. Bend the lockwasher tab over the nut to lock it.

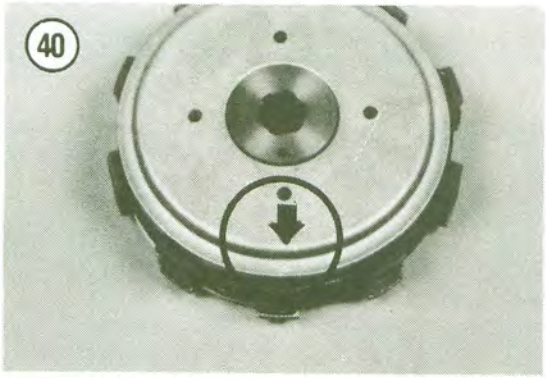
NOTE
If all of the clutch nut lockwasher tabs have been used, install a new lockwasher.

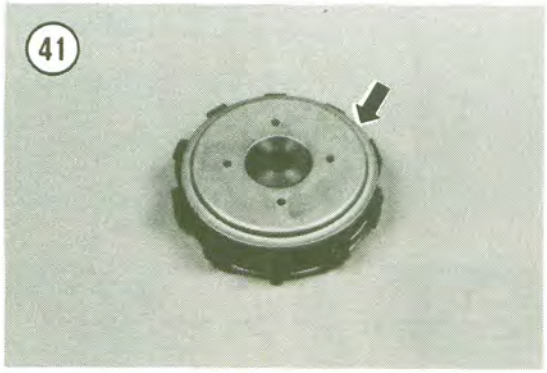
10. Install the clutch springs (**Figure 17**) and the spring plate (**Figure 16**). Install the 4 clutch spring bolts. Tighten the bolts in a crisscross pattern in 2-3 stages to the specifications in **Table 2**.
11. Install the bearing (**Figure 15**).
12. Install the pushrod (**Figure 14**).

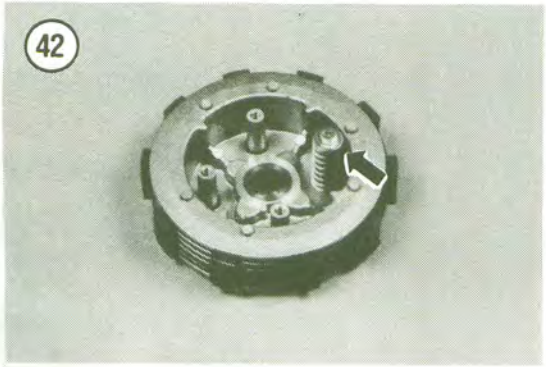












NOTE
Steps 13-16 describe installation of the primary (centrifugal) clutch assembly.

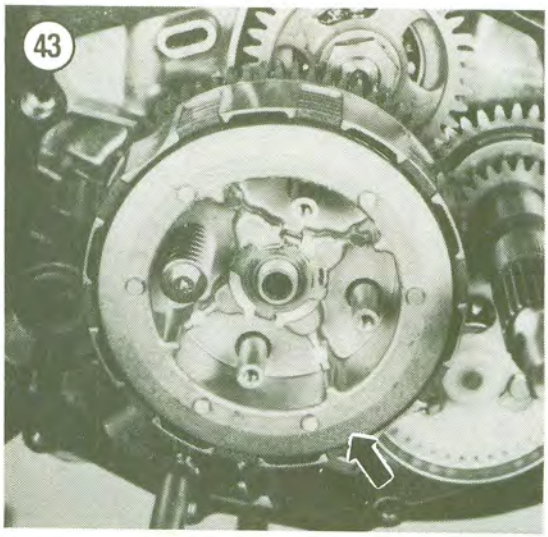
13. Align the notch in the secondary clutch housing with the crankshaft (**Figure 11**).

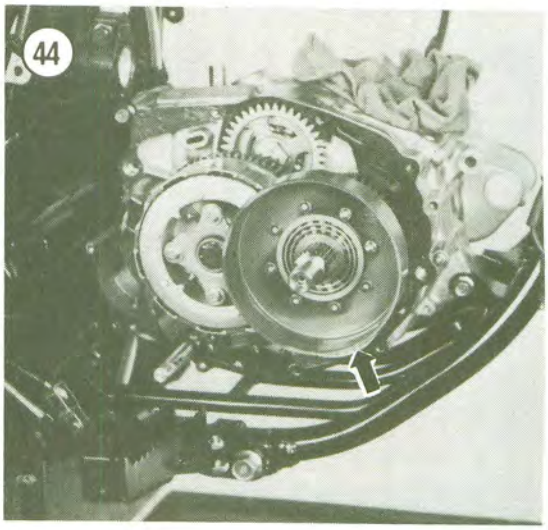
14. Install the primary clutch washer (**Figure 13**).

15A. If the primary clutch assembly was not disassembled, slide it (**Figure 12**) onto the crankshaft.

15B. If the primary clutch was disassembled, assemble it as follows:

a. Install the primary clutch housing (**Figure 44**).

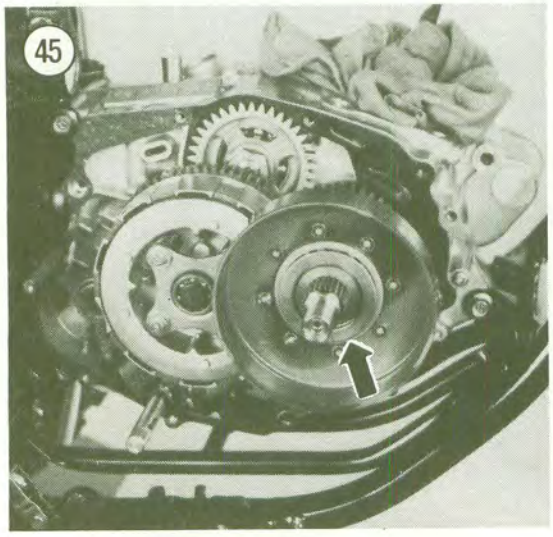


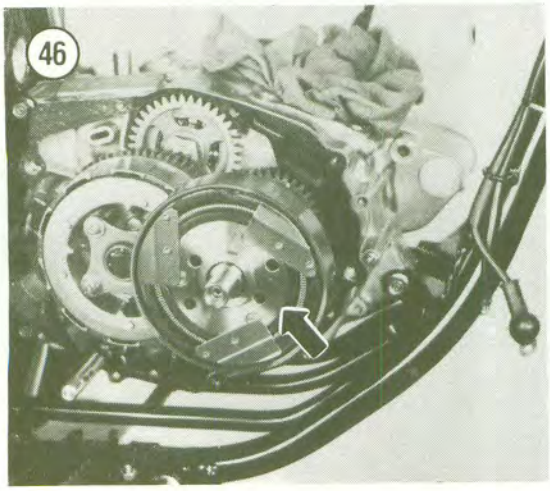


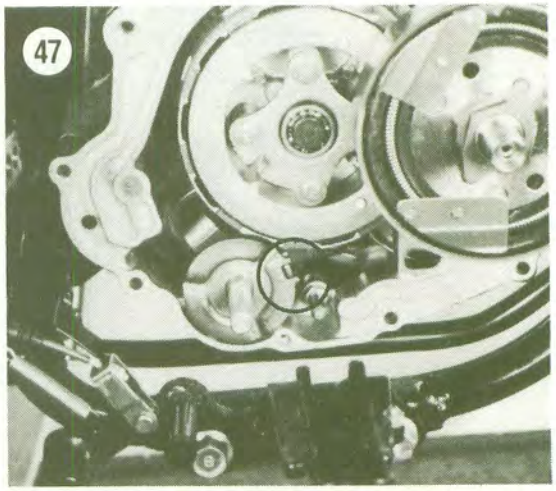
b. Install the washer (**Figure 45**).
c. Install the primary clutch friction plate assembly (**Figure 46**).

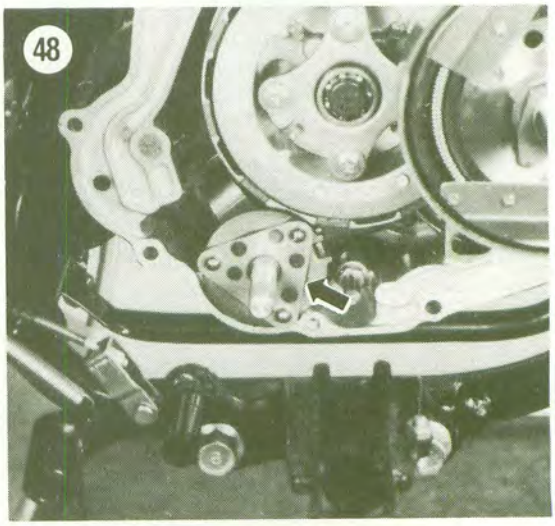
16. Install the primary clutch lockwasher and clutch nut. Hold the clutch assembly with the same tool used during disassembly and tighten the clutch nut to specifications in **Table 2**. Bend the lockwasher tab over the nut to lock it.

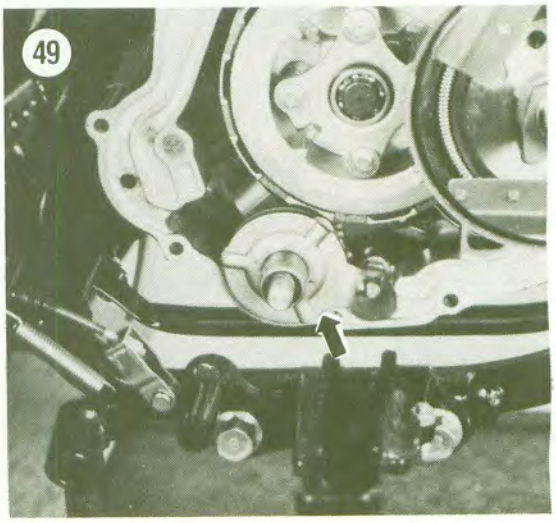
17. Install the shift guide pawl assembly as follows:
a. Align the notch in the No. 2 shift guide with the shift shaft arm and install the guide (**Figure 47**).

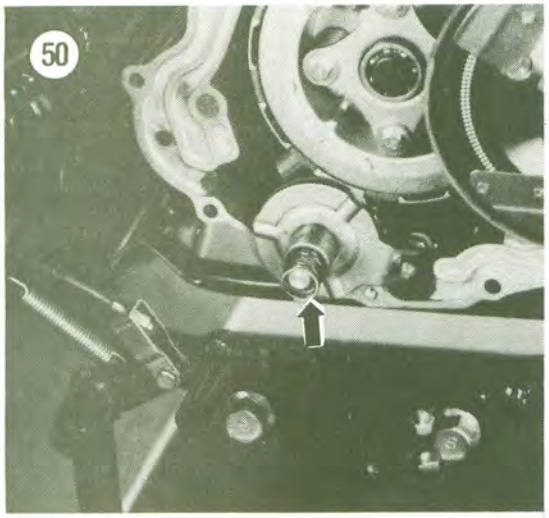






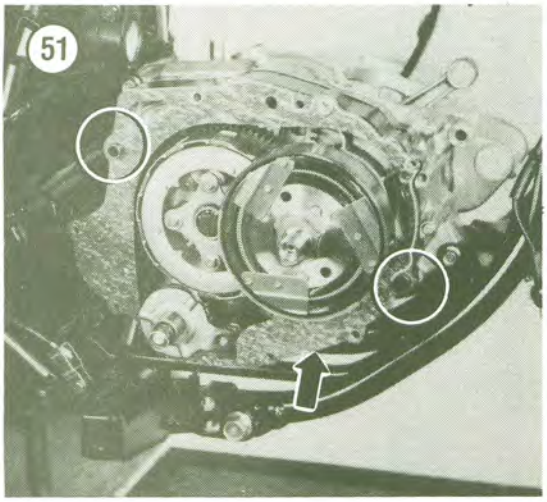






b. Slide the pawl holder onto the shift shaft (**Figure 48**).
c. Align the notch in the No. 1 shift guide with the shift shaft arm and install the guide (**Figure 49**).
d. Install the spring (**Figure 50**).

18. Install the 2 clutch cover dowel pins and a new clutch cover gasket. See **Figure 51**.
19. Align the shift guide spring (**Figure 50**) with the clutch lever (**Figure 52**) and install the clutch cover.



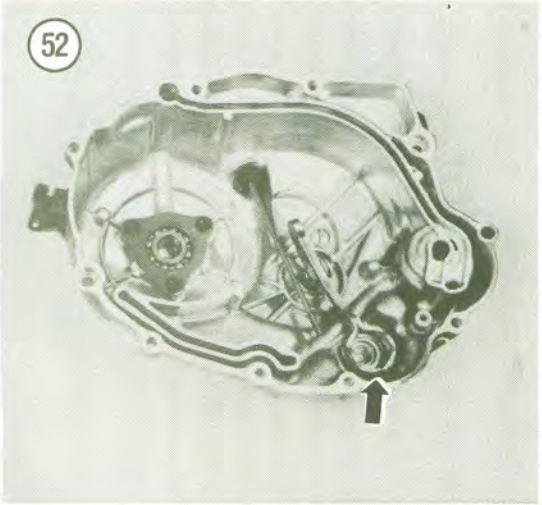
CAUTION

Do not install any of the clutch cover screws until the cover is snug against the crankcase surface. Do not try to force the cover into place with the screws. This is a sure way to break the cover. If the cover will not fit up against the crankcase, remove it and repeat Step 19.

20. Install the clutch cover screws. Install and tighten all screws in a crisscross pattern.

NOTE

Use an impact driver with a Phillips bit to tighten the clutch cover screws and to prevent damaging the Phillips screw heads.



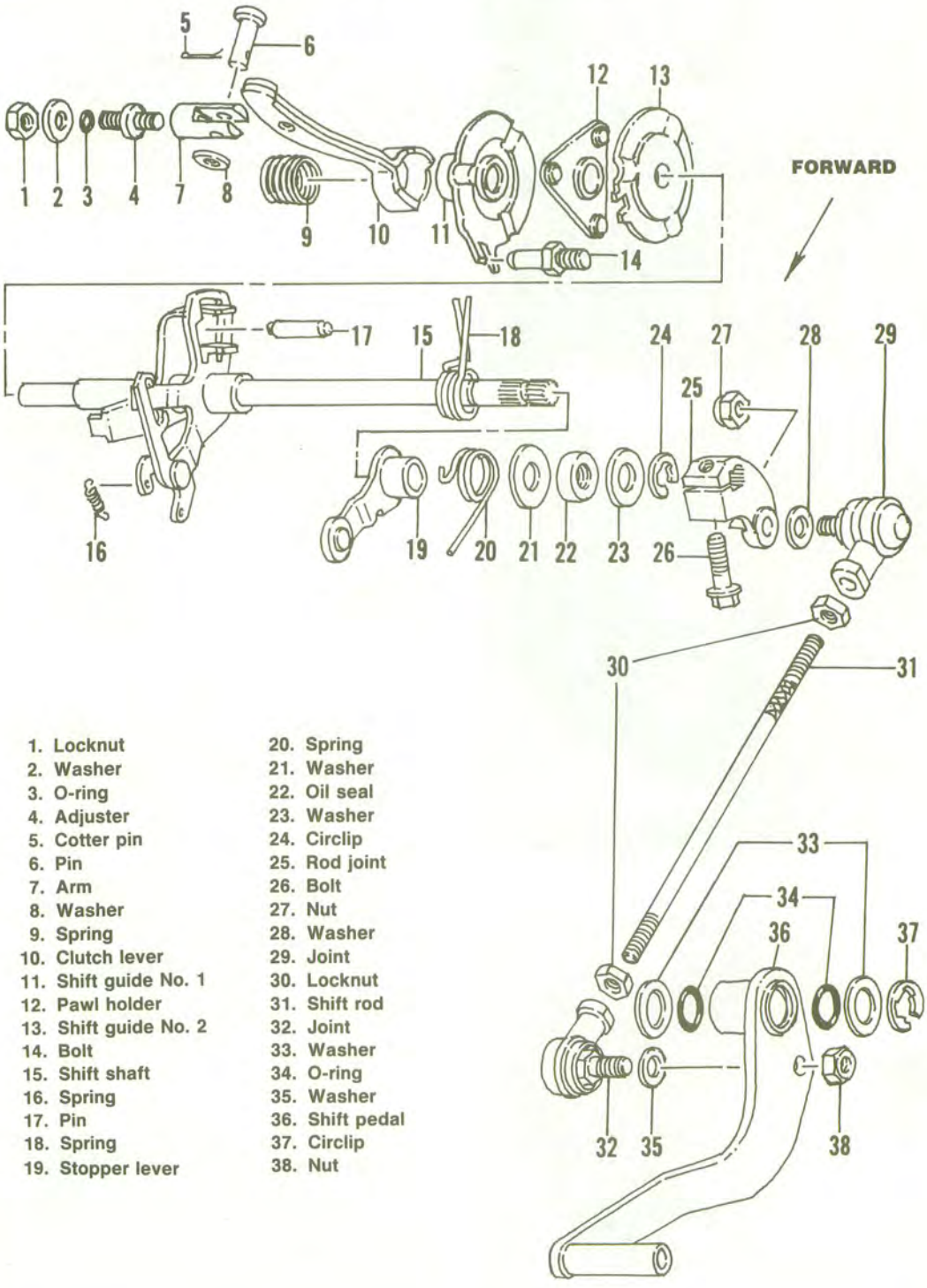
21. Install the oil filter and refill the engine oil as described in Chapter Three.
22. Adjust the clutch as described in Chapter Three.
23. Install the seat and fender assembly.

CLUTCH LEVER AND EXTERNAL SHIFT MECHANISM

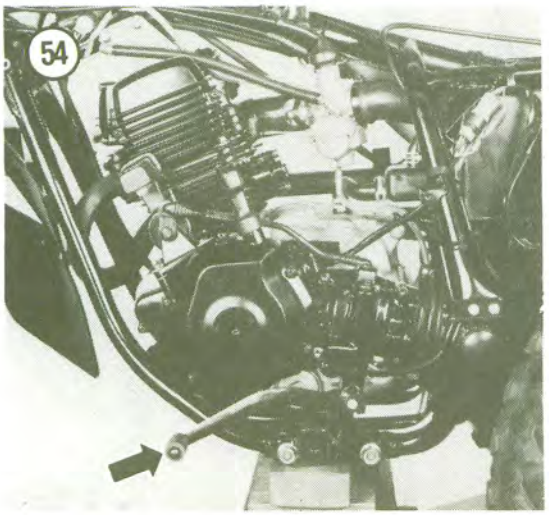
The clutch lever mechanism is located both within the clutch cover and on the external shift mechanism. When the gearshift lever is moved to shift gears it also activates the clutch lever, releasing the clutch. The clutch lever can be removed with the engine in the frame.

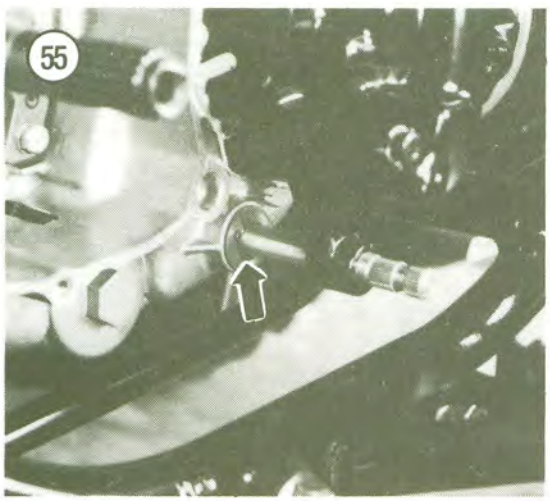
(53)

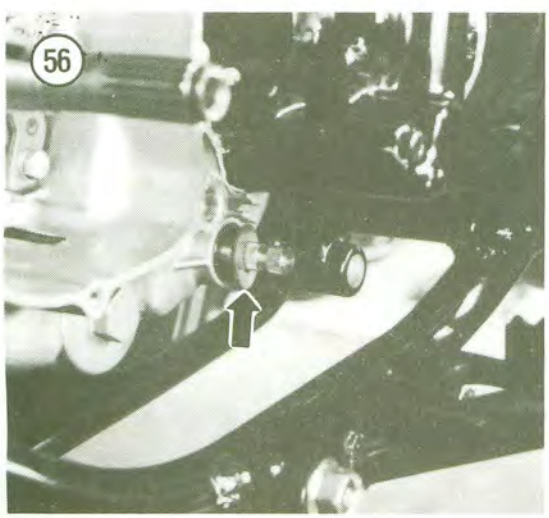
SHIFT SHAFT ASSEMBLY



1. Locknut
2. Washer
3. O-ring
4. Adjuster
5. Cotter pin
6. Pin
7. Arm
8. Washer
9. Spring
10. Clutch lever
11. Shift guide No. 1
12. Pawl holder
13. Shift guide No. 2
14. Bolt
15. Shift shaft
16. Spring
17. Pin
18. Spring
19. Stopper lever
20. Spring
21. Washer
22. Oil seal
23. Washer
24. Circlip
25. Rod joint
26. Bolt
27. Nut
28. Washer
29. Joint
30. Locknut
31. Shift rod
32. Joint
33. Washer
34. O-ring
35. Washer
36. Shift pedal
37. Circlip
38. Nut







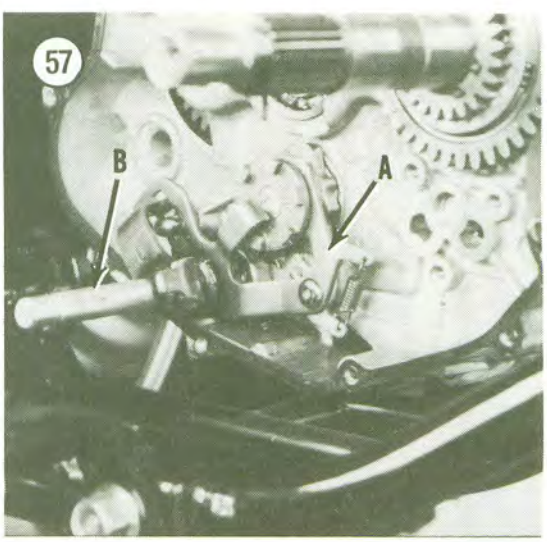
Refer to **Figure 53** for this procedure.

1. Remove the clutch cover as described in this chapter.
2. Remove the shift guide pawl assembly as follows:
   a. Remove the spring (**Figure 50**).
   b. Remove the No. 1 shift guide (**Figure 49**).
   c. Remove the pawl holder (**Figure 48**).
   d. Remove the No. 2 shift guide (**Figure 47**).
3. Remove the clutch as described in this chapter.

NOTE

The gearshift lever is subject to a lot of abuse. If the bike has been in a hard spill, the gearshift lever may have been hit and the shift shaft bent. It is very hard to straighten the shaft without subjecting the crankcase to abnormal stress where the shaft enters the case. If the shaft is bent enough to prevent it from being withdrawn from the crankcase, it is necessary to cut the shaft off with a hacksaw very close to the crankcase. Then file the end of the shaft to remove all burrs before withdrawing the shaft. It is much cheaper in the long run to replace the shaft than risk damaging a very expensive crankcase.

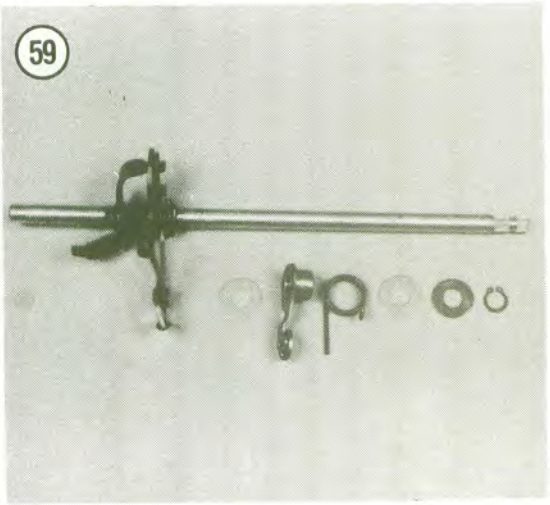
4. Remove the gearshift lever (**Figure 54**) from the left-hand side.
5. Remove the circlip (**Figure 55**) and washer (**Figure 56**) from the left-hand side.
6. Refer to **Figure 57**. Lift the shift arm away from the shift drum segment (A) and withdraw the shift lever assembly (B).

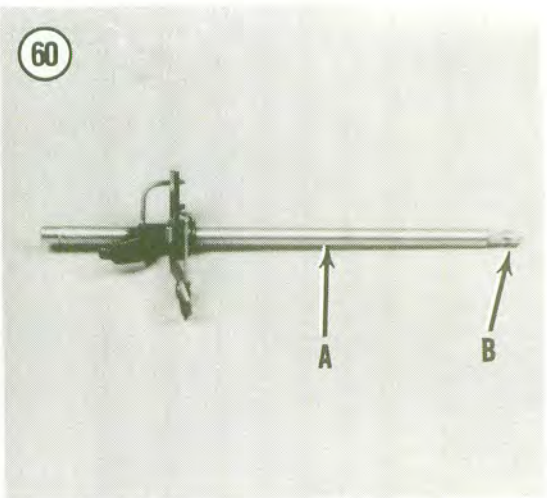


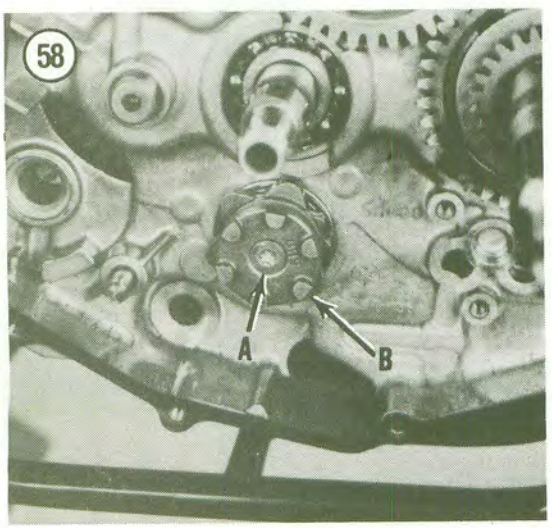
7. Using a T-30 Torx bit, remove the screw (A, **Figure 58**) and the shift cam segment (B, **Figure 58**).

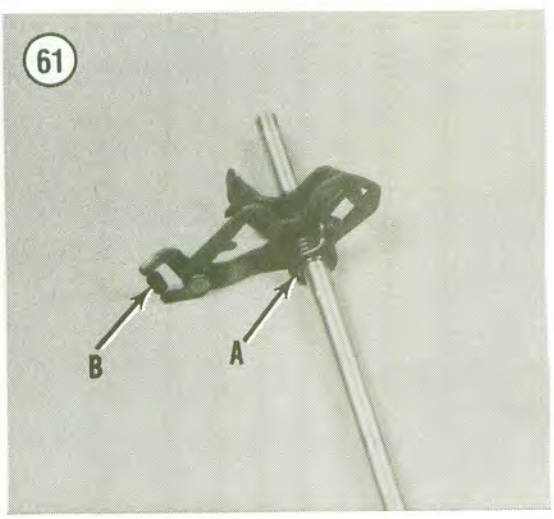
Inspection

1. Clean all parts in solvent and thoroughly dry with compressed air.
2. Inspect the balls in the pawl holder. They must rotate freely in the holder but not be so loose that they would fall out. Check the balls for evidence of wear, pitting or excessive heat (bluish tint). Replace if necessary.
3. Inspect the grooves and inside surfaces of both shift guides where the balls ride. Both surfaces must be smooth and free of burrs or scoring. Replace as necessary.
4. Check the movement of the clutch lever within the clutch cover (**Figure 52**). It must pivot freely or be replaced.
5. To remove the clutch lever, remove the cotter pin (**Figure 53**) and washer and push the pin out of the pivot joint. Lift off the clutch lever (**Figure 52**).
6. Slide the stopper lever, spring and washers off of the shift shaft. See **Figure 59**.
7. Check the external shift shaft (A, **Figure 60**). Make sure the shaft is not bent.
8. Examine the splines on the end of the shift shaft (B, **Figure 60**). If the splines are damaged, the shift shaft should be replaced. Eventually the splines will deteriorate to a point where the shift lever will slip during shifting.
9. Refer to **Figure 61**. Check the large (A) and small (B) tension springs. Replace the springs if fatigued or if they show signs of cracks or other









damage. If the springs are replaced, make sure they are installed as shown in **Figure 61**.

10. Refer to **Figure 62**. Inspect the stopper lever (A) and spring (B). Look for signs of wear at all contact points. Check the spring for fatigue or cracks. Replace any worn or damaged parts.

11. Examine all shift cam segment contact points (**Figure 63**) for wear or damage. Also check the 4 small and 1 large (**Figure 64**) segment pins. The pins can be replaced individually if worn or damaged. When installing the pins, make sure the pins are placed in the segment as shown in **Figure 64**. There will be one hole with no pin.

12. Install the clutch lever by reversing the procedure in Step 5.

13. Assemble the shift shaft assembly in the order shown in **Figure 59**.

Installation

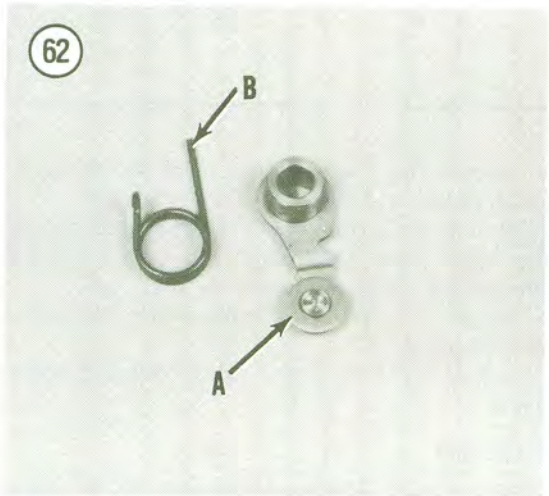
1. Align the long pin on the shift cam segment (**Figure 64**) with the hole in the shift cam (**Figure 65**) and install the segment.

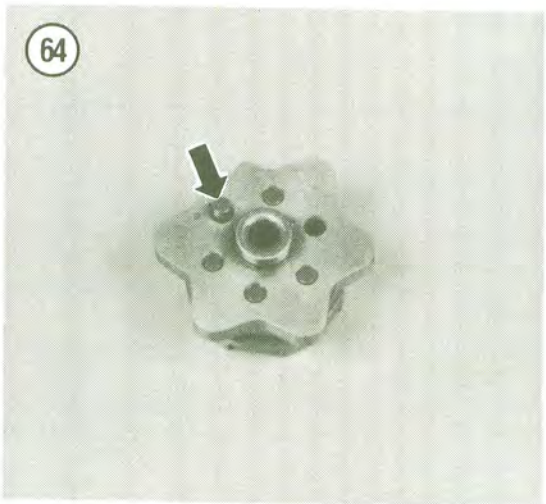
2. Coat the shift cam segment screw with Loctite 242 and install it (A, **Figure 58**). Tighten the secrew with a T-30 Torx socket. Tighten the screw securely.

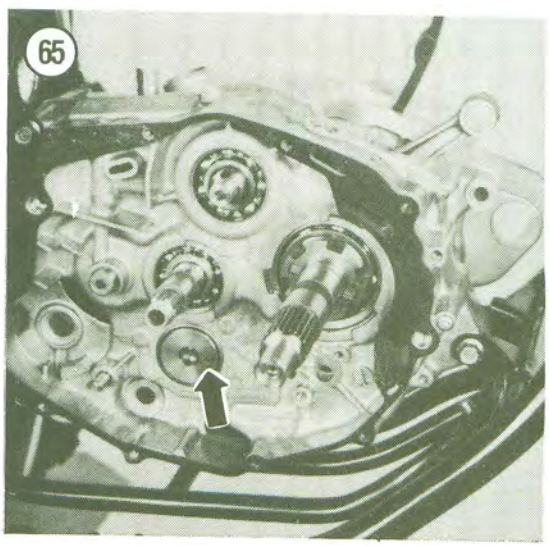
3. Install the shift shaft partway. Then from the left-hand side, install the washer (**Figure 56**) and circlip.

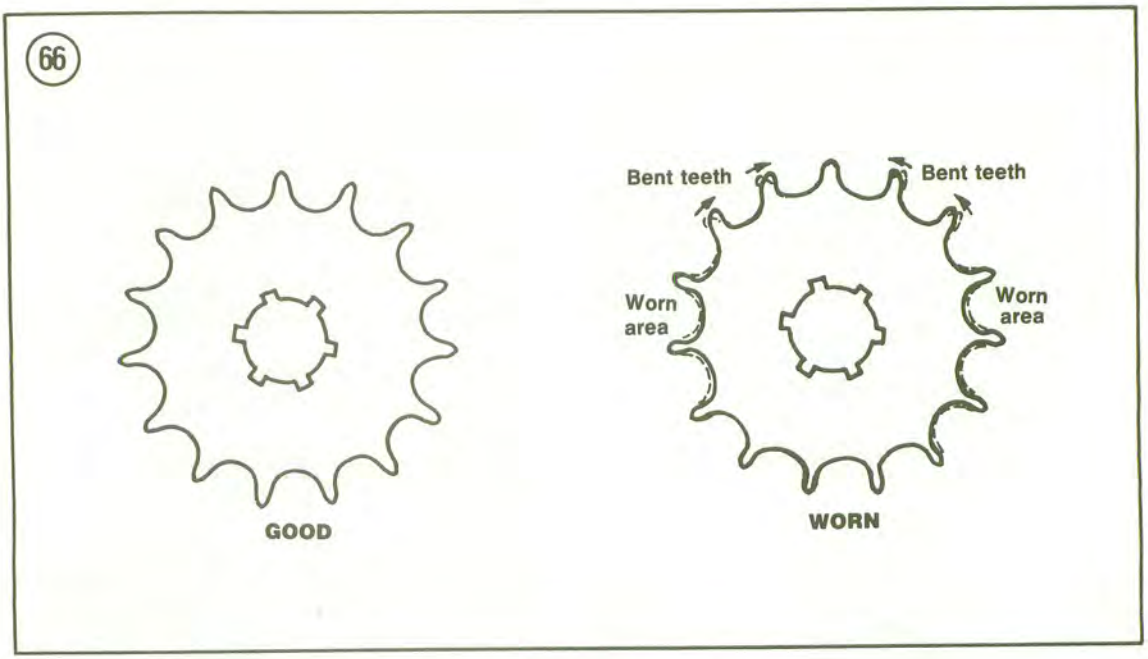
4. Install the shift shaft assembly (**Figure 57**) fully. Make sure the shift arm engages the shift cam segment pins.

5. After the shift shaft is installed, install the circlip into the shift shaft groove. See **Figure 55**.









6. Install the shift lever (**Figure 52**).
7. Install the clutch as described in this chapter.
8. Install the shift guide pawl assembly as follows:
   a. Align the notch in the No. 2 shift guide with the shift shaft arm and install the guide (**Figure 47**).
   b. Slide the pawl holder onto the shift shaft (**Figure 48**).
   c. Align the notch in the No. 1 shift guide with the shift shaft arm and install the guide (**Figure 49**).
   d. Install the spring (**Figure 50**).
9. Install the clutch cover as described in this chapter.
10. Refill the engine oil as described in Chapter Three.

DRIVE SPROCKET (YTM200K, L, N)

Removal/Installation

1. Park the vehicle on level ground. Set the parking brake.
2. Remove the bolt securing the gearshift lever and remove the lever.
3. Remove the screws securing the drive sprocket cover and remove the cover.
4. Have an assistant hold the rear brake on while you loosen the bolts securing the drive sprocket and drive sprocket holding plate.
5. Remove the bolts securing the drive sprocket and drive sprocket holding plate.
6. Loosen the rear chain adjusters to obtain as much chain slack as possible.
7. Rotate the holding plate in either direction to disengage it from the splines on the shaft; slide off the holding plate and drive sprocket.
8. Install by reversing these removal steps, noting the following.
9. Adjust the drive chain as described in Chapter Three.

Inspection

Inspect the condition of the teeth on the drive sprocket. If the teeth are visibly worn (**Figure 66**), replace the sprocket with a new one.

If the sprocket requires replacement, replace the rear sprocket and drive chain also. Running worn and new parts at the same time will rapidly wear out the new parts.

TRANSMISSION

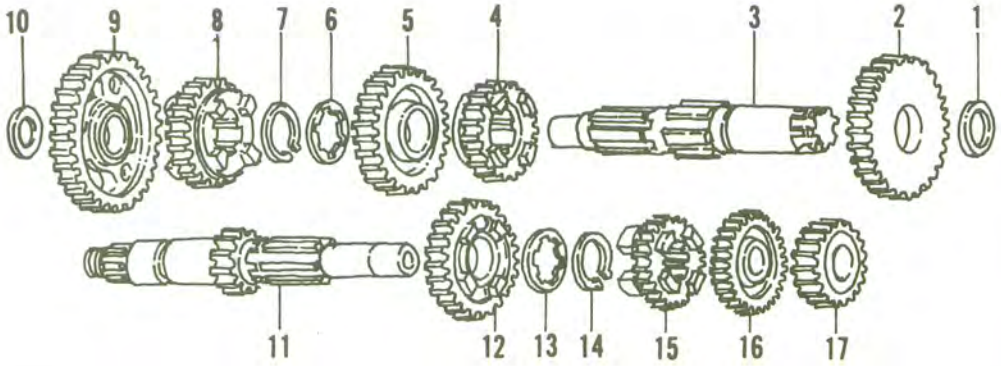
The crankcase must be disassembled to gain access to the transmission components. The transmission is shown in **Figure 67** (chain drive) or **Figure 68** (shaft drive).

Removal/Installation (Chain Drive)

Refer to **Figure 67** for this procedure.

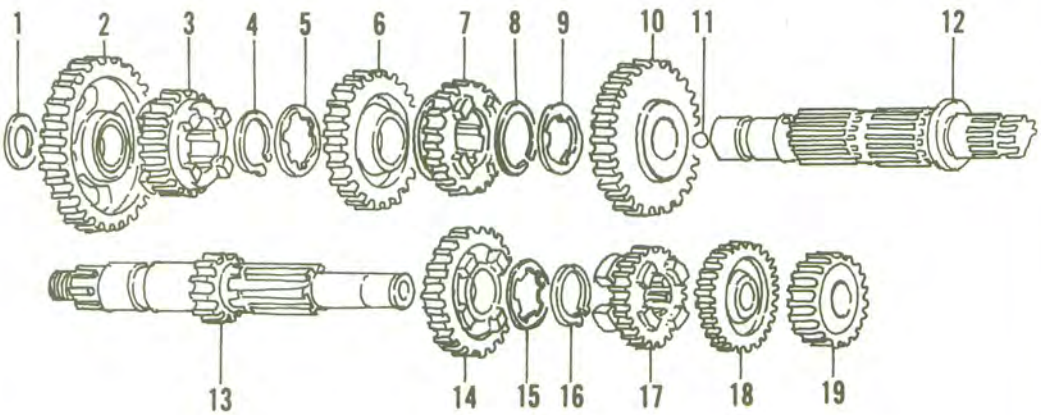
1. Remove the engine and split the crankcase as described in Chapter Four.

(67) TRANSMISSION (CHAIN DRIVE)



1. Washer
2. Countershaft 2nd gear
3. Countershaft
4. Countershaft 5th gear
5. Countershaft 3rd gear
6. Washer
7. Circlip
8. Countershaft 4th gear
9. Countershaft 1st gear
10. Washer
11. Mainshaft
12. Mainshaft 4th gear
13. Washer
14. Circlip
15. Countershaft 3rd gear
16. Countershaft 5th gear
17. Countershaft 2nd gear

(68) TRANSMISSION (SHAFT DRIVE)



1. Washer
2. Drive axle 1st gear
3. Drive axle 4th gear
4. Circlip
5. Washer
6. Drive axle 3rd gear
7. Drive axle 5th gear
8. Circlip
9. Washer
10. Drive axle 2nd gear
11. Plug
12. Drive axle
13. Mainshaft
14. Mainshaft 4th gear
15. Washer
16. Circlip
17. Mainshaft 3rd gear
18. Mainshaft 5th gear
19. Mainshaft 2nd gear

2. Lift up and remove the transmission components in the following order:
   a. Shift fork shafts (A, **Figure 69**).
   b. Shift drum (B, **Figure 69**).
   c. Shift forks (**Figure 70**).
   d. Transmission shafts (**Figure 71**).
3. Disassemble and inspect the shift forks and transmission assemblies as described later in this chapter.
4. Installation is the reverse of these steps, noting the following:
   a. If the transmission assemblies were disassembled, make sure all circlips are seated completely in their respective grooves.
   b. Before installation, coat all bearing and sliding surfaces of the shift forks, shafts, shift drum and transmission shafts with assembly oil.
   c. Make sure all cam pin followers are in mesh with the shift drum grooves.
   d. Spin the transmission shafts and shift through the gears using the shift drum. Make sure you can shift into all gears. This is the time to find that something may be installed incorrectly—not after the crankcase is completely assembled.

NOTE

This procedure is best done with the aid of a helper as the assemblies are loose and do not want to spin very easily. Have the helper spin the transmission shafts while you turn the shift drum through all the gears.

5. Assemble the crankcase as described in Chapter Four.

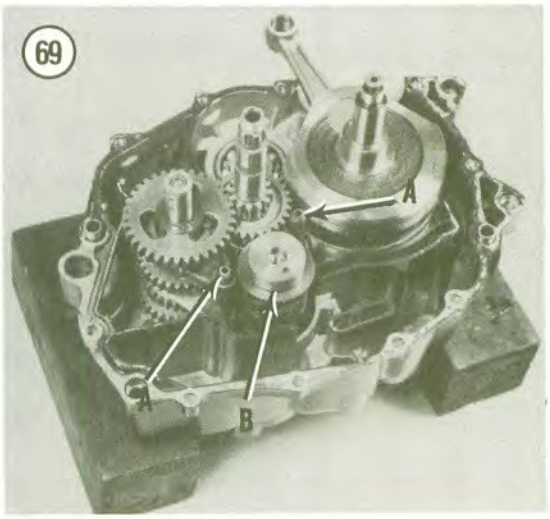
Mainshaft Disassembly/Assembly (Chain Drive)

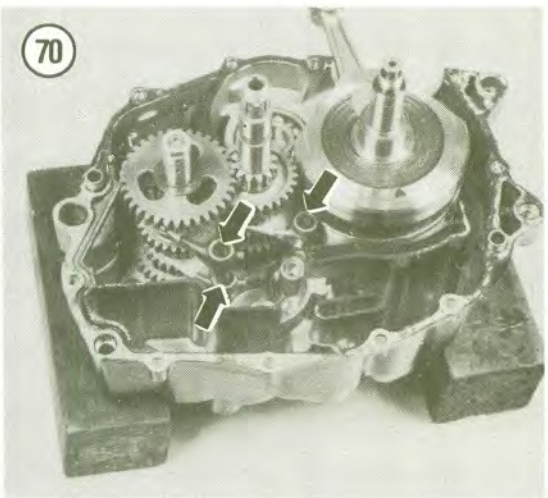
Refer to **Figure 67** for this procedure.

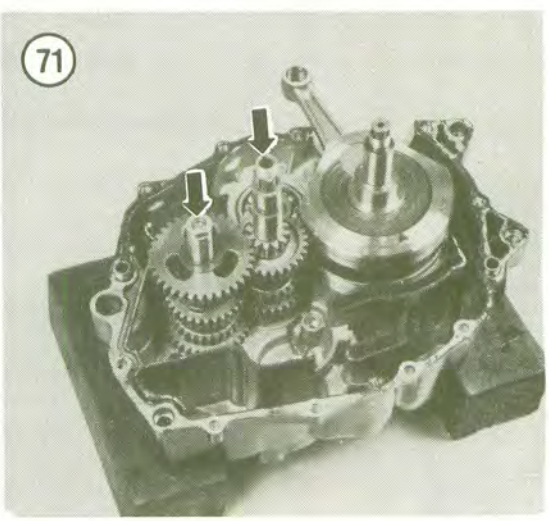
NOTE

A helpful "tool" that should be used for transmission disassembly is a large egg carton. As you remove a part from the shaft, identify it and then set it in one of the depressions in the exact same position from which it was removed. This is an easy way to remember the correct relationship of all parts.

1. Place the assembled shaft into a large can or plastic bucket and thoroughly clean with solvent and a stiff brush. Dry with compressed air or let it sit on rags to drip dry.







NOTE

*A hydraulic press is required to remove second gear from the mainshaft. Before disassembly, measure the assembled gear length with a vernier caliper (**Figure 72**) and record the measurement for reassembly.*

2. Press off second gear and fifth gear (**Figure 73**).
3. Slide off third gear.
4. Remove the circlip and splined washer.
5. Slide off fourth gear.
6. Inspect the mainshaft assembly as described in this chapter.
7. Make sure that all splined gears slide smoothly on the mainshaft splines.
8. Slide on fourth gear and install the splined washer and circlip.
9. Slide on third and fifth gears.
10. Press on fifth and second gears. Be sure to install gears to specifications made before disassembly.
11. Make sure all circlips are seated correctly in the main shaft grooves.

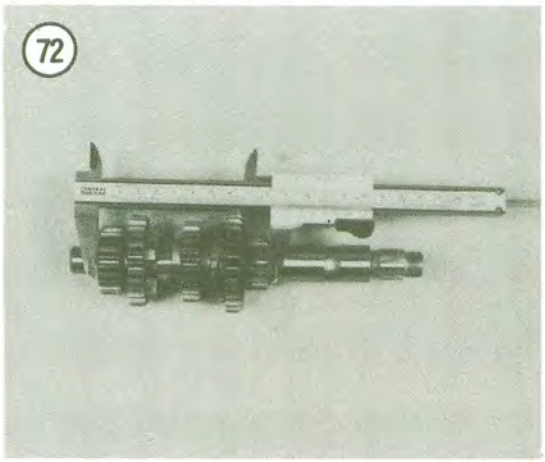
Countershaft Disassembly/Assembly (Chain Drive)

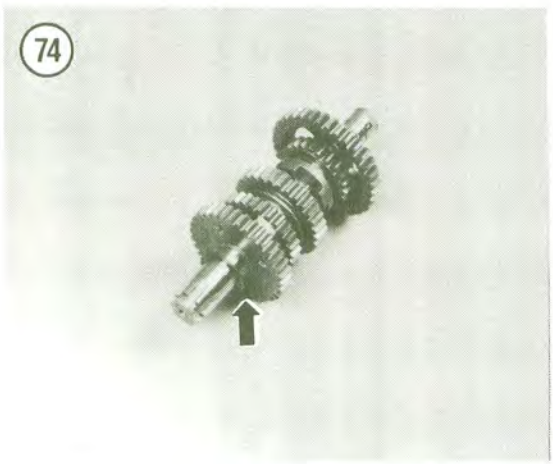
Refer to **Figure 67** for this procedure.

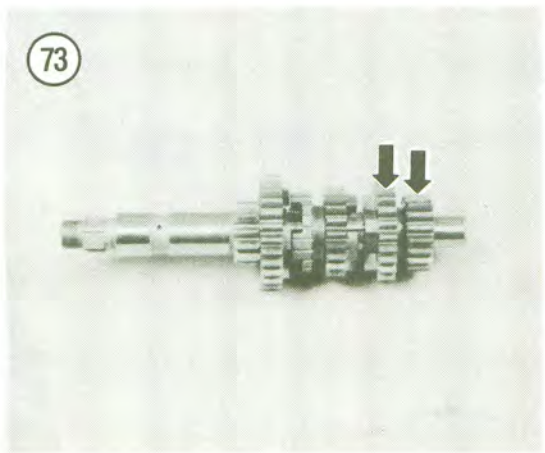
NOTE

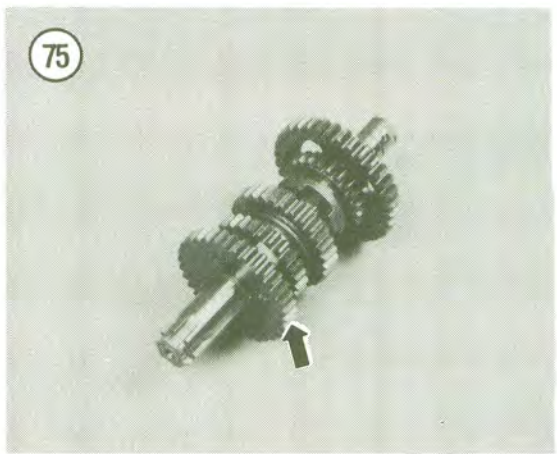
A helpful "tool" that should be used for transmission disassembly is a large egg carton. As you remove a part from the shaft, identify it and then set it in one of the depressions in the exact same position from which it was removed. This is an easy way to remember the correct relationship of all parts.

1. Place the assembled shaft into a large can or plastic bucket and thoroughly clean with solvent and a stiff brush. Dry with compressed air or let it sit on rags to drip dry.
2. Remove the washer (**Figure 74**) and slide off second gear (**Figure 75**).





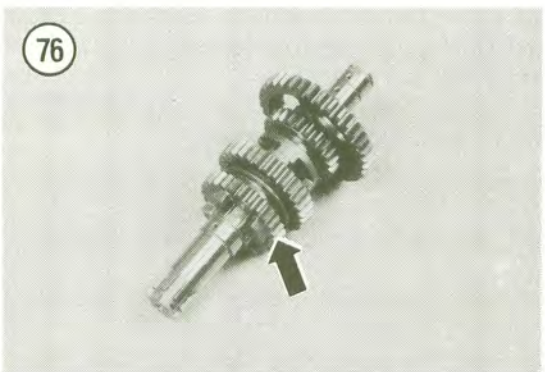


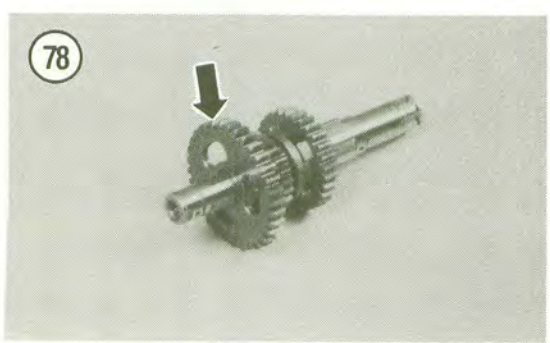


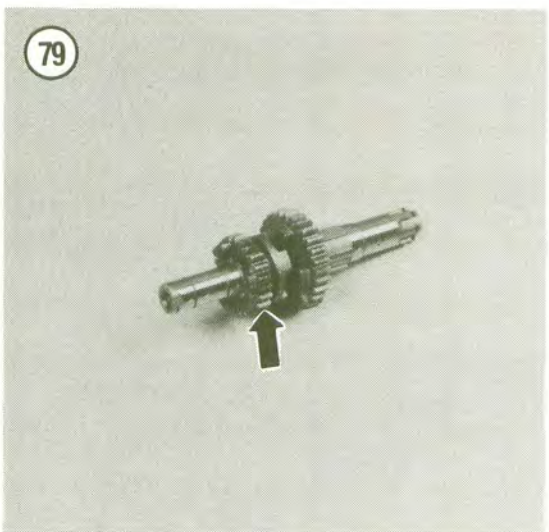
3. Slide off fifth gear (**Figure 76**).
4. Remove the circlip and washer (**Figure 77**).
5. Slide off third gear (**Figure 78**).
6. Slide off fourth gear (**Figure 79**).
7. Slide off first gear (**Figure 80**).
8. Inspect the countershaft assembly as described in this chapter.
9. Make sure that all gears slide smoothly on the countershaft splines.
11. Slide on second gear (**Figure 80**).
12. Slide on fourth gear (**Figure 79**).
13. Slide on third gear (**Figure 78**) and install the washer and circlip (**Figure 77**).
14. Slide on fifth gear (**Figure 76**), second gear (**Figure 75**) and install the washer (**Figure 74**).
15. After assembly is complete refer to **Figure 81** for the correct placement of all gears. Make sure all circlips are seated correctly in the countershaft grooves.

Removal/Installation (Shaft Drive)

Refer to **Figure 68** for this procedure.
1. Remove the engine and split the crankcase as described in Chapter Four.
2. Remove the No. 1 shift fork shaft (**Figure 82**) and fork (**Figure 83**).
3. Remove the No. 2 and No. 3 shift fork shaft (**Figure 84**). Then remove the No. 2 (**Figure 85**) and No. 3 (**Figure 86**) shift forks.







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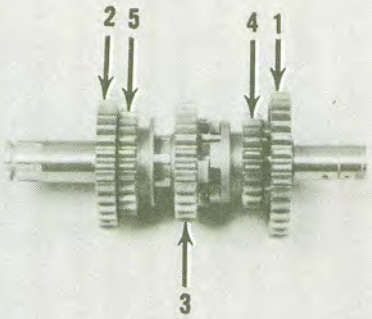

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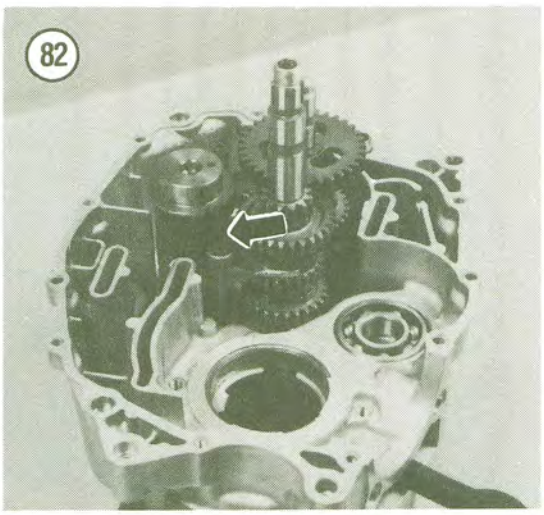

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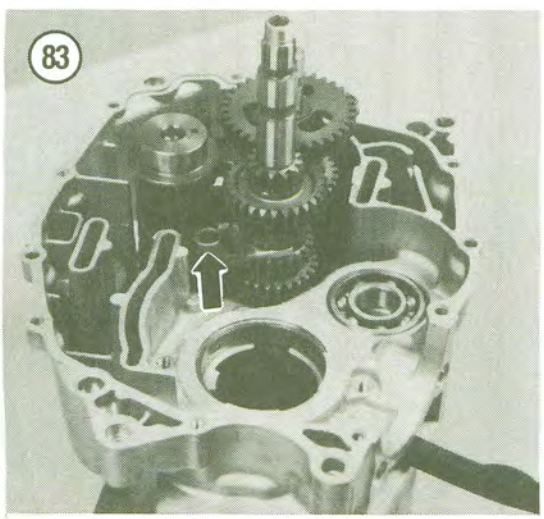

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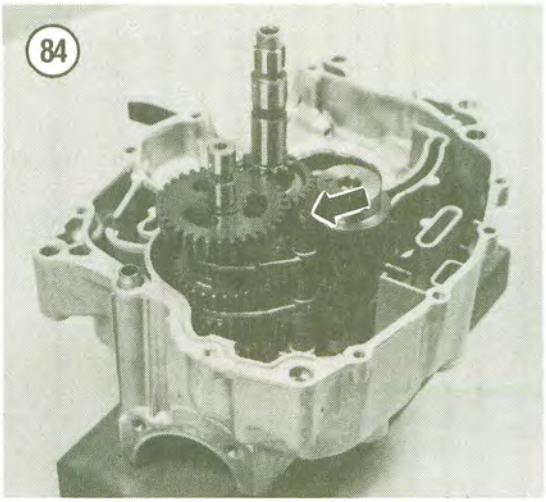

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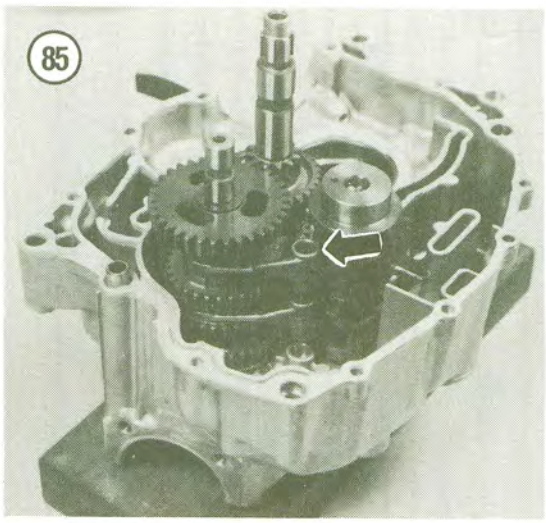

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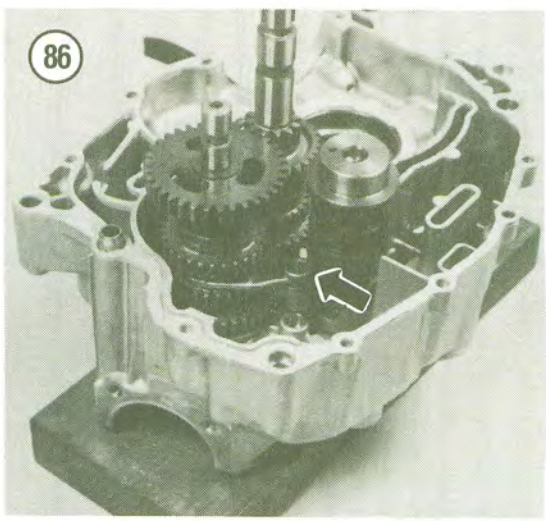
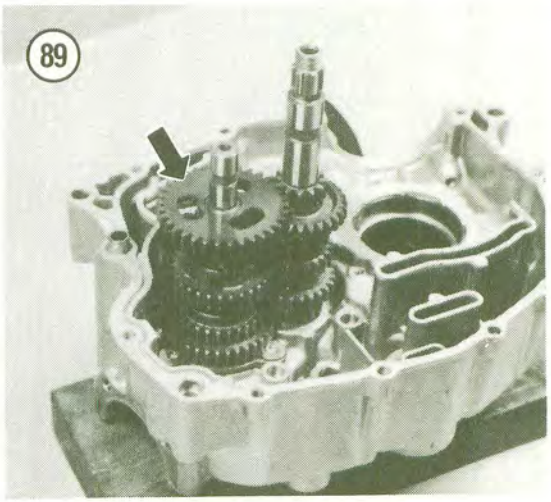
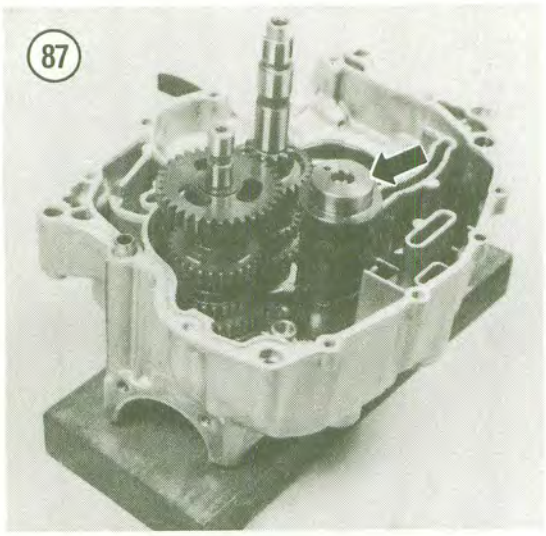
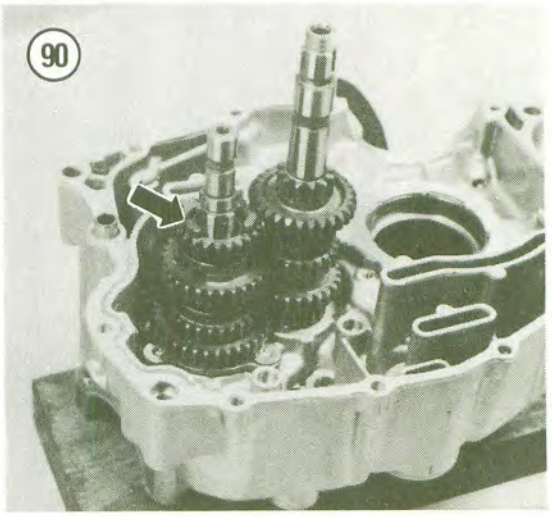
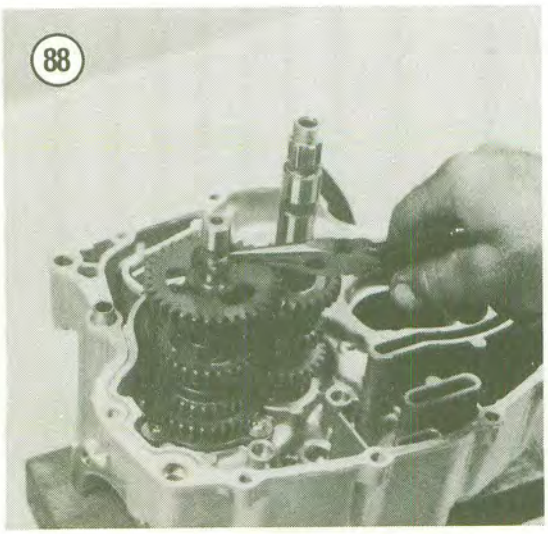


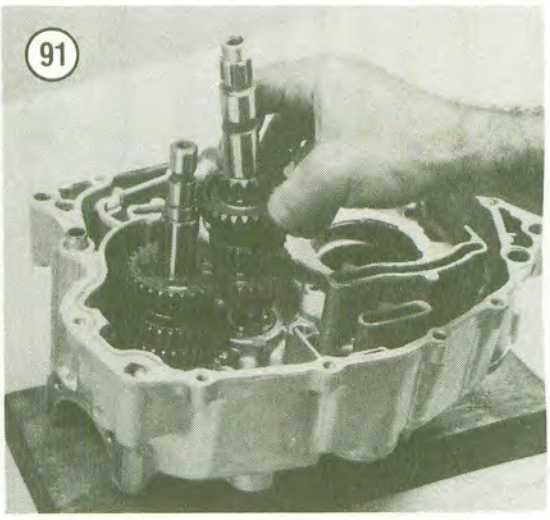
4. Remove the shift drum (**Figure 87**).
5. Remove the drive axle washer (**Figure 88**).
6. Remove drive axle first gear (**Figure 89**).
7. Remove drive axle fifth gear (**Figure 90**).
8. Remove the mainshaft assembly (**Figure 91**).
9. Remove the circlip (**Figure 92**) and washer (**Figure 93**).
10. Remove the drive axle third gear (**Figure 94**).
11. Remove the drive axle fourth gear (**Figure 95**).
12. Remove the circlip (**Figure 96**) and washer (**Figure 97**).
13. Remove the drive axle second gear (**Figure 98**).
14. To remove the drive axle, perform the following:
    a. Secure the drive axle (**Figure 99**) in a vise (with soft jaws) or with a suitable holding tool.

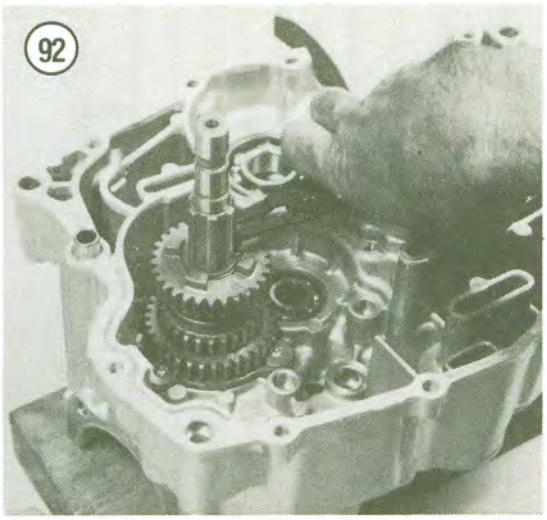








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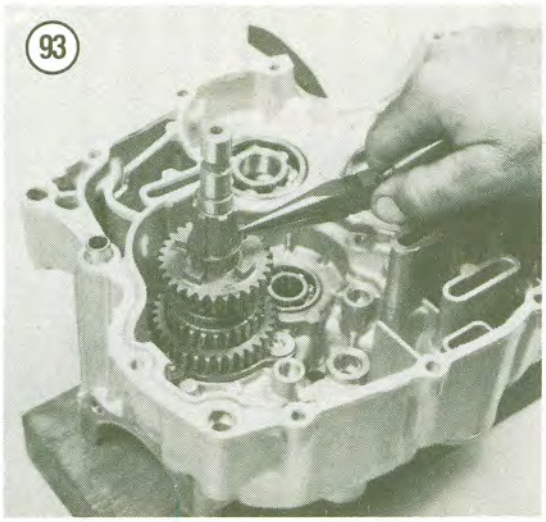
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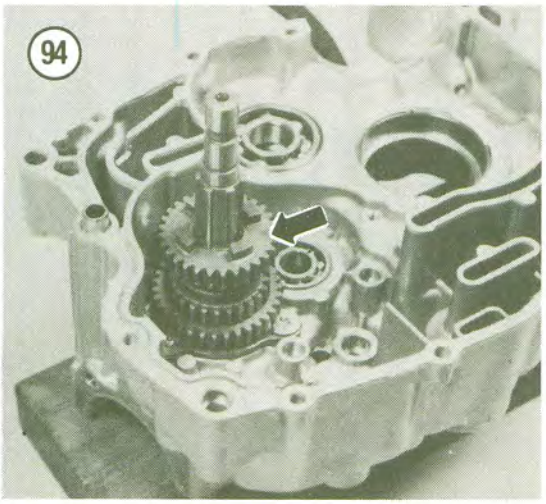
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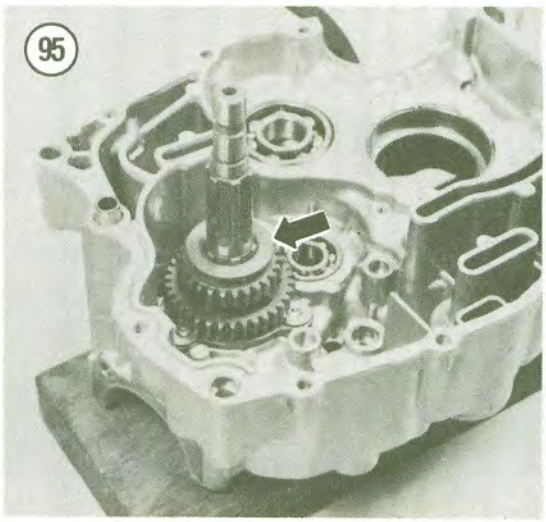
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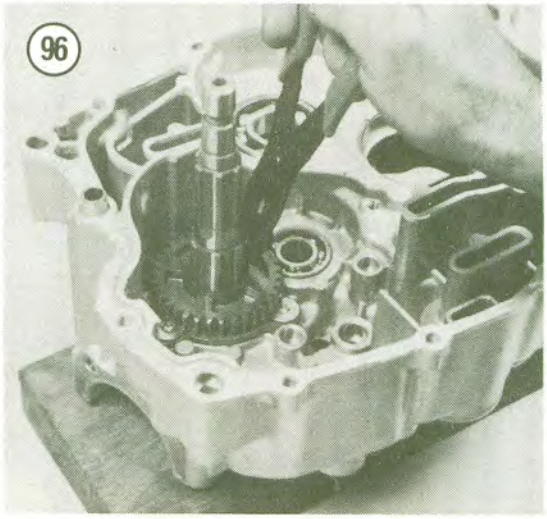
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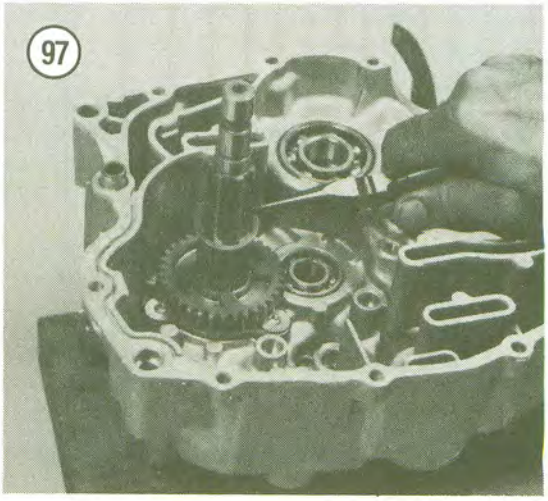
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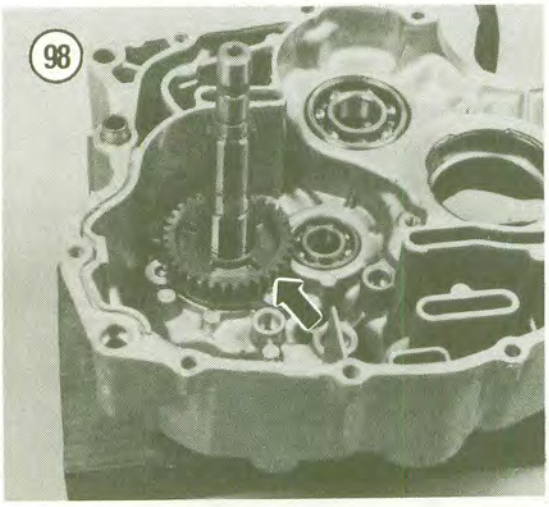
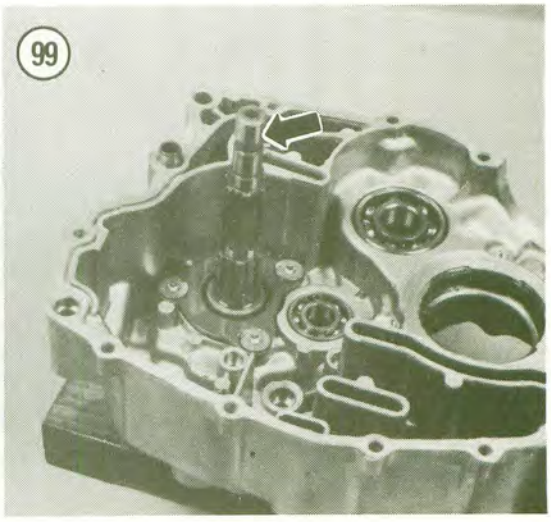




Make sure to use provisions to prevent damage to the drive axle.

b. Pry back the middle drive gear nut tab (A, **Figure 100**).

c. Loosen the middle drive gear nut (A, **Figure 100**) and remove it.

d. Remove the middle drive gear (B, **Figure 100**).

e. Remove the drive axle from the vise and remove it (**Figure 99**) from the crankcase.

15. Assembly is the reverse of these steps, noting the following.

16. Install a new middle drive gear nut (A, **Figure 100**) during installation. Tighten the nut to 60 N•m (43 ft.-lb.).

17. If the transmission assemblies were disassembled, make sure all circlips are seated completely in their respective grooves.

18. Before installation, coat all bearing and sliding surfaces of the shift forks, shafts, shift drum and transmission shafts with assembly oil.

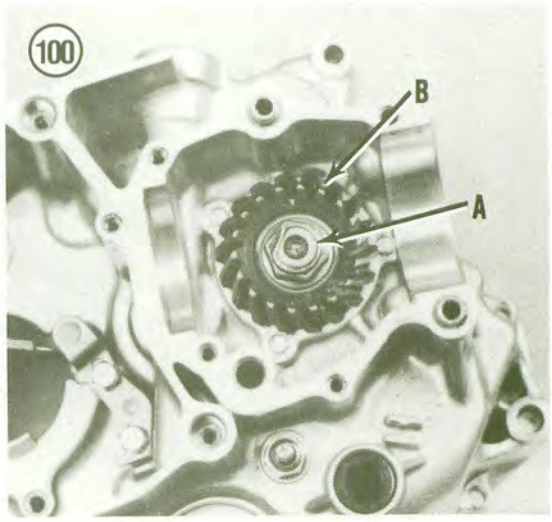
19. Make sure all cam pin followers are in mesh with the shift drum grooves.

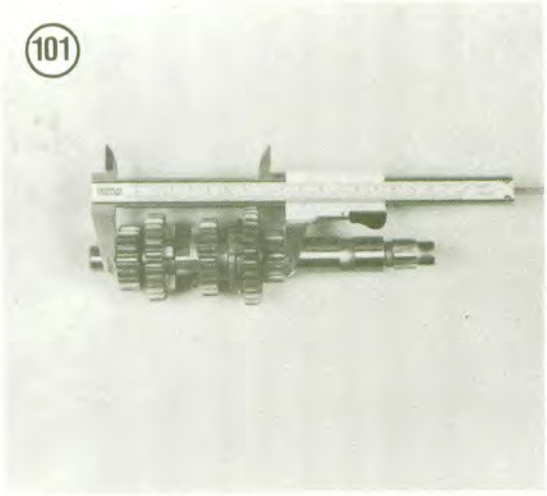
20. Spin the transmission shafts and shift through the gears using the shift drum. Make sure you can shift into all gears. This is the time to find that something may be installed incorrectly—not after the crankcase is completely assembled.

NOTE

This procedure is best done with the aid of a helper as the assemblies are loose and do not want to spin very easily. Have the helper spin the transmission shafts while you turn the shift drum through all the gears.

21. Assemble the crankcase as described in Chapter Four.





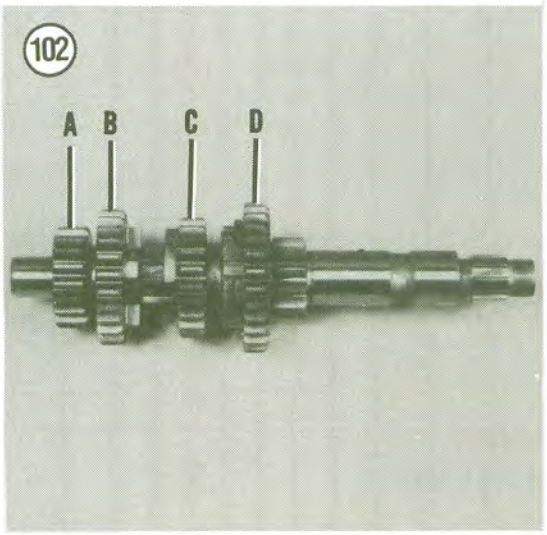
Main Shaft Disassembly/Assembly (Shaft Drive)

Refer to **Figure 68** for this procedure.

NOTE

A helpful "tool" that should be used for transmission disassembly is a large egg carton. As you remove a part from the shaft, identify it and then set it in one of the depressions in the exact same position from which it was removed. This is an easy way to remember the correct relationship of all parts.

1. Place the assembled shaft into a large can or plastic bucket and thoroughly clean with solvent and a stiff brush. Dry with compressed air or let it sit on rags to drip dry.



NOTE

*A hydraulic press is required to remove second gear from the mainshaft. Before disassembly, measure the assembled gear length with a vernier caliper (**Figure 101**) and record the measurement for reassembly.*

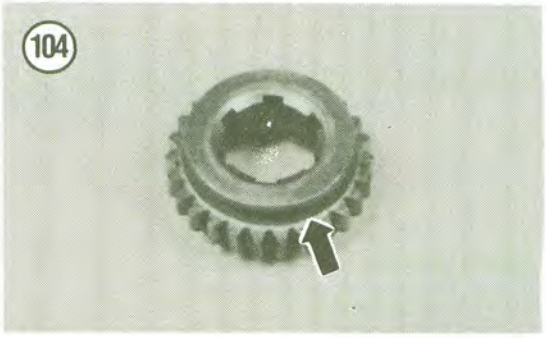
2. Press off second gear (A, **Figure 102**) and fifth gear (B, **Figure 102**).
3. Slide off third gear (C, **Figure 102**).
4. Remove the circlip and splined washer.
5. Slide off fourth gear (D, **Figure 102**).
6. Inspect the mainshaft assembly as described in this chapter.
7. Make sure that all splined gears slide smoothly on the main shaft splines.
8. Slide on fourth gear (D, **Figure 102**) and install the splined washer and circlip.
9. Slide on third gear (C, **Figure 102**).
10. See **Figure 102**. Press on fifth (B) and second gear (A). Be sure to install gears according to measurements made before disassembly.
11. Make sure all circlips are seated correctly in the main shaft grooves.

Drive Axle (Drive Shaft)

The drive shaft was disassembled during transmission removal.

Inspection

1. Clean all parts in cleaning solvent and thoroughly dry.
2. Inspect the gears visually for cracks, chips, broken teeth and burnt teeth. Check lugs on ends of gears (**Figure 103**) to make sure they are not rounded off. If lugs are rounded off, check the shift forks as described later in this chapter. More than likely, one or more of the shift forks is bent.
3. Check the slots in gears (**Figure 104**) for distortion or flaking that may indicate a bent shift fork.



NOTE

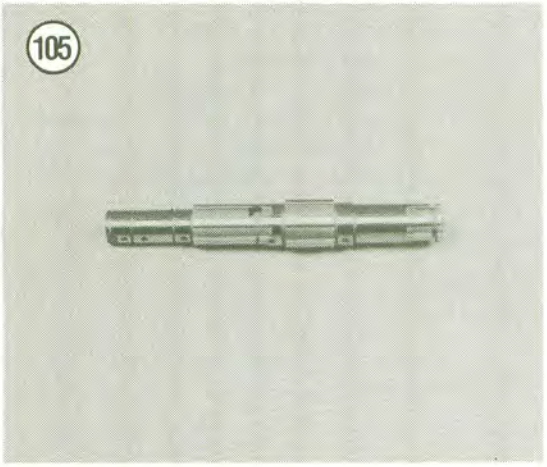
Defective gears should be replaced, and it is a good idea to replace the mating gear even though it may not show as much wear or damage. Remember that accelerated wear to new parts is normally caused by contact from worn parts.

4. Inspect all free wheeling gear bearing surfaces for wear, discoloration and galling. Inspect the mating shaft bearing surface also. If there is any metal flaking or visible damage, replace both parts.
5. Inspect the main shaft and countershaft or drive shaft splines for wear or discoloration (**Figure 105**). Check the mating gear internal splines also. If no visible damage is apparent, install each sliding gear on its respective shaft and work the gear back and forth to make sure the gear operates smoothly.
6. Check all circlips and washers. Replace any circlips that may have been damaged during operation or removal as well as any washers that show wear.
7. If some of the transmission components were damaged, make sure to inspect the shift drum and shift forks as described later in this chapter.

Internal Shift Mechanism Inspection

Refer to **Figure 106** for this procedure.

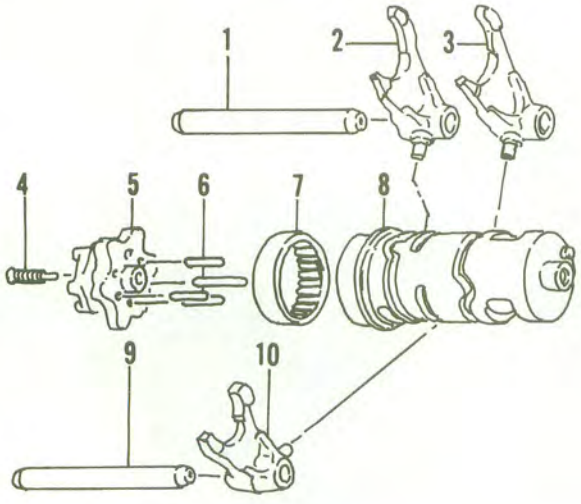
(105)



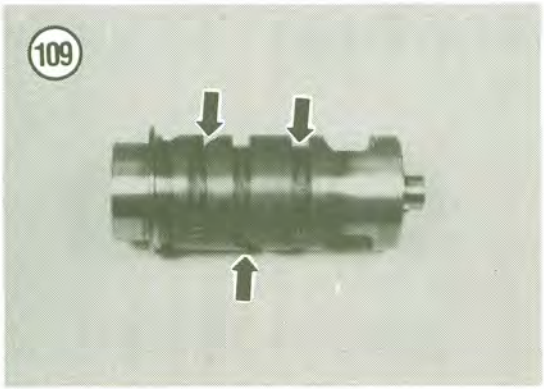
(107)

(106)

INTERNAL SHIFT ASSEMBLY



1. Guide bar
2. Shift fork No. 2
3. Shift fork No. 3
4. Screw
5. Segment
6. Pins
7. Bearing
8. Shift drum
9. Guide bar
10. Shift fork No. 1



NOTE

Before removal or disassembly of any of the components, lay the assembly down on a piece of paper or cardboard and carefully trace around it. Write down the identifying numbers and letter next to the item. This will take a little extra time now but it may save some time and frustration later.

1. Inspect each shift fork (**Figure 107**) for signs of wear or cracking. Examine the shift forks at the points where they contact the slider gear. This surface should be smooth with no signs of wear or damage. Make sure the forks slide smoothly on the shaft. Make sure the shaft is not bent. This can be checked by removing the shift forks from the shaft and rolling the shaft on a piece of glass. Any clicking noise detected indicates that the shaft is bent.
2. Check for any arc-shaped wear or burned marks on the shift forks (**Figure 108**). This indicates that the shift fork has come in contact with the gear. The fork fingers have become excessively worn and the fork must be replaced.
3. Check grooves in the shift drum (**Figure 109**) for wear or roughness.
4. Check the shift drum bearing surfaces for any signs of wear or damage. Replace the shift drum if necessary.

Table 1 CLUTCH WEAR LIMITS

	mm	in.
Primary clutch		
Shoe thickness		
YTM200K, L, N	2.5	0.098
All other models	1.5	0.0591
Secondary clutch		
Friction plate	2.8	0.11
Clutch plate warp limit	0.2	0.008
Clutch spring fee length	32.9	1.30

Table 2 CLUTCH TIGHTENING TORQUES

	N•m	ft.-lb.
Clutch cover screws	7	5.1
Primary clutch nut	78	56
Clutch spring screw	6	4.3
Clutch boss nut	50	36
Shift cam segment screw	12	8.7
Clutch adjuster nut	15	11

CHAPTER SIX

FUEL AND EXHAUST SYSTEMS

The fuel system consists of the fuel tank, shutoff valve, a single carburetor and air cleaner. The exhaust system consists of an exhaust pipe assembly and spark arrester.

This chapter includes service procedures for all parts of the fuel and exhaust systems. **Table 1** and **Table 2** are at the end of the chapter.

AIR CLEANER

The air cleaner must be cleaned frequently. Refer to Chapter Three for specific procedures and service intervals.

CARBURETOR OPERATION

For proper operation, a gasoline engine must be supplied with fuel and air mixed in proper proportions by weight. A mixture in which there is an excess of fuel is said to be rich. A lean mixture is one which contains insufficient fuel. A properly adjusted carburetor supplies the proper mixture to the engine under all operating conditions.

Mikuni carburetors consist of several major systems. A float and float valve mechanism maintain a constant fuel level in the float bowl. The pilot system supplies fuel at low speeds. The main fuel system supplies fuel at medium and high speeds. Finally, a starter (choke) system supplies the very rich mixture needed to start a cold engine.

CARBURETOR SERVICE

Major carburetor service (removal and cleaning) should be performed whenever the engine is decarbonized or when poor engine performance, hesitation, and little or no response to mixture adjustment is observed. The service interval will become natural to you after owning and running the vehicle for a period of time.

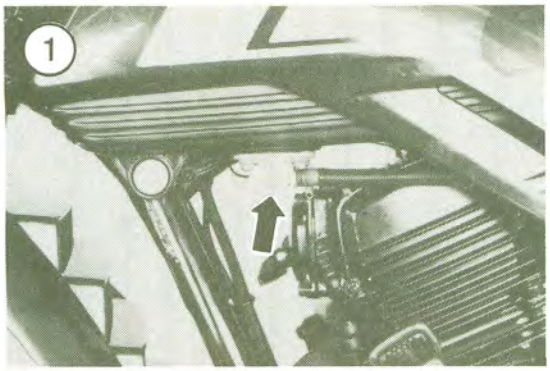
Carburetor Identification

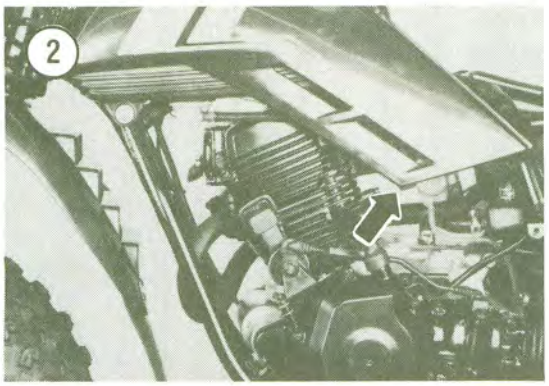
Refer to **Table 1** at the end of this chapter for carburetor specifications.

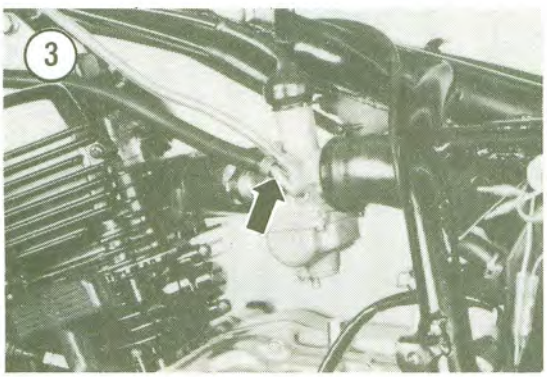
Removal/Installation

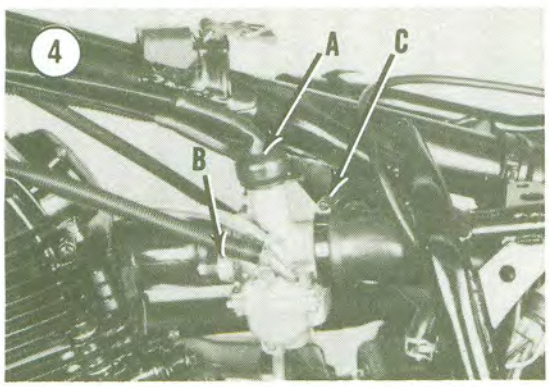
1. Park the vehicle on level ground. Set the parking brake.
2. Turn the fuel shutoff valve (**Figure 1**) to the OFF position.
3. Remove the tank side panels (**Figure 2**).
4. Disconnect the fuel line at the carburetor (**Figure 3**).
5. Pull the rubber cover off of the carburetor cap (A, **Figure 4**). Loosen the cap slightly but do not remove it.

6A. *Chain drive*: Loosen the 2 carburetor clamps.
6B. *Shaft drive*: Remove the 2 front carburetor-to-intake manifold bolts (B, **Figure 4**) and loosen the rear boot clamp (C, **Figure 4**).









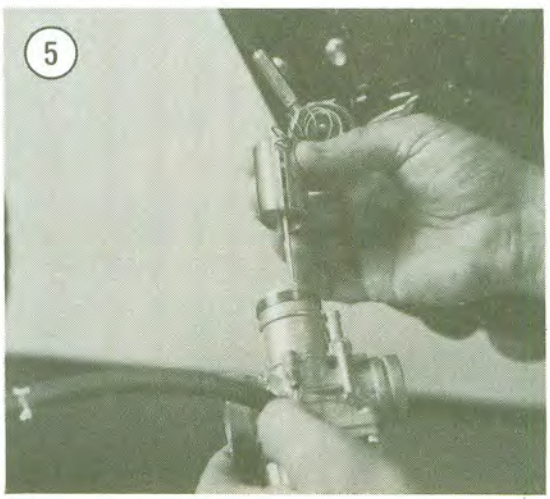
7. Work the carburetor away from the rubber boot(s) and remove it.

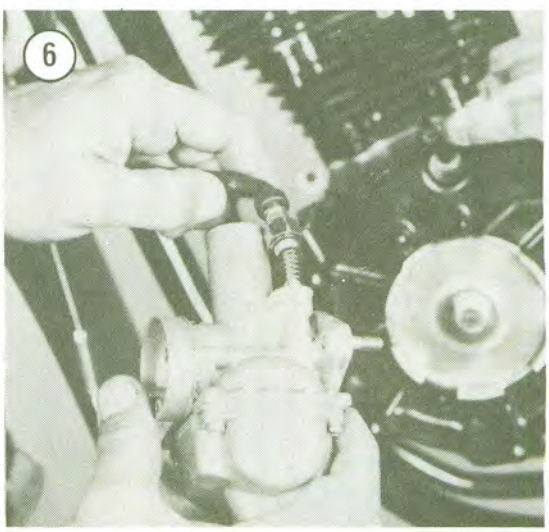
8. Loosen the cap and pull the throttle valve out of the carburetor (**Figure 5**).

9. Loosen the choke valve and remove it (**Figure 6**).

NOTE

If the top cap and throttle valve assembly are not going to be removed from the throttle cable for cleaning, wrap them in a clean shop cloth or place them in a plastic bag to help keep them clean.





10. If necessary, remove the throttle valve assembly as follows:

a. Hold the carburetor cap (A, **Figure 7**) and push the throttle valve (B, **Figure 7**) up. Then move the throttle cable end over to the larger hole in the throttle valve and withdraw the cable out through the top and remove it.

b. Remove the throttle valve and spring (**Figure 8**).

c. Remove the cable guide (**Figure 9**) from the throttle valve.

d. Remove the jet needle (**Figure 10**).

11. Take the carburetor to a workbench for disassembly and cleaning.

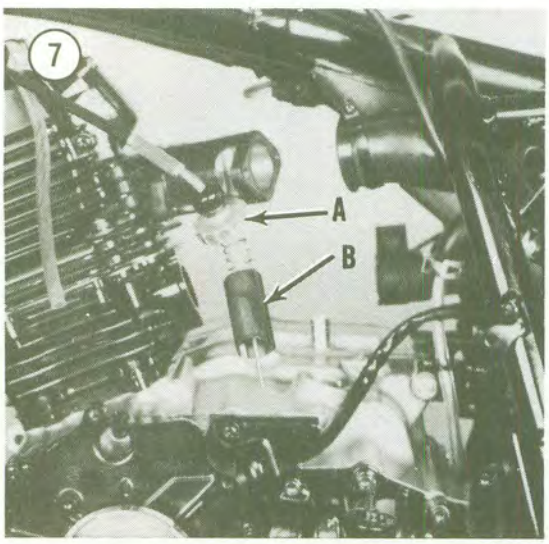
12. Install by reversing these removal steps, noting the following.

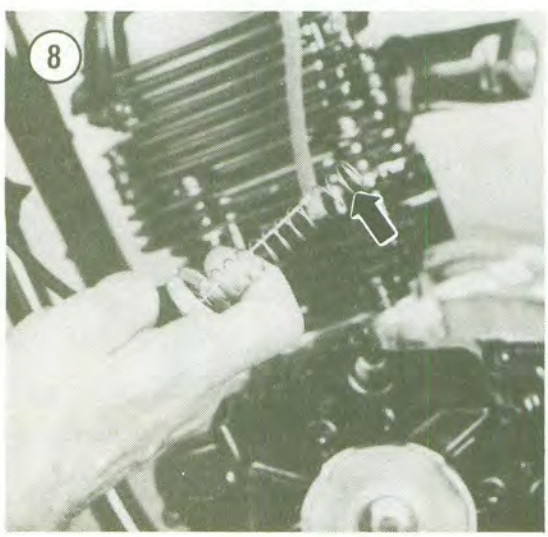
13. Install the cable clip onto the jet needle (**Figure 11**) before installing the needle into the throttle valve.

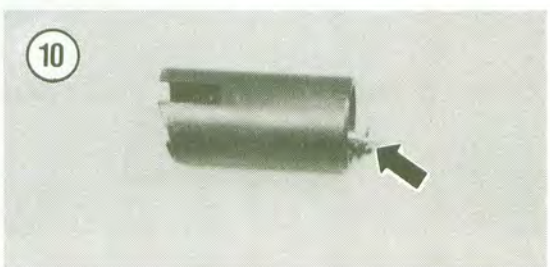
14. When installing the throttle valve, make sure to align the slot in the throttle valve with the pin in the carburetor bore. See **Figure 5**. Adjust the throttle cable as described in Chapter Three.

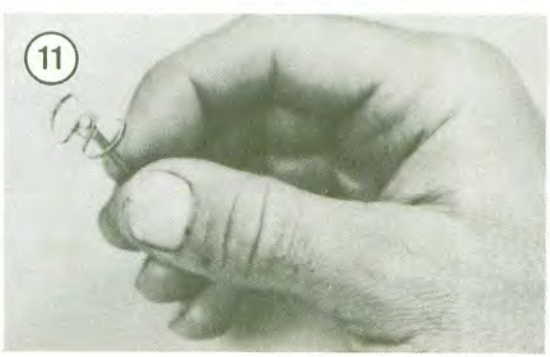
Disassembly/Cleaning/Inspection/Assembly

Refer to **Figure 12** (chain drive) or **Figure 13** (shaft drive) for this procedure.





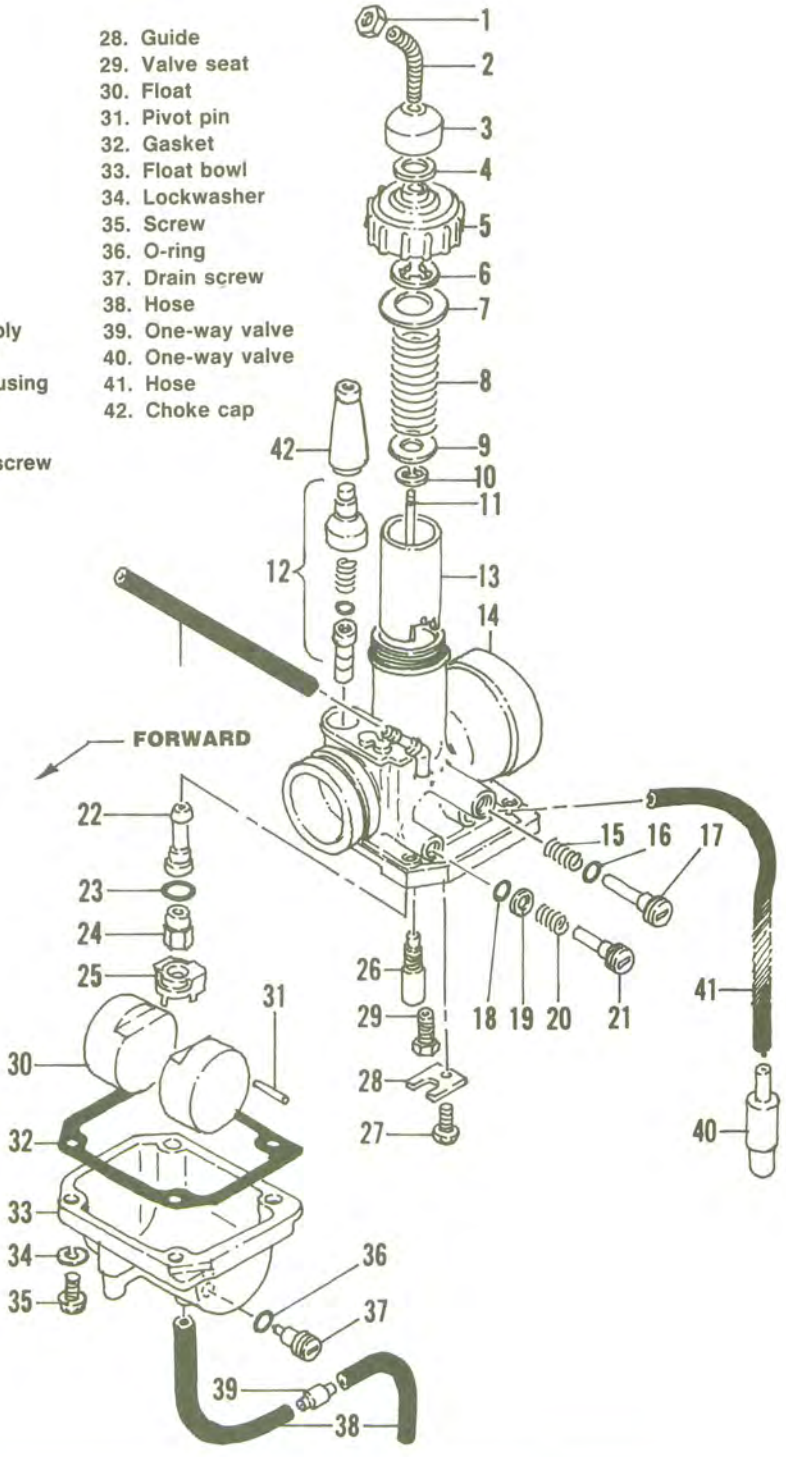




(12)

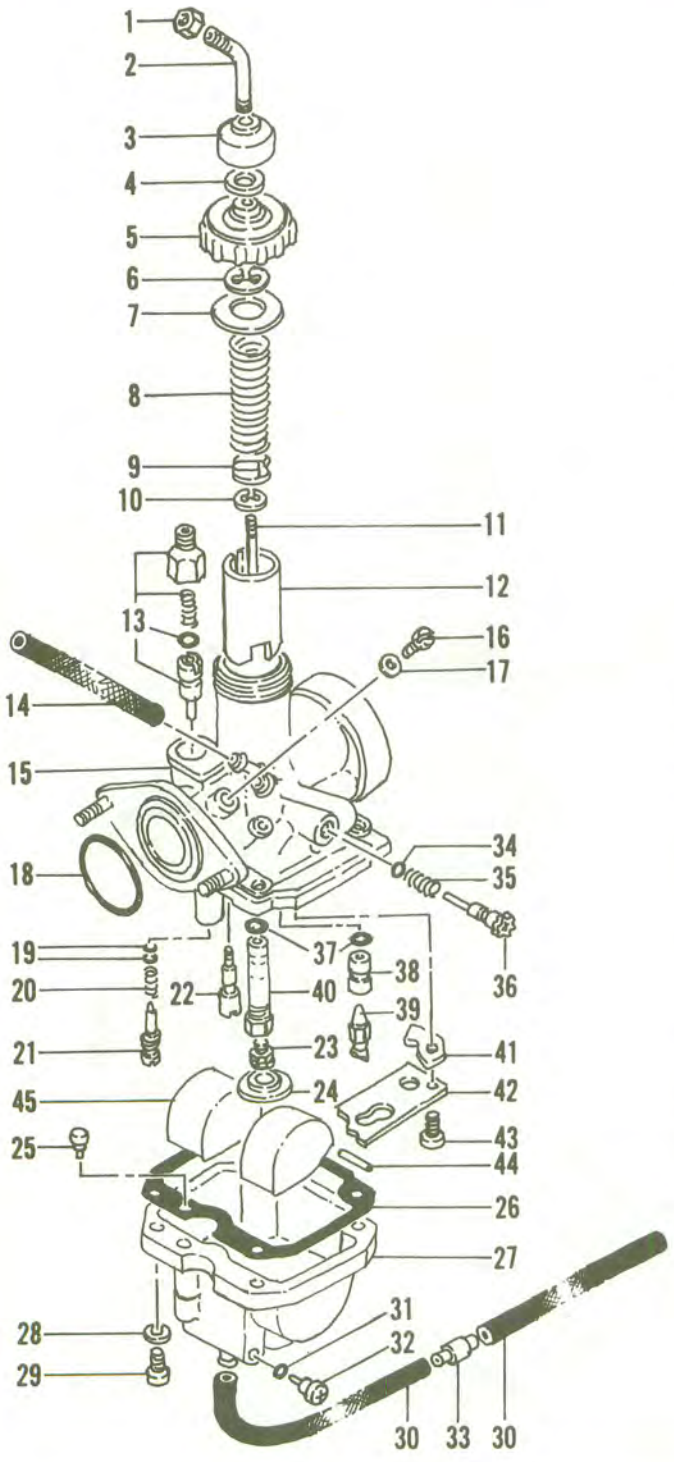
CARBURETOR (CHAIN DRIVE)

1. Nut
2. Cable guide
3. Cap
4. Washer
5. Cap
6. Circlip
7. Washer
8. Spring
9. Washer
10. Circlip
11. Jet needle
12. Choke assembly
13. Throttle valve
14. Carburetor housing
15. Spring
16. O-ring
17. Throttle stop screw
18. O-ring
19. Washer
20. Spring
21. Pilot screw
22. Needle jet
23. O-ring
24. Main jet
25. Cover
26. Pilot jet
27. Screw
28. Guide
29. Valve seat
30. Float
31. Pivot pin
32. Gasket
33. Float bowl
34. Lockwasher
35. Screw
36. O-ring
37. Drain screw
38. Hose
39. One-way valve
40. One-way valve
41. Hose
42. Choke cap

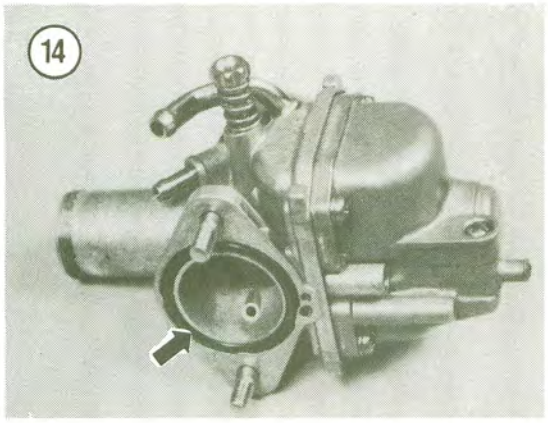


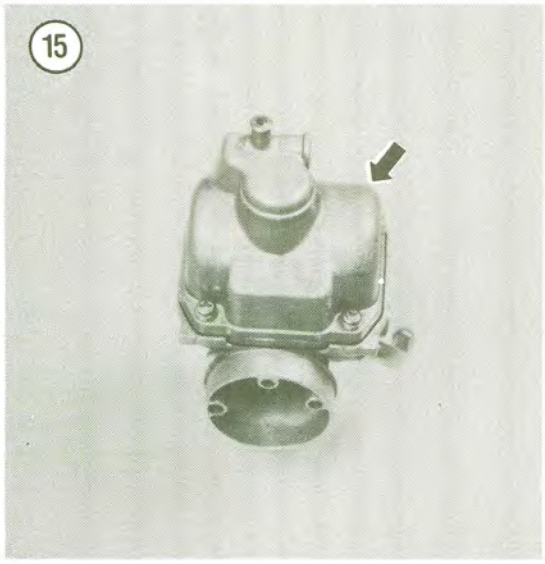
(13)

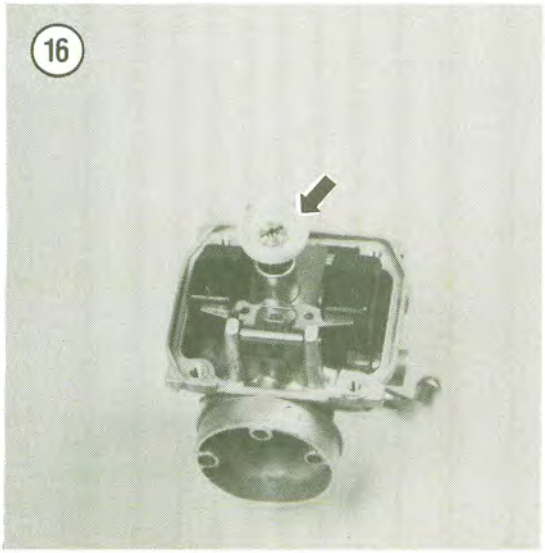
CARBURETOR (SHAFT DRIVE)



1. Nut
2. Cable guide
3. Cap
4. Washer
5. Cap
6. Circlip
7. Washer
8. Spring
9. Spring seat
10. Circlip
11. Jet needle
12. Throttle valve
13. Choke assembly
14. Hose
15. Carburetor housing
16. Screw
17. Washer
18. O-ring
19. O-ring
20. Spring
21. Pilot screw
22. Pilot jet
23. Main jet
24. Plastic cover
25. Starter jet
26. Gasket
27. Float bowl
28. Lockwasher
29. Screw
30. Drain hose
31. O-ring
32. Drain screw
33. One-way valve
34. O-ring
35. Spring
36. Throttle stop screw
37. O-ring
38. Valve seat
39. Needle valve
40. Needle jet
41. Tab
42. Holder
43. Screw
44. Float pin
45. Float







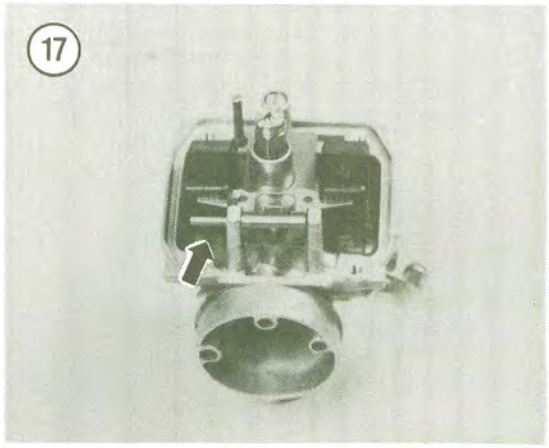
Both carburetors are basically the same, even though minor variations exist between different models. Where differences occur they are identified. The carburetor for shaft drive models (**Figure 13**) is photographed in the following procedure.

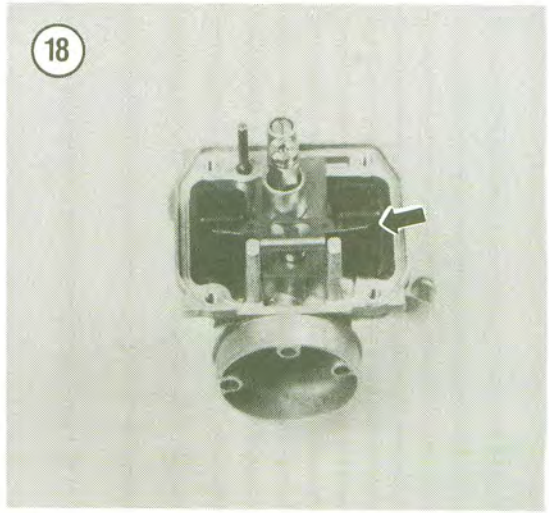
1. Remove all drain and overflow hoses.
2. *Shaft drive*: Remove the spigot O-ring (**Figure 14**).

CAUTION

If the float bowl is on tight in the next step, tap it with a plastic tipped hammer to loosen it. Do not pry it off or you may damage the casting.

3. Remove the screws securing the float bowl (**Figure 15**) and remove it and its gasket.
4. Remove the main jet plastic cover (**Figure 16**).
5. Remove the float pin (**Figure 17**).
6. Remove the float (**Figure 18**).





NOTE

The float valve needle is attached to the float arm. See ***Figure 19****.*

7A. *Chain drive:* Remove the screw and washer and remove the float valve seat.

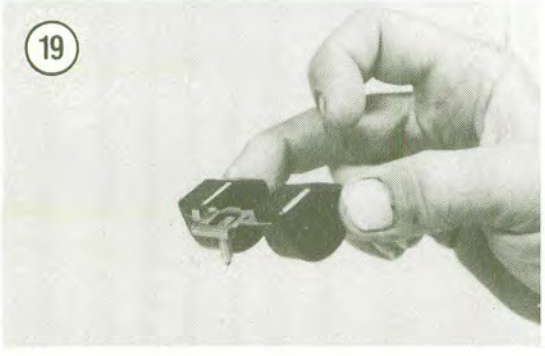
7B. *Shaft drive:* Remove the float valve seat as follows:

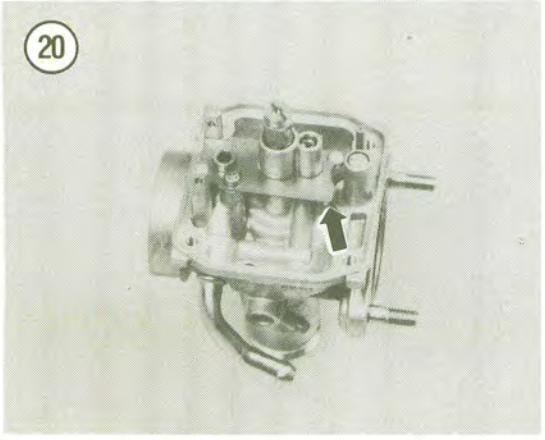
a. Remove the screw securing the plate and remove it and the plate (**Figure 20**).
b. Remove the washer (**Figure 21**) under the plate.
c. Remove the float valve seat (**Figure 22**).

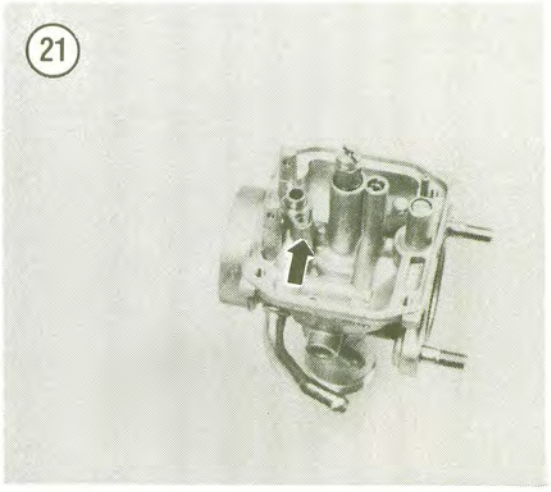
8. Remove the main jet (**Figure 23**).
9. Remove the needle jet (**Figure 24**).
10. Remove the pilot jet (**Figure 25**).
11. Remove all O-rings from all jets and needles (**Figure 26**).
12. Remove the rubber gaskets and covers from the carburetor cap (**Figure 27**).

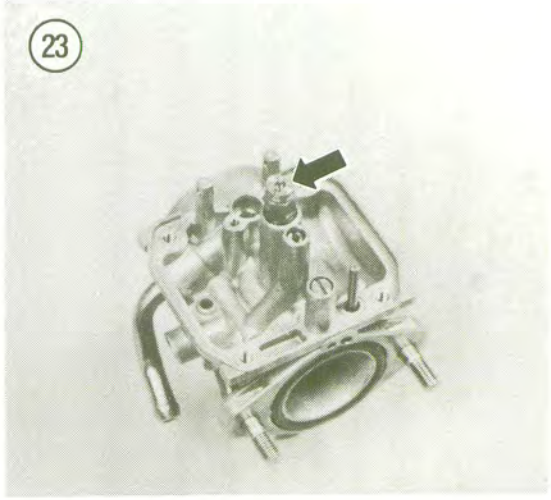
NOTE

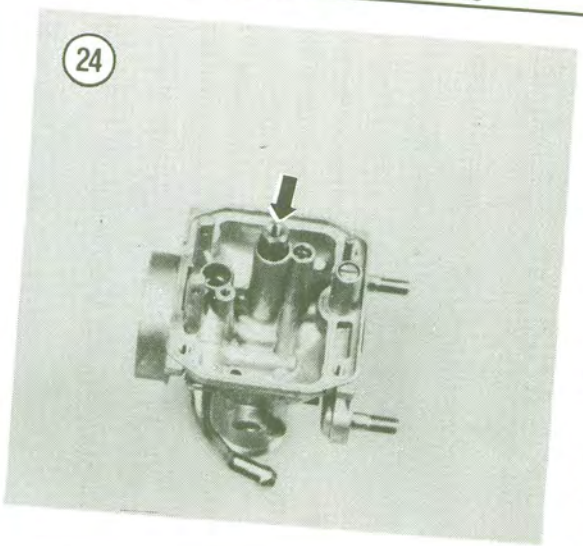
Before removing the carburetor adjustment screws in Step 13 and Step 14, count the number of turns required to close each screw and record this measurement.



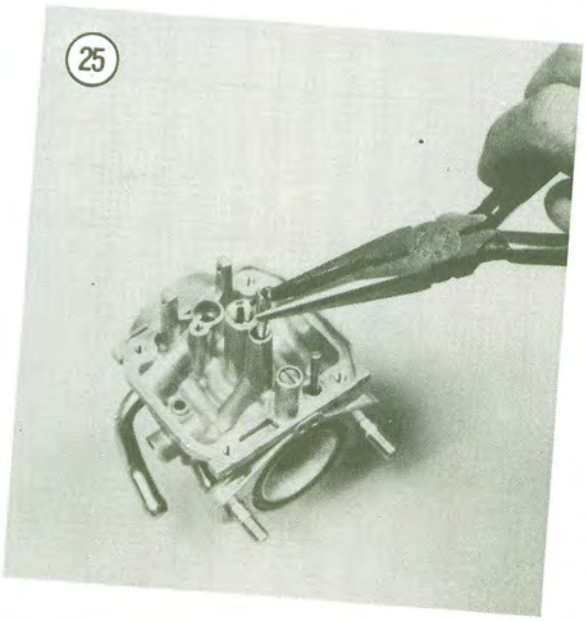


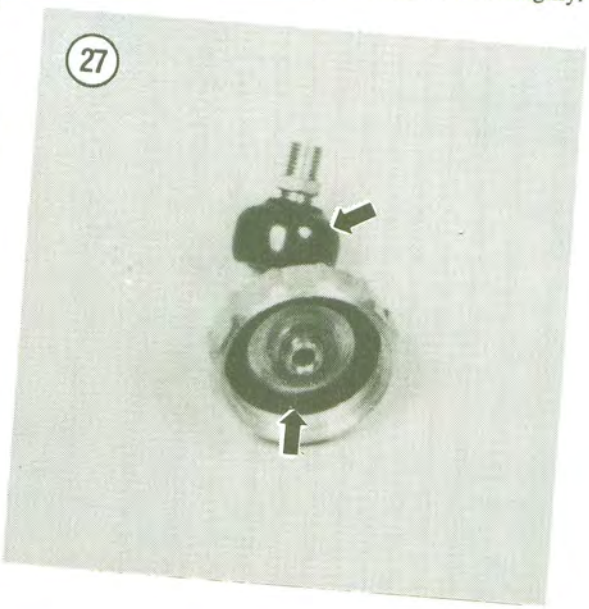


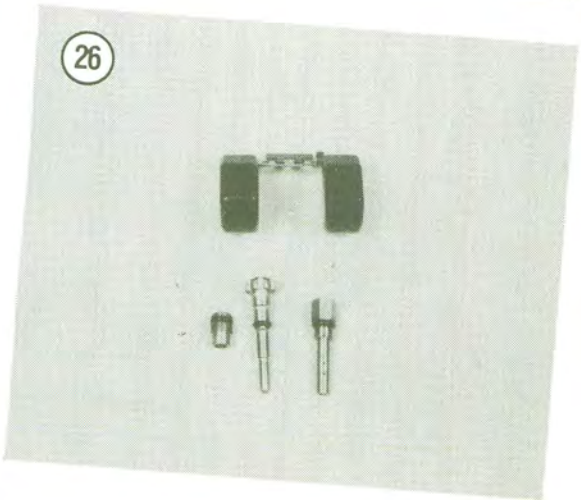


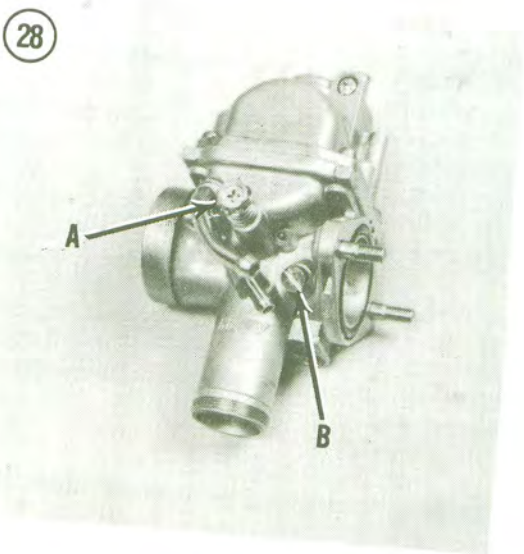


13. Remove the throttle stop screw (A, **Figure 28**).
14A. *Chain drive:* Remove the pilot screw.
14B. *Shaft drive:* Remove the pilot screw plugs. See B, **Figure 28** and **Figure 29**. Then remove the pilot screw.
15. Clean all parts, except rubber or plastic parts, in a good grade of carburetor cleaner. This solution is available at most automotive or motorcycle supply stores, in a small, resealable tank with a dip basket. If it is sealed when not in use, the solution will last for several cleanings. Follow the manufacturer's instructions for correct soak time (usually about 1/2 hour).
16. Remove all parts from the cleaner and rinse with water. Then allow the parts to dry thoroughly.







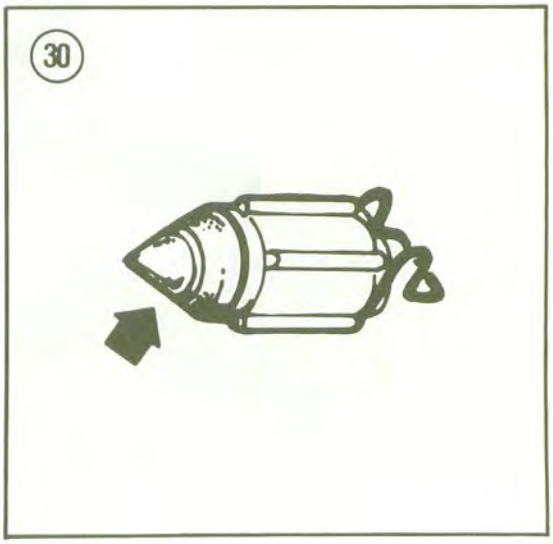


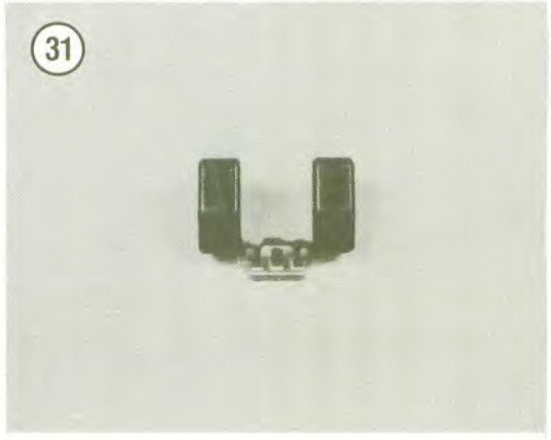
17. Blow out the jets with compressed air. *Do not* use a piece of wire to clean them as minor gouges in the jet can alter flow rate and upset the fuel/air mixture.
18. Inspect all O-rings for wear or damage; replace if necessary.
19. Inspect the throttle valve for signs of wear or deep scratches that could cause the throttle to hang open when the engine is operating. Replace the throttle valve (and check the throttle valve bore in the carburetor body) if necessary.
20. The needle valve must close against the needle seat completely to make sure that no gas passes through the seat when it is not required to do so. If there are any wear marks or scratches on either mating surface, fuel flow cannot be stopped, resulting in a rich fuel/air mixture. Inspect the condition of the needle valve and seat (**Figure 30**). Replace the needle valve and seat as a complete unit if any one is damaged.

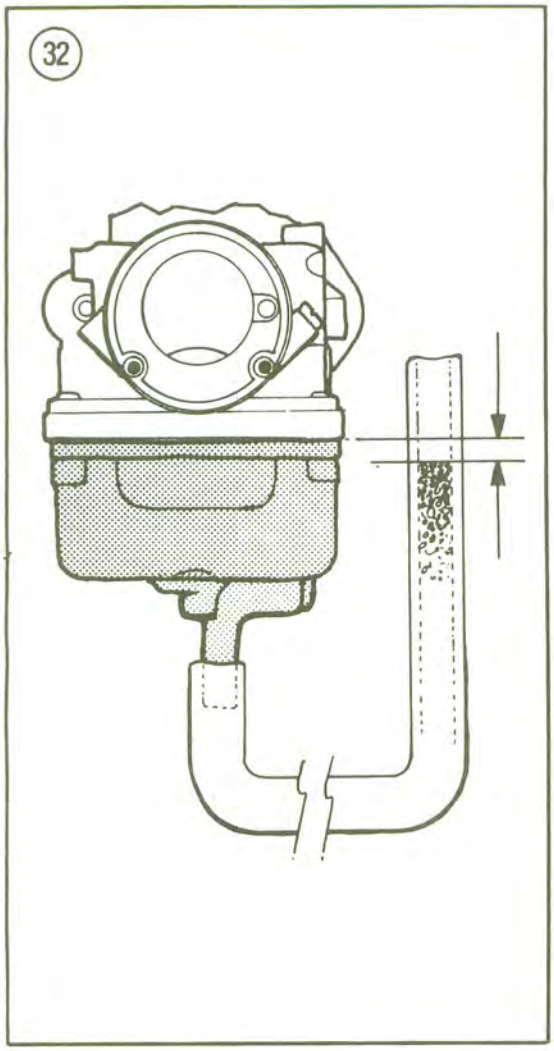
NOTE

Damage to the needle valve and seat are normally due to dirt or other debris in the fuel. Check and clean the fuel tank fuel valve more often if this is a problem.

21. Check the floats (**Figure 31**) for any signs of damage. If the floats are suspected of leaking, shake the floats by hand and listen for fuel sloshing around inside the float(s). Another way to check for leakage is by immersing the floats completely in a container of water or solvent (do not use gasoline) and checking for air bubbles. Replace the floats if necessary.
22. Assembly is the reverse of these steps, noting the following.
23. Install a new float bowl gasket if the old one is torn. Make sure the gasket does not cover or block any holes or components.
24. Attach the needle valve onto the float arm (**Figure 19**) before installation.
25. Check the float height and adjust if necessary as described in this chapter.
26. Install the pilot screw so that it lightly bottoms. Then back it out to the following specifications (or use the specifications recorded during disassembly):
    a. Chain drive models: 2 1/4 turns.
    b. Shaft drive models: 1-2 turns.
27. After the carburetor has been assembled, adjust the idle speed as described in this chapter.







CARBURETOR ADJUSTMENTS

Fuel Level Adjustment

NOTE

*Before performing this adjustment, remove the float assembly and check the condition of the float valve and valve seat (**Figure 30**). If worn, this adjustment will be incorrect. Replace any worn parts.*

The vehicle must be *exactly level* for this measurement to be accurate. Park the vehicle on a level surface and set the parking brake.

Use either the Yamaha special level gauge (part number 90890-01312-00 (**Figure 32**) or a piece of clear vinyl tubing with an inside diameter of 6 mm (0.24 in.). The length of the tubing should be long enough to reach up to the side of the carburetor as shown in **Figure 32**.

WARNING

Before starting any procedure involving gasoline have a class B fire extinguisher rated for gasoline or chemical fires within reach. Do not smoke, allow anyone to smoke or work where there may be open flames. The work area must be well-ventilated.

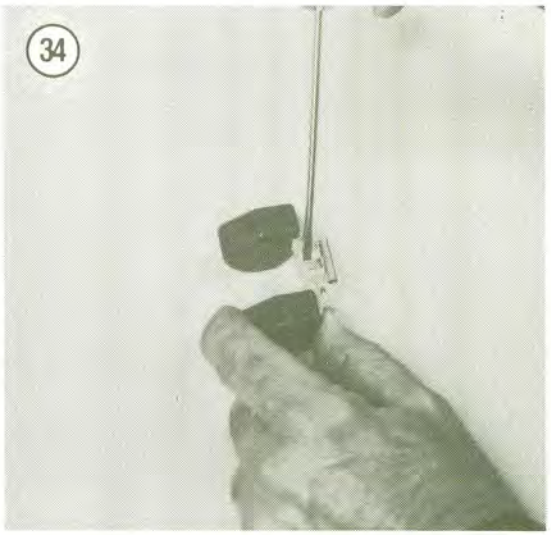
1. Park the vehicle on a level surface. Set the parking brake.
2. Turn the fuel shutoff valve to the OFF position.
3. Place a small container under the carburetor to catch any fuel that may drip from the float bowl.
4. Insert the level gauge adapter and hose into the carburetor drain nozzle. **Figure 32** shows the hose installed. **Figure 33** shows the drain nozzle.
5. Hold the loose end of the tube up above the float bowl level (**Figure 32**).
6. Turn the fuel shutoff valve ON. Then start the engine and let it run for 2-3 minutes. This is necessary to make sure the fuel level is at the normal operating level in the float bowl.
7. Hold the loose end of the tube up against the carburetor body (**Figure 32**). Measure the fuel level in the tube from the edge of the carburetor body to the fuel level. See **Figure 32**. This is the fuel level measurement. See **Table 2** for specifications. Remove the tube from the carburetor float bowl nozzle. Immediately wipe up any spilled fuel on the engine.

WARNING

Do not let any fuel spill on the exhaust system as it is warm.

8. If the fuel level is incorrect, remove the carburetor and adjust the float as follows.

9. Adjust the float by carefully bending the tang on the float arm (**Figure 34**). Bend the float tang upward very slightly to lower the fuel level; bend the float tang downward to raise the fuel level. If the float level is set too high, the result will be a rich air/fuel mixture. If it is set too low, the mixture will be too lean.
10. Install the carburetor and repeat this procedure until the fuel level is correct.



Needle Jet Adjustment

The position of the needle jet (**Figure 35**) can be adjusted to affect the fuel/air mixture for medium throttle openings.

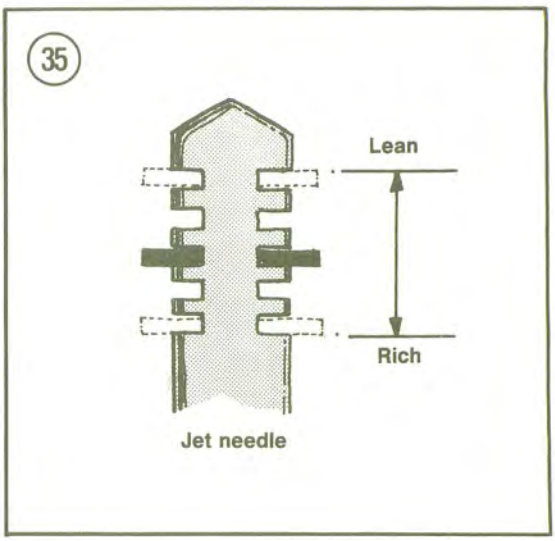
The top of the carburetor must be removed for this adjustment.

1. Unscrew the carburetor top cap and pull the throttle valve assembly up and out of the carburetor.

NOTE

Before removing the top cap, thoroughly clean the area around it so no dirt will fall into the carburetor.

2. At the end of the throttle cable, push up on the throttle valve (slide) spring. Then remove the cable guide.
3. Move the throttle cable end over to the larger hole in the throttle valve and withdraw the cable out through the top and remove it.
4. Remove the needle jet (**Figure 36**) from the throttle valve assembly.
5. Slide the needle jet out of the connector and note the position of the clip. Raising the needle (lowering the clip) will enrich the mixture during mid-throttle opening, while lowering it (raising the clip) will lean the mixture. Refer to **Figure 35**.
6. Refer to **Table 1** at the end of the chapter for standard clip position for all models.
7. Reassemble and install the top cap.



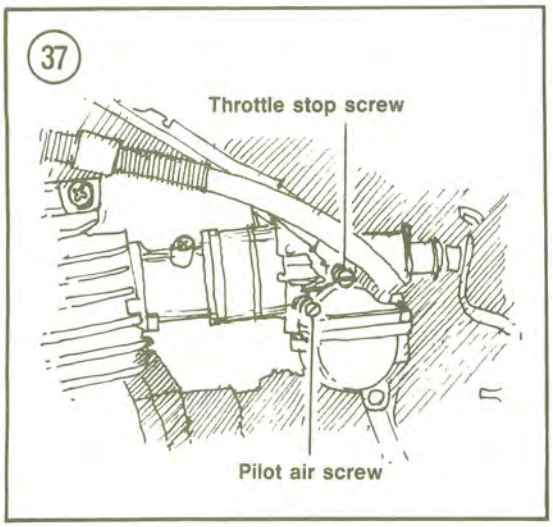
Pilot Screw and Idle Speed Adjustment

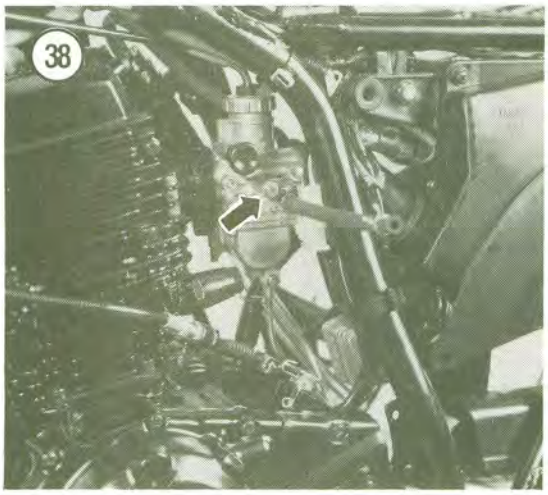
Before starting this procedure the air cleaner must be clean, otherwise this procedure cannot be done properly.

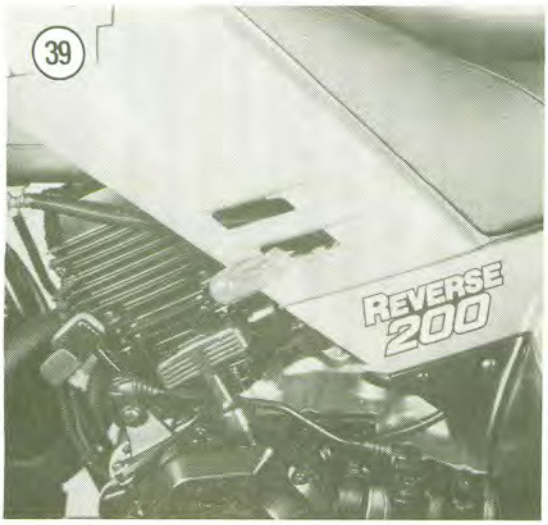
1A. *Chain drive:* Turn the pilot air screw (**Figure 37**) in until it lightly seats. Back the screw out the correct number of turns for your model (**Table 1**).

1B. *Shaft drive:* The pilot screw on these models is only accessible by removing the carburetor from the vehicle and removing the float bowl. Perform the following:

a. Remove the carburetor from the vehicle as described in this chapter. It is not necessary to







disconnect the throttle valve or choke assemblies.

WARNING

Fuel will flow out of the carburetor when performing the next step. Take precautions to prevent the fuel from contacting the engine and exhaust pipes (if hot) and work away from all open flames.

b. Remove the float bowl (**Figure 15**).
c. Turn the pilot air screw (**Figure 29**) in until it lightly seats. Then back it out the specified number of turns (**Table 1**).
d. Reinstall the float bowl and install the carburetor as described in this chapter.

2. Start the engine and let it reach normal operating temperature.
3. Turn the throttle stop screw in or out to achieve the desired idle speed. See **Figure 38** and **Figure 39**. **Table 1** lists the correct idle speed for all models.

WARNING

With the engine idling, move the handlebar from side to side. If idle speed increases during this movement, the throttle cable needs adjusting or it may be incorrectly routed through the frame. Correct this problem immediately. Do not ride the vehicle in this unsafe condition.

High Altitude Adjustment (Main Jet Replacement)

If the vehicle is going to be operated for any sustained period of time in high elevations (above 5,000; 1,500 m), the main jet should be changed to a one-stop smaller jet; never change the jet by more than one size at a time without test riding the bike and running a spark plug test. Refer to *Reading Spark Plugs* in Chapter Three.

The carburetor is set with the standard jet for normal sea level conditions. But if the vehicle is run at higher altitudes or under heavy load—deep sand or mud—the main jet should be replaced or it will run too rich and carbon up quickly.

CAUTION

If the vehicle has been rejetted for high altitude operation (smaller jet), it must be changed back to the standard main jet if ridden at altitudes below 5,000 ft. (1,500 m); engine overheating and piston seizure may occur.

Refer to **Table 1** (end of chapter) for standard main jet sizes.

1. Turn the fuel shutoff valve to the OFF position and disconnect the fuel line.
2. Remove the carburetor from the vehicle as described in this chapter. It is not necessary to disconnect the throttle valve or choke assemblies.
3. Loosen the drain screw and drain out all fuel in the bowl.

WARNING

Place a metal container under the cover to catch the fuel that will flow out. Do not let it drain out onto the engine or the vehicle's frame as it presents a real fire danger. ***Do not perform this procedure with a hot engine****. Dispose of the fuel properly; wipe up any that may have spilled on the bike and the floor (if inside a garage).*

4. On all models, remove the float bowl (**Figure 15**).
5. The main jet is directly under the cover. Remove the plastic cover (**Figure 16**) and remove the main jet (**Figure 17**). Replace it with a different one. Remember, only one jet size at a time.
6. Install the float bowl. Tighten it securely.
7. Install the carburetor. Tighten the clamping band screws and reinstall the carburetor fuel line.

THROTTLE CABLE

Removal

1. Park the vehicle on level ground and set the parking brake.
2. Remove the side covers and seat.
3. Remove the fuel tank as described in this chapter.
4. Clean the area around the carburetor cap thoroughly so that no dirt will fall into the carburetor. Then unscrew the cap and pull the throttle valve assembly up and out of the carburetor (**Figure 40**). Depress the throttle valve spring (**Figure 41**), then remove the throttle valve and spring and remove the throttle cable from the throttle valve.

NOTE

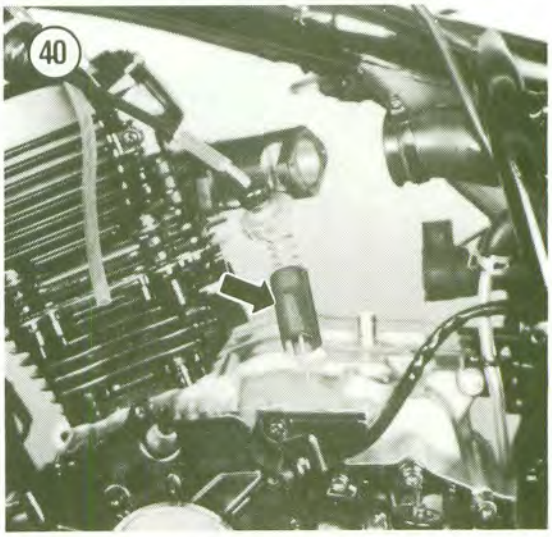
Place a clean shop rag over the top of the carburetor to keep any foreign matter from falling into the carburetor bore.

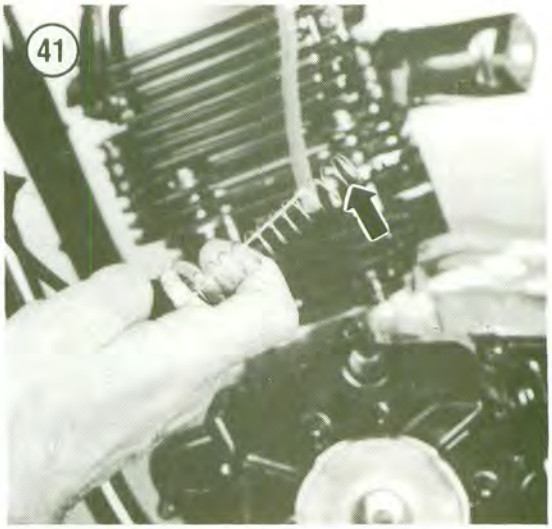
5. Remove the screws securing the throttle cover (A, **Figure 42**) and remove it.
6. Slide the rubber protector (B, **Figure 42**) away from the throttle housing.
7. Disconnect the throttle cable (**Figure 43**) at the throttle lever.

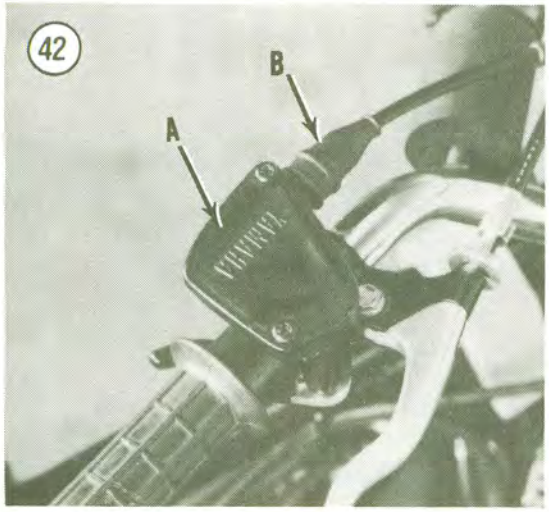
NOTE

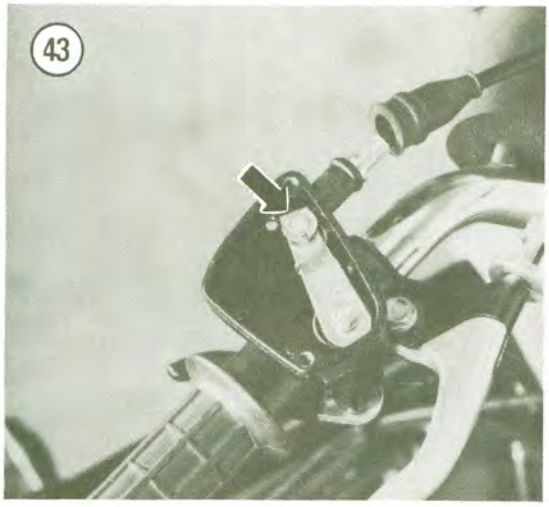
The piece of string attached in the next step will be used to pull the new throttle cable(s) back through the frame so it will be routed in the exact same position as the old one.

8. Tie a piece of heavy string or cord (approximately 6-8 ft./1.8-2.4 m long) to the carburetor end of the throttle cable. Wrap this end with masking or duct tape. Do not use an excessive amount of tape as it will be pulled through the frame loop during removal. Tie the other end of the string to the frame.
9. At the twist grip end of the cable, carefully pull the cable (and attached string) out through the frame loop and from behind the headlight housing









(**Figure 44**). Make sure the attached string follows the same path of the cable through the frame and behind the headlight.

10. Remove the tape and untie the string from the old cable.

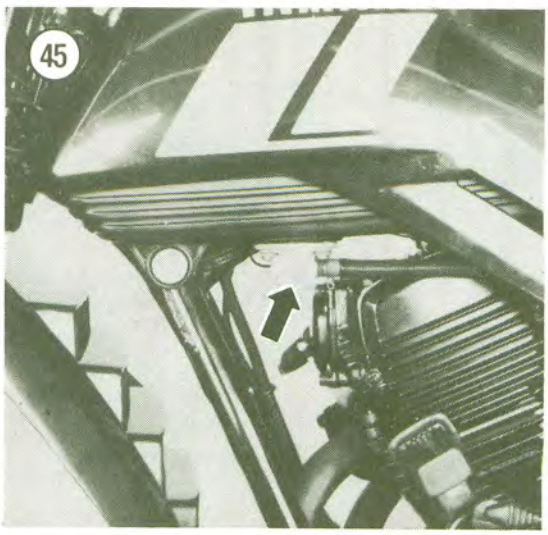
Installation

1. Lubricate the new cable as described in Chapter Three.
2. Tie the string (used during *Removal*) to the new throttle cable and wrap them with tape.
3. Carefully pull the string back through the frame routing the new cable through the same path as the old one.
4. Remove the tape and untie the string from the cable and the frame.
5. Reverse Steps 1-7 of *Removal*, noting the following.
6. Operate the throttle lever and make sure the carburetor is operating correctly and with no binding. If operation is incorrect or there is binding carefully check that the cable is attached correctly and there are no tight bends in the cable.
7. Adjust the throttle lever as described in Chapter Three.
8. Test ride the bike to make sure the throttle is operating correctly.

FUEL TANK

Removal/Installation

1. Park the vehicle on level ground. Set the parking brake.
2. Turn the fuel shutoff valve to the OFF position and remove the fuel line to the carburetor (**Figure 45**).



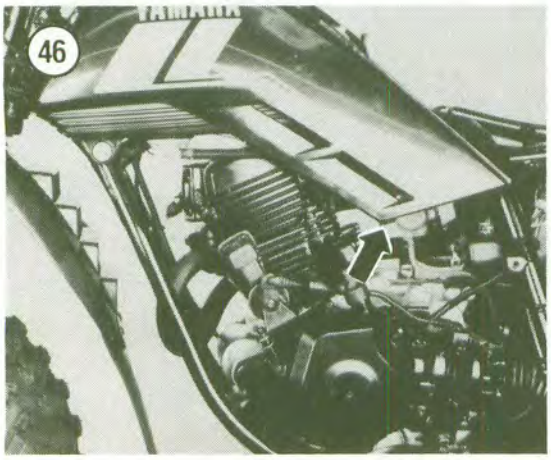
3. Remove the seat.
4. Remove the fuel tank covers. See **Figure 46** (YTM200 and YTM225) or **Figure 47** (YFM200).
5. Remove the bolts securing the the fuel tank and remove it.
6. Inspect the rubber cushions on the frame where the fuel tank is held in place. See **Figure 48** (front) and **Figure 49**. Replace as necessary if damaged or starting to deteriorate.
7. Install by reversing these removal steps.

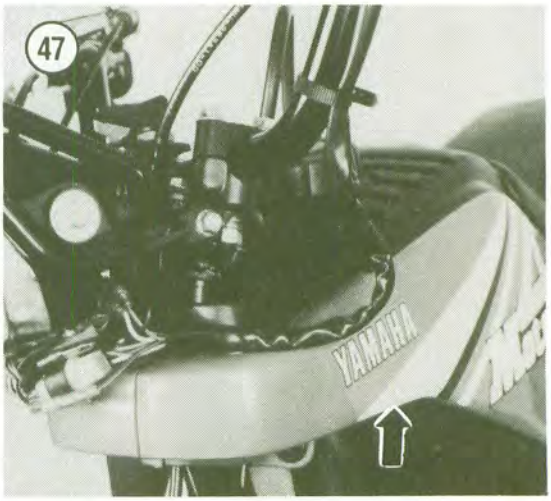
FUEL SHUTOFF VALVE

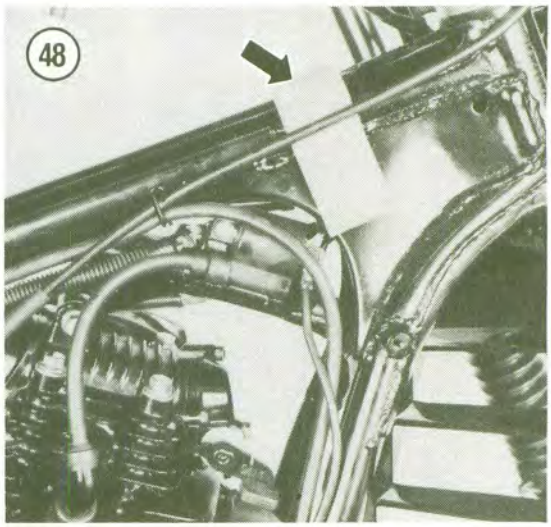
Removal/Cleaning/Installation

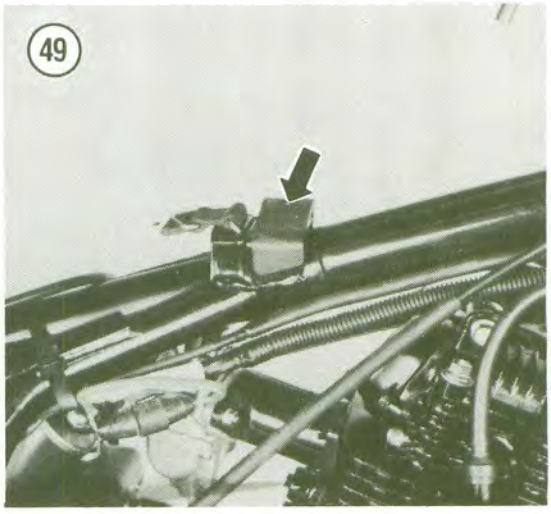
The integral fuel filter in the fuel shutoff valve removes particles in the fuel which might otherwise enter into the carburetor. This could cause the float needle to stay in the open position or clog one of the jets.

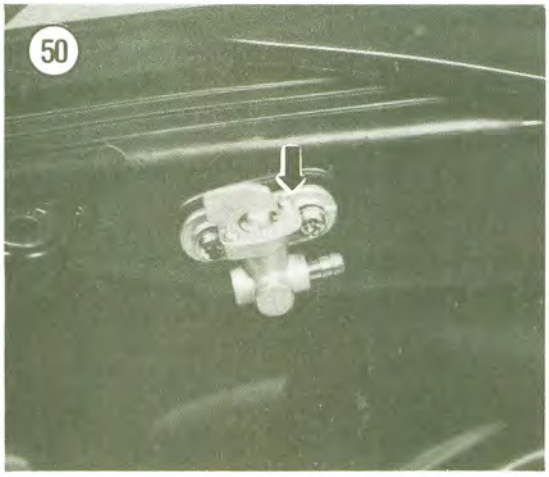
1. Place the fuel hose into a clean, sealable metal container. This fuel can be reused if kept clean.
2. Turn the fuel shutoff valve to the RES position and open the fuel filler cap. This will speed up the flow of fuel. Drain the tank completely.
3. Remove the fuel tank.
4. Remove the screws securing the fuel shutoff valve to the tank and remove the valve. See **Figure 50**.
5. After removing the valve, insert a corner of a clean shop rag into the opening in the tank to stop the dribbling of fuel onto the engine and frame.
6. Clean the screen in solvent with a soft toothbrush, then dry. Check the O-ring gasket. Replace it if it is starting to deteriorate or get hard. Make sure the lever spring is not broken or getting soft. Replace if necessary.
7. Reassemble the valve and install it on the tank. Don't forget the O-ring gasket. Check for fuel leakage after installation is completed.







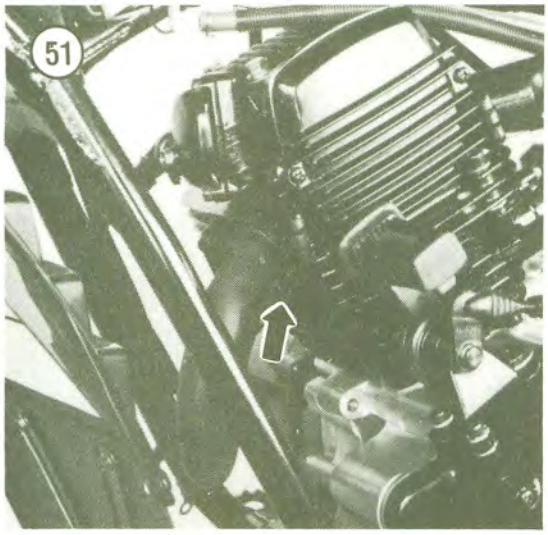




EXHAUST SYSTEM

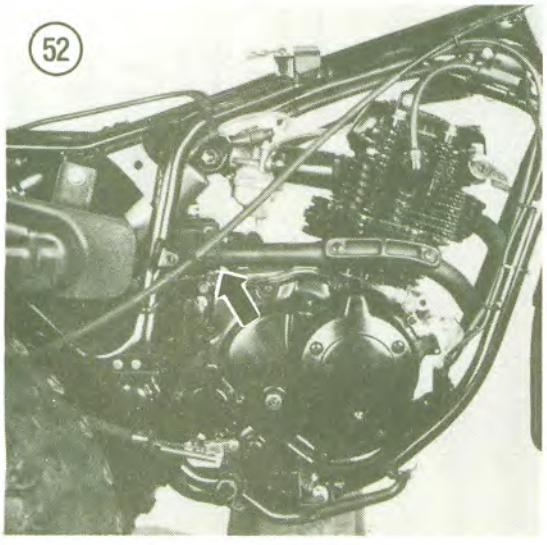
The exhaust system is a vital performance component and frequently, because of its design, it is a vulnerable piece of equipment. Check the exhaust system for deep dents and fractures and repair them or replace parts immediately. Check the muffler frame mounting flanges for fractures and loose bolts. Check the cylinder head mounting flange for tightness. A loose exhaust pipe connection will not only rob the engine of power, it could also damage the piston and cylinder.

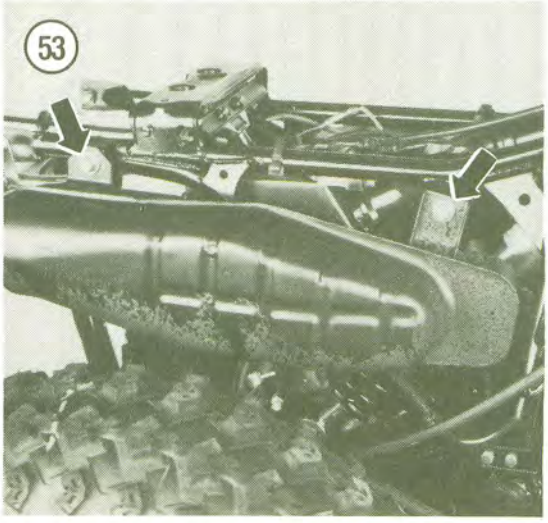
The exhaust system consists of an exhaust pipe, muffler and spark arrestor.



Removal/Installation

1. Park the vehicle on level ground. Set the parking brake.
2. Remove the fuel tank covers. See **Figure 46** or **Figure 47**.
3. Remove the bolts securing the header pipe to the cylinder (**Figure 51**) and slide the pipe bracket away from the engine.
4. On models with separate muffler and header pipe assemblies, loosen the pipe clamp bolt (**Figure 52**).
5. On models with one-piece exhaust systems, move the exhaust system to the rear and remove it. On two-piece exhaust systems, remove the muffler (**Figure 53**) and header pipe separately.
6. Inspect the condition of the gaskets at all joints; replace as necessary.
7. Installation is the reverse of these steps, noting the following.





8. To minimize exhaust leaks, install all exhaust system components before tightening the fasteners.

9. Tighten all fasteners securely.

10. Make sure the head pipe is correctly seated in the exhaust port.

11. After installation is complete, start the engine and make sure there are no exhaust leaks.

Carbon Removal

The spark arrester should be removed and cleaned every 6 months.

1. Remove the screw and pull the spark arrester out of the muffler.
2. Using a wire brush and solvent, clean the spark arrester of all carbon build-up.
3. After the carbon build-up, clean the spark arrester with solvent and allow to dry.
4. Reverse to install.

Table 1 CARBURETOR SPECIFICATIONS

Item	YTM200K, L, N	YTM200EK, EL
Type	Mikuni VM22	Mikuni VM22
I.D.	21V00	23W00
Main jet	102.5	112.5
Main air jet	1.5	1.7
Jet needle/Position	4L25/3	4H23/3
Needle jet	N-8	N-6
Slide cutaway	3.5	4.0
Pilot jet	35	25
Pilot air jet	1.3	1.3
Pilot screw (turns)	2 1/4	1 1/2
Valve seat	2.0	1.8
Starter jet	65	65
Item	**YTM200ERN**	**YTM225DXK, DXL, DXN**
Type	Mikuni VM22SH	Mikuni VM22
I.D.	24W01	29U00
Main jet	112.5	112.5
Main air jet	1.7	1.6
Jet needle/Position	4H23/3	5L10/3
Needle jet	N-6	N-8
Slide cutaway	4.0	3.5
Pilot jet	25	20
Pilot air jet	130	60
Pilot screw (turns)	2 1/2	1 1/2
Valve seat	1.8	1.8
Starter jet	85	65
Item	**YTM225DRN**	**YTM225DRS**
Type	Mikuni VM22	Mikuni VM24
I.D.	29U01	1NV00
Main jet	112.5	112.5
Main air jet	1.6	1.6
Jet needle/Position	5L10/3	5L10/4
Needle jet	N-8	0-0
Slide cutaway	3.5	3.5
Pilot jet	20	20
Pilot air jet	60	120
Pilot screw (turns)	1 1/2	1 3/4
Valve seat	1.8	1.8
Starter jet	80	60
Item	**YFM200N**	**YFM200DXS**
Type	Mikuni VM22SH	Mikuni VM22SH
I.D.	52H-00	1NU00
Main jet	115	117.5
Main air jet	1.7	1.7
Jet needle/Position	4DH1/3	4D11/3
Needle jet	N-6	N-6
Slide cutaway	4.0	4.0
Pilot jet	27.5	20
Pilot air jet	130	—
Pilot outlet	—	0.7
Pilot screw (turns)	1 1/2	2.0
Valve seat	1.8	1.8
Starter jet	85	—

Table 2 CARBURETOR FUEL AND FLOAT LEVELS

Fuel level	
YFM200DXS	2.5-3.5 mm (0.10-0.14 in.)
All other models	2.0-3.0 mm (0.08-0.12 in.)
Float height	21.5 ±0.5 mm (0.85 ±0.02 in.)

CHAPTER SEVEN

ELECTRICAL SYSTEM

This chapter contains operating principles and service procedures for all electrical and ignition components.

The electrical systems include:

a. Charging system.
b. Ignition system.
c. Starting system.
d. Lighting system.

Refer to Chapter Three for routine ignition system maintenance. Electrical system specifications are found in **Tables 1-4**. **Tables 1-6** are at the end of the chapter.

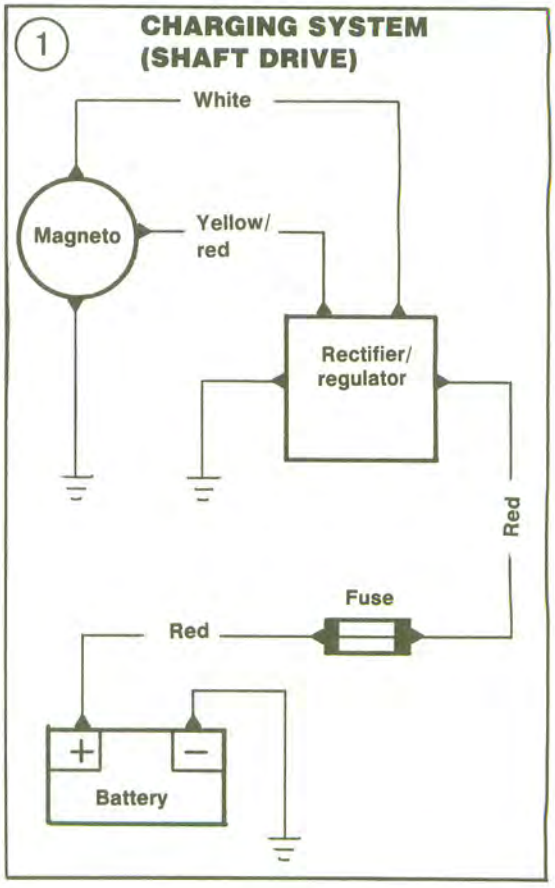
CHARGING SYSTEM (SHAFT DRIVE MODELS)

The charging system consists of the battery, alternator and a solid state rectifier/voltage regulator. See **Figure 1**.

The alternator generates an alternating current (AC) which the rectifier converts to direct current (DC). The regulator maintains the voltage to the battery and load (lights, ignition, etc.) at a constant level regardless of variations in engine speed and load. Refer to Chapter Three for battery service.

Charging System Output Test

Whenever the charging system is suspected of trouble, make sure the battery is fully charged



before going any further. Clean and test the battery as described in Chapter Three. If the battery is in good condition, test the charging system as follows.

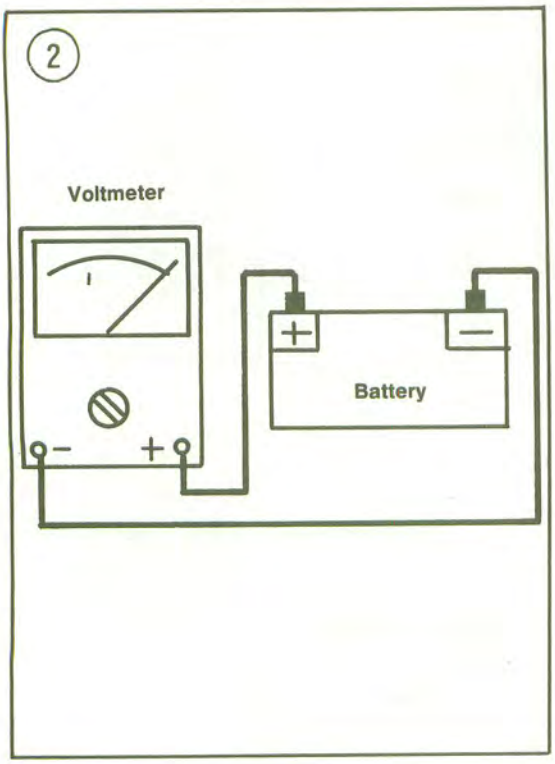
1. Remove the rear fender assembly.
2. Connect a 0-20 volt DC voltmeter onto the battery terminals as shown in **Figure 2**. The battery is shown in **Figure 3**.
3. Start the engine and idle it at 5,000 rpm. Check the output and compare to the specifications in **Tables 2-4**.
4. If charging voltage is lower than specified, check the alternator and voltage regulator/rectifier. It is less likely that the charging voltage is too high; however, in that case the regulator is probably faulty. Test the separate charging system components as described in this chapter.

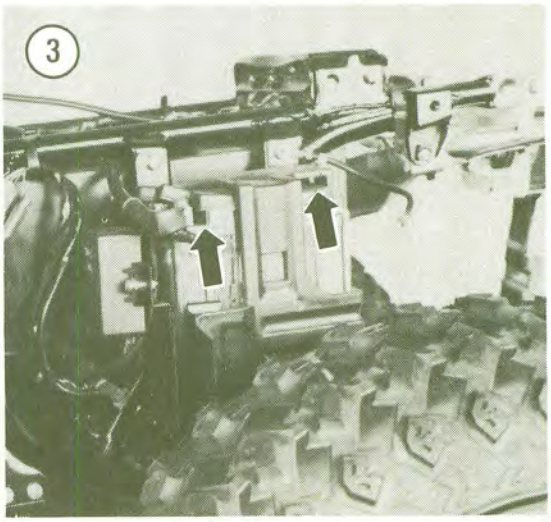
CHARGING SYSTEM (CHAIN DRIVE MODELS)

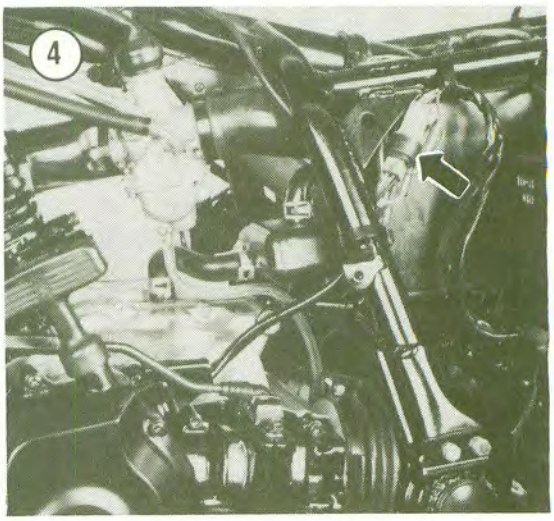
The AC generator charging system performance test is described in the lighting system section of this chapter. Refer to *Lighting Voltage Test* for testing information.

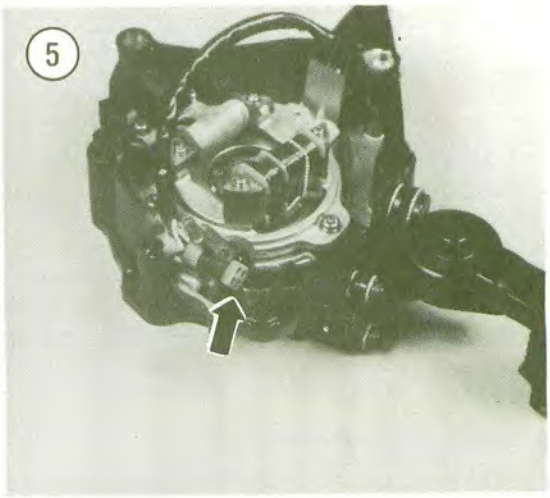
ALTERNATOR

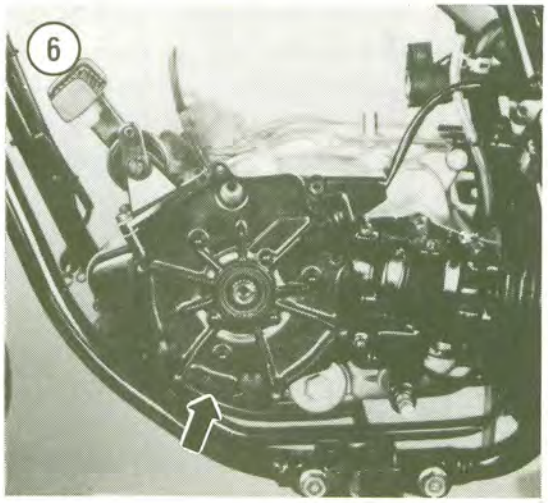
The alternator is a form of electrical generator in which a magnetized field called a rotor revolves within a set of stationary coils called a stator. As

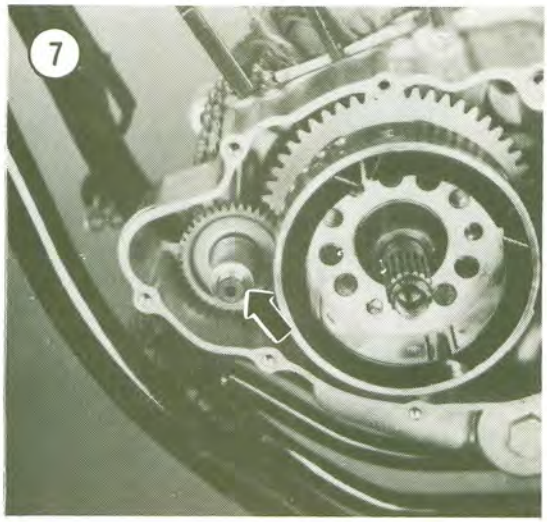


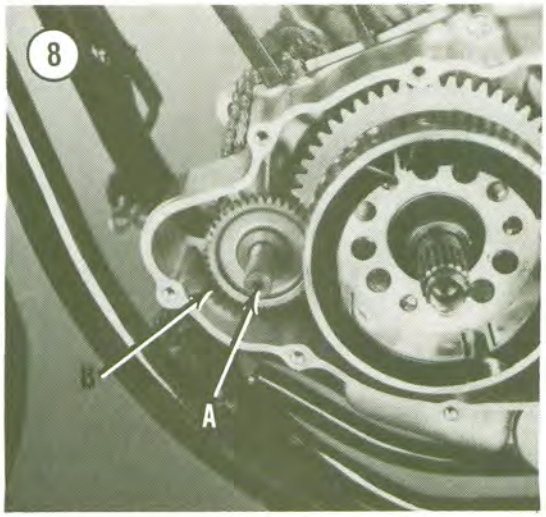












the rotor revolves, alternating current is induced in the stator. The current is then rectified to direct current and used to operate the electrical accessories on the motorcycle and to charge the battery (if so equipped). The rotor is a permanent magnet.

Charge Coil Testing

It is not necessary to remove the stator assembly to perform the following tests. It is shown removed in the following procedures for clarity.

In order to get accurate resistance measurements the stator assembly and coil must be approximately 68° F (20° C).

1. Remove the seat and fender assembly.
2. Disconnect the alternator connector (**Figure 4**).
3. Connect an ohmmeter between the white and black (shaft drive) or the brown to black (chain drive) wires as shown in **Figure 5**. The specified resistance is listed in **Tables 1-4**.
4. If the value is not within the specified range, check the electrical wires to and within the connector. If they are okay, remove and inspect the stator and rotor as described in this chapter.

Rotor Removal

1. Remove the recoil starter as described in Chapter Four.
2. Drain the engine oil as described in Chapter Three.
3. Disconnect the battery negative terminal (if so equipped).
4. Disconnect the alternator electrical connector (**Figure 5**).

CAUTION

An impact driver with a Phillips bit (described in Chapter One) will be necessary to loosen the alternator cover screws in Step 5. Attempting to loosen the screws with a Phillips screwdriver may ruin the screw heads.

5. Remove the bolts securing the alternator cover and remove the cover (**Figure 6**), gasket and the electrical harness from the frame. Note the path of the wire harness as it must be routed the same during installation.
6. Remove the following parts in order:
   a. Spacer (**Figure 7**).
   b. Starter idler gear shaft (A, **Figure 8**).
   c. Starter idler gear (B, **Figure 8**).

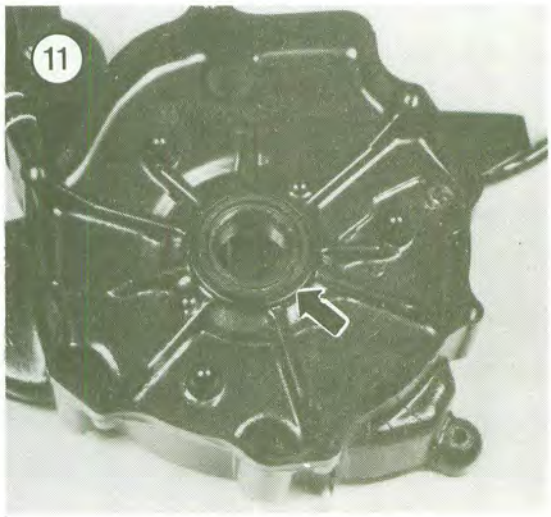
7. Remove the alternator rotor (**Figure 9**) with a 3-way universal puller (**Figure 10**).

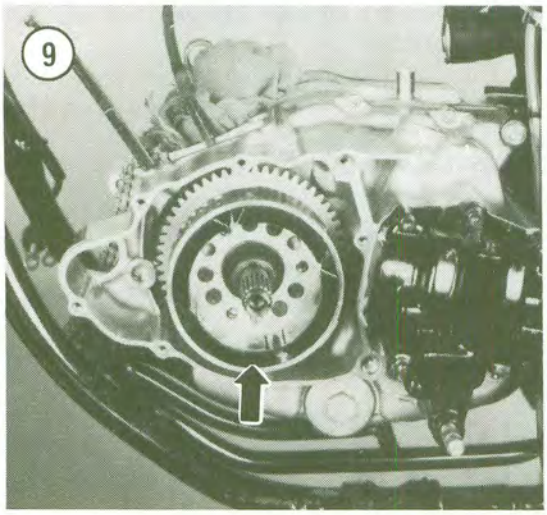
Rotor Inspection

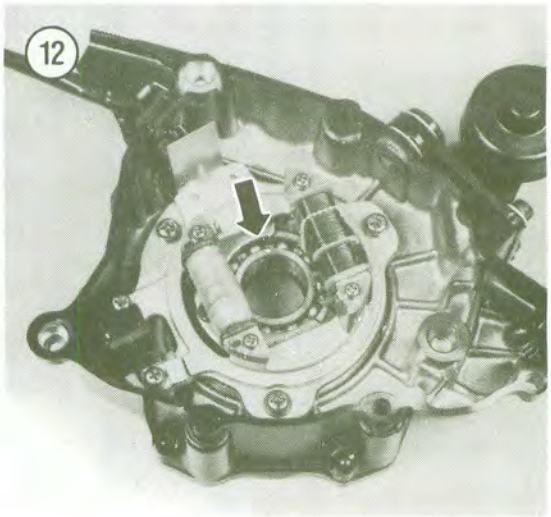
1. Inspect the alternator cover oil seal (**Figure 11**) for wear or damage. If necessary, replace the oil seal as described under *Bearing and Oil Seal Replacement* in Chapter Four.
2. Check the alternator cover bearing (**Figure 12**). Make sure the bearing spins freely without excessive noise or roughness. If necessary, replace the bearing by first removing the stator coils as described in this chapter. Then refer to *Bearing and Oil Seal Replacement* in Chapter Four.

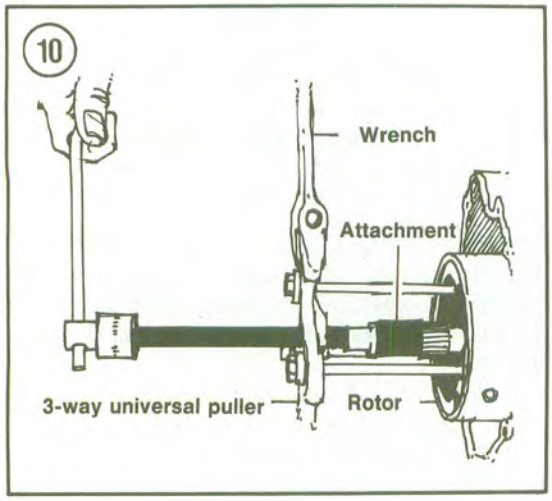
Rotor Installation

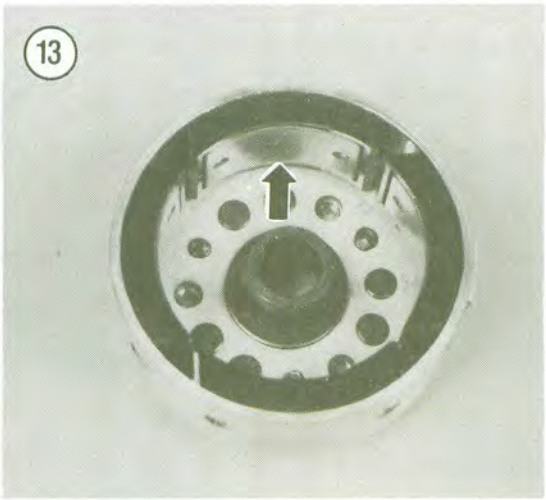
1. Carefully inspect the inside of the rotor (**Figure 13**) for small bolts, washers or other metal "trash"

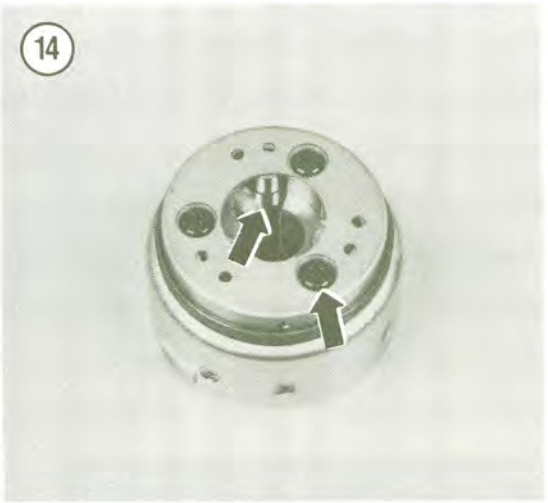


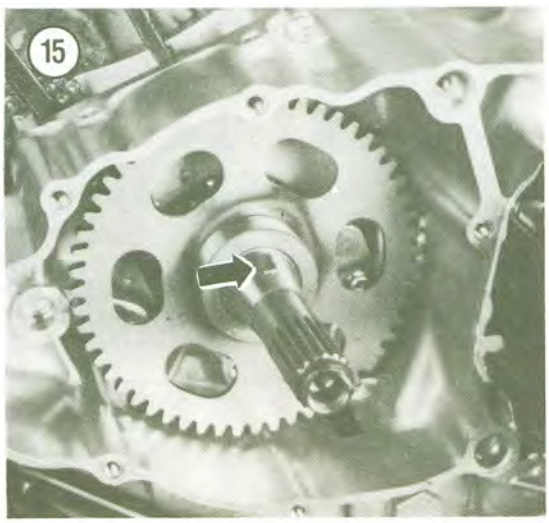


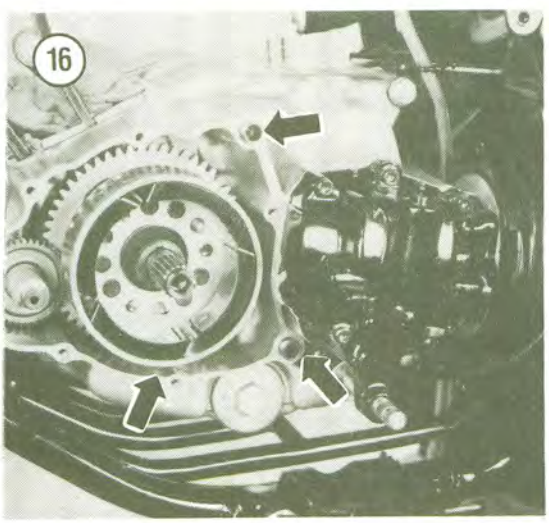












that may have been picked up by the magnets. These small bits can cause severe damage to the alternator stator assembly.

2. *Electric start models:* If the rollers and springs in the starter clutch ring (**Figure 14**) have become loose or fallen out, refer to ***Alternator Rotor, Starter Clutch Assembly and Gears*** in Chapter Four.

3. Align the keyway in the rotor with the Woodruff key (**Figure 15**) and install the rotor (**Figure 13**).

4. Install the following parts in order:
   a. Idler gear (B, **Figure 8**).
   b. Idler gear shaft (A, **Figure 8**).
   c. Spacer (**Figure 7**).

5. Install the 2 alternator cover dowel pins (**Figure 16**) and install a new alternator cover gasket.

6. Install the alternator cover (**Figure 6**) and tighten the screws securely.

NOTE

Use an impact driver with a Phillips bit to tighten the alternator cover screws and to prevent damaging the Phillips screw heads.

7. Route the alternator stator wire harness through the frame. Clean the wire connectors of all dirt and grit and connect the electrical connectors (**Figure 4**).

8. Install the recoil starter assembly as described in Chapter Four.

9. Refill the engine oil as described in Chapter Three.

Stator Assembly
Removal/Installation

1. Perform Steps 1-5 under *Rotor Removal* in this chapter.

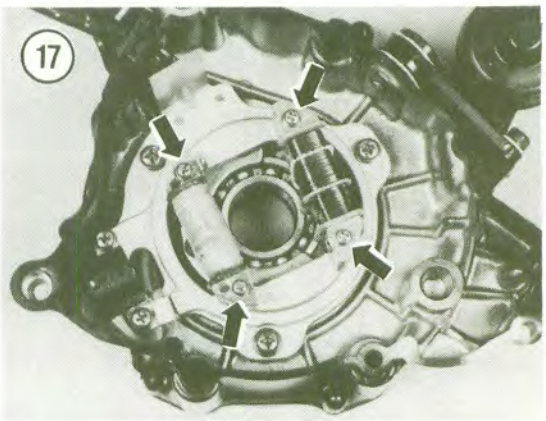
2. Install by reversing these removal steps. Route the electrical wires in their original position. Make sure to keep them away from the exhaust system.

Coil Replacement

When replacing an individual coil, it will be necessary to heat the wire connection at the bad coil with a soldering iron before disconnecting the wire. When the solder has melted, pull the wire away from the connection. This step will give you enough wire to work with when resoldering. If the wire is cut at the connection, it could cause the wire to fall short at the connection. During reassembly, rosin core solder must be used—never use acid core solder on electrical connections—to reconnect the wire.

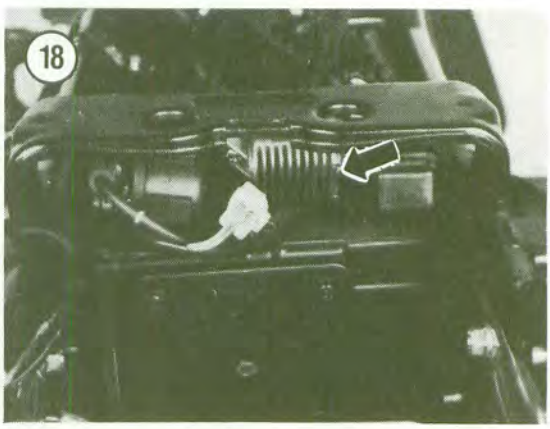
1. Remove the alternator cover as described in this chapter under *Rotor Removal.*

2. Remove the screws securing the coils to the stator plate. See **Figure 17**.
3. Carefully unsolder the wire from the bad coil.
4. Resolder the new coil to the wire.
5. Install by reversing these removal steps.
6. Make sure all electrical connections are tight and free from corrosion. This is absolutely necessary with electronic ignition systems.



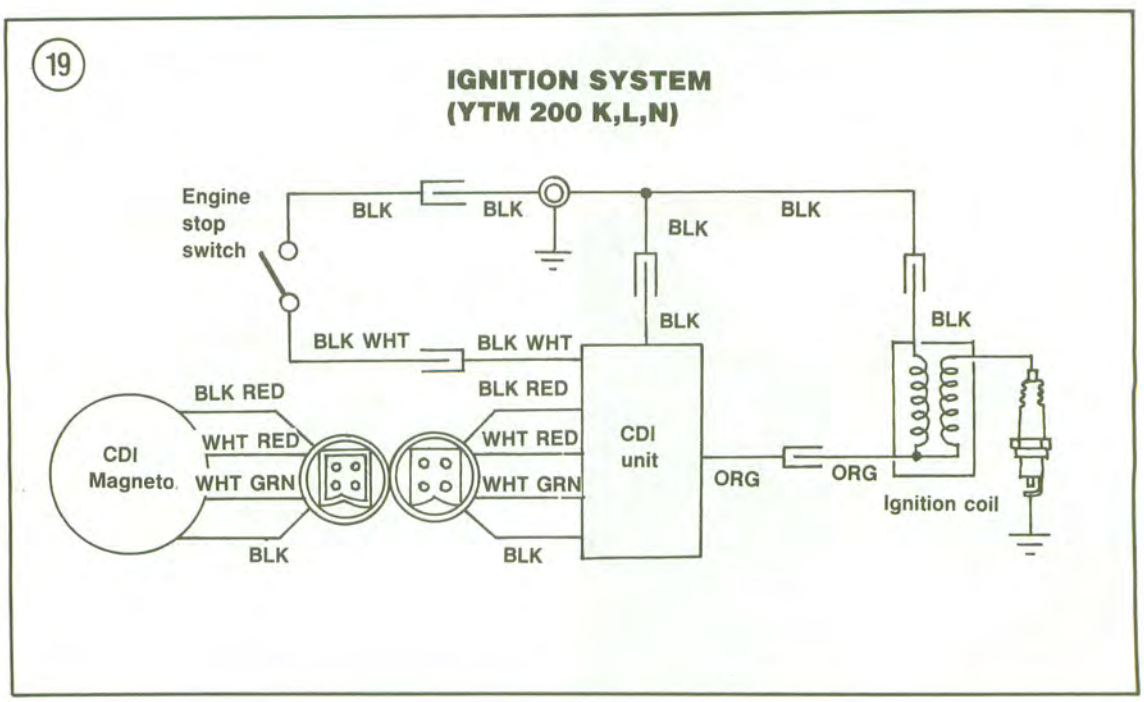
Voltage Regulator/Rectifier Removal/Installation

1. Remove the seat and fender assembly.
2. Disconnect the battery negative lead.
3. Disconnect the electrical connector from the regulator/rectifier and remove the unit (**Figure 18**).
4. Install by reversing these removal steps. Make sure all electrical connections are clean and tight.



Voltage Regulator/Rectifier Testing

1. Disconnect the electrical connector from the rectifier. See **Figure 18**. The rectifier connector contains 4 wires (red, black, white and yellow/red).
2. Connect an ohmmeter positive lead to the red wire and the negative lead to the white wire. The ohmmeter should show continuity.
3. Reverse the ohmmeter leads and repeat Step 2. This time the ohmmeter should show no continuity.
4. If the rectifier fails to pass the tests in Step 2 and Step 3, the unit is defective and must be replaced.



IGNITION SYSTEM (FULLY TRANSISTORIZED)

All models are equipped with a capacitor discharge ignition (CDI) system which is a solid-state system that uses no breaker points. Refer to **Figure 19** or **Figure 20** for the ignition circuit for your model.

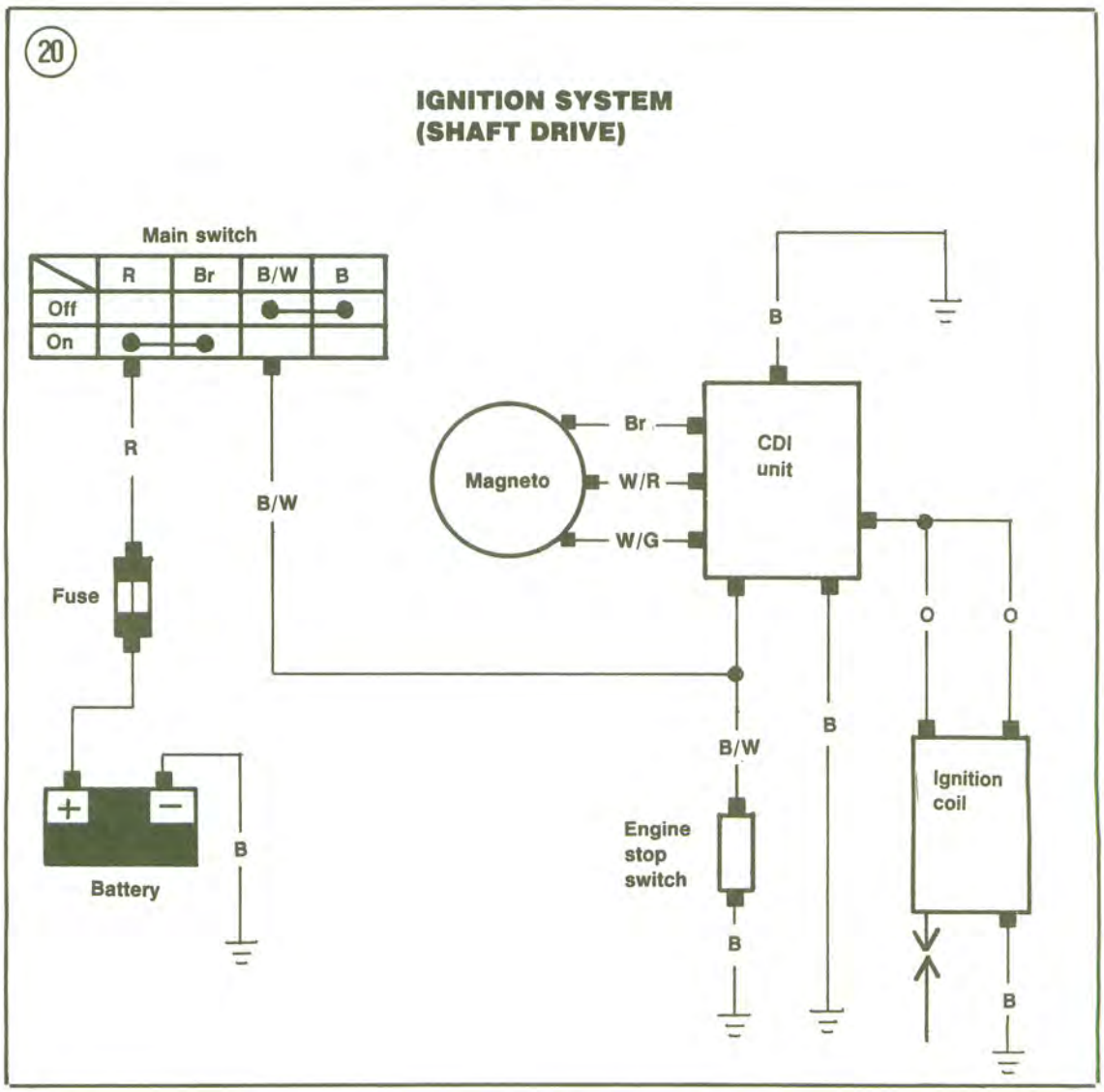
Alternating current from the alternator is rectified to direct current and is used to charge the capacitor. As the piston approaches the firing position, a pulse from the pick-up coil is used to trigger the silicone controlled rectifier. The rectifier in turn allows the capacitor to discharge quickly into the primary circuit of the ignition coil, where the voltage is stepped up in the secondary circuit to a value sufficient to fire the spark plug.

NOTE

The electric starter can only be used to start the engine when the transmission is in NEUTRAL. This is due to the installation of a starting circuit. When the transmission is in gear, current cannot reach the starter motor.

Precautions

Certain measures must be taken to protect the capacitor discharge system.



1. Never connect the battery backwards. If the battery polarity is wrong, damage will occur to the voltage regulator, alternator and ignition unit.
2. Do not disconnect the battery while the engine is running. A voltage surge will occur which will damage the voltage regulator and possibly burn out the lights.
3. Keep all connections between the various units clean and tight. Be sure that the wiring connectors are pushed together firmly.
4. Each solid state unit is mounted on a rubber vibration isolator. Always be sure that the isolators are in place when replacing any units.

Troubleshooting

Problems with the capacitor discharge ignition system are usually limited to the production of a weak spark or no spark at all. Test procedures for troubleshooting the ignition system are found in Chapter Two.

IGNITION UNIT

Removal/Installation

1. Remove the seat and fender assembly.
2. Disconnect the battery negative lead.
3. Disconnect the electrical connectors from the ignition unit and remove it. See **Figure 21**.
4. Install by reversing these removal steps. Before connecting the electrical wire connectors at the CDI unit, make sure the connectors are clean of any dirt or moisture.

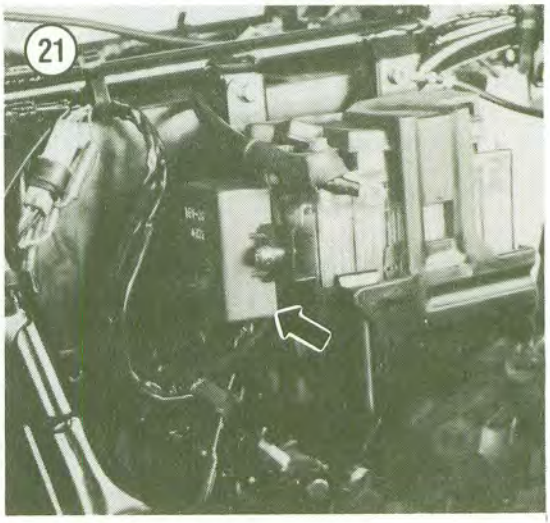
Testing

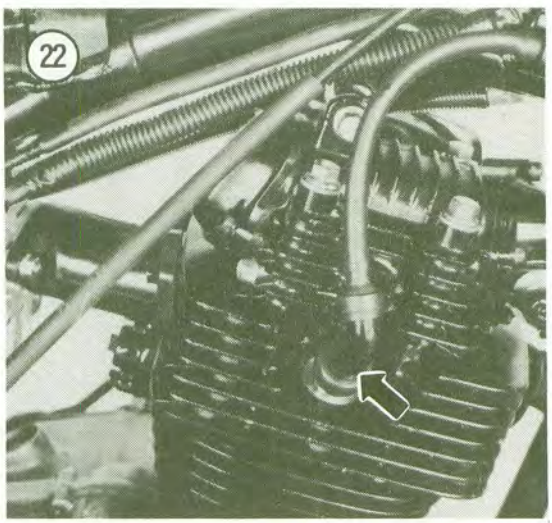
The ignition unit should be tested by a Yamaha mechanic familar with capacitor discharge ignition testing. Improper testing of a good unit can damage it.

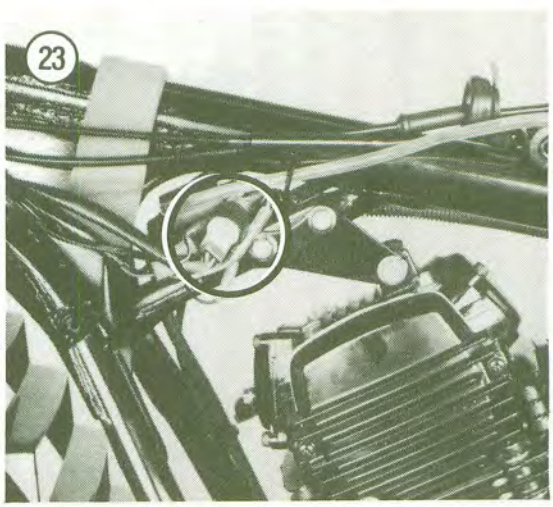
IGNITION COIL

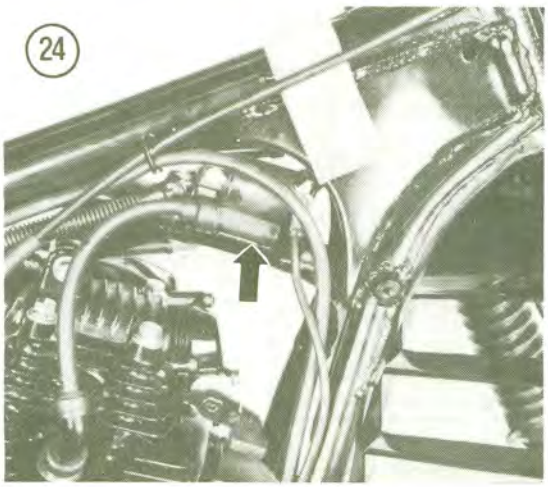
Removal/Installation

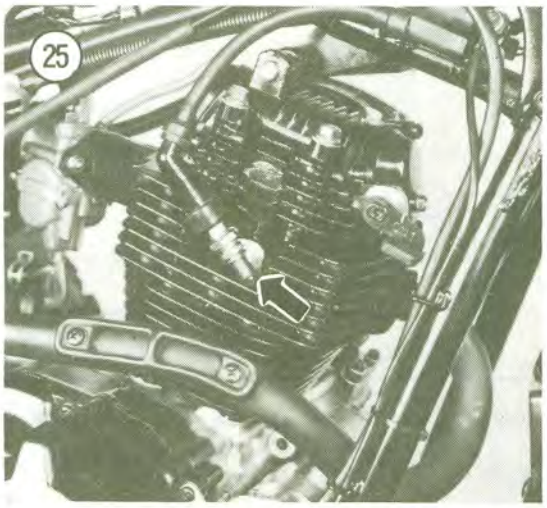
1. Disconnect the battery negative lead from the battery.
2. Remove the fuel tank as described in Chapter Six.
3. Disconnect the spark plug lead (**Figure 22**) and the coil primary electrical wires at the electrical connector (**Figure 23**).
4. Remove the 2 nuts and lockwashers securing the coil to the frame and remove the coil (**Figure 24**).
5. Install by reversing these removal steps. Make sure to correctly connect the primary electrical wires to the coils and the spark plug leads to the











correct spark plug. In addition, make sure the ground wire is attached correctly.

Testing

The ignition coil is a form of transformer which develops the high voltage required to jump the spark plug gap. The only maintenance required is that of keeping the electrical connections clean and tight and occasionally checking to see that the coil is mounted securely.

If the coil condition is doubtful, there are several checks which may be made.

First, as a quick check of coil condition, disconnect the high voltage lead from the spark plug (**Figure 22**). Remove the spark plug from the cylinder head. Connect a new or known good spark plug to the high voltage lead and place the spark plug base on a good ground like the engine cylinder head (**Figure 25**). Position the spark plug so you can see the electrode.

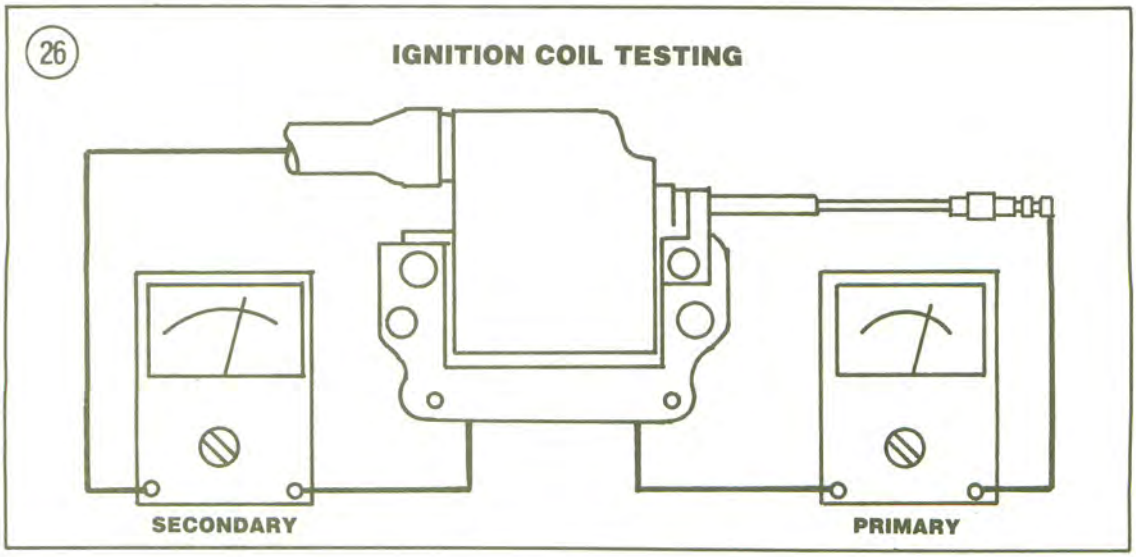
WARNING

Do not hold the high voltage lead by hand. The high voltage generated by the CDI could produce serious or fatal shocks.

Turn the engine over with the recoil starter. If a fat blue spark occurs, the coil is in good condition; if not, proceed as follows. Make sure that you are using a known good spark plug for this test. If the spark plug used is defective, the test results will be incorrect.

Reinstall the spark plug in the cylinder head.

Refer to **Figure 26** for this procedure. Disconnect all ignition coil wires before testing.



NOTE

To get accurate resistance measurements the coil must be at approximately 60° F (20° C).

1. Measure the coil primary resistance using an ohmmeter set at R × 1. Measure between the primary terminal (orange wire) and ground. Resistance is specified in **Tables 1-4**.
2. Measure the secondary resistance using an ohmmeter set at R × 100. Measure between the secondary lead (spark plug lead) and the orange wire. Resistance is specified in **Tables 1-4.**
3. Replace the coil if the spark plug lead shows visible damage or if it does not test within the specifications in Step 1 or Step 2.

PICKUP COIL

Removal/Installation

Remove the alternator coil assembly as described under *Rotor Removal* in this chapter. If necessary, replace the pickup coil as described under *Coil Replacement* in this chapter.

Magneto Coil Testing

It is not necessary to remove the stator plate to perform the following tests. It is shown removed in the following procedures for clarity.

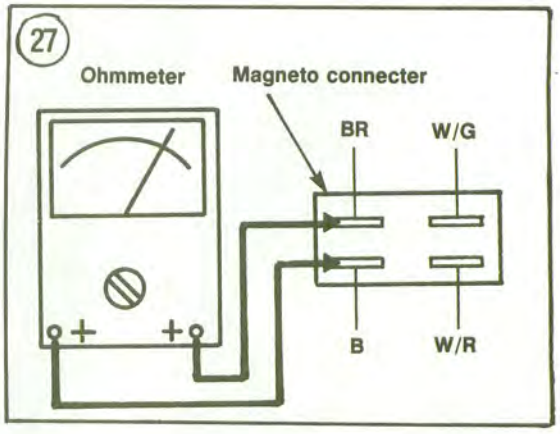
To get accurate resistance measurements the stator assembly and coil must be approximately 68° F (20° C).

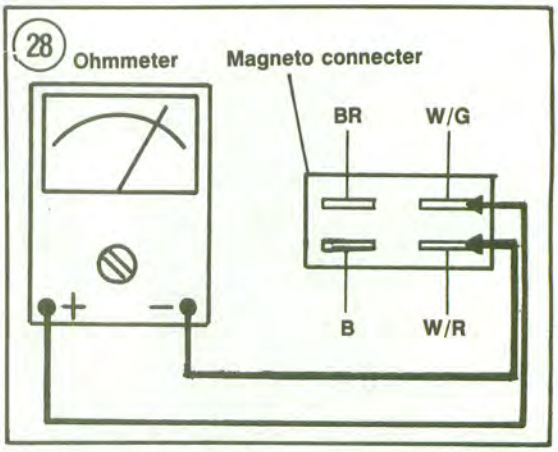
Source coil resistance

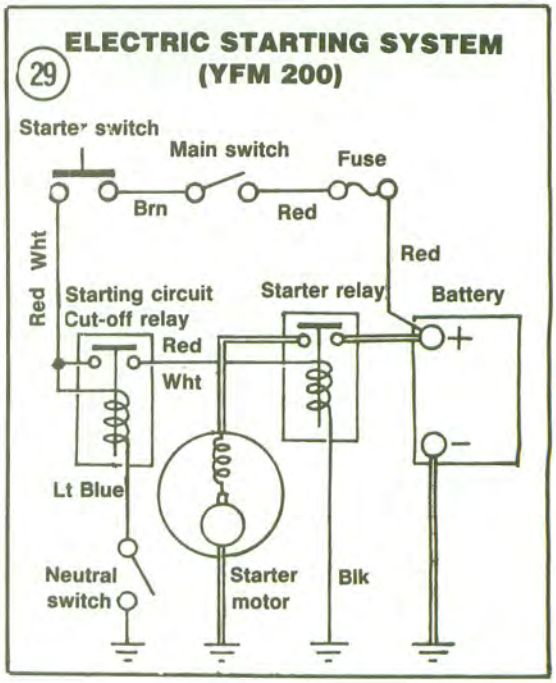
Use an ohmmeter set at R × 10 and check resistance between the brown and black wires. See **Figure 4** and **Figure 27.** If there is continuity (specified resistance listed in **Tables 1-4**) the coil is good. If there is no continuity or the resistance is much less or more than specified, the coil is bad and must be replaced.

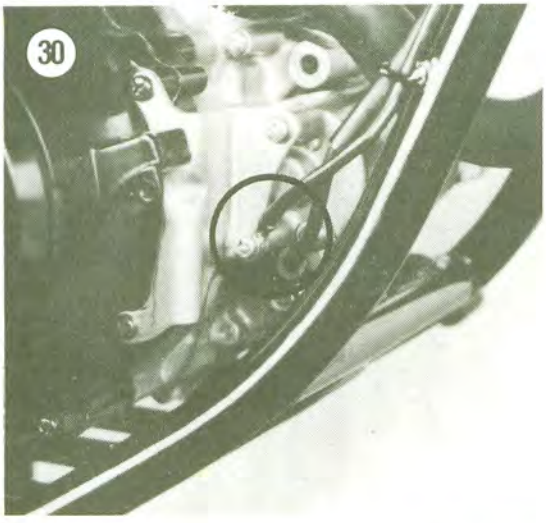
Pickup coil resistance

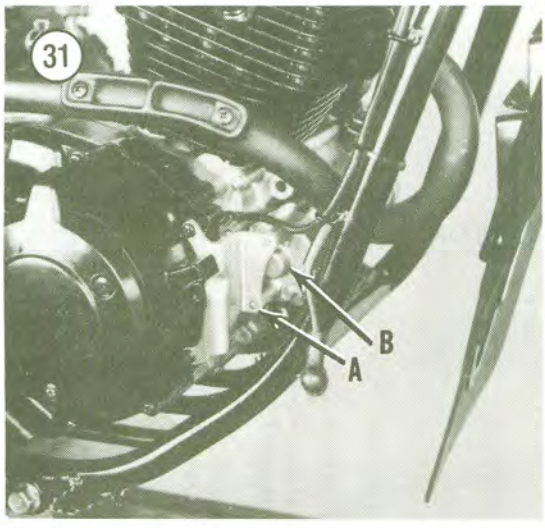
Use an ohmmeter set at R × 10 and check resistance between the white/red and white/green wires. See **Figure 28**. If there is continuity (specified resistance listed in **Tables 1-4**), the coil is good. If there is no continuity or the resistance is much less or more than specified, the coil is bad and must be replaced.

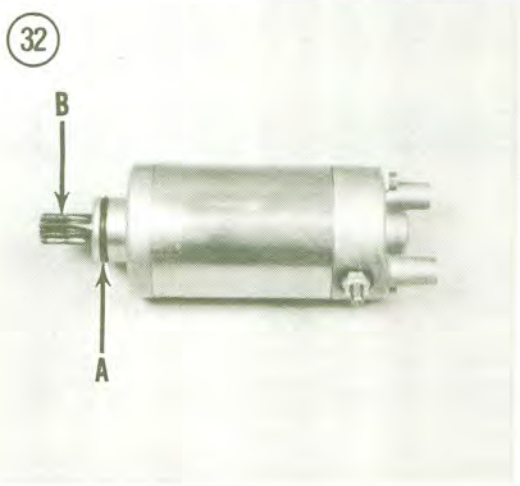












SPARK PLUGS

The spark plugs recommended by the factory are usually the most suitable for your machine. If riding conditions are mild, it may be advisable to go to spark plugs one step hotter than normal. Unusually severe riding conditions may require slightly colder plugs. See Chapter Two and Chapter Three for details.

STARTING SYSTEM

The starting system consists of the starter motor, starter solenoid, starter circuit cutoff relay and the starter button.

The starting system is shown in **Figure 29**. When the starter button is pressed, it engages the solenoid switch that closes the circuit. The electricity flows from the battery to the starter motor.

CAUTION

Do not operate the starter for more than five seconds at a time. Let it rest approximately ten seconds, then use it again.

When the engine stop switch and the main switch are turned to ON, the engine can only be started if the transmission is in NEUTRAL.

If the above conditions are not met, the starting circuit cut-off relay will prevent the starter from operating.

The starter gears are covered in Chapter Four.

Table 5 lists starter specifications.

Troubleshooting

Starter troubleshooting tips and procedures are described in Chapter Two.

Removal/Installation

1. Park the vehicle on level ground.
2. Make sure the ignition switch is in the OFF position.
3. Remove the seat and fender assembly.
4. Disconnect the negative lead from the battery.
5. See **Figure 30**. Pull back on the rubber boot and disconnect the electrical cable. Remove the screw and disconnect the ground cable.
6. Remove the starter mounting bracket (A, **Figure 31**).
7. Pull the starter (B, **Figure 31**) to the right and remove it from the engine.
8. Installation is the reverse of these steps, noting the following.
9. Grease the starter O-ring (A, **Figure 32**) and insert the starter into the crankcase. Do not damage the O-ring during installation.

10. During installation, the starter gear (B, **Figure 32**) should engage with the starter idler gear (**Figure 33**).
11. Tighten the starter bracket bolts securely.

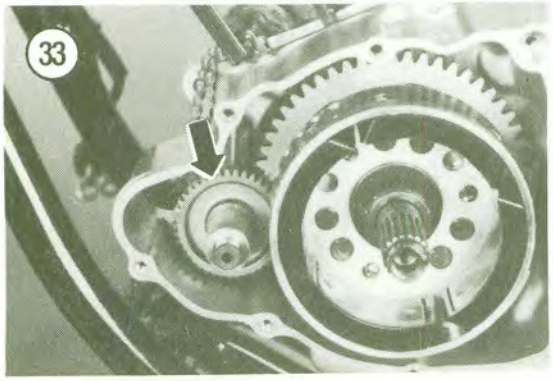
Starter Disassembly/Assembly

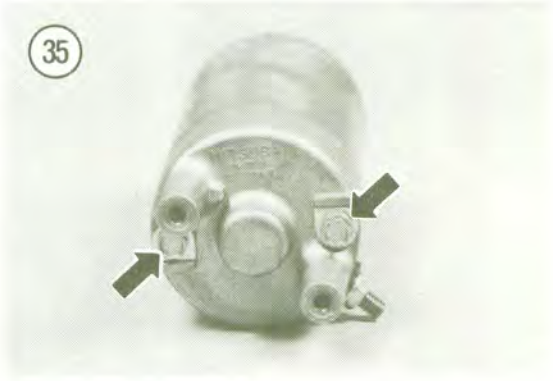
The overhaul of a starter motor is best left to an expert. This section shows how to determine if the unit is defective. Refer to **Figure 34** for this procedure.

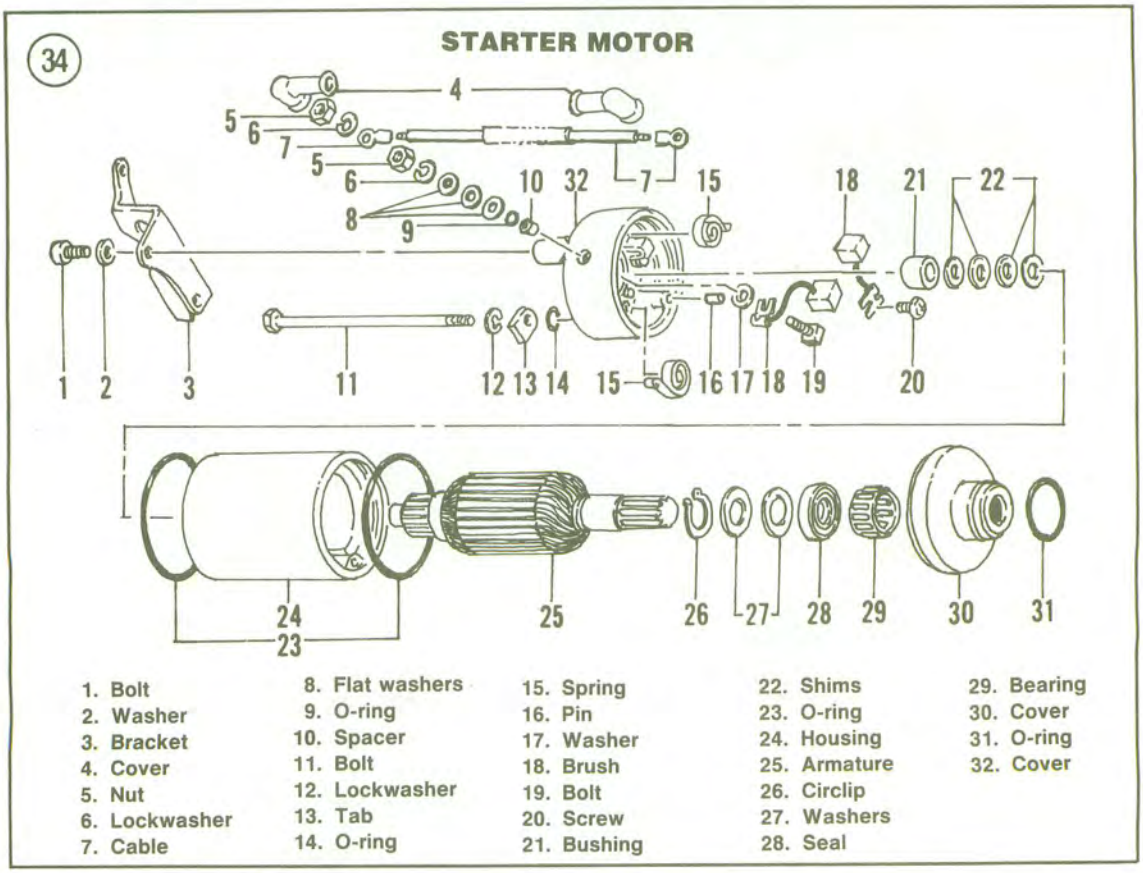
1. Remove the starter motor case bolts (**Figure 35**) and separate the case.
2. Clean all grease, dirt, and carbon dust from the armature, case and end covers.

CAUTION

Do not immerse brushes or the wire windings in solvent or the insulation might be damaged. Wipe the windings with a cloth slightly moistened with solvent and dry thoroughly.



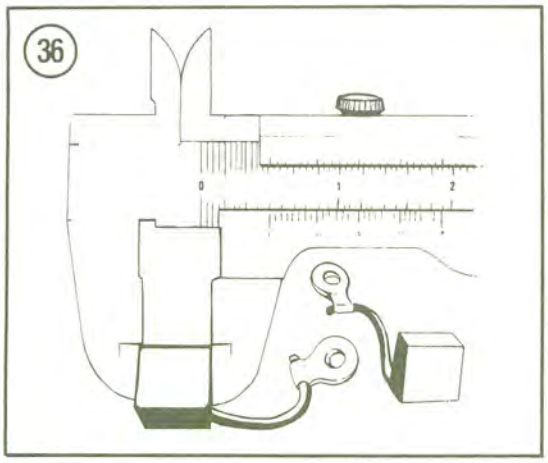


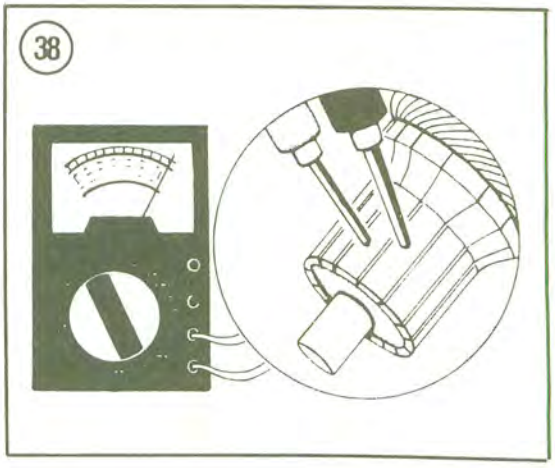


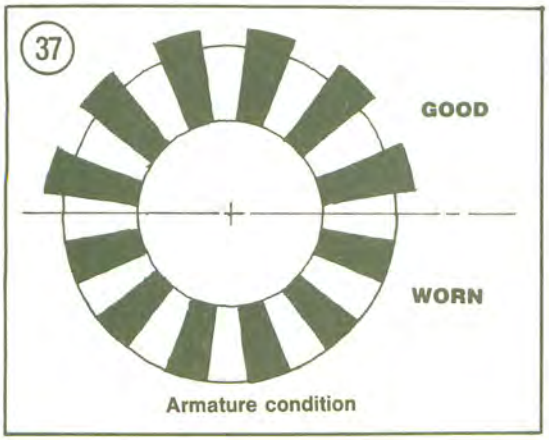
3. Pull back the spring from behind the brushes and remove the brushes from their guides. Measure the length of each brush with a vernier caliper (**Figure 36**). If they are worn to less than the minimum (**Table 5**), replace them.
4. Check the spring tension by comparing to a new set of springs. Replace if necessary.
5. Inspect the condition of the commutator. The mica in a good commutator is below the surface of the copper bars (**Figure 37**). A worn commutator is indicated by the copper and mica being level with each other. A worn commutator can be undercut, but it requires a specialist. Take the job to a dealer or electrical repair shop.
6. Inspect the commutator bars for discoloration. If a pair of bars are discolored, that indicates grounded armature coils.
7. Use an ohmmeter and check the electrical continuity between pairs of commutator bars (**Figure 38**) and between the commutator bars and the shaft mounting (**Figure 39**). If there is a short, the armature should be replaced.
8. Inspect the field coil by checking continuity from the cable terminal to the motor case with an ohmmeter; there should be no continuity. Also check from the cable terminal to each brush wire; there should be continuity. If the unit fails either of these tests, the case/field coil assembly must be replaced.
9. Check the end bushing and bearings in the end cover. If either is worn or damaged, the starter motor must be replaced. Replacement bushings and bearings are not available through Yamaha dealers.
10. When the armature is inserted through the case, make sure each of the 2 brushes contact the commutator evenly. Then attach the cable terminal to the end cover and install the end cover.

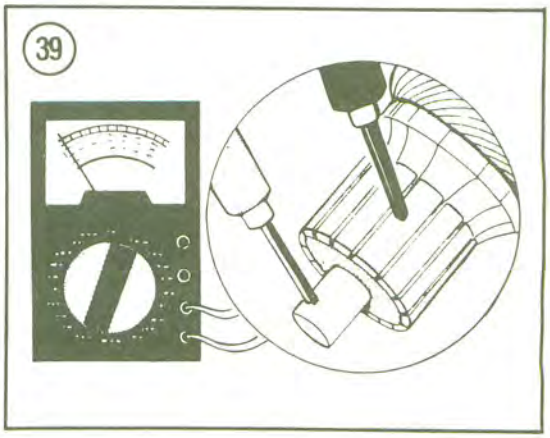
Starter Solenoid Removal/Installation

1. Park the vehicle on level ground.
2. Remove the seat and rear fender assembly.









3. Pull the solenoid (A, **Figure 40**) partway out of its holder.
4. Disconnect both starter cables and the electrical connector at the solenoid and remove it.
5. Installation is the reverse of these steps.

Troubleshooting

1. Remove the seat and fender assembly.
2. Disconnect both starter cables at the solenoid.

NOTE
Do not disconnect the solenoid electrical connector.

3. Connect an ohmmeter at the starter solenoid as shown in **Figure 41**. Set the ohmmeter scale to read ohms×1. Turn the ignition switch ON and shift the transmission into NEUTRAL. Press the starter button and measure the resistance between the terminals shown in **Figure 41**. If the solenoid is operating correctly, the solenoid should click once and the ohmmeter should read zero ohms. If not, replace the solenoid.

NOTE
If the solenoid did not click in Step 3, check the lead from the starter switch (black) to the starting circuit cut-off relay (red/white) for damage.

4. Turn the ignition switch OFF.
5. Connect an ohmmeter between the solenoid black and red/white leads as shown in **Figure 42**. Set the ohmmeter scale to read ohms×1. The ohmmeter should read 3.4 ohms. If the reading is incorrect, replace the solenoid.

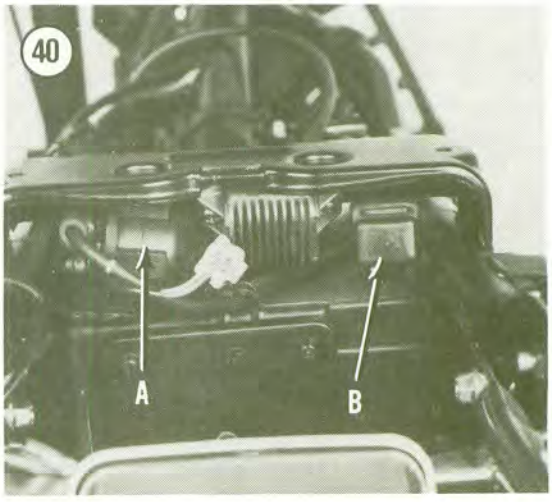
Starting Circuit Cut-Off Relay Testing

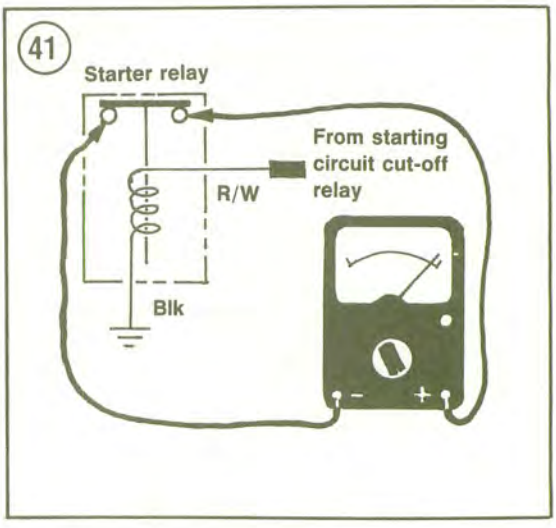
All models with electric start are equipped with a cut-off switch in the ignition circuit. On these models, the bike cannot be started (with the electric starter) unless the transmission is in NEUTRAL.

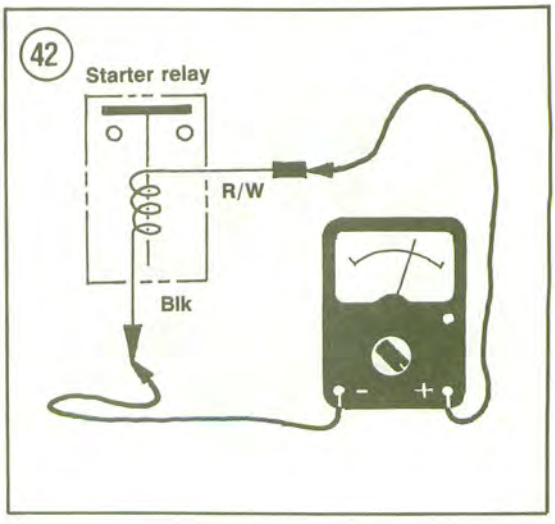
If the engine will not start and you've made all the other checks listed previously, perform the following tests.

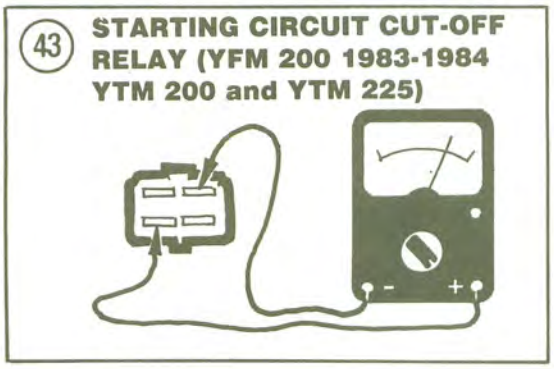
Resistance check

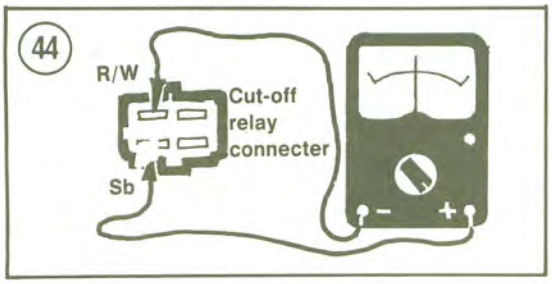
Use an ohmmeter set at R×10 and check resistance at the cut-off relay connector as shown in **Figure 43** or **Figure 44**. If there is continuity (specified resistance listed in **Table 5**), the relay is good. If there is no continuity or the resistance is much less or more than specified, the relay is bad and must be replaced.

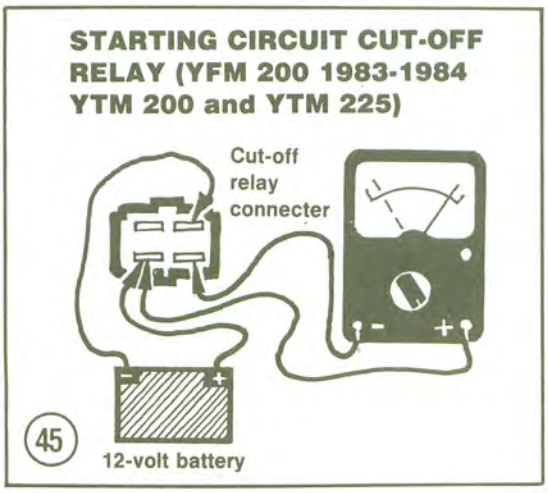


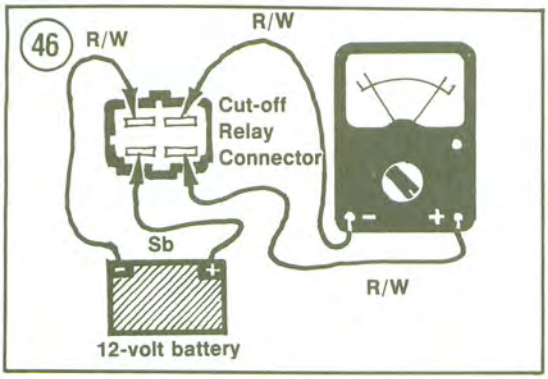












Voltage check

Connect a 12V DC voltmeter and battery to the cut-off relay connector as shown in **Figure 45** or **Figure 46**. When the negative battery terminal is disconnected, the voltage reading should be 0 volts; with the negative terminal connected, the reading should be 12 volts. If the cut-off relay tested incorrectly, replace it.

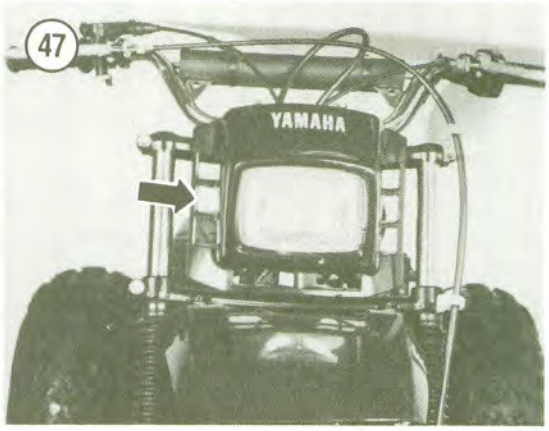
LIGHTING SYSTEM

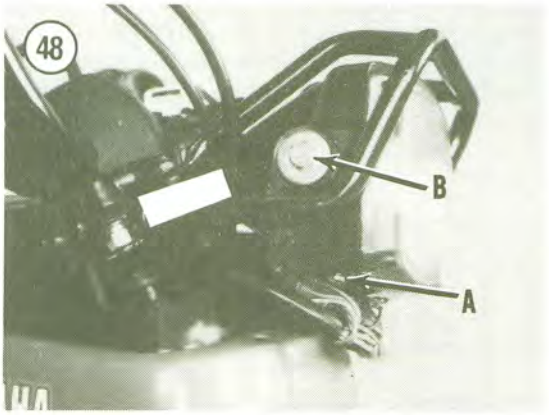
The lighting system consists of a headlight, taillight and indicator bulbs.

Always use the correct wattage bulb. A larger wattage bulb will give a dim light and a smaller wattage bulb will burn out prematurely. **Table 6** lists bulb sizes.

Headlight Bulb Replacement

1. If so equipped, remove the headlight cover (**Figure 47**).
2. Remove the screws at the bottom of the headlight housing (A, **Figure 48**) and pull the lens assembly out of the housing.





3. Turn the bulb holder counterclockwise and remove it. Remove the bulb from the socket. Replace with a new bulb.

NOTE

Do not touch the bulb with your fingers or bulb life will be shortened.

4. To remove the lens, carefully remove the spring clips from the backside of the headlight trim bezel and remove the headlight lens unit.

5. Install by reversing these removal steps.

Headlight Beam Adjustment

The headlight beam on all models can be set for vertical adjustment.

1. Park the vehicle on level ground.
2. *Headlight without cover:* To adjust, loosen the bolts securing the headlight housing and turn the housing up or down as necessary to adjust the beam direction. See B, **Figure 48**.
3. *Headlight with cover:* To adjust, turn the adjusting screw counterclockwise (lower beam) or clockwise (raise beam). See **Figure 49**.

Taillight Replacement

Remove the screws securing the lens and remove the lens (**Figure 50**). Wash the lens with a mild detergent and wipe dry.

Inspect the lens gasket and replace it if damaged or deteriorated.

Turn the bulb counterclockwise and remove it (**Figure 51**). Reverse to install. When installing the lens, do not overtighten the screws as the lens may crack.

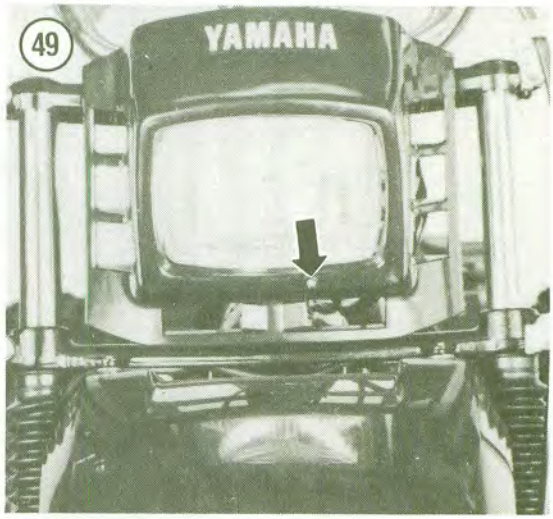
Indicator Bulbs

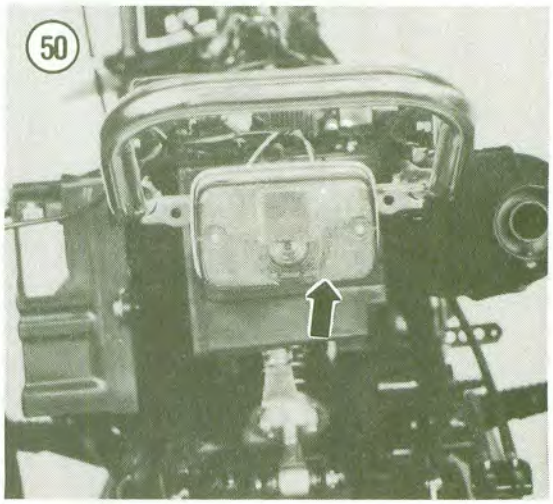
Electric start models are equipped with a neutral indicator light and models with reverse are equipped with a reverse indicator light. The neutral indicator (green) lights when the transmission is in NEUTRAL. The reverse indicator (red) lights when the transmission is in REVERSE. Both indicator lights are mounted on the instrument panel beside the main switch. To replace a bulb, remove its connector from underneath the instrument panel and replace the bulb. Reverse to install.

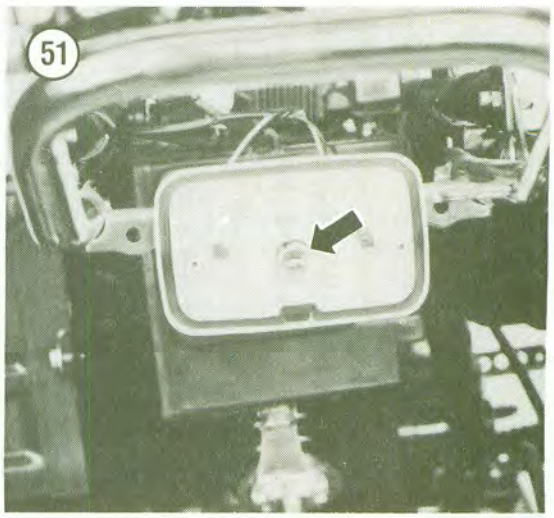
Lighting Voltage Test

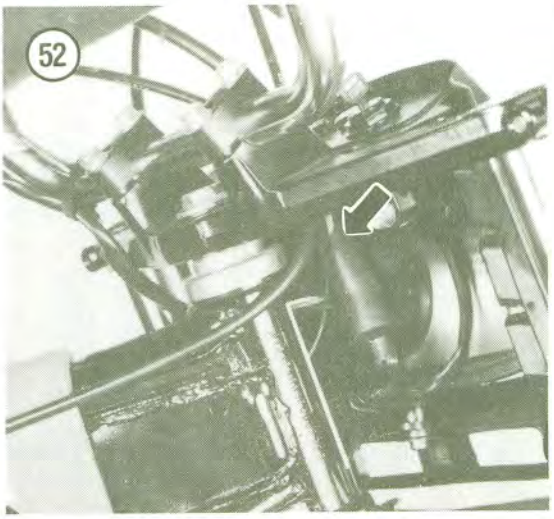
NOTE

While this test is performed on all models, it also is used to determine the condition of the charging system for YTM200K, L and N models (chain drive).

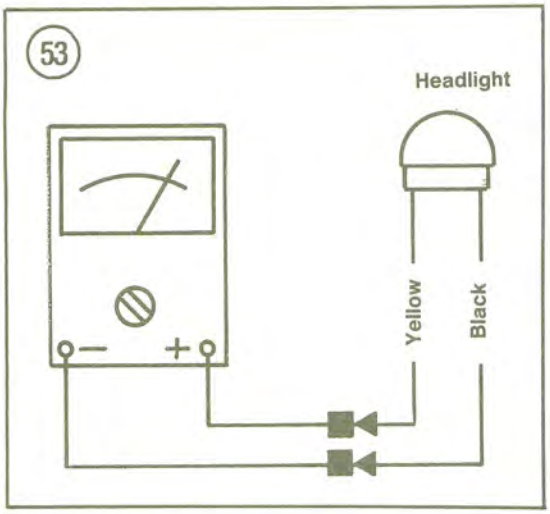






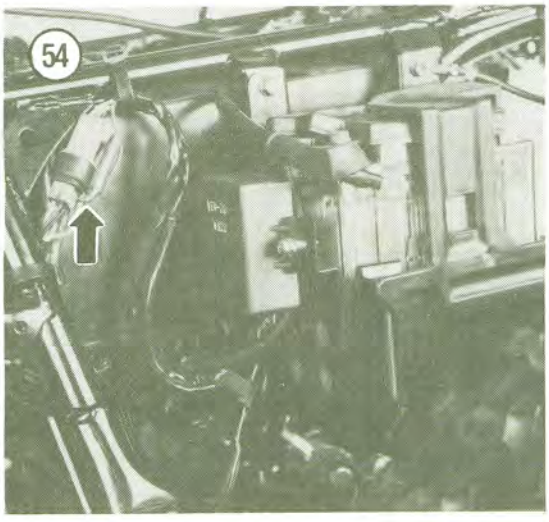


1. Disconnect the headlight connector from behind the headlight assembly (**Figure 52**).
2. Use a multimeter set to AC20 volts. Connect the positive test lead to the yellow headlight wire connector and the negative test lead to ground. See **Figure 53**.
3. Start the engine and, with the lights operating, check the output voltage at the specified rpm in **Tables 1-4**. Compare voltage to specifications in **Tables 1-4**.
4. If the output voltage is incorrect, check for bad or dirty wire connections, damaged wires or bulbs of incorrect wattage. If the problem cannot be corrected by checking and repairing these components, perform the *Lighting Coil Resistance Check* in this chapter.



Lighting Coil Resistance Check

Use an ohmmeter set at R×1 and check resistance between the yellow/red wire (from the ignition unit) and ground (black wire). See **Figure 54**. If there is continuity (specified resistance listed in **Tables 1-4**), the coil is good. If there is no continuity or the resistance is much less or more than specified, the coil is bad and must be replaced as described in this chapter under *Coil Replacement*.



SWITCHES

Switches can be tested with an ohmmeter (Chapter One) or with a homemade test light (**Figure 55**). To test a switch, disconnect its electrical connector. Identify its terminals by referring to the continuity diagram in each test procedure. **Figure 56** shows a typical continuity

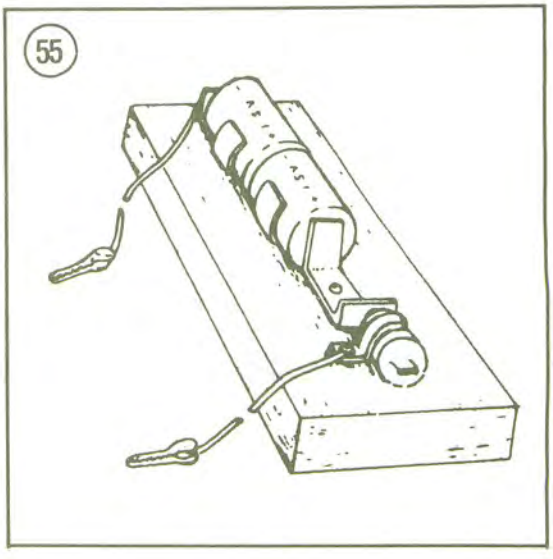


diagram. It tells which terminals should show continuity when the switch is in a given position.

When the switch is in the OFF position, there should be continuity between wire connectors R and E. This is indicated by the line on the continuity diagram. An ohmmeter connected between these wire connectors should indicate little or no resistance.

When the switch is in the ON position, there should be continuity between wire connectors B, R and E. An ohmmeter connected between these connectors should indicate little or no resistance.

If the switch doesn't perform correctly, replace it. Refer to the appropriate figure for switch continuity diagrams for your model:

a. **Figure 57**: (YTM200K, L, N).
b. **Figure 58**: (YTM200EK, EL, ERN; all 1983-1984 YTM225).
c. **Figure 59**: (1985-1986 YTM225 and all YFM200).

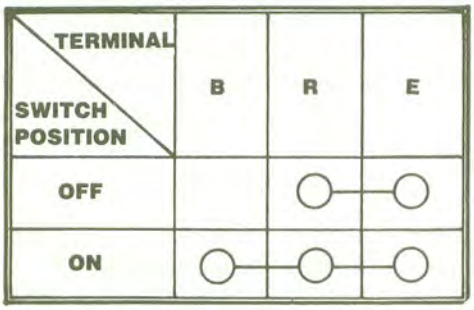
Handlebar Switch Replacement

The stop, lighting and electric starter (if so equipped) switches are all mounted in the left-hand handlebar switch housing (**Figure 60**). If one switch is bad, the complete switch housing must be replaced as a unit. Replace the housing by disconnecting the switch connectors and removing the switch screws (**Figure 60**). Reverse to install.

Main Switch Replacement (Electric Start Only)

Electric start models are equipped with a main switch mounted on the instrument panel (**Figure 61**). Replace the switch by disconnecting the

(56)



(57) **SWITCHES (YTM 200 K, L, N)**

ENGINE STOP SWITCH

SWITCH POSITION	Wire code	
	B	B/W
STOP	●	●
RUN		
STOP	●	●

LIGHT SWITCH

SWITCH POSITION	Wire code			
	Y/R	L	G	Y
HI	●	●		●
LO	●	●	●	
OFF				

(58) **SWITCHES (YTM 200 EK, EL, ERN; 1983-1984 YTM 225)**

MAIN SWITCH

Switch Position	Wire code					
	B/W	B	R	Br	L	L/B
ON			●	●	●	●
OFF	●	●				
LIGHT	●	●	●			●

STARTER SWITCH

Switch position	Wire code	
	R/W	Br
ON	●	●
OFF		

STOP SWITCH

Switch position	Wire code	
	B	B/W
OFF	●	●
RUN		

LIGHT SWITCH

Switch position	Wire code				
	Y/R	L	L/B	G	Y
HI	●	●	●		●
LO	●	●	●	●	
OFF					

59 SWITCHES: (YFM 200; YTM 1984-1985)

MAIN SWITCH

Switch position	Wire code			
	B/W	B	R	Br
ON			●	●
OFF	●	●		

STARTER SWITCH

Switch position	Wire code	
	R/W	Br
ON	●	●
OFF		

ENGINE STOP SWITCH

Switch Postion	Wire code	
	B	B/W
OFF	●	●
RUN		

LIGHT SWITCH

Switch Position	Wire code			
	Y/R	L	G	Y
HI	●	●		●
LO	●	♥	●	
OFF				

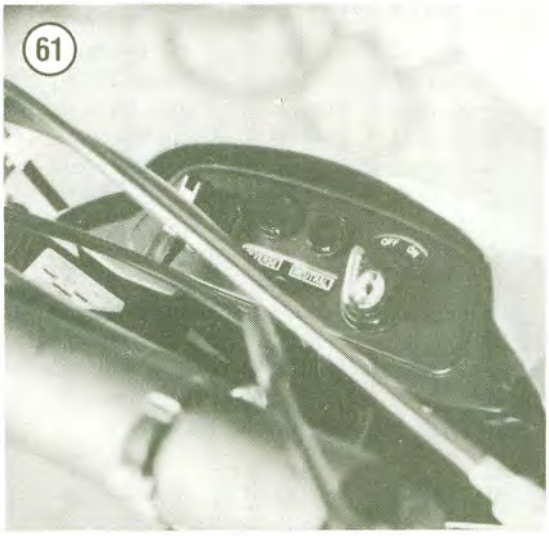
connectors and removing the top switch nut. Pull the switch out of the panel. Reverse to install.

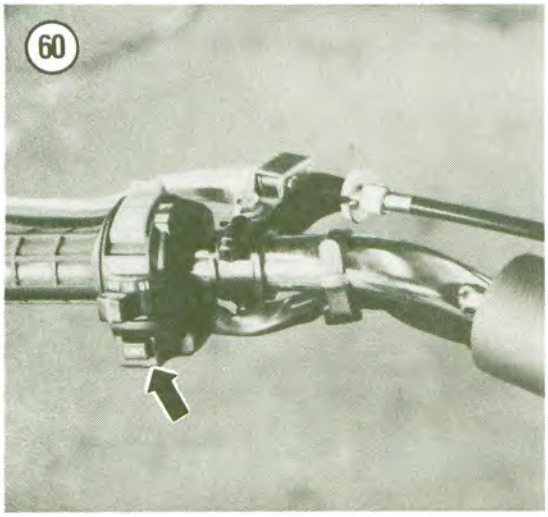
Neutral Switch

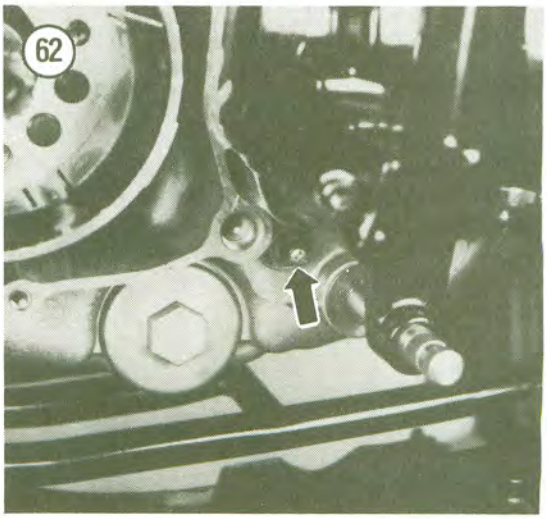
Replacement

The neutral switch is located on the left-hand crankcase near the shift lever. Replace the switch as follows:

1. Remove the shift lever assembly as required to to gain access to the neutral switch (**Figure 62**).
2. Drain the engine oil as described in Chapter Three.
3. Remove the screw and disconnect the wire at the neutral switch.
4. Unscrew the neutral switch.
5. Remove the neutral switch and gasket.



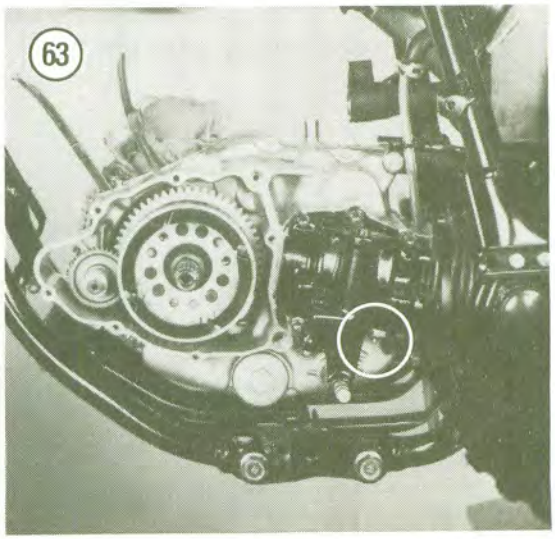




6. Reverse to install. Note the following.
7. Refill the engine oil as described in Chapter Three.

Reverse Switch Replacment

The reverse switch is located on the reverse gear housing (**Figure 63**). Replace the switch as follows:
1. Drain the engine oil as described in Chapter Three.
2. Remove the screw and disconnect the wire at the reverse switch (**Figure 63**).
3. Unscrew the reverse switch.
4. Remove the reverse switch and gasket.
5. Reverse to install. Note the following.
6. Refill the engine oil as described in Chapter Three.



FUSE (ELECTRIC START MODELS)

There is only one fuse. It is the 10-amp main fuse (**Figure 64**). Fuse location varies among the different models. The fuse in **Figure 64** is shown mounted to the upper right-hand frame tube. On other models, the fuse is located underneath the seat.

NOTE
Always carry a spare fuse.

Whenever a fuse blows, find out the reason for the failure before replacing the fuse. Usually the trouble is a short circuit in the wiring. This may be caused by worn-through insulation or a disconnected wire shorting to ground.

CAUTION
Never substitute metal foil or wire for a fuse. Never use a higher amperage fuse than specified. An overload could result in fire and complete loss of the vehicle.

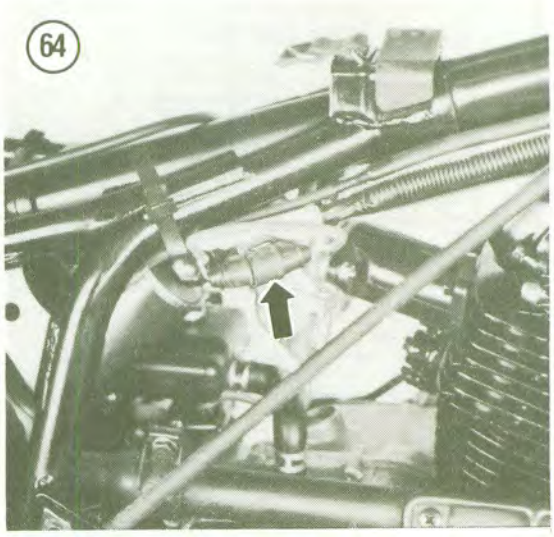


Table 1 ELECTRICAL SPECIFICATIONS—YTM200K, L, N

Charging/lighting system	
Lighting voltage	12 volts or more @ 3,000 rpm 18 volts or less @ 8,000 rpm
Lighting coil	
Resistance	0.78 ohms ±10%*
Wire connector colors	Yellow/red to black
Charging coil	
Resistance	0.4 ohms ±10%*
Wire connector colors	White to ground
Ignition system	
Pickup coil	
Resistance	196 ohms ±10%*
Wire connector colors	White/red to white/green
Ignition coil	
Primary	0.85 ohms ±20%*
Secondary	5.9K ohms ±20%*

* Test @ 68° F (20° C).

Table 2 ELECTRICAL SPECIFICATIONS—YTM200EK, EL

Charging/lighting system	
Charging current	0.7A or more @ 3,000 rpm 4A or less @ 8,000 rpm
Lighting voltage	11.3 volts or more @ 3,000 rpm 18 volts or less @ 8,000 rpm
Lighting coil	
Resistance	0.34 ohms ±10%*
Wire connector colors	Yellow/red to black
Charging coil	
Resistance	0.4 ohms ±10%*
Wire connector colors	White to black
Ignition system	
Pickup coil	
Resistance	196 ohms ±10%*
Wire connector colors	White/red to white/green
Charging coil	
Resistance	381 ohms ±10%*
Wire connector colors	Brown to black
Ignition coil	
Primary	0.85 ohms ±20%*
Secondary	5.9K ohms ±20%*

* Test @ 68° F (20° C).

Table 3 ELECTRICAL SPECIFICATIONS—YTM225 (ALL)

Charging/lighting system	
Charging current	
YTM225DXK, DXL, DXN	0.7A or more @ 3,000 rpm 4A or less @ 8,000 rpm
All other models	1.8A or more 3,000 rpm 4.5A or less @ 8,000 rpm
Lighting voltage	11.3 volts or more @ 3,000 rpm 18 volts or less @ 8,000 rpm
Lighting coil	
Resistance	0.34 ohms ±10%*
Wire connector colors	Yellow to black
Charging coil	
Resistance	0.4 ohms ±10%*
Wire connector colors	White to black
Ignition system	
Pickup coil	
Resistance	196 ohms ±10%*
Wire connector colors	White/red to white/green
Charging coil	
Resistance	381 ohms ±10%*
Wire connector colors	Brown to black
Ignition coil	
Primary	0.85 ohms ±20%*
Secondary	5.9K ohms ±20%*

* Test @ 68° F (20° C).

Table 4 ELECTRICAL SPECIFICATIONS—YTM200ERN; YFM200

Charging/lighting system	
Charging current	
Day	1.8A or more @ 3,000 rpm 4.5A or more @ 8,000 rpm
Night	0.7A or more @ 3,000 rpm 1.7A or more @ 8,000 rpm
Lighting voltage	11.3 volts or more @ 3,000 rpm 12.5-13.5 volts or less @ 8,000 rpm
Lighting coil	
Resistance	0.34 ohms ±10%*
Wire connector colors	
YFM200DXS	Yellow to black
All other models	Yellow/red to black
Charging coil	
Resistance	0.4 ohms ±10%*
Wire connector colors	White to black
Ignition system	
Pickup coil	
Resistance	196 ohms ±10%*
Wire connector colors	White/red to white/green
Charging coil	
Resistance	381 ohms ±10%*
Wire connector colors	Brown to black
Ignition coil	
Primary	0.85 ohms ±20%*
Secondary	5.9K ohms ±20%*

* Test @ 68° F (20° C).

Table 5 ELECTRIC STARTER SPECIFICATIONS

Armature coil resistance	0.023 ohms*
Brush length	10.5 mm (0.41 in.)
Wear limit	5.0 mm (0.20 in.)
Commutator diameter	23 mm (0.901 in.)
Wear limit	22 mm (0.866 in.)
Mica undercut	
YTM200EK, EL	1.8 mm (0.071 in).
All other models	0.55 mm (0.022 in.)
Cut-off relay resistance	75 ohms ±10% *
Starter relay resistance	3.43 ohms*

* @ 68° F (20° C).

Table 6 BULB SPECIFICATIONS

Headlight	45W
Tailight	
YTM225DRN, DRS; YFM200	7.5W
All other models	8W
Neutral indicator light	3.4W
Reverse indicator light	3.4W

CHAPTER EIGHT

FRONT SUSPENSION AND STEERING (YTM 200 AND YTM 225)

This chapter describes repair and maintenance of the front wheel, forks and steering components.

Refer to **Table 1** for specifications. **Tables 1-3** are at the end of the chapter.

FRONT WHEEL

Removal/Installation

Refer to **Figure 1** for this procedure.

1. Park the vehicle on level ground and set the parking brake. Block the rear wheels so the vehicle will not roll in either direction.
2. Jack up the front of the vehicle with a small hydraulic jack or have assistants raise the front end and support the vehicle with large wood blocks. If a hydraulic jack is used, place a piece of wood between the jack and the engine crankcase if this location is used. Apply just enough pressure to take any weight off the front wheel.
3. Remove the cotter pin and axle nut from the left-hand side (A, **Figure 2**).
4. Completely unscrew the front brake cable adjusting nut (**Figure 3**). Withdraw the brake cable from the pivot pin in the brake arm.
5. Withdraw the axle (A, **Figure 4**) from the right-hand side.
6. Roll the wheel forward and remove the spacer (B, **Figure 4**).
7. Remove the brake panel from the wheel.
8. Place the spacer(s), washers and axle nuts on the axle to prevent their loss.
9. Installation is the reverse of these steps, noting the following:
   a. Align the boss on the outer fork tube with the locating slot on the brake panel. See B, **Figure 2**.
   b. Install the axle nut and tighten to specifications (**Table 2**). Install a new cotter pin and bend the end over completely.
   c. Adjust the front brake as described in Chapter Three.

FRONT HUB

Refer to **Figure 1** for this procedure.

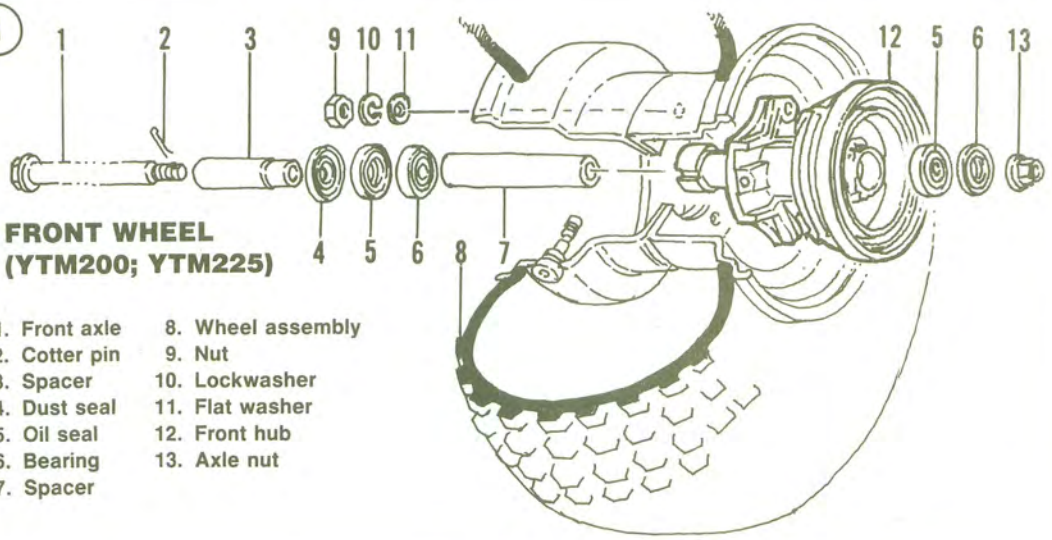
Disassembly

1. Remove the front wheel as described in this chapter.

NOTE
Do not remove the hub assembly from the tire/wheel assembly as it makes an ideal holding fixture.

2. Remove the oil seals (**Figure 5**) from both sides of the wheel by prying the seal out with a large flat-tipped screwdriver.

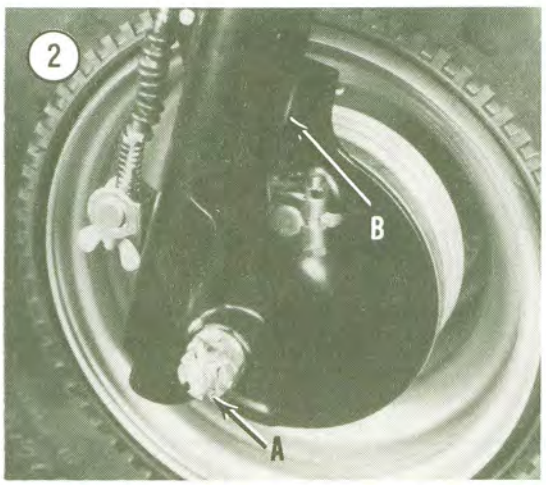
1



FRONT WHEEL (YTM200; YTM225)

1. Front axle
2. Cotter pin
3. Spacer
4. Dust seal
5. Oil seal
6. Bearing
7. Spacer
8. Wheel assembly
9. Nut
10. Lockwasher
11. Flat washer
12. Front hub
13. Axle nut

2



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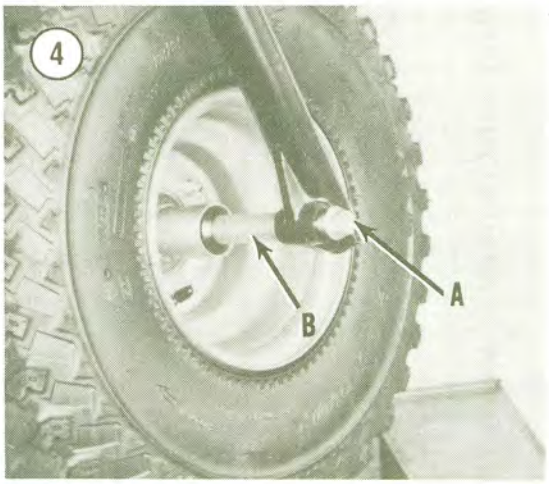

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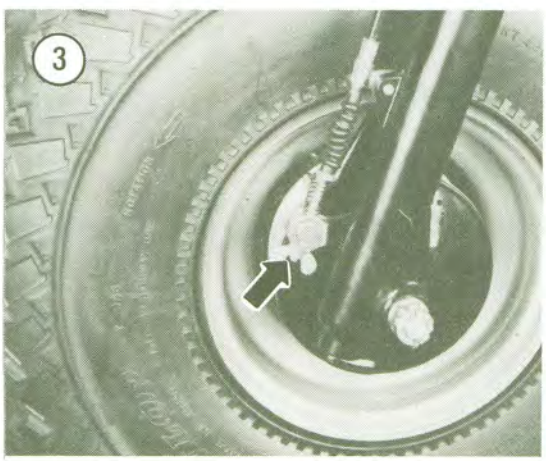

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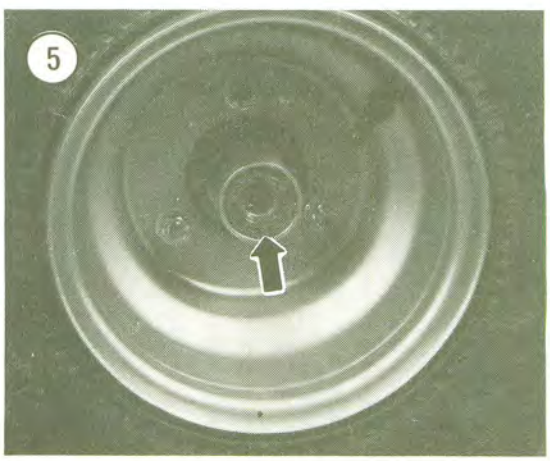


8

3. With the seals removed, turn each bearing by hand. The bearings should turn smoothly with no roughness or excessive noise. Check balls for evidence of wear, pitting or excessive heat (bluish tint). If the bearings are rough or appear worn, remove them as follows.
4. Determine which bearing you will remove first. Then apply heat with a propane torch to the hub assembly around the bearing. Wave the heat back and forth until the paint in the heated area begins to discolor slightly.
5. Turn the wheel over so that the heated hub area faces down.
6. Using a drift, pry the long spacer over slightly so that it can be struck with a metal rod to remove the bearing.
7. Place a drift on the long spacer and tap the spacer to drive the bearing out of the hub.

NOTE

Tapping the bearing on its inner race destroys the bearing. Bearings removed by this method must be replaced.

8. Heat the opposite bearing area as described in Step 4. Then turn the wheel assembly over and drive the opposite bearing out.
9. Remove the long spacer.
10. Deburr the center spacer as required, using a file or grinder. Then slide the spacer over the axle to make sure it slides freely.
11. To remove the hub from the wheel assembly, remove the mounting bolts (A, **Figure 6**) and remove the hub (B, **Figure 6**).

Inspection

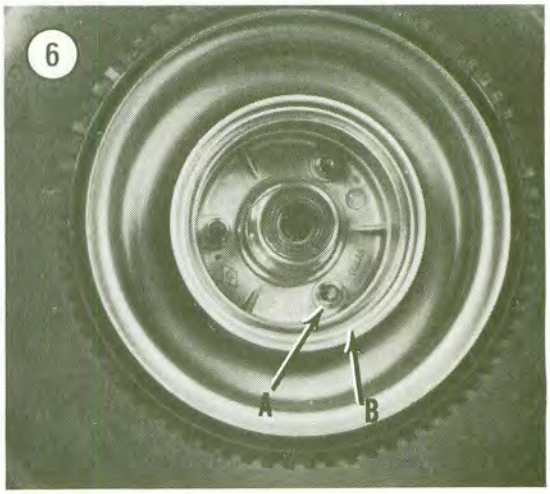
1. Thoroughly clean the inside of the hub with solvent and dry with compressed air or a shop cloth.
2. If the bearings were not removed, clean non-sealed bearings in solvent. Then dry with compressed air, holding the inner race to prevent it from rotating. Do not clean sealed bearings.

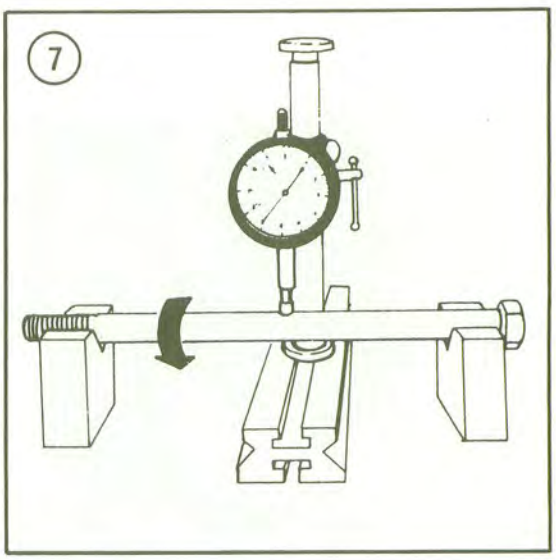
WARNING

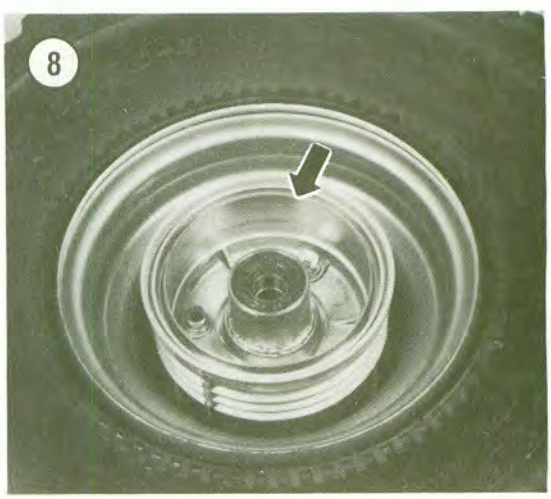
Never spin a bearing with the high-pressure air jet. This could damage the bearing or cause it to disintegrate, creating a severe safety hazard.

NOTE

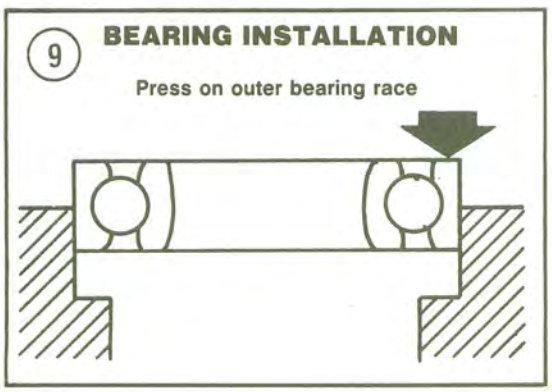
Fully sealed bearings are available from good bearing specialty shops. Fully sealed bearings provide better protection from dirt and moisture that may get into the hub.

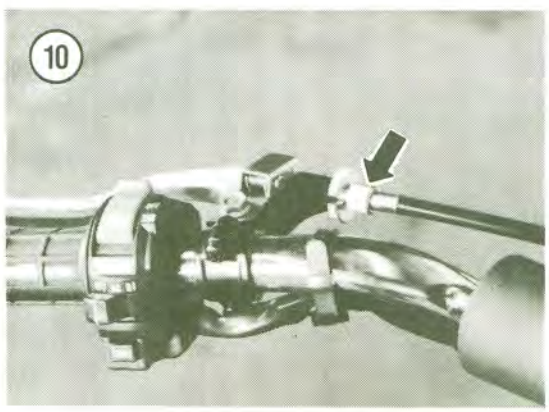


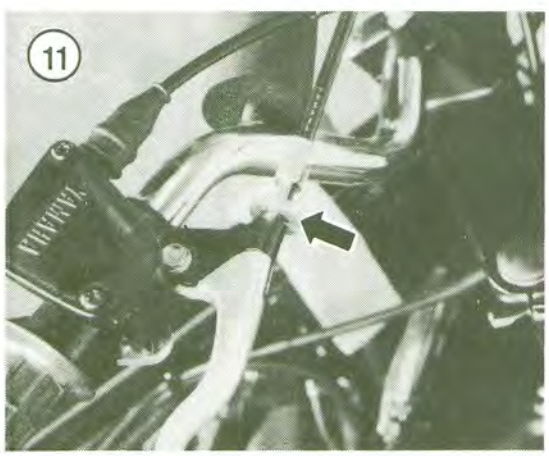




3. A bent front axle will cause poor handling, vibration and premature wheel bearing wear. Check the axle for signs of fatigue, fractures and bends. Use V-blocks and a dial indicator as shown in **Figure 7**. If the runout is 0.5 mm (0.02 in.) or greater, the axle should be replaced.
4. Check the hub and wheel assembly for dents, cracks or other obvious signs of damage. Replace the hub and/or wheel if necessary.







5. If so equipped, check the hole in the end of the axle where the cotter pin fits. Make sure there are no fractures or cracks leading out toward the end of the axle. If any are found, replace the axle immediately.
6. If the brake drum (**Figure 8**) appears worn or damaged, check it further as described in Chapter Eleven under *Front Brake*.

Assembly

1. If the old bearings were removed, install new bearings as follows:
   a. On non-sealed bearings, pack the bearings with a good quality bearing grease. Work the grease between the balls thoroughly. Turn the bearings by hand a couple of times to make sure the grease is distributed evenly inside the bearing.
   b. Pack the wheel hub and the center spacer with multipurpose grease.

CAUTION

*Install the wheel bearings with the sealed side facing out. During installation, tap the bearings squarely into place and tap on the outer race only. Use a socket (**Figure 9**) that matches the outer race diameter. Do not tap on the inner race or the bearing may be damaged. Be sure that the bearings are completely seated.*

   c. Apply heat with a propane torch to one end of the hub assembly around the bearing area. Wave the heat back and forth until the paint in the heated area begins to discolor slightly.
   d. Install the first bearing.
   e. Install the center spacer.
   f. Turn the hub over and install the opposite bearing in the same manner as the first.
2. Allow the hub to cool.
3. Apply a light coat of multipurpose grease to the grease seals and install one on each side of the hub.
4. Install the front wheel as described in this chapter.

HANDLEBAR

Removal

1. Park the vehicle on level ground. Block the wheels to prevent the vehicle from moving forward or backward. Release the parking brake.
2. Loosen the cable adjusters at the handlebar. See **Figure 10** (left-hand side) and **Figure 11** (right-hand side). Then disconnect the cable(s).
3. Loosen and remove the wire cable guides at the handlebar.

NOTE

In the following steps, be careful that the cables do not get crimped or damaged.

4. Remove the screws securing the left-hand handlebar switch assembly (**Figure 12**) and remove it from the handlebar.
5. Remove the throttle assembly clamp screws and remove the throttle assembly (**Figure 13**).
6. Remove the bolts and washers (**Figure 14**) securing the handlebar holders and remove the holders and the handlebar.
7. To maintain a good grip on the handlebar and to prevent it from slipping down, clean the knurled section of the handlebar with a wire brush. It should be kept rough so it will be held securely by the holders. The holders should also be kept clean and free of any metal that may have been gouged loose by handlebar slippage.
8. Examine the handlebar and replace it if bent.

WARNING

A bent handlebar should be replaced immediately as it can loosen in its clamps and cause an accident.

Installation

1. Position the handlebar on the lower holders. Install the upper handlebar holders with the bolts and washers (**Figure 14**).
2. Tighten the forward bolts first and then the rear bolts. Tighten all bolts to specifications (**Table 2**). Sit on the vehicle and check the height of the handlebar; reposition as required.
3. Install the throttle (**Figure 13**) and switch (**Figure 12**) assembly on the handlebar. Tighten the screws securely.
4. Attach the brake cables. See **Figure 10** and **Figure 11**. Adjust the cables as described in Chapter Three.

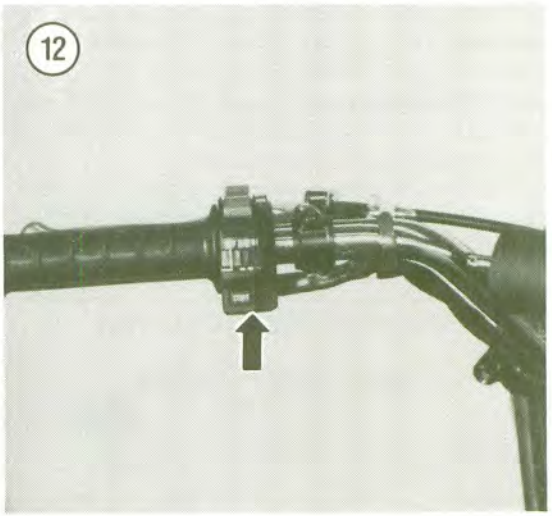
STEERING HEAD

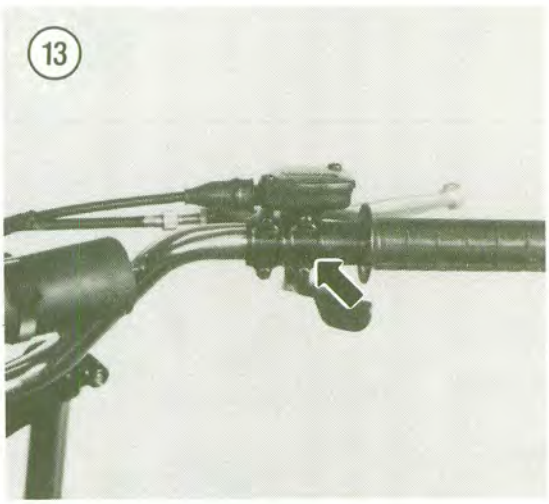
The steering assembly supports the handlebar and front forks. Loose ball bearings in the upper and lower ends of the head pipe allow the steering stem to turn smoothly.

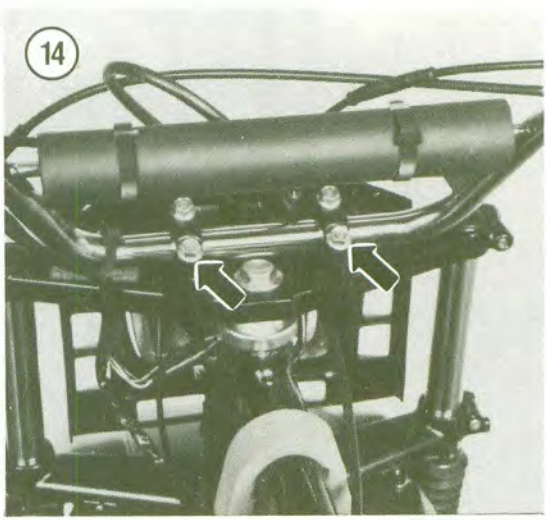
The steering stem assembly does not wear, but it can become bent or damaged.

All models use removable hydraulic forks. This procedure describes removal, installation and inspection of the steering head assembly.

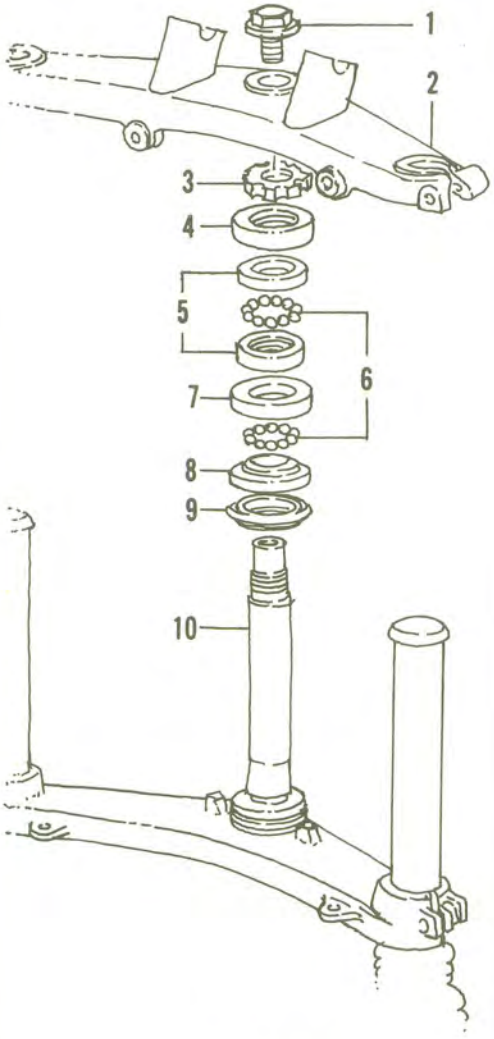
Refer to **Figure 15** for this procedure.







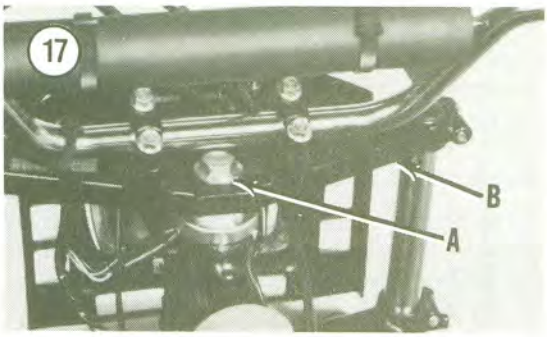
(15) STEERING ASSEMBLY (YTM200; YTM225)

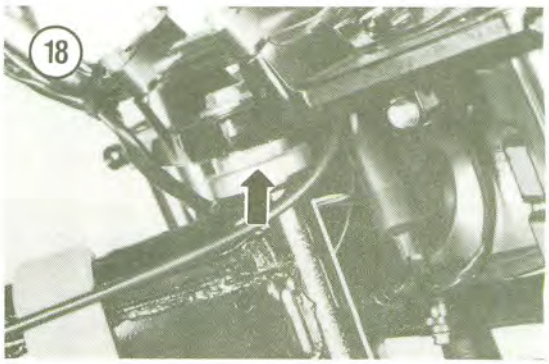


1. Steering bolt
2. Steering crown
3. Ring nut
4. Bearing cover
5. Bearing race
6. Ball bearings
7. Bearing race
8. Bearing race
9. Dust seal
10. Steering stem

Removal

1. Remove the front wheel as described in this chapter.
2. Remove the front fender.
3. Remove the front forks as described in this chapter.
4. Remove the handlebar assembly as described in this chapter.
5. Remove the screws securing the headlight to the front housing and remove the headlight assembly (**Figure 16**). Disconnect all electrical wires to the headlight assembly.
6. Remove the steering stem nut (A, **Figure 17**).
7. Remove the top steering crown (B, **Figure 17**).
8. Remove the steering adjusting nut (**Figure 18**). Use a large drift and hammer or use a universal





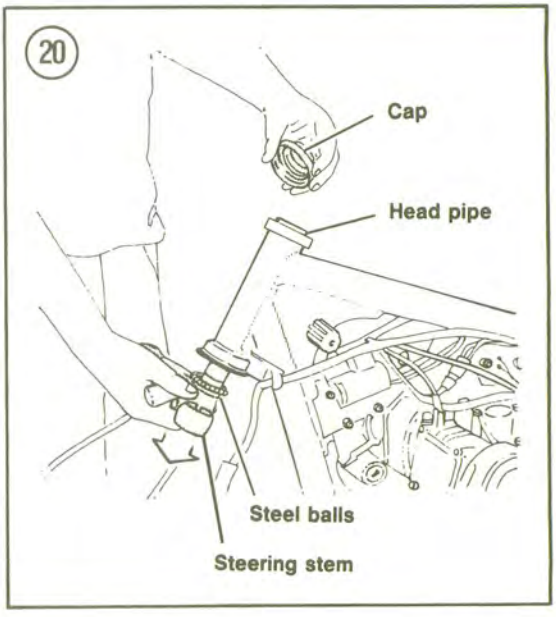
spanner wrench (**Figure 19**).
9. Remove the cover (**Figure 20**) and the bearing race (**Figure 20**).

NOTE
Have an assistant hold a large pan under the steering stem while you carefully lower the steering stem.

10. Lower the steering stem assembly down and out of the steering head. Remove the balls from the upper (**Figure 21**) and lower race. Do not intermix the balls because on some models, the upper and lower race balls are of different sizes. See **Table 1** for ball numbers and sizes.

Inspection

1. Clean the bearing races in the steering head, the steering stem races and the steel balls with solvent.
2. Check the welds around the steering head for cracks and fractures. If any are found, have them repaired by a competent frame shop or welding service.
3. Check the balls for pitting, scratches or discoloration indicating wear or corrosion. Replace them in sets if any are bad.
4. Check the races for pitting, galling and corrosion. If any of these conditions exist, replace the races as described in this chapter.
5. Check the steering stem for cracks and check its race for damage or wear. If this race or any race is damaged, the bearings should be replaced as a complete bearing set. Take the old races and bearings to your dealer to ensure accurate replacement.



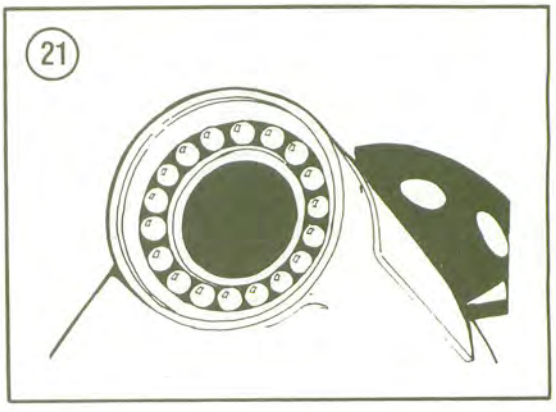
Steering Head Bearing Races

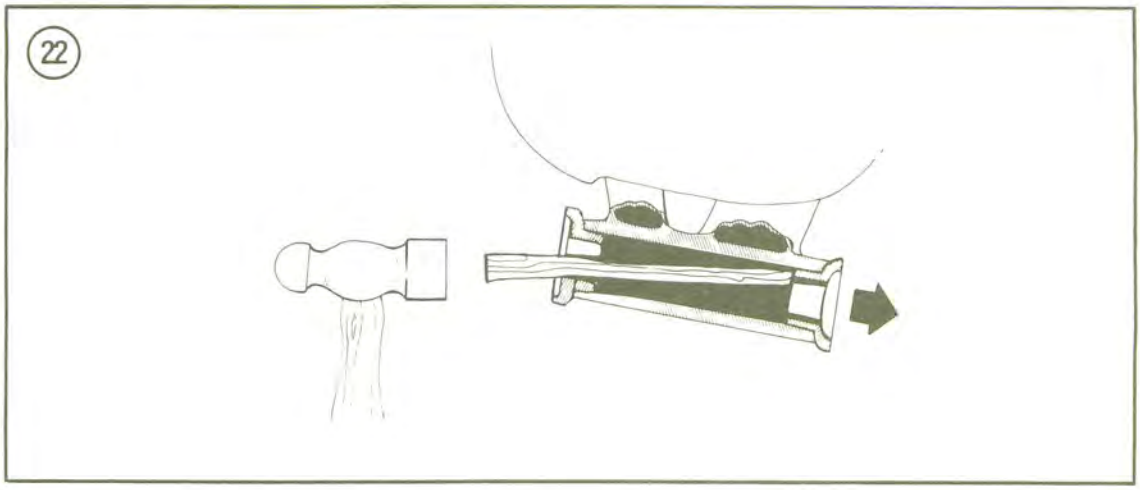
The headset and steering stem bearing races are pressed into place. Because they are easily bent, do not remove them unless they are worn and require replacement.

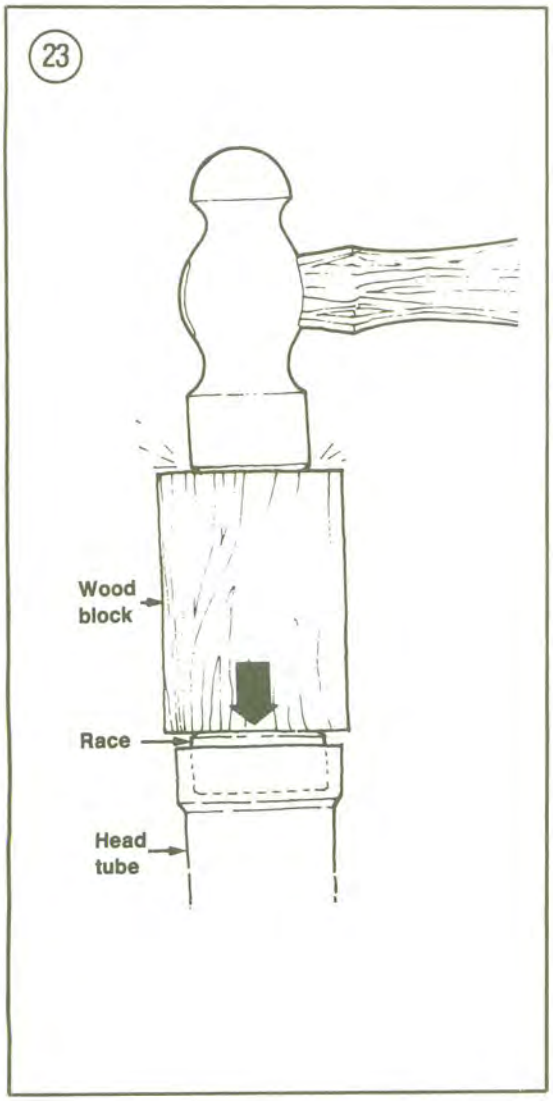
Headset bearing race removal/installation

To remove the headset race, insert a hardwood stick or brass punch into the head tube (**Figure 22**) and carefully tap the race out from the inside. After it is started, tap around the race so that neither the race nor the head tube is damaged.

To install the headset race, tap it in slowly with a block of wood, a suitable size socket or piece of pipe (**Figure 23**). Make sure that the race is squarely seated in the headset race bore before tapping it into place. Tap the race in until it is flush with the steering head surface.







Steering stem bearing race and grease seal removal/installation

To remove the steering stem race, try twisting and pulling it up by hand. If it will not come off, carefully pry it up with a screwdriver; work around in a circle, prying a little at a time to remove it.

Slide the lower race over the steering stem with the bearing surface pointing up. Tap the race down with a piece of hardwood; work around in a circle so the race will not be bent or jam sideways. Make sure it is seated squarely and is all the way down.

Installation

1. Make sure the steering head and stem races are properly seated.
2. Apply a coat of cold grease to the upper bearing race cone and fit the correct number of balls around it. See **Table 1** and **Figure 21**.
3. Apply a coat of cold grease to the lower bearing race cone and fit the correct number of balls around it. See **Table 1**.
4. Install the steering stem assembly into the head tube and hold it firmly in place (**Figure 20**).
5. Install the upper race on top of the bearings.
6. Install the race cover (**Figure 20**).
7. Install the steering stem adjusting nut (**Figure 18**) and tighten it to approximately 38 N•m (27 ft.-lb.). Then back it off approximately 1/4 turn or as required to obtain proper steering stem play.

NOTE

The adjusting nut should be just tight enough to remove both horizontal and vertical play, yet loose enough so that the assembly will turn to both lock positions under its own weight after an assist.

8. Install the top fork crown (B, **Figure 17**) and steering stem bolts. Tighten the steering stem bolt to specifications. See **Table 2**.
9. Install the fork tubes as described in this chapter.
10. Attach the electrical wires to the headlight assembly.
11. Install the handlebar assembly as described in this chapter.
12. Install the front fender.
13. Install the front wheel as described in this chapter.
14. After a few hours of riding, the bearings have had a chance to seat; readjust the free play in the steering stem with the steering stem adjusting nut as described in Step 7.

Steering Stem Adjustment

If the steering head should become loose, adjust it as follows.
1. Raise the front of the vehicle so that the front wheel clears the ground.

WARNING
Block the rear wheel to prevent the vehicle from sliding off the supports.

2. Loosen the steering stem bolt (A, **Figure 17**).
3. Tighten the steering stem adjusting nut (**Figure 18**) to approximately 38 N•m (27 ft.-lb.). Then back it off approximately 1/4 turn or as required to obtain proper steering stem play.

NOTE
The adjusting nut should be just tight enough to remove both horizontal and vertical play, yet loose enough so that the assembly will turn to both lock positions under its own weight after an assist.

4. Tighten the steering stem bolt to specifications (**Table 2**).
5. Lower the vehicle's front wheel back onto the ground.

FRONT FORKS

This section describes removal, disassembly, inspection and installation of the front forks. Service procedures pertaining to the steering head are found under *Steering Head and Front Fork* in this chapter.

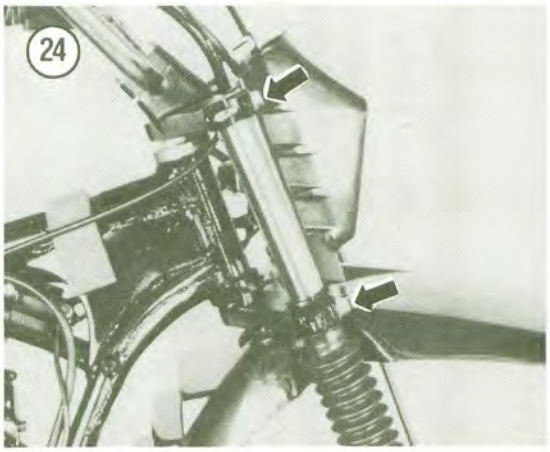
To simplify fork service and to prevent the mixing of parts, the legs should be removed, serviced and installed individually.

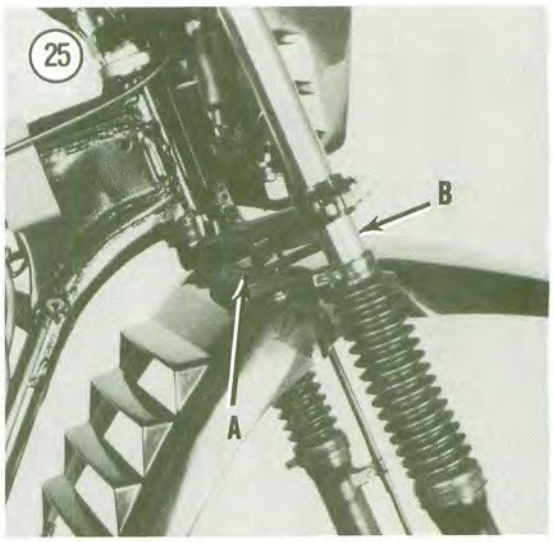
Removal/Installation

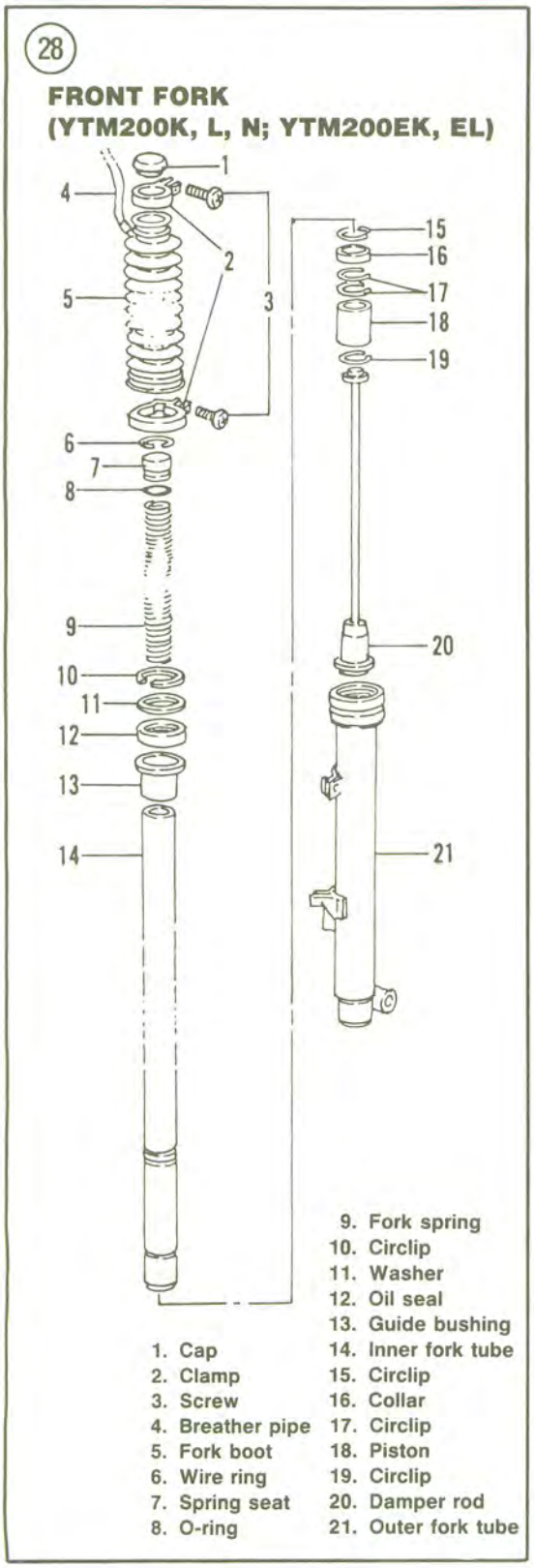
1. Remove the front wheel as described in this chapter.

NOTE
Before removing the fork, measure and write down the distance from the top of the fork tube to the top of the upper fork crown. This is a factory dimension. Some models are installed with the top of the fork flush with the fork crown.

2. Loosen the upper and lower fork crown bolts (**Figure 24**).
3. Slide the fork boot rubber hose (A, **Figure 25**) out from the center of the steering stem. See **Figure 26**.
4. Remove the fork tube (B, **Figure 25**). It may be necessary to slightly rotate the fork tube while pulling it down and out.





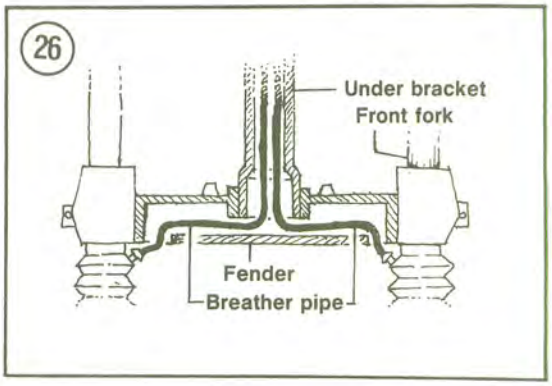


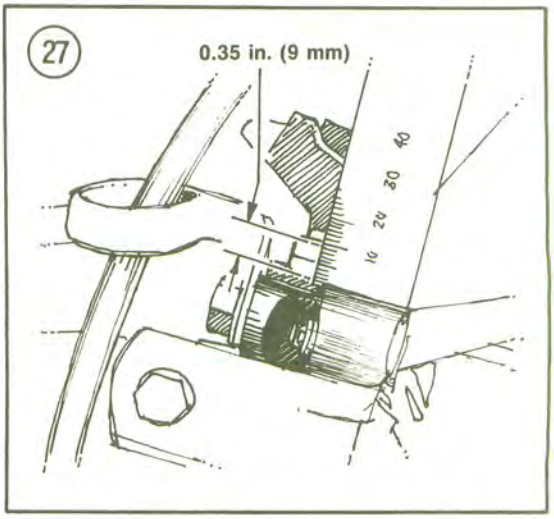
5. Install by reversing these removal steps, noting the following:
6. *YTM200K, L, N and YTM200EK and EL:* Install the fork tube so that the top of the fork tube is at the specified distance to the fork crown as shown in **Figure 27**:
   a. YTM200K, L, N: 10 mm (13/32 in.).
   b. YTM200EK and EL: 9 mm (11/32 in.).
7. Tighten the bolts to the torque values in **Table 2**.
8. When inserting the fork boot rubber hose (A, **Figure 25**) into the bottom of the steering stem, it will be easier if the 4 front fender bolts are first loosened.
9. Install the front wheel as described in this chapter.

Disassembly

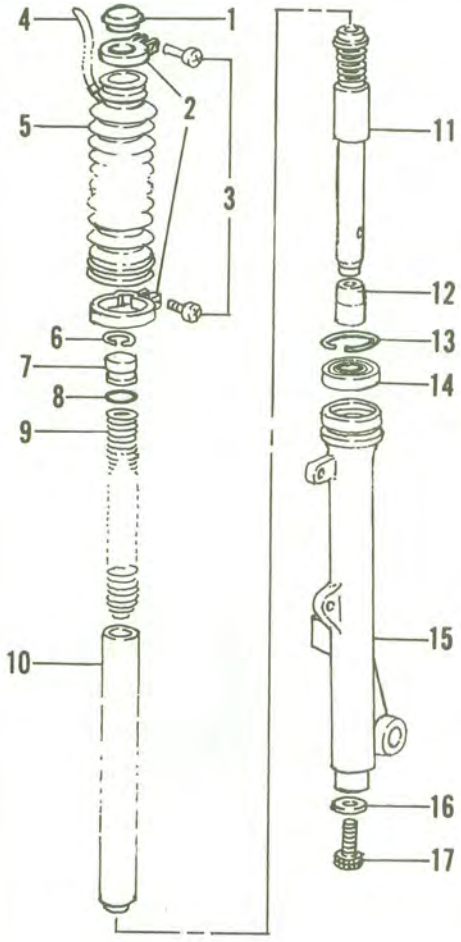
The fork tube assemblies are shown in **Figures 28-30**.

a. **Figure 28**: YTM200K, L, N, YTM200EK and EL.



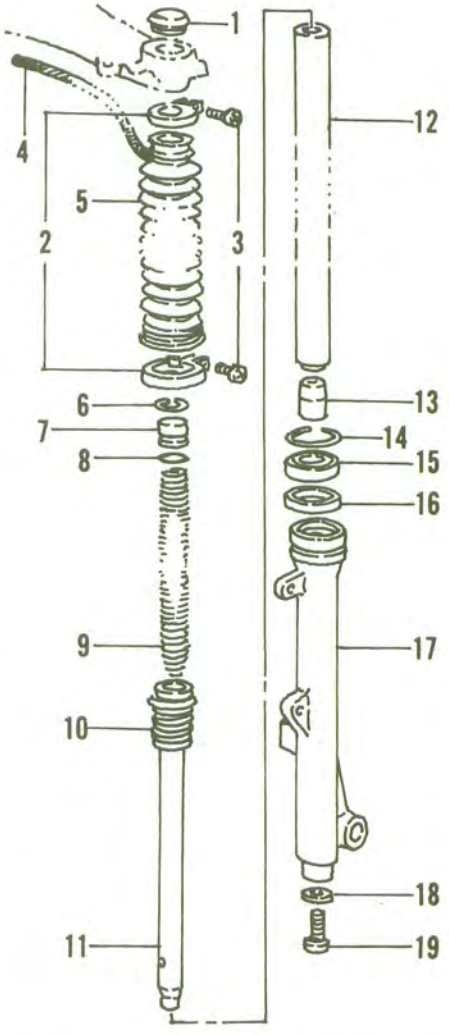


(29) FRONT FORK (YTM200ERN;YTM225DXK, DXL, DXN AND DRN)



1. Cap
2. Clamp
3. Screw
4. Breather pipe
5. Fork boot
6. Wire ring
7. Spring seat
8. O-ring
9. Spring
10. Inner fork tube
11. Damper rod
12. Taper spindle
13. Circlip
14. Oil seal
15. Fork tube
16. Washer
17. Allen bolt

(30) FRONT FORK (YTM225DRS)



1. Cap
2. Clamp
3. Screw
4. Breather pipe
5. Fork boot
6. Wire ring
7. Spring seat
8. O-ring
9. Spring
10. Damper rod spring
11. Damper rod
12. Inner fork tube
13. Taper spindle
14. Circlip
15. Oil seal
16. Guide bushing
17. Fork tube
18. Washer
19. Allen bolt

b. **Figure 29**: YTM200ERN; YTM225, DXK, DXL, DXN, DRN.
c. **Figure 30**: YTM225DRS.

Pay particular attention to the location and positioning of spacers, washers and springs to make sure they are assembled in the correct location.

YTM200ERN and YTM225

NOTE

All models use a wire ring to secure the fork cap and spring. See ***Figure 31****. It will be easier to remove the wire ring with the front fork and front tire installed on the vehicle.*

1. Remove the fork tube rubber cap (**Figure 32**).

WARNING

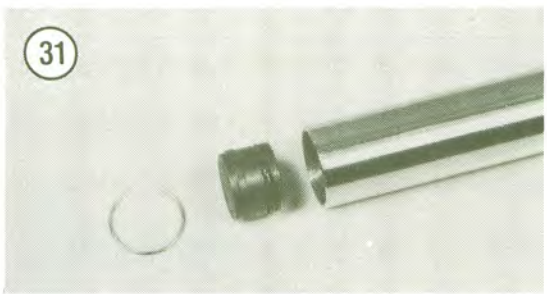
The fork is assembled with spring preload. Keep your face away from the fork end. The fork cap may spring out.

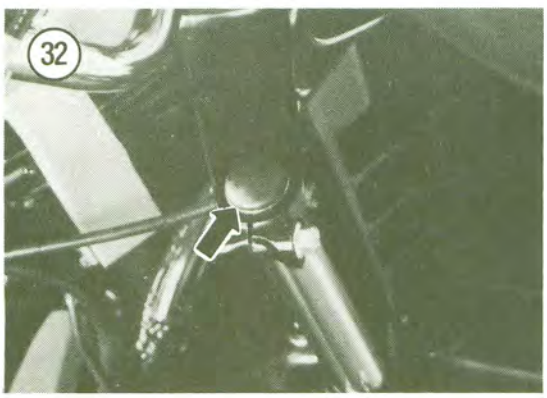
2. Remove the fork cap (**Figure 33**) by pushing the cap in and prying out the wire ring. See **Figure 34**.

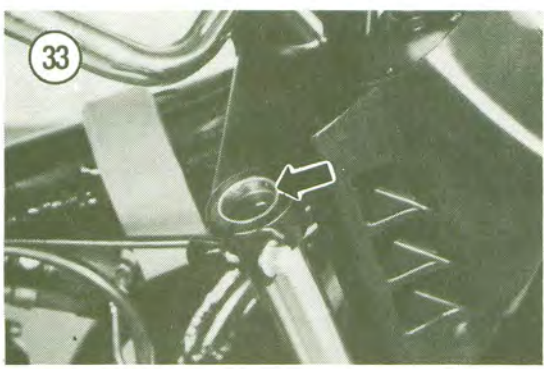
NOTE

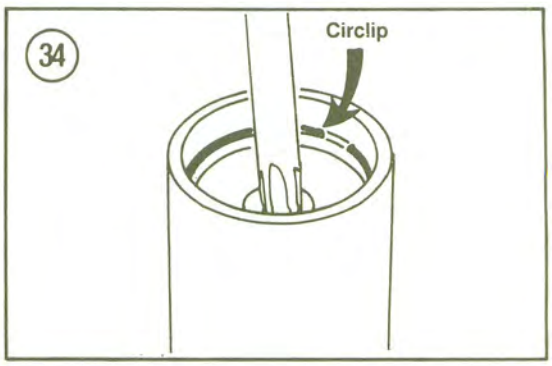
A small screwdriver or scribe will be necessary to pry out the wire ring. See ***Figure 35****.*

3. Remove the fork tube as described in this chapter.
4. Remove the fork spring (**Figure 36**).









5. Pour the fork oil out and discard it. Pump the fork several times by hand to expel most of the remaining oil.
6. Slide the rubber boot off the fork tube (**Figure 37**)..
7. Hold the upper fork tube in a vise with soft jaws (**Figure 38**).

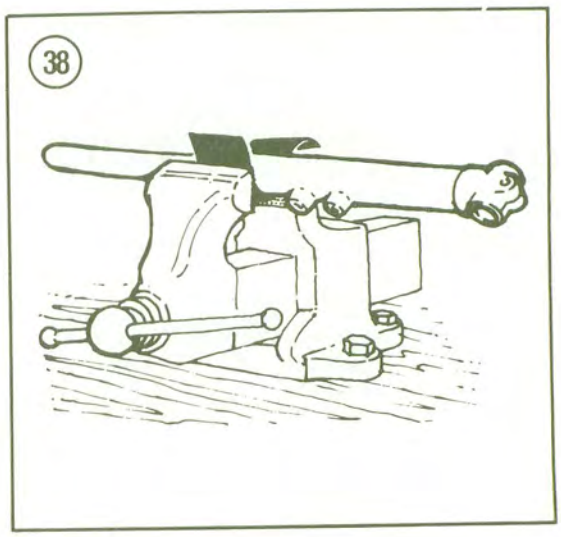
NOTE

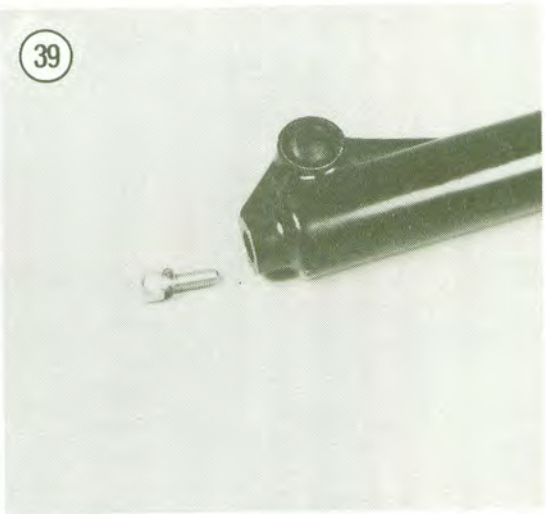
When removing the Allen bolt in Step 8, make sure to use a metric Allen wrench or socket. This will insure a good "bite" on the bolt and reduce the chances of rounding out the bolt's Allen slot.

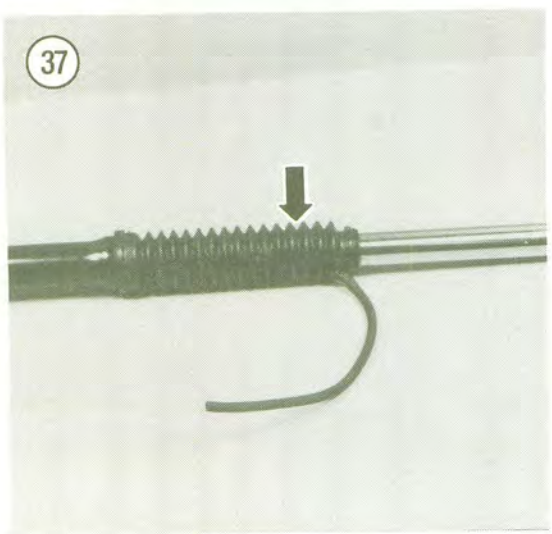
8. Remove the Allen bolt and gasket from the bottom of the slider. See **Figure 39**.

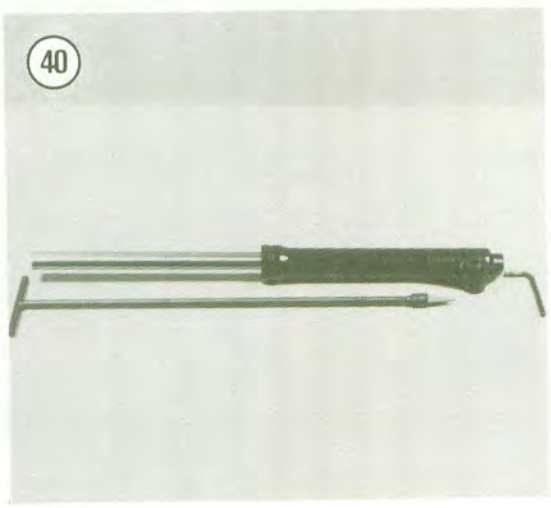
NOTE

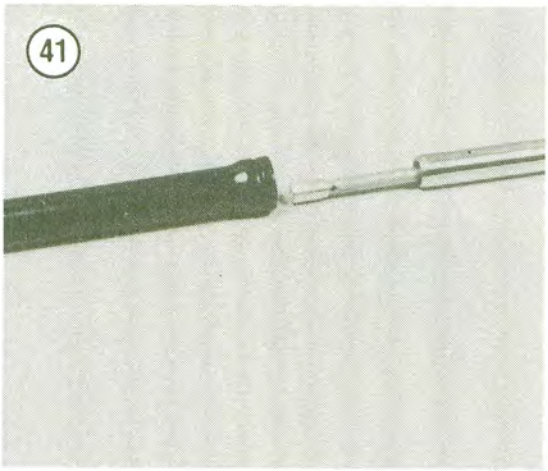
*The bolt has been secured with Loctite and can be difficult to remove; the damper rod will turn inside the slider. It can be removed with an air impact driver or you may be able to install the fork spring and fork cap and wire ring to add pressure to the damper rod and get it off. If these methods are not successful, you will have to keep the damper rod from turning with a special tool on the end of several socket extensions. Your Yamaha dealer has a special tool (**Figure 40**) that can be used. If you are unable to remove it, take the fork tubes to a dealer and have the bolts removed.*

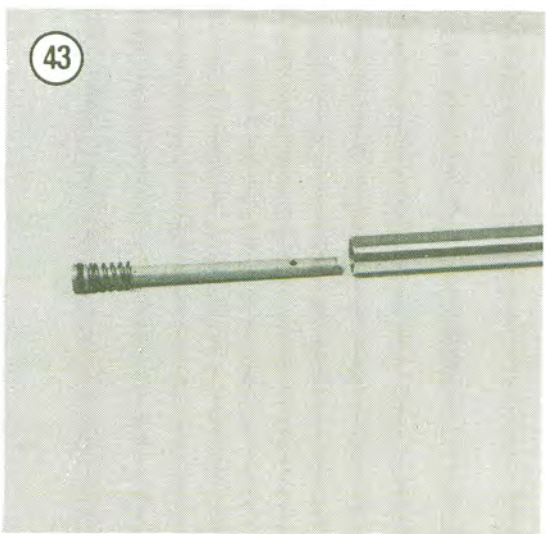




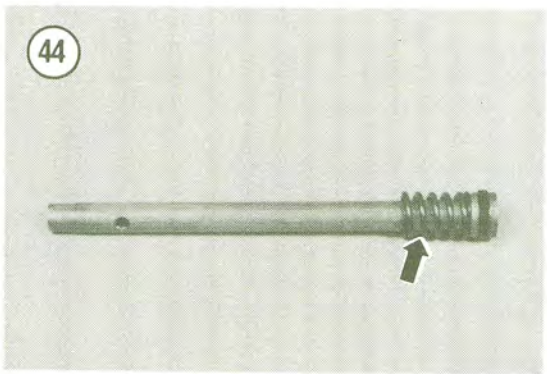


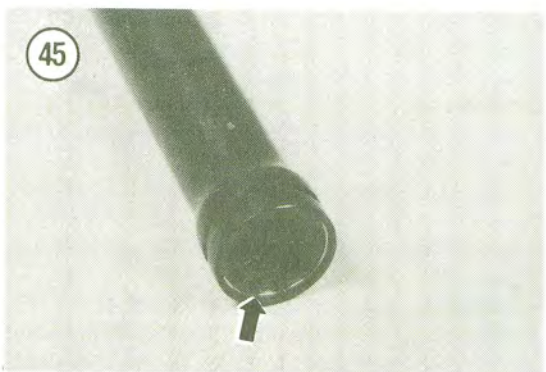




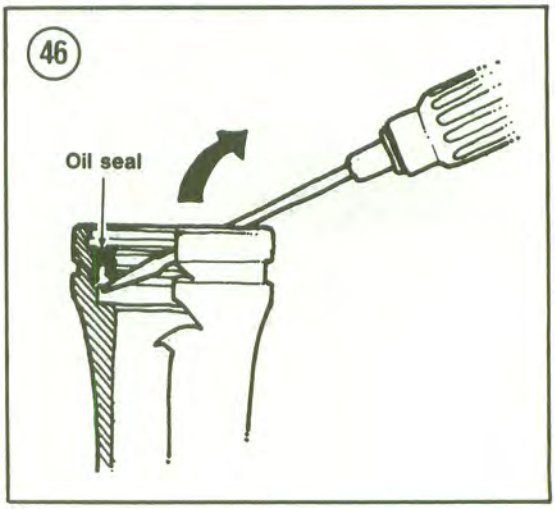


9. If the damper rod Allen bolt slot is rounded out, it will be impossible to remove the bolt with the Allen socket or wrench. If this condition is present, remove the Allen bolt as follows:
   a. Secure the fork tube in a vise with soft jaws (**Figure 38**).
   b. Select a drill bit with almost the same diameter as that of the Allen screw.
   c. Carefully drill the Allen screw head until the head is completely drilled off of the bolt. Work slowly and do not drill into the fork tube. Stop and check your progress often.
   d. When the bolt head is drilled off, pull the fork slider off of the fork tube.
   e. Unscrew the remaining portion of the bolt from the damper rod.
10. Pull the fork tube out of the slider (**Figure 41**).
11. Remove the oil lock piece (**Figure 42**) from the damper rod.
12. Remove the damper rod and spring (**Figure 43**) through the top of the fork tube.
13. Slide the rebound spring (**Figure 44**) off of the damper rod.
14. If oil has been leaking from the top of the slider, remove the oil seal as follows:
   a. Secure the slider in a vise with soft jaws.
   b. Remove the oil seal circlip (**Figure 45**).



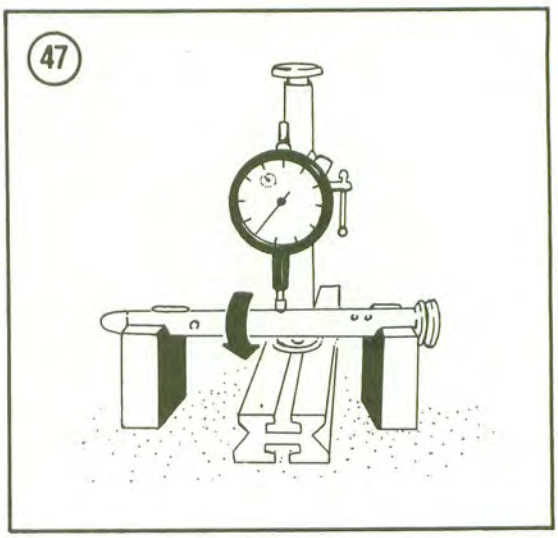


c. Place a rag onto one edge of the slider. Then use a screwdriver or pry bar and carefully pry the oil seal up and out of the slider (**Figure 46**). When prying the seal, start at one point and slowly work around the oil seal; pry the seal up evenly. Do not pry continuously at one point. Check often to make sure the screwdriver does not cut through the shop rag and damage the top of the slider.



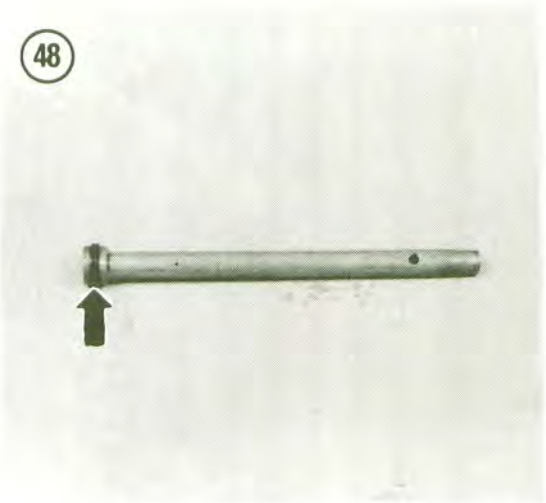
Inspection

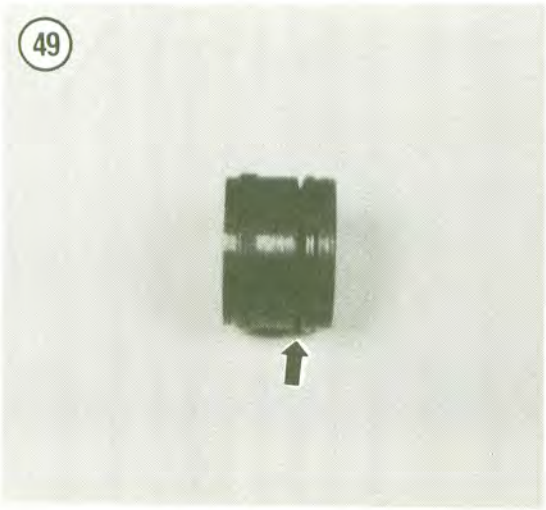
1. Thoroughly clean all parts in solvent and dry. Check the fork tube for signs of wear or scratches.
2. Check the damper rod for straightness. **Figure 47** shows one method. The rod should be replaced if the runout is 0.2 mm (0.008 in.) or greater.
3. Check the damper piston ring (**Figure 48**) for wear or damage.
4. Inspect the oil seals for scoring, nicks and loss of resiliency. Replace them if their condition is questionable.
5. Check the upper fork tube for straightness. If bent or severely scratched, it should be replaced.
6. Check the lower slider for dents or exterior damage that could cause the upper fork tube to hang up during riding conditions. Replace if necessary.
7. Measure the uncompressed length of the main fork spring. The standard spring length for all models is listed in **Table 1**. Replace the spring if shorter than the standard dimensions.
8. Inspect the O-ring in the fork cap (**Figure 49**). Replace the O-ring if necessary.
9. Replace the fork boot (**Figure 50**) if damaged.
10. Any parts that are worn or damaged should be replaced. Simply cleaning and reinstalling unserviceable components will not improve performance of the front suspension.

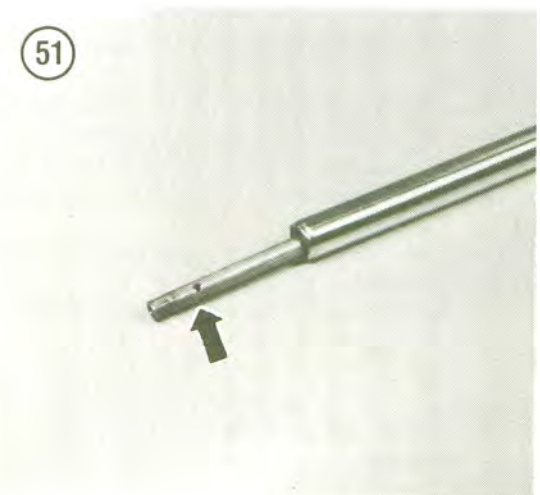


Assembly

1. Install a new oil seal by driving it into the slider with a large socket or piece of pipe. Make sure the driver fits the outer portion of the seal. Do not drive on the inner seal area.
2. Install the oil seal snap ring (**Figure 45**).
3. Install the rebound spring (**Figure 44**) onto the damper rod.
4. Insert the damper rod into the fork tube (**Figure 51**).
5. Install the oil lock piece onto the damper rod (**Figure 42**).
6. Install the slider as shown in **Figure 41**.
7. Apply Loctite 242 to the threads of the Allen bolt before installation. Install it in the fork slider







(**Figure 39**) and tighten it to specifications (**Table 2**). If necessary, use Yamaha tool shown during disassembly to prevent the damper rod from turning when tightening the bolt.

8. Install the fork boot (**Figure 37**) so that the hose faces to the top of the fork.
9. Install the fork tube onto the vehicle. Tighten the fork bolts to the specifications in **Table 2**.
10. Fill each fork with the specified viscosity and quantity of fork oil. Refer to **Table 1**.

NOTE

The viscosity of the oil can be varied according to your own preference and to the type of riding terrain (lower viscosity for less damping and higher viscosity for more damping action). Always use the specified ***amount*** *of oil.*

NOTE

To measure the correct amount of fluid, use a plastic baby bottle. These have measurements in fluid ounces (oz.) and cubic centimeters (cc) on the side.

11. Install the fork spring (**Figure 36**).

NOTE

An assistant will be required to help install the fork cap and wire ring.

12. Insert the fork cap in the fork tube and push it down with a drift. Then install a new wire ring, making sure it engages the ring in the fork tube. See **Figure 34**. Release tension against the drift and allow the fork cap to seat against the wire ring.

YTM200K, L, N; YTM200EK, EL

The fork tube (**Figure 28**) on these models requires a press and special tools for complete disassembly and reassembly. Thus it is recommended that the all service related to fork tube disassembly and reassembly be referred to a Yamaha dealer. Fork oil replacement is described in Chapter Three. Refer to Chapter Thirteen for suspension adjustment procedures.

TIRES

All models are equipped with low pressure tires designed specifically for off-road use only. Rapid tire wear will occur if the vehicle is ridden on paved surfaces. Due to their low pressure requirements, they should be inflated only with a

hand-operated air pump instead of using an air compressor or the air available at service stations.

CAUTION

Do not overinflate the stock tires as they will be permanently distorted and damaged. If overinflated they will bulge out similar to an inner tube that is not within the constraints of a tire and they will not return to their original contour.

The rims used on these models are of the 1-piece type and require a special type of tool for tire changing. There are various models available from dealers and mail order houses. When purchasing a tire tool, get the type that exerts all of the applied pressure to a very small section of the tire bead at a time. Many aftermarket bead breakers spread out the applied pressure over a larger section of the tire bead and therefore are unable to break the bead loose from the rim.

NOTE

A tire tool that applies pressure to a small area and that can break all ATV tire/wheel assemblies is "The Original Bead Buster." See ***Figure 52****. This tool is available from Jenco Products, P.O. Box 610, Glide, Oregon 97443.*

CAUTION

Do not use conventional motorcycle tire irons *for tire removal as the tire sealing bead will be damaged when forced away from the rim flange.*

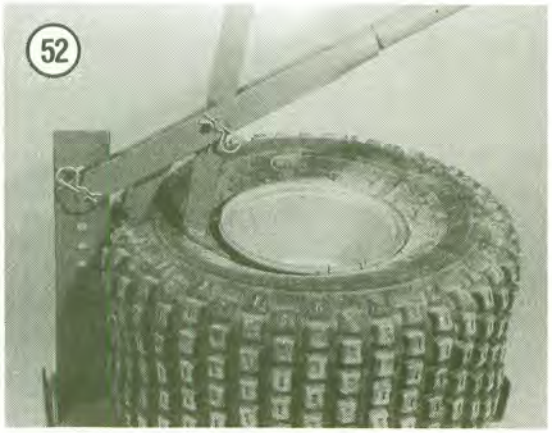
Tire Changing

1. Remove the valve stem cap and core and partially deflate the tire. Do not let all of the air out. Leave approximately 0.05-0.10 kg/cm2 (0.7-1.4 psi) of air pressure in the tire. This will help during the initial tire removal sequence.
2. Lubricate the tire bead and rim flanges with water.

CAUTION

If you are running aftermarket aluminum wheels, special care must be taken when changing tires to avoid scratches and gouges to the outer rim surface.

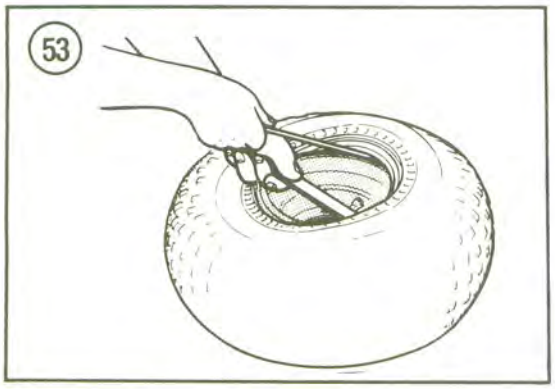
3. Position the wheel into the tire removal tool (**Figure 52**).
4. Slowly work the tire tool, making sure the tool is up against the rim, and break the tire bead away from the rim.



5. Using your hands, press down on the tire on either side of the tool and try to break the rest of the bead free from the rim.
6. If the rest of the tire bead cannot be broken loose, raise the tool, rotate the tire/rim assembly and repeat Step 4 and Step 5 until the entire bead is broken loose from the rim.
7. Remove the tire/rim assembly from the tool assembly.
8. Reinflate the tire to approximately 0.05-0.10 kg/cm2 (0.7-1.4 psi).
9. Turn the wheel over and repeat Steps 2-6 for the rim flange on the other side.
10. Remove the tire from the rim using tire irons and rim protectors (**Figure 53**).
11. Inspect the rim sealing surface of the rim. If the rim has been severely hit it will probably cause an air leak. Repair or replace any damaged rim.
12. Inspect the tire for cuts, tears, abrasions or any other defects.
13. Apply clean water to the rim flanges, tire rim beads and onto the outer rim. Make sure the rim flange is clean. Wipe with a lint-free cloth.
14. Apply tire mounting lubricant or water to both tire beads.
15. Position the tire so the arrow on the sidewall is pointing in the correct direction of rotation.
16. Position the rim with the outer side facing up.
17. Install the rim into the tire as shown in **Figure 54**.
18. Press the tire onto the rim with your hands as shown in **Figure 55**.
19. Repeat Step 18 for the other side of the tire.

CAUTION

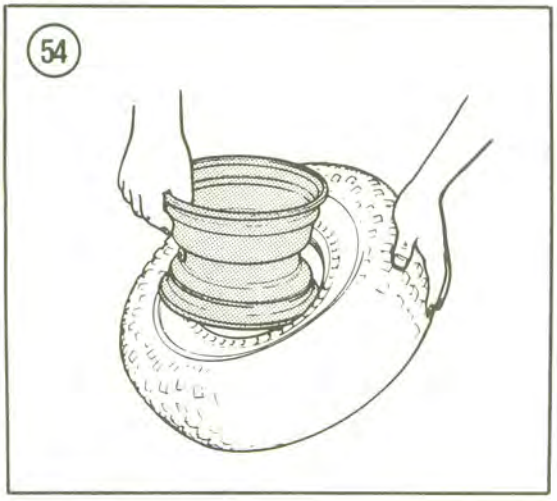
Do not inflate the tire past the maximum inflation pressure of 0.7 kg/cm2 (10 psi).

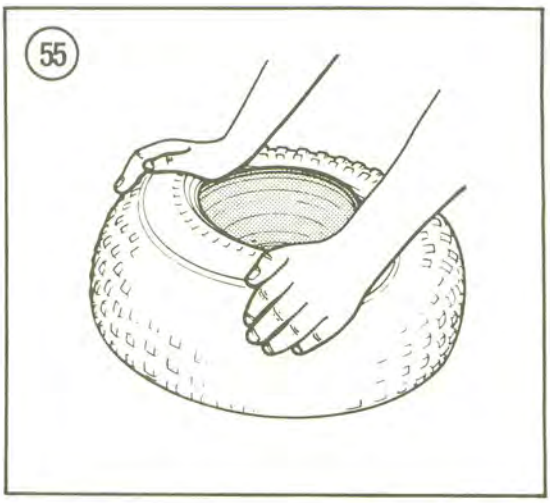


20. Inflate the tire to the recommended tire pressure; refer to **Table 3**.
21. Inspect the "rim line" of the tire in relation to the rim. It must be equally spaced from the rim all around the circumference (**Figure 56**). If the distance varies, the bead is not properly seated and the tire must be reinstalled correctly on the rim. Repeat Steps 15-21.
22. Check for air leaks and install the valve cap.

Cold Patch Repair

Refer to the manufacturer's instructions when using cold patch products.





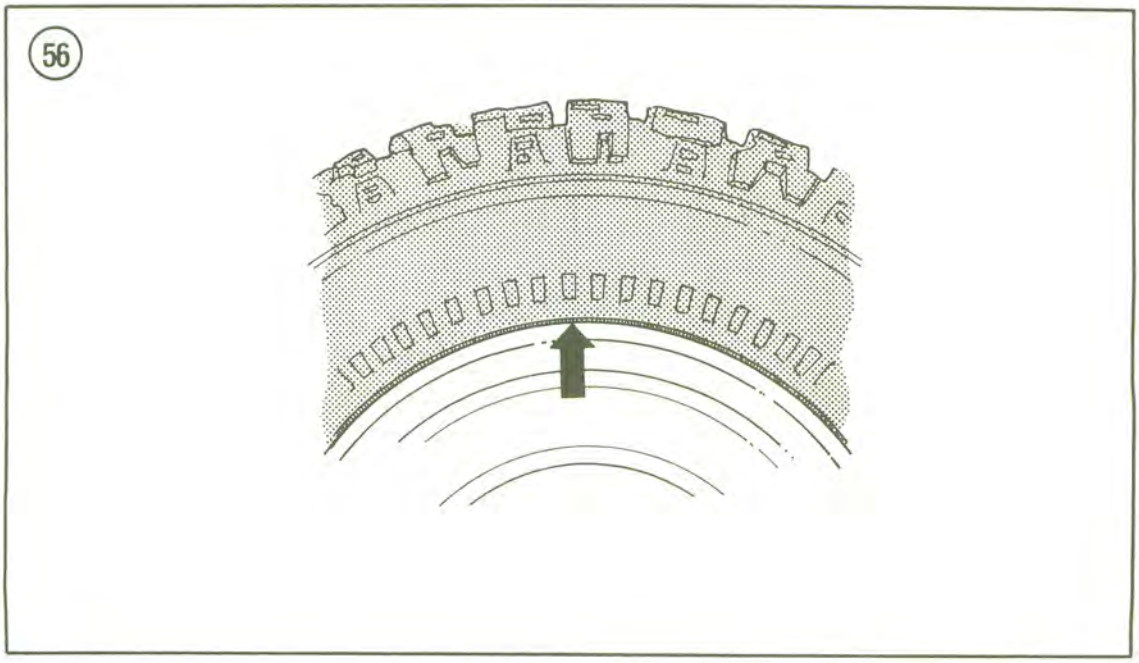


Table 1 STEERING SPECIFICATIONS—YTM200 AND YTM225

Steering	
Ball bearings	
Quantity (size)	
YTM200K, L, N; YTM200EK, EL; YTM225DXK, DXL, DXN	
Upper	22 (1/4 in.)
Lower	19 (3/16 in.)
YTM200ERN; YTM225DRN; YTM225DRN; YTM225DRS	
Upper and lower	19 (1/4 in.)
Front fork spring free length limit	
YTM200K, L, N	395.1 mm (15.56 in.)
YTM200EK, EL	395.1 mm (15.56 in.)
YTM225DXK, DXL, DXN	501.1 mm (19.73 in.)
YTM200ERN	395.1 mm (15.56 in.)
YTM225DRN	501.1 mm (19.73 in.)
YTM225DRS	526.6 mm (20.73 in.)
Rim runout limit	
YTM200K, L, N; YTM200EK, EL;	
YTM200DXK, DXL, DXN;	2.0 mm (0.08 in.)
YTM200ERN; YTM225	1.0 mm (0.04 in.)

Table 2 TIGHTENING TORQUES—YTM200 AND YTM225

	N•m	ft.-lb.
Front axle nut	50	36
Front wheel panel	45	32
Lower steering bracket and inner fork tube		
YTM225DRS	48	35
All other models	30	22
Steering stem and inner fork tube	20	14
Steering stem bolt	90	65
Steering shaft ring nut	38	27
Handlebar holder	20	14

Table 3 TIRE INFLATION PRESSURE

Tire size	Air pressure
YTM200 and YTM225 models	
22×11-8	
Recommended	0.15 kg/cm² (2.2 psi)
Maximum	0.7 kg/cm² (10 psi)
Minimum	0.12 kg/cm² (1.8 psi)
25×12-9	
Recommended	0.15 kg/cm² (2.2 psi)
Maximum	0.7 kg/cm² (10 psi)
Minimum	0.12 kg/cm² (1.8 psi)
YFM200 models	
YFM200N	
25×12-9 (front)	
and 22×11-8 (rear)	
Recommended	0.15 kg/cm² (2.2 psi)
Maximum	0.7 kg/cm² (10 psi)
Minimum	0.12 kg/cm² (1.8 psi)
YFM200DXS	
22×8-10 (front)	
and 22×11-8 (rear)	
Recommended	0.20 kg/cm² (2.8 psi)
Minimum	0.17 kg/cm² (2.4 psi)

CHAPTER NINE

FRONT SUSPENSION AND STEERING (YFM 200)

This chapter describes repair and maintenance of the front wheels, suspension and steering components for YFM200 models.

Tables 1-3 are located at the end of the chapter.

FRONT WHEEL

Removal/Installation

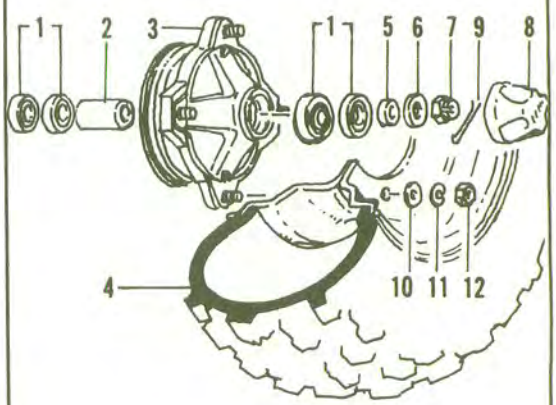
Refer to **Figure 1** for this procedure.

1. Park the vehicle on level ground and set the parking brake. Block the rear wheels so the vehicle will not roll in either direction.
2. Jack up the vehicle with a small hydraulic jack. Place the jack under the frame with a piece of wood between the jack and frame.
3. Remove the 4 nuts (**Figure 2**) securing the wheel to the hub and remove the wheel.
4. Installation is the reverse of these steps, noting the following.
5. Tighten the wheel nuts to the specifications in **Table 2** or **Table 3**.

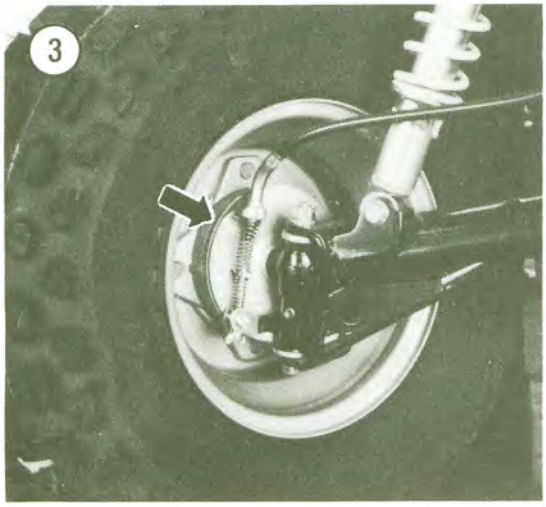
Inspection

1. With the wheel mounted on the vehicle, check the vertical and lateral wheel runout with a dial indicator. The vertical and lateral runout limits are 2.0 mm (0.08 in.). If a dial indicator is not available, visually check side play as follows:
   a. Jack up the vehicle's front end.

(1) FRONT WHEEL (YFM200)



1. Bearing
2. Spacer
3. Hub
4. Wheel assembly
5. Spacer
6. Flat washer
7. Axle nut
8. Cap
9. Cotter pin
10. Flat washer
11. Lockwasher
12. Nut



b. Push the wheel from side to side and detect the amount of play at the hub at the point shown in **Figure 3**.

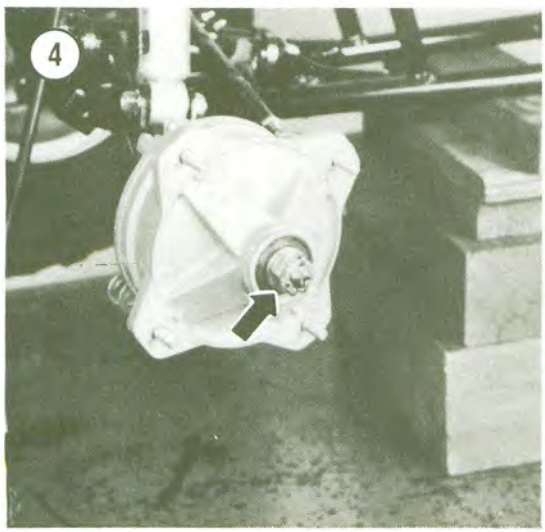
2. If the runout is excessive, remove the wheel and inspect the wheel bearing as described under *Front Hubs* in this chapter. If the bearing is okay, it will be necessary to replace the wheel.

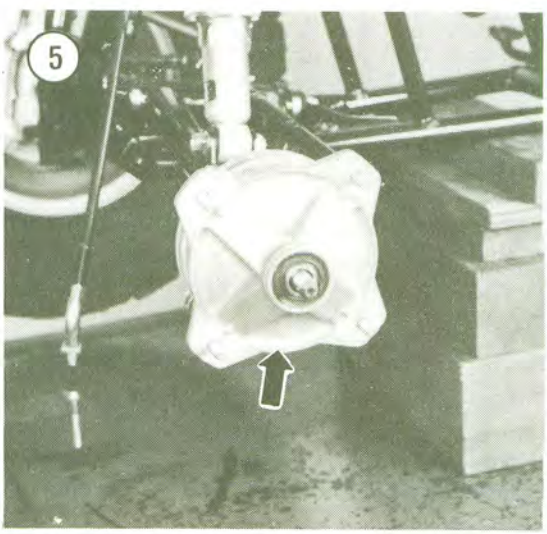
FRONT HUBS

Removal/Installation

This procedure describes removal of the front hub. If the front hub is being removed to service the wheel bearings and/or grease seals, it is not necessary to remove the tire/wheel assembly from the hub as described under *Front Wheel Removal* in this chapter. The tire/wheel assembly is an ideal holding fixture for the hub. All service can be performed with the tire/wheel installed on the hub.

1. Park the vehicle on level ground and set the parking brake. Block the rear wheels so the vehicle will roll in either direction.
2. Jack up the vehicle with a small hydraulic jack. Place the jack under the frame with a piece of wood between the jack and frame.
3. If necessary, remove the front wheel as described in this chapter.
4. Remove the wheel cap.
5. Remove the front axle cotter pin and axle nut (**Figure 4**).
6. Remove the front hub (**Figure 5**).
7. Installation is the reverse of these steps, noting the following.
8. Tighten the front hub nut to the specifications in **Table 2** or **Table 3**.

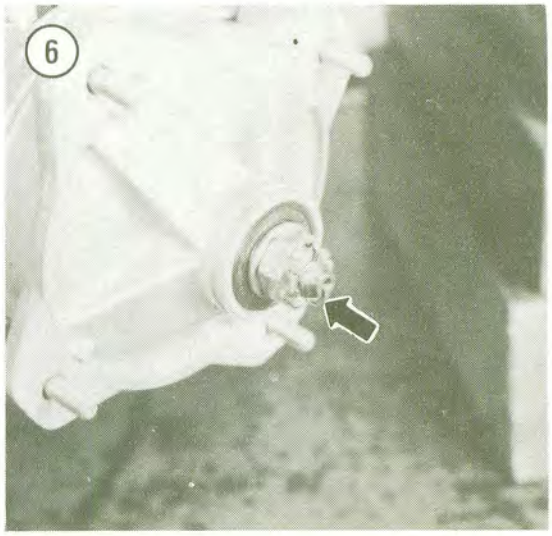




9. Secure the front axle nut with a new cotter pin and bend it over completely (**Figure 6**).

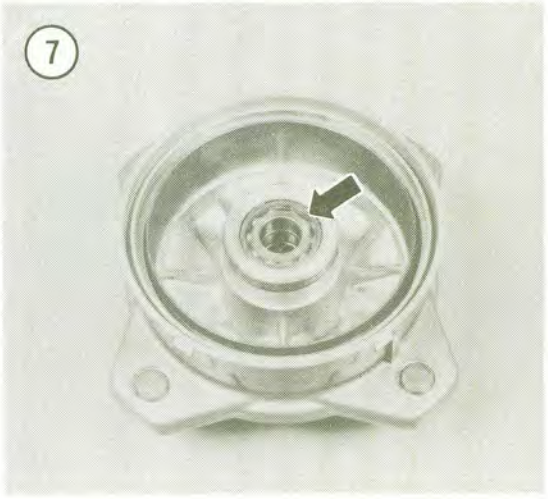
NOTE

Always use a new cotter pin whenever possible. A reused cotter pin may break and fall out of the axle. Purchase extra cotter pins and store them in your tool box.



Inspection

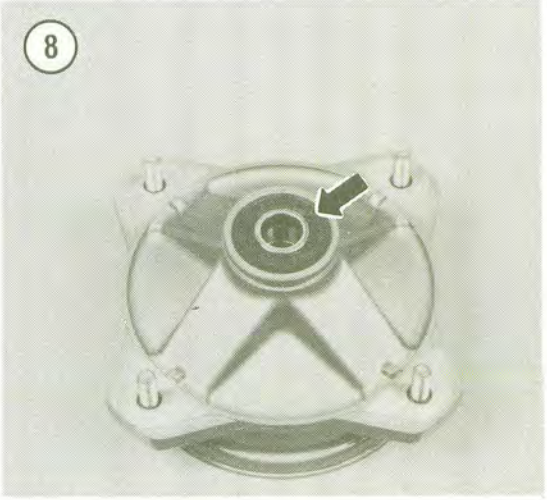
1. Thoroughly clean the inside of the hub with solvent and dry with compressed air or a shop cloth.
2. Rotate the bearings (**Figure 7**) by hand and check for roughness and radial play (some axial play is normal). The bearings should turn smoothly. Replace any bearing with tight spots or excessive play as described in this chapter.
3. If the bearings are not to be removed, clean non-sealed bearings (**Figure 7**) in solvent. Then dry with compressed air, holding the inner race to prevent it from rotating. Do not clean sealed bearings (**Figure 8**).



WARNING

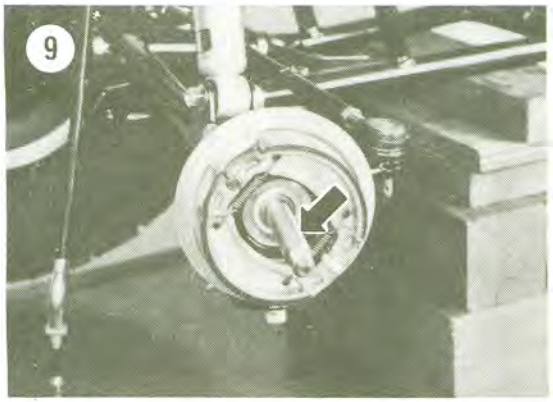
Never spin a bearing with the high-pressure air jet. This could damage the bearing or cause it to disintegrate, creating a severe safety hazard.

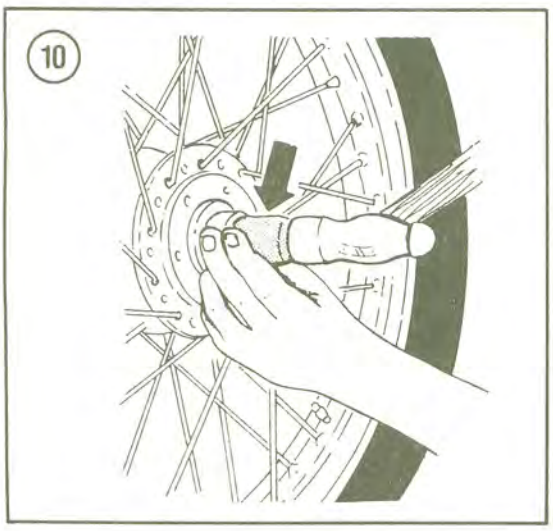
4. A bent front axle (**Figure 9**) will cause poor handling, vibration and premature wheel bearing wear. Check the axle for signs of fatigue, fractures and bends. If necessary, replace it as described under *Steering Knuckle Removal/Installation* in this chapter.
5. Check the hole in the end of the axle where the cotter pin fits. Make sure there are no fractures or cracks leading out toward the end of the axle. If any are found replace the steering knuckle as described in this chapter.
6. Check the hub and wheel assembly for dents, cracks or other obvious signs of damage. Replace the hub and/or wheel if necessary.
7. If the brake drum (**Figure 8**) appears worn or damaged, check it further as described in Chapter Eleven under *Front Brake.*



Bearing Replacement

Hub bearings (**Figure 7**) should only be removed when they are worn or damaged as removal usually damages them. See **Figure 1**.
1. Remove the front wheel as described in this chapter.





NOTE
Do not remove the hub assembly from the tire/wheel assembly as it makes an ideal holding fixture.

2. To remove the bearings perform the following:
   a. Insert a long driver into end side of the hub. Push the spacer to one side so that the drift can be applied to the inner race of the bearing.
   b. Tap the bearing out of the hub by working the perimeter of the bearing race.
   c. Remove the second bearing in the same manner.
   d. Remove the spacer.
   e. Tap out the opposite bearings.
3. Thoroughly clean all bearing cavities with solvent and a clean rag. Do not clean sealed bearings (**Figure 8**) in solvent.
4. Install new bearings as follows:
   a. On non-sealed bearings, pack the bearings with a good quality bearing grease. Work the grease between the balls thoroughly. Turn the bearings by hand a couple of times to make sure the grease is distributed evenly inside the bearing.
   b. Pack the wheel hub and the center spacer with multipurpose grease.

CAUTION
*Install the wheel bearings with the sealed side facing out (**Figure 8**). During installation, tap the bearings squarely into place and tap on the outer race only. Use a socket (**Figure 10**) that matches the outer race diameter. Do not tap on the inner race or the bearing may be damaged. Be sure that the bearings are completely seated.*

   c. Apply heat with a propane torch to one end of the hub assembly around the bearing area. Wave the heat back and forth until the paint in the heated area begins to discolor slightly.
   d. Install the bearings for one side.
   e. Install the center spacer.
   f. Turn the hub over and install the opposite bearings in the same manner as the first.

STEERING

The steering assembly on YFM200N models consists of a steering shaft connected by a tie rod to a right and left steering knuckle (**Figure 11**). On YFM200DXS models, a lower arm and shock absorber have been added (**Figure 12**).

Always keep all steering components clean and well lubricated. The environment these machines are operated in (dirt, sand and water) is particularly harmful to steering components if they are not properly maintained. Proper maintenance can ensure a long service life; however, if neglected, the parts will wear quickly.

STEERING SHAFT

Removal/Lubrication/Installation

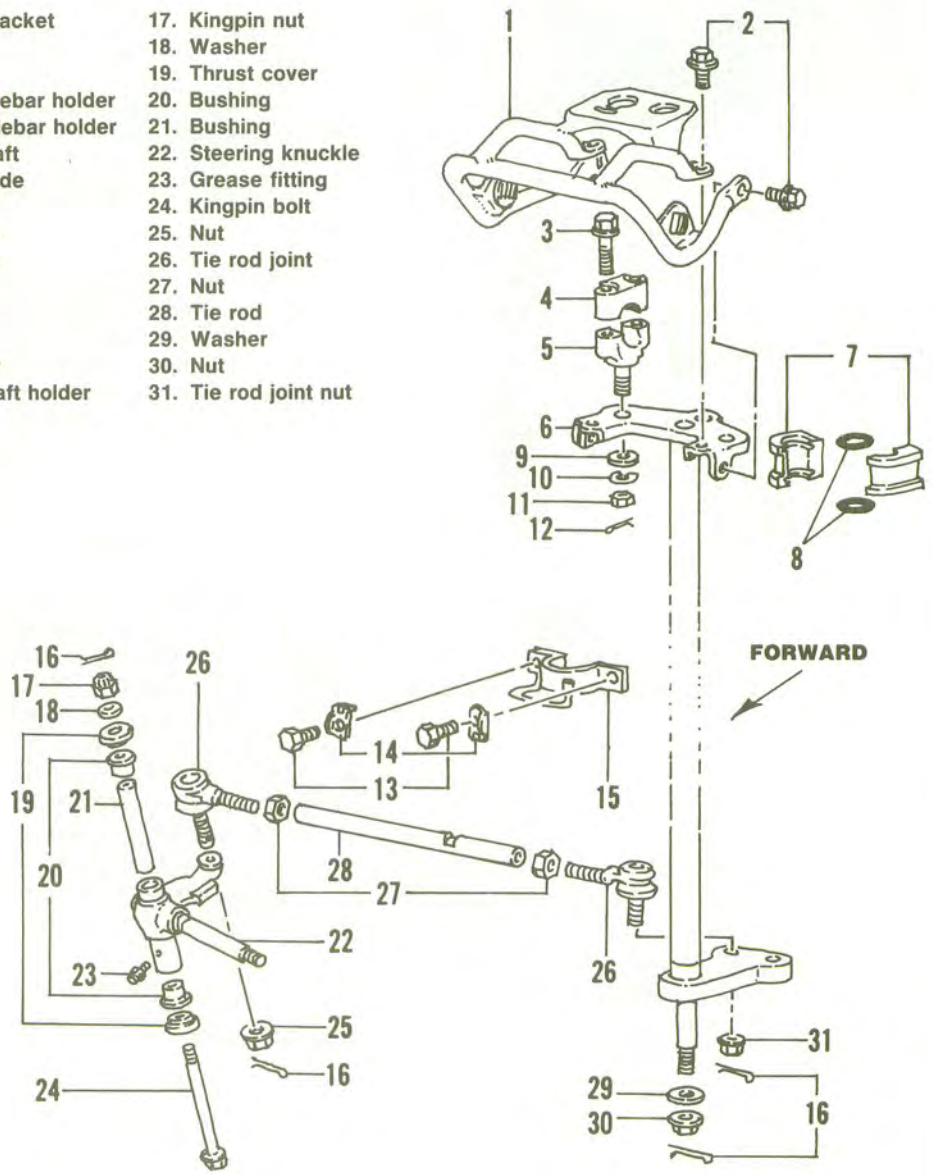
Refer to **Figure 11** or **Figure 12** for this procedure.

1. Remove the seat and front fender assembly.
2. Remove the fuel tank cover as described in Chapter Six.
3. Remove the engine guard from underneath the frame.
4. Remove the handlebar cover.
5. Remove the headlight bracket securing bolts and remove the bracket.

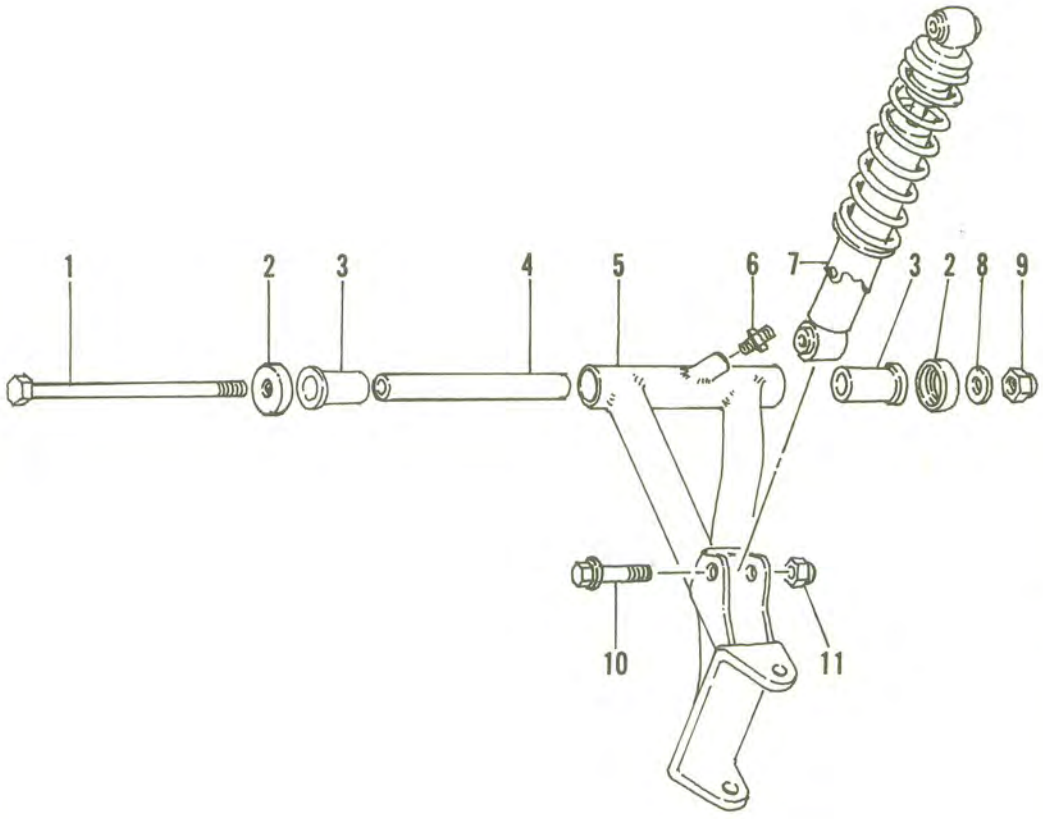
(11)

STEERING ASSEMBLY

1. Headlight bracket
2. Bolt
3. Bolt
4. Upper handlebar holder
5. Lower handlebar holder
6. Steering shaft
7. Steering guide
8. O-ring
9. Flat washer
10. Lockwasher
11. Nut
12. Circlip
13. Bolt
14. Lockwasher
15. Steering shaft holder
16. Cotter pin
17. Kingpin nut
18. Washer
19. Thrust cover
20. Bushing
21. Bushing
22. Steering knuckle
23. Grease fitting
24. Kingpin bolt
25. Nut
26. Tie rod joint
27. Nut
28. Tie rod
29. Washer
30. Nut
31. Tie rod joint nut



(12) **LOWER ARM ASSEMBLY (YFM 200 DXS)**



1. Pivot bolt
2. Thrust cover
3. Bushing
4. Spacer
5. Lower arm
6. Grease nipple
7. Shock absorber
8. Washer
9. Nut
10. Bolt
11. Nut

6. Remove the handlebar as described in this chapter.
7. Flatten the steering shaft guide holder lockwasher tabs (**Figure 11**). Then remove the guide holder bolts.
8. Remove the guide holder (**Figure 11**) and O-rings (**Figure 11**).
9. Remove the left- and right-hand side tie rod-to-steering shaft cotter pins and nuts (**Figure 13**).
10. Detach the tie rods from the steering shaft.
11. Remove the cotter pin securing the steering shaft nut (**Figure 14**) and remove the nut and washer.
12. Lift the lower end of the steering shaft (**Figure 15**) out of the frame and carefully remove it.
13. Remove the steering shaft bushings (**Figure 11**).
14. Inspect the steering shaft as described in this chapter.
15. Installation is the reverse of these steps, noting the following.
16. Lubricate all bushings and O-rings with a waterproof grease such as boat trailer wheel bearing grease.
17. Tighten the steering shaft and tie rod nuts to the specifications in **Table 2** or **Table 3**.
18. Tighten the guide holder bolt to the specifications in **Table 2** or **Table 3**. Then bend the lockwasher tabs against the guide holder bolts to lock them.
19. Tighten the handlebar nut to the specifications in **Table 2** or **Table 3**.

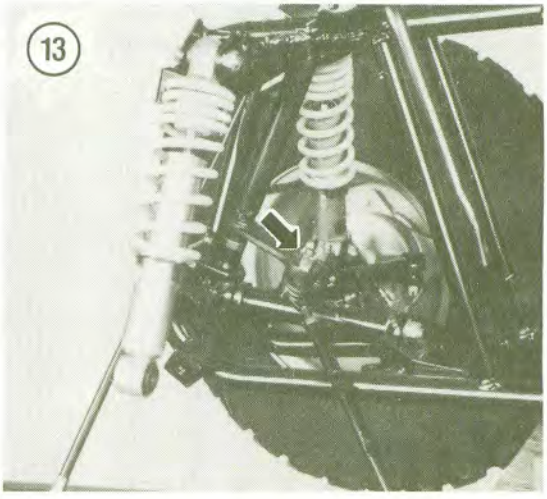
NOTE

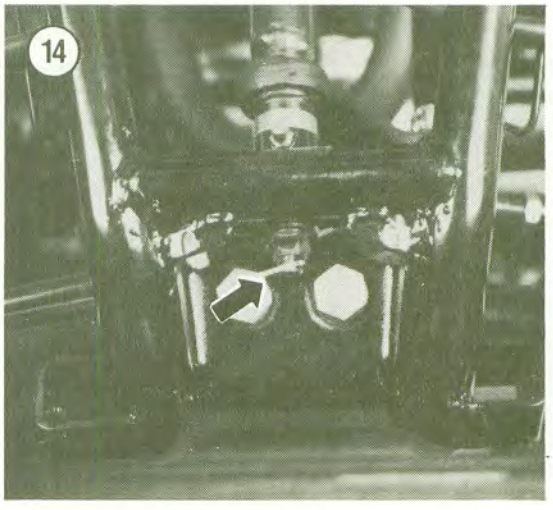
*Refer to **Handlebar Installation** to make sure all cables and wiring are routed correctly.*

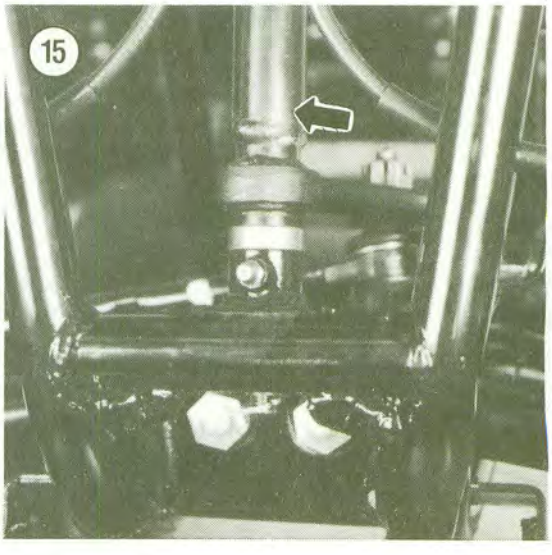
20. Install new cotter pins.

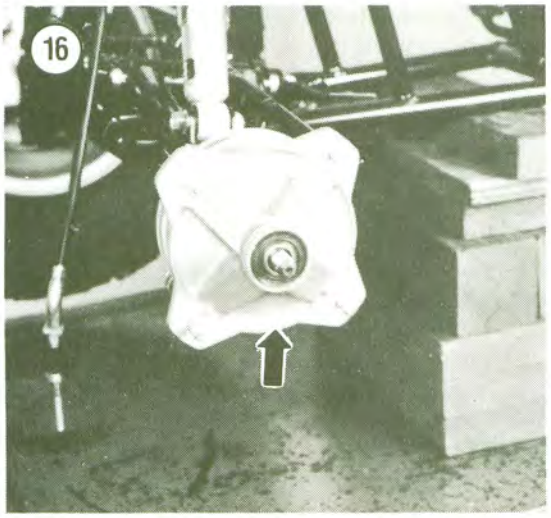
Steering Shaft Inspection

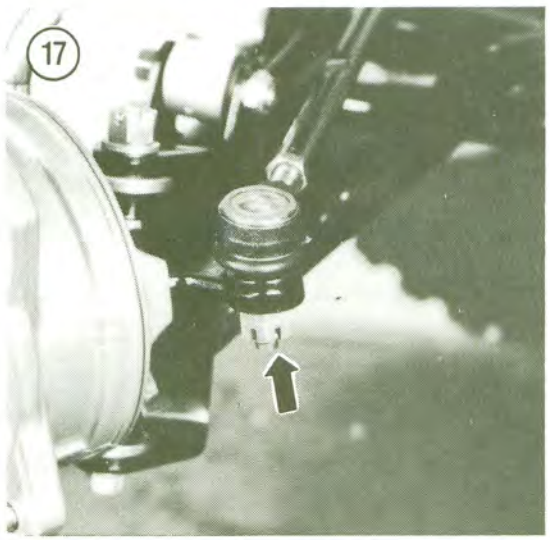
1. Carefully inspect the entire steering shaft assembly (**Figure 11**), especially if the vehicle has been involved in a collision or spill. If the shaft is bent or twisted in any way it must be replaced. If a damaged shaft is installed in the machine, it will cause rapid wear on the bushings as well as place undue stress on other components in the frame and steering system.
2. Examine the lower bushings in the frame (**Figure 11**) for wear or for signs of galling due to lack of lubrication. Check bushing wear by installing the steering shaft into the bushing and checking free play. There should be no noticeable free play when the shaft is moved back and forth. Replace the bushings if necessary.











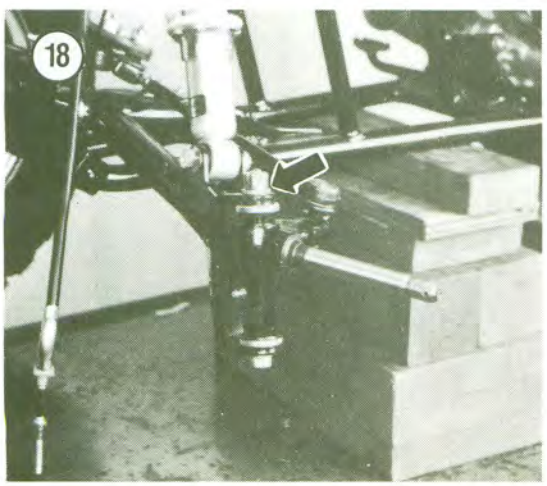
3. Check the steering shaft guides and O-rings for wear or damage. If the O-rings are damaged in any way, they should be replaced. A damaged O-ring will allow grit and moisture to enter the steering shaft guide.
4. Check the lower bushing guide holder (**Figure 11**) at the frame for damage or cracking. If the holder is damaged, have a Yamaha dealer or mchine shop repair the frame.

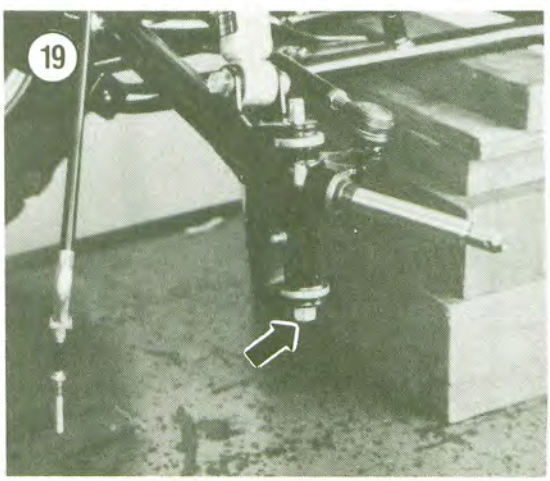
Steering Knuckle
Removal/Installation

The removal procedure is the same for either side. Refer to **Figure 11** for this procedure.
1. Remove one or both front wheels as described in this chapter.
2. Remove the front hub (**Figure 16**) if it was not removed with the wheel.
3. Remove the brake backing plate from the steering knuckle as described in Chapter Eleven.
4. Remove the cotter pin securing the tie rod nut (**Figure 17**).
5. Remove the nut and washers and lift the tie rod end out of the arm on the steering knuckle. If the tie rod end is difficult to remove, install the nut just enough to cover the threads on the end of the bolt and tap the tie rod end out of the steering knuckle with a soft-faced mallet.

CAUTION
If the tie rod is difficult to remove from the steering knuckle, do not attempt to pry it out or damage to the seal on the tie rod end may result.

6. Remove the cotter pin securing the kingpin nut (**Figure 18**).
7. Remove the nut securing the kingpin bolt and remove the kingpin bolt (**Figure 19**) and washer.





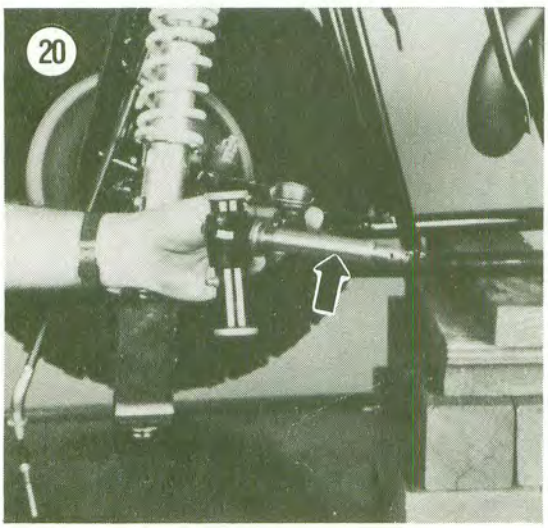
Slide the steering knuckle out of the frame (**Figure 20**). Take care not to drop the thrust covers on each end of the steering knuckle.

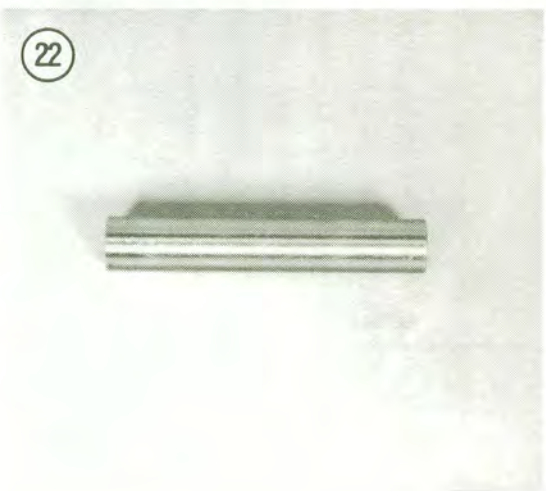
8. Perform *Steering Knuckle Inspection and Lubrication* in this chapter.
9. Installation is the reverse of these steps, noting the following.
10. Lightly grease the kingpin bolt before installing the bolt through the steering knuckle.
11. Tighten the nuts securing the tie rod end and the kingpin bolt to the torque values specified in **Table 2** or **Table 3**.
12. Use new cotter pins to secure the tie rod end and kingpin nuts. Bend both halves of the cotter pin to lock it.
13. Reinstall the brake backing plate as described in Chapter Eleven.
14. Install the front wheel as described in this chapter.

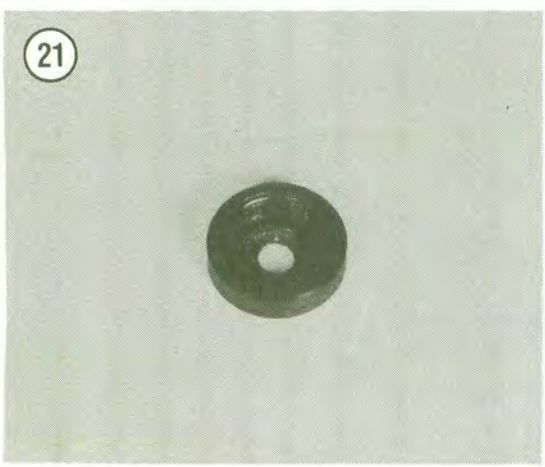
Steering Knuckle Inspection and Lubrication

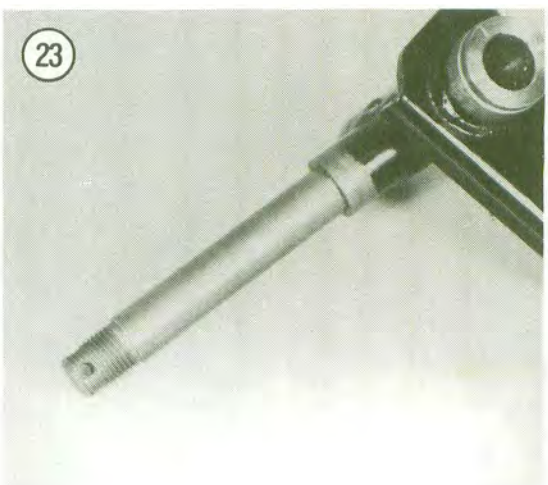
Refer to **Figure 11** for this procedure.

1. Remove the steering knuckle as described in this chapter.
2. Remove the thrust covers from each end of the steering knuckle. Wipe the inside of each cover with a clean rag and carefully check it for damage or wear (**Figure 21**).
3. Remove the kingpin spacer (**Figure 22**) from the steering knuckle.
4. Clean the steering knuckle and spacer in clean solvent or wipe the parts with a clean rag.
5. Examine the kingpin spacer for signs of wear or corrosion caused by moisture. Replace the spacer if it is damaged or worn.
6. Slide the spacer into the steering knuckle. Try to move the spacer side-to-side in the bushing. The spacer should rotate freely but have no side-to-side









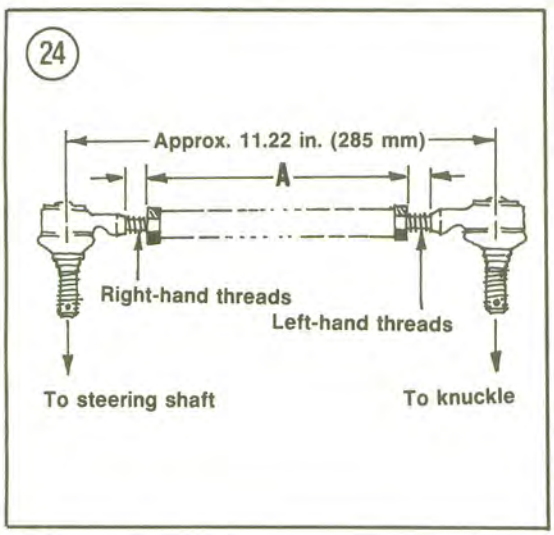
movement. Any side-to-side movement (more than just perceptible) is an indication that the steering knuckle bushings are worn.

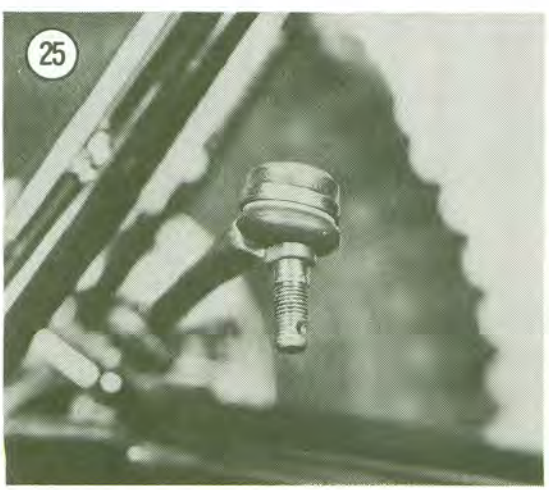
7. Visually inspect the steering knuckle bushings for wear or damage. In most cases damage will be caused by lack of lubrication or entry of sand and dirt. If the bushings show any signs of damage or wear, have a Yamaha dealer or machine shop replace them.

8. Inspect the front axle (**Figure 23**) for signs of wear or damage. A hard spill or collision may cause a bend in the front axle. If the axle is damaged in any way, the steering knuckle must be replaced.

CAUTION

If the vehicle is operated with a bent front axle, further damage to the wheel bearings and front hub will result.





9. Coat the inside of the steering knuckle bushings with a waterproof grease such as boat trailer wheel bearing grease. Apply a light film of grease to the spacer and install the spacer in the steering knuckle.

10. Apply a small quantity of grease to the inside lips of each thrust cover and install the covers over each end of the steering knuckle.

11. Install the steering knuckle as described in this chapter.

Tie Rod

Removal/Installation

Refer to **Figure 11** and **Figure 24** for this procedure.

1. Remove one or both front wheels as described in this chapter.
2. Remove the cotter pin securing the tie rod nut on each end. See **Figure 13** and **Figure 17**.
3. Remove the nut and washer from both ends and lift the tie rod end out of the steering knuckle and steering shaft. If either tie rod end is difficult to remove, install the nut just enough to cover the threads on the end of the bolt and tap the tie rod end out of the steering knuckle with a soft-faced mallet. The inner tie rod ends can be reached with a long drift through the bottom of the frame.

CAUTION

If the tie rod is difficult to remove from the steering knuckle, do not attempt to pry it out or damage to the seal on the tie rod end may result.

4. Ensure that the rubber boot over each tie rod swivel joint is in good condition (**Figure 25**). Replace the tie rod end if the rubber boot is damaged in any way. The swivel joints are permanently packed with grease. If the rubber boots are damaged, dirt and moisture can enter the swivel joints and destroy them. Tie rod ends can be replaced separately.
5. If tie rod ends are to be replaced, refer to **Figure 24** and perform the following:
   a. Carefully measure the overall length of the old tie rod assembly before removing the worn tie rod ends. **Figure 24** shows the approximate factory length setting.
   b. Loosen the locknuts securing the tie rod end to be replaced. The nuts securing the outside tie rod ends have left-hand threads (**Figure 24**).
   c. Unscrew the old tie rod end. Install the new tie rod end and turn it in or out until the overall length of the tie rod is the same as the old unit. Leave the locknuts securing each tie

rod end loose at this time. They are tightened after the wheel alignment is adjusted.

6. Installation is the reverse of these steps, noting the following.
7. Make sure the tie rods are installed with the flat spot (**Figure 24**) toward the center of the machine.
8. Perform *Wheel Alignment* as described in this chapter.
9. Tighten the nuts securing the tie rods to the torque valves specified in **Table 2** or **Table 3**.
10. Install new cotter pins.

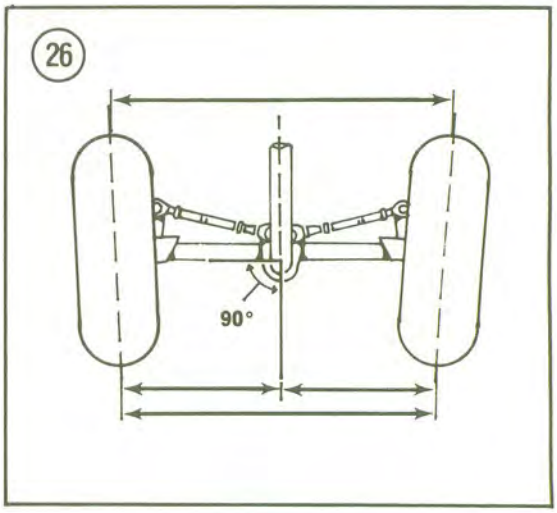
Wheel Alignment

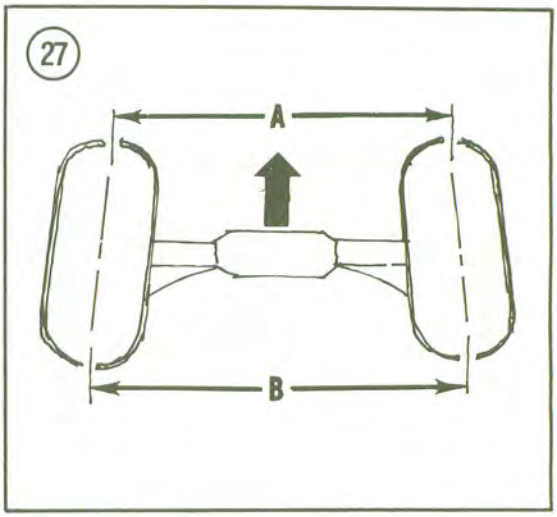
Wheel alignment consists of centering the handlebars and adjusting the toe-in of both front wheels. The handlebars are centered when the tie rods are adjusted to equal lengths on both sides. Toe-in of the front wheels is obtained by adjusting the tie rods until the distance between the front tires at the front is less than the distance between the front tires at the rear.

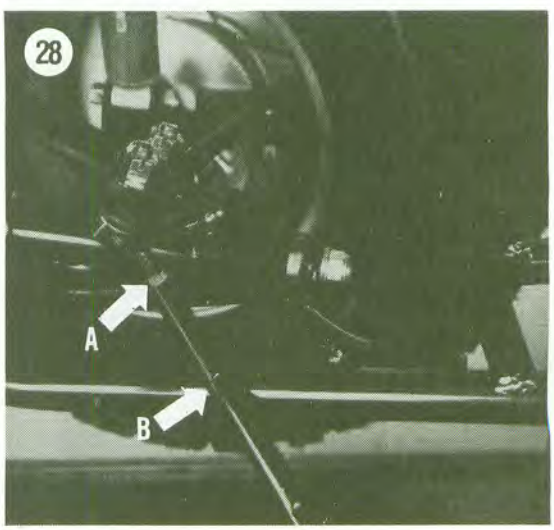
1. Park the vehicle on level ground with the handlebars straight ahead.
2. Set the tire pressure on all tires. See Chapter Three.
3. Use a stick with 2 marking points or a ruler in front of the machine and carefully measure the distance between the center of both front tires (**Figure 26**). Mark the tires with a piece of chalk at these points. Write down the measurement.
4. Move the vehicle so that the front tires rotate exactly 180°. Measure the distance between the center of both front tires at the points marked in Step 3. Write down the measurement.
5. Subtract the measurement in Step 3 from Step 4 as shown in **Figure 27**. Toe-in is correct if the difference is 0-5 mm (0-0.2 in.).
6. Refer to **Figure 28**. If the measurement is not correct, loosen the locknuts (A) securing each tie rod. Use a wrench on the flat portion of the tie rods (B) and slowly adjust one or both tie rods until the measurement is correct. Recheck each measurement after each adjustment. Turn the tie rods only a small amount each time. It takes very little adjustment of the tie rods to move each tire a large amount.
7. When the adjustments are correct, hold each tie rod in place and tighten the locknuts securing each tie rod end. Install new cotter pins.

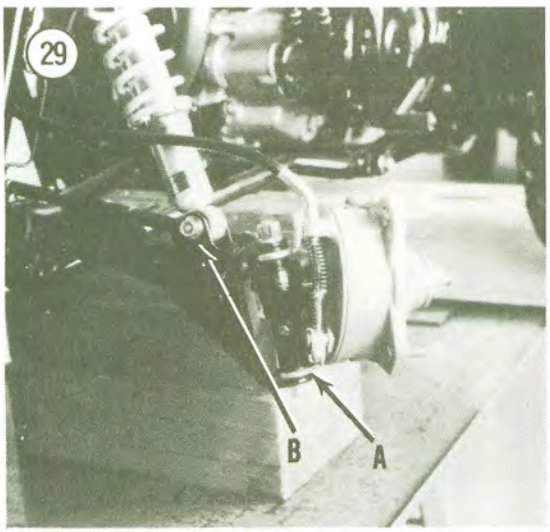
Lower Arm Removal/Installation (YFM200DXS)

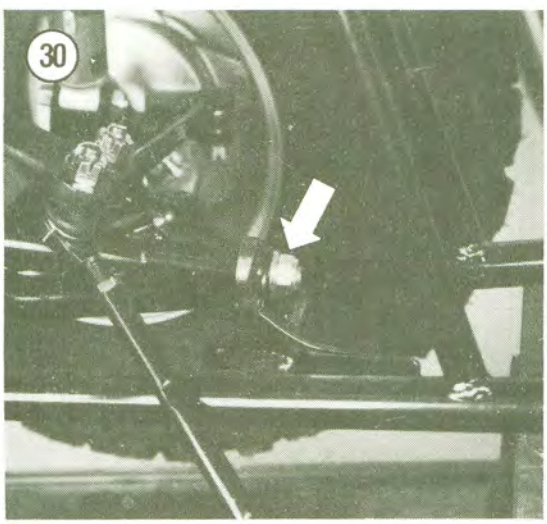
Both lower arm assemblies are the same. Refer to **Figure 12** for this procedure.

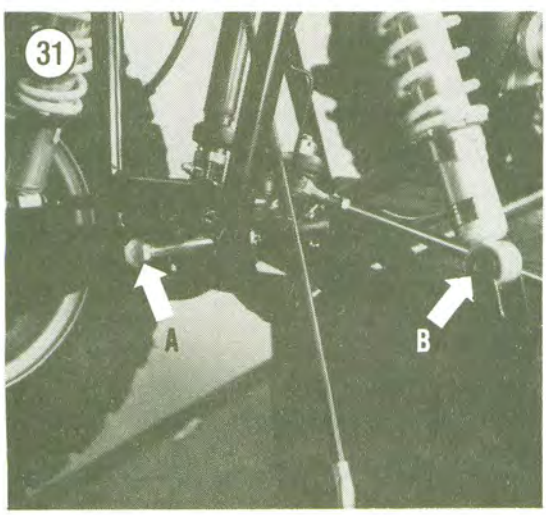








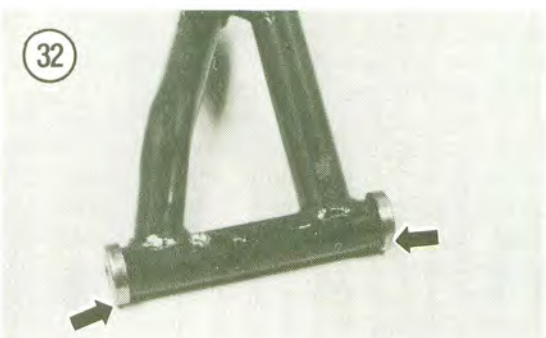


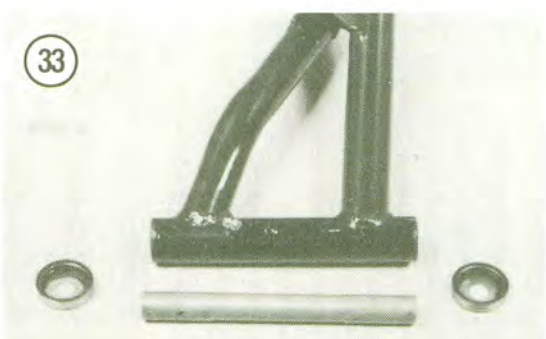


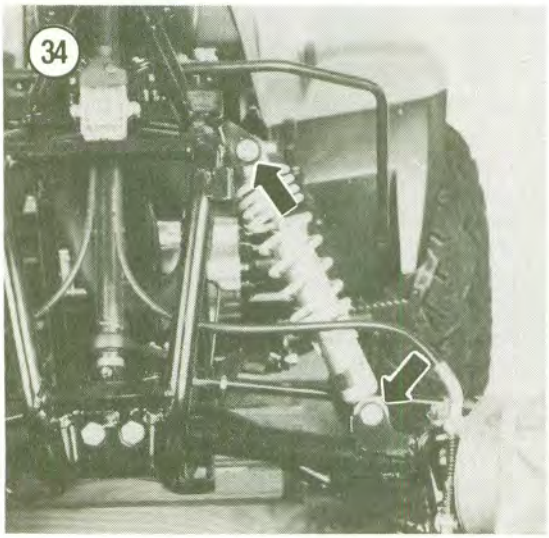
1. Remove the steering knuckle (A, **Figure 29**) at the lower arm as described in this chapter.
2. Remove the lower shock absorber bolt (B, **Figure 29**) and disconnect the shock from the lower arm.
3. Remove the lower arm pivot bolt nut (**Figure 30**).
4. Remove the pivot bolt (A, **Figure 31**) and remove the lower arm (B, **Figure 31**). Take care not to drop the dust seals on each end of the lower arm pivot area.
5. Perform *Lower Arm Inspection.*
6. Installation is the reverse of these steps, noting the following.
7. Lightly grease the lower arm pivot bolt before installing the bolt through the lower arm.
8. Tighten the lower arm nuts to the specifications in **Table 3**.

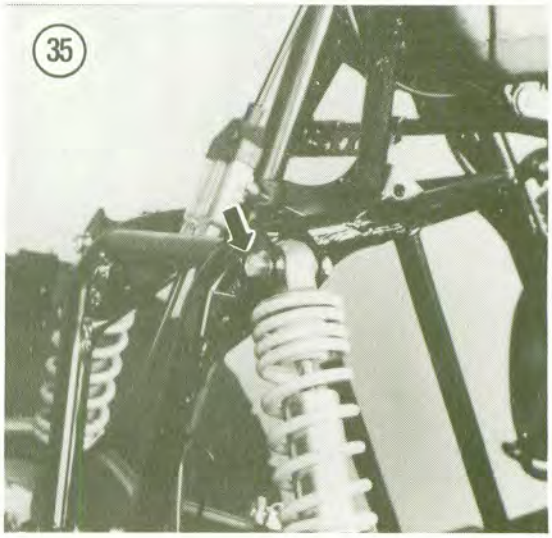
Lower Arm Inspection

Refer to **Figure 12** for this procedure.
1. Remove the lower arm as described in this chapter.
2. Remove the thrust covers from each end of the lower arm (**Figure 32**). Wipe the inside of each cover with a clean rag and carefully check it for damage or wear (**Figure 21**).
3. Remove the spacer (**Figure 33**) from the lower arm.









4. Clean the lower arm and spacer in clean solvent or wipe the parts clean with a clean rag.
5. Examine the lower arm oil seals for wear or damage. Replace them by prying them out with a small screwdriver.
6. Examine the spacer for signs of wear or corrosion caused by moisture. Replace the spacer if it is damaged or worn.
7. Slide the spacer into the lower arm. Try to move the spacer side-to-side in the bushing. The spacer should rotate freely but have no side-to-side movement. Any side-to-side movement (more than just perceptible) is an indication that the lower arm bushings are worn.
8. Visually inspect the lower arm bushings for wear or damage. In most cases damage will be caused by lack of lubrication or entry of sand and dirt. If the bushings show any signs of damage or wear, have a Yamaha dealer or machine shop replace them.
9. Check the lower arm for bending, cracks or other damage. Replace it if necessary.

CAUTION
If the vehicle is operated with a bent lower arm, further damage to the wheel bearings and front hub will result.

10. If removed, install new oil seals by driving them into the lower arm with a suitable size socket or piece of pipe placed on the outside of each seal.
11. Coat the inside of the bushings with a waterproof grease such as boat trailer wheel bearing grease. Apply a light film of grease to the spacer and install the spacer in the steering knuckle.
12. Apply a small quantity of grease to the inside lips of each thrust cover and install the covers over each end of the lower arm (**Figure 32**).
13. Install the lower arm as described in this chapter.

HANDLEBAR

Removal/Installation

Refer to Chapter Eight under *Handlebar* for complete procedures.

FRONT SHOCK ABSORBERS (YFM200DXS)

Removal/Installation

1. Jack the vehicle front end up. Set the parking brake and block the rear wheels.

2. Remove the front wheels as described in this chapter.

3. Remove the upper and lower shock absorber bolts (**Figure 34**) and remove the shock.

4. Installation is the reverse of these steps, noting the following.

5. Install the shock bolts so that the bolt head faces to the front of the vehicle (**Figure 35**).

6. Tighten the shock bolts to the specifications in **Table 3**.

Table 1 STEERING SPECIFICATIONS

Toe-in	
YFM200N	0-5 mm (0-0.2 in.)
YFM200DXS	0-10 mm (0-0.4 in.)

Table 2 TIGHTENING TORQUES—YFM200N

	N•m	ft.-lb.
Front axle nut	85	61
Front wheel nut	28	20
Knuckle shaft bolt	30	22
Tie-rod end to steering shaft nut	45	32
Tie-rod end to knuckle nut	40	29
Tie-rod locknut	39	22
Steering shaft nut	30	22
Steering shaft holder bolt	23	17
Handlebar		
Upper holder bolt	20	14
Lower holder nut	30	22

Table 3 TIGHTENING TORQUES—YFM200DXS

	N•m	ft.-lb.
Steering knuckle nut	85	61
Front wheel panel and hub nut	28	20
Steering knuckle and lower arm bolt	35	25
Tie rod nut		
At steering knuckle	40	29
At steering shaft	40	29
Tie rod locknut	30	22
Steering shaft and frame nut	30	22
Steering shaft holder and frame bolt	23	17
Steering shaft and lower handlebar nut	30	22
Lower arm and frame nut	68	49
Shock absorber nut (upper and lower)	45	32

CHAPTER TEN

REAR SUSPENSION AND FINAL DRIVE

This chapter contains repair and replacement procedures for the rear wheels, rear hub, rear suspension and final drive components. **Tables 1-6** are at the end of the chapter.

REAR WHEEL

Removal/Installation

1. Park the vehicle on level ground and set the parking brake. Block the front wheel so the vehicle will not roll in either direction.
2. Jack up the rear of the vehicle with a small hydraulic jack. Place wood blocks under the engine; release jack pressure and securely support the vehicle on the wood blocks.
3. Remove the wheel nuts securing the wheel to the hub and remove the wheel. See **Figure 1**.
4. If necessary, remove the hub as follows:
   a. Remove the rear axle cotter pin and axle nut (**Figure 2**).
   b. Slide the hub (**Figure 3**) off of the axle.

NOTE

*If necessary the hub can be removed with the rear wheel. To do so, remove the rear axle cotter pin and axle nut and slide the wheel assembly off of the axle (**Figure 4**).*

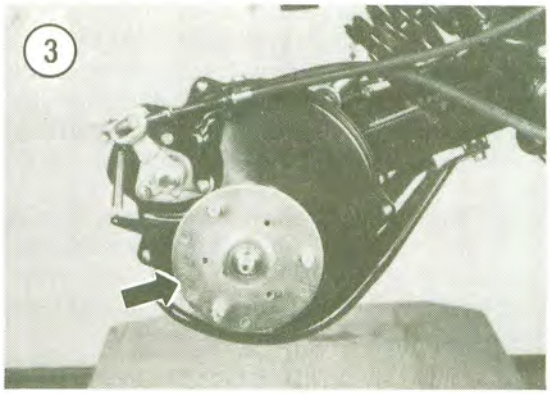
5. Install by reversing these removal steps. Tighten the wheel nuts to specifications. See **Tables 2-6**.
6. If necessary, install a new cotter pin and bend it over completely. Never reuse an old cotter pin as it may break and fall out.

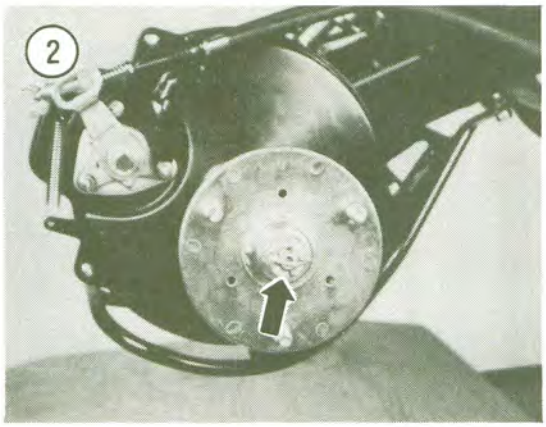
REAR AXLE (CHAIN DRIVE)

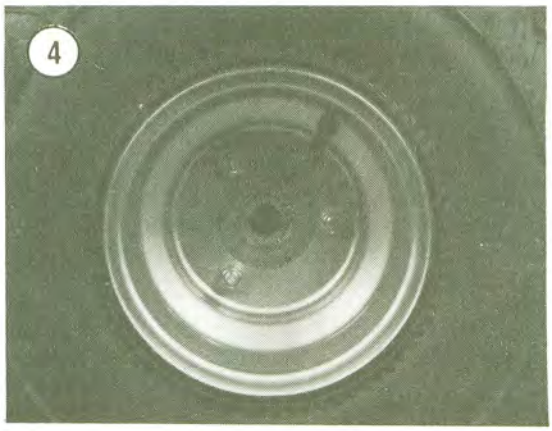
Refer to **Figure 5** for procedures in this section.

Removal

1. Park the vehicle on level ground. Block the front wheel.
2. Remove the seat and fenders.
3. Remove both rear wheels as described in this chapter.
4. Remove the cotter pin and castellated nut securing the left-hand rear hub (**Figure 2**). Remove the lockwasher and slide the hub (**Figure 3**) off the axle. Remove the right-hand hub in the same manner.
5. Remove the sprocket cover from the left-hand side.
6. Remove the brake caliper and brake disc as described in Chapter Eleven.

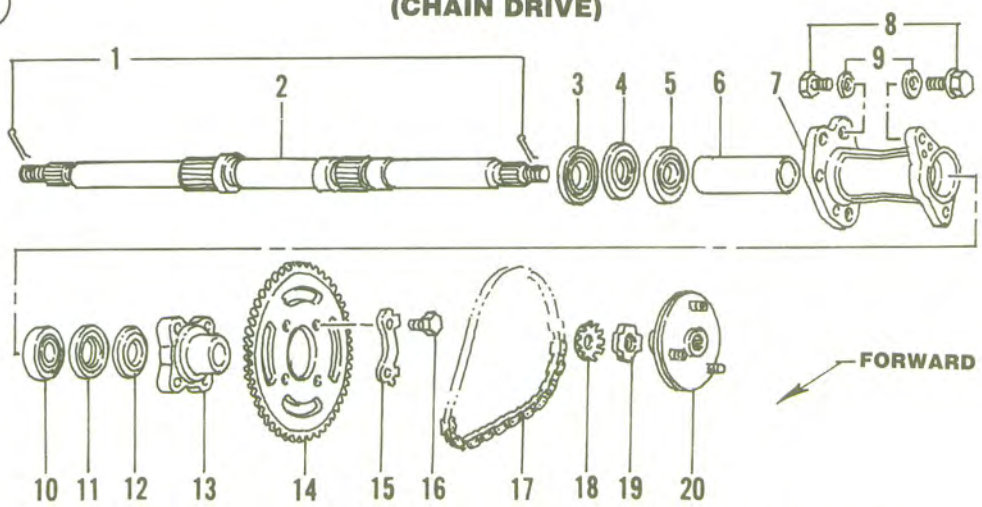






5

REAR AXLE (CHAIN DRIVE)



1. Cotter pins
2. Rear axle
3. Oil seal
4. Bearing
5. Bearing
6. Spacer
7. Rear hub
8. Bolts
9. Lockwashers
10. Bearing
11. Bearing
12. Oil seal
13. Boss
14. Rear sprocket
15. Lockwasher
16. Bolt
17. Drive chain
18. Lockwasher
19. Axle nut
20. Wheel hub

7. Loosen the chain adjuster (**Figure 6**) to obtain as much drive chain slack as possible.
8. Remove the bolts (**Figure 7**) securing the driven sprocket to the sprocket boss and pull the sprocket and chain off the boss (**Figure 8**). Slide the drive chain off both sprockets and remove the driven sprocket.
9. Pry back the lockwasher clips (**Figure 9**) and remove the ringnut securing the sprocket boss. The ringnut can be loosened with a spanner wrench (**Figure 10**) or with a punch and hammer (**Figure 11**). Remove and discard the lockwasher.

CAUTION

Do not heat the ringnut in order to remove it, as the heat would remove the temper from the axle. If you are unable to remove the ringnut, have a mechanic do it for you.

10. Slide the sprocket boss (**Figure 12**) off the axle.

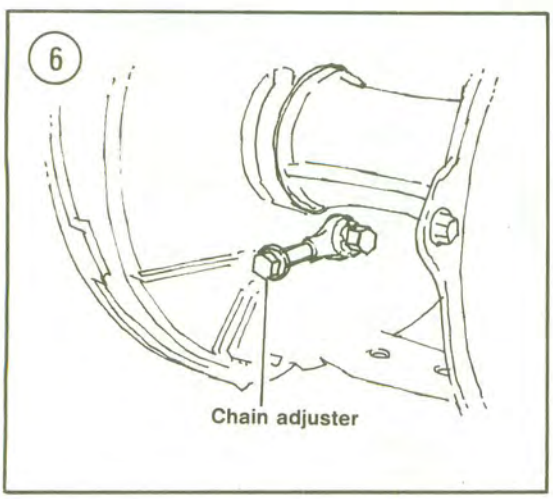
NOTE

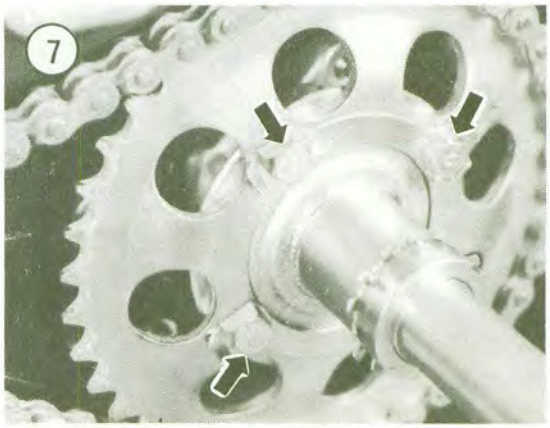
Mark the axle's left or right side before removing it. The axle should be installed so that it operates in its original installed position.

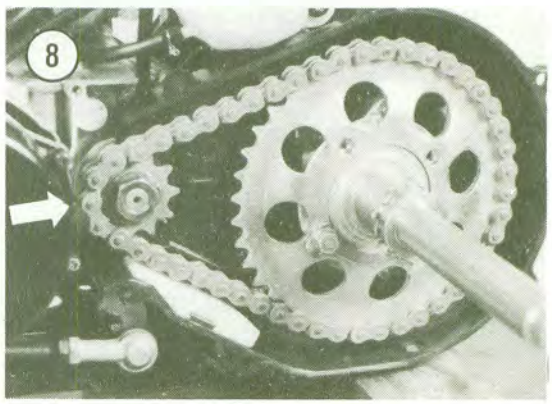
11. Pull the axle out of the bearing holder from the right-hand side.

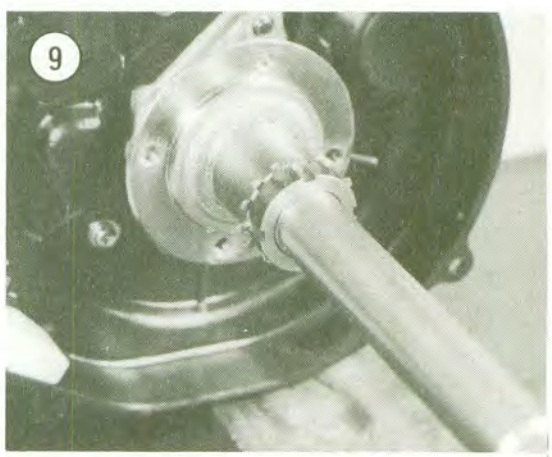
Inspection

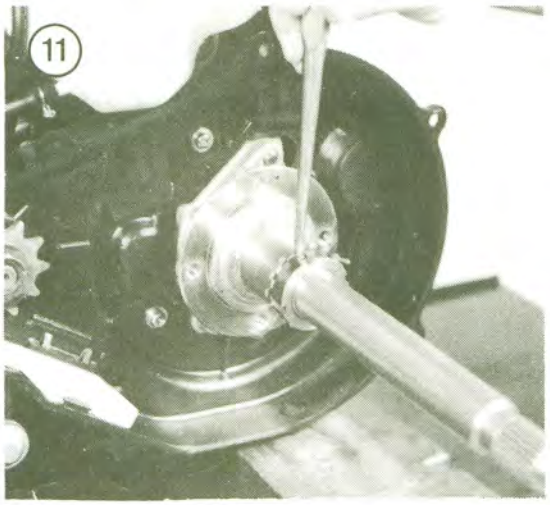
1. Inspect the hub splines and the threads on the hub nut studs. See **Figure 13**. Replace the hub if necessary.
2. Inspect the sprocket boss splines. Replace the boss if necessary. The dust seal should be replaced if worn or damaged.
3. Inspect the axle for signs of fatigue, fractures or damage. Inspect all splines for wear or damage.







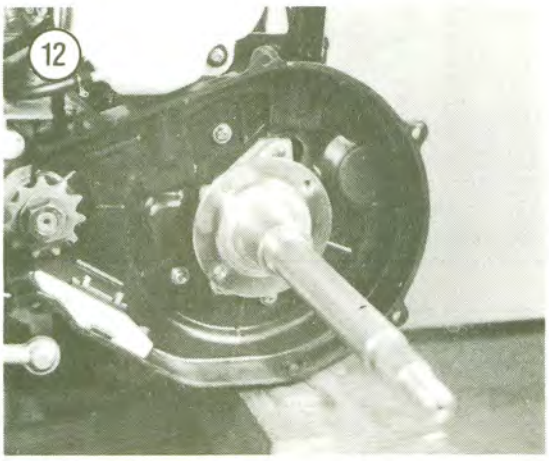


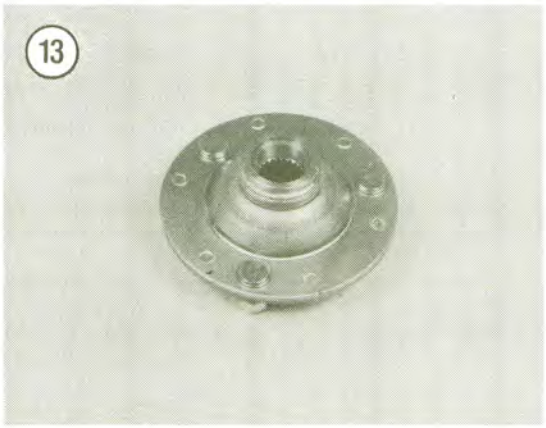


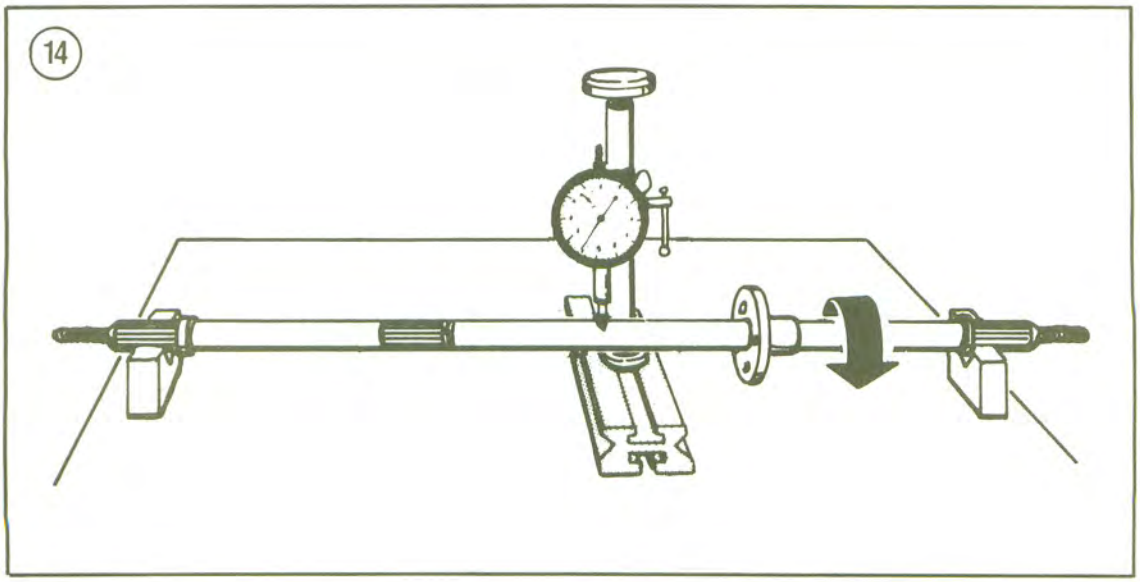
4. Check the axle bearing surfaces for wear or scoring marks. Replace the axle if damage or wear is apparent.
5. Check the hole at each end of the axle where the cotter pin fits in. Make sure there are no fractures or cracks leading out toward the end of the axle. If any are found, replace the axle.
6. Check the axle runout. Use V-blocks and a dial indicator as shown in **Figure 14**. If the runout is 1.5 mm (0.06 in.) or greater the axle must be replaced.
7. Inspect the drive chain and the driven sprocket as described in this chapter.
8. Inspect the brake components as described in Chapter Eleven.

Installation

1. Grease all splines and bearing surfaces on the axle.

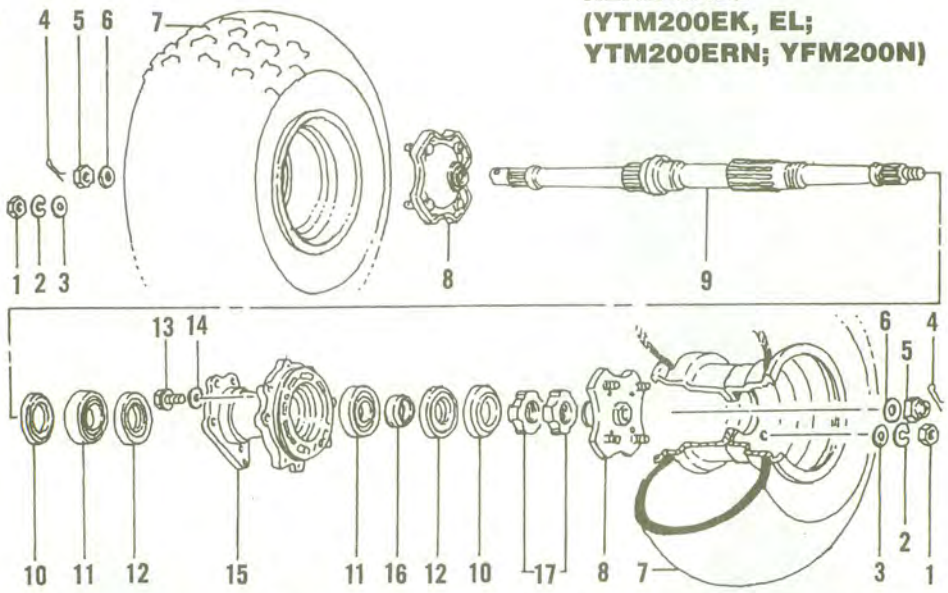






(15)

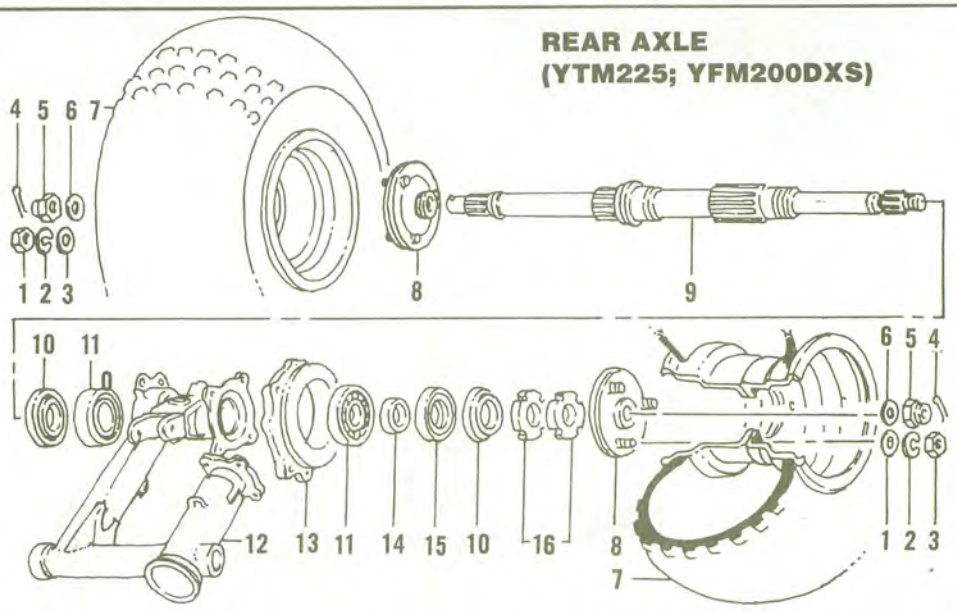
REAR AXLE (YTM200EK, EL; YTM200ERN; YFM200N)



1. Axle nut
2. Lockwasher
3. Flat washer
4. Cotter pin
5. Nut
6. Washer
7. Wheel assembly
8. Hub
9. Rear axle
10. Dust seal
11. Bearing
12. Oil seal
13. Bolt
14. Washer
15. Bearing holder
16. Spacer
17. Ring nuts

(16)

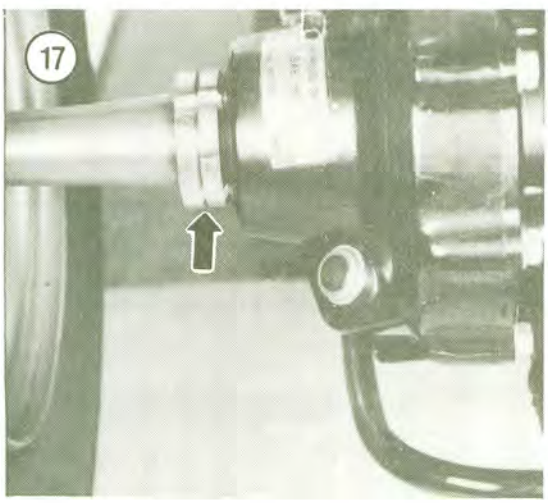
REAR AXLE (YTM225; YFM200DXS)

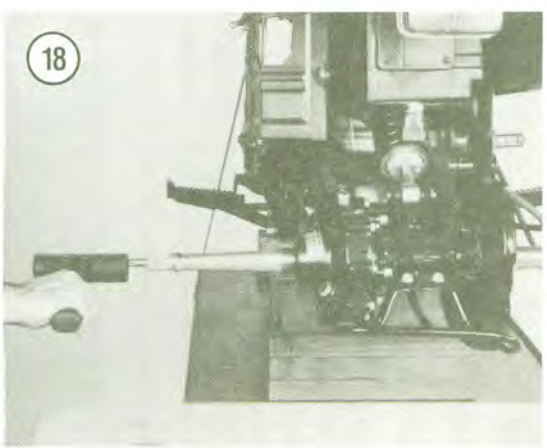


1. Nut
2. Lockwasher
3. Flat washer
4. Cotter pin
5. Nut
6. Washer
7. Wheel assembly
8. Hub
9. Rear axle
10. Dust seal
11. Bearing
12. Swing arm assembly
13. Cover
14. Spacer
15. Oil seal
16. Ring nuts

2. Install the axle. Approximately line up the bearing surfaces on the axle with the bearings in the bearing holder.
3. Grease the dust seal on the backside of the sprocket boss. Then slide the boss onto the axle and seat it against the left-hand bearing.
4. Slide the driven sprocket over the axle. Attach the drive chain to the front and rear sprockets and fit the driven sprocket onto the driven sprocket boss (**Figure 8**). Turn the axle by hand to align the holes in the boss with the sprocket holes. Install the sprocket bolts with lockwashers and tighten securely.
5. Install the brake disc and caliper as described in Chapter Eleven.
6. Install the lockwasher and ringnut onto the left-hand side of the axle. Using a spanner wrench, tighten it to specifications in **Table 2**.

7. Bend over the lockwasher lock tabs to lock the ringnut.





NOTE

Make sure when installing the ringnut and washer to replace any damaged or worn part before tightening to specification.

8. Clean out the left-hand side cover. Remove any accumulation of drive chain lubricant, sand, gravel and other trail dirt. Then install the side covers.
9. Apply a light coat of multipurpose grease to the axle splines.
10. Install both wheel hubs and wheels as described in this chapter.
11. Adjust the drive chain as described in Chapter Three.
12. Adjust the rear brake as described in Chapter Three.

REAR AXLE (SHAFT DRIVE)

Refer to **Figure 15** or **Figure 16** for this procedure.

Removal

1. Park the vehicle on level ground. Block the front wheel.
2. Remove the seat and fenders.
3. Remove both rear wheels as described in this chapter.
4. Remove the cotter pin and castellated nut securing the left-hand rear hub (**Figure 2**). Remove the lockwasher and slide the hub (**Figure 3**) off the axle. Remove the right-hand hub in the same manner.
5. Remove the trailer hitch.
6. Remove the rear axle ring nuts (**Figure 17**) from the left-hand side. The ringnuts can be loosened with a spanner wrench (**Figure 10**) or with a punch and hammer (**Figure 11**).

CAUTION

Do not heat the ringnut in order to remove it as the heat would remove the temper from the axle. If you are unable to remove the ringnut, have a professional mechanic do it for you.

7. Remove the rear brake caliper as described in Chapter Eleven.

NOTE

Mark the axle's left or right side before removing it in Step 8. The axle should be installed so that it operates in its original installed position.

8. Tap the axle out of the bearing holder from the right-hand side. See **Figure 18**.

Inspection

1. Inspect the axle for signs of fatigue, fractures or damage. Inspect all splines for wear or damage.
2. Check the axle bearing surfaces for wear or scoring marks. Replace the axle if damage or wear is apparent.
3. Check the hole at each end of the axle where the cotter pin fits in. Make sure there are no fractures or cracks leading out toward the end of the axle. If any are found, replace the axle.
4. Check the axle runout. Use V-blocks and a dial indicator as shown in **Figure 14**. If the runout is 1.5 mm (0.06 in.) or greater the axle must be replaced.
5. Inspect the brake components as described in Chapter Eleven.

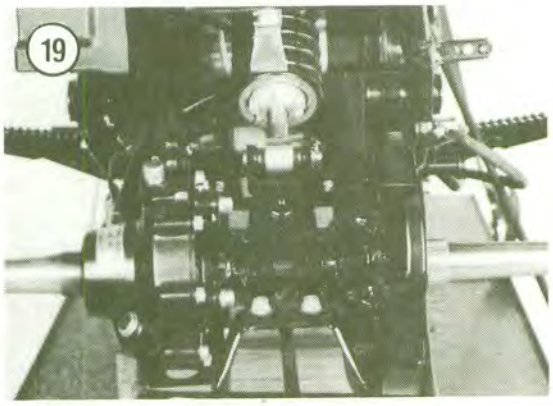
Installation

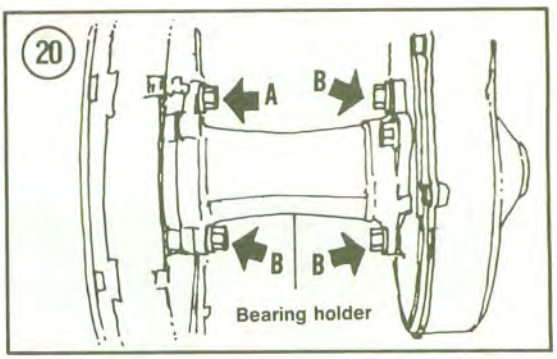
1. Grease all splines and bearing surfaces on the axle.
2. Install the axle. Approximately line up the bearing surfaces on the axle with the bearings in the bearing holder. **Figure 19** shows the axle installed.
3. Install the rear brake caliper as described in Chapter Eleven.
4. Adjust the rear brake as described in Chapter Three.
5. Apply the parking brake.
6. Install the inner ringnut and tighten it to specifications (**Tables 3-6**).
7. Apply Loctite to the outer ringnut and install it onto the axle. Hold the inner ringnut with a wrench to prevent it from turning. Then tighten the outer ringnut to specifications (**Tables 3-6**).
8. Install both wheel hubs (**Figure 3**).
9. Install the washer and castellated nut on each side of the axle. Tighten to specifications in **Tables 3-6** (**Figure 2**).
10. Install a *new* cotter pin and bend it over completely (**Figure 2**). Never reuse an old cotter pin as it may break and fall out.
11. Install the rear wheels as described in this chapter.
12. Install the trailer hitch.
13. Install the fenders and seat.

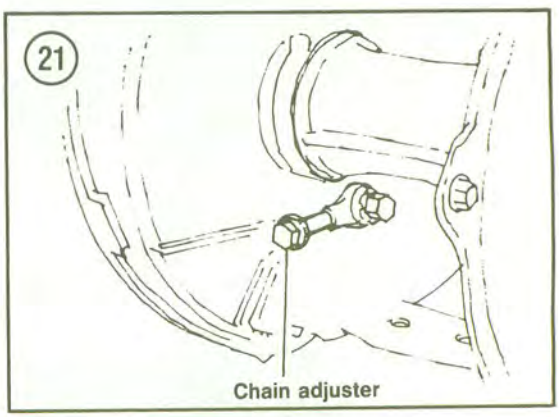
DRIVE CHAIN (YTM200K, L, AND N)

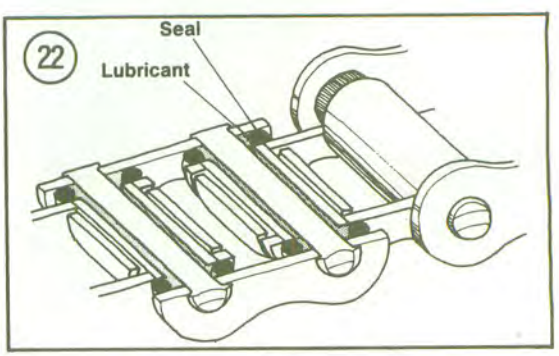
Removal/Installation

Refer to **Figure 5** for this procedure.
1. Park the vehicle on level ground. Block the front wheel.
2. Remove the seat and fenders.









3. Remove the left-hand wheel as described in this chapter.
4. Remove the the drive sprocket cover.
5. Loosen the rear wheel hub bolts (**Figure 20**). Then referring to **Figure 21**, turn the chain adjuster bolt to loosen the drive chain as much as possible.
6. With the drive chain loosened all the way, attempt to work it off of the rear sprocket (**Figure 22**). Do not try to force the chain off. If the chain will not come off, perform Step 7.
7. Remove the drive chain as follows:
   a. Remove the bolts securing the driven sprocket to the sprocket boss and pull the sprocket and chain off the boss (**Figure 8**).
   b. Slide the drive chain off both sprockets and remove from the axle.
8. Installation is the reverse of these steps, noting the following.
9. Attach the drive chain to the front and rear sprockets and fit the driven sprocket onto the driven sprocket boss. Turn the axle by hand to align the holes in the boss with the sprocket holes. Install the sprocket bolts with lockwashers and tighten securely. Bend over the lockwasher tabs to lock the sprocket bolts.
10. Clean out the drive chain side cover. Remove any accumulation of drive chain lubricant, sand, gravel and other trail dirt.
11. Install the drive chain side cover.
12. Install the rear wheel as described in this chapter.
13. Adjust the drive chain as described in Chapter Three.
14. Adjust the rear brake as described in Chapter Three.

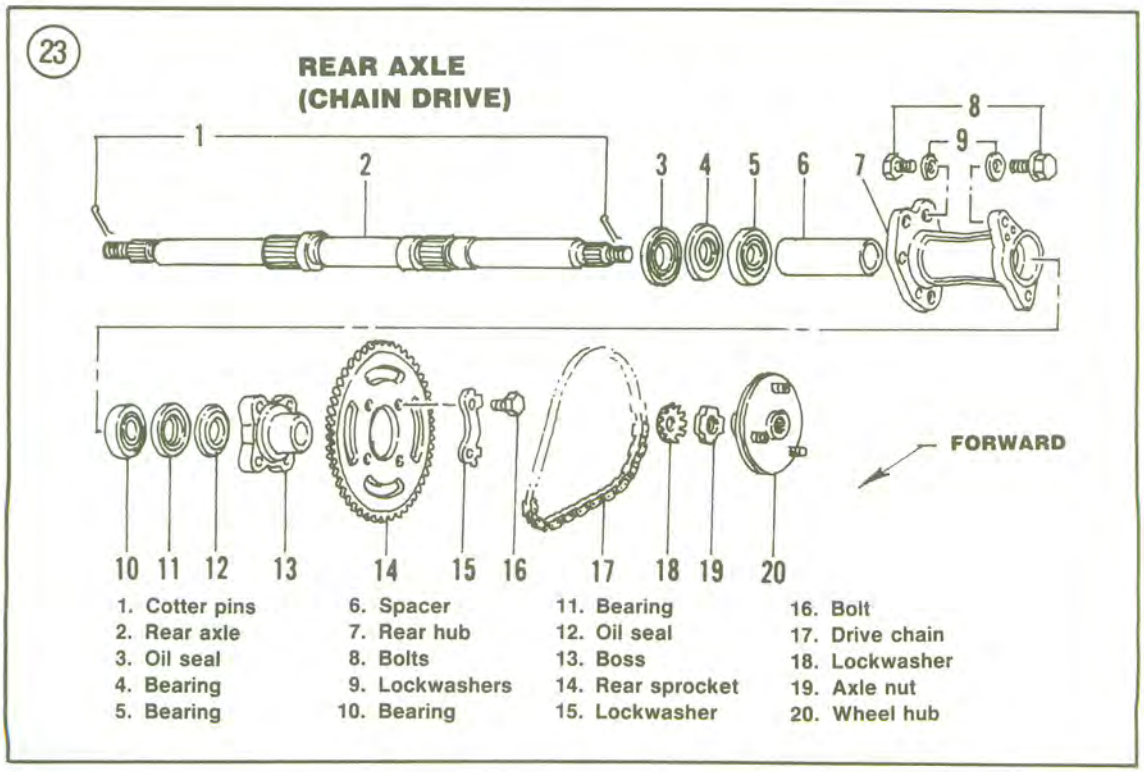
Cleaning/Inspection/Lubrication

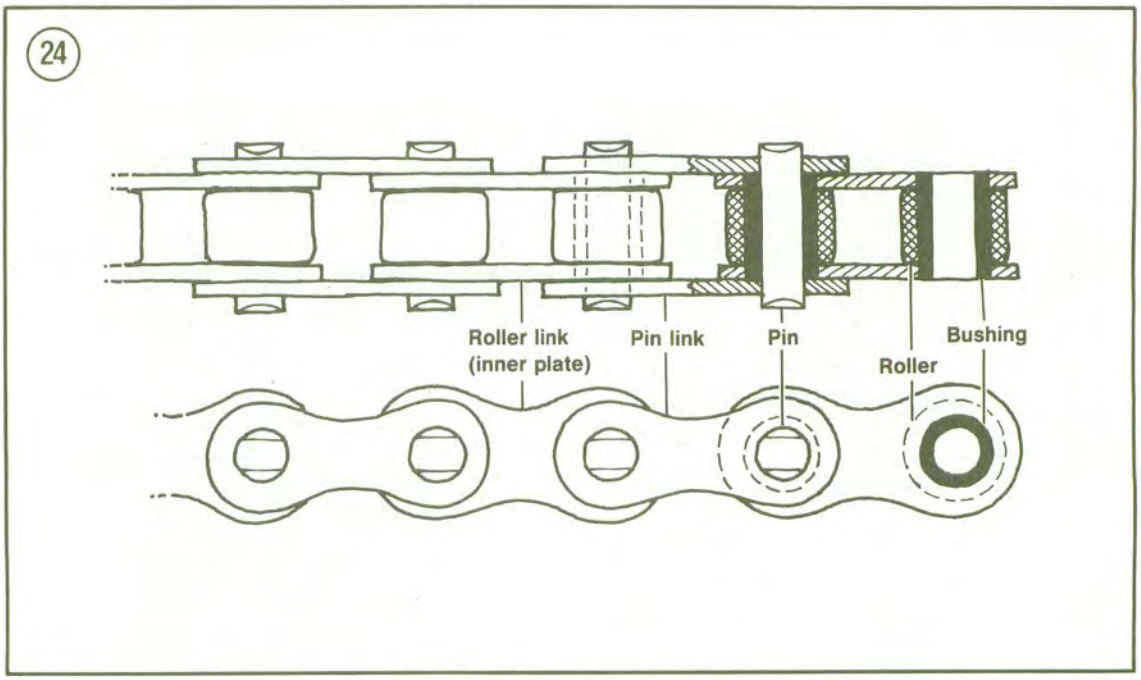
1. Remove the drive chain as described in this chapter.

NOTE

*Special care must be observed when servicing and cleaning the drive chain on all models. The drive chain has small rubber O-rings fitted between the side plates (**Figure 23**). The O-rings can be damaged by steam cleaning and high-pressure car washes. Clean the drive chain with kerosene (do not use any other solvent) and wipe it dry.*

2. Immerse the chain in a pan of kerosene and allow it to soak for about half an hour. Move it around and flex it during this period so that the dirt





between the links, pins and rollers (**Figure 24**) may work its way out.

3. Scrub the rollers and side plates with a stiff brush and rinse away loosened dirt. Rinse it a couple of times to make sure all dirt and grit are washed out. Hang up the chain and allow it to drip dry.

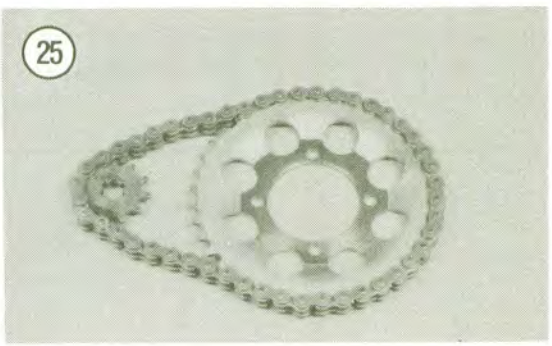
4. After cleaning the chain, examine it carefully for wear or damage. If any signs are visible, replace the chain.

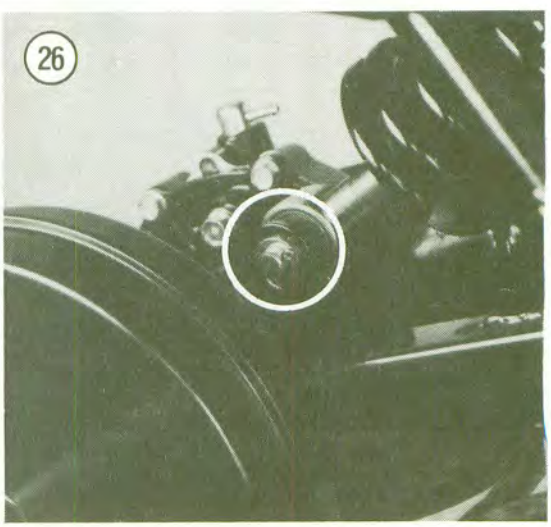
NOTE

*Always check both sprockets every time the chain is removed. If any wear is visible on the teeth, replace the sprockets and chain (**Figure 25**). Never install a new chain over worn sprockets or a worn chain over new sprockets.*

5. The chain on these models should be lubricated only with SAE 20W-50 weight motor oil. Do not use any other type of lubricant as it may damage the O-rings.

6. Reinstall the chain as described in this chapter.



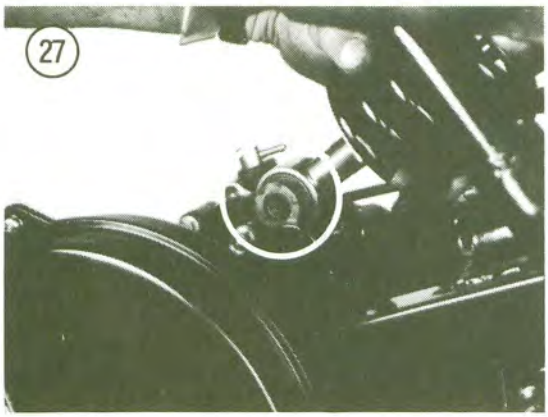


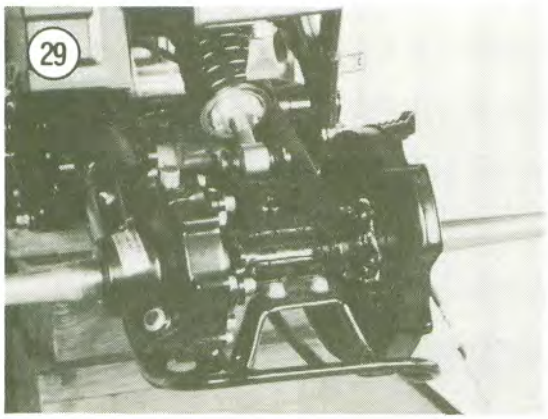
DRIVEN SPROCKET (CHAIN DRIVE)

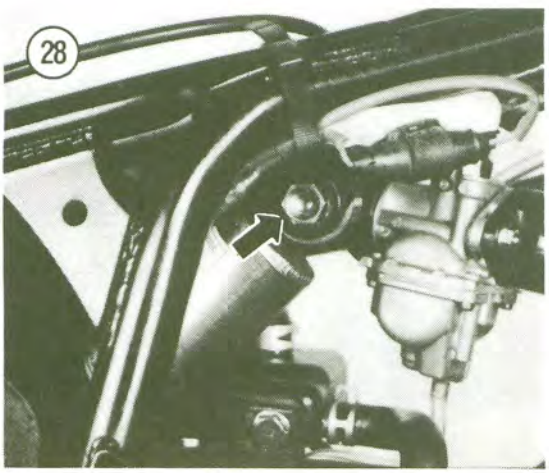
Removal/Inspection/Installation

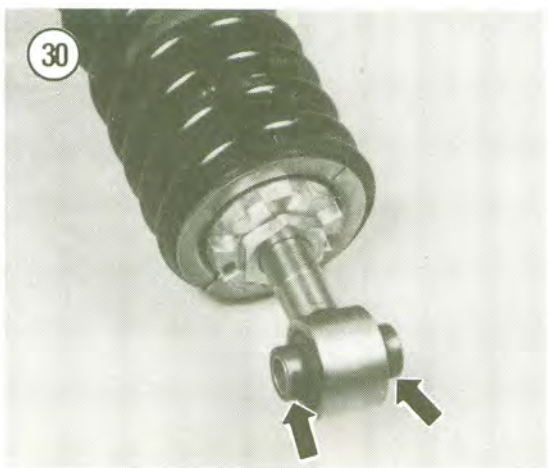
1. Remove the driven sprocket as described under *Rear Axle Removal* in this chapter.

2. Inspect the teeth on the sprocket. If the teeth are visibly worn, replace the sprocket.









NOTE

If the driven sprocket is worn or damaged and must be replaced, also inspect the drive chain and drive sprocket for damage. Never replace just one of these 3 components without a thorough inspection of all the rest. If one is replaced, the other 2 should also be replaced or the new component will wear out prematurely.

3. Install the driven sprocket as described under *Rear Axle Installation* in this chapter.

TIRE CHANGING AND TIRE REPAIRS

Service the rear tire in the same manner as the front tire. See Chapter Eight.

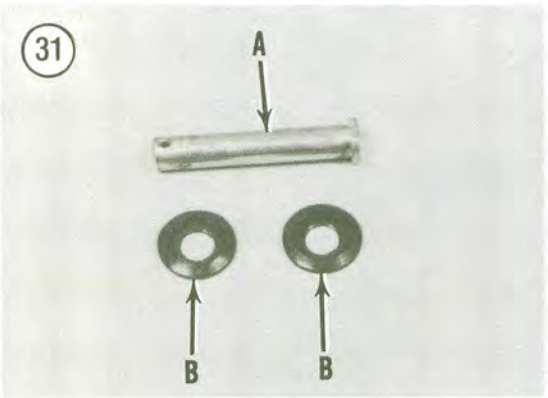
REAR SHOCK ABSORBER (YTM225 AND YFM200DXS)

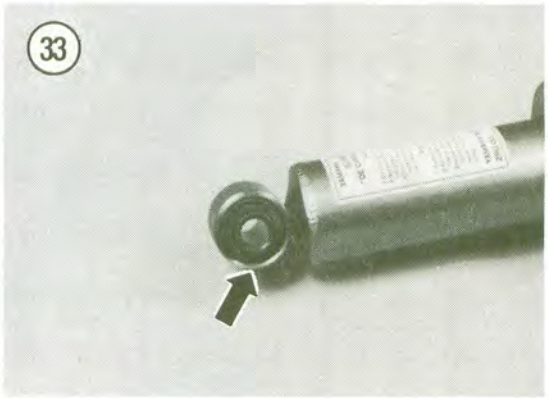
Adjustment

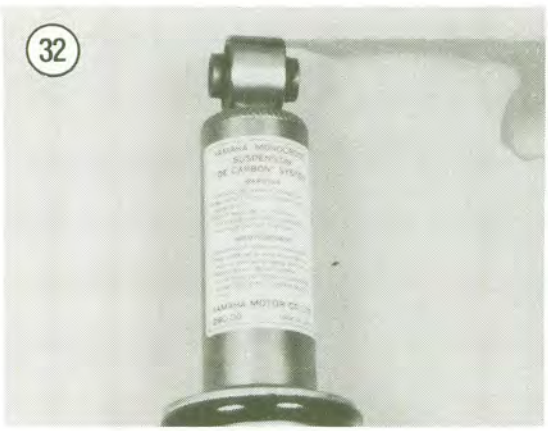
Refer to Chapter Three for complete shock adjustment procedures.

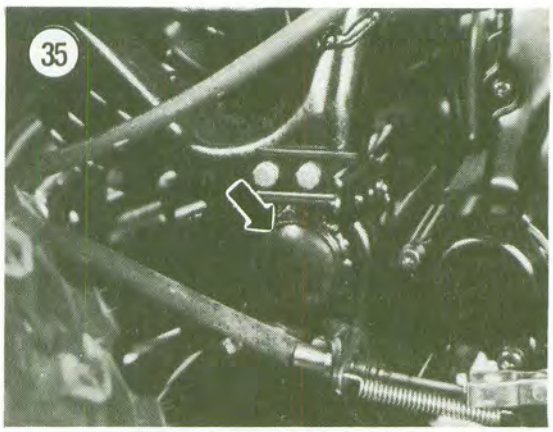
Removal

1. Park the vehicle on level ground. Block the front wheel.
2. Remove the seat and fender assembly.
3. Remove the rear wheels as described in this chapter.
4. Remove the cotter pin from the lower shock absorber pivot bolt (**Figure 26**). Then remove the washers and pivot pin.
5. Lift the shock up slightly and remove the thrust covers from both sides of the shock (**Figure 27**).
6. Remove the upper shock absorber mounting bolt (**Figure 28**).
7. Lift the rear of the shock away from the swing arm. Then remove it through the rear of the frame (**Figure 29**), making sure not to damage the shock body.
8. Remove the 2 upper shock bushings (**Figure 30**).
9. Installation is the reverse of these steps, noting the following.









10. Apply a coat of molybdenum disulfide grease to the upper bushings (**Figure 30**) and to the lower pivot bolt (A, **Figure 31**).
11. Make sure the 2 thrust covers (**Figure 27**) are installed in the lower shock bushings.
12. Install the upper bolt from the right-hand side (**Figure 28**).
13. Install the lower shock pivot shaft from the left-hand side.
14. Install a new pivot shaft cotter pin (**Figure 26**).

Inspection

WARNING

The shock absorber body contains highly compressed nitrogen gas. Do not tamper with or attempt to open the damper unit. Do not place it near an open flame or other extreme heat. Do not dispose of the shock assembly yourself. Take it to a dealer where it can be deactivated and disposed of properly. Do not store a worn or damaged shock assembly.

Service by the home mechanic is limited to removal and installation of the shock and adjustment (Chapter Three). Under no circumstances should you attempt to disassemble the shock absorber unit due to the high internal pressure of the nitrogen. See the warning label on the reservoir (**Figure 32**).
1. Check the upper and lower shock bushings (**Figure 33**) for wear or damage. If the bushings are worn, it is necessary to replace the shock absorber.
2. Check the shock body for dents, oil leakage or other damage. Make sure the damper rod is straight.

NOTE

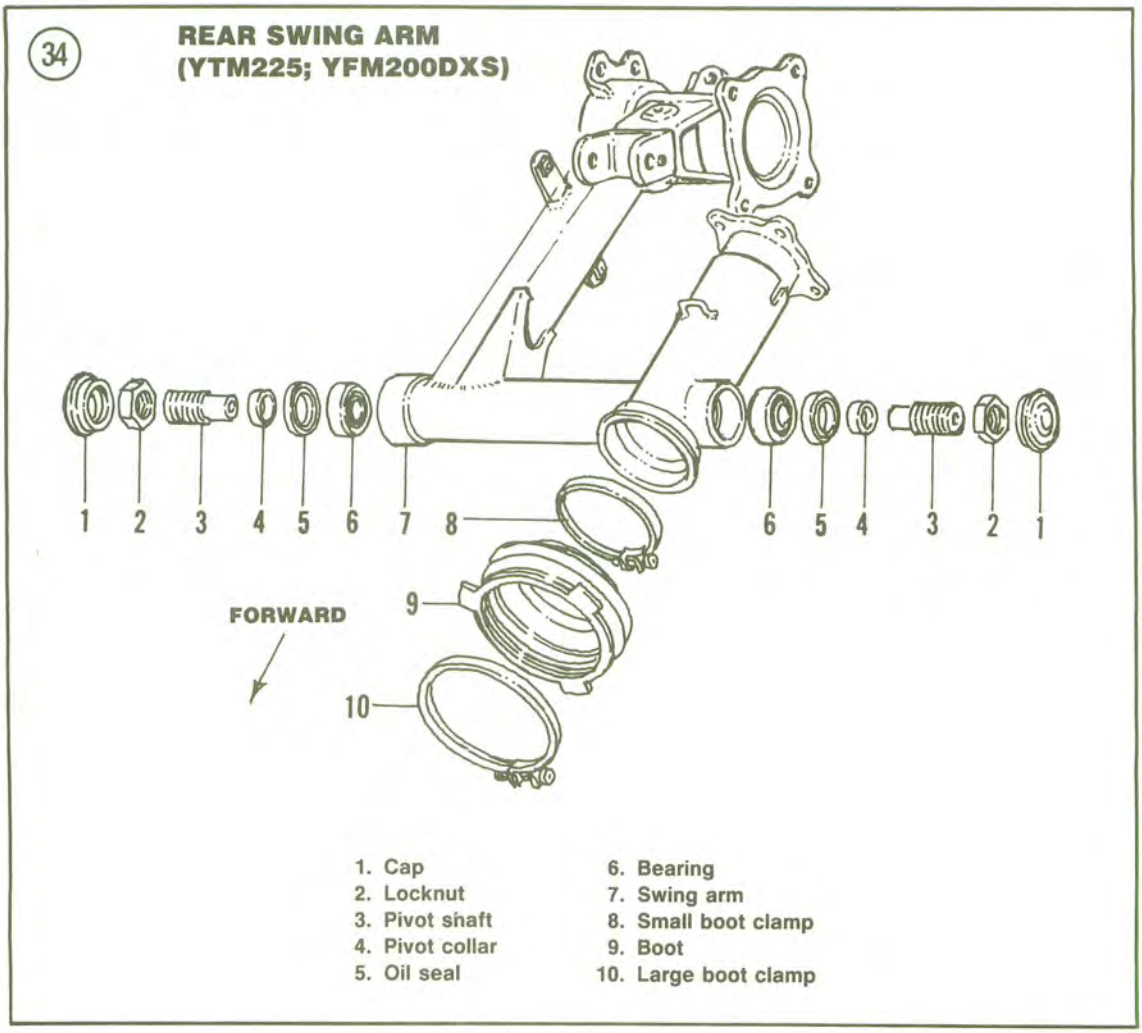
The shock cannot be rebuilt; it must be replaced as a unit.

3. Check the thrust covers (B, **Figure 31**) for wear or damage. Replace them if necessary.

SWING ARM (YTM225 AND YFM200DXS)

Removal/Installation

Refer to **Figure 34** for this procedure.



1. Cap
2. Locknut
3. Pivot shaft
4. Pivot collar
5. Oil seal
6. Bearing
7. Swing arm
8. Small boot clamp
9. Boot
10. Large boot clamp

1. Park the vehicle on level ground. Block the front wheel.
2. Remove the seat and fender.
3. Remove the rear axle as described in this chapter.
4. Remove the shock absorber as described in this chapter.
5. Grasp the rear end of the swing arm and try to move it from side to side in a horizontal arc. There should be no noticeable side play. If play is evident and the pivot bolt is tightened correctly, the bearings or pivot collars should be replaced.
6. Remove the final gear and drive shaft assemblies from the swing arm as described in this chapter.
7. Remove the pivot shaft caps (**Figure 35**) from the left and right sides.
8. Remove the locknut and pivot shafts from both sides. See **Figure 36**.

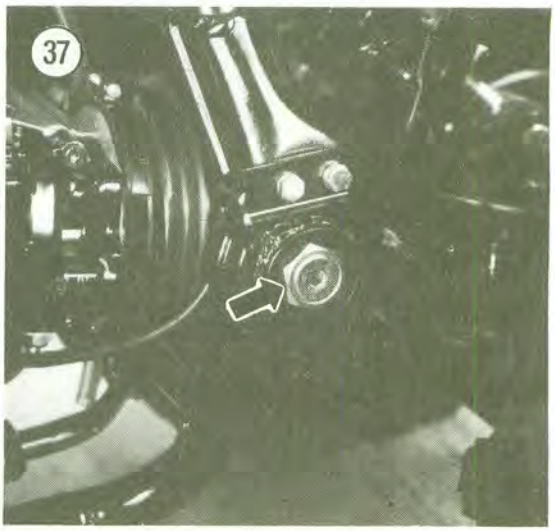
9. Pull back on the swing arm and remove the swing arm from the frame.
10. Inspect the swing arm as described in this chapter.
11. Installation is the reverse of these steps, noting the following.
12. Apply wheel bearing grease to the pivot shafts before installation.
13. Align the swing arm in the frame and install the left- and right-hand pivot shafts finger-tight only.
14. Tighten the left-hand pivot shaft (**Figure 37**) to 6 N•m (4.3 ft.-lb.).
15. Install the left-hand pivot shaft locknut. Then while holding the left-hand pivot shaft with an Allen wrench to prevent the shaft from turning, tighten the locknut to 100 N•m (72 ft.-lb).
16. Tighten the right-hand pivot shaft (**Figure 36**) to 6 N•m (4.3 ft.-lb.).
17. Install the right-hand pivot shaft locknut. Then while holding the right-hand pivot shaft with an Allen wrench to prevent the shaft from turning, tighten the locknut to 100 N•m (72 ft.-lb.).
18. Lift the swing arm up and down by hand to make sure the bearings are not binding. Loosen and retighten the swing arm pivot shafts and locknuts if necessary.
19. Install the pivot shaft caps (**Figure 35**).
20. Install the drive shaft and final gear assemblies as described in this chapter.
21. Install the rear axle as described in this chapter.
22. Tighten all remaining nuts and bolts to the specifications in **Table 4** and **Table 6**.

Disassembly/Inspection/Assembly

Refer to **Figure 34** for this procedure.
1. Remove the swing arm as described in this chapter.
2. Remove the pivot collar (4, **Figure 34**) and seal (5, **Figure 34**) from both pivot points.
3. Remove the tapered bearings from each side.
4. Clean all parts in solvent and dry thoroughly.
5. Yamaha does not provide service limit dimensions for the pivot collars. Inspect the inside and outside of all pivot collars for wear, abrasion or cracks. Remove rust from the pivot collars with a wire wheel chucked in a drill press or hand drill. Replace parts if necessary.

NOTE

*If the swing arm pivot collars are replaced, the bearings (6, **Figure 34**) at each end must be replaced at the same time.*



6. Wipe off any excess grease from the bearing races within each swing arm pivot area. Turn each bearing with your fingers; make sure they rotate smoothly. Check the rollers for evidence of wear, pitting or color change (reddish tint) indicating lack of lubrication.

NOTE

Always replace both bearings even though only one may be worn.

7. Replace the bearing races as follows:
   a. Purchase the new bearings. Place the new bearing races in a freezer. This will allow the races to shrink slightly for installation. Reinstall the roller bearings into their box until installation.
   b. Using a blind bearing puller, remove both bearing races.
   c. Clean the bearing race cavity in the swing arm of all dirt and grease.
   d. Secure the swing arm in a vise with soft jaws.
   e. Locate a socket or piece of pipe with an outside diameter of approximately 39.5 mm.
   f. Remove one of the bearing races from the freezer. Then align the race with the bearing area facing up and drive the race squarely into the swing arm until it bottoms on the bearing stop. A change in sound will let you know when the bearing has bottomed.
   g. Repeat Step f for the opposite bearing race.
8. Thoroughly grease the new tapered roller bearings and install them into the bearing races in the swing arm.

9. Install the new swing arm bearing seals by tapping them into the swing arm with a suitable size socket or piece of metal (solid) placed over the seal.

NOTE

If you are using a socket to install the grease seals, place the bottom side of the socket against the seal. This will place a large amount of surface area over the seal to prevent damage. Use a brass hammer when driving the socket to prevent socket damage.

10. Before installing the pivot collars, coat them with a good quality axle grease. Insert the pivot collars.

FINAL DRIVE UNIT AND DRIVE SHAFT

Removal

1. Drain the final drive unit oil as described in Chapter Three.
2. Remove the rear axle as described in this chapter.
3. Remove the nuts and washers securing the final drive/drive shaft unit to the swing arm or frame.
4. Pull the final drive unit and drive shaft straight back until it is disengaged from the splines on the universal joint.
5. Installation is the reverse of these steps, noting the following.
   a. Apply a light coat of molybdenum disulfide grease to the splines of the drive shaft and to the ring gear in the final drive unit.
   b. Tighten all nuts and bolts to the specifications in **Tables 3-6**.

Disassembly/Inspection/ Reassembly

The final drive unit requires a considerable number of special Yamaha tools for disassembly and assembly. The price of all these tools could be more than the cost of most repairs to the final drive unit. Refer all service and adjustment to a Yamaha dealer.

REAR AXLE BEARING HOLDER

The rear axle bearing holder is attached to the frame at the rear or is an integral part of the swing arm. The bearing holder contains the rear axle bearings and grease seals. It is also part of the rear brake. If the axle bearings require replacement, it is best to leave the bearing holder attached in the frame or the swing arm on the vehicle, since the frame acts as a holding fixture.

Removal/Installation

Refer to **Figure 5**, **Figure 15** or **Figure 16** for this procedure.

1. Remove the rear axle as described in this chapter.
2. *Final drive models:* Remove the final drive unit as described in this chapter.
3. *Swing arm models:* The bearing holder on these models is an integral part of the swing arm. If necessary, remove the swing arm as described in this chapter.
4. Remove the bearing holder bolts, lockwashers and washers.
5. Pull the bearing holder out of the frame.
6. Install by reversing these removal steps, noting the following.
7. Tighten the bearing holder bolts to the specifications in **Tables 1-3**.
8. Adjust the brakes and drive chain (if equipped) as described in Chapter Three.

Bearing Removal

1. Remove the oil seal from each side of the bearing. Pry the seal out with a large screwdriver.
2. Thoroughly clean the inside of the bearing holder with solvent and dry with compressed air or a shop cloth.
3. Check the bearings carefully for any signs of damage. Turn the bearings by hand to make sure they operate without wear or damage. Check balls for evidence of wear, pitting or excessive heat (bluish tint). Replace bearings if necessary; always replace as a complete set.
4. To remove the left- and right-hand bearings and center spacer, insert a soft aluminum or brass drift into one side of the hub. Push the center spacer (if used) over to one side and place the drift on the inner race of the opposite bearing. Tap the bearing out of the hub with a hammer, working around the perimeter of the inner race.

NOTE

Tapping the bearing on its inner race destroys the bearing. Bearings removed by this method must be replaced.

5. Remove that bearing and the center spacer.
6. Repeat Step 4 for the opposite bearing.

Bearing Installation

1. On non-sealed bearings, pack the bearings with a good quality bearing grease. Work the grease between the balls thoroughly. Turn the bearings by

hand a couple of times to make sure the grease is distributed evenly inside the bearing.
2. Pack the bearing holder and the center spacer with multipurpose grease.

CAUTION

Install the bearings with the sealed side facing out. During installation, tap the bearings squarely into place and tap on the outer race only. Use a socket that matches the outer race diameter. Do not tap on the inner race or the bearing may be damaged. Be sure that the bearings are completely seated.

3. Install the left-hand bearing.
4. Install the center spacer (if used) and the right-hand bearing.
5. Apply a light coat of multipurpose grease to the grease seals and install one on each side of the bearing holder.
6. Install the rear axle as described in this chapter.

Table 1 REAR SUSPENSION SPECIFICATIONS—YTM200 AND YTM225

Drive chain size (number of links)	
YTM200K, L, N	DID520 (60)
Rear shock spring	
Free length	
YTM225DXK, DXL	201 mm (7.91 in.)
YTM225DRN, DRS	201 mm (7.91 in.)
Installed length	
YTM225DXK, DXL	196 mm (7.72 in.)
YTM225DRN, DRS	196 mm (7.72 in.)

Table 2 TIGHTENING TORQUES—YTM200K, L, N

	N•m	ft.-lb.
Rear axle shaft		
Nut	130	94
Ring nut	140	100
Sprocket nut	45	32
Rear hub and frame		
Left-upper bolt	60	43
All other bolts	45	32

Table 3 TIGHTENING TORQUES—YTM200EK, EL; YTM200ERN

	N•m	ft.-lb.
Rear axle		
Ring nuts	100	72
Hex nuts		
Nut flush with axle	210	150
Nut not flush with axle	145	105
Rear hub and frame bolts	50	36
Final gear housing and frame bolt		
YTM200EK, EL	45	32
Rear wheel hub and final gear housing bolt	23	17

Table 4 TIGHTENING TORQUES—YTM225DXK, DXL, DXN; YTM225DRN; YTM225DRS

	N•m	ft.-lb.
Rear axle shaft		
YTM225DRS	100	72
All other models		
Hex nut	130	94
Ring nut	100	72
Final gear housing and swing arm nut	23	17
Bearing retainer	100	72
Ring gear bearing housing and final gear housing bolt		
M8	23	17
M10	45	32
Rear wheel hub and final gear housing bolt	45	32
Pivot shaft		
Screw	6	4.3
Locknut	100	72
Shock absorber bolt	25	18

Table 5 TIGHTENING TORQUES—YFM200N

	N•m	ft.-lb.
Rear axle nut	100	72
Rear wheel nut	45	32
Rear wheel hub bolt	50	36
Final gear to housing stay bolt	50	36
Housing stay to frame bolt	50	36
Rear wheel hub and final gear housing bolt		
M8	23	17
M10	23	17

Table 6 TIGHTENING TORQUES—YFM200DXS

	N•m	ft.-lb.
Rear axle nut	120	85
Rear axle ring nut	See text	
Rear wheel panel and wheel collar bolt	43	31
Caliper and rear arm nut	50	36
Bearing housing and swing arm bolt	45	32
Rear gear housing and swing arm bolt	23	17
Rear shock bolt	25	18
Pivot shaft	See text	

CHAPTER ELEVEN

BRAKES

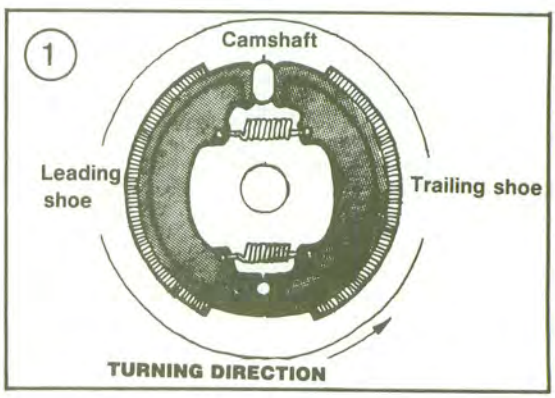
All models are equipped with front single-leading shoe drum brakes (**Figure 1**) and rear mechanical disc brakes.

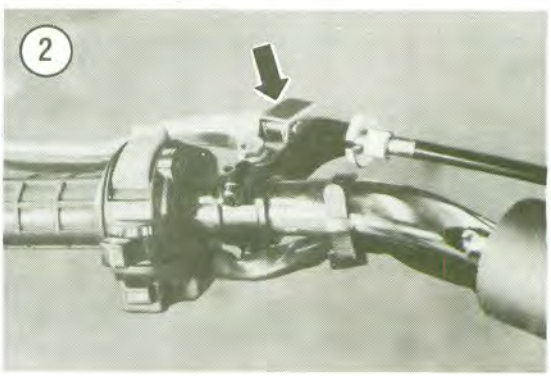
All models are equipped with a parking brake. This uses the rear brake and is activated by a lever (**Figure 2**) on the left-hand side of the handlebar. By pulling the brake lever on all the way and then flipping the lock into position, the rear brake will be held on.

Lever and pedal free play must be maintained on both brakes to minimize brake drag and premature brake wear and maximize braking effectiveness. Refer to Chapter Three for complete adjustment procedures.

All brake cables must be inspected and replaced periodically as they will stretch with use until they can no longer be properly adjusted.

Table 1 and **Table 2** list brake specifications and tightening torques. **Table 1** and **Table 2** are at the end of the chapter.





FRONT DRUM BRAKE

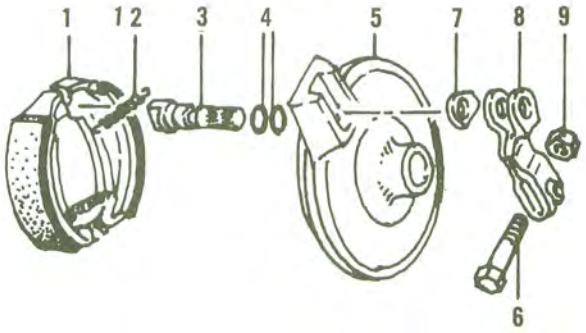
Disassembly

Refer to **Figure 3** (YTM200 and YTM225) or **Figure 4** (YFM200DXS) for this procedure.

1A. *YTM200 and YTM225:* Perform the following:

3

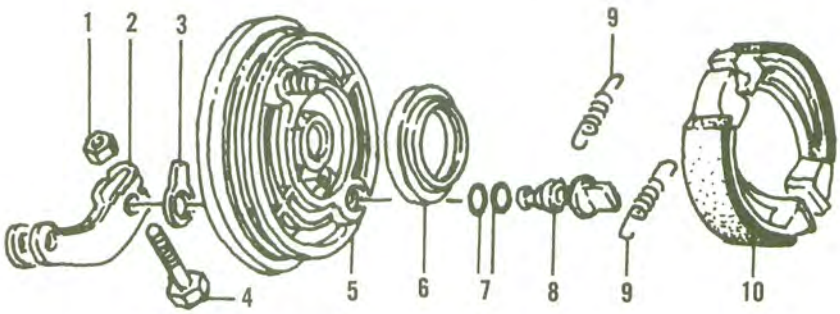
FRONT BRAKE (YTM200; YTM225)



1. Brake shoes
2. Spring
3. Brake cam
4. O-rings
5. Brake hub
6. Bolt
7. Wear indicator
8. Brake arm
9. Nut

4

FRONT BRAKE (YFM200)



1. Nut
2. Brake cam
3. Wear indicator
4. Bolt
5. Brake hub
6. Oil seal
7. O-rings
8. Brake cam
9. Spring
10. Brake shoes

a. Loosen the front brake wingnut (**Figure 5**) and remove it.
b. Remove the cable guide .
c. Remove the spring (**Figure 3**).
d. Remove the front wheel (Chapter Eight).
e. Pull the brake assembly straight out of the brake drum. See **Figure 6**.

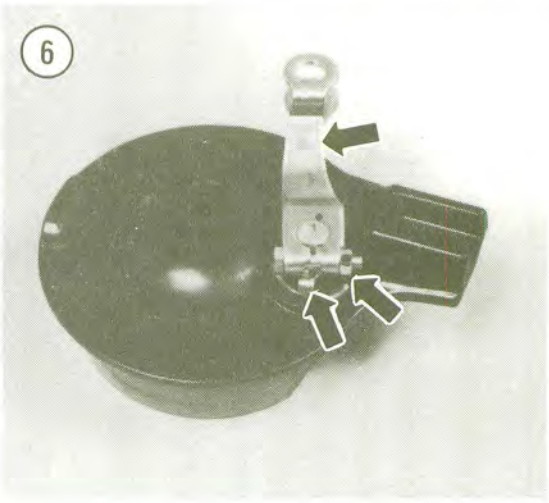
1B. *YFM200DXS:* Perform the following:
a. Remove the front wheel and hub.
b. Loosen the front brake wingnut (**Figure 7**) and remove it.
c. Remove the cable guide (A, **Figure 8**) and lower spring (B, **Figure 8**).
d. Remove the upper washer and spring (**Figure 9**).
e. Remove the circlip (**Figure 10**) and remove the brake cable (**Figure 11**) from the backing plate.
f. Remove the backing plate (**Figure 12**).
g. If necessary, repeat for the opposite side.

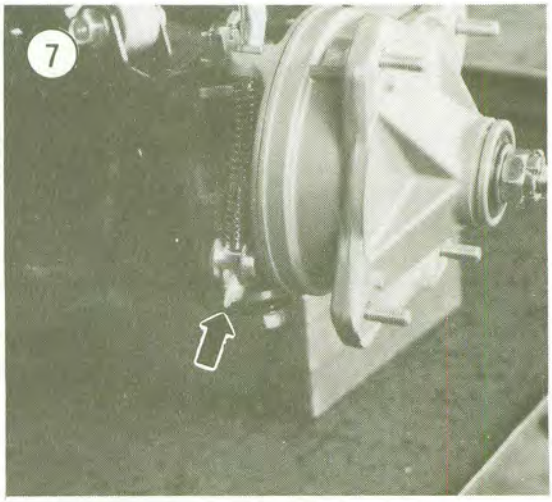
2. Mark the shoes (**Figure 13**) as either left or right so they may be reinstalled in the same position.

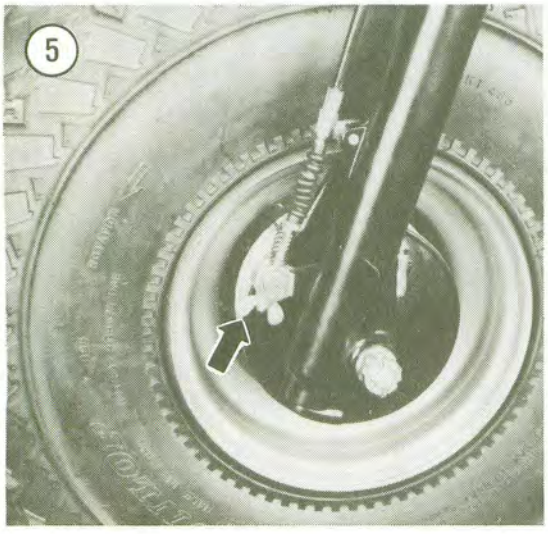
NOTE

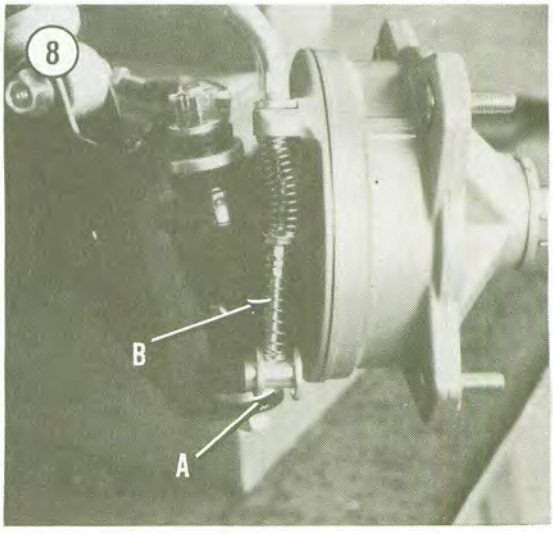
Before removing the brake shoe assembly in Step 3, place a clean shop rag on the linings to protect them from oil and grease during removal.

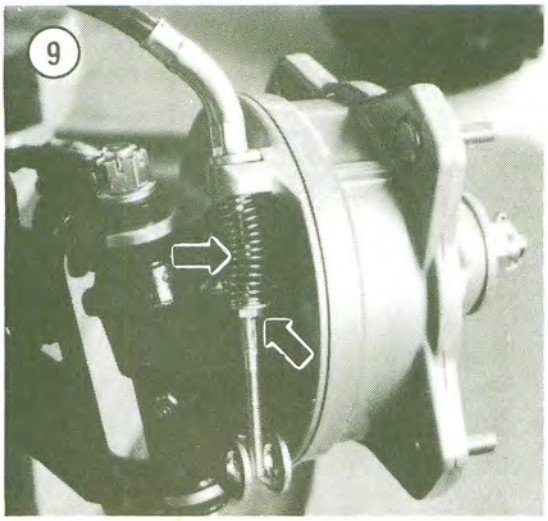
3. Remove the brake shoe assembly, including the return springs, from the backing plate as shown in **Figure 14**.
4. Remove the return springs (**Figure 15**) and separate the shoes.







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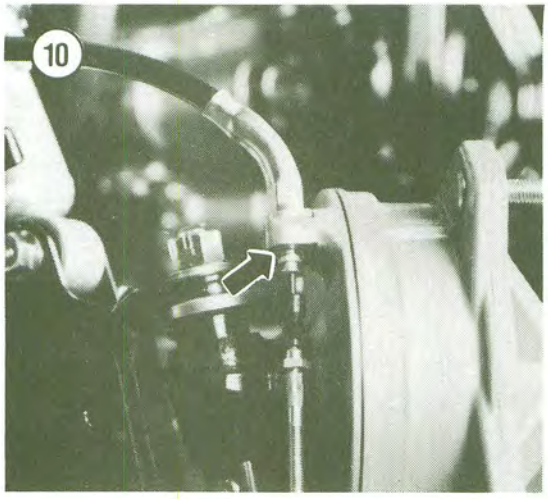
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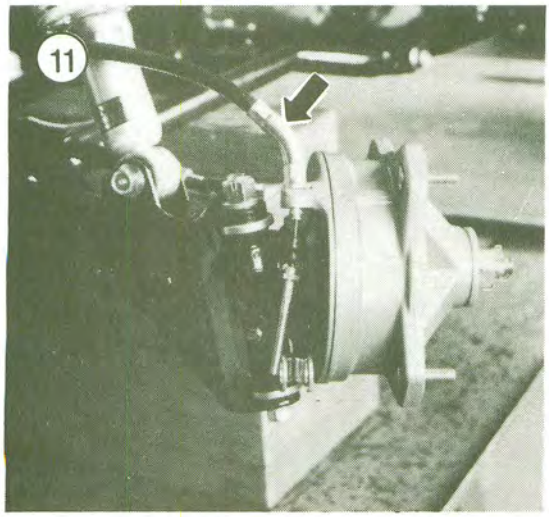
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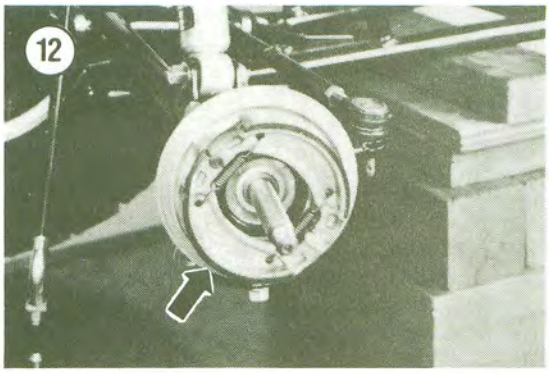
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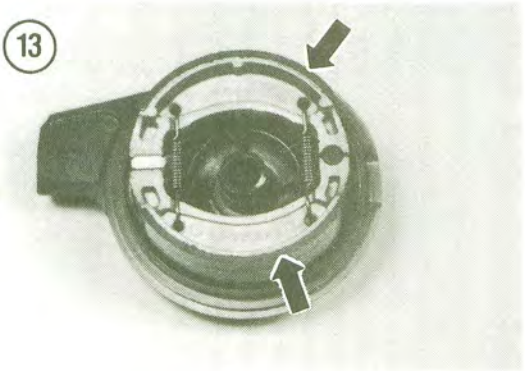
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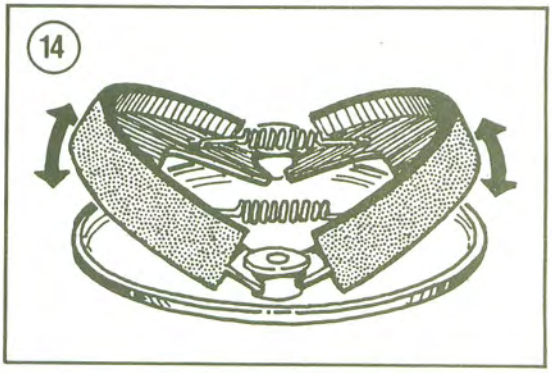
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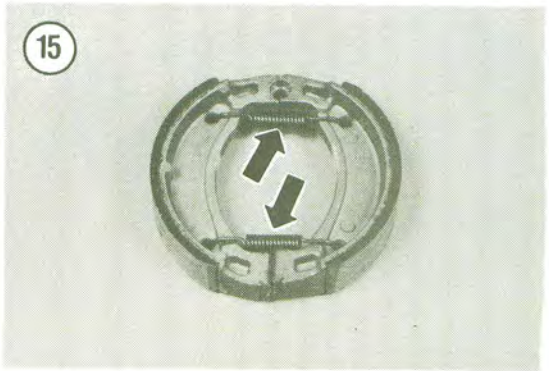
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5. Refer to **Figure 16**. Loosen the bolt (A) securing the brake lever to the cam. Remove the lever (B) and wear indicator (C). Remove the camshaft (**Figure 17**) from the opposite side.

Inspection

1. Thoroughly clean and dry all parts except the linings.
2. Check the contact surface of the drum for scoring. See A, **Figure 18** or A, **Figure 19**. If there are grooves deep enough to snag a fingernail, the drum should be replaced and new shoes fitted. This type of wear can be avoided to a great extent if the brakes are disassembled and thoroughly cleaned after riding the vehicle in water, mud or deep sand.
3. If oil or grease is on the drum surface, clean it off with a clean rag soaked in lacquer thinner—do not use any solvent that may leave an oil residue.

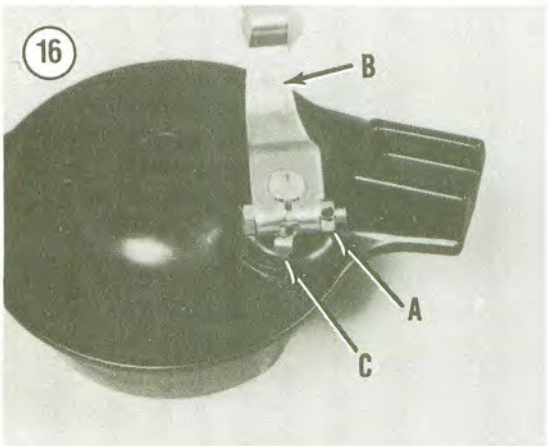
NOTE

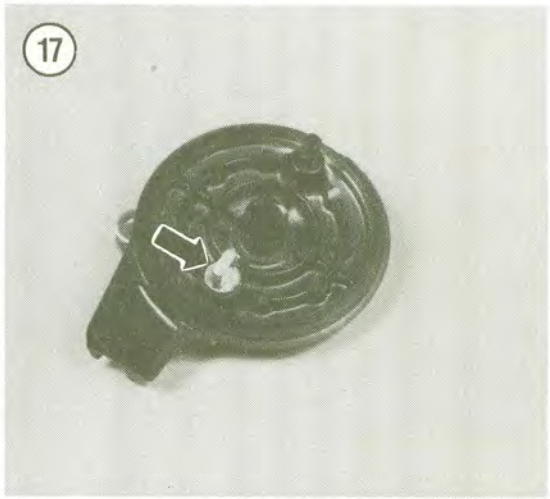
*Check the front wheel hub bearing oil seal B, **Figure 18** or B, **Figure 19** for signs of leakage or damage. If the seal is leaking, replace it as described in Chapter Eight or Chapter Nine under **Front Hub**. Grease leakage from this seal can work its way onto the brake shoes, causing brake fade.*

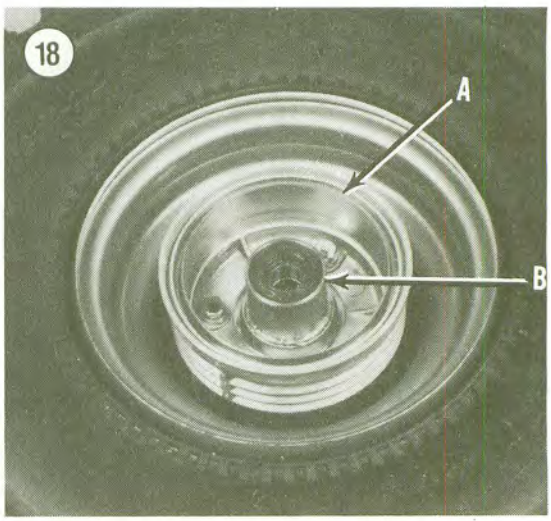
4. Use vernier calipers (**Figure 20**) and measure the brake drum inside diameter. The drum should be replaced if the diameter it too large (**Table 1**).
5. Use vernier calipers (**Figure 21**) and measure the thickness of each brake shoe lining. They should be replaced if lining thickness is less than specified (**Table 1**).

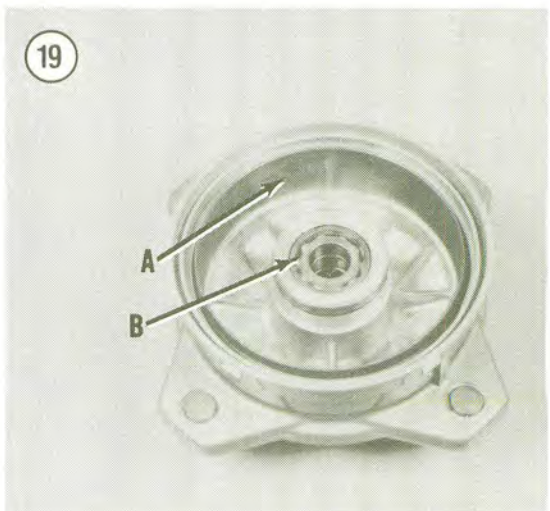
NOTE

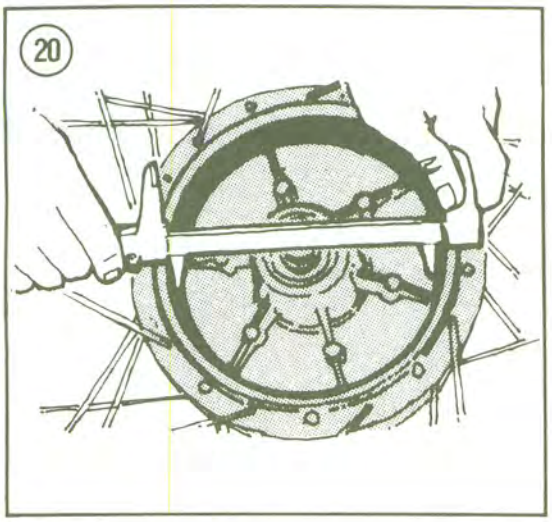
In Step 5, measure the thickness of the brake shoe lining only. Do not include the shoe's aluminum casting.

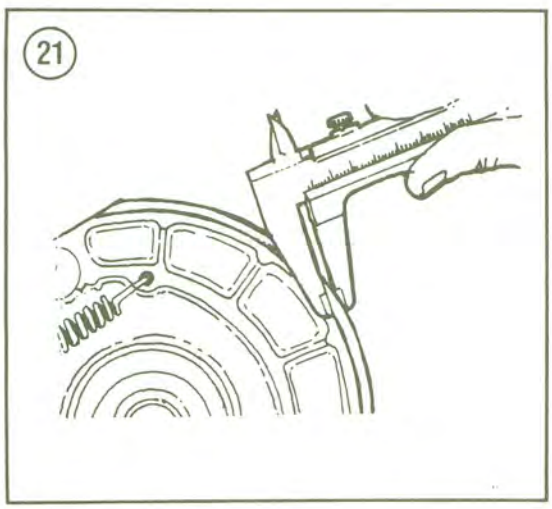


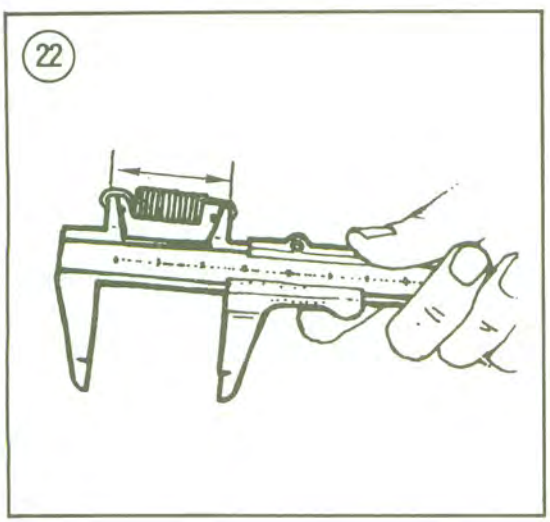












6. Inspect the linings for embedded foreign material. Dirt can be removed with a stiff wire brush. Check for traces of oil or grease. If the linings are contaminated, they must be replaced as a set.
7. Inspect the cam lobe and pivot pin area of the shaft for wear and corrosion. Minor roughness can be removed with fine emery cloth.
8. Check the brake shoe return springs for wear or distortion with vernier calipers (**Figure 22**). Refer to **Table 1** for specifications. If they are stretched, they will not fully retract the brake shoes from the drum, resulting in a power-robbing drag on the drums and premature wear of the linings. Replace as necessary and always replace as a pair.
9. *YFM200:* Check the brake backing plate seal (**Figure 23**) for wear or damage. Replace if necessary.

Assembly

1. Assemble the brake by reversing the disassembly steps, noting the following.
2. Grease the camshaft and anchor posts with a light coat of molybdenum disulfide grease; avoid getting any grease on the brake plate where the linings come in contact with it.
3. Hold the brake shoes in a "V" formation with the return springs attached (**Figure 14**) and snap them in place on the brake backing plate. Make sure they are firmly seated on it and that the springs are positioned correctly. See **Figure 15**.
4. When installing the brake arm onto the brake camshaft, align the punch marks on the brake lever and housing and tighten the bolt securely.
5. Insert the brake panel assembly into the brake drum.

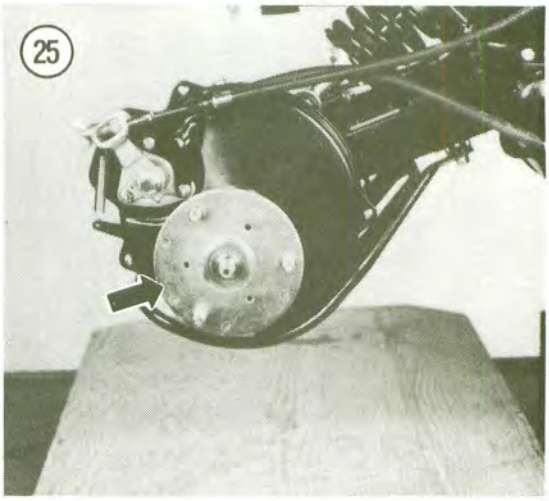
6. Install the front wheel as described in Chapter Eight or Chapter Nine.
7. Adjust the rear brake as described in Chapter Three.

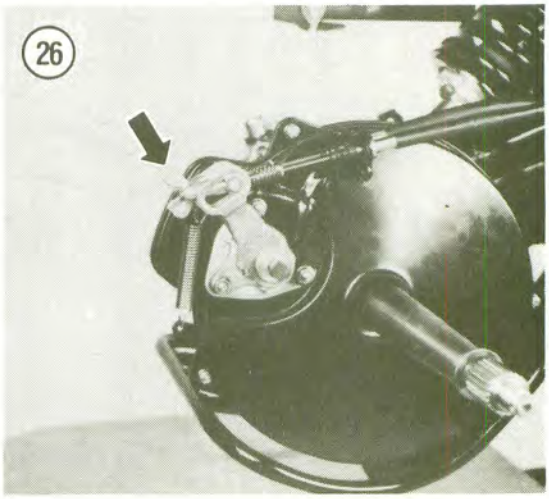
REAR DISC BRAKE

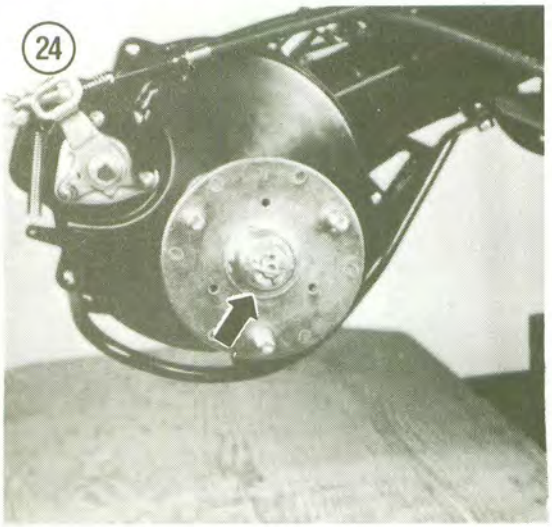
This section describes service for the rear brake pads, brake caliper and brake disc.

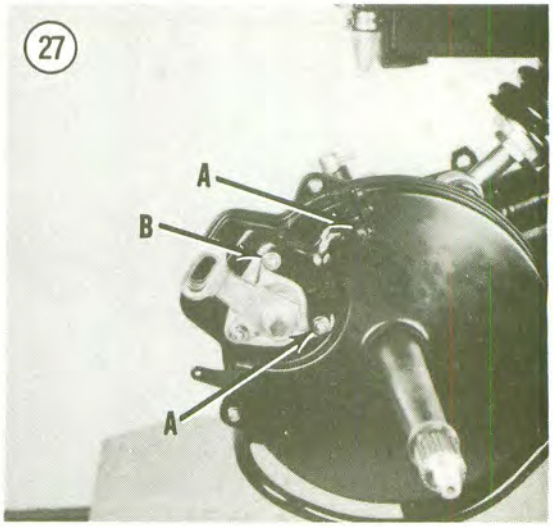
Removal/Disassembly

1. Remove the right rear wheel as described in Chapter Ten.
2. Release the parking brake.
3. Remove the cotter pin and castellated nut securing the right-hand rear hub (**Figure 24**). Remove the lockwasher and slide the hub (**Figure 25**) off the axle.
4. Disconnect the 2 brake cables, guides and springs at the brake arm (**Figure 26**).
5. Remove the 2 nuts (A, **Figure 27**) and remove the brake cable guide (B, **Figure 27**).
6. Remove the remaining nut and remove the brake arm (**Figure 28**).
7. Slide the outer brake cover (**Figure 29**) away from the brake and off the axle.
8. Remove the outer brake pad (**Figure 30**).
9. Remove the outer brake caliper half (**Figure 31**).
10. Remove the 2 inner brake caliper bolts (**Figure 32**) and remove the inner brake caliper half (**Figure 33**) and brake pad (**Figure 34**).









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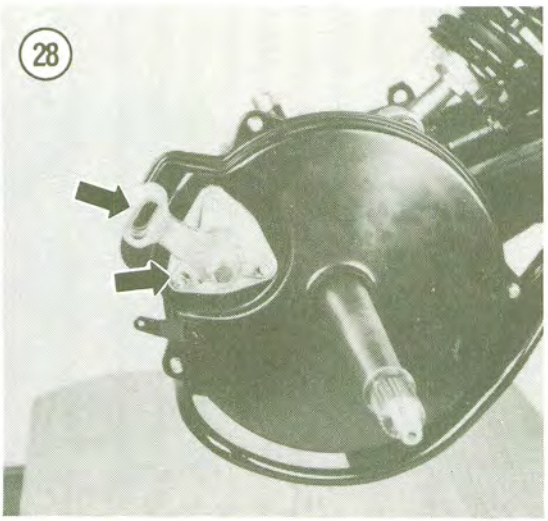

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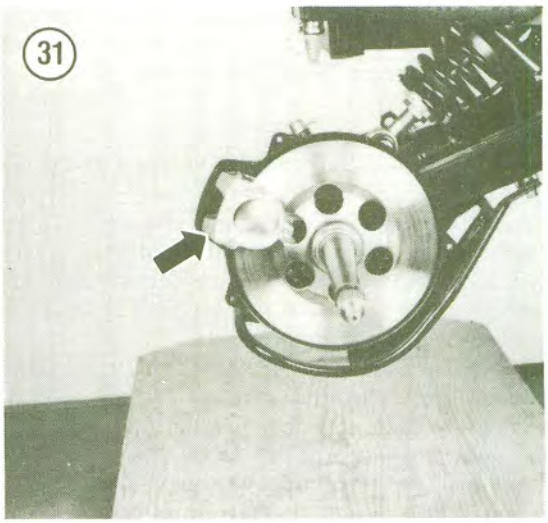

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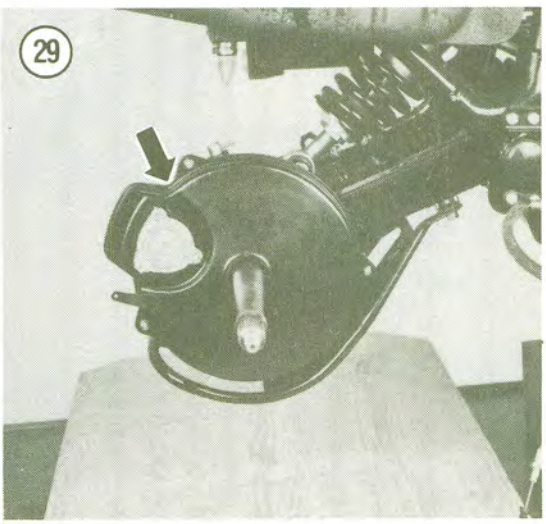

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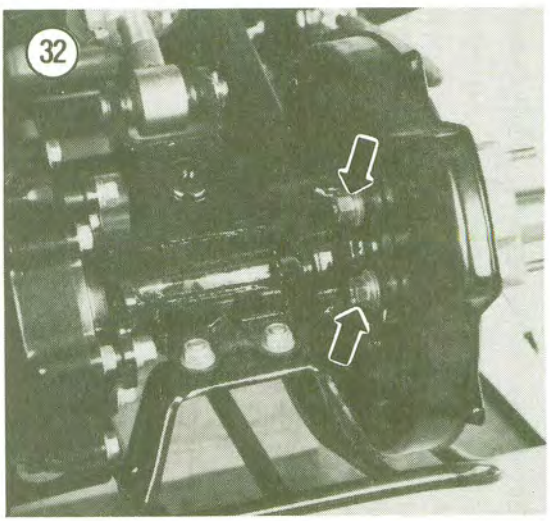

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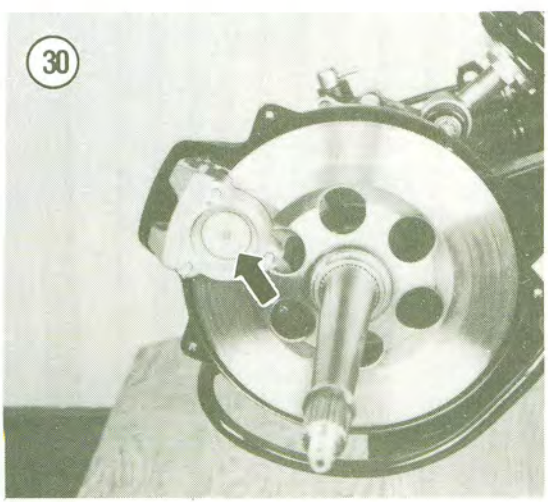

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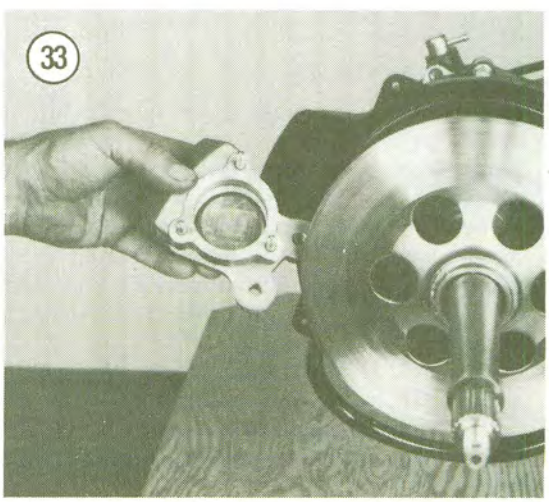


11. Slide the brake disc (**Figure 35**) off of the axle.
12. Remove the inner brake cover screws and slide the cover (**Figure 36**) off of the axle.

Inspection

1. Thoroughly clean and dry all parts except the brake pads.
2. Inspect the brake disc splines (**Figure 37**). Then measure the thickness around the disc at several locations with vernier calipers (**Figure 38**). The disc must be replaced if the thickness at any point is less than minimum (**Table 1**).
3. Referring to **Figure 39**, work the brake arm back and forth and check its operation. It should operate smoothly and with no binding or hesitation. Replace worn parts as necessary.
4. Check the brake arm push pad (**Figure 40**). It should show no signs of dirt, rust or damage. Clean or replace the pad as required.
5. Check the brake pad's friction surfaces (**Figure 41**) for oil or dirt buildup. Dirt can be removed with fine grade sandpaper but oil- or grease-contaminated pads must be replaced as a set.
6. Use vernier calipers and measure the thickness of the brake pads as shown in **Figure 42**. They should be replaced as a set if any one pad is worn to the service limit (**Table 1**).

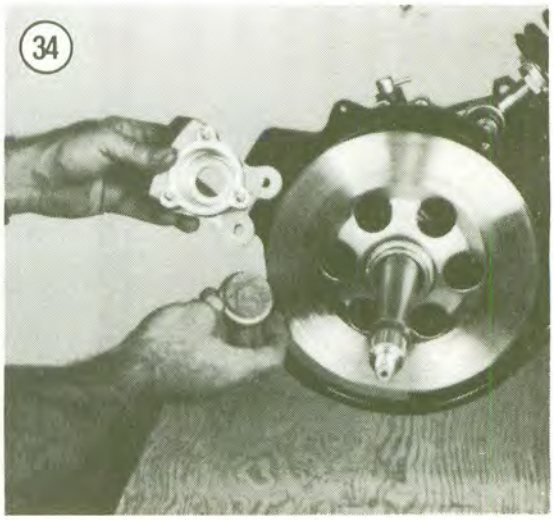
NOTE

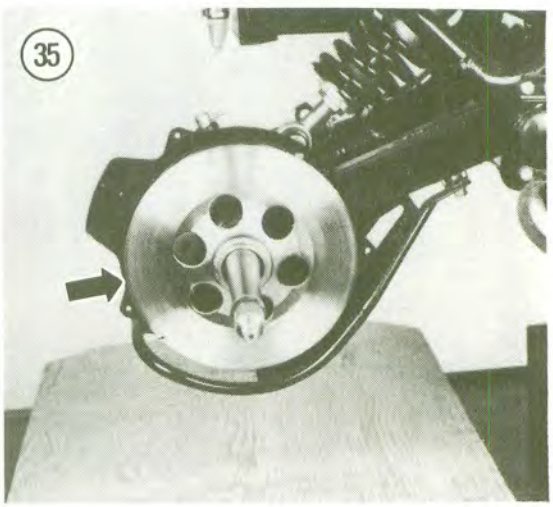
When measuring the brake pads in Step 7, measure the pad lining material only. Do not include the pad backing plate.

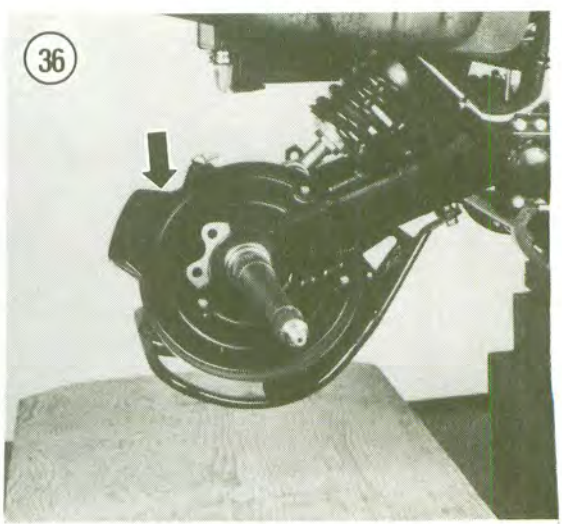
7. Inspect the inner brake caliper bore (**Figure 43**) for wear or damage. Also check the studs for thread damage. Replace the caliper if necessary.

Assembly/Installation

1. Install the inner brake cover (**Figure 36**) and secure with it with the screws.
2. Install the brake disc (**Figure 35**) partway onto the axle.
3. Install the inner brake pad (**Figure 34**) into the inner caliper half. Then align the cutout in the caliper with the brake disc (**Figure 33**) and install the caliper half over the brake disc. Align the caliper with the brake cover.
4. Insert the 2 brake caliper bolts through the cover and insert into the brake caliper (**Figure 32**). Do not tighten the bolts at this time.
5. Install the outer brake cover (**Figure 29**) and screws.







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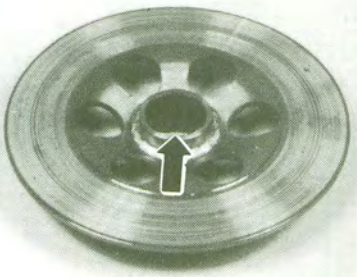

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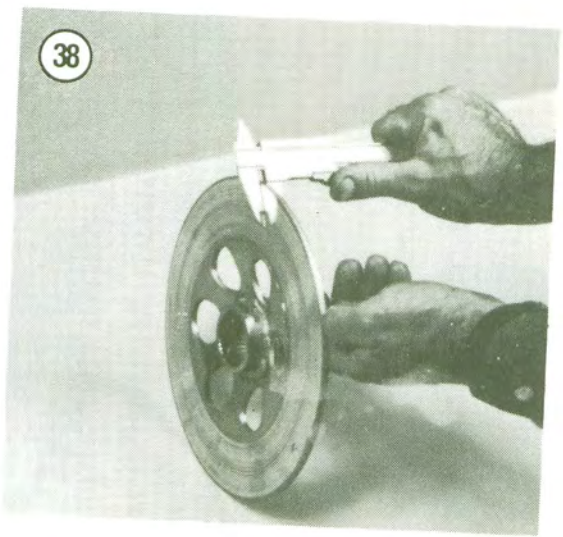

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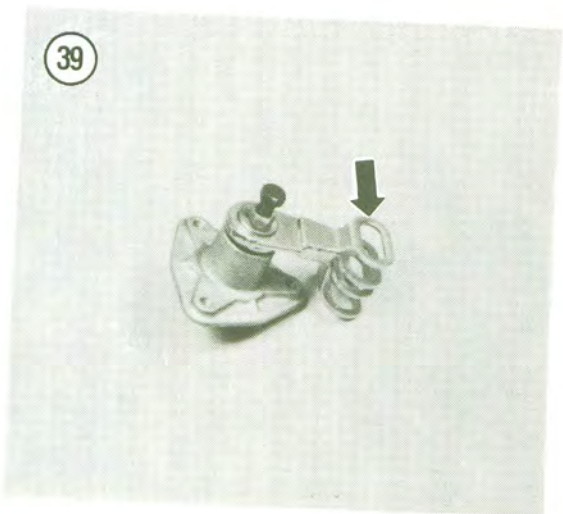

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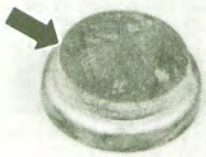

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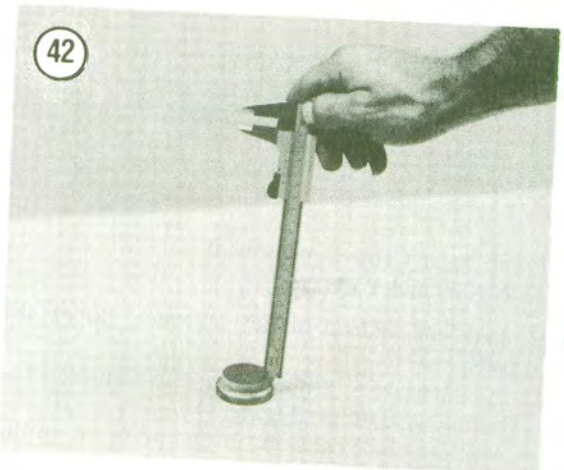

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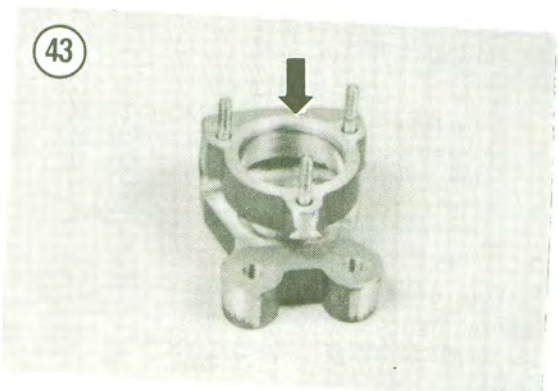


6. Install the outer brake pad into the outer caliper half and install the brake arm assembly (**Figure 28**). Install the lower nut (**Figure 28**) with the washer.
7. Install the brake cable guide (B, **Figure 27**) and the 2 nuts (A, **Figure 27**).
8. Tighten the 2 inner brake caliper bolts (**Figure 32**) to the specifications in **Table 2**. Tighten the outer brake caliper nuts securely.
9. Attach the brake cables, guides and springs (**Figure 26**).
10. Adjust the brakes as described in Chapter Three.
11. Install the rear hub and wheel as described in Chapter Ten.

BRAKE CABLES

Brake cable adjustment should be checked periodically as the cable stretches with use and increases brake lever free play. Free play is the distance that the brake lever travels between the released position and the point when the brake linings come in contact with the drum or disc.

If the brake adjustment as described in Chapter Three can no longer be achieved, the cable (or brake shoes or pads) must be replaced.

WARNING

Improperly installed brake cables can cause loss of brake or brake lockup. If you are unsure as to how a cable is correctly routed or installed, ask your Yamaha dealer.

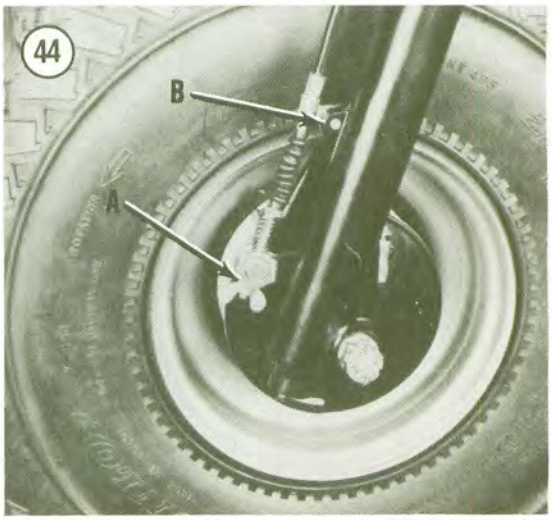
Front Brake Cable Replacement (YTM200 and YTM225)

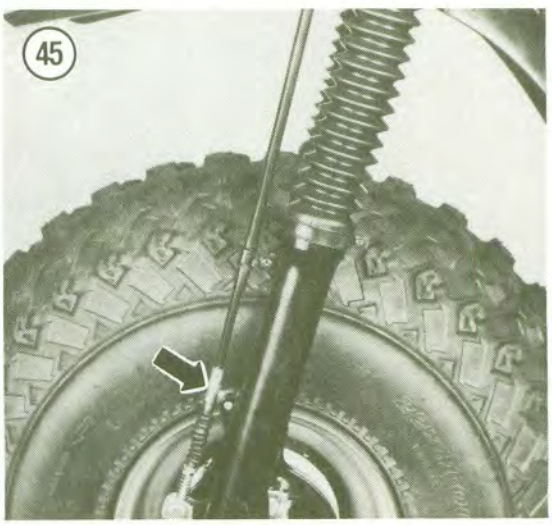
1. Park the vehicle on level ground. Block the wheels.
2. At the brake assembly, completely unscrew the adjusting wingnut (A, **Figure 44**).
3. Pull the brake cable out of the pivot pin in the brake lever.
4. Remove the cable guide screws. See B, **Figure 44** and **Figure 45**.

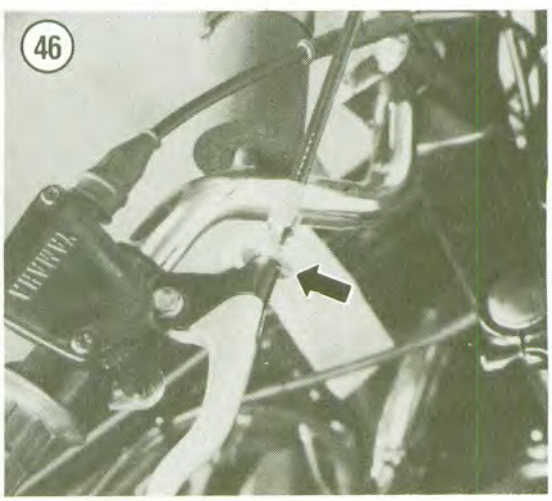
NOTE

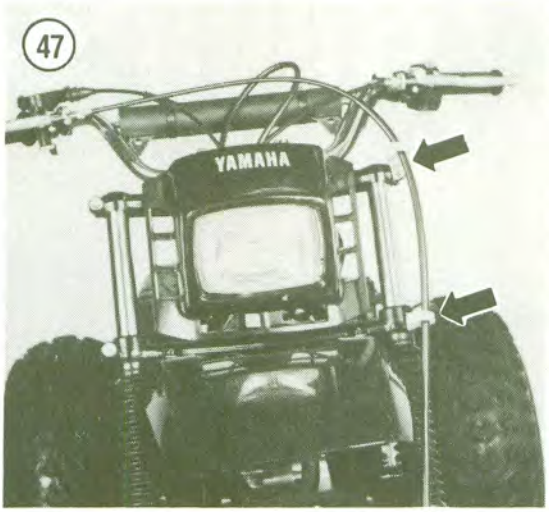
Before removing any cable, make a drawing (or take a Polaroid picture) of the cable routing through the frame. It is very easy to forget once it has been removed. Replace it exactly as it was, avoiding any sharp turns.

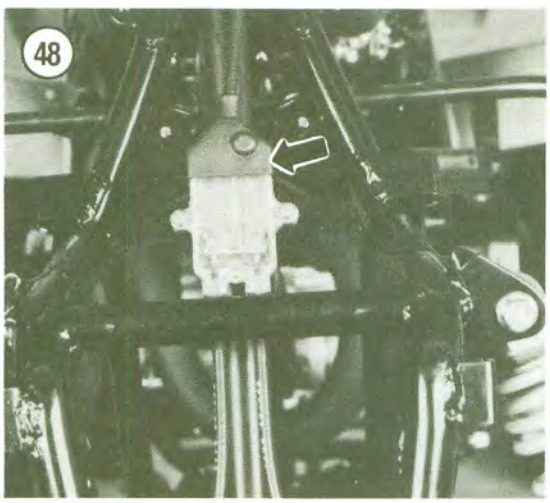
5. Loosen the knurled locknut securing the cable adjuster on the handlebar lever (**Figure 46**). Screw in the adjuster as far as possible to provide maximum cable slack.

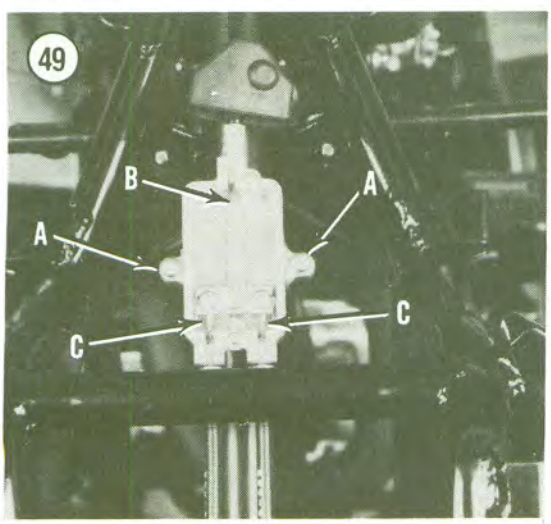












6. Disconnect the cable from the adjuster.
7. Pull the cable through the cable guides (**Figure 47**) and remove the cable.
8. Install by reversing these removal steps, noting the following:
   a. Lubricate the new cable as described in Chapter Three.
   b. Adjust the brake as described in Chapter Three.
   c. Make sure the cable is routed with no kinks or sharp bends.

Front Brake Cable Replacement (YFM200)

The brake cable assembly on these models is composed of 3 separate cables. The top cable connected to the left-hand brake lever connects to a junction box at the front of the vehicle. From the junction box, left- and right-hand cables are routed to their respective brake assemblies at the front wheels. The top cable is attached to the 2 lower cables by a slide mechanism. When the front brake lever is applied, the top cable pulls evenly on the slide mechanism to activate the 2 lower cables.

NOTE

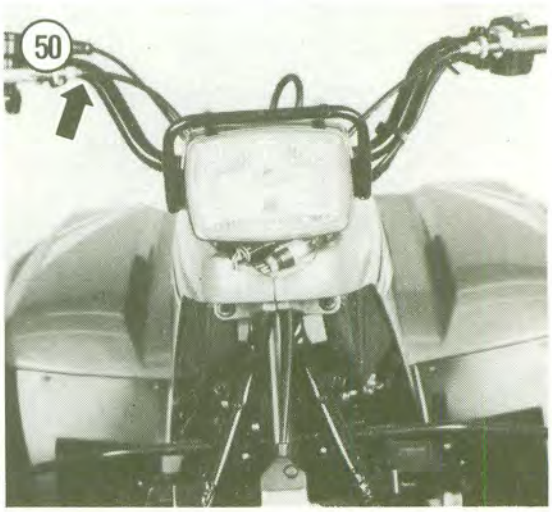
Prior to removing any cable, make a drawing (or take a Polaroid picture) of the cable routing through the frame. It is very easy to forget once it has been removed. Replace it exactly as it was, avoiding any sharp turns.

11

Top cable

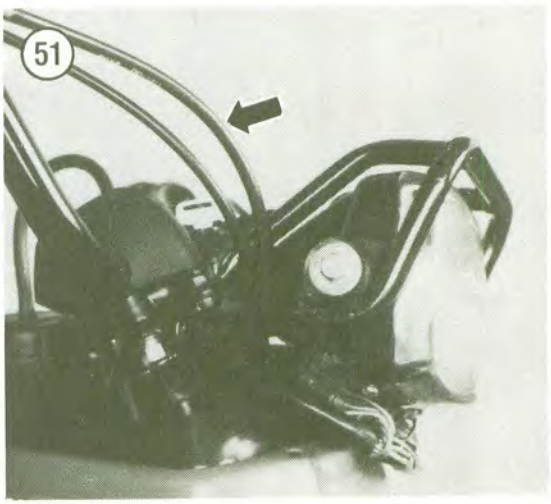
1. Park the vehicle on level ground. Block the wheels.
2. Remove the front fender.
3. Loosen the knurled locknut securing the cable adjuster on the handlebar lever (**Figure 46**). Screw in the adjuster as far as possible to provide maximum cable slack.
4. Disconnect the cable at the adjuster.
5. At the junction box, perform the following:
   a. Slide the rubber cover up (**Figure 48**).
   b. Remove the cover screws (A, **Figure 49**) and remove the cover.
   c. Lift the top cable up and disconnect the cable end from the junction box slide mechanism (B, **Figure 49**).

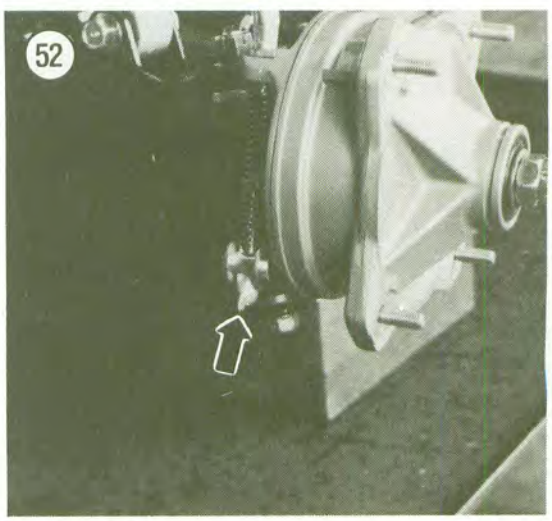
6. Remove the upper brake cable (**Figure 50**).
7. Installation is the reverse of these steps, noting the following.
8. Lubricate the new cable as described in Chapter Three.
9. Make sure the cable is routed correctly with no sharp bends. See **Figure 50** and **Figure 51**.
10. Make sure the upper cable is securely connected to the junction box.
11. Tighten the junction box cover screws securely. Then pull the cover over the box (**Figure 48**).
12. Adjust the brake as described in Chapter Three.



Lower cables

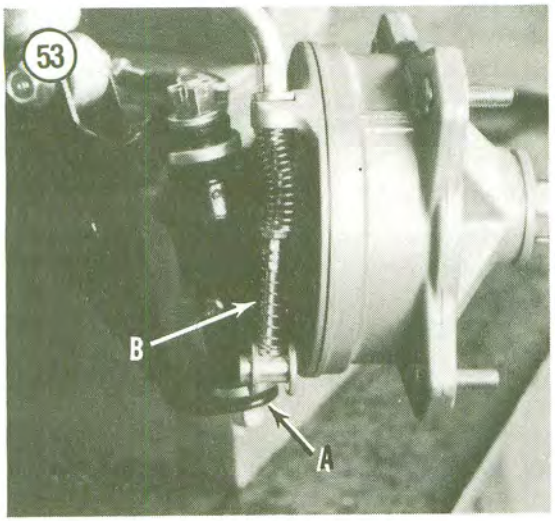
1. Park the vehicle on level ground and block the rear wheels.
2. Perform the following:
   a. Loosen the front brake wingnut (**Figure 52**) and remove it.
   b. Remove the cable guide (A, **Figure 53**) and lower spring (B, **Figure 53**).
   c. Remove the upper washer and spring (**Figure 54**).
   d. Remove the circlip (**Figure 55**) and remove the brake cable (**Figure 56**) from the backing plate.
3. At the junction box, perform the following:
   a. Slide the rubber cover up (**Figure 48**).
   b. Remove the cover screws (A, **Figure 49**) and remove the cover.
   c. Lift the bottom cables up and disconnect them from the junction block slide mechanism (C, **Figure 49**).
4. Remove the lower brake cables (**Figure 57**).
5. Installation is the reverse of these steps, noting the following.
6. Lubricate the new cables as described in Chapter Three.
7. Make sure the cables are routed correctly with no sharp bends. See **Figure 57** and **Figure 58**.
8. Make sure the lower cables are securely connected to the junction box slide mechanism.
9. Tighten the junction box cover screws securely. Then pull the cover over the box (**Figure 48**).
10. Adjust the brake as described in Chapter Three.





Rear Brake Cable Replacement

The rear brake is operated by the left-hand brake lever and the right-hand rear brake pedal. Both assemblies use individual cables.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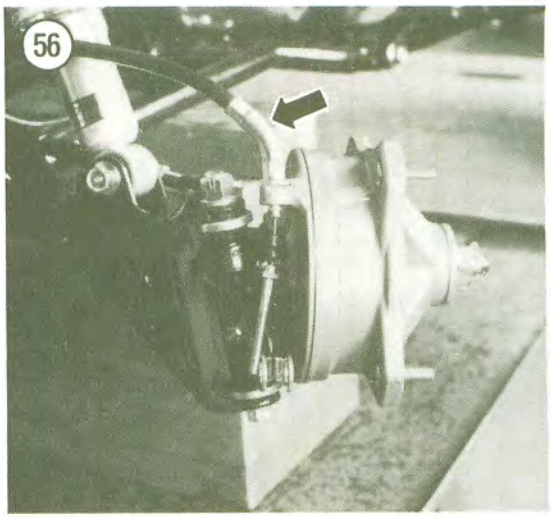
B
A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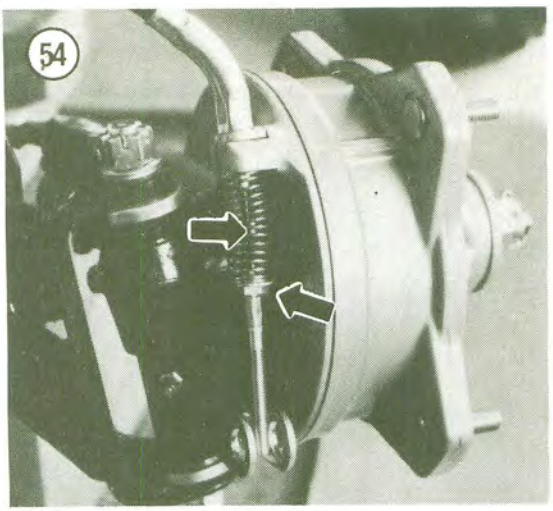
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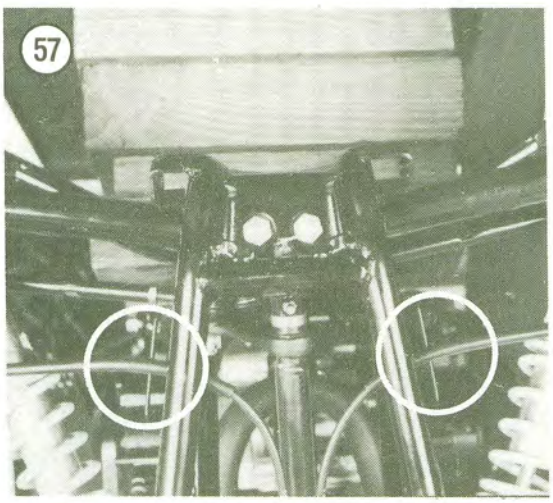
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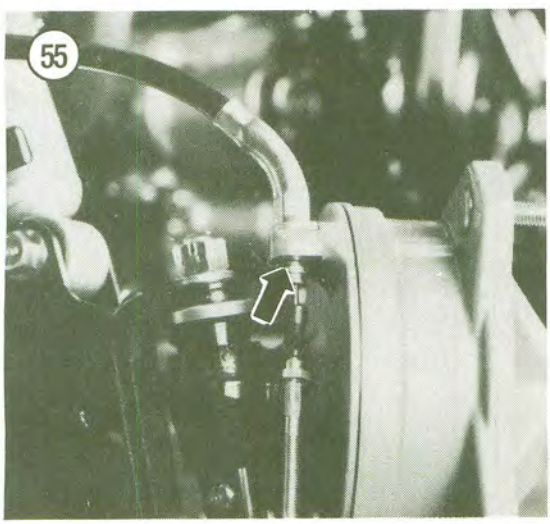
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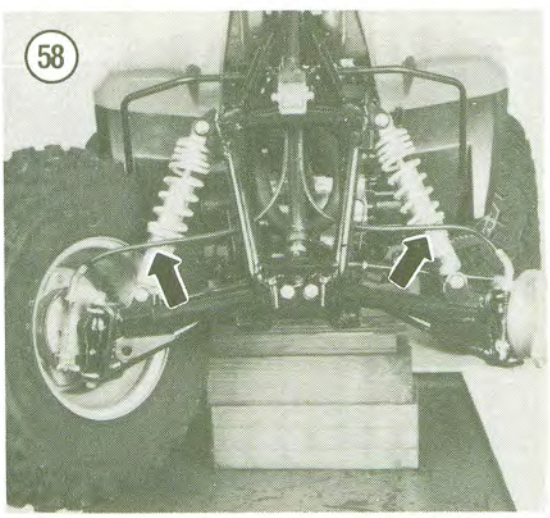
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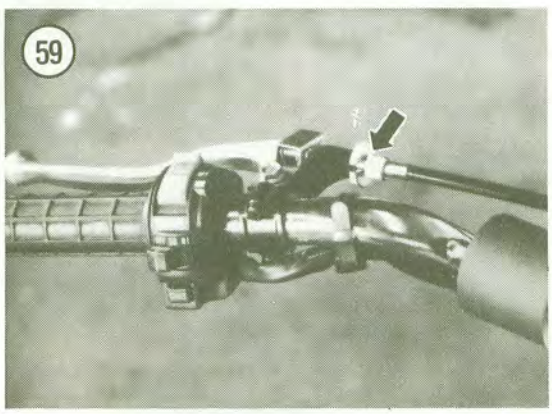
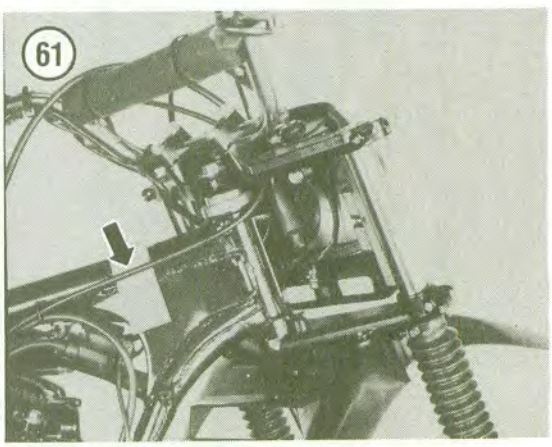
Hand brake lever cable

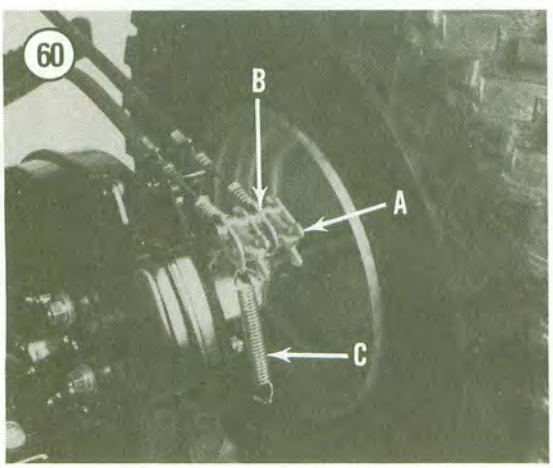
1. Park the vehicle on level ground and block the wheels so the vehicle will not roll in either direction.
2. Remove the seat and fenders.
3. Remove the fuel tank as described in Chapter Six.
4. Release the parking brake if set.
5. Loosen the knurled locknut securing the cable adjuster on the handlebar lever (**Figure 59**). Screw the adjuster in as far as possible to provide maximum cable slack.
6. Loosen the rear brake adjuster wingnut (A, **Figure 60**). Then remove the wingnut, cable guide and spring.
7. Disconnect the brake cable from the rear brake arm.
8. Pull the cable through the handlebar (**Figure 61**) and towards the rear of the vehicle. Then disconnect the cable from the cable guides. See **Figure 62** and **Figure 63**.
9. Remove the brake cable.
10. Installation is the reverse of these steps, noting the following.
11. Lubricate the new cable as described in Chapter Three.
12. Adjust the brake as described in Chapter Three.

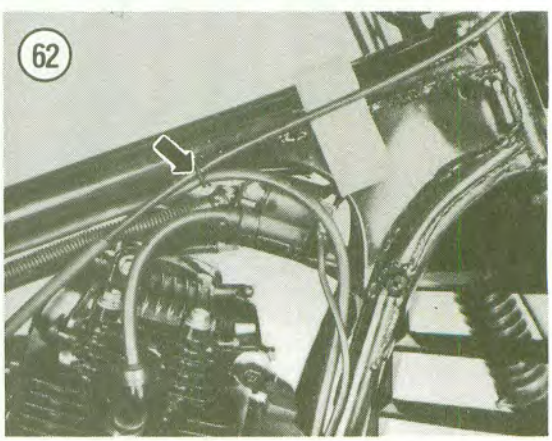
Brake pedal cable

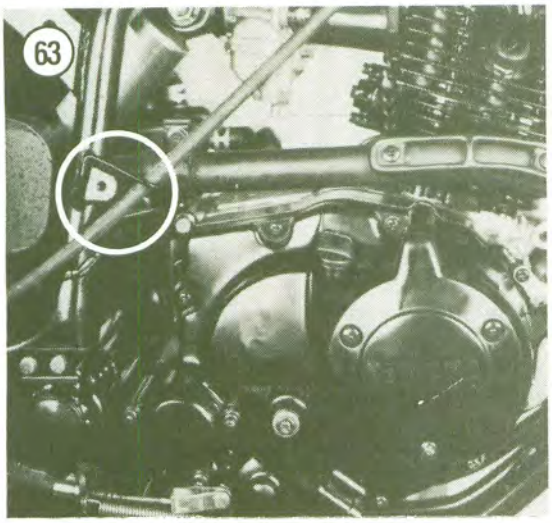
1. Loosen the rear brake adjuster wingnut (B, **Figure 60**). Then remove the wingnut, cable guide and spring.
2. Disconnect the brake cable from the rear brake arm.
3. Remove the rear cable return spring (C, **Figure 60**).
4. At the brake pedal, disconnect the return spring (A, **Figure 64**) and brake cable (B, **Figure 64**).
5. Remove the brake cable.
6. Installation is the reverse of these steps, noting the following.
7. Lubricate the new cable as described in Chapter Three.
8. Adjust the brake as described in Chapter Three.











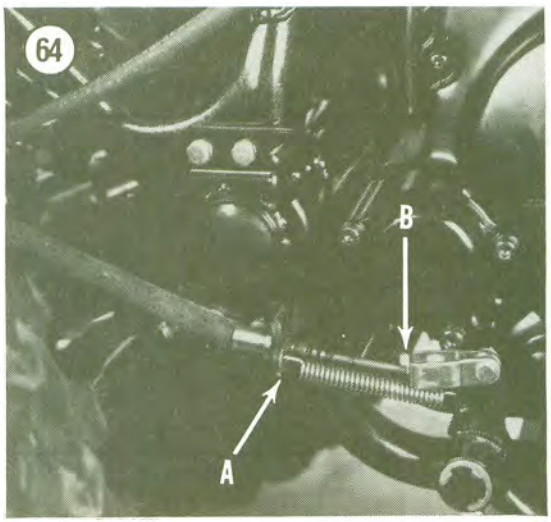


Table 1 BRAKE SPECIFICATIONS

Front drum brake	
Drum inside diameter	110 mm (4.33 in.
Wear limit	111 mm (4.37 in.)
Lining thickness	4.0 mm (0.16 in.)
Wear limit	2.0 mm (0.08 in.)
Brake shoe spring free length	34.5 mm (1.36 in.)
Rear disc brake	
Brake disc	
Outside diameter	224 mm (8.82 in.)
Thickness	4 mm (0.16 in.)
Wear limit	3.0 mm (0.12 in.)
Brake pad thickness	8.0 mm (0.31 in.)
Wear limit	
YTM225DRS	2.0 mm (0.079 in.)
All other models	1.5 mm (0.06 in.)

Table 2 BRAKE TIGHTENING TORQUES

	N•m	ft.-lb.
Rear brake caliper body bolt	45-50	32-36
Rear brake caliper nut	9	6.5
Brake pad adjuster locknut	16	11

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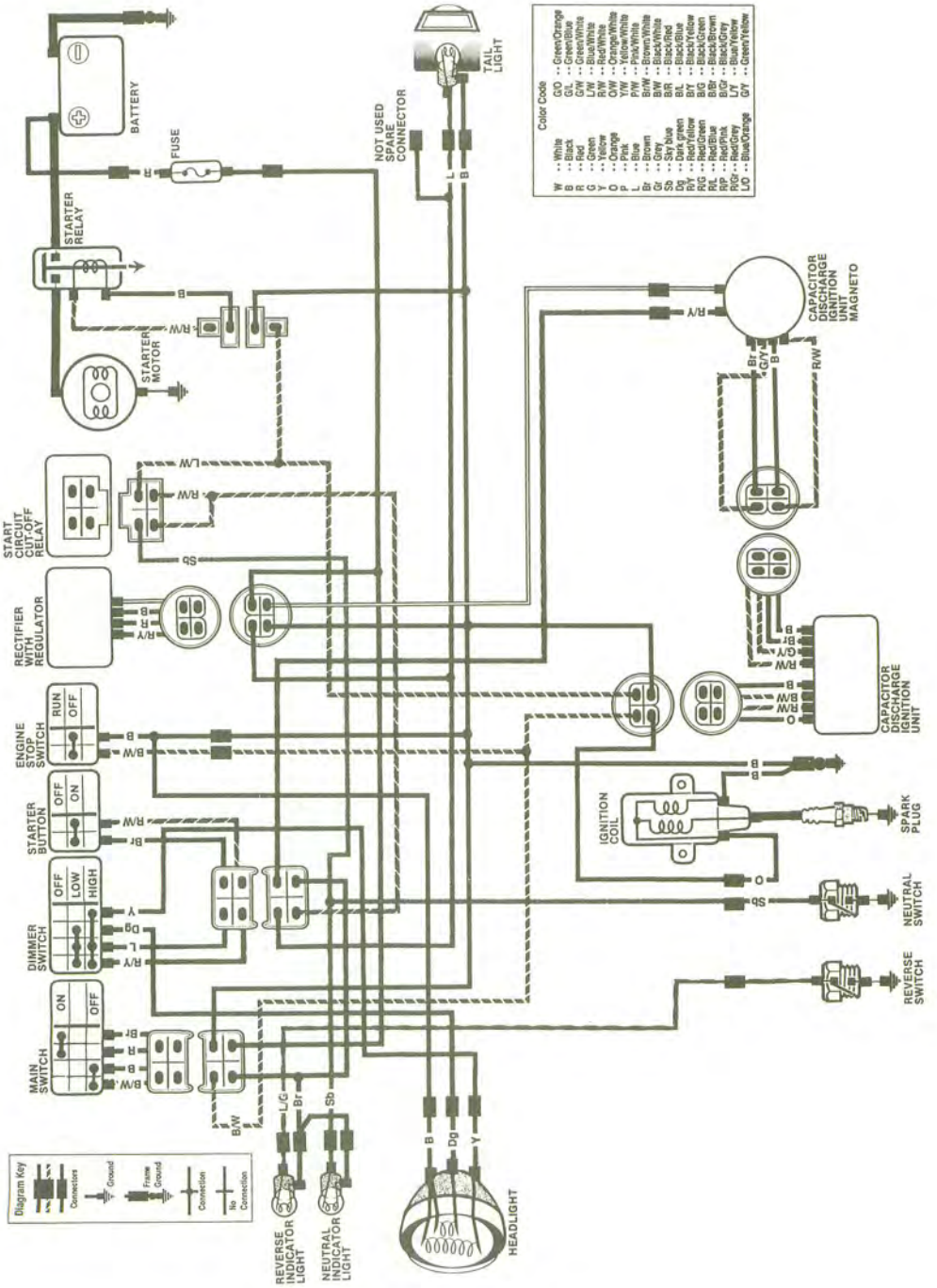
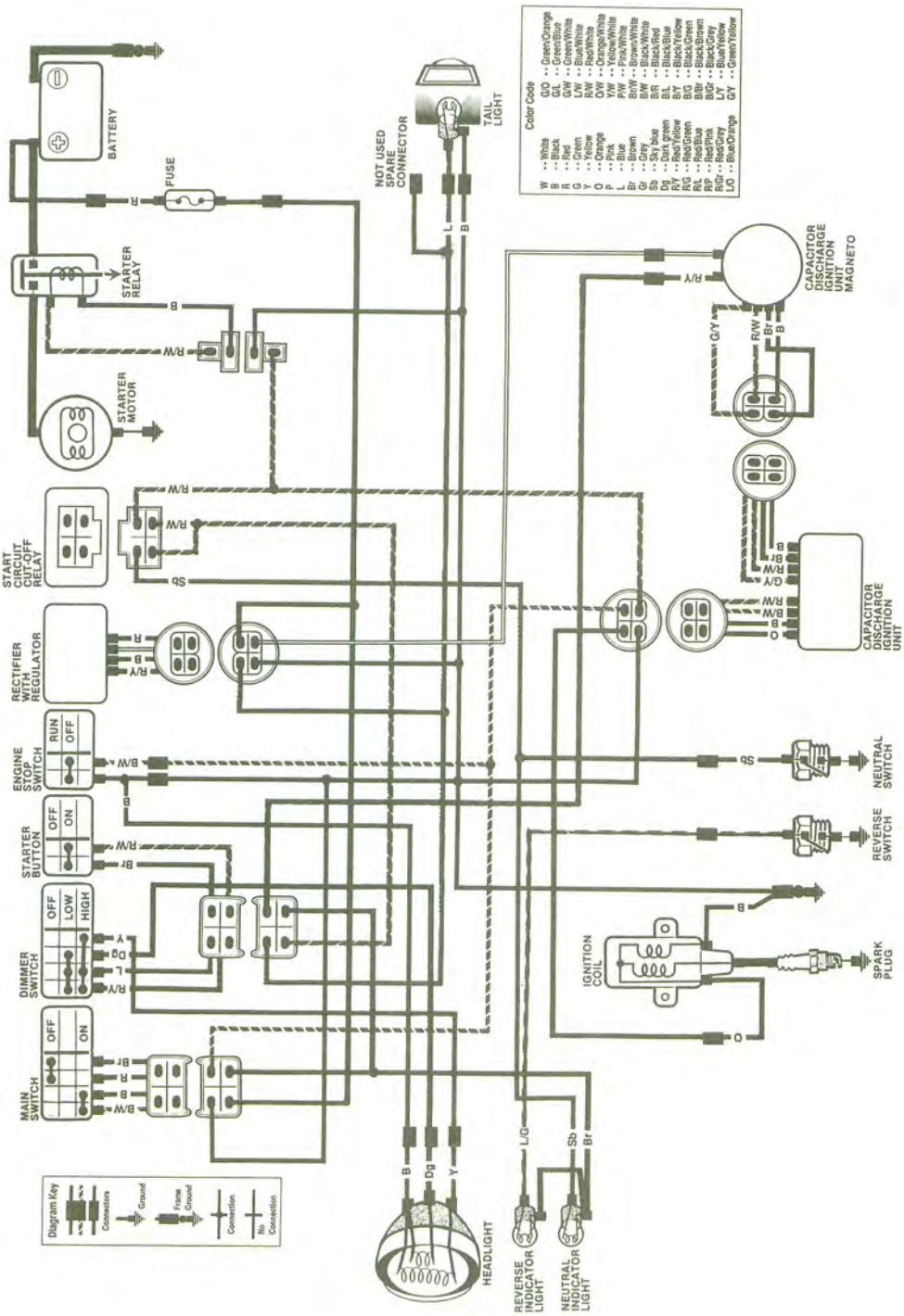

BATTERY
FUSE
STARTER RELAY
STARTER MOTOR
NOT USED SPARE CONNECTOR
TAIL LIGHT
START CIRCUIT CUT-OFF RELAY
RECTIFIER WITH REGULATOR
CAPACITOR DISCHARGE IGNITION UNIT MAGNETO
CAPACITOR DISCHARGE IGNITION UNIT
ENGINE STOP SWITCH
STARTER BUTTON
DIMMER SWITCH
MAIN SWITCH
IGNITION COIL
SPARK PLUG
NEUTRAL SWITCH
REVERSE SWITCH
REVERSE INDICATOR LIGHT
NEUTRAL INDICATOR LIGHT
HEADLIGHT
Diagram Key
Color Code

YTM225 ERN


BATTERY
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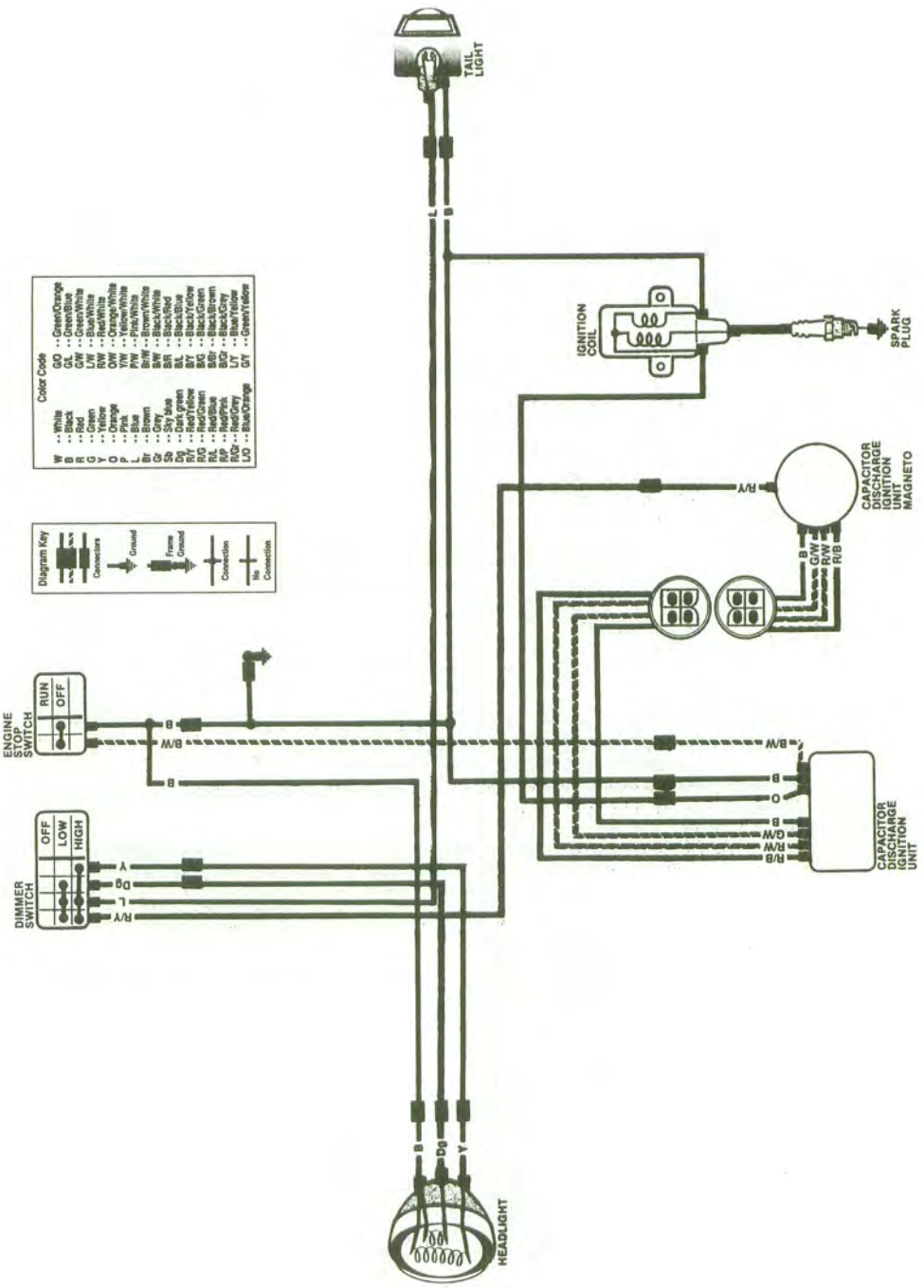
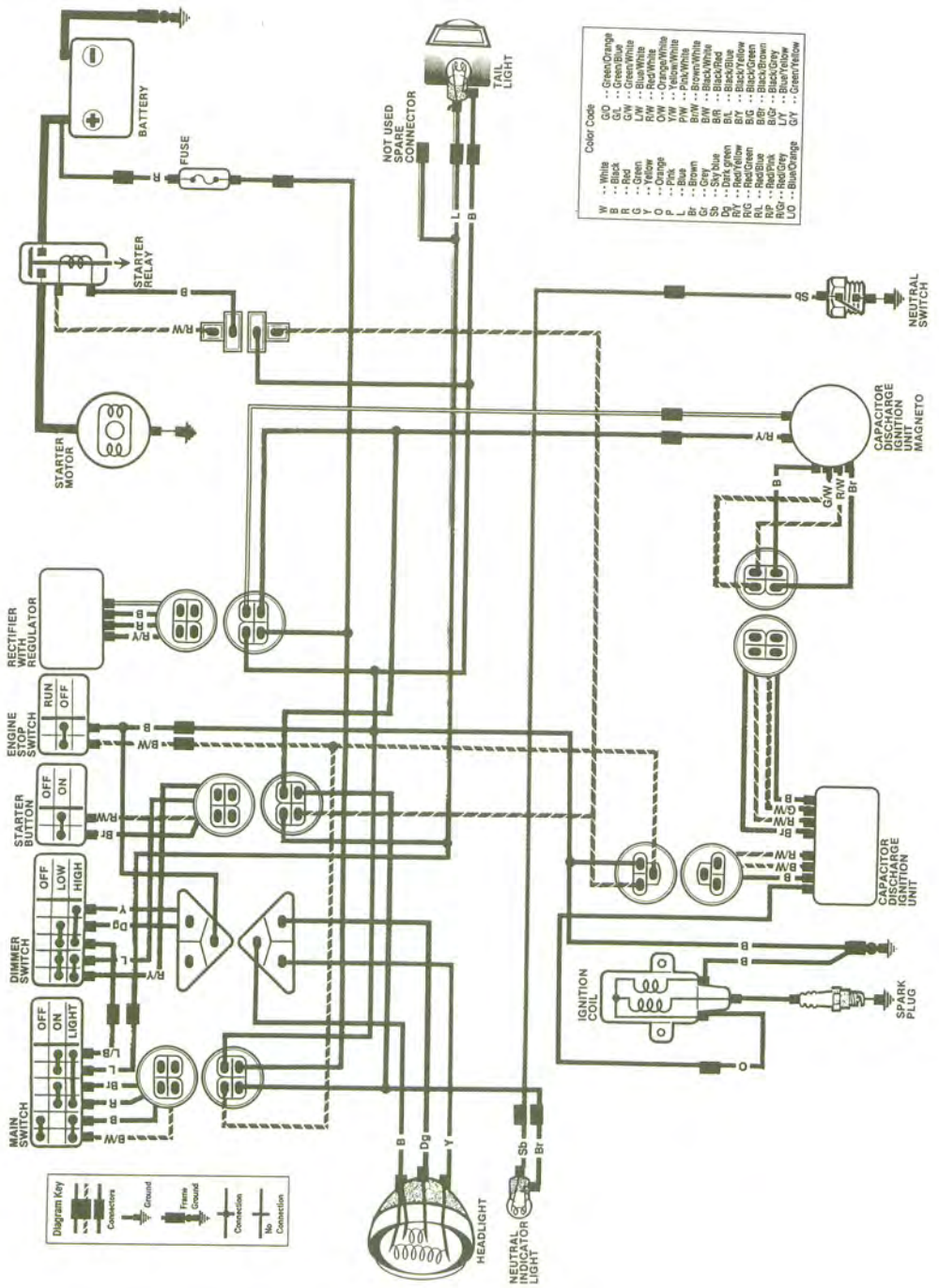
IGNITION COIL
SPARK PLUG
HEADLIGHT
REVERSE INDICATOR LIGHT
NEUTRAL INDICATOR LIGHT
Color Code
W -- White
B -- Black
R -- Red
G -- Green
Y -- Yellow
O -- Orange
P -- Pink
L -- Blue
Br -- Brown
Gr -- Grey
Sb -- Sky blue
Lg -- Leaf green
R/Y -- Red/Yellow
R/G -- Red/Green
R/L -- Red/Blue
R/P -- Red/Pink
R/Gr -- Red/Grey
L/O -- Blue/Orange
G/O -- Green/Orange
G/L -- Green/Blue
G/W -- Green/White
L/W -- Blue/White
R/W -- Red/White
O/W -- Orange/White
Y/W -- Yellow/White
P/W -- Pink/White
Br/W -- Brown/White
B/W -- Black/White
B/R -- Black/Red
B/L -- Black/Blue
B/Lg -- Black/Green
B/Y -- Black/Yellow
B/G -- Black/Green
B/Bl -- Black/Brown
B/Gr -- Black/Grey
L/Y -- Blue/Yellow
G/Y -- Green/Yellow
Diagram Key
Connection
Ground
Frame Ground
Connection
No Connection

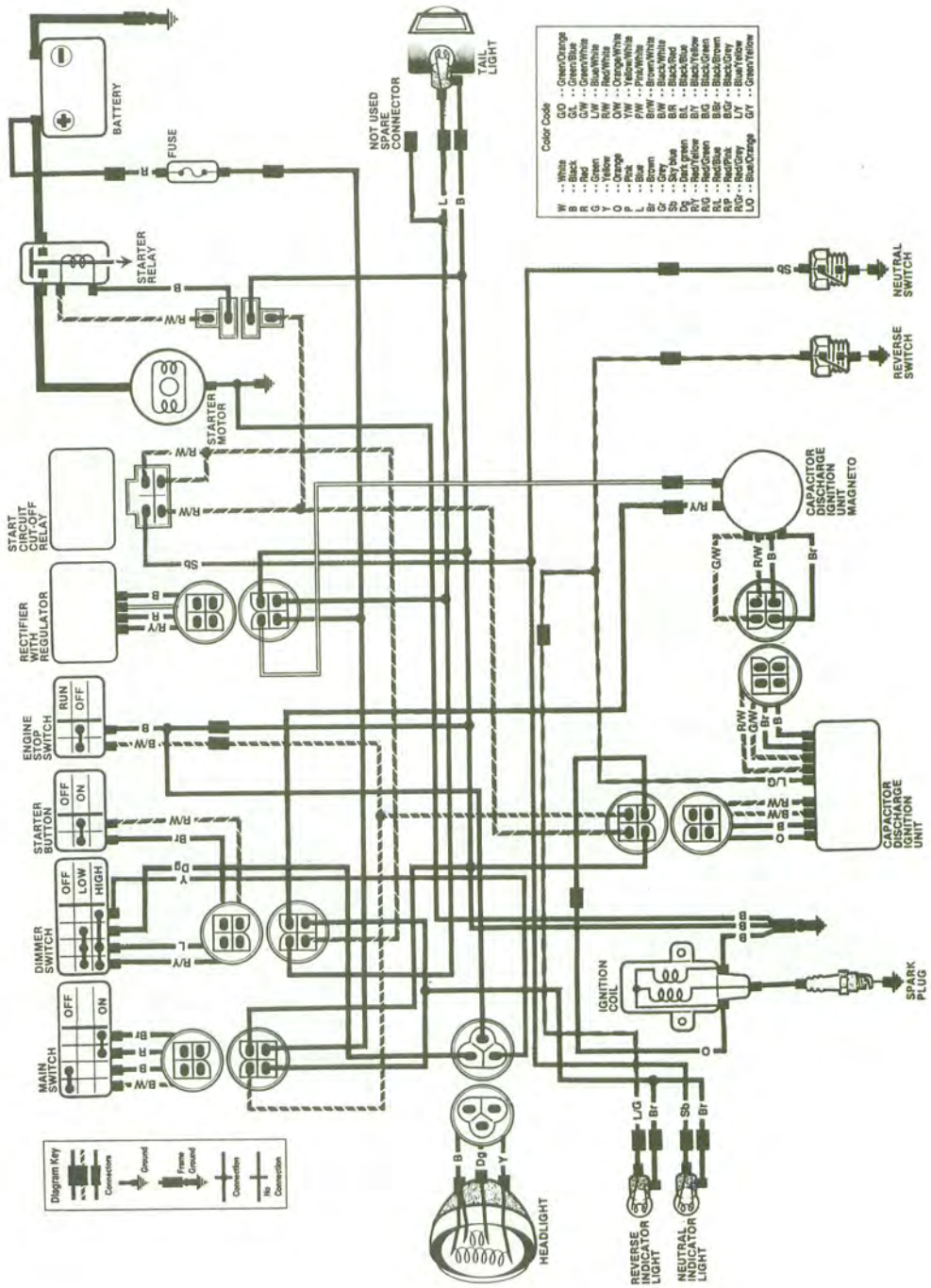
YTM200 K, L, N


TAIL LIGHT
IGNITION COIL
SPARK PLUG
CAPACITOR DISCHARGE IGNITION UNIT MAGNETO
ENGINE STOP SWITCH
RUN
OFF
DIMMER SWITCH
OFF
LOW
HIGH
CAPACITOR DISCHARGE IGNITION UNIT
HEADLIGHT
Color Code
Diagram Key
Ground
Frame Ground
Connection
No Connection

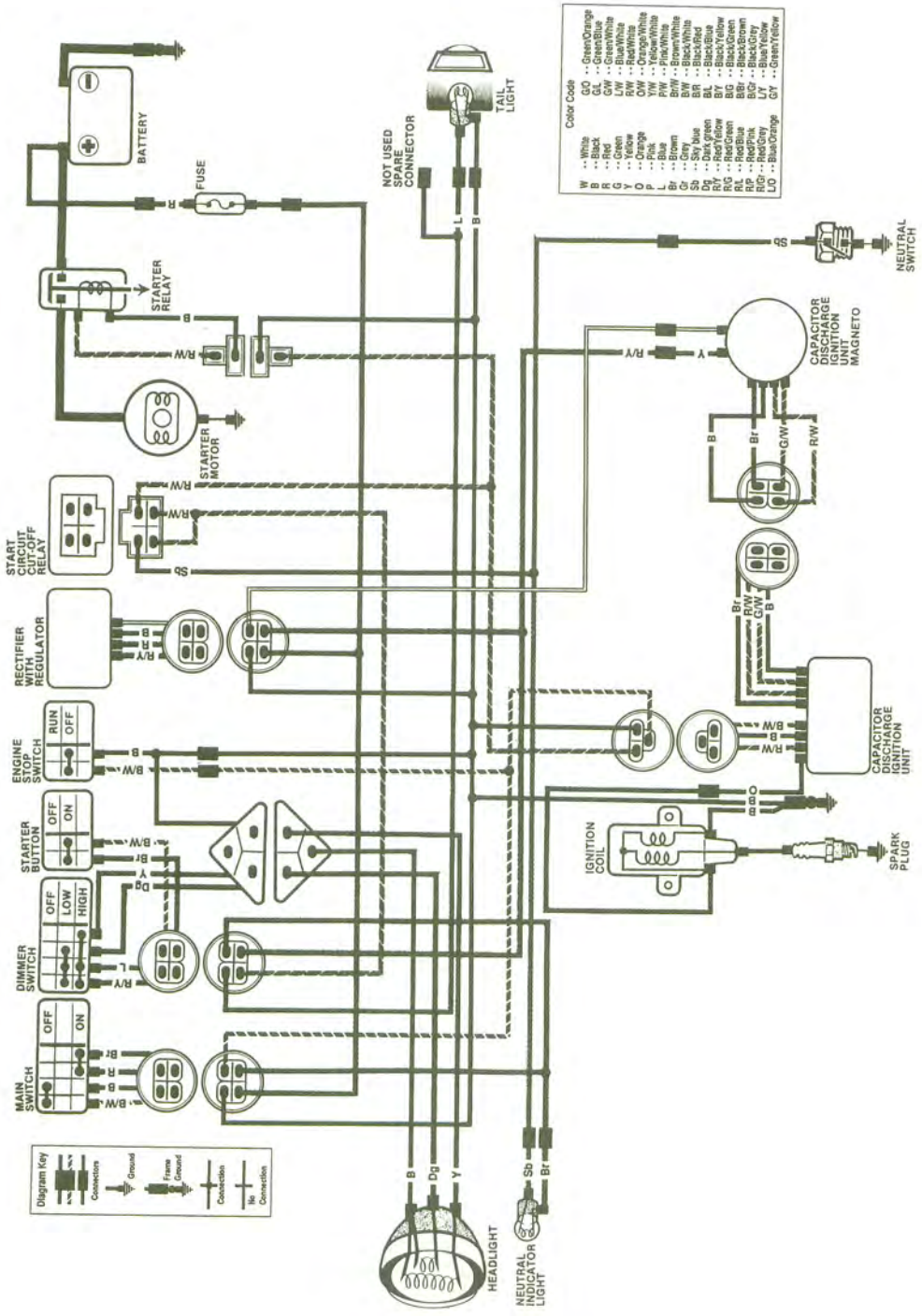
YTM200 EK, EL


BATTERY
FUSE
STARTER RELAY
STARTER MOTOR
NOT USED SPARE CONNECTOR
TAIL LIGHT
NEUTRAL SWITCH
CAPACITOR DISCHARGE IGNITION UNIT MAGNETO
RECTIFIER WITH REGULATOR
ENGINE STOP SWITCH
RUN
OFF
STARTER BUTTON
OFF
ON
DIMMER SWITCH
OFF
LOW
HIGH
MAIN SWITCH
OFF
ON
LIGHT
CAPACITOR DISCHARGE IGNITION UNIT
IGNITION COIL
SPARK PLUG
HEADLIGHT
NEUTRAL INDICATOR LIGHT
Color Code
W : White
B : Black
R : Red
G : Green
Y : Yellow
O : Orange
P : Pink
L : Blue
Br : Brown
Gr : Grey
Sb : Sky blue
Dg : Dark green
BY : Black/Yellow
BG : Black/Green
BL : Black/Blue
BR : Black/Brown
BGr : Black/Grey
LY : Blue/Yellow
GY : Green/Yellow
GO : Green/Orange
OB : Orange/Black
GW : Green/White
LW : Blue/White
RW : Red/White
OW : Orange/White
YW : Yellow/White
PW : Pink/White
BrW : Brown/White
BW : Black/White
BR : Black/Red
BL : Black/Blue
BY : Black/Yellow
BG : Black/Green
BL : Black/Blue
BR : Black/Brown
BGr : Black/Grey
LY : Blue/Yellow
LO : Blue/Orange
GY : Green/Yellow
Diagram Key
Connectors
Ground
Frame Ground
Connection
No Connection

YTM225 DRN, DRS



YTM225 DXK, DXL, DXN



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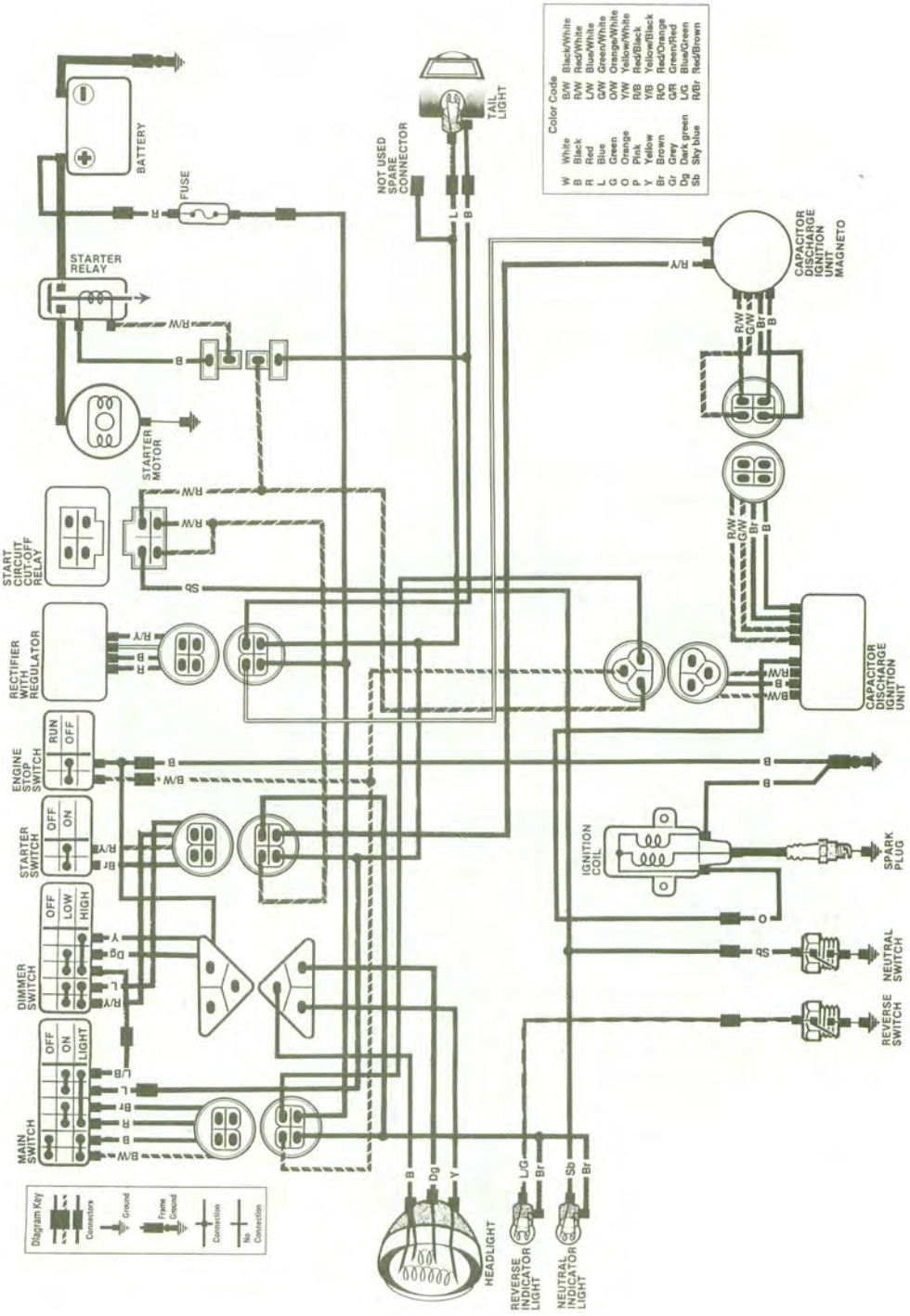
YTM225 ERN


Color Code
W White B/W Black/White
B Black R/W Red/White
R Red L/W Blue/White
L Blue G/W Green/White
G Green O/W Orange/White
O Orange Y/W Yellow/White
P Pink R/B Red/Black
Y Yellow Y/B Yellow/Black
Br Brown R/O Red/Orange
Gr Grey G/R Green/Red
Dg Dark green L/G Blue/Green
Sb Sky blue R/Br Red/Brown
BATTERY
FUSE
STARTER RELAY
STARTER MOTOR
START CIRCUIT CUT-OFF RELAY
RECTIFIER WITH REGULATOR
ENGINE STOP SWITCH
STARTER SWITCH
DIMMER SWITCH
MAIN SWITCH
NOT USED SPARE CONNECTOR
TAIL LIGHT
CAPACITOR DISCHARGE IGNITION UNIT MAGNETO
CAPACITOR DISCHARGE IGNITION UNIT
IGNITION COIL
SPARK PLUG
NEUTRAL SWITCH
REVERSE SWITCH
HEADLIGHT
REVERSE INDICATOR LIGHT
NEUTRAL INDICATOR LIGHT
Diagram Key
Connectors
Ground
Frame Ground
Connection
No Connection