

YAMAHA YDS-3 AND YM-1 MODELS

MODEL	YDS-3	YM-1
Displacement—cc	246	305
Bore—MM	56	60
Stroke—MM	50	54
Number of cylinders	2	2
Engine lubrication	Oil Injection	Oil Injection
Spark plug—		
NGK	B-8HC	B-8HC
Electrode gap—MM	0.6-0.7	0.6-0.7
Inch	0.024-0.028	0.024-0.028
Ignition—		
Point gap—MM	0.30-0.35	0.30-0.35
Inch	0.012-0.014	0.012-0.014
Timing—MM BTDC	1.8	2.0
Electrical system voltage	6	6
Battery terminal grounded	Neg	Neg
Tire size—Front	3.00-18	3.00-18
Rear	3.25-18*	3.25-18
Tire pressure—		
Front—kg/cm ²	1.6	1.6
Psi	22	22
Rear—kg/cm ²	2.0	2.0
Psi	28	28
Rear chain free play—MM	16-20	16-20
Inch	5/8-3/4	5/8-3/4
Rear chain size	#525	#525
Number of speeds	5	5

*YDS-3C models use 3.50x18 rear tire.

Illustrations courtesy of Yamaha International Corporation

MAINTENANCE

SPARK PLUGS. Recommended spark plug electrode gap is 0.6-0.7MM (0.024-0.028 in.). Suggested spark plug for normal use is NGK type B-8HC. Champion L-5 or L-81 can be used.

CARBURETORS. Two Mikuni VM carburetors are used. Idle speed should be set at approximately 1,200 rpm by turning adjusters (2—Fig. Y5-1). Make sure that throttle slides (7) both stop at exactly the same position and exhaust pressure is the same for both cylinders. Idle mixture is changed by turning needles (11). Initial setting is 1½ turns open. Turning the needle counter-clockwise leans the mixture. Carburetors must be synchronized to open ex-

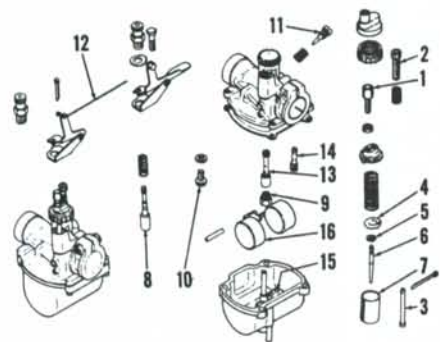


Fig. Y5-1—Exploded view of Mikuni VM carburetor. Starting valves for both carburetors are connected with rod (12).

1. Throttle cable guide
2. Idle speed adjuster
3. Idle speed rod
4. Retainer
5. Clip
6. Valve needle
7. Throttle slide
8. Starting valve
9. Main jet
10. Fuel inlet valve
11. Idle mixture needle
12. Link rod
13. Needle jet
14. Pilot jet
15. Starting jet
16. Float

actly the same amount by turning cable guides (1) on top of each carburetor. To synchronize, begin by turning idle speed adjusters (2) all the way down, then adjust cable guides (1) to begin raising throttle slides at the same time. Throttle cables must have some slack (free play). After carburetors are correctly synchronized, adjust idle speed and pump control cable.

Float level (H—Fig. Y5-2) should be 25.5MM (1 in.) and is adjusted by bending tang (17) on float. Refer to Fig. Y5-1 and the following standard specifications:

YDS-3 and YDS-3C

Main jet (9) #120 or 130
 Pilot jet (14) #20
 Needle jet (13) 0-0
 Valve needle (6) 4D4
 Clip (5) in second groove from top of needle (6).

YM-1

Main jet (9) #130
 Pilot jet (14) #20
 Needle jet (13) 0-0
 Valve needle (6) 4D4
 Clip (5) in second groove from top of needle (6).

IGNITION AND ELECTRICAL.

All models are equipped with a battery ignition system with an individual set of breaker points, condenser and coil for each cylinder. The generator is mounted at the right end of the crankshaft and the breaker points are mounted on the generator stator.

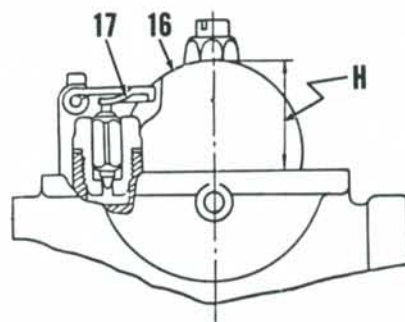


Fig. Y5-2—Float level (H) is adjusted by bending tang (17).

Breaker point gap at maximum opening should be 0.30-0.35MM (0.012-0.014 in.). The breaker points should just open when the piston is 1.8MM (0.071 in.) BTDC on YDS-3 models and 2.0MM (0.079 in.) BTDC on YM-1 models. Ignition timing must be checked and adjusted individually for each cylinder. A static timing light or meter can be used to indicate point opening and a dial indicator in the spark plug hole to position the piston. Timing is changed by moving the breaker point assembly in the elongated holes after loosening the two mounting screws.

LUBRICATION. The engine is lubricated by oil contained in a separate tank. A pump and metering unit pumps oil from the tank to each cylinder inlet passage. The oil should **never** be allowed to run dry. SAE 30 two-stroke oil should be used. The oil pump control cable should be accurately adjusted to provide the correct amount of oil. If the cable adjustment is incorrect, the engine may be damaged.

Before adjusting the pump control cable, it is important that the throttle cable guides (1—Fig. Y5-1) are correctly set. To adjust the throttle cable guides, turn the idle speed adjusters (2) all the way down, then synchronize cable guides (1) so that both throttle slides (7) begin to move at exactly the same time when the hand grip is turned. The throttle cables should have approximately 1/16-inch free play after they are synchronized. Adjust the idle speed to 1,100-1,300 rpm by turning both idle adjusters (2). Make certain that both throttle slides stop at exactly the same time. Turn the throttle hand grip just enough to take up free play from the throttle cables (without changing idle speed) and check the oil pump setting mark and guide pin as

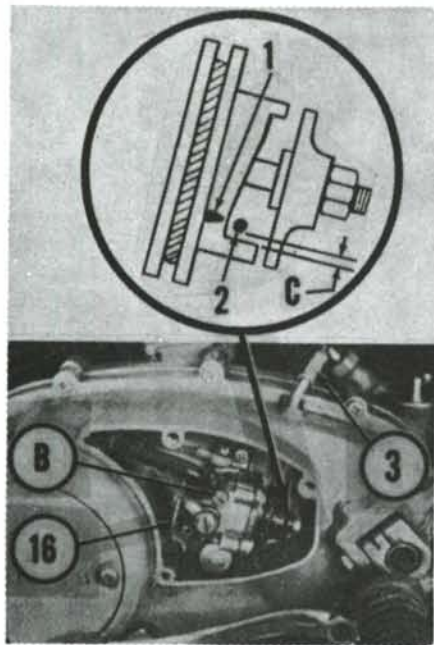


Fig. Y5-5—When carburetor controls are correctly adjusted and engine is at idle speed, mark (1) should be aligned with guide pin (2); cable adjuster is shown at (3). Clearance (C) at idle should be 0.35-0.40MM.

shown in Fig. Y5-5. If the "V" mark (1) is not exactly aligned with guide pin (2); loosen the lock nut and turn the pump cable adjuster (3) as required for alignment.

Check the minimum plunger stroke by turning starter plate (16—Fig. Y5-5) until clearance (A—Fig. Y5-7) between pulley and adjusting plate is at minimum. Clearance (A) should be 0.25-0.35MM (0.0098-0.0138 inch). If clearance is incorrect, add or deduct shims (8).

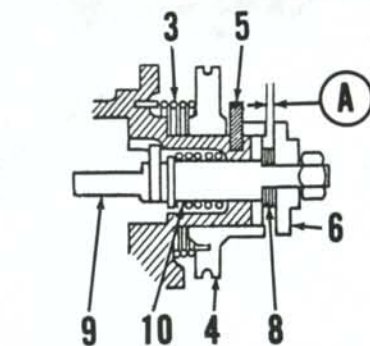


Fig. Y5-7—Clearance (A) should be 0.25-0.35MM and is adjusted by varying shims (8).

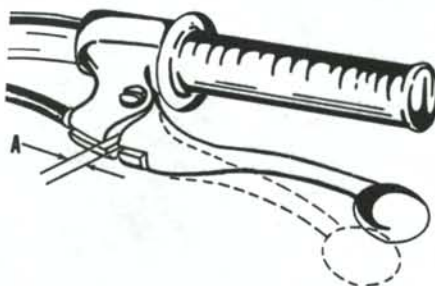


Fig. Y5-9—The clutch hand lever should have 2-3MM free play at (A).

If oil lines are drained or pump is removed, it is important that all lines be filled before starting engine. Remove bleeder screw (B—Fig. Y5-5) and pull the control cable up out of cable guide (3). Turn starter plate (16) until oil without air bubbles flows from the bleeder screw hole, then reinstall bleeder screw (B) and start engine. Run engine at idle speed until oil delivery lines (20—Fig. Y5-6) are free of air bubbles.

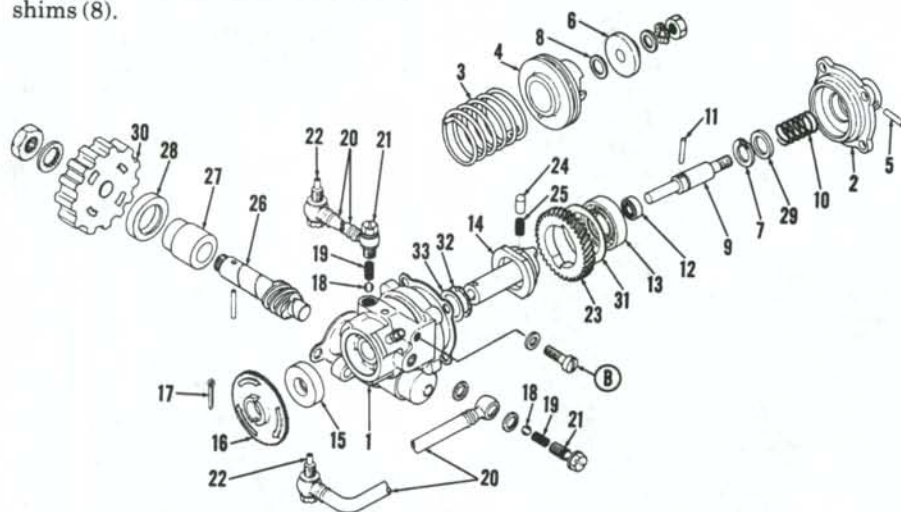


Fig. Y5-6—Exploded view of the oil injection pump unit. Bleeder screw is shown at (B).

- | | | | |
|------------------|---------------------------|--------------------|----------------------|
| 1. Pump case | 10. Plunger return spring | 17. Drive pin | 25. Spring |
| 2. Cover | 11. Cam guide pin | 18. Check balls | 26. Worm shaft |
| 3. Pulley spring | 12. Plunger oil seal | 19. Springs | 27. Bushing |
| 4. Adjust pulley | 13. Plunger cam oil seal | 20. Delivery pipes | 28. Oil seal |
| 5. Guide pin | 14. Distributor | 21. Injector bolt | 29. Spring seat |
| 6. Adjust plate | 15. Oil seal | 22. Worm wheel | 30. Drive gear |
| 7. Snap ring | 16. Starter plate | 23. Worm wheel pin | 31. Worm wheel plate |
| 8. Shims | | | 32. Wave washer |
| 9. Plunger | | | 33. Plate |

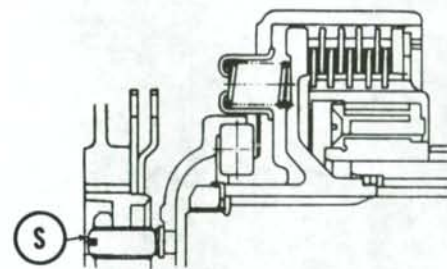


Fig. Y5-10—The clutch adjusting screw (S) is located under the small, round cover on engine left side cover.

The gear box contains 1.7 quarts of SAE 30 or 10W/30 motor oil and should be drained and refilled every 2000 miles.

CLUTCH CONTROLS. The clutch hand lever should have 1/16-1/8 inch free play at (A—Fig. Y5-9). To adjust, remove the cover from left side of engine and loosen lock nut. Turn the adjusting screw (S—Fig. Y5-10) in until slight resistance is felt, then back screw out 1/4 turn and tighten lock nut. Turn the cable guide at ends of cable until the hand lever free play (A—Fig. Y5-9) is correct.

SUSPENSION. Each front suspension unit contains 200cc of oil. The oil used should be a mixture of 80%SAE 30 motor oil and 20% SAE 60 spindle oil. Oil should be renewed every 4,000 miles.

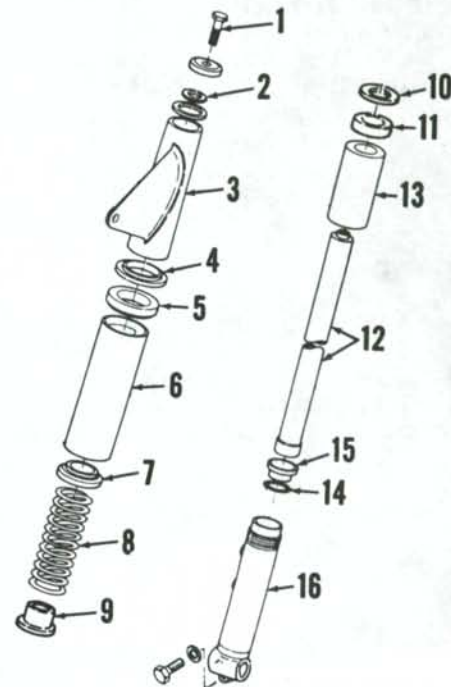


Fig. Y5-12—Exploded view of the front suspension system.

- | | |
|-----------------|----------------|
| 1. Filler screw | 9. Spring seat |
| 2. Seal | 10. Washer |
| 3. Cover | 11. Oil seal |
| 4. Guide | 12. Inner tube |
| 5. Washer | 13. Tube nut |
| 6. Cover | 14. "O" ring |
| 7. Spring seat | 15. Bushing |
| 8. Spring | 16. Lower tube |

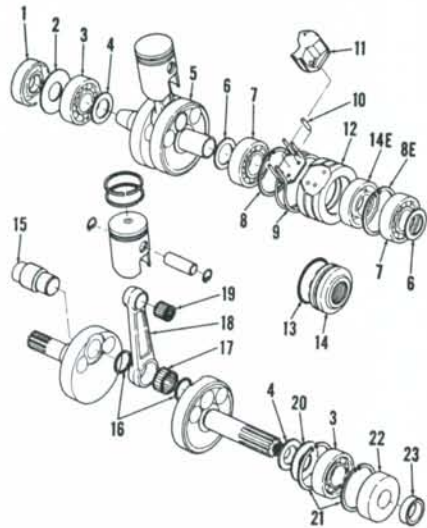


Fig. Y5-14—Exploded view of the crankshaft assembly. Parts (8E & 14E) should be discarded if later type seal (13 & 14) is installed.

- | | |
|-----------------------------------|-----------------------------------|
| 1. Oil seal | 13. "O" ring (late type) |
| 2. Bearing cover | 14. Center seal (late type) |
| 3. Main bearings | 14E. Center seal (early lip type) |
| 4. Shims | 15. Crankpin |
| 5. Crankshaft right cylinder half | 16. Crankpin washers |
| 6. Shims | 17. Crankpin bearing |
| 7. Center main bearings | 18. Connecting rod |
| 8. Snap ring | 19. Piston pin bearing |
| 8E. Snap ring (early models) | 20. Shim |
| 9. Gasket | 21. Snap ring |
| 10. Pin | 22. Oil seal |
| 11. Filler piece | 23. Collar |
| 12. Center housing | |

REPAIRS

PISTONS, RINGS AND CYLINDERS. Each piston can be removed after removing exhaust pipe, carburetor, cylinder head and cylinder. Refer to the following specifications:

- Ring end gap—
- Top ring 0.15-0.30MM (0.006-0.012 in.)
 - Second ring 0.1-0.2MM (0.004-0.008 in.)
- Standard cylinder bore diameter
- YDS-3 56MM (2.20 inch)
 - YM-1 60MM (2.36 inch)
- Maximum cylinder bore taper or out of round 0.05MM (0.002 in.)

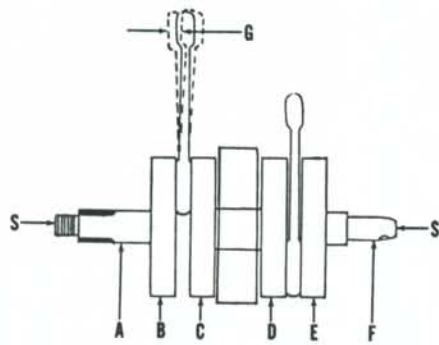


Fig. Y5-15—Refer to text to check crankshaft for correct assembly or wear.

Fig. Y5-16—Exploded view of the clutch assembly. Parts (1, 2 & 3) are located in the left cover.

1. Adjusting screw
2. Return spring
3. Release lever and screw
4. Push crown
5. Release bearing
6. Nut
7. Lock plate
8. Clutch drum
9. Spring cup
10. Spring
11. Drive plate
12. Friction discs (5 used)
13. Clutch plate (4 used)
14. Clutch plate (thick)
15. Snap ring
16. Thrust washers
17. Inner thrust washer
18. Primary drive gear bearing
19. Clutch hub and primary drive gear
20. Thrust washer (larger I.D.)
21. Thrust washer (small I.D.)

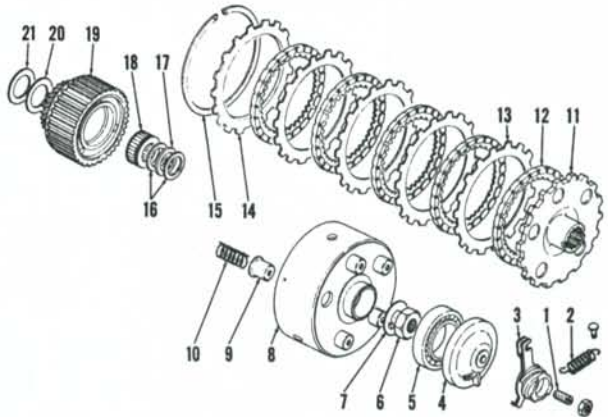
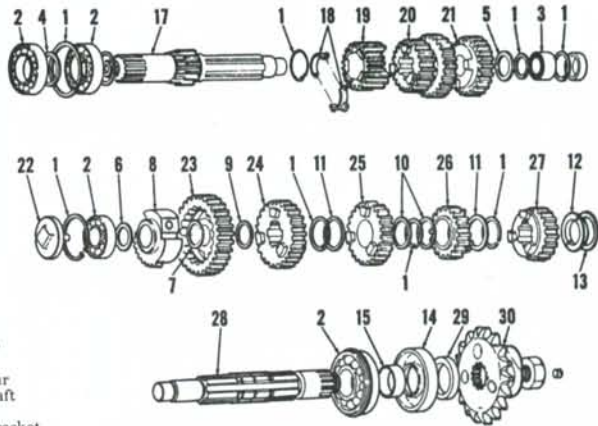


Fig. Y5-19—Exploded view of transmission. Refer also to Fig. Y5-20.

1. Snap rings
2. Ball bearings
3. Needle bearing
4. Spacer
5. Washer
6. Shim
7. Thrust washer
8. Kick starter pinion
9. Spacer
10. Washers
11. Washers
12. Setting plate
13. Shim
14. Oil seal
15. Collar
17. Input shaft
18. Setting plate
19. Second gear
20. Third & fifth gear
21. Fourth gear
22. Oil catcher
23. First gear
24. Second gear
25. Third gear
26. Fifth gear
27. Fourth gear
28. Output shaft
29. Spacer
30. Output sprocket



Piston skirt to cylinder clearance—

- YDS-3 0.050-0.055MM (0.0020-0.0022 in.)
- YM-1 0.054-0.058MM (0.0021-0.0023 in.)

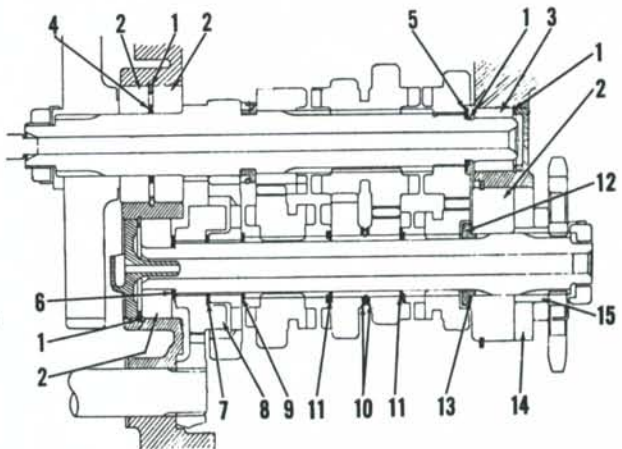
Piston skirt clearance in cylinder bore should be measured by first measuring piston diameter at right angles to piston pin and cylinder bore diameter, then subtracting. The piston should be measured 10MM (0.4 inch) above bottom edge of skirt. The dark piston ring should be installed in lower groove and chrome plated ring should

be in top groove. Make sure that rings correctly engage pins in the ring grooves. Pistons should be installed on connecting rods with arrow pointing toward front. Cylinder head stud nuts should be torqued to 180 inch-pounds.

CONNECTING RODS AND CRANKSHAFT. The crankcase halves must be separated to remove the crankshaft. Connecting rods, crankpins, rod bearings and the center main bearings are removed by pressing the crankshaft apart. The crankshaft

Fig. Y5-20—Cross sectional view of the transmission assembly showing location of spacers and washers.

1. Snap rings
2. Ball bearings
3. Needle bearing
4. Spacer (1.8MM)
5. Washer (1.0MM)
6. Shim
7. Thrust washer O.D. 26MM (1.0MM thick)
8. Kickstarter pinion
9. Spacer O.D. 28MM (1.0MM thick)
10. Washers O.D. 32MM (1.0MM thick)
11. Washer O.D. 26MM (1.0MM thick)
12. Setting plate
13. Shim O.D. 34MM (1.2MM thick)
14. Oil seal
15. Collar



SERVICE

should be disassembled **ONLY** if required tools are available to correctly check and align the reassembled crankshaft. If side shake (G—Fig. Y5-15) at piston pin end of connecting rod exceeds 2MM (0.08 in.), the connecting rod, crankpin and lower bearing should be renewed. Shake (G) should be 0.8-1.0MM (0.032-0.039 in.). Side clearance of connecting rod between the crankshaft counter weights can be measured with a feeler gage. Side clearance should be 0.1-0.3MM

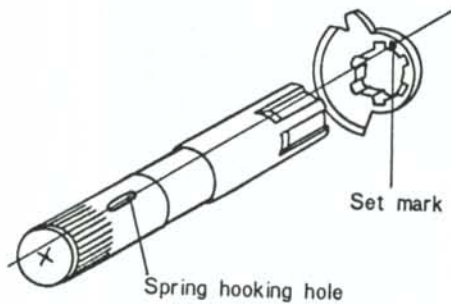


Fig. Y5-21—Mark on kickstarter gear should be aligned with spring hooking hole as shown.

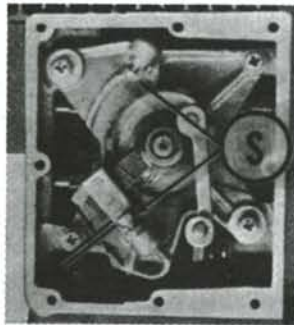


Fig. Y5-22—Gear change stop bolts (S) should have approximately 1MM clearance when stop ball engages detent in shifter cam.

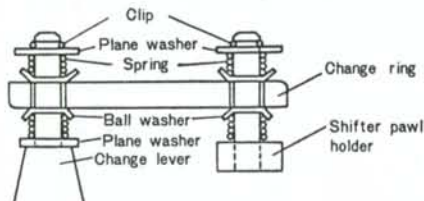


Fig. Y5-23—View of shift change ring installation.

(0.0039-0.012 in.). With crankshaft supported between lathe centers (S—Fig. Y5-15), maximum eccentricity when measured with dial indicator at points (A & F) should not exceed 0.03MM (0.0012 in.) and should not exceed 0.06MM (0.0024 in.) at points (B, C, D & E).

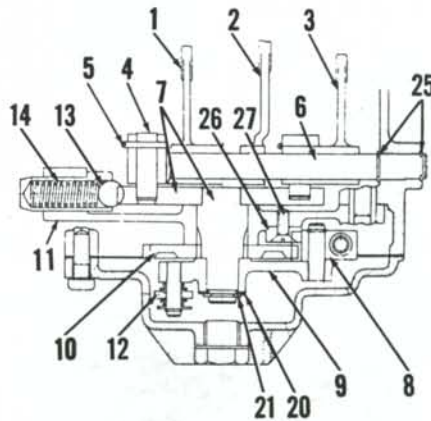
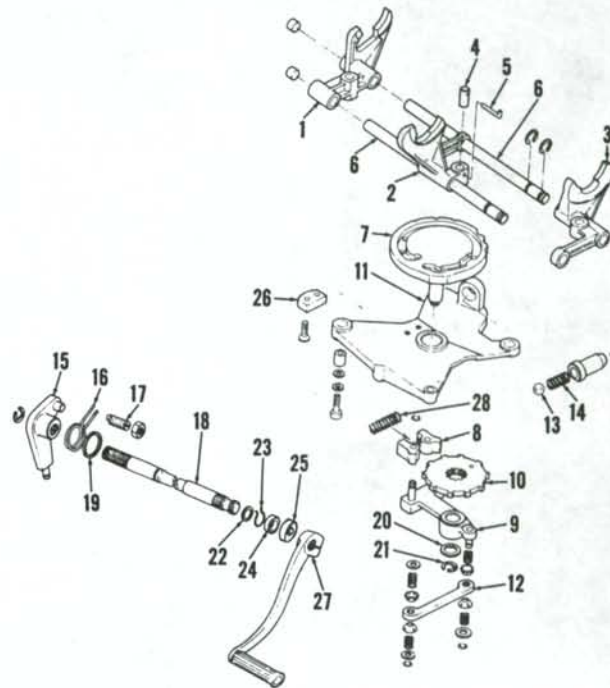


Fig. Y5-24—Cross sectional view of the shift assembly. Refer to Fig. Y5-25 for legend.

Fig. Y5-25—Exploded view of shift assembly. Shift fork (1) moves gear (26—Fig. Y5-19), fork (2) moves gear (20—Fig. Y5-19) and fork (3) moves gear (24—Fig. Y5-19).

1. Shift fork (5th)
2. Shift fork (2nd & 4th)
3. Shift fork (1st & 3rd)
4. Shift rotor (3 used)
5. Stop pin (3 used)
6. Shift rails
7. Shift cam
8. Shifter pawls
9. Pawl holder
10. Working plate
11. Mounting plate
12. Change link
13. Cam detent ball
14. Detent spring
15. Change lever
16. Return spring
17. Eccentric screw
18. Shift pedal shaft
19. Washer
20. Shims
21. Snap ring
22. Washer
23. Snap ring
24. Oil seal
25. Seal
26. Pawl plate
27. Shift pedal
28. Shift pawl spring



Yamaha YDS-3 and YM-1

CLUTCH. The multiple disc wet type clutch is located on the left end of the crankshaft. The clutch can be removed after removing the engine left side cover and the clutch retaining nut (6—Fig. Y5-16).

Clutch friction discs (12) should be renewed if less than 4MM (0.158 in.) thick. Thickness when new is 4.3MM (0.169 in.). Free length of clutch springs (10) should be 25.4MM (1 in.). Springs should be renewed if less than 23.5MM (0.925 in.). Inspect all parts for wear, warpage or evidence of overheating.

CRANKCASE AND GEAR BOX.

The 5 speed transmission is shown in Figs. Y5-19 and Y5-20. The kickstarter gear should be installed on shaft with mark on gear aligned with spring hooking hole as shown in Fig. Y5-21. Shifter stop bolts (S—Fig. Y5-22) should have approximately 1MM (0.04 in.) clearance as the stop ball falls into detent in the cam.

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