Yamaha Enduros

Model Coverage

Years 1968 - 1976

JT1	AT1/B/C
JT2/M/L	AT2, AT3
GT1/MX	DT125A/B/C
GTMXB	CT1/B/C, CT2, CT3
GT80B/C	DT175A/B/C
HT1/B/MX	DT1/B/S/C/E, DT2, DT3
L5T/A	DT250A/B/C
LT2/2M	RT1/B, RT2, RT3
LT3	DT360A
DT100A/B/C	DT400B/C

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General Specifications

	JT1 JT2 M L	GT1/MX GT80A/B/C	GTMXB	HT1/B	HT1BMX	L5T/A	LT2 LT3	LT2M
Net Weight (lbs)	121②	141	130	190	181	198	187	185
Overall Length (in.)	41.5	63.4③	61.0	73.8	73.4	70.9	75.2	74.0
Overall Width (in.)	27.6	27.2	27.2	35.4	35.4	31.7	35.4	34.1
Overall Height (in.)	36.6	36.6	36.6	40.7	40.9	40.2	41.3	42.5
Ground Clearance (in.)	6.3	7.7	7.7	8.9	9.1	6.3	8.6	8.3
Wheelbase (in.)	45.1	41.1	41.1	48.0	48.4	46.3	48.8	49.6
Tire Size (in.) Front	2.50 x 15	2.50 x 15	2.50 x 15	2.75 x 18	3.00 x 18	2.75 x 17	2.75 x 18	2.75 x 19
Rear	2.50 x 15	2.50 x 14	2.75 x 14	3.00 x 18	3.25 x 18	3.00 x 17	3.00 x 18	3.00 x 18
Displacement (cc)	58	72	72	89	89	97	97	97
Bore x Stroke (mm)	42 x 42	47 x 42	47 x 42	50 x 45.6	50 x 45.6	52 x 45.6	52 x 45.6	52 x 45.6
Compression Ratio (: 1)	6.4	6.8	6.8	6.8	8.1	6.8	6.9	7.8
Transmission	4-speed	4-speed	4-speed	5-speed	5-speed	3-speed④	5-speed	5-speed
Fuel Induction①	RV	RD	RD	PP	PP	RV	RD	RD

	DT100A/B/C	AT1 B/C	AT2, AT3	DT125A/B	DT125C	CT1C CT1, CT1B CT2 (1971)	CT2 (1972–73) CT3	DT175A/B
Net Weight (lbs)	201	218	221	227	229	211	214	214
Overall Length (in.)	77.8	77.2	77.2	79.3	79.3	77.4	77.2	79.5
Overall Width (in.)	34.3	35.8	35.8	34.3	34.3	35.8	35.8	34.3
Overall Height (in.)	42.5	42.9	42.9	42.5	42.8	43.1	42.9	42.9
Ground Clearance (in.)	8.9	8.9	8.9	9.1	9.3	9.1	8.9	9.1
Wheelbase (in.)	50.4	50.6	50.6	51.6	51.6	50.6	50.6	52.2
Tire Size (in.) Front	2.75 x 19	3.00 x 18	3.00 x 18	3.00 x 19	2.75 x 21	3.25 x 18	3.25 x 18	3.00 x 19
Rear	3.00 x 18	3.25 x 18	3.25 x 18	3.25 x 18	3.25 x 18	3.50 x 18	3.50 x 18	3.50 x 18
Displacement (cc)	97	123	123	123	123	171	171	171
Bore x Stroke (mm)	52 x 45.6	56 x 50	56 x 50	56 x 50	56 x 50	66 x 50	66 x 50	66 x 50
Compression Ratio (: 1)	6.8	7.0	7.1	7.1	7.1	6.8	7.1	6.8
Transmission	5-speed	5-speed	5-speed	5-speed	5-speed	5-speed	5-speed	5-speed
Fuel Induction①	RD	PP	RD	RD	RD	⑤	RD	RD

	DT175C	DT1	DT1B S C	DT1E DT2	DT3	DT250A	DT250B C	RT1/B RT2
Net Weight (lbs)	214	232	232	⑥	258	265	266	258
Overall Length (in.)	79.5	78.3	81.1	78.3	83.7	85.8	85.8	82.7
Overall Width (in.)	34.3	28.9	28.9	28.9	35.0	34.3	34.3	35.0
Overall Height (in.)	42.9	42.5	42.5	43.5	46.1	44.9	44.9	45.7
Ground Clearance (in.)	9.3	9.6	9.6	10.0	10.2	7.9	8.7	10.0
Wheelbase (in.)	52.2	50.8	51.6	54.7	54.7	55.7	55.7	54.7
Tire Size (in.) Front	2.75 x 21	3.25 x 19	3.25 x 19	3.25 x 19	3.00 x 21	3.00 x 21	3.00 x 21	3.25 x 19
Rear	3.50 x 18	4.00 x 18	4.00 x 18	4.00 x 18	4.00 x 18	4.00 x 18	4.00 x 18	4.00 x 18
Displacement (cc)	171	246	246	246	246	246	246	351
Bore x Stroke (mm)	66 x 50	70 x 64	70 x 64	70 x 64	70 x 64	70 x 64	70 x 64	80 x 70
Compression Ratio (: 1)	6.8	6.8	6.8	6.4	6.8	6.8	6.8	6.6
Transmission	5-speed	5-speed	5-speed	5-speed	5-speed	5-speed	5-speed	5-speed
Fuel Induction①	RD	PP	PP	⑦	RD	RD	RD	⑧

General Specifications (cont.)

	RT3	DT360A	DT400B/C
Net Weight (lbs)	262	276	273
Overall Length (in.)	83.3	85.8	85.8
Overall Width (in.)	35.0	34.3	34.3
Overall Height (in.)	46.1	44.9	44.9
Ground Clearance (in.)	10.2	8.7	8.7
Wheelbase (in.)	54.7	56.1	55.5
Tire Size (in.) Front	3.00 x 21	3.00 x 21	3.00 x 21
Rear	4.00 x 18	4.00 x 18	4.00 x 18
Displacement (cc)	351	351	397
Bore x Stroke (mm)	80 x 70	80 x 70	85 x 70
Compression Ratio (: 1)	NA	6.4	6.4
Transmission	5-speed	5-speed	5-speed
Fuel Induction①	RD	RD	RD

① RV: rotary valve; PP: piston port; RD: reed valve
② JT2—132
③ GT1MX—61.0
④ Two-range transmission
⑤ CT1—PP; CT2—RD
⑥ DT1E—245; DT2—258
⑦ DT1E—PP, DT2—RD
⑧ RT1—PP; RT2—RD

Maintenance

NOTE: *Common maintenance procedures are explained in detail in "General Information."*

Lubrication

ENGINE

The crankshaft bearings, cylinder and piston are lubricated by the Yamaha "Autolube" oil injection system.

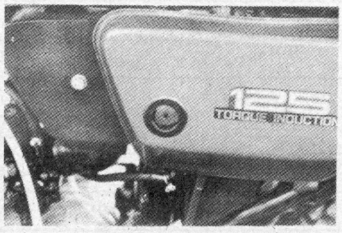
The system does not require maintenance except for a periodic check on oil pump cable adjustment and stroke provided that the Autolube tank is kept full of oil. A level glass is provided for this purpose.

"Yamalube" oil is recommended by the factory. If this is not available, one of the following types of oil can also be used:

a. Any high-quality two-stroke oil labeled "BIA certified for service TC-W";

b. Any high-quality SAE 30W two-stroke oil designed for air cooled engines.

If the Autolube tank ever runs out of oil, if the feed line is disconnected for any reason, or if removal and cleaning of the tank is ever necessary due to the presence of water or other contaminants, it is necessary to bleed the system before operating the motorcycle. Refer to the "Lubrication System" section for procedures.



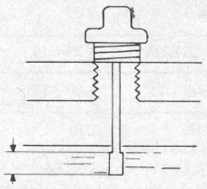
Level view port on oil tank (Courtesy Yamaha Int. Corp.)

TRANSMISSION

The transmission and clutch are lubricated by an oil bath. Yamalube 4-cycle, SAE 20W/40 or SAE 10W/30 service rating "SE" is recommended for all models.

Checking Oil

1. The machine should be on the center stand or vertically supported, preferably on a level surface when checking the transmission oil level.
2. The engine should be warm.



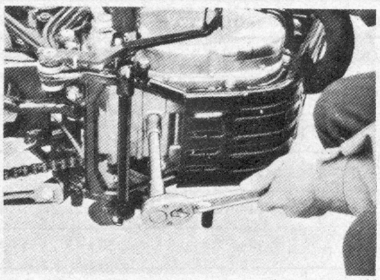
When checking transmission oil level, the dipstick should be allowed to rest on the top of the hole (Courtesy Yamaha Int. Corp.)

3. A dipstick is provided; unscrew it and wipe it off. Reinsert, allowing the dipstick cap to rest on top of the threads of its hole. The oil level should be between the maximum and minimum marks on the dipstick. If too low, add oil until the level is correct.

Changing Oil

The transmission oil should be changed at least every 2,000 miles (except for competition use) after break-in is over.

1. Oil should be changed when the engine is at or close to operating temperature.
2. The machine should be supported vertically or be on the center stand and parked on a level surface.
3. Remove the dipstick.
4. Remove the drain plug and allow the oil to drain off for several moments.



Removing the transmission drain plug (Courtesy Yamaha Int. Corp.)

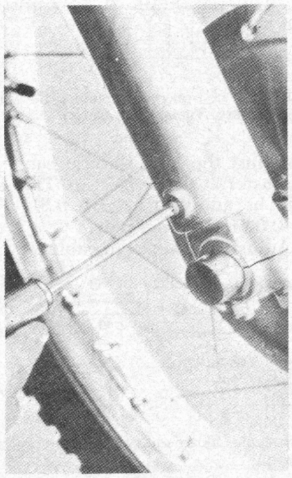
5. Check the condition of the drain plug gasket. Replace it with a new one if it is damaged or cracked. Refit the drain plug and tighten firmly. Torque to 30 ft lbs.
6. Fill the transmission with the cor-

rect type and quantity of oil. Capacity is stamped on the crankcase. After filling, allow a moment for the oil to distribute itself, then check the level with the dipstick or level plug.

NOTE: *The use of oil additives is not recommended since these may cause clutch slippage.*

FRONT FORKS

1. Change the front fork oil at the proper service intervals or when changing the fork's damping qualities is required. Refer to the charts at the end of this section for the fork capacity and recommended service intervals.
2. Yamaha fork oil or SAE 10W-30 oil is recommended for the front forks.
3. To drain the fork oil, remove the drain plug at the lower portion of one of the fork sliders. Allow the oil to drain into a suitable container; pump the slider up and down several times.



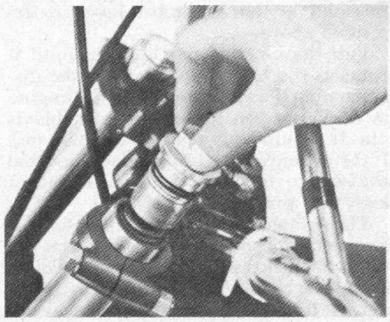
Front fork drain screw removal (Courtesy Yamaha Int. Corp.)

After most of the oil is expelled, turn the forks all the way to the right to completely drain the right fork leg, or to the left for the left fork leg. Check the condition of the drain plug gasket. Replace it if necessary. Refit and tighten the drain plug.

4. Repeat the procedure with the other fork leg.
5. Support the front wheel off the ground. Remove the fork filler bolt from the top of each fork leg. If upper triple clamp pinch-bolts are fitted, loosening these first may make removal of the filler bolts easier. On some machines, it will be necessary to loosen the handlebar clamps and move the bars to gain access to the filler bolts.
6. Add the correct quantity of oil to each fork leg.
7. Inspect the condition of the fork filler bolt O-rings if they are fitted to your model, and replace them if torn or cracked. Fit the bolts and tighten them securely. Tighten the handlebar and pinch-bolts if they were loosened.

THERMAL FLOW SHOCK ABSORBER

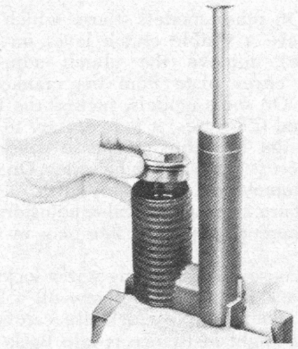
Unless you are using your machine in competition, there isn't any set interval for changing the oil in the thermal flow type shocks. The sealed type shocks, which don't have an external reservoir, have no provision for oil changes.



Removing the fork filler bolt (Courtesy Yamaha Int. Corp.)

Change the fluid every fourth meet if you're racing, whenever the shocks feel too spongy, if they leak, or if you'd like heavier oil to compensate for your weight or riding style.

Yamaha recommends using a high-quality 10W/30 oil rated SE; however ATF, heavier or lighter oil may be used at your discretion.



Removing the thermal-flow shock absorber oil reservoir cap (Courtesy Yamaha Int. Corp.)

To change the oil, remove the shock from the bike, then remove the rebound springs and the reservoir cap. Empty out the old oil and thoroughly flush out the entire unit. Pumping the shock will assure the expulsion of all the oil and solvent. Pour in the fresh oil while slowly pumping the shock to evenly distribute the oil, then reassemble the unit. Capacity is 6.1 oz (181 cc). Torque the reservoir cap to 14.5–16.7 ft lbs.

CHASSIS LUBRICATION

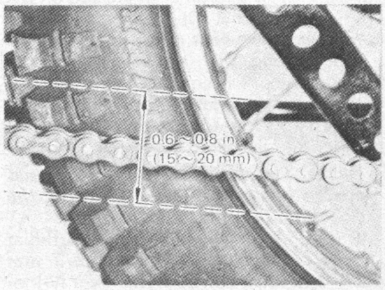
1. On most machines, the swing arm pivot is fitted with a grease nipple. This item should be lubricated with a good grade of chassis grease every 2,000 miles. Grease should be applied until some of it shows at either end of the swing arm.
2. Wheel and steering head bearings are lubricated with bearing grease. This should be accomplished every 4,000 miles. Refer to the "Chassis" section for procedures.

Service Checks and Adjustments

DRIVE CHAIN

1. The chain should have about 0.6–0.8 in. (15–20 mm) of total up-and-down free-play measured in the middle of the lower chain run.
2. *Before* checking or adjusting the chain slack, the following conditions should be met:

a. The machine should be off the center stand, and with a rider sitting on the seat;

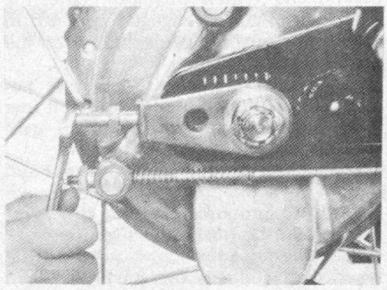


Drive chain slack adjustment (Courtesy Yamaha Int. Corp.)

b. The chain should be clean and well lubricated;

c. The chain should have been checked for any tight spots by slowly rotating the wheel and checking for variances in the chain tension at different points. If a tight spot exists, the chain should be adjusted to the prescribed free-play at the tight spot. Note, however, that such a condition is indicative of a worn chain and probably sprockets which should be replaced as soon as possible.

3. To adjust the chain, first back off the rear brake adjuster nut.
4. Remove the axle nut cotter pin and loosen the axle nut several turns. Loosen the sprocket hub securing nut (if fitted). Loosen the locknut on each adjuster bolt.
5. Turn each of the adjuster bolts (or nuts on some machines) in by equal amounts until chain tension is approximately correct.
6. Check wheel alignment by means of the adjusting marks inscribed on both sides of the swing arm. Be sure that both adjusters are lined up with the same mark



Adjusting the drive chain (Courtesy Yamaha Int. Corp.)

on each side. If not, turn one of the adjuster bolts or nuts in or out so that alignment is achieved.

7. Tighten the sprocket nut (if fitted) and the axle nut and check the chain tension. Correct if necessary. After adjustment is correct, torque the axle nut to the torque given in the Specifications chart at the end of the "Chassis" section. Fit a new cotter pin. Tighten the adjuster locknuts. Readjust the rear brake.

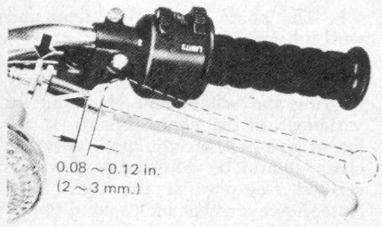
CLUTCH

There are two clutch adjustments: the clutch *plates* and the clutch *cable*. The clutch plates are adjusted by means of an adjuster screw and locknut located on the engine itself. This adjustment is made to compensate for wear of the plates.

The second adjustment, that of the clutch cable, is accomplished by means of the cable adjusters on the engine or the handlebar. This adjustment is made to compensate for cable stretch.

NOTE: *The clutch cable free-play must always be checked after adjusting the clutch plates.*

1. The clutch lever on the handlebar should be able to be moved 2–3 mm (0.08–0.12 in.) away from the lever holder before the clutch begins to disengage.



Adjust the clutch cable so that the clutch lever has the indicated amount of free-play before disengagement begins (Courtesy Yamaha Int. Corp.)

2. If adjustment is necessary, use the cable adjuster either at the handlebar or the engine until cable adjustment is correct.

3. If adjusting the cable does not provide satisfactory clutch performance, the clutch plates should be adjusted.

4. On models which have an external clutch lever on the crankcase, check the position of the clutch lever relative to the clutch pushrod. The lever should be 10° behind the clutch pushrod centerline when the clutch is engaged, and 10° in front of the pushrod centerline when the clutch is disengaged.

If the clutch crankcase lever is not properly positioned, remove the left rear (countershaft) crankcase cover to gain access to the clutch adjuster screw.

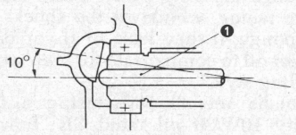
Loosen the adjuster screw locknut and tighten the screw fully. Use the cable adjuster(s) to properly position the lever just behind the pushrod centerline.

Back the adjuster screw out until the lever shaft contacts the pushrod. Then turn it in ⅛ turn and tighten the locknut.

Adjust the cable to give the proper free-play at the handlebar lever as described above.

Pull the clutch hand lever in until it contacts the hand-grip. Measure the distance from the cable holder on the engine to the center on the clutch lever clevis pin. It should be at least 55 mm (2.2 in.). If the distance is too small, use the cable adjuster to increase the distance to at least this much.

Those familiar with general clutch adjustment procedures will realize that the lifter mechanism for this type of clutch is somewhat different. The adjuster screw moves the clutch (crankcase) lever up and down. The lower end of the lever shaft is tapered, and turning the adjuster screw out will eventually bring the end of the shaft into contact with the pushrod. A slight free-play from this position is desired, which is why the adjuster screw must be turned in ⅛ turn after contact with the pushrod.



Clutch (engine) lever adjustment should be 10° behind the pushrod centerline (1) when the clutch is properly adjusted (Courtesy Yamaha Int. Corp.)

5. On other models (those which do not have a visible clutch lever on the engine), remove the clutch adjuster screw cover plate from the crankcase cover. On some models, such as the LT, AT, and CT-series, it is necessary to remove the left front crankcase cover to gain access to the adjusting screw. On the L5T, remove the carburetor cover.

6. Turn in the clutch cable adjusters so that there is plenty of free-play in the cable.

7. Loosen the adjusting screw locknut and back the adjusting screw off a few turns. Then turn it clockwise carefully until a slight resistance is felt. Back the screw off ¼ turn, and tighten the locknut.

8. Adjust the clutch cable to the prescribed free-play, and check clutch operation.

THROTTLE CABLES

1. Throttle cables should be adjusted *after* the idle speed. This procedure is given in the "Tune-Up" section.

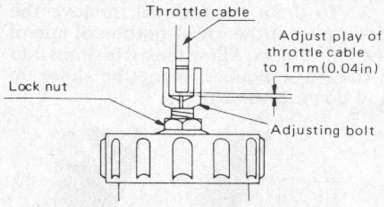
2. The oil pump cable must be adjusted after adjusting the throttle cables.

3. A cable adjuster is fitted to the top of the carburetor and another at the twist-grip. One throttle cable runs from the twist-grip to a junction box. There, it is connected to the oil pump cable and a shorter throttle cable which runs to the carburetor. Therefore, each cable must be adjusted.



Clutch adjusting screw and locknut (Courtesy Yamaha Int. Corp.)

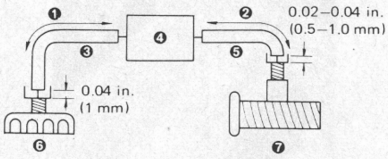
4. After setting the idle speed, use the adjuster on the carburetor cap to give 1 mm (0.04 in.) of cable free-play. This can be measured by gently lifting the cable out of the adjuster. It should come out no more than the amount shown before the throttle slide begins to rise. Loosen the locknut and screw the adjuster clockwise (in) to increase the slack and counterclockwise (out) to decrease it. Tighten the locknut.



Throttle cable free-play adjustment at the carburetor cap (Courtesy Yamaha Int. Corp.)

5. Adjust the long throttle cable with the adjuster at the twist-grip. This cable should be adjusted to give 0.5–1.0 mm (0.02–0.04 in.) of free-play.

6. Adjust the oil pump cable.



Throttle cable adjustment points (Courtesy Yamaha Int. Corp.)

1. Short throttle cable free-play
2. Longer throttle cable free-play
3. Short cable
4. Junction box
5. Long cable
6. Carburetor cap
7. Twist-grip

OIL PUMP CABLE

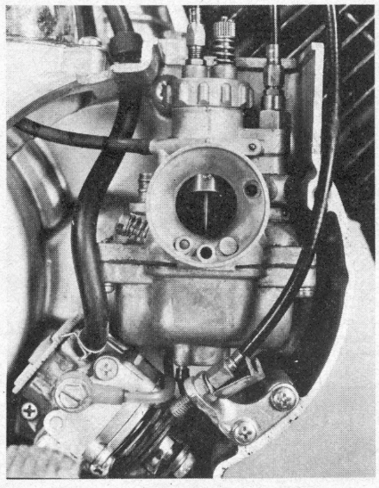
NOTE: *This procedure MUST be done after adjusting the throttle cable free-play.*

1. Set the throttle cable adjustments as described above.

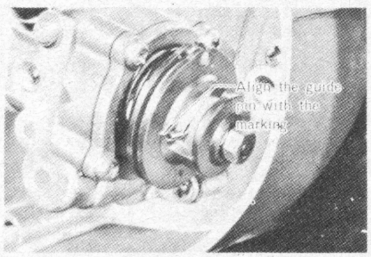
2. Remove the oil pump cover. On rotary valve models, this will expose the carburetor as well.

3. On rotary valve models, note the punch mark on the throttle slide. Turn the throttle twist-grip until the upper part of the punch mark aligns with the top of the carburetor bore. Holding the throttle in this position, check that the mark on the oil pump pulley is aligned with the oil pump guide pin. If it is not, loosen the locknut, and turn the oil pump cable adjuster in or out until alignment is achieved. Tighten the locknut.

4. On piston-port models, turn the throttle twist-grip until all slack is taken out of the cables, but the throttle slide has not moved. At this point, the raised mark on the oil pump pulley should align



The oil pump cable should be adjusted when the throttle slide punch mark is aligned with the top of the carburetor bore



Adjusting the oil pump (Courtesy Yamaha Int. Corp.)

with the oil pump guide pin. If it does not, loosen the locknut on the oil pump cable adjuster located in the side cover and turn the adjuster in or out until adjustment is achieved. Tighten the locknut on the adjuster.

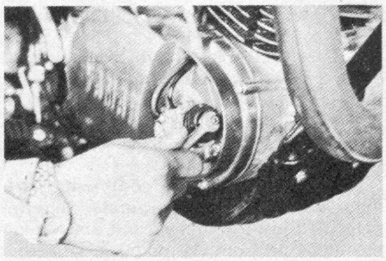
MINIMUM OIL PUMP STROKE

Before beginning, have a feeler gauge of the correct size at hand. The minimum oil pump strokes are as follows:

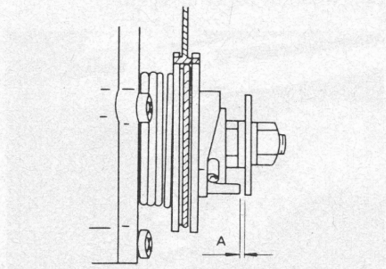
JT2L/M, GT1/MX	0.30–0.35 mm
All other models	0.20–0.25 mm

Note the following terms: the *starter plate* is the plastic disc at one side of the oil pump and is used to operate the pump by hand. The *adjustment pulley* is that to which the oil pump cable is attached. The *adjustment plate* is the small plate at the opposite end of the pump from the starter plate. It is secured by a locknut.

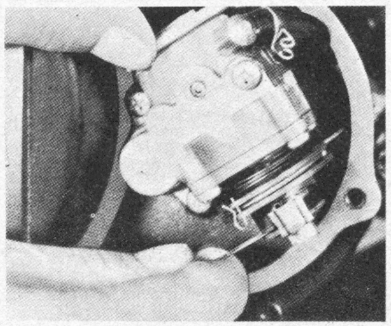
1. Remove the oil pump cover. Make sure that the throttle twist-grip is fully closed.
2. Slowly turn the starter plate by hand in the direction of rotation indicated by the arrow on the plate. As the starter plate is turned, a gap will be created between the adjusting plate and the pulley. Continue to turn the starter plate until this gap is at its maximum width. This can be done by gauging the gap with your eye.
3. Insert the correct sized feeler gauge between the adjusting pulley and the adjusting plate. The clearance between the two should be within the specification given.



Removing the adjusting plate locknut (Courtesy Yamaha Int. Corp.)



Minimum oil pump stroke (A) (Courtesy Yamaha Int. Corp.)



Minimum oil pump stroke adjustment: check the gap between the plate and the pulley (Courtesy Yamaha Int. Corp.)

4. If the clearance is not correct, remove the adjusting plate locknut, then the adjusting plate. Add or remove the 0.1 mm adjusting shims (supplied for this purpose) to the oil pump shaft to correct the adjustment, then refit the adjusting plate and tighten the locknut securely. Recheck the clearance.

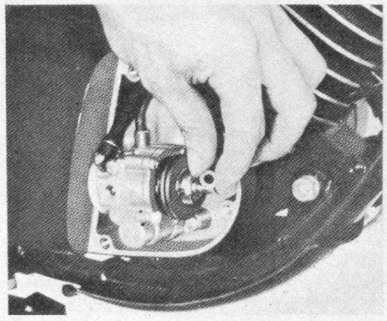
NOTE: *If the original adjusting plate-to-pulley clearance was too great, remove a shim; if it was too small, add a shim or shims.*

BRAKES

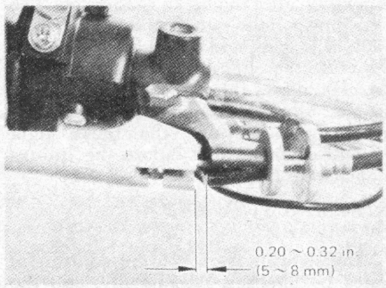
Front

The front brake can be adjusted at either the front brake hub or at the handlebar lever. Unless the cable has stretched considerably, most adjustments can be made at the hand lever.

Adjust the cable by loosening the handlebar adjuster locknut and screwing the adjuster in or out so that the brake lever will move 5–8 mm (0.2–0.3 in.) before the brake shoes contact the drum.



Add or remove adjusting shims to the oil pump shaft to correct the minimum stroke (Courtesy Yamaha Int. Corp.)



Front brake lever adjustment (Courtesy Yamaha Int. Corp.)

This value is measured between the handlebar lever and the holder as illustrated.

When the handlebar adjuster comes close to the end of its adjustment range, adjust the brake using the hub adjuster as follows:

a. Turn the handlebar adjuster in so that the cable has as much free-play as possible;

b. Loosen the locknut on the hub-mounted cable adjuster, and screw the adjuster out until the adjustment is close to the proper specification. Tighten the locknut.

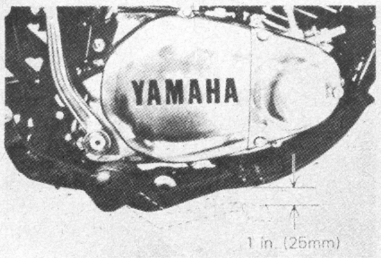
c. Use the lever adjuster as necessary so that the brake lever has the correct amount of movement before the brakes contact the drum.

Rear

Adjustment is made by means of the nut on the end of the brake rod. The brake pedal should move about 25 mm (1 in.) before the shoes contact the drum. This measurement should be made with the weight of the rider on the machine. Turning the adjusting nut clockwise will decrease pedal travel; rotating it counterclockwise will increase it. The adjuster nut is turned in increments of ½ turn.

NOTE: *After adjusting the rear brake, check the brake light switch adjustment.*

If, after adjusting the brakes, the angle formed by the brake cable or rod and the lever on the brake hub is seen to be greater than 90° when the brake is applied, the lining thickness should be checked.



The rear brake pedal should have about 1 in. of free-play before the shoes contact the drum (Courtesy Yamaha Int. Corp.)

Brake Light Switch

The switches should be checked for operation after the brake is adjusted. The rear brake light switch is mounted in a slotted bracket and secured by locknuts. Moving the light switch up on the bracket allows the brake light to turn on sooner. Moving it down allows it to come on later. Generally, the brake light should come on just before the linings contact the drum.

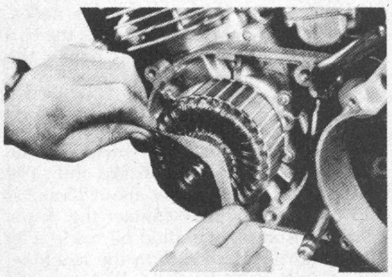
STEERING STEM AND SWING ARM

The steering stem bearing adjustment must be checked periodically, and the swing arm bushing should be checked for wear. Both procedures are given in the "Chassis" section.

GENERATOR

1. Begin inspection of the carbon brushes on machines with (DC) generators after 4,000 miles. Brushes will usually have a wear limit line marked on them. Replace them if worn to near the limit line.

2. Clean off the generator commutator with a gasoline-soaked rag. The commutator surface can be polished with #400–600 sandpaper or fine emery cloth. After polishing, clean the commutator thoroughly.



Cleaning the generator commutator surface (Courtesy Yamaha Int. Corp.)

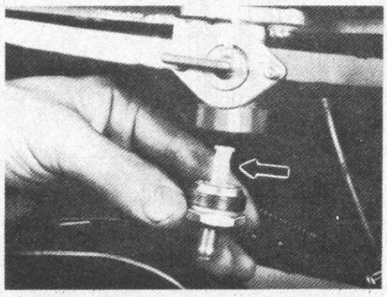
Fuel System

1. Fuel system maintenance involves cleaning the petcock and filter, cleaning or replacing the air cleaner, and cleaning the carburetor.

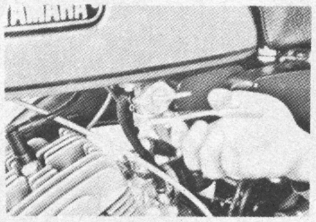
2. The carburetor should be removed, disassembled, and cleaned every 4,000 miles. The procedures are outlined in the "Fuel Systems" section.

3. The petcock should be serviced every 2,000 miles. On early models, shut the fuel off, then unscrew and remove the petcock sediment bowl. Take out the fuel filter. Clean the parts in a solvent and reinstall. Check for leaks.

Late models have no sediment bowl, but a filter screen is incorporated into the petcock. Shut the fuel off and disconnect the fuel line from the petcock. Unscrew and remove the fuel line fitting nut, which will come away with the filter screen. Clean the screen, or replace it if punctured or badly clogged.



Removing the petcock (late models) (Courtesy Yamaha Int. Corp.)



Removing the fuel petcock sediment bowl (Courtesy Yamaha Int. Corp.)

4. The air cleaner should be serviced or replaced every 1,000 miles, depending on conditions. If the air cleaner is the paper type, it should be kept free of water, solvents, etc.

The paper filters can be cleaned, after a fashion, by tapping off heavy dirt deposits, or brushing them off the outside, and blowing compressed air through the inside of the filter element. This technique, however, is limited in usefulness, and it is really preferable to replace the element every 2,000 miles or so (once again, depending on conditions).

If a foam-type air cleaner is used, wash it in gasoline to remove dirt, and squeeze until it is dry. Immerse the filter in light motor oil (20 or 30W) and squeeze off the excess oil. Then install on the machine.

Periodic Maintenance

Enduro and Trail Models

Every 200 miles
- Lubricate chain

Every 1,000 miles
- Spark plugs: clean or replace
- Check wheel run-out
- Air filter: clean or replace

Every 2,000 miles
- Change transmission oil
- Adjust clutch (as required)
- Check ignition timing
- Check cylinder compression
- Adjust carburetor
- Remove, clean, and lubricate chain
- Lubricate grease fittings
- Lubricate control and instrument cables
- Decarbonize engine
- Check oil pump cable adjustment
- Clean fuel petcock

Every 4,000 miles
- Disassemble and clean carburetor
- Change front fork oil
- Check generator brushes (if fitted)
- Check brake linings
- Pack wheel and steering head bearings
- Grease speedometer drive mechanism

MX Models

Every Heat
- Check cylinder head torque
- Replace spark plug
- Clean and lubricate chain
- Check chain tension
- Check spoke tension

Every Meet
- Clean and flush fuel tank
- Clean fuel filter
- Clean and oil air filter
- Inspect and clean piston: replace if necessary
- Replace piston rings
- Check compression
- Decarbonize engine
- Adjust clutch
- Check connecting rod bearings
- Clean, inspect, and adjust carburetor
- Check piston pin
- Check flywheel nut for tightness
- Inspect exhaust system
- Clean and inspect frame
- Inspect swing arm
- Lubricate and adjust controls and cables
- Clean, check, and adjust brakes
- Check tire pressure
- Check wheel run-out
- Check spoke tension
- Check wheel bearings
- Check steering head adjustment
- Tighten all nuts and bolts
- Check wiring connectors

Every Second Meet
- Change transmission oil

Every Third Meet
- Lubricate swing arm
- Clean and repack steering head bearings
- Drain and refill front forks

Every Fourth Meet
- Drain and refill shock absorbers (Thermal Flow)

Recommended Lubricants

Autolube
- Yamalube
- Two-stroke oil (TC-W)
- Two-stroke oil SAE 30W

Transmission
- Yamalube 4-cycle oil
- SAE 20W/40, Service rating "SE"
- SAE 10W/30, Service rating "SE"

Forks
- Yamaha fork oil
- SAE 10W-30
- SAE 30
- SAE 20

Grease Fittings
- High-quality Lithium or Moly-based chassis grease

Drive Chain
- High-quality chain lube specifically developed for motorcycle drive chains

Wheel and Steering Head Bearings
- Lithium or Moly-based bearing grease

Cables
- Light motor oil
- Graphite-based lubricant
- Molybdenum disulphide-based lubricant

Maintenance Data

Model	Fuel (gal)	Autolube Tank (qt)	Trans-mission (qt/cc)	Forks @ Leg (cc/oz)	Rear Shocks (oz/cc)	Tires (psi) Front/Rear
JT1	1.1	1.10	0.64/600	150/5.1	—	22/28
JT2	1.1	1.10	0.64/600	150/5.1	—	22/28
GT1, GT80B/C, GTMX/A-B	1.3	0.70	0.53/500	①	—	23/31
HT1, HTMX	1.7	1.30	0.75/700	140/4.8	—	14/17
HT1B	1.7	1.30	0.75/700	140/4.8	—	14/17
L5T/A	1.8	1.50	0.65/625	140/4.8	—	26/28
LT2, LTMX	1.6	1.30	0.75/700	136/4.6	—	14/17
LT3	1.6	1.30	0.75/700	140/4.8	—	14/17
DT100A/B/C	1.6	1.30	0.69/650	160/5.5	—	14/17
AT1	1.9	1.30	0.79/750	150/5.1	—	14/17
AT1B	1.9	1.30	0.79/750	150/5.1	—	14/17
AT1C	1.9	1.30	0.85/800	150/5.1	—	14/17
AT2	1.9	1.30	0.79/750	120/4.1	—	14/17
AT3	1.9	1.30	0.79/750	120/4.1	—	14/17
DT125A/B/C	1.8	1.30	0.79/750	130/4.4	—	14/17
CT1	1.9	1.27	0.79/750	150/5.1	—	14/17
CT1B	1.9	1.27	0.79/750	150/5 1	—	14/17
CT1C	1.9	1.27	0.85/800	120/4.1	—	14/17
CT2	1.9	1.27	0.79/750	120/4.1	—	14/17
CT3	1.9	1.27	0.79/750	120/4.1	—	14/17
DT175A/B/C	1.8	1.30	0.69/650	130/4.4	6.1/181	14/17
DT1	2.5	1.70	1.06/1000	210/7.1	—	14/17
DT1C	2.5	1.70	1.06/1000	210/7.1	—	14/17
DT1B	2.5	1.70	1.06/1000	210/7.1	—	14/17
DT1E	2.5	1.70	1.06/1000	175/6.0	—	13/16
DT2	2.5	1.70	1.06/1000	175/6.0	—	14/17
DT3	2.5	1.60	1.06/1000	175/6.0	—	13/17
DT250A/B/C	2.4	1.60	1.06/1000	175/6.0	6.1/181	17/21
RT1	2.5	1.70	1.06/1000	210/7.1	—	20/24
RT1B	2.5	1.70	1.06/1000	175/6.0	—	13/16
RT2	2.5	1.70	1.06/1000	175/6.0	—	14/17
RT3	2.5	1.60	1.06/1000	175/6.0	—	13/17
DT360A	2.4	1.60	1.25/1200	175/6.0	6.1/181	13/16
DT400B/C	2.4	1.60	1.06/1000	175/6.0	6.1/181	17/21

① Right leg—97/3.3; left leg—120/4.1

Tune-Up

NOTE: *Common tune-up procedures are explained in detail in "General Information."*

Contact Breaker Points

LOCATION

1. On machines with magneto ignition, breaker points are located beneath magneto rotor on the left-side of the engine. Remove the left-side engine cover to gain access to the points. Cutouts are provided in the rotor to allow the points to be cleaned and gapped.

2. On machines with battery-and-coil ignition, the points are located beneath a cover plate on the left-side engine case.

GAPPING

Points should be filed (if necessary) and cleaned before gapping.

Magneto Ignition

Point gapping must be accomplished in conjunction with ignition timing. Refer to that section.

Battery Ignition

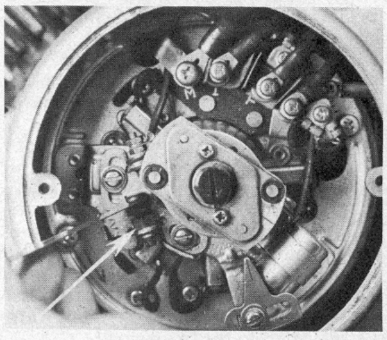
1. Remove the points cover, and turn the engine over until the points are fully open.

2. With the proper feeler gauge, check the point gap. Be sure to use the correct gap for your machine as given in the "Tune-Up Specifications" chart.

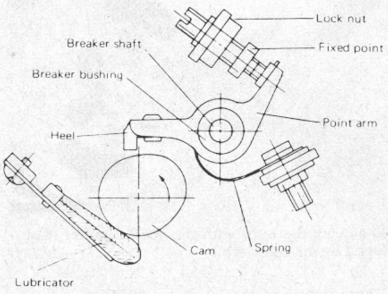
3. The feeler gauge should be a light slip fit between the points.

4. If the gap is not within specification, it must be adjusted. On older models (those with a fixed point secured by a locknut), loosen the locknut and screw the fixed point in or out on its bracket so that the gap is correct. Secure the locknut.

On all newer models, the fixed point is a part of a plate and is secured with a screw. Loosen the fixed point securing screw and with a thin screwdriver applied to the pry slot provided, move the fixed point toward or away from the movable point until the gap is correct. Tighten the fixed point securing screw and recheck the gap.



Checking the point gap (generator models). If adjustment is necessary, loosen the fixed point locknut (arrow) and turn the point by means of the slotted fitting



Older type point assembly (Courtesy Yamaha Int. Corp.)

REPLACEMENT

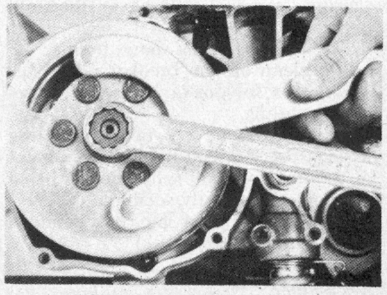
Magneto Ignition

Two special tools are needed to replace the points on magneto-ignition machines. A rotor holder is used to hold the magneto flywheel steady while the nut is removed, and a special puller, threaded into the center of the rotor, is used to pull it off its tapered shaft.

CAUTION: *The rotor puller is essential for this job. It is not wise to attempt to remove the rotor in any other way.*

1. Remove the left-side engine cover, after loosening the pinch-bolt and pulling the gearshift lever off its shaft. The use of an impact driver to remove and install phillips head case screws is recommended.

2. Holding the magneto rotor with the



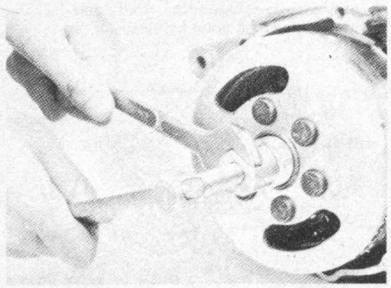
Removing the magneto rotor nut (Courtesy Yamaha Int. Corp.)

special tool, or a suitable substitute, loosen and remove the rotor nut.

3. Thread the rotor puller into the rotor. The puller bolt should be backed off enough so that the puller outer has a good number of threads in the rotor.

NOTE: *The puller outer has a left-hand thread. Thread it into the rotor in a counterclockwise direction.*

4. Tighten the puller bolt against the end of the crankshaft to remove the rotor. The rotor should come off the taper. If it is stuck, tighten the puller bolt as much as possible, and give it a sharp rap with a hammer. This should free the rotor. Note the key fitted to the crankshaft.



Removing the rotor with the special puller (Courtesy Yamaha Int. Corp.)

CAUTION: *Never use heat in an attempt to remove the rotor, since this may affect its magnetic properties. Handle the rotor with care: avoid dropping or striking it, as this, too, will affect its magnetism.*

5. Disconnect the primary wire from the breaker point terminal, then remove the securing screw. Remove the old points set.

6. Clean the contact surfaces of the new set of points to remove any protective coating present. Install the points and reconnect the primary wire.

7. Grease or oil the crankshaft taper slightly before fitting the rotor to make removal easier next time. Line up the slot in the rotor with the key in the crankshaft. Push the rotor into place. If the puller is still fitted, strike the puller bolt once or twice to ensure that the rotor is firmly seated, but do not strike the rotor itself. Refit the rotor nut and tighten it securely. Reset the point gap and check the ignition timing.

Battery Ignition

1. Remove the breaker point cover.

2. Disconnect the primary wire at the breaker points terminal, and remove the securing screw(s). Remove the old points.

3. Before installing new points, be sure to clean off the breaker point surfaces with a solvent to remove any protective coating.

4. Install the new points, tightening the securing screw(s) lightly. Reconnect the terminal primary wire. Be sure that the small nut is firmly secured.

5. Adjust the point gap, and recheck the ignition timing.

LUBRICATION

1. Whenever the point gap is checked or points replaced, it is necessary to lubricate the cam follower fiber heel and the pivot point of the contact breaker.

2. A small dab of grease (high melting point, if possible) or oil should be applied to the lubricator felt so that the lubricator can distribute it onto the breaker cam. A drop of engine oil should be applied to the pivot point.

3. In both cases it is imperative that care be taken to keep the lubricant away from the points.

4. The lubricating felt should be adjusted so that it just contacts the breaker cam.

5. If the felt is missing, or the model not equipped with it, the grease can be sparingly applied to the cam itself.

Ignition Timing

CDI MODELS

A dial indicator is necessary to set the ignition timing.

1. Remove the spark plug and insert the dial gauge into the plug hole.

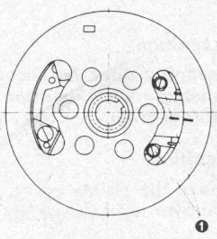
2. Remove the left front crankcase cover.

3. Turning the magneto rotor slowly by hand, rotate the engine until the dial gauge needle reaches the highest reading and begins to reverse. When the needle is at the highest reading, the piston is at Top Dead Center. Turn the engine back-and-forth a few degrees in either direction until TDC is exactly determined. Position the piston at that point. Set the dial gauge to read zero.

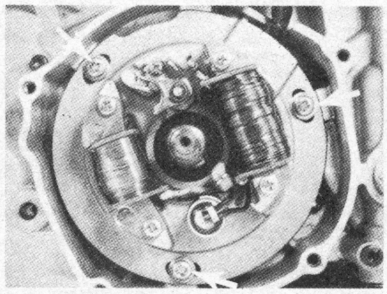
4. Turn the magneto rotor *clockwise* until the dial gauge reads about 4 mm before TDC.

5. Rotate the flywheel slowly in the *counterclockwise* direction until the dial gauge indicates that the piston is at the firing point: proper number of millimeters before TDC as indicated in the "Tune-Up Specifications" chart. When the piston is at this position, the mark on the rotor must line up with the mark on the pulser coil.

6. If the marks do not line up, loosen the two pulser set screws and rotate the pulser until the marks line up. Tighten the screws and recheck the timing. These marks must be in exact alignment. Do not settle for an approximation.



CDI timing marks aligned. Adjust by loosening the pulser set screws (1) and turning pulser until marks align (Courtesy Yamaha Int. Corp.)



On models with slotted breaker plate holes, center the mounting scores in the slots if the plate has been removed

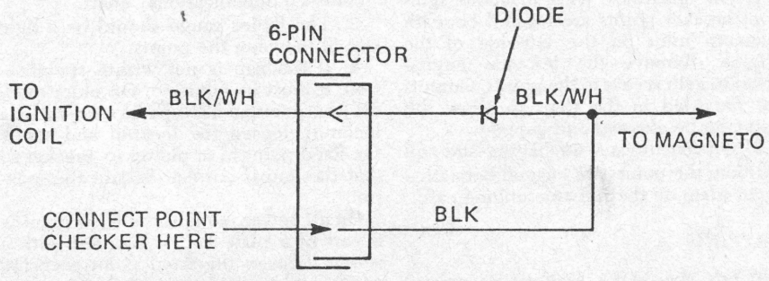
MAGNETO IGNITION

Some 1974 and later models have a breaker point plate with slotted holes for the three mounting screws. If the plate has been removed for any reason, center the mounting screws in these slots before setting timing.

Models such as the DT100 and DT175 have a diode in the black/white wire coming from the points. It is not possible to obtain a Points Checker reaction if the Checker is connected to this wire. Therefore, on these models, disconnect the magneto wires at the plastic connector. Note that a black wire coming from the magneto has no connection going to the ignition coil. This black wire by-passes the diode. Connect the positive lead of the Point Checker to this wire, and the negative lead to ground on the engine or frame.

Some models, such as the DT175C, have a spark advance mechanism built into the magneto flywheel. The advance mechanism must be locked into the full-advance position when checking the ignition timing.

1. The ignition timing is adjusted by changing the breaker point gap. A dial gauge and a point checker are necessary



Ignition timing point checker connection for diode-equipped models (1974 and later 100–175 cc) (Courtesy Yamaha Int. Corp.)

for ignition timing.

2. Remove the magneto cover. Inspect the condition of the breaker point contact surfaces. Clean them thoroughly.

3. Turn the rotor so that the points are fully open and check the gap with a feeler gauge. The proper specifications are given in the "Tune-Up Specifications" chart at the end of this section.

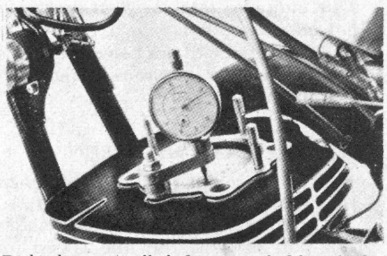
4. If the gap is not within the given specification, it must be adjusted. The fixed point is secured with a screw. Loosen the screw and, with a thin screwdriver applied to the pry slot provided, move the fixed point toward or away from the movable point until the gap is correct. Tighten the fixed point securing screw and recheck the gap.

5. Remove the spark plug. On models with an angled spark plug hole, remove the cylinder head. Install the dial indicator.

6. Position the piston at top dead center by turning the engine over by hand until the dial gauge indicates the highest reading and then begins to reverse. The highest reading is top dead center. Turn the crankshaft a few degrees in either direction to check your finding, then position the piston at TDC and zero the gauge.

7. Attach the negative (black) lead of the ohmmeter or Point Checker to the engine case (ground) and the positive (red) lead to the breaker point primary wire coming from the magneto. This primary wire is colored black. On DT100 and 175, connect the Checker to the diode by-pass (black) lead at the connector.

8. Turn the engine "backward" (turn the rotor clockwise) until the dial gauge indicates that the piston is about 4 mm BTDC. Since most models fire about 2 mm BTDC, the breaker points will be fully closed at this point, as indicated by zero resistance on the meter.



Dial indicator installed after removal of the cylinder head for models with angled plug holes (Courtesy Yamaha Int. Corp.)

9. Slowly turn the engine in the normal direction of rotation (counterclockwise) until the dial gauge indicates that the piston is at the firing point. This point is given for each model in the "Tune-Up Specifications" chart.

10. When the piston reaches this point, the points should open as indicated by the reaction of the checker. If the points open before the piston reaches the correct position, the timing is too advanced. If they open when the piston is past it, the timing is retarded.

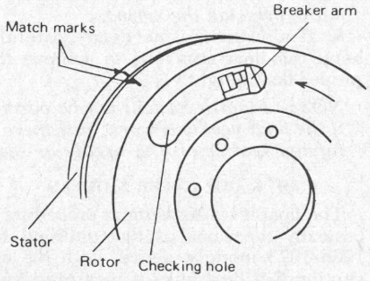
11. If adjustment is necessary, loosen the breaker point securing screw, and use a thin screwdriver on the pry slot provided to increase or decrease the point gap until the timing is right on. It should be possible to correct the timing while keeping the point gap within the specification given.

12. If the timing was too advanced, *decrease* the point gap. If it was too retarded, *increase* the gap.

13. Recheck the ignition timing, and repeat the procedure, if necessary until the points open at the instant the piston reaches the correct distance BTDC. Timing should be accurate to within 0.1 mm of the given value.

14. After setting the timing, recheck the point gap in the fully open position. It should still be within the proper specification. If it is not, the fiber heel on the points is probably worn and the points should be replaced.

NOTE: *Although not guaranteed to give accurate results, the timing can be set in emergency situations with the timing marks inscribed on the rotor and crankcase, if fitted to your machine. The point at which the contact breakers open can be determined with a very thin piece of paper or cellophane, if a meter is not available. Trap the paper between the closed points, and tug lightly while slowly rotating the engine. When the paper is freed, the matching marks should be lined up as shown in the illustration. Due to the inaccuracies involved in this method, it is not recommended except in emergency cases.*



Ignition timing can be set by setting point gap so that the points open when the marks on the crankshaft and the rotor align (Courtesy Yamaha Int. Corp.)

BATTERY IGNITION

On battery ignition machines, a dial gauge is used to find piston position, while the moment of points opening can be determined either with the Point Checker, or with a test or continuity light.

1. Remove the points cover, and clean and gap the breaker points.

2. If a timing advance mechanism is fitted, wedge the counterweights in the OPEN (fully advanced) position.

3. Remove the spark plug and fit the dial gauge.

4. Position the piston at top dead center by turning the engine over by hand until the dial gauge indicates the highest reading and then begins to reverse. The highest reading is top dead center. Turn the crankshaft a few degrees in either direction to check your finding, then position the piston at TDC and zero the gauge.

5. Refer to the "Tune-Up Specifications" chart at the end of this section for the proper timing for your machine. Ordinarily, the firing point will be 2 mm or more BTDC.

6. Hook up the test light or Point Checker: one lead to ground on the engine or frame, the other to the primary wire terminal of the points.

7. Turn the crankshaft opposite the normal direction of rotation to about 3–4 mm BTDC. The points should be closed at this position.

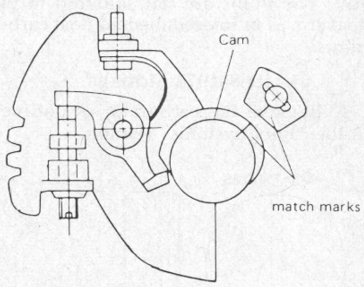
8. Slowly rotate the engine in the normal direction of rotation. When the dial indicator shows that the piston is at the proper distance BTDC, the points should open.

9. If the points open before the piston reaches this distance, the timing is too advanced; if they open after it passes the timing distance, the timing is retarded.

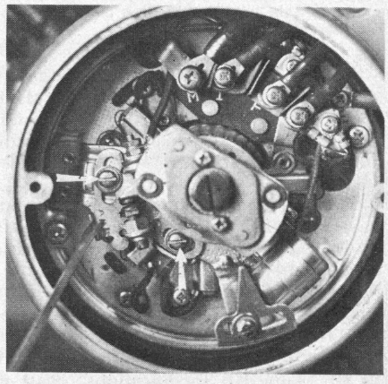
10. To adjust the timing, loosen the two timing screws which hold the large point mounting plate to the generator housing just enough to allow the points to be moved. Move the points in the direction of crankshaft rotation to correct advanced timing; move them opposite the direction of crankshaft rotation to correct retarded timing.

11. After adjustment, recheck the timing. The points should open at the precise instant that the dial gauge indicates that the piston is correctly positioned. Accuracy must be within 0.1 mm of the given specification.

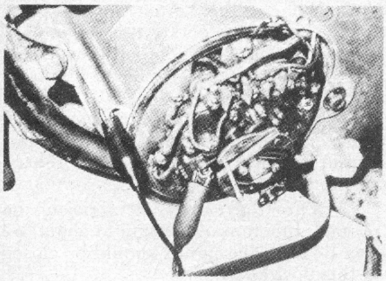
NOTE: *Tightening the timing screws may change the timing slightly. So check your setting after they are secured.*



Ignition timing by aligning the marks (battery ignition models) (Courtesy Yamaha Int. Corp.)



To adjust the timing, use the pry slots provided after loosening the points timing screws (arrows)



When timing battery ignition machines, the timing advance weights should be wedged in the open position (Courtesy Yamaha Int. Corp.)

Carburetor

Three adjustments to be made to the carburetor are float level, idle mixture, and idle speed. For the first of these, the carburetor must be removed from the machine.

NOTE: *JT1 and JT2 models and bikes equipped with the early Y16P carburetor do not have an adjustable float level. If the float needle valve, part of which is attached to the bottom of the float, is in good condition and the float is not damaged or leaking, the float level is correct as set by the factory.*

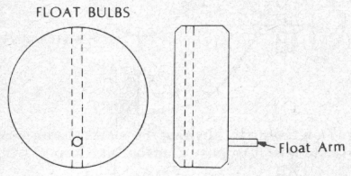
ADJUSTING FLOAT LEVEL

Independent Floats

As the name implies, a carburetor with independent floats has a float assembly consisting of two float bulbs and a float arm. The bulbs are not soldered to the float arm as in interconnected float carburetors.

1968–1973 Models

1. Remove the carburetor as outlined in the "Fuel Systems" section.



Independent floats must be installed with the float arm toward the bottom of the float bowl (Courtesy Yamaha Int. Corp.)

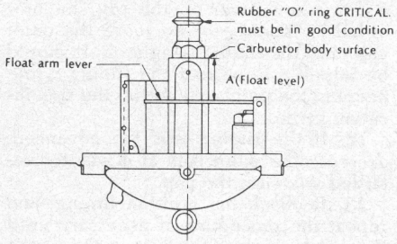
2. Turn the carburetor upside down and remove the float bowl screws. Lift the float bowl carefully off the carburetor body. Note that the floats will remain in the float bowl, so exercise caution while handling.

3. Make sure that the float needle and seat are clean. With the needle in place in its seat, carefully lower the float arm lever until it just touches the needle. Measure the distance from the carburetor body surface to the float arm lever as illustrated. This is the float level. Compare your finding with the correct value given in the "Tune-Up Specifications" chart at the end of this section.

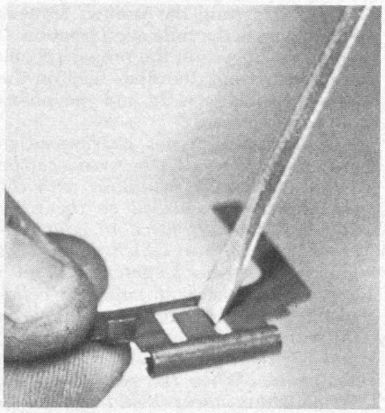
NOTE: *When measuring float level, the float arm lever should just be resting on the spring-loaded needle, but not depressing the spring.*

4. If adjustment is necessary, carefully bend the float arm tang to achieve the proper float height.

NOTE: *Float level will not be correct if the float needle is worn, or if there is foreign matter on the needle or seat.*



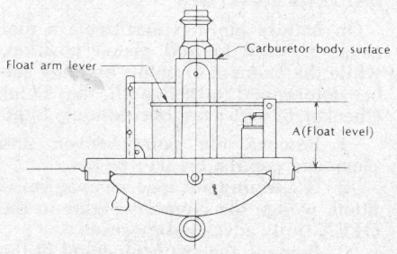
Float level adjustment, independent-type float carburetors—1968–73 (Courtesy Yamaha Int. Corp.)



Bend the float arm lever tang to adjust the float level (Courtesy Yamaha Int. Corp.)

1974 and Later Models

The float level adjustment procedure is basically the same as that outlined for 1968–1973 models, above, with the exception that float level is measured from the float bowl gasket surface (gasket removed) to the float arm lever as illustrated.



Float level adjustment-independent float carburetors, 1974 and later (Courtesy Yamaha Int. Corp.)

Interconnected Float Carburetors

The float bulbs are soldered to the float arm on this type of carburetor, making a one-piece float assembly.

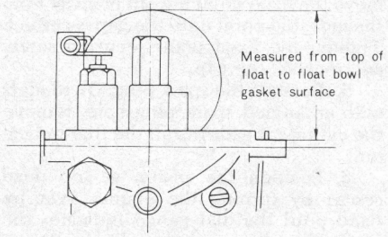
1. Remove the carburetor as outlined in the "Fuel Systems" section.

2. Turn the carburetor upside down, and remove the four float bowl screws carefully lifting off the float bowl.

3. Remove the float bowl gasket.

4. Float level can be measured with a steel rule or a vernier caliper. Float height is defined as the distance from the float bowl gasket surface to the top of the float, when the tang of the float arm is just touching the float needle.

NOTE: *Lower the float down until the tang just contacts the float needle. Hold the float in this position, then measure the float level.*



Float level adjustment, interconnected-float carburetors (Courtesy Yamaha Int. Corp.)

5. Compare the value obtained with the correct specification for your machine given in the "Tune-Up Specifications" chart at the end of this section. If the float level is too high or low, pull out the pin which holds the float in place, and bend the tang very slightly to correct the adjustment.

NOTE: *If float level is too high, bend the tang away from the carburetor body. If too low, bend it toward the carburetor body.*

6. Refit the float and recheck the adjustment.

CAUTION: *Bend only the float tang to make an adjustment. Do not bend the float arms. The floats must be level. If the floats show different heights, the float assembly should be replaced. This indicates that the float assembly has been mishandled.*

7. Float level will not be correct if the needle is worn, or if there is foreign matter on the needle seat.

IDLE SPEED AND MIXTURE

NOTE: *These must be adjusted when the engine is at operating temperature.*

1. On all rotary valve, and the smaller piston-port models, the idle speed (or throttle stop) screw is located on the carburetor top. On other models it is located on one side of the carburetor body.

2. On some rotary valve models, the pilot air screw is located in the carburetor mouth, and is accessible after removing the carb cover plate. On all other models it is located on one side of the carburetor body.

3. The throttle cable(s) should be adjusted after making the idle speed and mixture adjustments. After adjusting the throttle cables, adjust the oil pump cable. Both of these operations are covered in the "Maintenance" section.

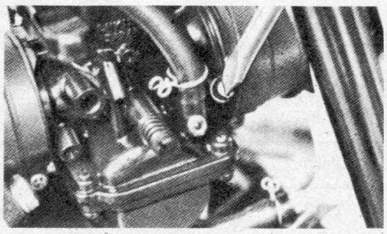
4. Ensure that the throttle cable adjustment is approximately correct so that the cable has enough slack to allow the throttle slide to be fully closed.

5. Screw the pilot air screw in (carefully) until it bottoms lightly, then turn it out the number of turns shown in the "Tune-Up Specifications" chart.

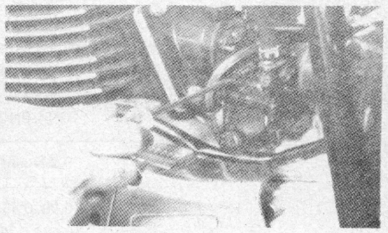
6. Start the engine. When operating temperature is reached, adjust the throttle stop screw (if necessary) so that the engine idles as slowly as possible. Then turn the pilot air screw in or out until the engine runs smoothly. It should not be necessary to vary the air screw more than ½ turn in either direction from the given setting.

7. Adjust the throttle stop screw so that the engine idles at the desired rpm.

8. After idle speed and mixture are set, adjust the throttle cable and oil pump cable as outlined in the "Maintenance" section.



Adjusting the pilot air screw (idle mixture) (Courtesy Yamaha Int. Corp.)



Adjusting the throttle-stop screw (Courtesy Yamaha Int. Corp.)

Tune-Up Specifications

	Breaker Point Gap (mm)	*Ignition Timing (mm BTDC)*	*Spark Plug (NGK)*	*Spark Plug Gap (mm)*	*Carburetor Air Screw (no. of turns)*	*Idle Speed (rpm)*	*Float Level (mm)*
JT1	0.30–0.40	1.7–1.9	B7HS	0.5–0.6	1½	1200–1400	①
JT2	0.30–0.40	1.7–1.9	B7HS	0.5–0.6	1¾	1200–1400	①
GT1/MX	0.30–0.40	1.7–1.9	B7HS	0.5–0.6	1½	1250–1350	①
GT80B/C, GTMXB/C	0.30–0.40	1.8	B8HS	0.5–0.6	2	1300	23.0
L5T/A	0.30–0.35	1.7–1.9	B8HS	0.5–0.6	1¾	1400	22.0
HT1	0.30–0.40	1.7–1.9	B8HC	0.5–0.6	1¾	1300–1500	22.5
HT1B	0.30–0.40	1.7–1.9	B8ES	0.5–0.6	1¾	1300–1500	22.5
HT1BMX	0.30–0.40	2.4–2.6	B8ES	0.5–0.6	1¼	1300–1500	25.5
LT2	0.30–0.40	1.7–1.9	B8HS	0.5–0.6	1¾	1100–1200	21.0
LT2MX	0.30–0.40	2.0	B9HS	0.5–0.6	1¼	1350–1450	15.1
LT3	0.30–0.40	1.7–1.9	B8HS	0.5–0.6	1¾	1100–1200	21.0
DT100A/B	0.30–0.40	1.7–1.9	B8HS	0.6–0.7	1¼	1350–1450	21.0
DT100C	0.30–0.40	3.2	B7ES	0.5–0.6	1½	1350–1450	21.0
AT1/M	0.30–0.35	1.7–1.9	B8E	0.5–0.6	1½	1400–1500	25.5
AT1B	0.30–0.35	1.7–1.9	B8E	0.5–0.6	1½	1400–1500	25.8
AT1BMX	0.30–0.35	2.5 ± 0.1	B8E	0.5–0.6	1¼	——	25.5
AT1C	0.30–0.40	1.7–1.9	B8ES	0.5–0.6	1½	1400–1500	25.8
AT1CMX	0.30–0.40	2.0	B9E	0.5–0.6	1½	1200–1300	25.5
AT2	0.30–0.40	1.7–1.9	B8ES	0.5–0.6	1¾	1400–1500	21.0
AT3	0.30–0.40	1.7–1.9	B8ES	0.5–0.6	1¾	1400–1500	21.0
DT125A/B	0.35–0.40	1.7–1.9	B8ES	0.6–0.7	1½	1300–1400	21.0
DT125C	0.30–0.35	1.8	B8ES	0.5–0.6	1¾	1300–1400	21.0
CT1	0.30–0.35	1.7–1.9	B8E	0.5–0.6	1½	1400–1500	25.8
CT1B	0.30–0.35	1.7–1.9	B8E	0.5–0.6	1½	1400–1500	25.8
CT1C	0.30–0.40	1.7–1.9	B8ES	0.5–0.6	1½	1400–1500	25.8
CT2	0.30–0.40	1.7–1.9	B8ES	0.5–0.6	2	1400–1500	21.0
CT3	0.30–0.40	1.7–1.9	B8ES	0.5–0.6	2	1400–1500	21.0

Tune-Up Specifications (cont.)

	Breaker Point Gap (mm)	Ignition Timing (mm BTDC)	Spark Plug (NGK)	Spark Plug Gap (mm)	Carburetor Air Screw (no. of turns)	Idle Speed (rpm)	Float Level (mm)
DT175A/B	0.30–0.40	1.7–1.9	B8ES	0.6–0.7	1¾	1300–1400	15.8
DT175C	0.30–0.40	3.2	B8ES	0.5–0.6	1½	1300–1400	21.0
DT1	0.30–0.40	3.1–3.3	B7E	0.5–0.6	1½	1400–1500	14.1
DT1B/S	0.30–0.35	3.1–3.3	B7E (N)	0.5–0.6	1½	1400–1500	14.1
DT1C	0.30–0.35	3.1–3.3	B7E	0.5–0.6	1½	1400–1500	14.1
DT1E	0.30–0.40	3.1–3.3	B8ES	0.5–0.6	1½	1400–1500	14.1
DT2	0.30–0.40	3.1–3.3	B8ES	0.5–0.6	1½	1400–1500	14.1
DT3	0.30–0.40	3.1–3.3	B8ES	0.5–0.6	1½	1400–1500	14.1
DT250A	0.30–0.40	3.1–3.3	B8ES	0.5–0.6	1½	1200–1300	17.3
DT250B/C	0.30–0.40	3.2	B8ES	0.5–0.6	1¾	1400	17.3
RT1	0.30–0.35	3.3–3.5	B7E	0.5–0.6	1¼	1400–1500	14.1
RT1B	0.30–0.40	2.8–3.0	B9ES	0.5–0.6	1¾	1400–1500	21.4
RT2	0.30–0.40	2.8–3.0	B9ES	0.5–0.6	1½	1400–1500	21.4
RT3	0.30–0.40	2.8–3.0	B9ES	0.5–0.6	1½	1400–1500	21.4
DT360A	2.9	3.1–3.3	B9ES	0.5–0.6	1½	1200–1300	17.3
DT400B/C	——	2.9	B9ES	0.5–0.6	1½	1500	17.3

① Float level not adjustable

Engine and Transmission

NOTE: *For engine component inspection techniques and procedures, refer to "Engine Rebuilding" under the General Information section.*

IN-FRAME SERVICE

Service to the following components can be carried out with the engine in the frame:

a. Top end (cylinder head, cylinder, piston, rings, small end bearing);
b. Clutch;
c. Magneto/generator;
d. Countershaft sprocket;
e. Rotary valve (where fitted);
f. Oil pump;
g. Kick-starter;
h. Shifter shaft and shift linkage.

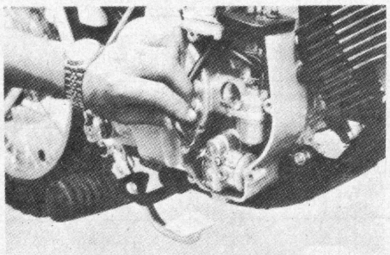
Service to the crankshaft, transmission, shift drum, or crank and transmission bearings will necessitate splitting the cases.

Engine Removal

Clean the engine thoroughly before removal.

JT1/JT2

1. Drain the transmission oil.
2. Remove the seat mounting pin and pull the seat back and off.
3. Disconnect the fuel line, remove the gas tank mounting bolt, and remove the gas tank.
4. Disconnect the spark plug cap. Disconnect the magneto lead wire.
5. Remove the muffler by unscrewing the flange ring nut at the cylinder and removing the mounting bolt on the frame. The ring nut should be removed with a pin wrench.

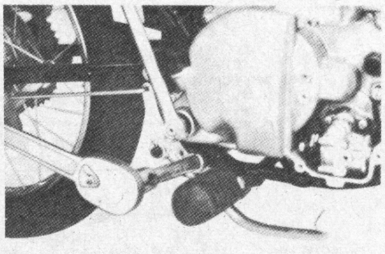


Removing the oil pump feed line (Courtesy Yamaha Int. Corp.)

6. Remove the gearshift lever. Remove the left crankcase cover. Use an impact driver to loosen the phillips head case screws.
7. Disconnect the drive chain.

NOTE: *If the countershaft sprocket is to be removed, bend down the tab on the lockwasher and loosen the sprocket nut before disconnecting the chain. Applying the rear brake will secure the sprocket so that the nut can be loosened.*

8. Remove the oil pump cover. Disconnect the pump cable.



Removing the rear engine mounting nuts (Courtesy Yamaha Int. Corp.)

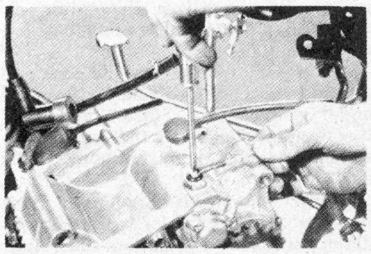
9. Disconnect the oil feed line from the tank. Plug the tank outlet to prevent oil loss.
10. Remove the carburetor.
11. Remove the four engine mounting bolts and remove the engine from the frame.

L5T/A

1. Drain the transmission oil. Disconnect the spark plug lead.
2. Remove the exhaust pipe. The ring nut at the cylinder head should be loosened with a pin wrench.
3. Remove the gearshift lever.
4. Remove the left crankcase cover. Use an impact driver to loosen the phillips head case screws.
5. Disconnect the wiring at the generator.
6. Disconnect the drive chain.

NOTE: *If the countershaft sprocket is to be removed, bend down the tab on the lockwasher and loosen the sprocket nut before disconnecting the chain. Applying the rear brake will secure the sprocket so that the nut can be loosened.*

7. Remove the carburetor cover. Remove the carburetor.
8. Disconnect the oil feed line at the tank. Plug the tank outlet to prevent oil loss.
9. Disconnect the oil pump cable. Remove the clutch cable holder from the crankcase.
10. Pull the air cleaner hose off the air cleaner.
11. Remove the two upper engine mounting bolts. Loosen the footpeg mounting bolt.
12. Tilt the engine forward, and disconnect the neutral indicator switch.
13. Remove the footpeg mounting bolt and remove the engine from the frame.

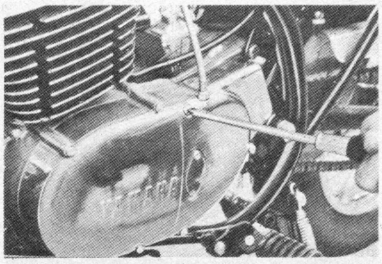


Disconnecting the neutral switch wire (Courtesy Yamaha Int. Corp.)

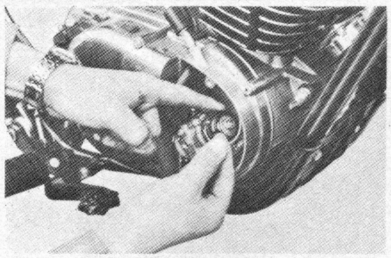
Piston Port Models

1. Drain the transmission oil.
2. Remove the ring nut or bolts, retaining springs, and remove the muffler assembly.
3. Remove the gearshift lever.
4. Remove the left-side crankcase cover(s). Use an impact driver on the crankcase screws.
5. Disconnect the clutch cable.

NOTE: *If the countershaft sprocket is to be removed, bend down the tab on the lockwasher and loosen the sprocket nut before disconnecting the chain. Applying the rear brake will secure the sprocket so that the nut can be loosened.*



Removing the left crankcase covers (Courtesy Yamaha Int. Corp.)



Disconnecting the oil pump cable (Courtesy Yamaha Int. Corp.)

6. Disconnect the drive chain.
7. Disconnect the magneto or generator wiring either at the snap connector, or at the generator terminals on older models.
8. Disconnect the neutral switch wire if so fitted.
9. Disconnect the spark plug lead from the plug.
10. Disconnect the compression release cable on models so equipped.
11. Remove the oil pump cover on the right-side of the engine. Turn the pump pulley against its spring, then detach the cable from the pulley.
12. Disconnect the oil pump feed line at the oil tank and plug the tank outlet to prevent oil loss.
13. Disconnect the tach cable.
14. Disconnect the fuel line at the carburetor. Disconnect the air cleaner hose at the carburetor.

NOTE: *On the HT1, remove the air cleaner assembly.*

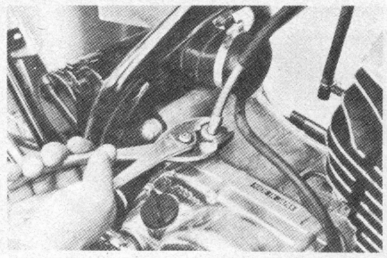
15. Remove the carburetor cap and pull out the slide assembly. Loosen the carburetor clamp screw, or loosen each securing nut ¼ turn at a time until loose, then remove the carburetor from the manifold.
16. Remove the engine mounting bolts and lift the engine out of the frame.

INSTALLATION

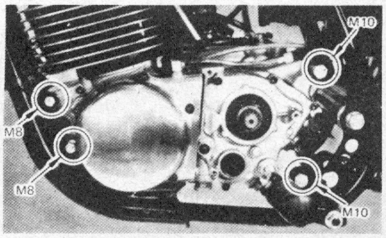
All Models

Installation is basically the reverse of the removal procedure. Note the following points:

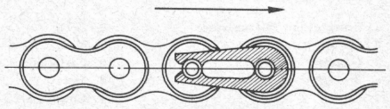
1. Engine mounting bolts should be firmly secured and checked for tightness after a run of a few miles.
2. Install the drive chain masterlink spring clip with the closed end facing the direction of chain rotation as shown.
3. Replace any worn or damaged exhaust system gaskets.
4. When installing the carburetor, if it is mounted on the manifold with nuts, be sure that the O-ring is not pinched between the carburetor flange and the manifold. Tighten the two flange nuts gradually and evenly. Do not overtighten.
5. Bleed the oil pump before operation.
6. Be sure that all oil and fuel lines are secured with spring clips.
7. Check chain and cable adjustments before operation.



Disconnecting the tachometer cable (Courtesy Yamaha Int. Corp.)



Engine mounting bolts for most Enduro models (Courtesy Yamaha Int. Corp.)



When installing the drive chain masterlink be sure that the closed end faces the direction of chain rotation (Courtesy Yamaha Int. Corp.)

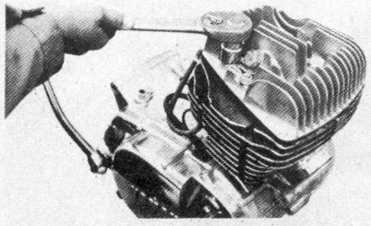
Top End

CYLINDER HEAD, CYLINDER, AND PISTON

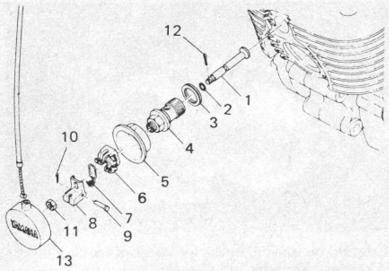
Removal

1. Clean the engine thoroughly to remove any dirt or deposits. The area around the cylinder base is especially important. Remove the gas tank if necessary.
2. Remove the spark plug.
3. Disconnect the exhaust pipe from the cylinder.
4. On piston port motorcycles, remove the carburetor from the cylinder.
5. Loosen the cylinder head nuts or bolts ¼ turn at a time in an "X" pattern until they are loose, then remove them and their washers.
6. Remove the cylinder head and the aluminum cylinder head gasket as well.

NOTE: *The cylinder head may become stuck to the cylinder due to carbon build-up. In this case, tap around the lower edge of head with a plastic mallet until the head is free. Do not strike the cooling fins.*

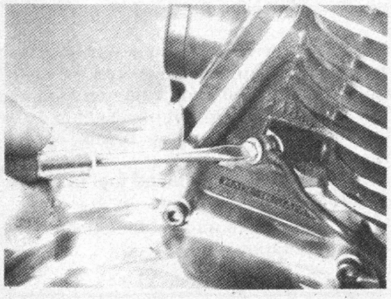


Removing the cylinder head bolts (Courtesy Yamaha Int. Corp.)



Compression release components (Courtesy Yamaha Int. Corp.)

1. Compression release valve
2. O-ring
3. Gasket
4. Bracket
5. Plate
6. Cable holder
7. Spring
8. Lever
9. Pin
10. Cotter pin
11. Nut
12. Cotter pin
13. Cover



Removing the oil feed line banjo screw (Courtesy Yamaha Int. Corp.)

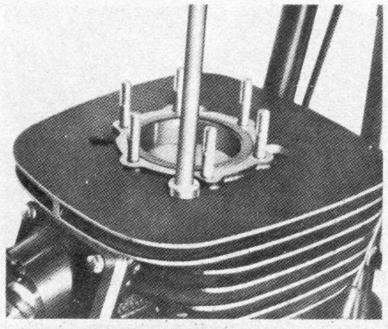
7. Remove the compression release, if necessary. On piston port models, disconnect the oil feed line banjo at the cylinder. Wrap a piece of plastic around the banjo, bolt, and washers. Secure it with a rubber band to prevent the entry of dirt. If cylinder securing nuts are fitted, loosen each one ¼ turn at a time in a cross pattern until they are loose, then remove them.

8. Place the piston at top dead center and lift the cylinder off the crankcases until there is enough room to stuff a clean rag between the cylinder and the cases. Pull the cylinder straight up, catching the piston with one hand when the cylinder is free so that the piston won't hit the studs.

NOTE: *If the cylinder is stuck, it may be freed by tapping around the fins with a plastic mallet.*

9. Remove and discard the cylinder base gasket. Remove all traces of old gasket from the crankcase and cylinder mating surfaces.

10. Remove the piston wrist pin snaprings with needlenose pliers. Grasp the piston with one hand and push out the wrist pin with a suitable drift. If the pin will not come out, the piston crown may be heated, evenly and gently, with a propane torch. If the pin still resists, it is advisable to use the shop wrist pin removal tool. This consists of a steel band or bands which fit around the piston while the attached screw device is used to push out the pin.



Removing the cylinder nuts (Courtesy Yamaha Int. Corp.)



Removing a wrist pin snap-ring (Courtesy Yamaha Int. Corp.)

11. When the wrist pin is about ¾ in. out of the piston, grasp the exposed end and pull it out until it is clear of the connecting rod. Remove the piston from the engine.

12. Most models are equipped with a caged needle small end bearing which is a slip fit in the connecting rod. The bearing may be removed to prevent loss.

CYLINDER HEAD

Inspection

1. Maximum allowable cylinder head warpage is 0.13–0.15 mm (0.005–0.006 in.).

CYLINDER AND PISTON

Inspection

1. If the cylinder walls are scratched, hone them and check for condition afterwards.

If scratches or score marks deeper than 0.03–0.05 mm (0.001–0.002 in.) remain, the cylinder should be bored out to the next oversize.

2. To check for wear of the bore, use an inside micrometer and take bore diameter measurements at the following points, holding the instrument in line with the intake and exhaust ports: just below the top edge of the cylinder; just above the exhaust port; just below the lower edge of the exhaust port; just above the top edge of the cylinder spigot. Record the diameters. Then turn the micrometer 90° and take another set of readings at the same points.

3. If the difference between the highest and lowest of these eight measurements exceeds 0.05 mm (0.0019 in.), or the difference between any two taken at the same level exceeds 0.01 mm (0.00039 in.), the cylinder should be bored and the next oversize piston fitted (see below).

4. With a micrometer, measure the diameter of the piston perpendicular to the wrist pin at a point 10 mm above the bottom edge of the piston skirt. Compare this reading of the piston diameter with the *smallest* of the cylinder bore measurements made earlier. Subtracting the piston diameter from the smallest of the bore measurements will give the piston-to-cylinder clearance. If the measured value is more than 0.1 mm (0.0039 in.), the cylinder should be bored and the next oversize piston fitted.

If the wear has occured primarily on the piston, fitting a new piston of the same original size you have might serve to bring the clearance into tolerance. This is, however, not often the case.

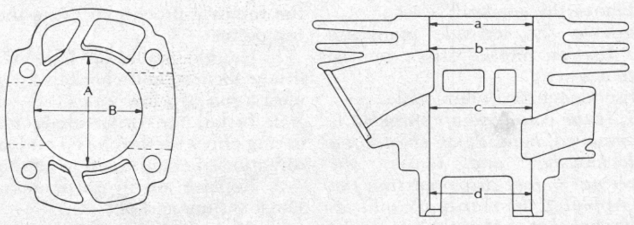
5. If the cylinder must be bored, first obtain the correct oversize piston and rings. Oversize pistons are available in two to four oversizes depending on model. Sizes range from 0.5 mm (0.02 in.) to 1.5 mm (0.060 in.).

Measure the diameter of the new piston, add the correct clearance for your model given in the "Piston and Ring Specifications" chart at the end of this section, and have the piston bored to the sum of the two.

After the cylinder is bored, use a small file to put a slight chamfer on the edges of all the ports. This is important since rings will catch on the edges of unchamfered ports.

Be certain that the bore is cleaned thoroughly, and that all foreign matter in the area is removed. Coat the bore with two-stroke oil.

6. There are several types of rings



Measure the cylinder bore at the four positions shown on the right and in the directions "A" and "B" (Courtesy Yamaha Int. Corp.)

having different shaped cross-sections. One type, the "plain" type ring, has a nearly square cross-section. The other two types are the "Keystone" or wedge-shaped, and the "L" shaped rings. These latter types are usually used as the top ring, although some machines have, for example, two Keystone rings or an "L" shaped top and Keystone lower ring. Single-ring pistons generally have an "L" shaped ring fitted.

7. Check ring side-clearance where specified. (Refer to the Specifications charts).

8. Check ring end-gap. Free end-gap is specified for some machines and is meant to determine whether the ring has lost tension or has been deformed through use.

Installed end-gap is checked by inserting the ring about ½ inch into the bottom of the bore. Check that the ring is contacting the bore at all points. If not, either the ring is deformed, or the bore is worn.

End-gap specifications are given in the charts at the end of this section.

9. The connecting rod small end needle bearing can be removed from the rod by hand, on models so equipped.

10. Needle bearings exhibiting flat spots or pitting on the rollers or races should be replaced along with the wrist pin.

11. Check the vertical play of the wrist pin in the rod small end. There should be no noticeable play. Maximum is 0.045 mm (0.002 in.). If it is in excess of this, the bearing and pin should be replaced.

12. Lightly oil the wrist pin and insert it into the piston. The pin should be a snug push fit. Note the amount of drag on the pin while attempting to push it in by hand. If the pin goes in easily, or can be easily turned after insertion, either it or the piston will have to be replaced.

13. To check for connecting rod straightness, fit the piston, minus the rings, onto the connecting rod and install the wrist pin. Install the clyinder. The piston should be dead center in the cylinder bore. If moved to either side, it should return to the center position after the engine is turned over once or twice. If it does not, or if it appears to be to one side or the other in the bore, the connecting rod is bent.

CYLINDER HEAD, CYLINDER, AND PISTON

Assembly

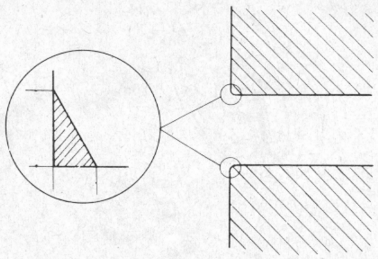
1. Assemble the piston and rings. Models which use only one keystone or "L" shaped ring will have this ring in the top groove.

Models with an "L" shaped ring and a keystone ring will have the "L" shaped ring in the top groove.

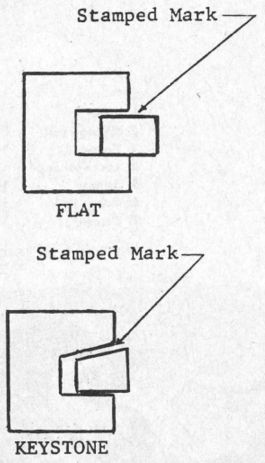
Models using two keystone rings have the rings marked with a number (1 or 2) and a letter: "1N," "2N," etc. The number is the ring position. "1" is the top ring, and "2" is the bottom ring.

Models with two plain rings will have the chrome-plated ring installed in the top piston groove.

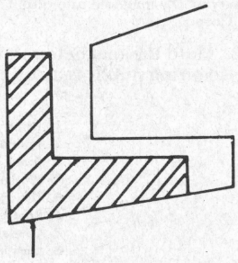
Due to the fact that the piston grooves are shaped to accommodate the shape of the ring, it is important to install rings in their proper locations.



After boring, a slight chamfer must be put on the edges of all ports



Comparison of the plain and "keystone" type piston rings and their grooves (Courtesy Yamaha Int. Corp.)



Cross section of an "L"-shaped ring

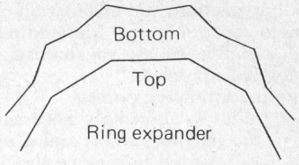
All rings are installed with the stamped mark facing *up*.

Install the ring expanders, if fitted, on the piston. Note that the expanders may be different for the top and bottom rings.

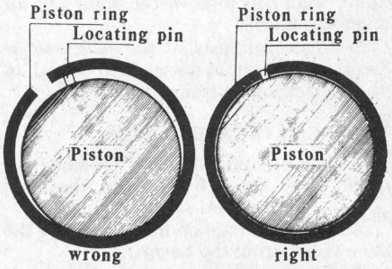
Spread the ring ends with your thumbs, while moving the other end of the ring down onto the piston. When the rings are in their proper groove, align the ring ends with the locating pin in the ring groove. Be sure that the rings are in this position when the piston is inserted into the bore.

2. Lubricate the connecting rod small end with two-stroke oil. Place the piston over the rod with the arrow on the piston crown pointing toward the *exhaust* port.

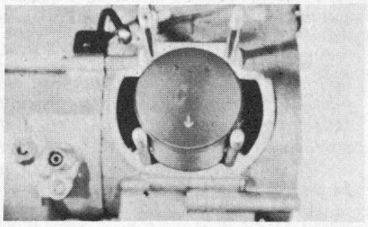
If the piston is equipped with induction holes in the piston skirt, make sure that they face rearward, toward the intake ports. Push the wrist pin into the piston until it is located between the snap-ring grooves.



Piston ring expanders may be shaped differently according to which position they occupy (Courtesy Yamaha Int. Corp.)



Be sure that the ring ends are seated on either side of the locating pin



Install the piston so that the arrow on the crown points towards the exhaust port (Courtesy Yamaha Int. Corp.)

3. Install *new* wrist pin snap-rings.

4. Clean off the crankcase mating surface and fit a new cylinder base gasket. Check again to ensure that the piston is correctly installed and that the ring ends are on either side of the locating pins.

5. Lubricate the piston rings and skirt with two-stroke oil. Place the piston at top dead center. Move the cylinder down over the piston until the piston begins to enter the bore. Then carefully compress the rings with your fingers until they enter the bore. Continue moving the cylinder downward until it is seated in the crankcase.

6. If cylinder studs are fitted, install the nuts and tighten in a cross pattern in increments of 5 ft lbs until the specified torque is reached.

7. Clean off the top of the cylinder. Apply some clean oil to both sides of the head gasket and install it on the cylinder. "Top" is marked on some head gaskets.

8. Clean the threads of the cylinder head bolts or studs. Fit the head and tighten the fasteners in a cross pattern in increments of 2–3 ft lbs until the proper torque is reached.

9. The remainder of the procedure is the reverse of removal. Use new exhaust pipe gaskets where applicable.

Left Crankcase Cover and Components

The following section covers the re-

moval, inspection, and installation of the magneto or generator (depending on model), clutch release mechanism, and countershaft sprocket.

Note the following points:

1. A puller is absolutely necessary to remove the magneto rotor, and a puller bolt is also needed to remove the armature on generator-equipped models. In addition, it may be necessary to use a rotor holder to remove the rotor nut on magneto bikes.

2. Electrical tests of the magneto or generator components can be found in the "Electrical Systems" section.

LEFT CRANKCASE COVER

1. Loosen and completely remove the shift lever pinch-bolt. Slide the shift lever off its splined shaft.

2. Using an impact driver, remove the screws securing the cover.

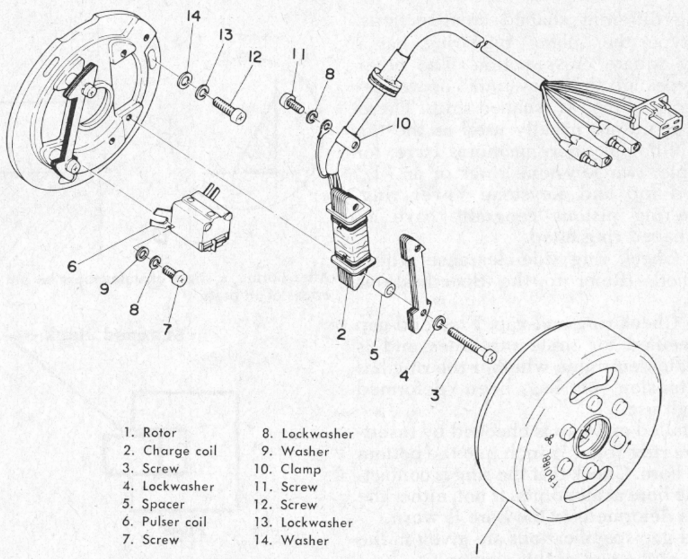
3. Remove the cover from the crankcase. If the cover is stuck, tap it lightly with a rubber mallet. If the cover gasket is not damaged it may be reused. Be careful not to nick the gasket surface.

NOTE: *On some models, the cover can be removed in halves, to expose the magneto or the countershaft sprocket. It is necessary to remove only the half shielding the component to be worked on. If only the magneto cover is to be removed it is not necessary to remove the shift lever.*

MAGNETO

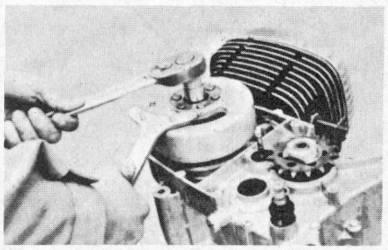
Removal and Installation

1. On models with a split left-side crankcase cover, remove the front half. Remove the whole cover on models with a solid cover.

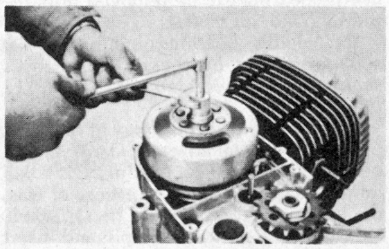


1. Rotor
2. Charge coil
3. Screw
4. Lockwasher
5. Spacer
6. Pulser coil
7. Screw
8. Lockwasher
9. Washer
10. Clamp
11. Screw
12. Screw
13. Lockwasher
14. Washer

Magneto-CDI components (Courtesy Yamaha Int. Corp.)

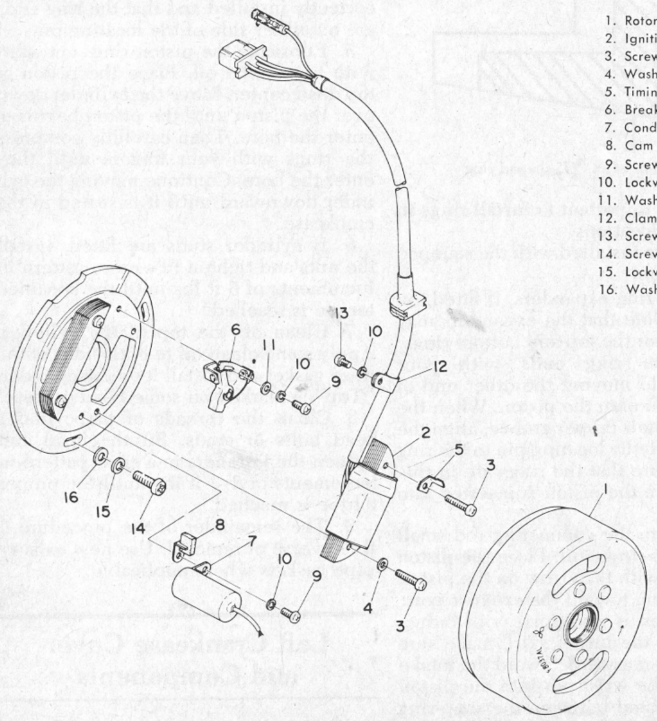


Removing the magneto rotor nut (Courtesy Yamaha Int. Corp.)



Removing the magneto rotor (Courtesy Yamaha Int. Corp.)

2. Hold the magneto rotor and remove the securing nut. It is a normal right-hand thread. An impact driver may be used to remove the nut while holding the rotor with your hand. Alternately, placing the machine in gear and applying the rear brake may enable you to remove the rotor nut.



1. Rotor
2. Ignition source coil
3. Screw
4. Washer
5. Timing plate
6. Breaker points assembly
7. Condenser
8. Cam lubricator
9. Screw
10. Lockwasher
11. Washer
12. Clamp
13. Screw
14. Screw
15. Lockwasher
16. Washer

Magneto components (Courtesy Yamaha Int. Corp.)

3. If the engine is not in the frame, the countershaft sprocket can be secured by looping a length of old drive chain around it and securing the ends of the chain in a vise. Engaging the transmission will then effectively lock the rotor in place so that the nut can be removed.

4. Use the special puller to remove the magneto rotor. Back the puller bolt off several turns so that the puller can be threaded a good way into the rotor. Thread in the puller (left-hand thread). When it is in as far as possible, hold the puller with a wrench and turn the puller bolt clockwise until the rotor comes off the crankshaft.

NOTE: *If the rotor resists removal, tighten the puller bolt as much as possible, then give the end of the bolt a sharp rap with a hammer, which should break it loose.*

CAUTION: *Do not strike the rotor itself. Do not hit the bolt hard enough to damage the tapered shaft. Never try to pry or otherwise force the flywheel off its tapered shaft. Do not strike the tapered shaft as this will mushroom or bend the threaded portion.*

5. Remove the woodruff key from the shaft to keep from losing it.

6. Disconnect the magneto wiring at the back of the engine.

7. To remove the magneto base plate complete with coils and points, remove the three or four securing screws at the perimeter of the plate and lift the plate from the engine.

Inspection

1. Check the rotor for loose hub rivets or cracks. Check the inside of the rotor and note any scoring which may have been caused by contact with the stator coil cores. If such scoring exists, the cause must be determined and remedied.

2. Check the stator assembly for any damage visible to the eye such as scored coil core ends, broken or frayed wiring, loose coils, etc.

3. The tapered portion of the crankshaft should be smooth and free of corrosion, rust, etc. Finish off any scratches or scores with fine emery cloth. Clean the area thoroughly.

4. Check the end of the crankshaft for play which would indicate a bad crank bearing. This is one thing which would cause the rotor to strike the coil cores.

Installation

1. Installation is the reverse of removal. On some models, the magneto plate has slotted mounting holes. Install the plate so that the mounting screws are centered in the slots.

2. Do not forget to install the woodruff key. Apply some oil or grease to the crankshaft taper to facilitate removal next time.

3. Push the rotor on by hand after lining up the rotor slot with the key.

4. Use the rotor nut to drive the rotor home. Do not strike the rotor. Torque the rotor nut to the proper specification.

5. Set the ignition timing.

GENERATOR

Removal and Installation

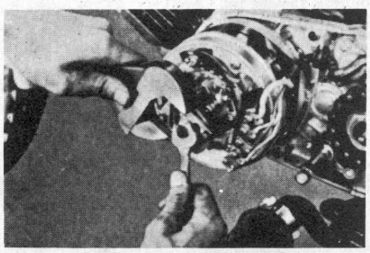
1. Remove the left-side crankcase cover. On models so equipped, remove only the front half of the cover.

2. Label and disconnect all generator wiring at the stator terminals.

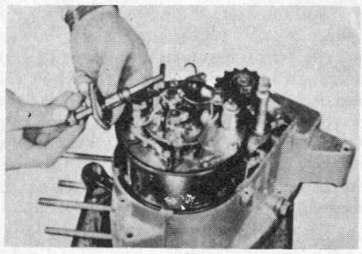
3. Remove the slotted armature bolt securing the points cam and advance mechanism to the crankshaft.

4. Remove the stator securing screws at the edge of the stator assembly and remove the assembly complete with the points and brushes.

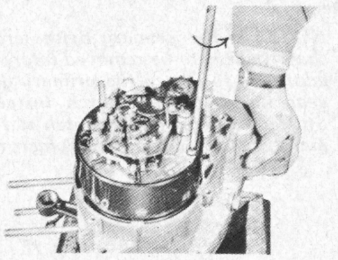
5. Using an armature puller or slide hammer, remove the armature from its keyed tapered shaft.



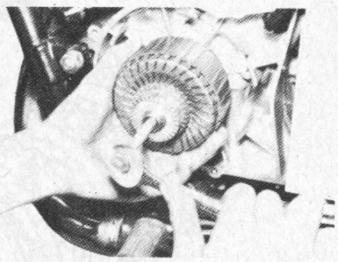
Secure the timing advance weights to remove the armature bolt (Courtesy Yamaha Int. Corp.)



Removing the armature bolt and timing advance weights (Courtesy Yamaha Int. Corp.)



Removing the stator screws (Courtesy Yamaha Int. Corp.)



Removing the armature (Courtesy Yamaha Int. Corp.)

6. Remove the woodruff key to prevent loss.

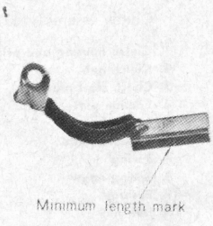
7. Installation is the reverse of removal. The tapered shaft may be lubricated with a very light coat of grease to ease future removal. The point gap and engine timing will have to be reset. When reinstalling the stator assembly, be careful not to damage the brushes.

Inspection

1. Check the brush length and condition.

2. There is a mark on the brush indicating minimum length. Replace the brushes if worn too short. Three-quarters of the brush contact surface area must contact the commutator.

3. When replacing the brushes, make sure that the lead to the positive brush does not ground out on the breaker plate or the brush holder.

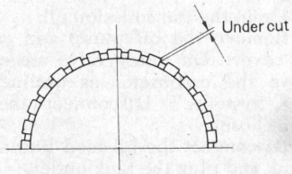


Check the carbon brushes for wear. Minimum length is usually marked (Courtesy Yamaha Int. Corp.)

4. Clean the commutator of carbon, oil and dirt. The commutator may be polished with 400 sandpaper or crocus cloth. The commutator must be completely round and devoid of flat spots. Do not remove excess metal with the sandpaper. Flat spots may be identified by irregularly shaped darkened areas spanning several commutator bars.

5. Inspect the generator armature for wear or scoring of the commutator segments. If the armature has been rubbing against the stator, the cause must be determined. This may be caused by an improperly mounted stator, a bent crankshaft, damaged crank bearing, etc. When the armature rotates it must not touch the stator at any point. The commutator may be turned on a lathe to remove any out of roundness or flat spots. A maximum of 2 mm may be removed from the standard 40 mm commutator diameter.

6. After the commutator is turned or cleaned, it will be necessary to remove metal and carbon deposits between the metal commutator bars. Clean the grooves with the broken end of a hacksaw blade. The groove must be kept square shaped.



Commutator undercut (Courtesy Yamaha Int. Corp.)

CAUTION: *Never clean a commutator groove with a pointed instrument. Be sure that the groove does not have a thin sliver of insulator against one of the commutator bars.*

Commutator undercut should be 0.5–1.0 mm (0.02–0.04 in.).

CLUTCH RELEASE MECHANISM

The clutch release mechanism is located in the left crankcase cover. This mechanism, although seemingly out of the way, is subject to a great deal of grit and corrosion carried in by the chain. If excessive effort is necessary to operate the clutch, it may be necessary to remove and clean the mechanism.

1. Remove the small mechanism cover and then remove the crankcase cover. When removing the crankcase cover, be careful not to lose the small ball bearing in the mechanism.

2. Disconnect the clutch cable.

3. Loosen the adjuster locknut and turn the adjuster screw out of the cover.

4. Turn the release mechanism out of the crankcase cover.

5. Clean the mechanism in a solvent and reinstall it in the cover. Upon reinstallation, lightly lubricate the mechanism with grease. Excessive amounts of grease will cause rapid build-up of dirt.

6. Readjust the clutch.

COUNTERSHAFT SPROCKET

Removal and Installation

1. Remove the left crankcase cover, or

the rear half of the crankcase cover, if so equipped.

2. Flatten the bent edge of the sprocket nut lockwasher with a cold chisel.

3. Holding the sprocket by applying the rear brake hard, loosen and remove the sprocket securing nut. An alternate method of holding the sprocket is to put the transmission in First gear and use an impact wrench to remove the nut.

Right Crankcase Cover and Components

Included in the following section are the primary drive gear, clutch, gearshifter shaft, kick-starter mechanism, rotary valve, and tach drive gear.

RIGHT CRANKCASE COVER

Removal and Installation

NOTE: *The right crankcase cover may be removed while leaving the oil pump in place if desired.*

1. Remove the kick-starter lever pinch-bolt and pull the lever off the splined shaft.

2. Drain the transmission oil.

3. Remove the oil pump and carburetor covers. On rotary valve machines, remove the carburetor as outlined in "Fuel Systems." Disconnect the air cleaner hose.

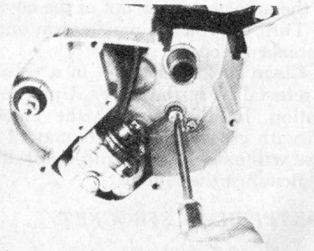
4. Disconnect the oil feed line at the oil tank and plug the tank outlet.

5. Disconnect the oil pump cable from the pump and the adjuster holder or adjuster from the cover. Disconnect the oil pump feed line from the engine. On piston port models, this is on the cylinder or manifold; on rotary valve engines it is located in the oil pump compartment (see the illustration). Cover the banjo bolt and washers with a plastic bag to prevent the entry of dirt.

6. Place a drip pan beneath the cover to catch any oil residue. Loosen all of the phillips head cover screws with an impact driver and remove them. On some models there is a screw in the oil pump compartment. Tap around the edges of the cover with a plastic mallet to free it, if stuck, and remove the cover. Pull off the cover gasket.

7. When installing the cover, use Yamaha Bond #5 on both mating surfaces.

8. It is sometimes helpful to grease the kick-starter shaft before installing the side cover to minimize chances of rendering the kick-starter shaft oil seal unusable.



Disconnecting the oil pump feed line (rotary valve models) (Courtesy Yamaha Int. Corp.)

9. On models which have the oil pump driven directly off the crankshaft, be sure that the pump driveshaft engages its hole in the end of the crank. If the shaft had remained in place when the cover was removed, carefully rotate the oil pump with the starter plate while fitting the pump so that the oil pump gear engages the shaft worm gear. Do not attempt to force the cover into place.

CLUTCH

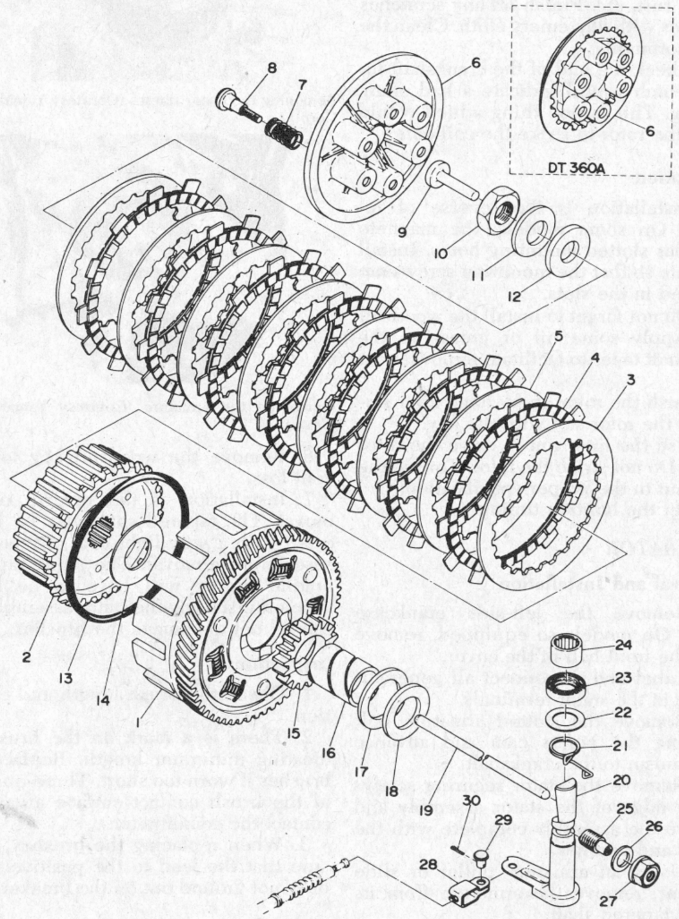
Removal

NOTE: *If the primary drive (crankshaft) gear is to be removed later, it is advisable to loosen the primary drive gear nut with the clutch installed. Stuff a rag between the clutch and primary gears to lock them in place, then loosen the nut. Using impact rather than steady pressure on this nut will make removal easier.*

Removing the clutch hub nut requires some method of holding the hub in place. This can be accomplished with a tool which may be fabricated by welding a hefty handle onto an unused steel clutch plate. Other methods which can be used are: if the engine is in the frame, engaging the transmission and applying the rear brake; if out of the frame, engaging the transmission, looping a length of old drive chain around the countershaft sprocket and locking the ends of the chain in a vise; using an impact driver on the nut may also be effective.

1. Remove the right-side cover.

2. Loosen the clutch pressure plate screws gradually and evenly, then remove them, the pressure plate, and the



Clutch assembly (DT250/360) (Courtesy Yamaha Int. Corp.)

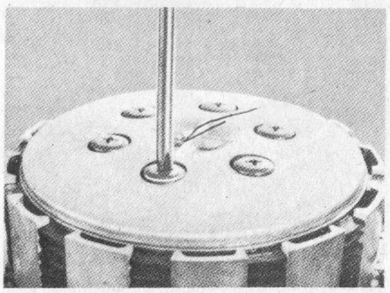
1. Clutch housing and primary driven gear
2. Clutch hub
3. Clutch steel plate
4. Friction plate
5. Steel plate
6. Pressure plate
7. Spring
8. Spring screw
9. Pushrod
10. Hub nut
11. Spring washer (DT250)
12. Spring washer (DT360)
13. O-ring (DT250)
14. Thrust washer
15. Kick-starter pinion gear
16. Spacer
17. Thrust washer (DT250)
18. Thrust washer
19. Pushrod
20. Lifter lever
21. Return spring
22. Washer
23. Oil seal
24. Bearing
25. Adjusting screw
26. Gasket
27. Adjusting screw locknut
28. Cable fitting
29. Pin
30. Cotter pin

clutch springs.

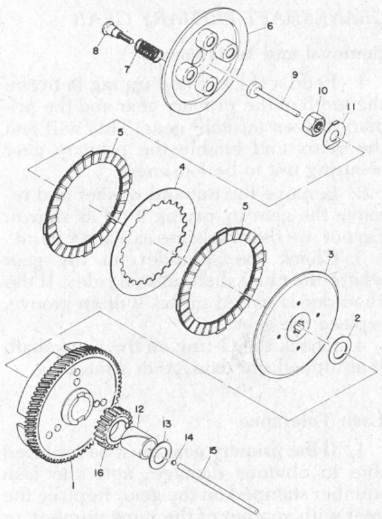
3. Remove the clutch pushrod. If the engine is on the bench, note that there is a ball bearing behind this outer pushrod which will come out if the engine is tilted.

4. Remove the clutch steel and friction plates on some models. Handle them carefully. Note the order of the plates and bands as they are removed. All components must be installed in the same order.

5. Remove the clutch hub nut using one of the methods suggested above.



Removing the clutch pressure plate screws (Courtesy Yamaha Int. Corp.)



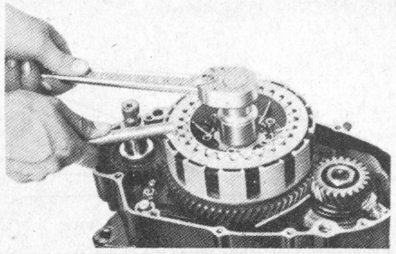
Clutch assembly (JT1/2) (Courtesy Yamaha Int. Corp.)

1. Clutch housing and primary driven gear
2. Thrust washer
3. Clutch hub
4. Steel plate
5. Friction plate
6. Pressure plate
7. Clutch spring
8. Spring screw
9. Pushrod
10. Locknut
11. Lockwasher
12. Spacer
13. Thrust washer
14. Pushrod ball
15. Pushrod
16. Kick-starter pinion gear

6. Remove the clutch hub. Note the presence of any thrust washers or shims behind the hub.

7. It is now possible to slide the clutch housing and gear assembly off its shaft. Note that there is one or more of the following behind the housing assembly: kick-starter pinion gear, thrust washers, or needle bearing. These are very close tolerance parts and they should be kept very clean.

CAUTION: *All thrust washers or shims in the clutch assembly must be labeled and installed in their original locations. In most cases, the washers are not interchangeable. Thickness may vary, and if incorrectly installed will impair clutch operation.*



Removing the clutch hub nut (Courtesy Yamaha Int. Corp.)

Inspection

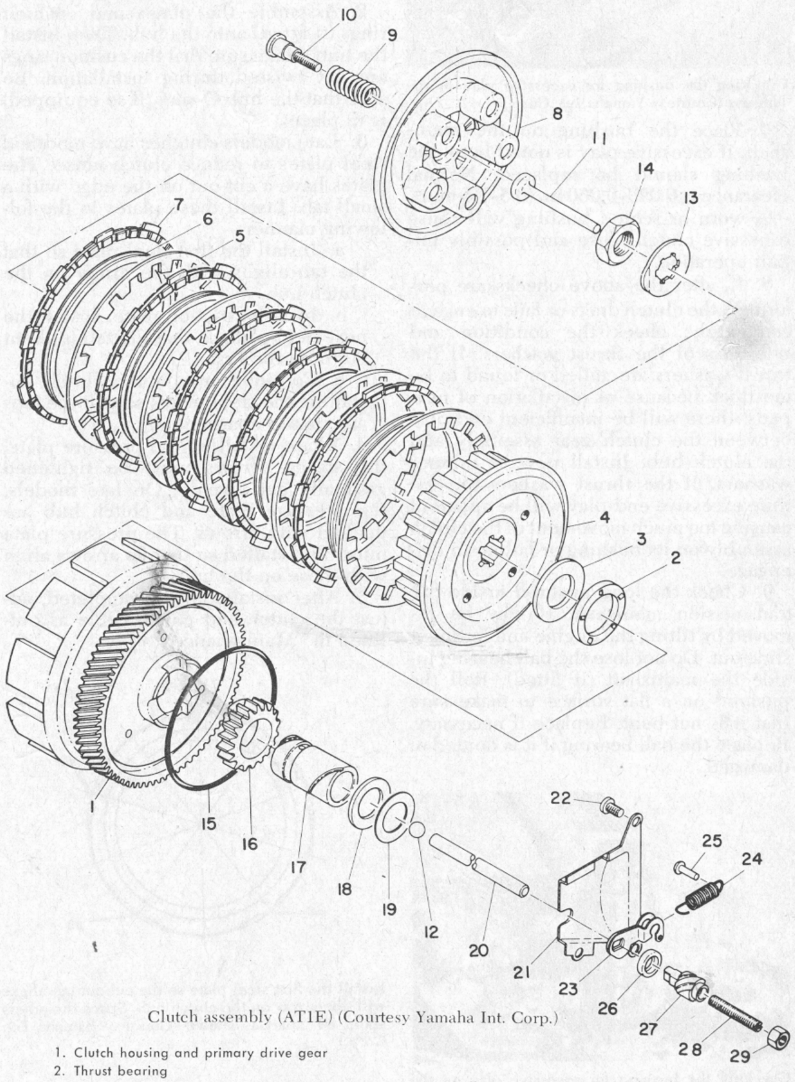
1. Refer to the "Clutch Specifications" chart at the end of this section for individual models.

2. Check spring free length and replace the set if any spring is 1.0 mm (0.04 in.) or more under the standard specification.

3. Check friction plate thickness.

4. Check steel plate warpage. Maximum allowable warpage is 0.2 mm (0.008 in.) for 175 cc and smaller machines before 1975, and 0.05 mm (0.002 in.) for 175 cc and smaller machines 1975 and later and 250–400 cc bikes, all years.

5. Remove the bushing from the housing and inspect both inner and outer surfaces for scoring, scratches, or wear. Remove any such imperfections with emery cloth or sandpaper. If the damage

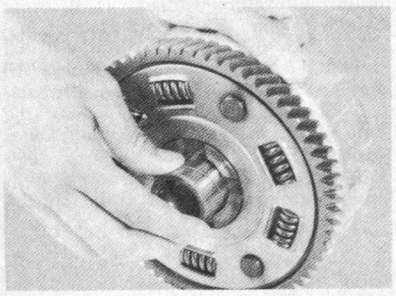


Clutch assembly (AT1E) (Courtesy Yamaha Int. Corp.)

1. Clutch housing and primary drive gear
2. Thrust bearing
3. Thrust washer
4. Clutch hub
5. Steel plate
6. Cushion ring
7. Friction plate
8. Pressure plate
9. Clutch spring
10. Spring screw
11. Pushrod
12. Pushrod ball
13. Lockwasher
14. Locknut
15. O-ring
16. Kick-starter pinion gear
17. Spacer
18. Thrust washer
19. Thrust washer
20. Pushrod
21. Dust seal
22. Screw
23. Lifter lever
24. Return spring
25. Hook
26. Oil seal
27. Lifter screw
28. Adjusting screw
29. Locknut

cannot be remedied in this way, replace the bushing.

6. Insert the bushing into the housing and check for play. If the clearance is excessive, replace the bushing. If a new bushing yields an excess of play, replace the housing. The bushing should be a smooth press fit; it should rotate easily. Proper clearance is 0.009–0.048 in. (0.23–1.2 mm).



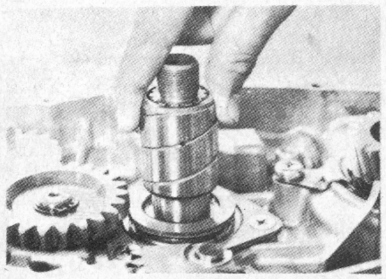
Checking the bushing for excessive play in the housing (Courtesy Yamaha Int. Corp.)

7. Place the bushing on the mainshaft. If excessive play is noted here, the bushing should be replaced. Normal clearance is 0.020–0.060 in. (0.5–1.5 mm).

A worn or scored bushing will cause excessive clutch noise and possibly impair operation.

8. If, after the above checks are performed, the clutch drags or fails to engage completely, check the condition and thickness of the thrust washers. If the thrust washers are galled or found to be too thick because of installation of new parts, there will be insufficient end-play between the clutch gear assembly and the clutch hub. Install new or thinner washers. If the thrust washers are too thin, excessive end-play will be apparent causing too much movement of the clutch assembly on its bushing or failure to disengage.

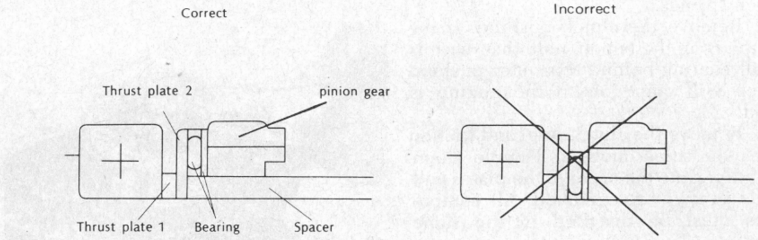
9. Check the long pushrod inside the transmission mainshaft. If may be removed by tilting the engine and letting it slide out. Do not lose the ball bearing inside the mainshaft (if fitted). Roll the pushrod on a flat surface to make sure that it is not bent. Replace if necessary. Replace the ball bearing if it is dented or damaged.



Checking the bushing for excessive play on the mainshaft (Courtesy Yamaha Int. Corp.)

Installation

1. The installation of the thrust washers in their original locations is critical. Note that in most clutches, these washers are found on either end of the clutch hub bushing. It is possible that a thrust washer fitted onto the transmission shaft may slip down while the bushing is being installed. This will impair clutch operation. All thrust components should be held in place with bearing grease or the like.



Exercise caution when fitting the clutch that the thrust washers are correctly positioned (Courtesy Yamaha Int. Corp.)

2. Assemble the plates and cushion rings (if fitted) onto the hub. Then install the hub. Make sure that the cushion rings are not twisted during installation. Be sure that the hub O-ring (if so equipped) is in place.

3. Late models clutches have modified steel plates to reduce clutch noise. The plates have a cut-out on the edge with a small tab. Install these plates in the following manner:

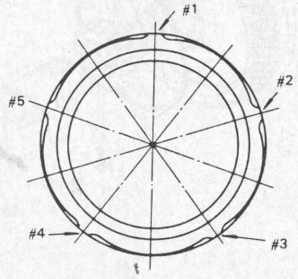
a. Install the first steel plate so that the tab aligns with the arrow on the clutch hub.

b. Install a friction plate. Install the next steel plate so that the tab is about 60° from the first.

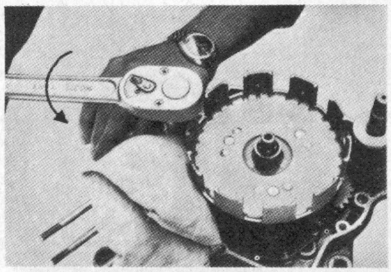
c. Continue around the clutch, installing the steel plates so that the tabs are spaced apart equally.

4. When installing the pressure plate, the spring screws must be tightened gradually and evenly. On late models, the pressure plate and clutch hub are marked with arrows. The pressure plate must be installed so that its arrows align with those on the hub.

5. After installation is completed, adjust the clutch and clutch cable as outlined in "Maintenance."



Install the first steel plate so the cut-out tab aligns with the arrow on the clutch hub. Space the others about 60° apart as shown (Courtesy Yamaha Int. Corp.)



A rolled up rag between the clutch and primary gear teeth will jam the gears so that the primary gear nut can be removed (Courtesy Yamaha Int. Corp.)

CRANKSHAFT PRIMARY GEAR

Removal and Installation

1. Feed a thick rolled up rag between the teeth of the primary gear and the primary driven (clutch) gear. This will jam the gears and enable the primary gear securing nut to be loosened.

2. Remove the nut and washer and remove the gear by prying it off as shown. Do not use the crankcase as a lever point.

3. Check the shoulder on the gear where the crankshaft oil seal rides. If the shoulder is galled or has a deep groove, replace the gear.

4. Check the O-ring on the crankshaft, if equipped, for damage or stretching.

Lash Tolerance

1. If the primary gear must be replaced due to obvious damage, note the lash number stamped on the gear. Replace the gear with another of the same number, or refer to the following specifications.

2. Lash tolerance is obtained by adding the lash numbers of the primary drive and primary driven (clutch housing) gears. If the sum of the two numbers is less than the minimum, excessive wear will occur. If greater, noise will be the result.

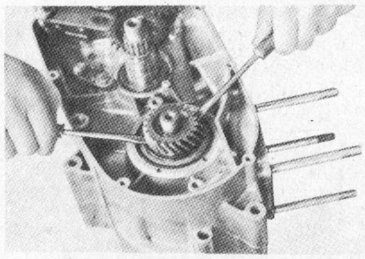
ROTARY VALVE

Removal

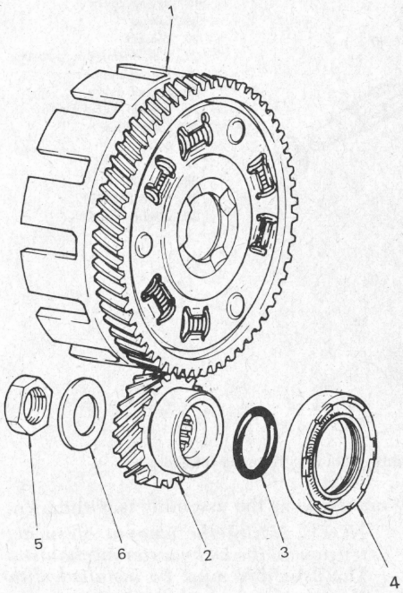
1. Remove the engine side cover, primary drive gear, and clutch assembly as outlined in the preceding sections.

Lash Tolerance

Model	*Primary Drive Gear*	*Primary Driven Gear*	*Lash Tolerance*
DT100C	80–83	52–56	135–137
DT125C/175C	88–92	52–56	144
DT250A/B/C	2–6	42–49	41–44
DT360A, 400B/C	23–27	45–52	64–68

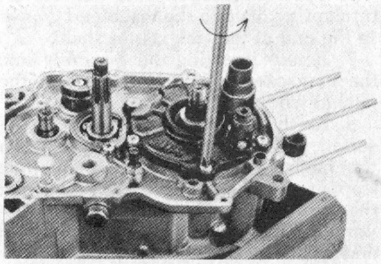


Prying off the primary gear. Take care not to damage the crankcases or seal (Courtesy Yamaha Int. Corp.)



Primary drive gear assembly and clutch gear (typical) (Courtesy Yamaha Int. Corp.)

1. Clutch housing and primary driven gear
2. Primary gear
3. O-ring
4. Crankshaft oil seal
5. Primary drive gear nut
6. Spring washer



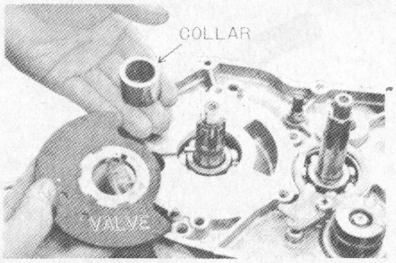
Removing the rotary valve cover (Courtesy Yamaha Int. Corp.)

2. Remove the phillips head screws which hold the rotary valve cover to the engine. Carefully remove the valve cover.

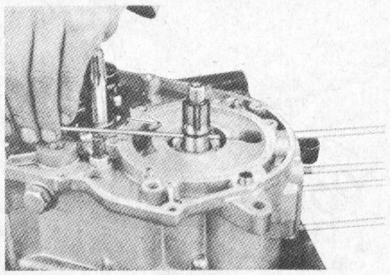
3. Remove the rotary valve and the rotary valve collar.

4. Remove the rotary valve locating pin from the crankshaft either by pulling it out with pliers or by tapping it out.

CAUTION: *Take care not to damage the crankcase or rotary valve mating surfaces during this operation.*



Rotary valve and collar (Courtesy Yamaha Int. Corp.)



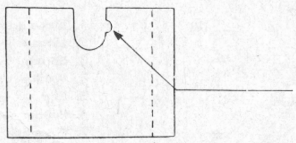
Removing the rotary valve driving pin (Courtesy Yamaha Int. Corp.)

5. Remove the O-ring from the crankshaft and discard it; a new one must be fitted on assembly.

Inspection

1. The rotary valve must be close to perfectly flat. If warped, replace it.

2. Inspect the valve collar for step-wear caused by the valve locating pin. Replace the collar if wear shows at this point.



Check the collar for step-wear caused by the pin (Courtesy Yamaha Int. Corp.)

3. Insert the collar into the valve. If play is excessive, replace the collar.

4. Place the collar onto the crankshaft; if play is excessive here, the collar must be replaced.

5. Remove any score marks from the collar surfaces with emery cloth.

6. Check the cover oil seal for cracked or damaged lips and replace it if necessary.

7. Replace the locating pin if it is bent or damaged in any way.

Installation

1. The crankshaft and rotary valve cover O-rings should be replaced if they have been disturbed. The valve cover O-ring must be replaced if it will no longer fit properly in its groove.

2. Grease the O-rings thoroughly before installing them. The valve cover O-ring should be seated in the cover groove. The crankshaft O-ring should be located in the crankshaft groove.

3. Grease the lips of the valve cover oil seal before installing the cover.

KICK-STARTER MECHANISM

On some models it is necessary to remove the clutch assembly before the kick-starter mechanism can be removed. The clutch must be removed to take off the kick-starter idler gear.

Three basic types of kick-starters are fitted depending on model and year. Refer to the correct procedure for your model.

Removal and Installation

OLDER TYPE

This type of kick-starter assembly was fitted to most models 1968–1973 except for 1971 and later DT and RT machines.

1. Remove the kick-starter lever and the right crankcase cover.

2. On models where the kick-starter gear will not clear the clutch, remove the clutch assembly.

3. Disconnect the kick-starter return spring from the crankcase.

4. Lift out the kick-starter shaft and gear assembly, noting the position of any thrust washers. The kick-starter mechanism may be disassembled by removing the circlip at either end of the shaft.

5. To remove the idler gear, remove the clutch assembly (if still in place). Then remove the idler gear circlip and slide the gear off its shaft.

6. Installation is the reverse of the removal procedure. The wishbone clip projection must be seated in the crankcase recess.

NON-CONSTANT MESH TYPE

This kickstarter is used on DT100, 125, and 175 models as well as late GT machines.

1. Remove the kickstarter lever and right crankcase cover.

2. Remove the clutch assembly.

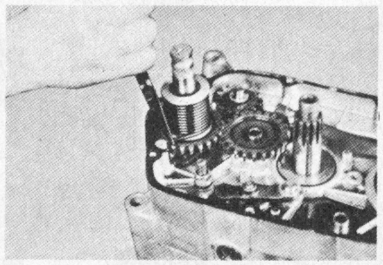
3. Disconnect the kickstarter return spring from the pin.

4. Rotate the kickstarter shaft counterclockwise and pull it out. Remove the idler gear circlip and take the gear off its shaft.

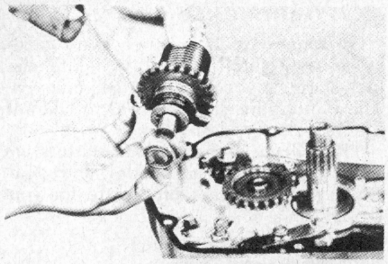
5. Disassemble the shaft by removing the circlip.

6. When assembling, install the kickstarter gear so the side with the chamfered tooth edges faces the return spring.

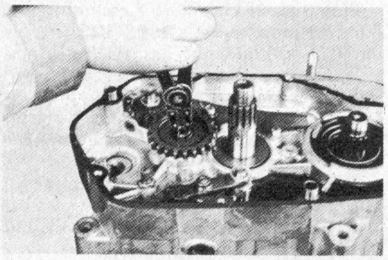
7. Install the components on the shaft. Temporarily fit the starter crank. Holding the shaft stopper vertically, engage the return spring with the slot at the end of the shaft. Turn the shaft counterclockwise about ¾ of a turn and push in, making sure the return spring engages its pin.



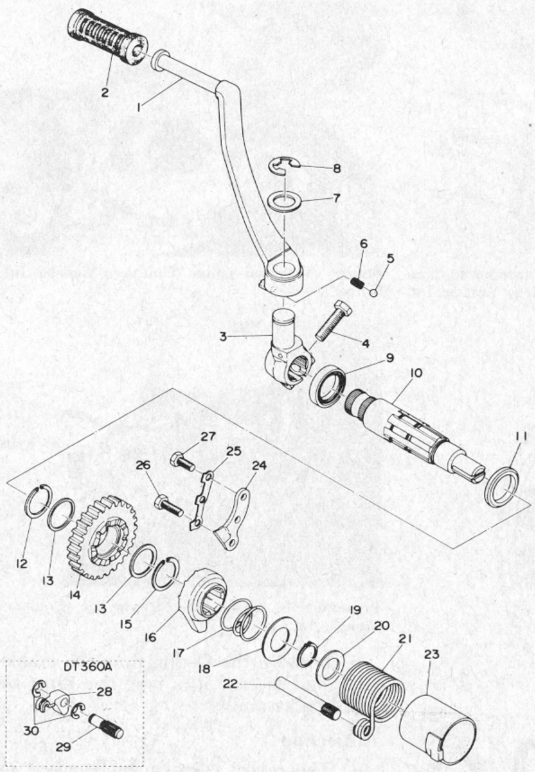
Detaching the return spring from the case (Courtesy Yamaha Int. Corp.)



Note any shims behind the kick-starter assembly when it is removed (Courtesy Yamaha Int. Corp.)



Removing the kick-starter idler gear circlip (Courtesy Yamaha Int. Corp.)



1. Kick-starter crank
2. Rubber cover
3. Crank mount
4. Pinch-bolt
5. Detent ball
6. Stopper spring
7. Washer
8. Circlip
9. Oil seal
10. Kick-starter shaft
11. Shaft spacer (DT250)
11. Washer (DT360)
12. Circlip
13. Washer
14. Kick-starter gear
15. Circlip
16. Ratchet wheel
17. Ratchet wheel spring
18. Spring cover
19. Circlip
20. Washer
21. Kick-starter return spring
22. Spring stopper
23. Spring guide
24. Ratchet wheel guide
25. Lockwasher
26. Bolt
27. Bolt
28. Link (DT360)
29. Shaft (DT360)
30. Circlip (DT360)

Ratchet-wheel type kickstarter assembly (Courtesy Yamaha Int. Corp.)

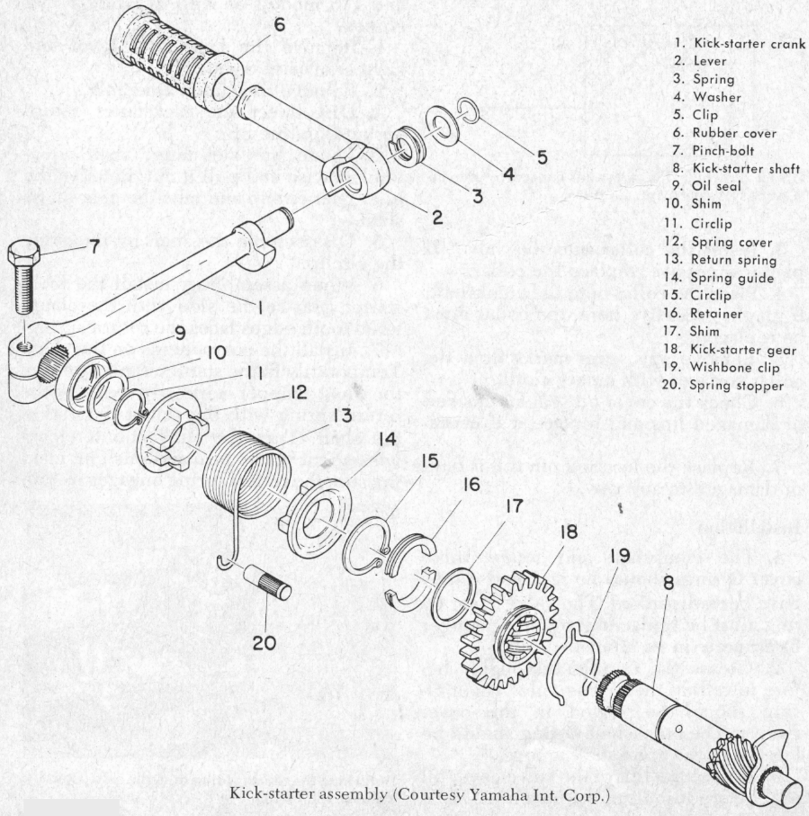
Ratchet Type

This mechanism uses a ratchet wheel to engage the idler gear, and is fitted to 250–400 cc machines after 1971.

1. Remove the kick-starter lever and the right crankcase cover.
2. Remove the clutch assembly if the kick-starter gear will not clear the clutch mechanism. Disconnect the compression release cable, if fitted.
3. Rotate the kick-starter shaft assembly about 45° and pull the assembly out of the crankcase. This will allow the ratchet wheel to clear the guide bolted onto the crankcase as the assembly is withdrawn.

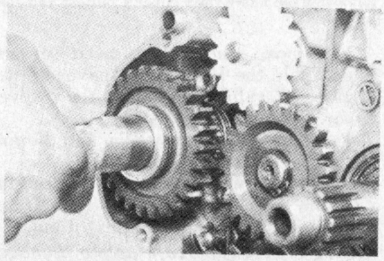
NOTE: *Notice the amount of spring tension on the kick-starter mechanism. The assembly must be installed with the proper amount of tension to ensure proper disengagement of the ratchet wheel.*

4. Disassemble the kick-starter shaft and gear assembly by removing the circlips from either end of the shaft.
5. Removal of the idler gear is accomplished by removing the circlip.
6. Upon installation note that the return spring fits into the machined groove in the end of the kick-starter shaft.
7. Before inserting the assembly into the crankcase, align the marks on the ratchet wheel and the shaft.
8. As the kick-starter assembly is inserted, slide the ratchet wheel pawl over the ratchet wheel guide and onto the stopper attached to the case. Be sure that the pawl is in close contact with the stopper. Now pull the return spring forward and hook it onto its pin.



1. Kick-starter crank
2. Lever
3. Spring
4. Washer
5. Clip
6. Rubber cover
7. Pinch-bolt
8. Kick-starter shaft
9. Oil seal
10. Shim
11. Circlip
12. Spring cover
13. Return spring
14. Spring guide
15. Circlip
16. Retainer
17. Shim
18. Kick-starter gear
19. Wishbone clip
20. Spring stopper

Kick-starter assembly (Courtesy Yamaha Int. Corp.)



Removing the kick-starter shaft (ratchet-wheel type) (Courtesy Yamaha Int. Corp.)

Inspection

ALL MODELS

Follow the inspection procedures applicable to your model.

1. Check the splines on the kick-starter shaft. If torn, worn, or splintered to the extent that they will not hold the kick-starter lever in place, replace the shaft.

2. Check the gear teeth on the shaft. If any are broken or worn, the shaft should be replaced.

3. Check the condition of the ratchet wheel on models so equipped. The inside gear teeth should be in good condition. Replace the gear if they are worn or broken. The ratchet wheel should be fairly loose on its splines but not so loose that it cocks and jams. Make a close inspection of the ratchet teeth (on the side of the gear). The gear must be replaced if these show signs of wear. If they are worn, check the condition of the ratchet teeth on the kick-starter gear in the same manner. Replace this gear as well if the teeth are worn.

4. If the kick-starter gear has a plain bore, check it for scoring and finish up any defects with a fine emery cloth. Check that the gear does not have excessive play on the shaft.

5. Check the kick-starter gear teeth for wear, chipping, and other damage, and replace the gear if the teeth are damaged.

6. Inspect the kick-starter idler gear in the same ways (Steps 4–5). The idler gear must spin freely on its shaft without excessive play.

7. If the early-type kick-starter mechanism is fitted, check the inside surfaces of the kick-starter gear. If the internal splines are worn or chipped, replace the gear.

8. Check the wishbone clip and replace it if twisted or deformed.

9. Check the condition of the kick-starter return spring. If the spring has fatigued or twisted ends, it should be replaced. If the kick-starter lever returns slowly or fails to return completely, replace the spring.

10. Replace any broken or twisted circlips.

11. Check the kick-starter shaft for wear in any area a gear rides on. Insert the shaft into its bushing. If there is excessive play, either the shaft or the bushing should be replaced.

12. On models with a compression release, insufficient free-play will cause the ratchet wheel to hang up and jam the starter mechanism.

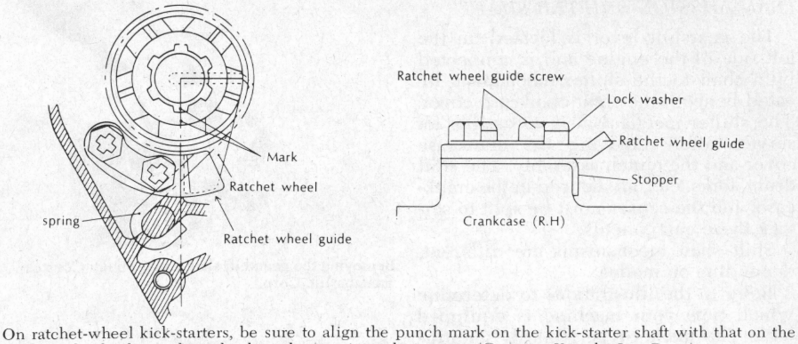
13. On models equipped with a ratchet wheel, check the ratchet wheel spring length. It should be 15.0–17.2 mm.

TACHOMETER DRIVE GEARS

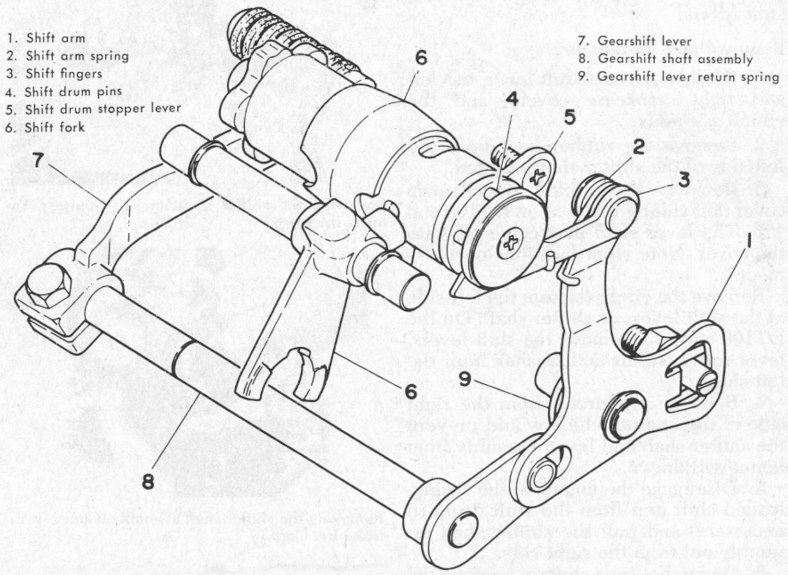
Removal and Installation

1. The tachometer driven gear may be removed from the right crankcase without removing the cover. Remove the bolt holding the C-shaped clamp to the crankcase.

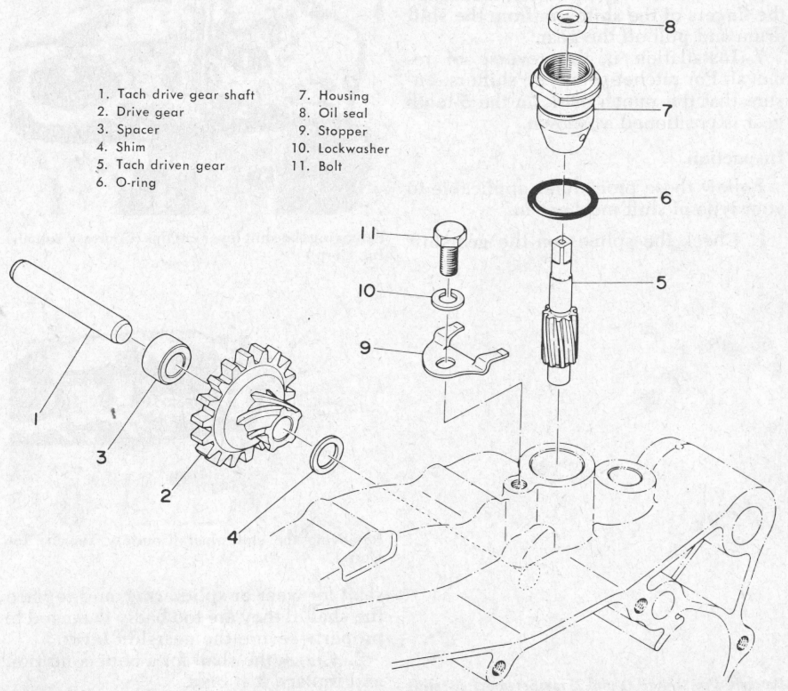
2. Pull the stopper out of the case,



On ratchet-wheel kick-starters, be sure to align the punch mark on the kick-starter shaft with that on the ratchet wheel. The ratchet wheel pawl must sit on the stopper (Courtesy Yamaha Int. Corp.)



Shifter mechanism (GT-models) (Courtesy Yamaha Int. Corp.)



Tachometer drive gear assembly (Courtesy Yamaha Int. Corp.)

Inspection

ALL MODELS

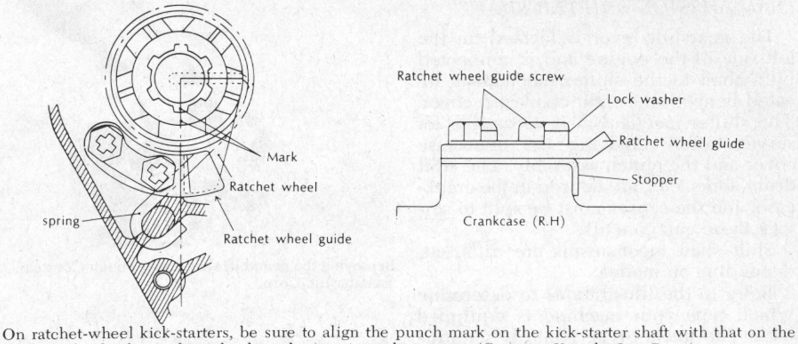
Follow the inspection procedures applicable to your model.

1. Check the splines on the kick-starter shaft. If torn, worn, or splintered to the extent that they will not hold the kick-starter lever in place, replace the shaft.
2. Check the gear teeth on the shaft. If any are broken or worn, the shaft should be replaced.
3. Check the condition of the ratchet wheel on models so equipped. The inside gear teeth should be in good condition. Replace the gear if they are worn or broken. The ratchet wheel should be fairly loose on its splines but not so loose that it cocks and jams. Make a close inspection of the ratchet teeth (on the side of the gear). The gear must be replaced if these show signs of wear. If they are worn, check the condition of the ratchet teeth on the kick-starter gear in the same manner. Replace this gear as well if the teeth are worn.
4. If the kick-starter gear has a plain bore, check it for scoring and finish up any defects with a fine emery cloth. Check that the gear does not have excessive play on the shaft.
5. Check the kick-starter gear teeth for wear, chipping, and other damage, and replace the gear if the teeth are damaged.
6. Inspect the kick-starter idler gear in the same ways (Steps 4–5). The idler gear must spin freely on its shaft without excessive play.
7. If the early-type kick-starter mechanism is fitted, check the inside surfaces of the kick-starter gear. If the internal splines are worn or chipped, replace the gear.
8. Check the wishbone clip and replace it if twisted or deformed.
9. Check the condition of the kick-starter return spring. If the spring has fatigued or twisted ends, it should be replaced. If the kick-starter lever returns slowly or fails to return completely, replace the spring.
10. Replace any broken or twisted circlips.
11. Check the kick-starter shaft for wear in any area a gear rides on. Insert the shaft into its bushing. If there is excessive play, either the shaft or the bushing should be replaced.
12. On models with a compression release, insufficient free-play will cause the ratchet wheel to hang up and jam the starter mechanism.
13. On models equipped with a ratchet wheel, check the ratchet wheel spring length. It should be 15.0–17.2 mm.

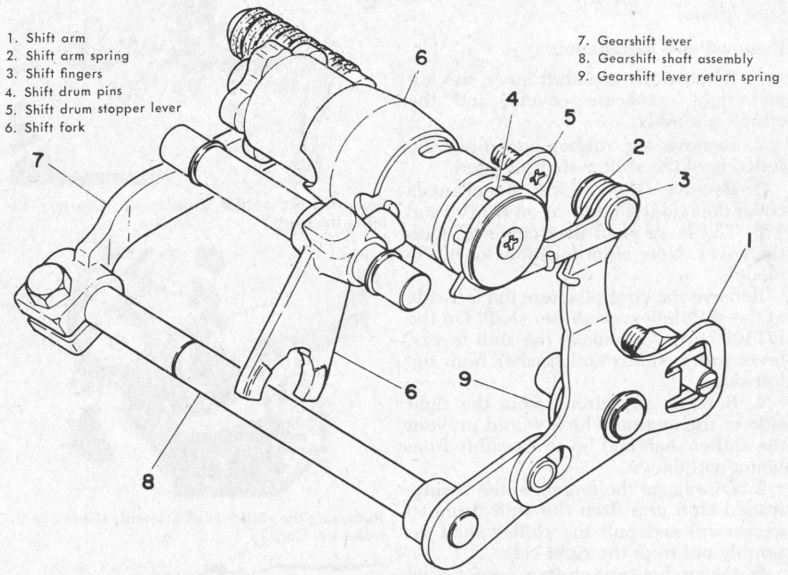
TACHOMETER DRIVE GEARS

Removal and Installation

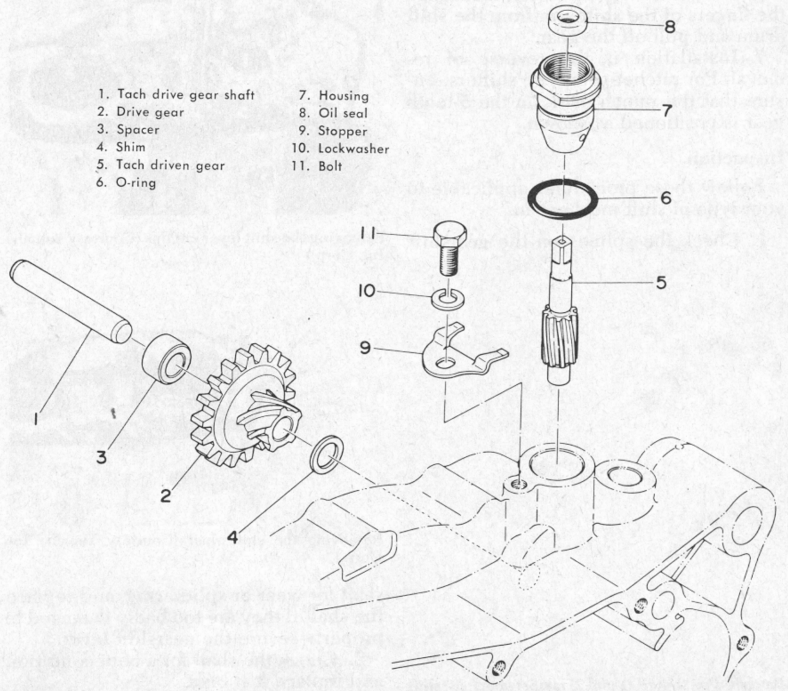
1. The tachometer driven gear may be removed from the right crankcase without removing the cover. Remove the bolt holding the C-shaped clamp to the crankcase.
2. Pull the stopper out of the case,



On ratchet-wheel kick-starters, be sure to align the punch mark on the kick-starter shaft with that on the ratchet wheel. The ratchet wheel pawl must sit on the stopper (Courtesy Yamaha Int. Corp.)



Shifter mechanism (GT-models) (Courtesy Yamaha Int. Corp.)



Tachometer drive gear assembly (Courtesy Yamaha Int. Corp.)

TRANSMISSION SHIFTER SHAFT

The gearshift lever is located on the left-side of the engine and is connected by a shaft to the shifter mechanism located beneath the right crankcase cover. The shifter mechanism is accessible for service after removing the crankcase cover and the clutch assembly. The shift drum, forks, etc., are housed in the crankcase, and the causes must be split to service these components.

Shift shaft mechanisms are different, depending on model.

Refer to the illustrations to determine which type your machine is equipped with. The ratchet-type is easily identifiable because of the gear teeth on the two shift levers.

Removal and Installation

1. Remove the gearshift lever, the left and right crankcase covers, and the clutch assembly.
2. Remove the rubber boot from the left-side of the shifter shaft, if fitted.
3. Remove the shifter mechanism cover (left side) if fitted, as on DT100 and 175. The lever shaft may come off with the cover. Note shim locations on these models.

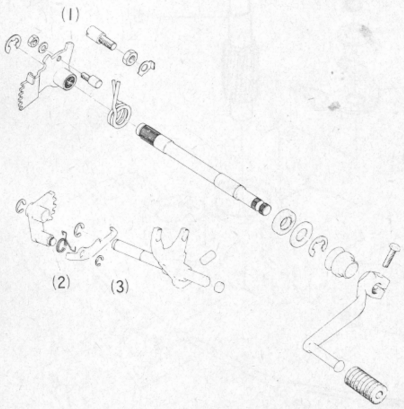
Remove the circlip(s) from the left-side of the shift levers or shifter shaft. On the DT100 and 175, remove the shift levers, lever roller, shims and washer from the left side.

4. Remove any circlip from the right side of the engine which would prevent the shifter shaft and lever assembly from being withdrawn.
5. Disengage the fingers of the spring-loaded shift arm from the shift drum (if necessary) and pull the shifter shaft assembly out from the right side.
6. On ratchet-type shifters, remove the remaining ratchet gear circlip, disengage the fingers of the shift arm from the shift drum and pull off the gear.
7. Installation is the reverse of removal. For ratchet-gear type shifters, ensure that the punch mark on the 5-tooth gear is positioned as shown.

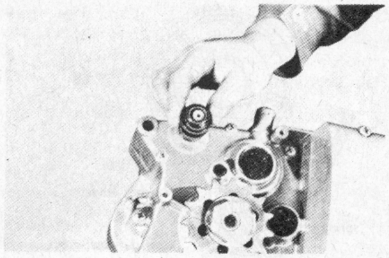
Inspection

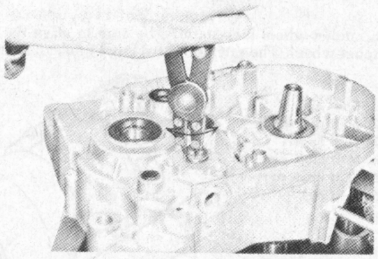
Follow those procedures applicable to your type of shift mechanism.

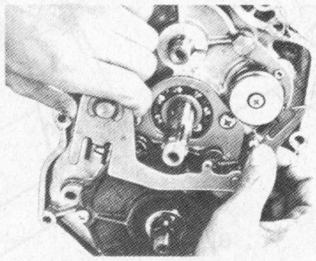
1. Check the splines on the gearshift shaft for wear or splintering, and replace the shaft if they are too badly damaged to properly secure the gearshift lever.
2. Check the shaft for a bent condition and replace it if bent.
3. Check the shift arm for straightness. Check the shift fingers for straightness, and especially for wear at the tips.
4. Inspect the shifter return spring and replace it if broken, or if the ends of the spring show signs of twisting or fatigue.
5. Check the other springs in the shift linkage and replace any that are deformed or damaged. There should be no free-play in the linkage. If play exists, check for weak or broken springs and replace them.

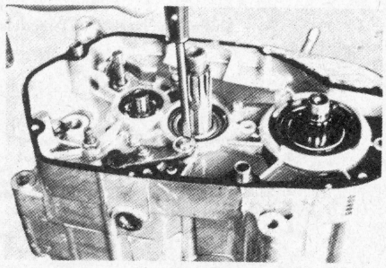


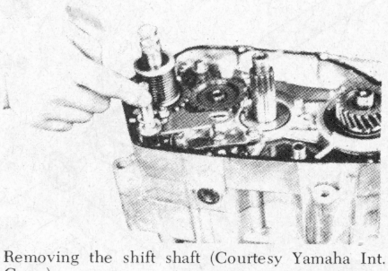
Ratchet-type shifter: (1 and 2) ratchet gears; (3) shift arm (Courtesy Yamaha Int. Corp.)

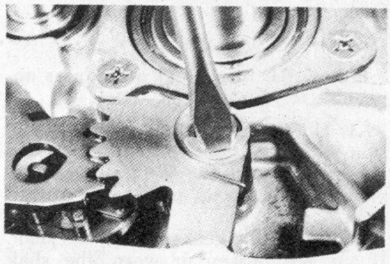

Removing the gearshift shaft rubber boot (Courtesy Yamaha Int. Corp.)

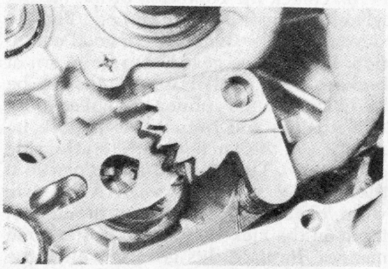

Removing the shifter shaft circlip (Courtesy Yamaha Int. Corp.)

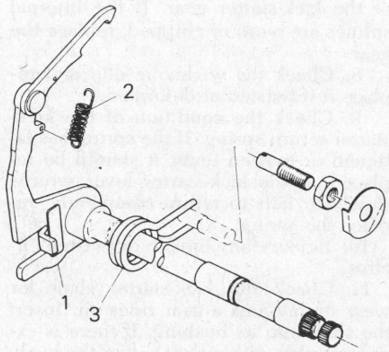

Removing the shifter shaft assembly (Courtesy Yamaha Int. Corp.)


Removing the shift lever circlips (Courtesy Yamaha Int. Corp.)

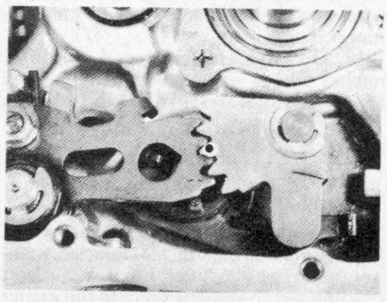

Removing the shift shaft (Courtesy Yamaha Int. Corp.)


Removing the ratchet gear circlip (Courtesy Yamaha Int. Corp.)


Removing the ratchet gear (Courtesy Yamaha Int. Corp.)



Double-change shaft shifter mechanism: (1) shift arm; (2) shift arm spring; (3) shifter return spring (Courtesy Yamaha Int. Corp.)


Line up the ratchet gears as shown when installing ratchet-type shift mechanism (Courtesy Yamaha Int. Corp.)

6. Inspect the shift arm roller and replace it if worn.

Adjustment

The adjustment procedure will vary according to the type of shift linkage fitted. Some mechanisms require two adjustments be made, others only one.

Where a simple double-change shaft mechanism is fitted, only one adjustment is necessary. Refer to the accompanying illustration. Loosen the locknut and turn the adjusting screw so that the distances "A" and "A'" are equal.

Where two adjusting screws are fitted (one on the shift arm plate and the other on the crankcase), adjust as follows: first adjust the smaller adjusting screw on the shift arm plate so that the distances "a" and "a'" as shown in the illustration are equal. Then use the crankcase-mounted adjuster so that distances "b" and "b'" are equal.

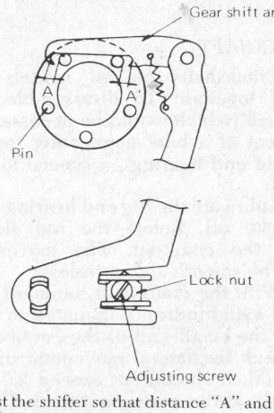
For ratchet-gear type shifters, proceed as follows:

a. Place the transmission in Second or Fourth gear. Check the distance between the two fingers of the shift arm and the shift drum dowel pins. The distances should be equal. If adjustment is necessary, use adjusting screw "A" in the illustration to effect equalization.

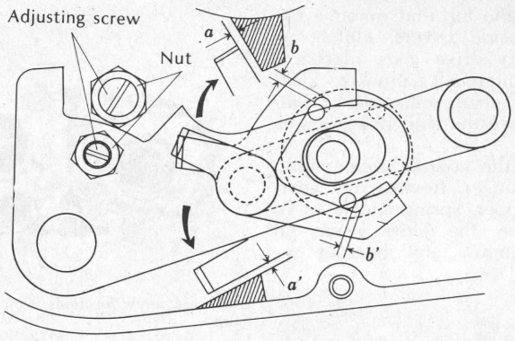
b. Place the transmission in Third or Fifth gear, and hold the shift lever down so that the stop on the shifter ratchet gear abuts against the adjusting screw "B" in the illustration. Measure the gap between the shift arm "C" and the drum dowel pin "D." Shift the transmission down one gear to either Second or Fourth, hold the shift lever down and check the gap again. Use adjusting screw "B" if necessary so that the gap is equal in both cases.

Lower End and Transmission

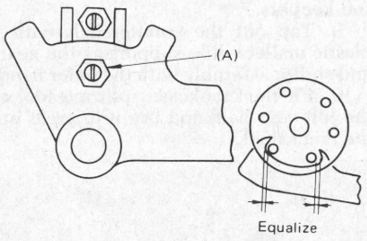
The following section deals with service to the crankshaft, transmission, shifter assembly (drum), crankcase bearings and seals. Removing the engine from the frame and splitting the crankcases is necessary to service these components.



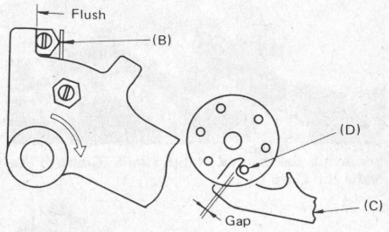
Adjust the shifter so that distance "A" and "A'" are equal (Courtesy Yamaha Int. Corp.)



The smaller adjusting screw is used to equalize distance "a" and "a'"; the larger for "b" and "b'" (Courtesy Yama Int. Corp.)



Ratchet-type shifter: first adjustment (Courtesy Yamaha Int. Corp.)



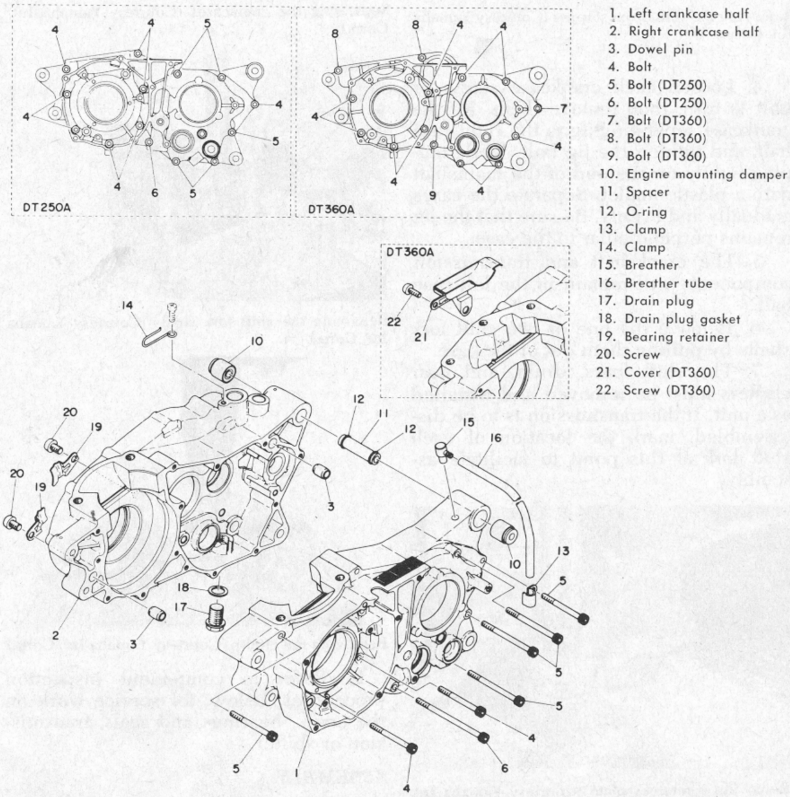
Ratchet-type shifter: second adjustment (Courtesy Yamaha Int. Corp.)

SPLITTING THE CRANKCASES

The crankcases split vertically. Before beginning, have on hand a complete set of engine gaskets, rotary valve O-rings (if applicable), and transmission and crankshaft seals.

In addition to special tools needed to remove the components already covered, a jig is necessary to split the cases. Tapping the cases apart is not recommended.

1. Remove the engine from the frame.

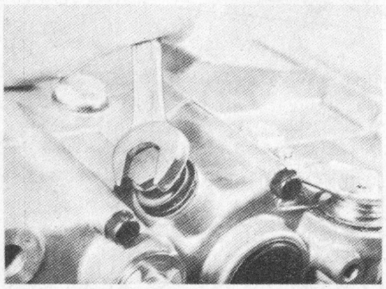


1. Left crankcase half
2. Right crankcase half
3. Dowel pin
4. Bolt
5. Bolt (DT250)
6. Bolt (DT250)
7. Bolt (DT360)
8. Bolt (DT360)
9. Bolt (DT360)
10. Engine mounting damper
11. Spacer
12. O-ring
13. Clamp
14. Clamp
15. Breather
16. Breather tube
17. Drain plug
18. Drain plug gasket
19. Bearing retainer
20. Screw
21. Cover (DT360)
22. Screw (DT360)

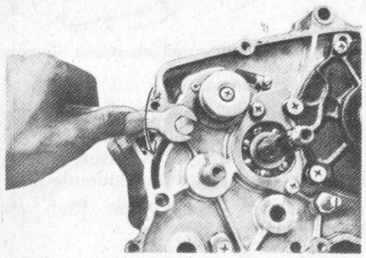
Crankcase assemblies (DT250/360) (Courtesy Yamaha Int. Corp.)

2. Remove the top end; remove the left and right-side covers, clutch assembly, primary drive gear, electrical generator, countershaft sprocket, kickstarter shaft and gears, rotary valve (if fitted), etc. Remove the shift linkage components.

3. Remove the neutral stopper bolt, spring, and plunger. Remove the gearshift drum stopper, spring and lever (if fitted). Remove the shift guide (if equipped). Remove any bearing retainer plates.



Removing the neutral stopper bolt (Courtesy Yamaha Int. Corp.)



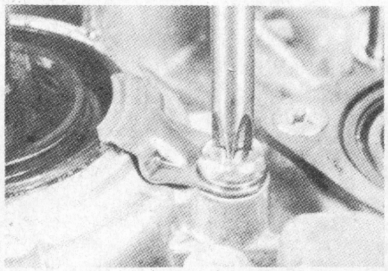
Removing the shift drum stopper (Courtesy Yamaha Int. Corp.)

4. Loosen each crankcase screw or bolt ¼ turn, then remove them. Fit the crankcase separating jig to the right case half, and tighten the jig bolt, while tapping lightly on the end of the mainshaft with a plastic mallet. Separate the cases gradually and evenly. Be sure that the jig remains perpendicular to the case.

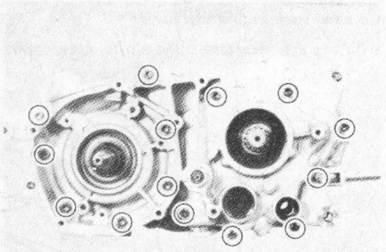
5. The crankshaft and transmission components will remain in the left case half.

6. Remove the one or two shift fork shafts by pulling them out of the case.

7. The shift forks, drum, and gear clusters must be removed and installed as a unit. If the transmission is to be disassembled, mark the location of each shift fork at this point to facilitate assembly.



Removing a retainer plate (Courtesy Yamaha Int. Corp.)

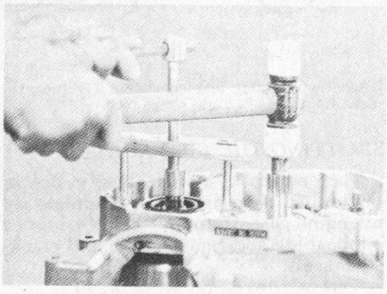


Crankcase screw locations (Courtesy Yamaha Int. Corp.)

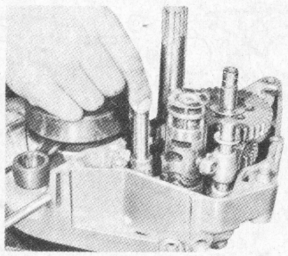
8. Remove the shift drum cover (if fitted) from the outside of the left crankcase half. Remove the drum circlip, washer, and keepers.

9. Tap out the countershaft with a plastic mallet while supporting the gears and shifter assembly with the other hand.

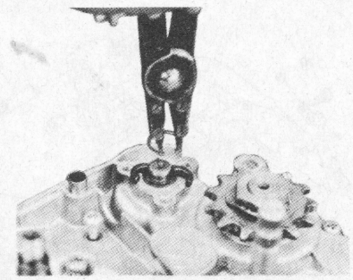
10. Fit the crankcase splitting tool to the left case half, and use it to press out the crankshaft.



Separating the crankcases (Courtesy Yamaha Int. Corp.)



Removing the shift fork shafts (Courtesy Yamaha Int. Corp.)

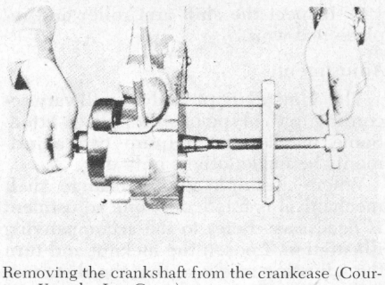


Removing the circlip (Courtesy Yamaha Int. Corp.)

11. Refer to component inspection procedures, below, for service work on the crank, bearings and seals, transmission or shifter.

ASSEMBLY

1. When assembling the cases, note the following points:



Removing the crankshaft from the crankcase (Courtesy Yamaha Int. Corp.)

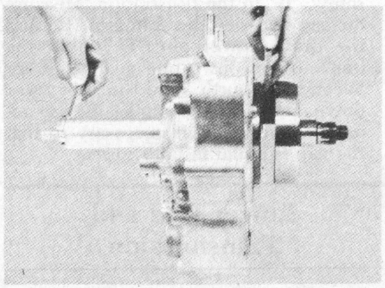
2. Draw the crankshaft into the left case half with the special puller, while holding the connecting rod at TDC.

3. Assemble the shift forks, drum and gear clusters as an assembly. Be sure that the shift drum is positioned in Neutral while refitting the assembly to the cases. The gears and shift assembly must be installed together.

4. Coat the mating surface of the left case half with Yamaha Bond #4. Join the cases with care. Tighten the crankcase screws or bolts securely.

CAUTION: *Do not use the crankcase screws to force the cases together. They should be tightened only after the cases have been mated.*

5. Lubricate all crankshaft and transmission bearings thoroughly before installing the rest of the engine components.



Installing the crankshaft (Courtesy Yamaha Int. Corp.)

6. When installing retainer plates, drum guide or any other component secured with small screws, note that these screws must be firmly tightened. Use an impact wrench or thread locking compound.

CRANKSHAFT

1. Crankshafts on all models are pressed together. To disassemble any crankshaft (which would be necessary in the event of a bent connecting rod, or worn big end bearing), a special tool is needed.

2. Lubricate the big end bearing with two-stroke oil. Rotate the rod slowly around the crankpin. The movement should be smooth and noiseless.

3. With the crankshaft mounted in a jig, and a dial indicator mounted to bear against the small end of the connecting rod, check the lateral movement of the small end. It should not exceed 2.0 mm (0.08 in.). If the movement exceeds this figure, the con rod big end bearing is

worn, and it must be replaced.

When new, rod small end movement should be 0.8–1.0 mm (0.032–0.040 in.).

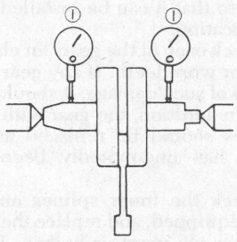
4. Check the connecting rod big end side clearance, with a feeler gauge placed between the rod big end and one of the flywheels. Side clearance should be 0.4–0.5 mm (0.016–0.020 in.). If side clearance exceeds this figure for 250–400 cc machines or 0.6 mm (0.024 in.) for smaller bikes, the crank should be disassembled and inspected for wear to the rod, thrust washers, or flywheels.

5. Mount the crankshaft in a set of V-blocks, and attach dial indicators to each end of the crank.

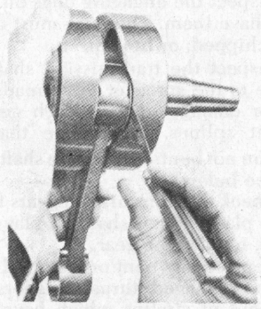
Rotate the crank slowly, and note the indicator readings. The maximum allowable run-out is 0.03 mm (0.0011 in.). If run-out exceeds this figure, the crankshaft is either bent, or the flywheels are out of alignment.

6. The following procedure concerning crankshaft truing should only be undertaken by an experienced mechanic.

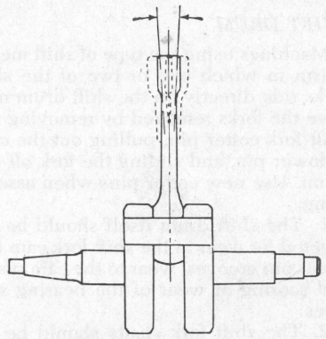
7. The crankshaft must be checked for eccentricity and for parallel fly-



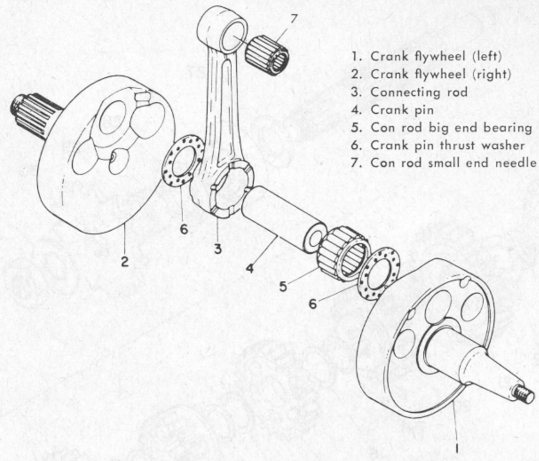
Measuring crankshaft run-out with two dial gauges (Courtesy Yamaha Int. Corp.)



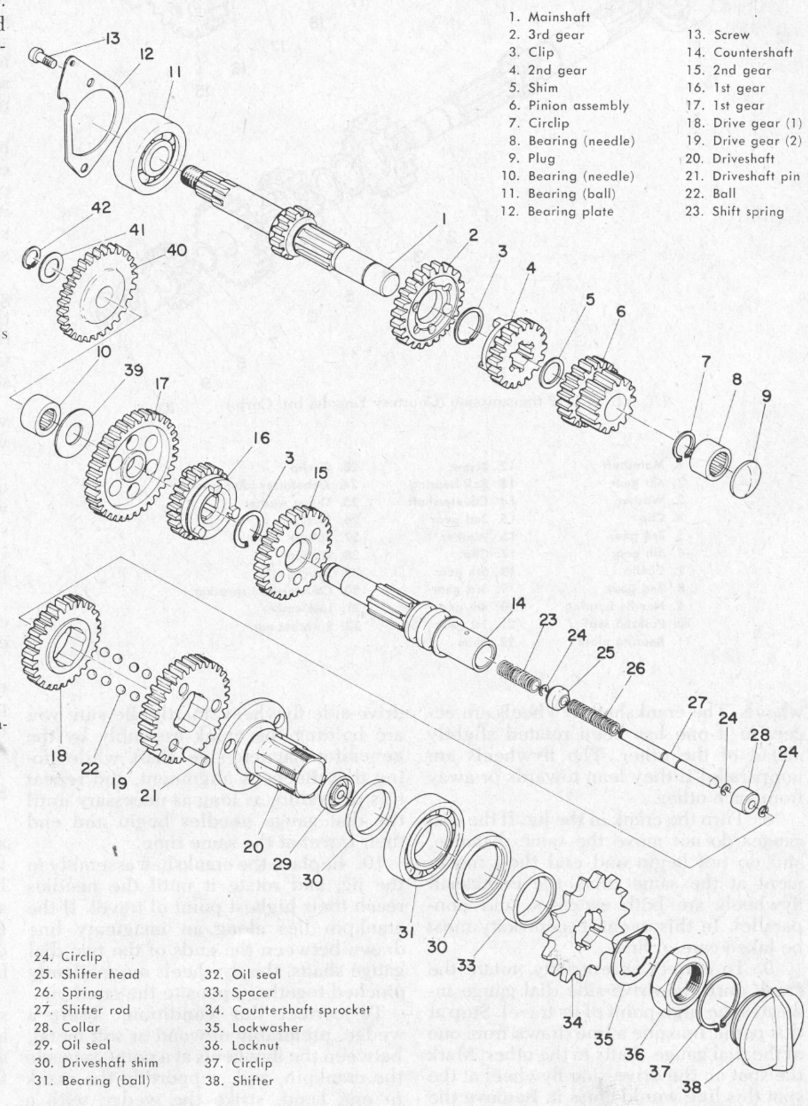
Measuring big end side clearance (Courtesy Yamaha Int. Corp.)



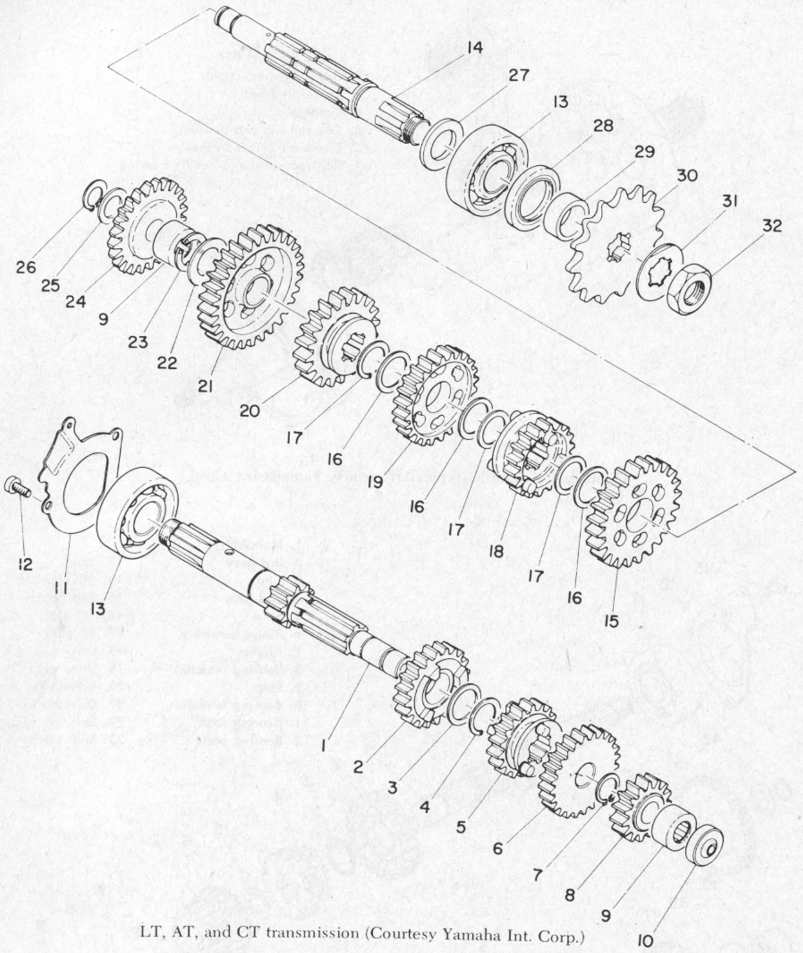
Small end movement is an indicator of big end bearing wear



Crankshaft assembly (typical) (Courtesy Yamaha Int. Corp.)



L5T/A transmission (Courtesy Yamaha Int. Corp.)



LT, AT, and CT transmission (Courtesy Yamaha Int. Corp.)

1. Mainshaft
2. 4th gear
3. Washer
4. Clip
5. 3rd gear
6. 5th gear
7. Circlip
8. 2nd gear
9. Needle bearing
10. Pushrod seal
11. Bearing plate
12. Screw
13. Ball bearing
14. Countershaft
15. 2nd gear
16. Washer
17. Clip
18. 5th gear
19. 3rd gear
20. 4th gear
21. 1st gear
22. Shim
23. Circlip
24. Kick-starter idler gear
25. Thrust washer
26. Circlip
27. Spacer
28. Oil seal
29. Spacer
30. Countershaft sprocket
31. Lockwasher
32. Sprocket nut

wheels. The crankshaft flywheels are eccentric if one has been rotated slightly ahead of the other. The flywheels are nonparallel if they lean towards or away from each other.

8. Turn the crank in the jig. If the dial gauges do not move the same distance, and do not begin and end their movement at the same time, the crankshaft flywheels are both eccentric and nonparallel. In this event, eccentricity must be taken care of first.

9. To correct eccentricity, rotate the crank until the drive-side dial gauge indicates the high point of its travel. Stop at this point. Imagine a line drawn from one of the dial gauge shafts to the other. Mark the spot on the drive-side flywheel at the spot this line would cross it. Remove the crankshaft from the aligning jig, and, with the brass hammer, strike this spot on the drive-side flywheel smartly. Be sure you are holding the crank assembly by the generator/magneto-side shaft while doing this. Recheck alignment, and repeat this procedure as long as necessary until the dial gauge needles begin and end their travel at the same time.

10. Replace the crankshaft assembly in the jig, and rotate it until the needles reach their highest point of travel. If the crankpin lies along an imaginary line drawn between the ends of the two dial gauge shafts, the flywheels are evidently pinched together opposite the crankpin.

To correct this condition, insert a wedge, preferably of wood or soft metal, between the flywheels at a point opposite the crankpin, and, supporting the crank in one hand, strike the wedge with a hammer to spread the flywheels apart. Continue until the flywheels are parallel within specifications.

11. If, when checking for parallelism, the crankpin was *not* along or near the line drawn between the ends of the dial gauge shafts, if it was opposite this line, then the flywheels are too far apart, opposite the crankpin. In this case, once again make a mark on either flywheel where the imaginary line would cross it. (Note that the crank should be positioned so that the dial gauges are at the highest point of their travel). Remove the crank, and, with the brass hammer, strike the flywheel sharply on the *side* to bring the flywheels closer together. Check again, and repeat the procedure until crank runout is within specification.

12. Clean the crank assembly thoroughly, and oil the big end bearing well.

TRANSMISSION

1. The gears should not be removed from their shafts unless absolutely necessary. If the gears are being removed, be sure that each gear, thrust washer, shim, and snap-ring is laid out in the order of removal so that it can be installed in the proper location.

2. Check each of the gears for chipped, broken, or worn teeth. If any gear shows evidence of such damage, it should be replaced. In addition, the gear with which it meshes should be replaced as well, since it has undoubtedly been overstressed.

3. Check the inner splines on those gears so equipped, and replace the gear if the splines are worn or broken. Inspect the corresponding splines on the shafts. Gears with plain bores must show no score marks on the bore.

4. Inspect the engaging dogs on gears which have them. The dogs must not be worn, chipped, or broken.

5. Inspect the transmission shafts for damage to the sprocket nut threads, and wear or damage to the clutch gear, or sprocket splines. Make sure that the shafts are not bent. Inspect the shaft bearings (see below).

6. Check the transmission gears for excessive play on their shafts. If play is excessive, replace the gear.

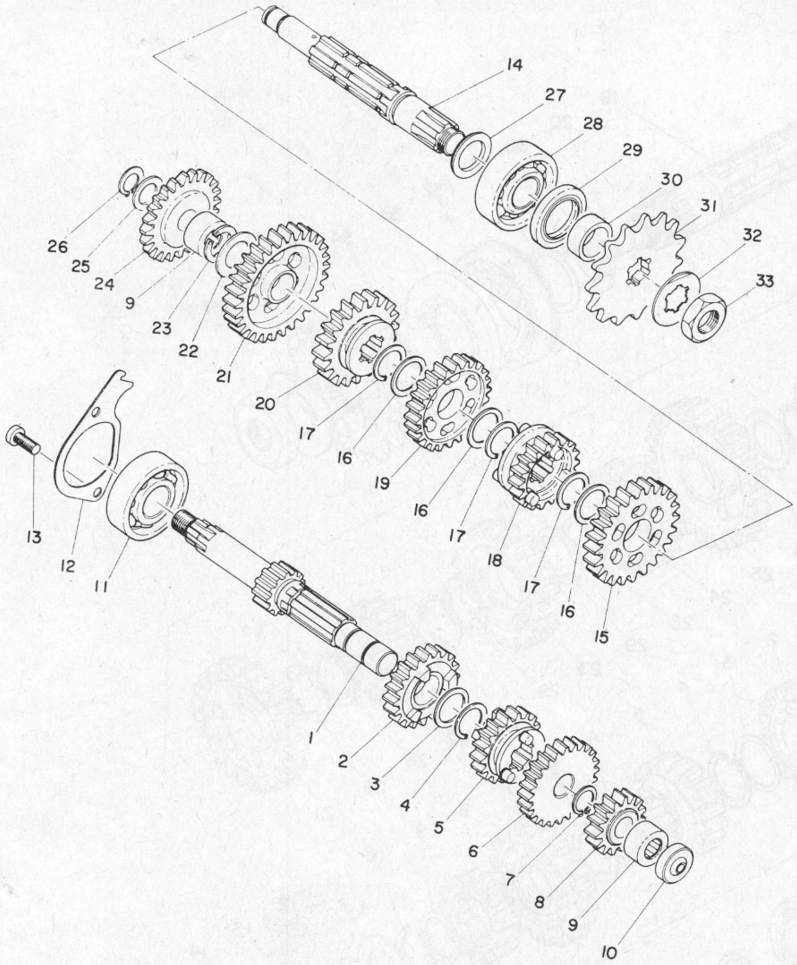
7. Replace any bent or distorted snaprings or damaged thrust washers. Replacement of circlips which have been removed from the shafts is recommended.

SHIFT DRUM

Machines using the type of shift mechanism in which one or two of the shift forks ride directly on the shift drum may have the forks removed by removing the shift fork cotter pin, pulling out the cam follower pin, and sliding the fork off the drum. Use new cotter pins when assembling.

1. The shift drum itself should be inspected for wear in the shift fork cam follower pin grooves, wear to the cam plate, and scoring or wear of the bearing surfaces.

2. The shift fork shafts should be inspected for wear in those areas on which the shift forks ride. Roll the shafts along a



HT transmission (Courtesy Yamaha Int. Corp.)

1. Mainshaft	12. Bearing cover plate	23. Circlip
2. 4th gear	13. Screw	24. Kick-starter idler gear
3. Washer	14. Countershaft	25. Thrust washer
4. Clip	15. 2nd gear	26. Circlip
5. 3rd gear	16. Washer	27. Spacer
6. 5th gear	17. Clip	28. Ball bearing
7. Circlip	18. 5th gear	29. Oil seal
8. 2nd gear	19. 3rd gear	30. Spacer
9. Needle bearing	20. 4th gear	31. Countershaft sprocket
10. Pushrod seal	21. 1st gear	32. Lockwasher
11. Ball bearing	22. Shim	33. Sprocket nut

flat surface to check them for a bent condition.

3. Check the shift forks themselves. Note any wear to the fork bore. Check the fingers for bends, or for chipping or wear.

4. Check the shift fork cam follower pins for wear.

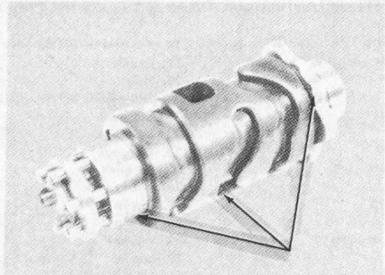
5. Check the shift drum dowel pins.

BEARINGS AND SEALS

1. Bearings can be checked in place.

2. Lightly lubricate the bearing in question with some motor oil and rotate it slowly. Movement must be smooth, effortless, and quiet.

3. If bearing movement is halting, rough, or noisy, or if the bearing shows discoloration (due to heat) or obvious signs of damage, it should be replaced.



Check the shift drum for wear at the bearing surfaces, cam grooves, and shift cam (Courtesy Yamaha Int. Corp.)

4. Crankshaft bearings should always be replaced in pairs.

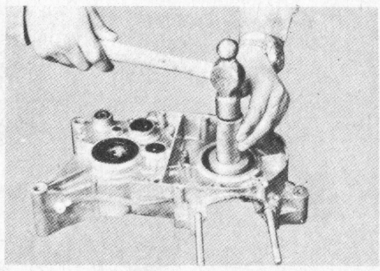
5. Bearings, either crankshaft or transmission, can be removed from the crankcases after taking away any oil seals, bearing retainer plates, or snap-rings which may be fitted.

6. Bearing removal may be facilitated by gently heating the crankcase with a propane torch in the vicinity of the bearing boss. Drive out the old bearing, refit the retainer, and drive the new one straight in with a bearing driver or a sturdy block of wood.

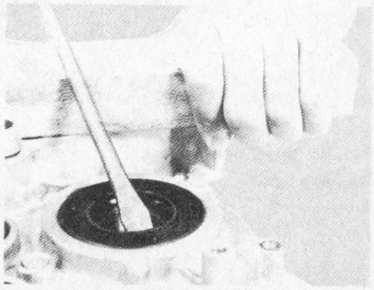
NOTE: *Install bearings and oil seals with the manufacturer's marks or numbers facing outward (i.e., visible after installation).*

7. Oil seals on both the crank and transmission shafts should always be replaced as a matter of course. Seals can be removed by prying them out of the cases with a screwdriver using a block of wood as a leverage point, as shown, or can be removed with a hooked tool. Some seals are fitted with snap-rings which must be removed first. Once removed, seals cannot be reused for any reason.

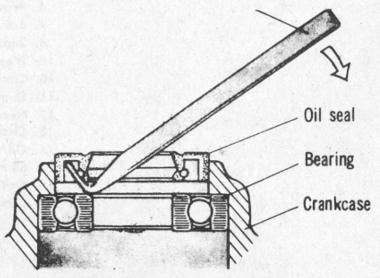
8. Install seals by pressing them straight into place with a large block of wood or the like. Ensure that the seal is not cocked in the case.



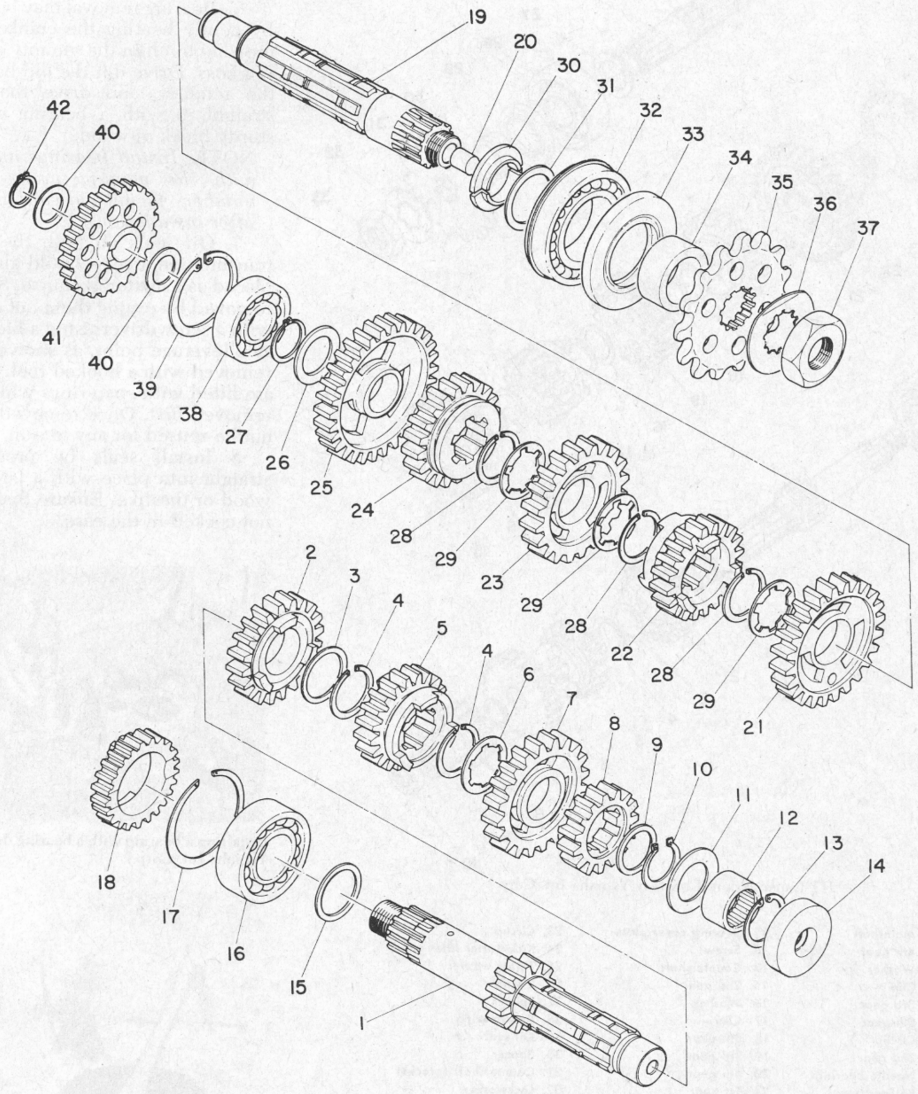
Installing a bearing with a bearing driver (Courtesy Yamaha Int. Corp.)



Removing a crankshaft oil seal (Courtesy Yamaha Int. Corp.)

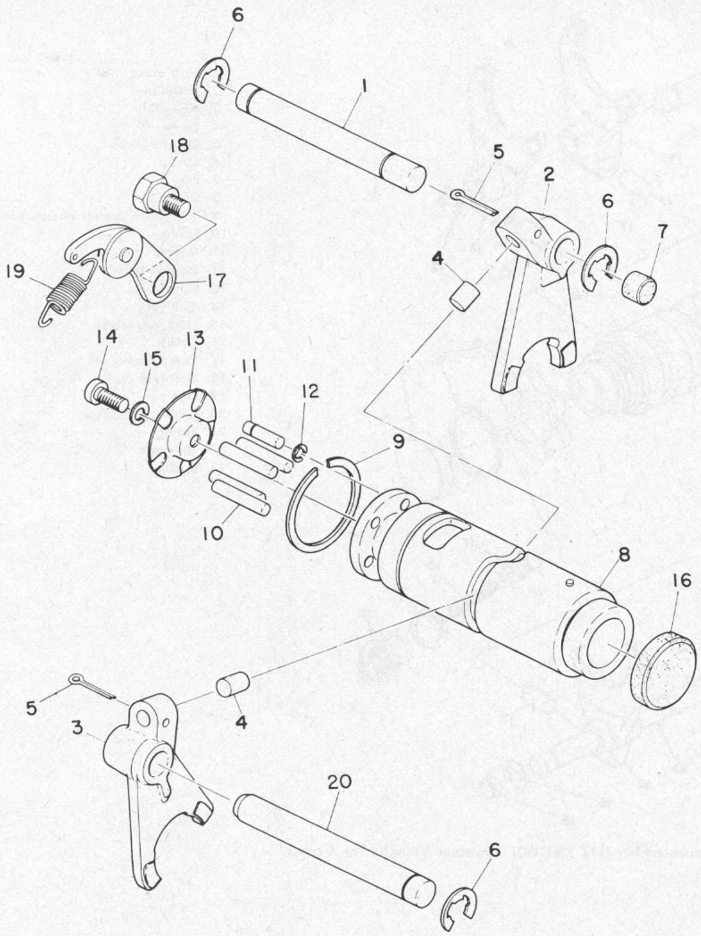


Removing an oil seal with a hooked tool



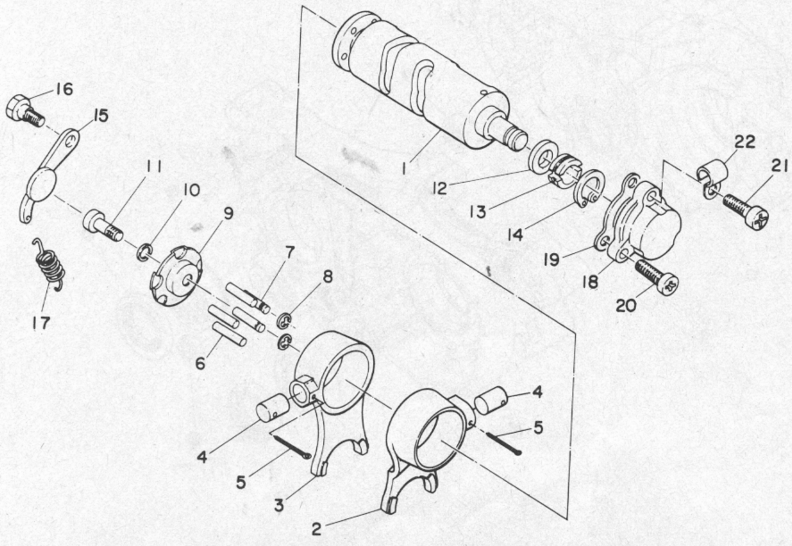
DT, RT transmission (Courtesy Yamaha Int. Corp.)

1. Mainshaft
2. 4th gear
3. Washer
4. Circlip
5. 3rd gear
6. Washer
7. 3rd gear
8. 2nd gear
9. Washer
10. Circlip
11. Shim
12. Needle bearing
13. Circlip
14. Oil seal
15. Shim
16. Ball bearing
17. Circlip
18. Kick-starter pinion gear
19. Countershaft
20. Plug
21. 2nd gear
22. 3rd gear
23. 3rd gear
24. 4th gear
25. 1st gear
26. Washer
27. Circlip
28. Circlip
29. Washer
30. Spacer
31. Shim
32. Ball bearing
33. Oil seal
34. Spacer



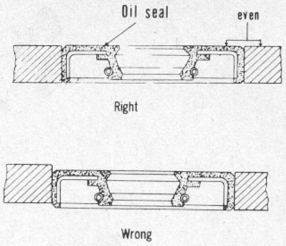
Shift drum assembly (JT1/2) (Courtesy Yamaha Int. Corp.)

1. Shift fork shaft
2. Shift fork
3. Shift fork
4. Cam follower pin
5. Cotter pin
6. Circlip
7. Plug
8. Shift drum
9. Circlip
10. Dowel pin
11. Locating pin
12. Circlip
13. Side plate
14. Screw
15. Spring washer
16. Plug
17. Shift drum stopper lever assembly
18. Stopper bolt
19. Stopper spring
20. Shift fork shaft

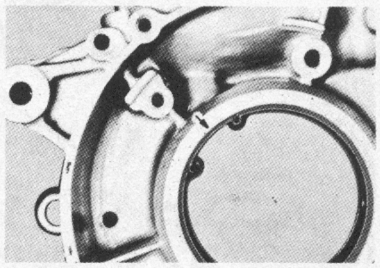


Shift drum assembly (L5T/A) (Courtesy Yamaha Int. Corp.)

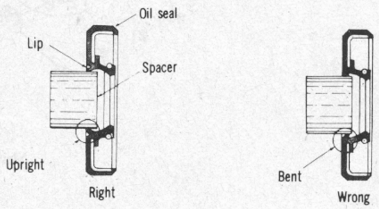
1. Shift drum
2. Shift fork
3. Shift fork
4. Cam follower pin
5. Cotter pin
6. Dowel pin
7. Locating pin
8. Circlip
9. Side plate
10. Washer
11. Screw
12. Washer
13. Keeper
14. Circlip
15. Stopper lever assembly
16. Stopper bolt
17. Spring
18. Shift drum cover
19. Gasket
20. Screw
21. Screw
22. Clamp



The seals must be correctly seated in the case as illustrated



Models using snap-ring bearing retainers must have the gap in the snap-ring located at the mark on the crankcase (Courtesy Yamaha Int. Corp.)



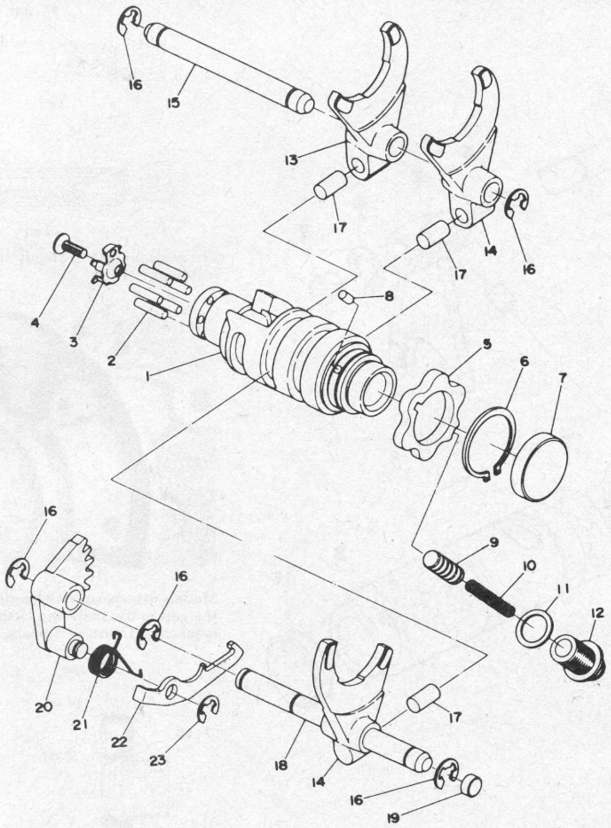
The lips of the oil seals may become twisted when their shafts are inserted

9. Before assembling the cases, lubricate the bearings with the type of oil usually supplied to it (i.e., either transmission or two-stroke oil). Grease the lips of all oil seals before inserting any shafts into them.

10. Models which use large snap-rings to retain crank bearings may have an indicator mark on the crankcase. The open end of the snap-ring must be positioned at this mark as illustrated.

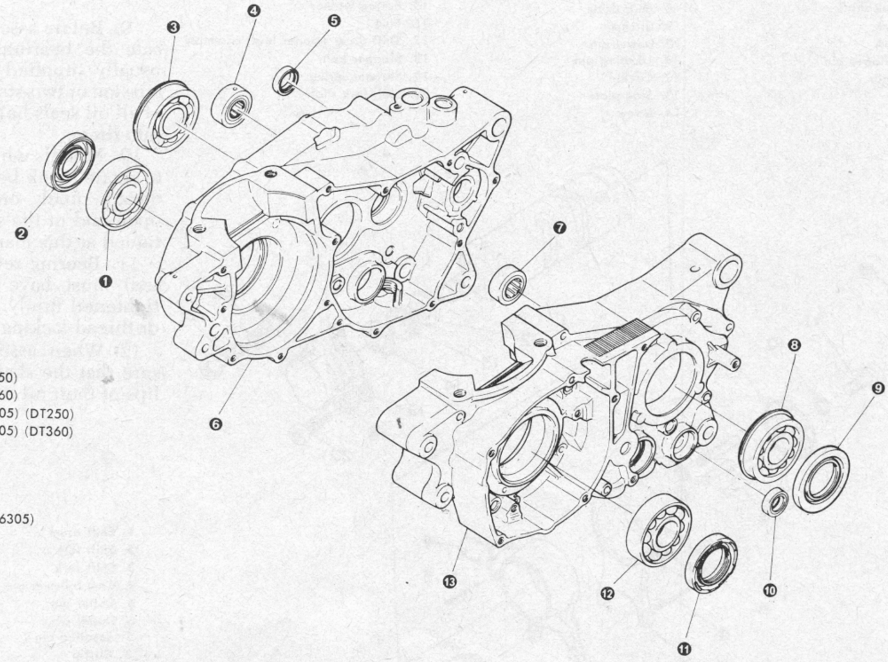
11. Bearing retainer plates (where fitted) must have their securing screws tightened firmly. Use an impact wrench or thread locking compound.

12. When assembling the cases, ensure that the shafts do not fold over the lips of their oil seals.



1. Shift drum
2. Dowel pin
3. Side plate
4. Screw
5. Stopper plate
6. Circlip
7. Plug
8. Dowel pin
9. Shift drum neutral stopper plunger
10. Spring
11. Gasket
12. Stopper bolt
13. Shift fork
14. Shift fork
15. Shift fork shaft
16. Circlip
17. Cam follower pin
18. Shift fork shaft
19. Plug
20. Ratchet shift lever
21. Spring
22. Shift arm
23. Circlip

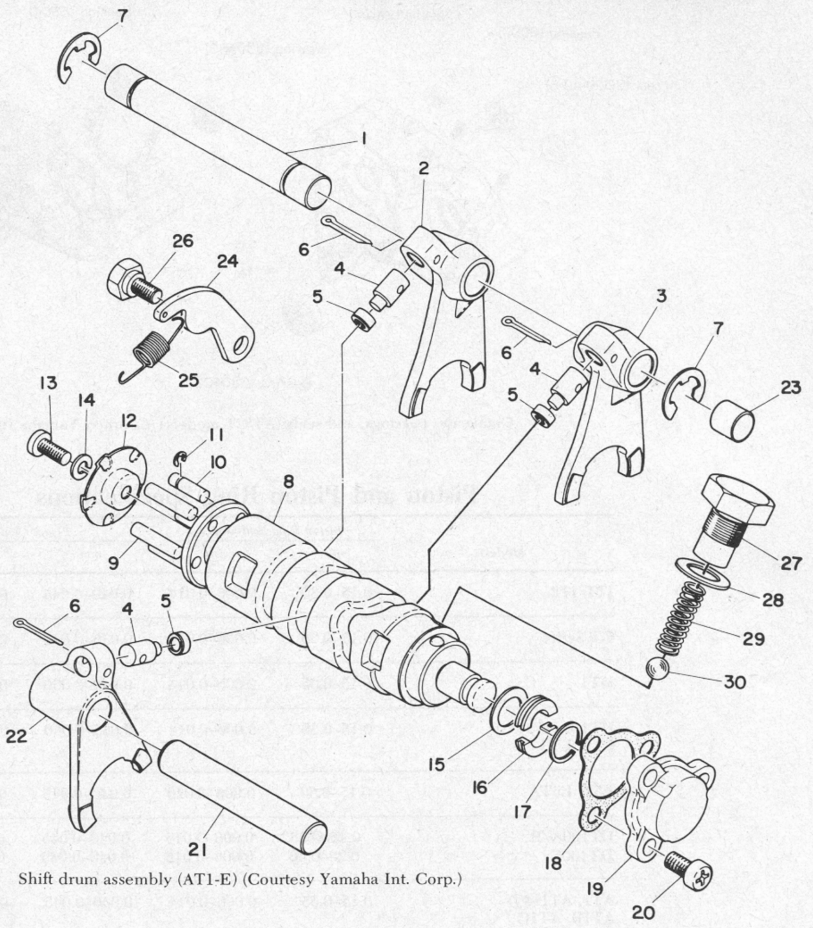
Shift drum assembly (DT 250/360) (Courtesy Yamaha Int. Corp.)



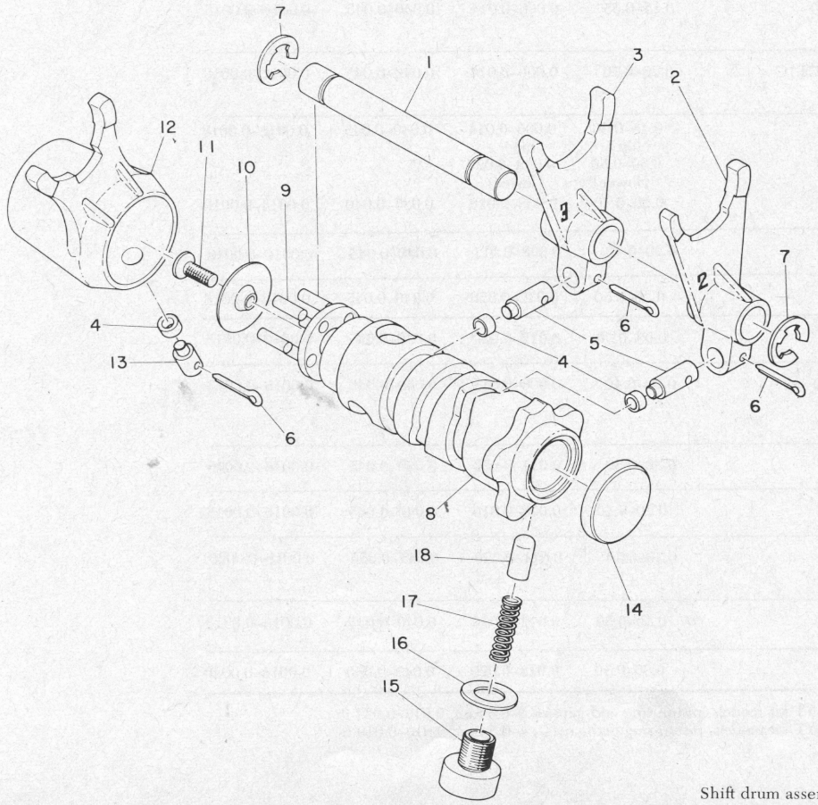
1. Crank bearing (B6306)
2. Oil seal (SW-40-62-10) (DT250)
   (SW-38-62-10) (DT360)
3. Mainshaft ball bearing (B6205) (DT250)
   (B4205) (DT360)
4. Countershaft needle bearing
5. Oil seal (SD-25-35-7)
6. Right crankcase half
7. Mainshaft needle bearing
8. Countershaft ball bearing (B6305)
9. Oil seal (SD-35-62-6)
10. Oil seal (SDO-14-24-6)
11. Oil seal (SW-30-62-10)
12. Crank bearing (B6306)
13. Left crankcase half

Crankcase, bearings, and seals (DT250/360) (Courtesy Yamaha Int. Corp.)

1. Shift fork shaft
2. Shift fork
3. Shift fork
4. Cam follower pin
5. Roller
6. Cotter pin
7. Circlip
8. Shift drum
9. Dowel pin
10. Location pin
11. Clip
12. Side plate
13. Screw
14. Washer
15. Washer
16. Keeper
17. Circlip
18. Cover gasket
19. Cover
20. Screw
21. Shift fork shaft
22. Shift fork
23. Plug
24. Stopper lever
25. Spring
26. Bolt
27. Neutral stopper bolt
28. Gasket
29. Spring
30. Ball

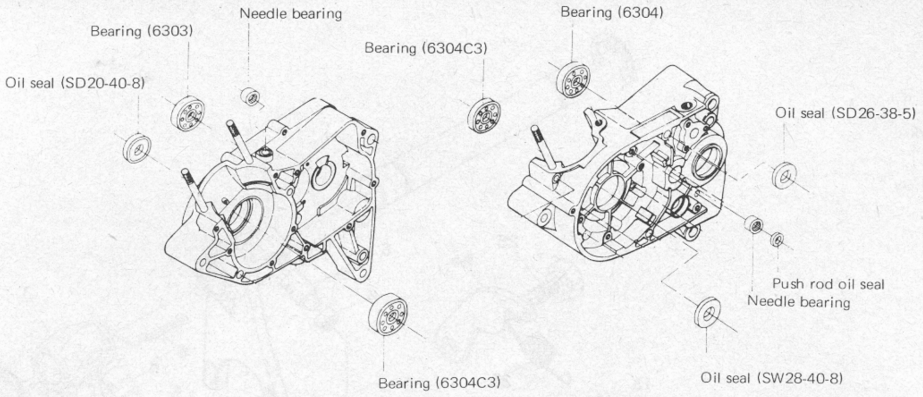


Shift drum assembly (AT1-E) (Courtesy Yamaha Int. Corp.)



1. Shift fork shaft
2. Shift fork
3. Shift fork
4. Roller
5. Cam follower pin
6. Cotter pin
7. Circlip
8. Shift drum
9. Dowel pin
10. Side plate
11. Screw
12. Shift fork
13. Cam follower pin
14. Plug
15. Neutral stopper bolt
16. Gasket
17. Spring
18. Stopper plunger

Shift drum assembly (DT1) (Courtesy Yamaha Int. Corp.)



Crankcase, bearings, and seals (AT/CT models) (Courtesy Yamaha Int. Corp.)

Piston and Piston Ring Specifications

Model	Piston Ring End-Gap③		Piston Clearance	
	mm	in.	mm	in.
JT1/JT2	0.15–0.35	0.006–0.014	0.040–0.045	0.0016–0.0018
GT Series	0.15–0.35	0.006–0.014	0.035–0.040	0.0014–0.0016
HT1	0.15–0.35	0.006–0.014	0.040–0.050	0.0016–0.0020
HT1B, HTMX① LT2, LT3	0.15–0.35	0.006–0.014	0.035–0.040	0.0014–0.0016
L5T, L5TA	0.15–0.50	0.006–0.020	0.040–0.045	0.0016–0.0018
DT100A/B DT100C	0.15–0.35 0.20–0.40	0.006–0.014 0.008–0.016	0.040–0.045 0.040–0.045	0.0016–0.0018 0.0016–0.0018
AT1, AT1M① AT1B, AT1C	0.15–0.35	0.006–0.014	0.040–0.045	0.0016–0.0018
CT1, CT1B, CT1C AT2, AT3	0.30–0.50	0.006–0.014	0.040–0.045	0.0016–0.0018
DT125A/B	0.15–0.36 (top) 0.30–0.50 (lower)	0.006–0.014 (top) 0.012–0.020 (lower)	0.040–0.045	0.0016–0.0018
DT125C	0.20–0.40	0.008–0.016	0.035–0.040	0.0014–0.0016
CT2, CT3	0.20–0.40	0.008–0.011	0.040–0.045	0.0016–0.0018
DT175A/B	0.30–0.50	0.012–0.020	0.040–0.045	0.0016–0.0018
DT175C	0.03–0.50	0.012–0.020	0.040–0.045	0.0016–0.0018
DT1, DT1B② DT1S, DT1C DT1E	0.20–0.40	0.008–0.015	0.040–0.045	0.0016–0.0018
DT2, DT3②	0.30–0.50	0.011–0.020	0.040–0.045	0.0016–0.0018
DT250A/B/C	0.20–0.40	0.008–0.016	0.040–0.045	0.0016–0.0018
RT1, RT1B RT2, RT3	0.30–0.50	0.011–0.020	0.045–0.050	0.0018–0.0020
DT360A	0.30–0.50	0.012–0.020	0.040–0.045	0.0016–0.0018
DT400B/C	0.30–0.50	0.012–0.020	0.045–0.050	0.0018–0.0020

① MX and GYT kit models, piston ring end-gap—0.4–0.6 mm, 0.016–0.024 in.
② MX and GYT kit models, piston ring end-gap—0.4–0.5 mm, 0.016–0.019 in.
③ Installed

Piston Ring Side Clearance

Model	Top		Lower	
	mm	in.	mm	in.
JT1/2, L5T/A	0.04–0.08	0.0016–0.0032	0.04–0.08	0.0016–0.0032
DT100A/B	0.02–0.09	0.008–0.0035	0.03–0.07	0.0012–0.0028
DT125A/B	0.01–0.09	0.004–0.0035	0.03–0.07	0.0012–0.0028
DT175A/B	0.07–0.14	0.0028–0.0055	0.03–0.07	0.0012–0.0028
DT100C DT125C DT175C	——	——	0.03–0.07	0.0012–0.0028
DT250A/B/C DT360A DT400B/C	——	——	0.03–0.08	0.0012–0.0032

—— Not applicable

Piston Ring Free End-Gap Specifications

Model	Top		Lower	
	mm	in.	mm	in.
GT80B/C, GTMXB/C	7.5	0.30	7.5	0.30
DT100A/B	3.0	0.12	4.0	0.16
DT100C	6.5	0.26	6.0	0.24
DT125A/B	5.5	0.22	3.5	0.14
DT125C	4.5	0.18	5.5	0.22
DT175A/B	8.5	0.34	4.5	0.18
DT175C	8.5	0.34	4.0	0.16
DT250A	5.5	0.22	5.5	0.22
DT250B/C	5.5	0.22	7.0	0.28
DT360A	5.0	0.20	5.0	0.20
DT400B/C	11.0	0.44	6.5	0.26

Clutch Specifications

Model	Spring Length				Friction Plate			
	Free-Length		Maximum Compression		New Thickness		Minimum Thickness	
	mm	in.	mm	in.	mm	in.	mm	in.
JT1, JT2	34	1.34	1.0	0.04	3.5	0.14	3.2	0.13
GT1, GTMX	31.5	1.24	1.0	0.04	3.5	0.14	3.2	0.13
HT Series	34	1.34	1.0	0.04	4.0	0.16	3.6	0.14
L5T, L5TA	28.2	1.14	1.0	0.04	3.5	0.14	3.2	0.13
LT Series	31.5	1.24	1.0	0.04	4.0	0.16	3.6	0.14
DT100A/B DT125A/B DT175A/B	34	1.34	1.0	0.04	4.0	0.16	3.7	0.15
DT100C DT125C DT175C	36.4	1.43	1.0	0.04	3.0	0.12	2.7	0.11
AT and CT Series	31.5	1.24	1.0	0.04	4.0	0.16	3.6	0.14

Lubrication System

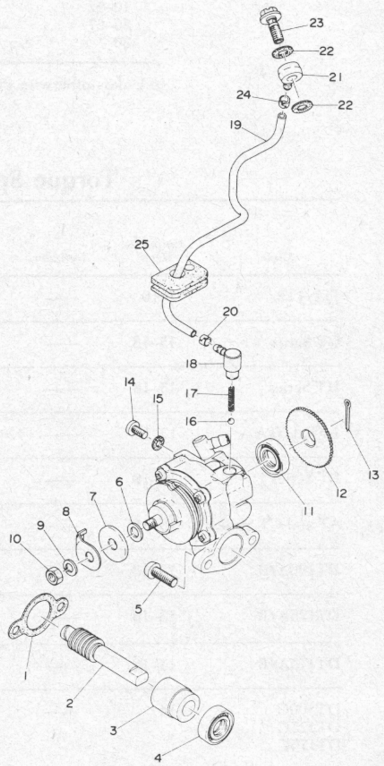
The lubrication system is virtually maintenance-free except for checks on the oil pump cable adjustment, the minimum pump stroke setting (see the "Maintenance" section), and pump bleeding (necessary only if the Autolube tank has run dry, or if the oil lines are disconnected for any reason).

Oil Pump

The oil pump must never be disassembled for any reason. To do so will render the pump unserviceable. If lubrication problems are traced to the pump, it must be replaced with a new one.

REMOVAL AND INSTALLATION

1. Remove the oil pump cover.
2. Disconnect the pump cable from the adjusting pulley. Disconnect the oil tank-to-pump line and plug it to avoid oil loss.



Oil pump (Courtesy Yamaha Int. Corp.)

1. Pump case gasket
2. Worm shaft
3. Worm shaft outer metal
4. Oil seal
5. Screw
6. Plunger shim
7. Adjusting plate
8. Cover
9. Spring washer
10. Nut
11. Oil seal
12. Starter plate
13. Cotter pin
14. Screw
15. Breather gasket
16. Ball (3/32 in.)
17. Check ball spring
18. Nozzle
19. Feed line
20. Clip
21. Banjo
22. Banjo bolt gasket
23. Banjo bolt
24. Clip
25. Line grommet

Clutch Specifications (cont.)

Model	Spring Length: Free-Length mm	Spring Length: Free-Length in.	Spring Length: Maximum Compression mm	Spring Length: Maximum Compression in.	Friction Plate: New Thickness mm	Friction Plate: New Thickness in.	Friction Plate: Minimum Thickness mm	Friction Plate: Minimum Thickness in.
DT1 All DT2 All DT3 All	36.4	1.43	1.0	0.04	3.0	0.12	2.7	0.11
DT250A	31.5	1.26	1.0	0.04				
DT250B/C	36.5	1.44	1.0	0.04	3.0	0.12	2.7	0.11
RT Series	36.4	1.43	1.0	0.04	3.0	0.12	2.7	0.11
DT360A	31.5	1.26	1.0	0.04				
DT400B/C	36.5	1.44	1.0	0.04	3.0	0.12	2.7	0.11

General Torque Specifications①

Bolt (thread dia)	Nut	Torque (ft lbs)
6	10	7
13–14	8	15
17	10	25–30
19–22	12–14	30–35
26–27	17–18	40–50
30	20	50–60

① Unless otherwise given

Torque Specifications②

Model	Cylinder Head	Cylinder	Magneto Nut	Primary Drive Gear Nut	Clutch Hub Nut	Countershaft Sprocket Nut
JT1/JT2	8–10	——	——	——	——	——
GT Series	15–18	——	——	——	30	30
HT Series	15–18	——	——	——	——	——
L5T, L5TA	15–18	——	——	——	——	——
LT Series	15–18	——	——	30	30	——
AT and CT Series	15–18	——	——	45	45	——
DT100A/B	13–18	——	18–33	22–36	22–36	18–33
DT125A/B	13–18	——	——	22–36	30–43	18–33
DT175A/B	13–18	——	18–33	22–36	30–43	18–33
DT100C DT125C DT175C	14	——	50	32–52	47–57	47–65
DT1 All DT2 All DT3 All	①	30–33	50	45	45	30
RT Series	①	30–33	50	45	45	50–65
DT 250 DT 360 DT 400	15–18	30–33	50	50	50	50–65

① 10 mm bolts— 27 ft lbs; 8 mm bolts—15 ft lbs
② in ft lbs

3. Disconnect the pump-to-engine line. This may be either a simple hose fitting or a banjo fitting secured with a screw and sealed with gaskets on either side of the banjo.

CAUTION: *If oil pump inlet and outlet fittings are identical, mark the location of each hose before disconnecting it, so that the hook-ups will be correct when the pump is refitted. If banjo fittings are used for the outlet lines, take care that the gaskets are not misplaced.*

4. Remove the securing screws and remove the pump.

5. Cover the oil line ends with small plastic bags secured by rubber bands to prevent the entry of dirt or other foreign matter in the event that the pump will be out of the machine for some time.

6. Check the condition of all oil lines. Replace any that are cracked, torn, or which show signs of damage. Check the banjo gaskets for condition and replace them if cracked.

7. The oil pump mating surface may be fitted with either an O-ring or a gasket, and this item should be replaced each time the pump is removed.

8. Installation is the reverse of the disassembly procedure. Ensure that all hose fittings are correct. Do not overtighten banjo connection screws.

9. After installation, turn the throttle twist-grip from closed to full open. Note that the guide pin should not touch the adjustment pulley at any point in its travel.

10. Before starting the engine, bleed the pump (see below), adjust the pump cable and minimum stroke.

11. When replacing the oil pump cover, ensure that it does not pinch any oil lines.

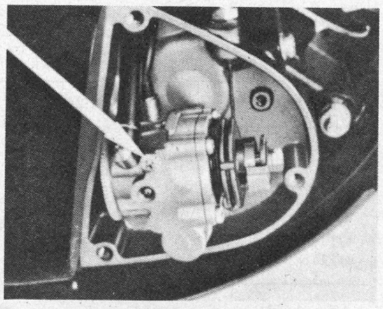
BLEEDING

As noted above, bleeding the pump is necessary any time that the oil pump has been removed from the machine, whenever any of the oil lines has been disconnected, or if the Autolube tank has been drained or run dry.

Before beginning, ensure that the oil tank has a sufficient supply of oil.

1. Remove the oil pump cover. Place a suitable receptacle beneath the oil pump compartment to catch the drained oil.

2. The pump is equipped with a plastic starter plate on one end. This is used to bleed the system.



Oil pump bleed screw (arrow) (Courtesy Yamaha Int. Corp.)

3. Loosen and remove the bleeder screw on the pump body.
4. Open the throttle fully and hold it open during the bleeding operation.
5. With your other hand, turn the starter plate in the direction of rotation indicated by the arrow on the plate.
6. Continue turning the starter plate while observing the flow of oil from the bleeder hole. When the oil is completely free of air bubbles, replace and tighten the bleeder screw. The system has now been bled.
7. After this operation has been completed, start the engine and allow it to idle for a few seconds while holding the oil pump open with the cable. This is only necessary on newly rebuilt engines to ensure sufficient lubrication during the first moments of operation. If the pump is held open too long, the plug may foul.
8. After bleeding, check the pump minimum stroke and the cable adjustment.
9. If the bleeding procedure does not work (i.e., air bubbles continue to come out of the bleeder hole), check for air leaks at the hose junctions. With the engine running, squirt some clean Autolube oil at the hose connections. If bubbles form, there is an air leak at that point.

PUMP OUTPUT CHECK

The delivery output of the oil pump should be measured on models for which an output is specified after all other possible causes of trouble have been eliminated (see "Troubleshooting," below).

Needed for this operation are: a laboratory tube graduated in cubic centimeters, and an extra oil pump-to-engine delivery line.

NOTE: *This check can be performed with the pump mounted on the bike or on a bench.*

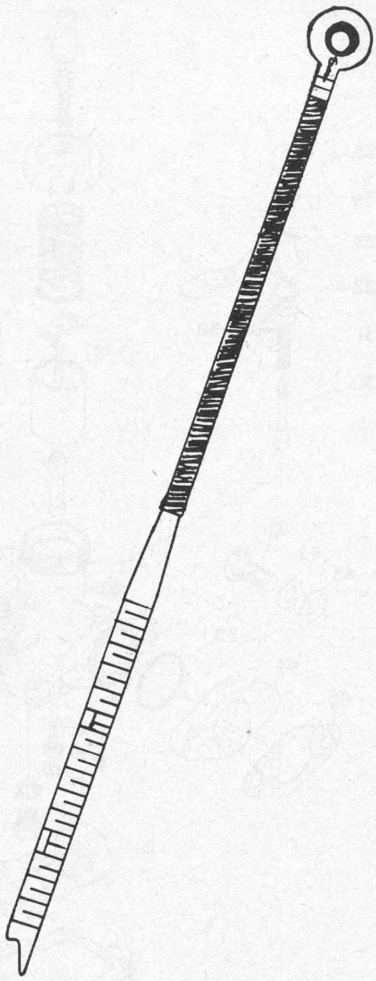
1. Cut one end off the extra delivery line and slide it over the end of the graduated tube (see the illustration).
2. Disconnect the oil pump delivery line banjo bolt and connect the extra one in its place with the graduated tube attached.
3. Make sure that there is sufficient oil in the oil tank, then set the pump at the minimum or maximum stroke.

NOTE: *When checking maximum output, turn the pump pulley so that the ramp moves along the guide pin to the maximum position. Do not push the pulley straight into position because the plunger stroke may then be longer than when in actual operation.*

4. Turn the starter plate 200 revolutions in the direction of rotation indicated by the arrow on the plate. Measure the amount of oil in the graduated tube, and compare this figure with the standard value given in the "Autolube Pump Output" chart.
5. To check at minimum pump stroke, reset the pulley to the minimum output position, and repeat the operation.

TROUBLESHOOTING

Before proceeding, first check that the oil tank has a sufficient supply of oil.

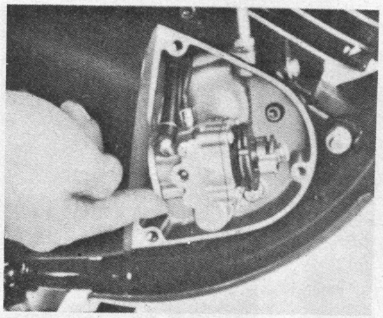


A graduated cylinder and pump feed line is used to check pump output manually (Courtesy Yamaha Int. Corp.)

1. In the event of piston seizure or overheating not caused by component failure or incorrect timing or carburetor settings, check the oil pump cable adjustment, the oil pump minimum stroke, the quality of oil being used (poor quality oil will cause this); check that the breather hole in the oil tank cap is open or that the oil tank breather tube (if fitted) is not blocked. Check for air in the lines by bleeding the pump. Check for air or oil leaks in the lines from the tank and to the engine.
2. In the case of excessive smoking or oil consumption, check the oil pump cable adjustment. Check for leakage at banjo fittings, and cracked or broken oil lines. Make sure that the oil is of good quality.
3. Check that the oil pump is feeding oil to the engine by removing a banjo fitting, turning the throttle twist-grip fully open, and turning the starter plate by hand in the direction of rotation indicated by the arrow on the starter plate. Oil should dribble out of the banjo bolt hole. If it does not, either the pump is not getting any oil because of an empty tank, blocked feed line, or blocked tank breather, or the pump is defective. The latter would be an extremely rare occurrence.

Autolube Pump Output

	Minimum Stroke (cc @ 200 rev)	Maximum Stroke (cc @ 200 rev)
JT1, HT1, HT1B, L5T, L5TA	0.50–0.63	4.65–5.15
AT1, AT1B, AT1C, CT1, CT1B, CT1C	0.50–0.63	8.80–9.76
DT100	0.50–0.63	4.63–5.15
DT125/175	0.95–1.19	8.79–9.74
DT1B, DT1C, DT1E, RT1 (late), RT1B	0.95–1.19	8.80–9.76
RT1 (early)	1.19–1.44	9.10–10.05



Rotating the starter plate to check pump output (Courtesy Yamaha Int. Corp.)

Fuel Systems

NOTE: *For carburetor theory, component inspection, and troubleshooting, refer to "Carburetors" in the General Information section.*

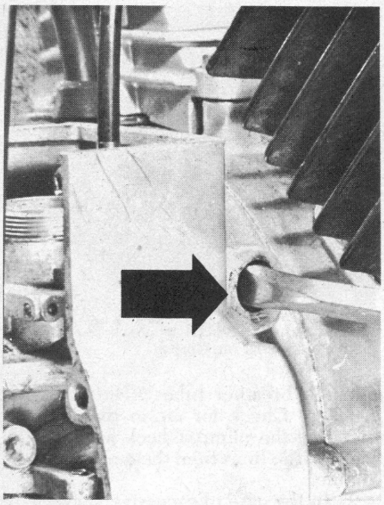
Carburetor

REMOVAL AND INSTALLATION

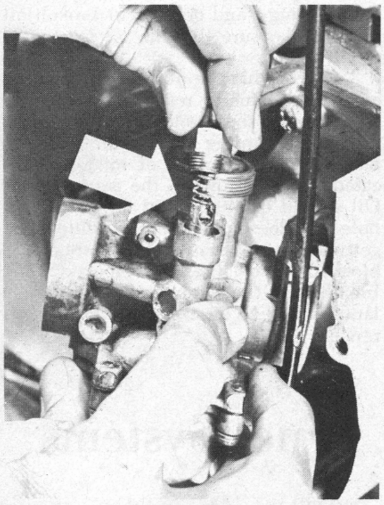
Rotary Valve Models

The carburetor is located beneath the cover at the forward end of the right-side engine case.

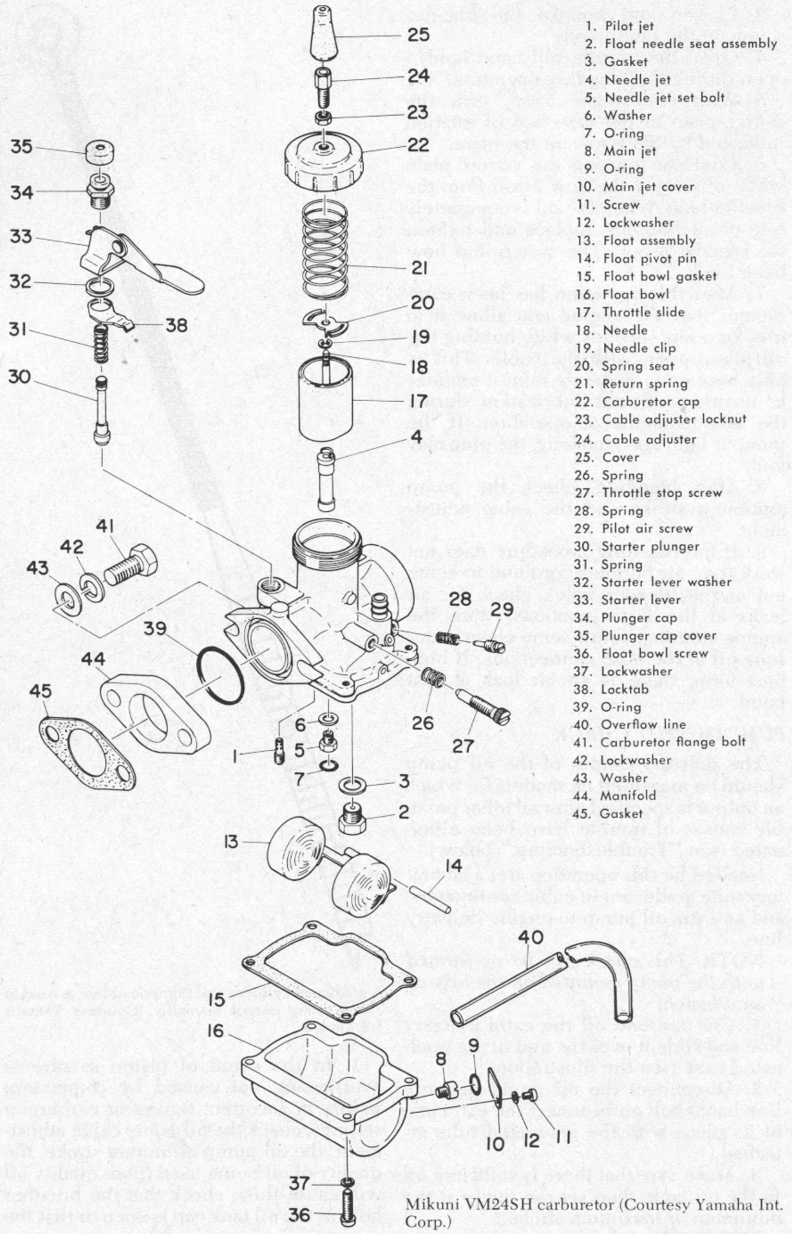
1. Lift up the rubber carburetor cover. Remove the rubber plug on the front of the right engine case. Using an impact driver, if necessary, unscrew and remove the carburetor cover.
2. Unscrew the carburetor cap and pull out the throttle slide assembly.
3. Shut the fuel petcock off. Disconnect the fuel line from the carburetor.
4. With a screwdriver (slot head) loosen the carburetor mounting clamp which is accessible through the plug hole at the front of the carburetor case.
5. Pull the carburetor off its spigot.
6. Disconnnect the overflow tube from



Loosening the carburetor clamp screw



Removing the starter plunger



Mikuni VM24SH carburetor (Courtesy Yamaha Int. Corp.)

the float bowl. Unscrew the starter plunger and pull it out of the carburetor body.

7. Drain the gasoline out of the carburetor before disassembly.

8. Installation is the reverse of the removal procedure. Be sure that all lines are firmly attached and that the rubber grommets are properly seated.

Piston Port Models

1. Shut off the fuel petcock. Disconnect the fuel line at the carburetor.

2. Loosen the air cleaner clamp screw at the carburetor.

3. Disconnect the overflow tube from the float bowl and the breather tube from the carburetor body. Slip the breather tube out of the holder on the carburetor body.

4. Unscrew the carburetor cap and pull out the throttle slide assembly.

5. If the carburetor is bolted to the manifold, loosen each of the nuts ¼ turn at a time until loose, then remove them and pull off the carburetor.

6. If the carburetor is mounted on a rubber sleeve intake manifold, loosen the manifold clamp screw, and pull the carburetor off. Models with a locating slot-and-pin to align the carburetor must have the carb pulled straight off and not twisted or turned while removing.

7. Drain the gas out of the carburetor before disassembly.

8. Installation is the reverse of the removal procedure. If manifold gaskets are fitted, replace them if damaged or if condition is doubtful. On rigidly-mounted carburetors, tighten the mounting nuts evenly; do not overtighten.

DISASSEMBLY

All Models

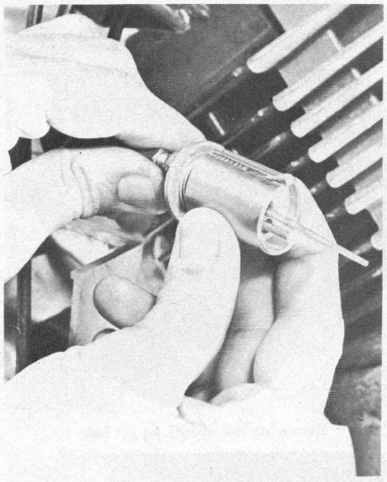
Disassembly procedures will vary slightly depending on the type of carburetor fitted.

NOTE: *Note the location of all O-rings, washers, and gaskets when disassembling the carburetors. Refer to the exploded views if necessary.*

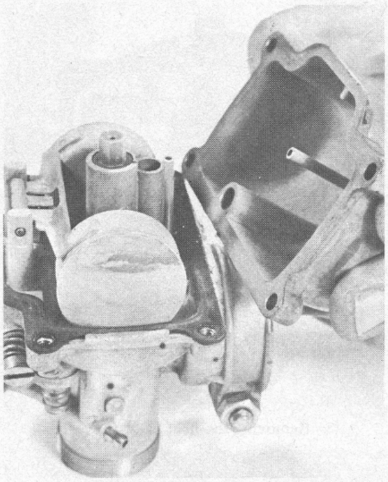
If disassembly of the throttle slide assembly is desired, refer to the procedures below. If a throttle stop rod is used to adjust the idle speed (rotary valve models), see Step 1 and following. On all other models, begin with Step 2.

1. The idle speed adjuster screw on the carburetor cap has a small cotter pin at the top. Removing this pin will allow the throttle stop rod to be taken out of the bottom of the throttle slide.

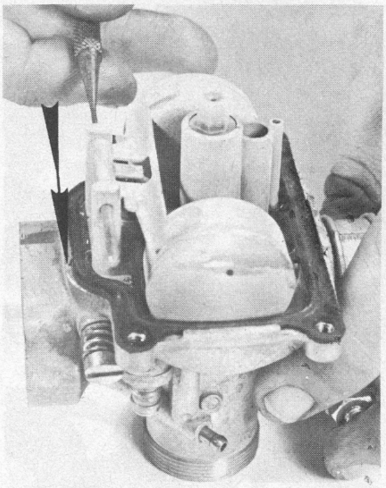
2. Compress the throttle slide against the carburetor cap until the end of the cable protrudes from the bottom of the



Disconnecting the throttle cable



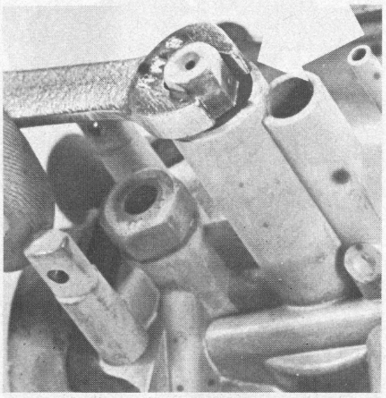
Removing the float bowl



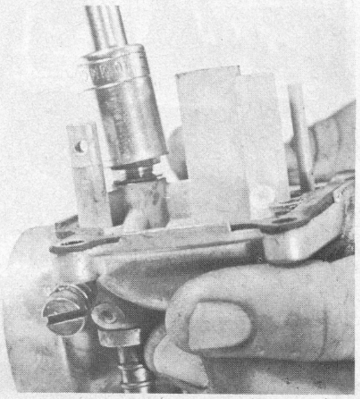
Pushing out the float pivot pin



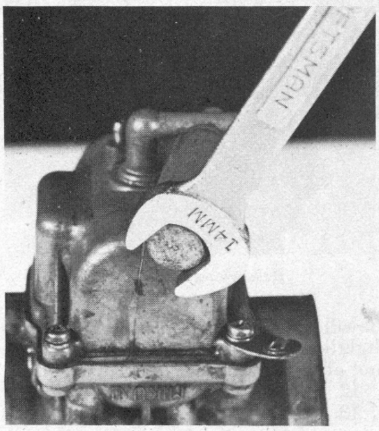
Removing the float needle



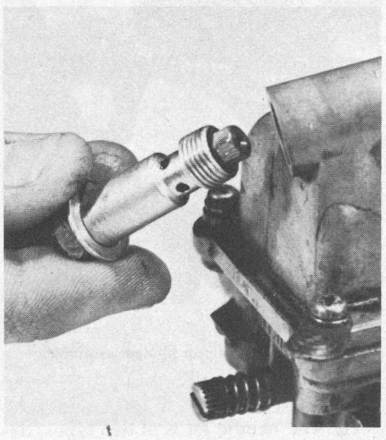
Removing the main jet



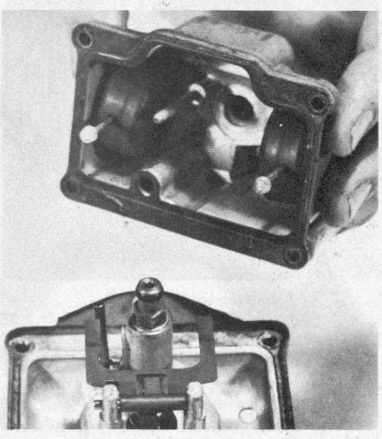
Removing the float needle seat



Removing the main jet cover bolt



Main jet and cover bolt



Removing the float bowl

slide. Slip the cable end up along the slot in the slide until free, then remove the spring and the throttle slide.

3. Remove the spring seat or circlip from the inside of the slide, then turn it upside down to remove the needle and clip

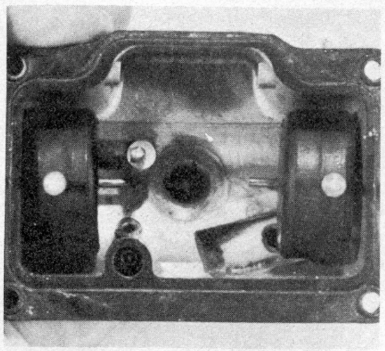
NOTE: *Do not remove the needle clip unless its position is to be changed.*

4. Turn the carburetor upside down. On models with a float bowl-mounted main jet, remove the jet cover bolt and the jet. The main jet is unscrewed from the end of the bolt if replacement is desired. Remove the four float bowl screws, and remove the float bowl carefully.

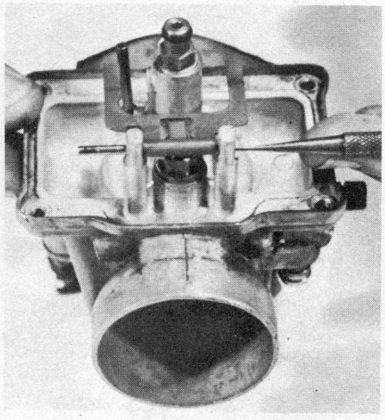
NOTE: *If the carburetor is old or has never been disassembled, the float bowl may be stuck to the gasket. Use a plastic mallet to tap around the float bowl until it is free. Restraint should be exercised while doing this.*

5. On independent-float models, the floats will remain in the float bowl. If removal is desired, remove the clips which secure the floats to their shafts, and remove the floats. Push out the float arm lever pivot pin by hand or with a small punch and remove the float arm lever from the carburetor body.

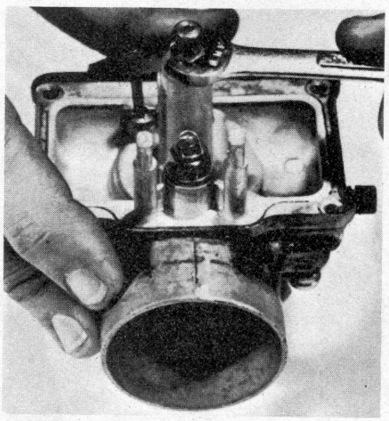
6. On one-piece float assembly models, push out the float pivot pin by hand or with a small punch and remove



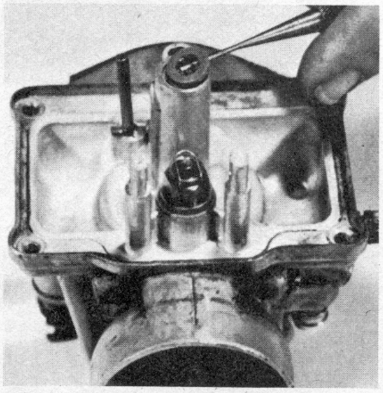
Floats installed (independent float carburetors)



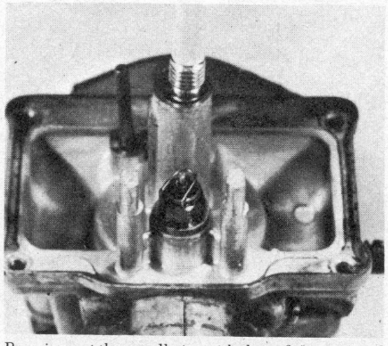
Removing the float pivot pin



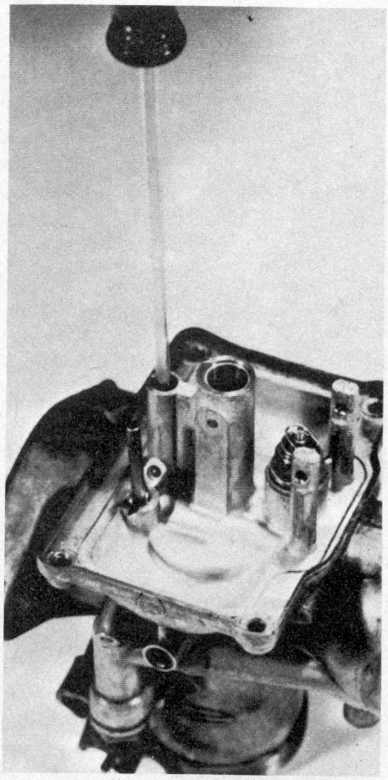
Removing the needle jet set bolt



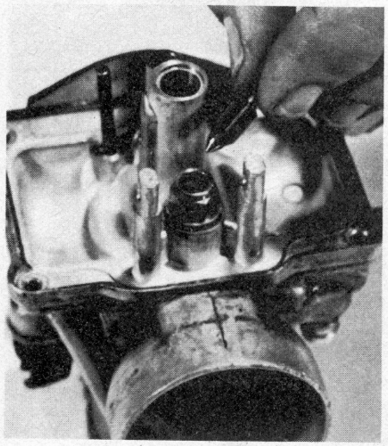
Removing the needle jet washer



Pressing out the needle jet with the soft (eraser) end of a pencil



Unscrewing the pilot jet



Removing the float needle



Removing the starter plunger assembly

the float assembly.

CAUTION: *Carefully note or mark the top side of one-piece float assemblies, since damage could occur if the attempt were made to install the assembly in the incorrect manner.*

7. Remove the float needle. On some models, removal of the small needle retaining clip is required first.

8. With a suitable socket, unscrew and remove the float needle seat.

9. Unscrew and remove the main jet on carburetors with a main jet mounted on the carburetor body.

10. On carburetors with a float bowl-mounted main jet, unscrew and remove the needle jet set bolt. The O-ring on this bolt *must* be replaced when the carburetor is assembled.

11. The needle jet is of two types, depending on model. If a hex-head is provided, simply unscrew and remove the needle jet in the same manner as the main jet.

If this is not the case, the needle jet is recessed into a holder in the carburetor body. After removing the main jet or set bolt, use a thin knife blade or something similar to remove the washer which is press-fitted at the bottom of the needle jet.

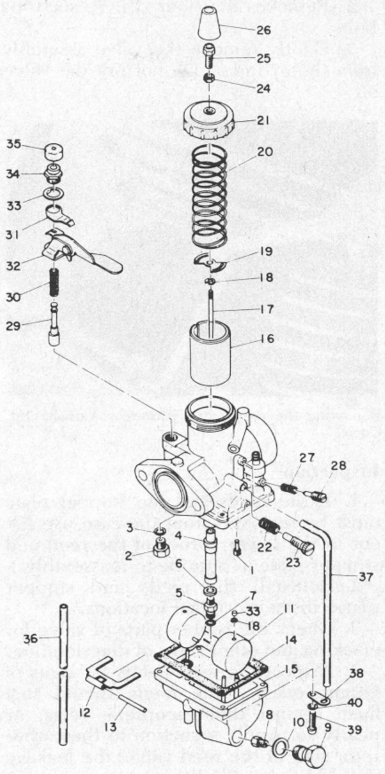
The needle jet is pressed into the carburetor body. To remove it, a wooden dowel should be used as a drift. Tap lightly on the needle jet to force the jet out of the carburetor.

12. Unscrew and remove the pilot jet.

13. If the starter plunger is still in place, unscrew the large nut on the carburetor body and remove the plunger assembly.

14. Unscrew and remove the pilot air jet. On most models, this is located on the side of the carburetor, but on some rotary valve models it is threaded into a passage just below the carb air intake.

15. Unscrew and remove the throttle stop screw (except rotary valve models). Both the pilot air screw and throttle stop screws are held in adjustment by small springs. Be careful that these are not lost when the screws are removed.



Mikuni SH model carburetor (Courtesy Yamaha Int. Corp.)

1. Pilot jet
2. Float needle seat assembly
3. Gasket
4. Needle jet
5. Needle jet set bolt
6. Washer
7. O-ring
8. Main jet
9. Main jet cover bolt
10. Gasket
11. Float
12. Float arm lever
13. Float arm pivot pin
14. Float bowl gasket
15. Float bowl
16. Throttle slide
17. Needle
18. Clip
19. Spring seat
20. Return spring
21. Carburetor cap
22. Throttle stop screw spring
23. Throttle stop screw
24. Cable adjuster locknut
25. Cable adjuster
26. Cover
27. Pilot air screw spring
28. Pilot air screw
29. Starter plunger
30. Plunger spring
31. Starter lever plate
32. Starter lever
33. Cap
34. Plunger cap
35. Cover
36. Overflow line
37. Breather line
38. Plate
39. Screw
40. Lockwasher

ASSEMBLY

1. The following parts should be replaced each time the carburetor is disassembled:

a. Manifold gasket and manifold O-ring (if fitted);

b. Float bowl gasket;

c. Float needle seat gasket;

d. Throttle stop rod cotter pin (if fitted);

e. Needle jet set bolt O-ring (if fitted);

f. Main jet gasket (if fitted).

2. On rotary valve models, assemble the throttle slide assembly by first fitting the carburetor cap onto the throttle cable. Install the throttle stop rod through the bottom of the slide and attach it with the cotter pin to the top of the idle adjusting screw on the carburetor cap.

3. Install the needle, making sure that the needle clip is positioned in the same groove as it was found, unless tuning changes have been made.

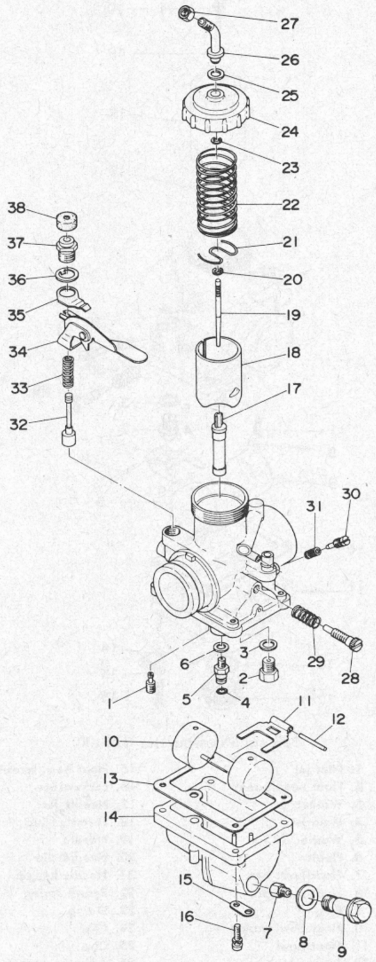
4. Install the spring seat, return spring, and engage the throttle cable on the slide in the reverse of the disassembly procedure.

5. Install the pilot jet, being careful when screwing the jet in that it is properly seated.

6. Install the needle jet. If the needle jet is the pressed-in type, install it as it was removed with a wooden dowel drift, tapping it into its seat. Install the needle jet washer.

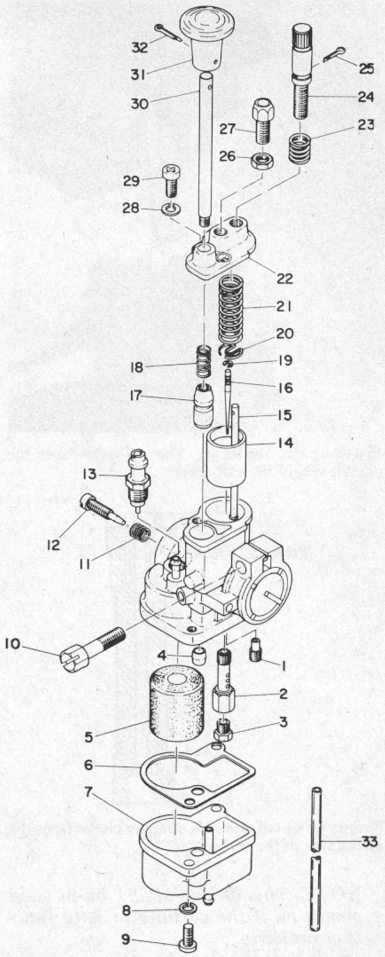
NOTE: *If this type of needle jet is used, make sure that it is installed with the cutaway at the top of the needle jet facing the ENGINE side of the carburetor.*

7. On models with a carburetor-mounted main jet, install the jet; tighten it securely. On models with the main jet in the float bowl, ensure that the jet is secured in the cover bolt, then install the cover bolt in the float bowl. Fit the needle jet set bolt on the carburetor body. A new O-ring should be used on the set bolt.



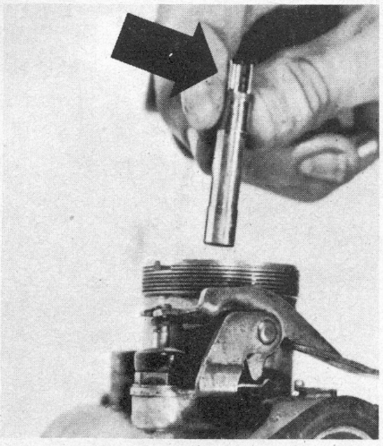
Mikuni SS carburetor (DT250/360)

1. Pilot jet
2. Float needle seat assembly
3. Washer
4. O-ring
5. Needle jet set bolt
6. Needle jet washer
7. Main jet
8. Gasket
9. Cover bolt
10. Float
11. Float lever arm
12. Float pivot pin
13. Float bowl gasket
14. Float bowl
15. Plate
16. Float bowl screw
17. Needle jet
18. Throttle slide
19. Needle
20. Clip
21. Spring seat
22. Throttle slide return spring
23. Clip
24. Carburetor cap
25. Gasket
26. Cable adjuster
27. Cable adjuster nut
28. Throttle stop screw
29. Spring
30. Pilot air screw
31. Spring
32. Starter plunger
33. Spring
34. Starter lever
35. Plate
36. Washer
37. Cap
38. Cover

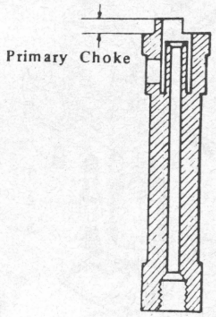


Y16P (Mini-Enduro) carburetor (Courtesy Yamaha Int. Corp.)

1. Pilot jet
2. Needle jet
3. Main jet
4. Starter jet
5. Float
6. Gasket
7. Float bowl
8. Lockwasher
9. Float bowl screw
10. Carburetor clamp screw
11. Spring
12. Pilot air screw
13. Float needle seat assembly
14. Throttle slide
15. Throttle rod
16. Needle
17. Starter plunger assembly
18. Plunger spring
19. Clip
20. Spring seat
21. Return spring
22. Carburetor cap
23. Throttle stop screw spring
24. Throttle stop screw
25. Cotter pin
26. Cable adjuster locknut
27. Cable adjuster
28. Lockwasher
29. Screw
30. Starter rod
31. Starter knob
32. Cotter pin
33. Breather line



Installing the needle jet. The cut-away faces the engine side of the carburetor



Needle jet installation: the primary choke faces the intake side of the carburetor

NOTE: *This O-ring MUST be in good condition if the carburetor is to function properly.*

8. Install the float needle seat gasket on the needle seat, and screw the needle seat into the carburetor. Insert the float needle into its seat.

9. On models with a one-piece float assembly, position the float assembly over the needle, ensuring that the correct side faces up. Slip the float pivot pin into the holder.

On models with independent floats, install each float into the float bowl, being sure that the pins on each float are positioned toward the bottom of the float bowl, and that they face *inward*. Secure the floats with the clips. Install the float arm on the carburetor.

10. Adjust the float level if necessary. See "Tune-Up."

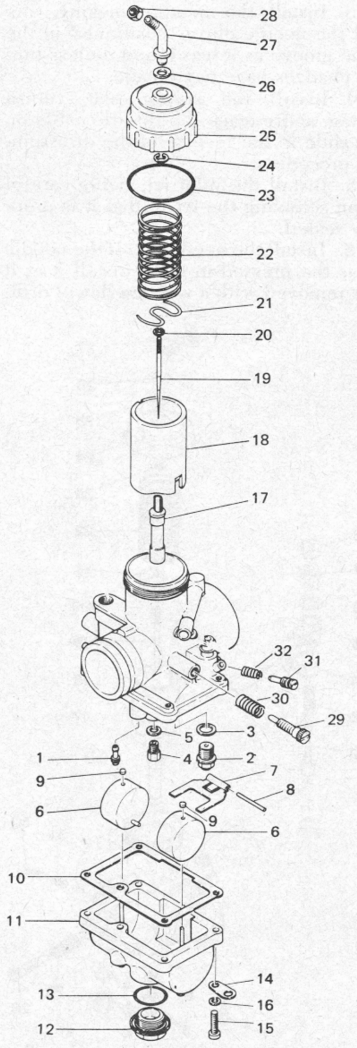
11. Fit a new float bowl gasket. Install the float bowl, and install the four phillips head screws, tightening them gradually, and in an "X" pattern.

12. Refit the pilot air screw and spring. Screw in the pilot air screw until lightly seated, then back it off the prescribed number of turns given in the "Carburetor Specifications" chart at the end of this section. This is an approximate setting and may have to be readjusted when the engine is started. Install the throttle stop screw and spring.

13. Install the starter plunger in the carburetor body and secure it.

14. Install the carburetor on the manifold and install the throttle slide assembly.

15. Refer to the "Maintenance" and "Tune-Up" sections if necessary to adjust pilot air and throttle stop screws and throttle cables.



Mikuni SS carburetor (DT400)

1. Pilot jet
2. Float needle seat
3. Washer
4. Main jet
5. Washer
6. Floats
7. Float lever arm
8. Float pivot pin
9. Plug
10. Float bowl gasket
11. Float bowl
12. Drain plug
13. O-ring
14. Tube bracket
15. Float bowl screws
16. Lockwasher
17. Needle jet
18. Throttle slide
19. Needle
20. Needle clip
21. Needle keeper
22. Return spring
23. O-ring
24. Clip
25. Cap
26. Adjuster washer
27. Adjuster
28. Adjuster nut

REED VALVE

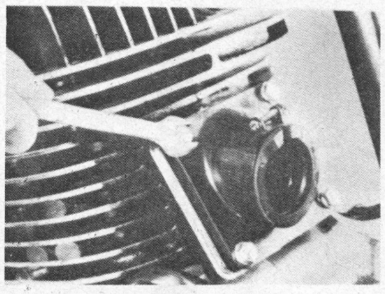
The valve must not be handled excessively. Salt from the hands may damage the valve. Do not expose it to the sun and store it in a cool dry place if it is removed.

Removal

1. Remove the carburetor.

2. Remove the four valve securing bolts.

3. Gently remove the valve assembly from the cylinder. Do not pry the valve off.



Removing the reed valve (Courtesy Yamaha Int. Corp.)

Inspection

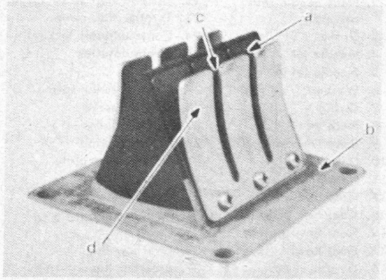
1. If the reeds and the stopper plate must be removed from the case use the cut in the lower corner of the reed and stopper plate as a guide to reassembly.

2. Reinstall the reeds and stopper plates in their original locations.

3. Check the rubber parts of valve for cracking and other signs of deterioration.

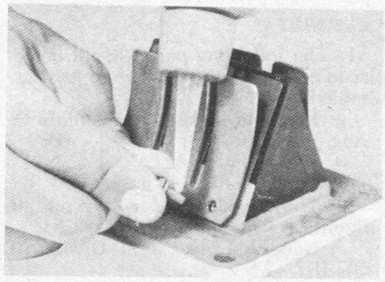
4. Inspect the reed petals for signs of fatigue cracks. The reeds should seat flush against their neoprene seats, or nearly so. Apply a suction to the carburetor side of the reed valve: the leakage should be very slight.

5. Clearance between the valve stopper and the seat should be about 9 mm (0.35 in.).



Reed valve assembly (Courtesy Yamaha Int. Corp.)

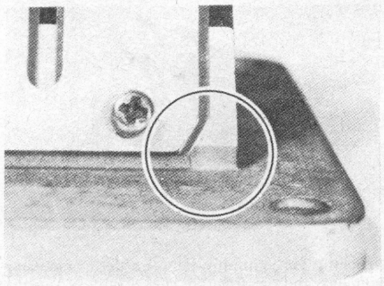
a. Reed valve
b. Valve case
c. Gasket
d. Valve stopper



Apply thread locking compound to the reed screws (Courtesy Yamaha Int. Corp.)

Installation

1. Apply Lock-Tite® or some similar thread bonder to the reed securing screws so that they will not fall into the



Use the cut-away as an aid to installation of the stopper

engine during operation. Torque the screws to 0.32 in. lbs.

2. Install the valve carefully into the cylinder and tighten the valve securing bolts in a cross pattern.

Fuel Petcock

1. The fuel petcock contains a wire mesh filter which should be removed and cleaned every 2,000 miles or every few months.

2. Unscrew the sediment bowl ring nut after shutting the fuel off.

3. Remove the filter from the petcock, and clean the bowl and the filter in a solvent.

4. Make sure that the petcock can fully shut off the gas. If leakage is noted when the petcock is in the "Off" position, the petcock should be replaced.

5. Check the condition of the sediment bowl gasket, and replace it if damaged.

6. Replace the filter and sediment bowl. Do not overtighten the bowl nut. After installation, turn on the petcock and check for leaks.

If water has been getting into the carburetor from the gas tank, some or most of it can be removed by disconnecting the fuel line at the carburetor or petcock, placing a suitable container underneath to catch the gasoline, and turning the petcock to the "Reserve" position. Letting the gasoline run out for several seconds in this manner should remove any water present around the petcock line inside the gas tank.

Carburetor Specifications

Model	Type① (Mikuni)	Main Jet	Air Jet	Needle Jet	Jet② Needle	Cut Away	Pilot Jet	Air Screw (turns out)	Starter Jet	Float Level (mm)
JT1, JT2	Y16P	86	0.7	2.085	032-2	1.5	38.0	1½	50	②
GT1 (73 and earlier)	Y16P-3	94	——	2.085	029-1	1.0	40	1½	90	②
GTMX (73 and earlier)	Y16P-3	98	——	2.085	029-2	1.0	40	1½	90	②
GT1, GTMX (74)	Y16P-3	88	——	2.080	049-2	1.0	40	1½	90	②
GT80B/C, GTMXB/C	Y16P-3	90	2.5–3.0	2.080	049-2	1.0	38	2	90	23.0
HT1, HT1B	VM20SC	85	——	N—6	4D3-3	2.0	30	1¾	40	22.5
HT1BMX	VM24SH	130	——	N—8	4DH7-2	2.0	30	1¼	40	25.5
L5T, L5TA	VM20SC	180	2.0	O—8	4D2-3	2.0	20	1¾	40	22.0
LT2, LT3	VM20SH(C)	130	——	N—6	4J13-2	1.5	25	1½	30	21.0
DT100A/B	VM22SS	150	2.5	N—4	4L6-2	1.5	25	1¼	30	21.0
DT100C	VM22SS	150	2.5	N—4	4L6-2	1.5	25	1½	30	21.0
AT1, AT1B, AT1C	VM24SH	150	——	N—8	4D3-3	2.0	30	1½	40	25.8
AT1BMX, AT1CMX	VM26SH	190	——	O—2	4F15-2	1.5	30	1½	40	25.5
AT2, AT3	VM24SH(C)	230	——	O—6	5J3-3	2.5	35	2	40	21.0
DT125A/B	VM24SH	140	0.5	O—0	4G2-3	2.0	25	1½	40	21.0
DT125C	VM24SH	140	0.5	O—0	4G2-3	2.0	25	1¾	40	21.0
CT1, CT1B, CT1C	VM24SH	150	——	N—8	4D3-3	2.0	40	1½	40	25.8
CT2, CT3	VM24SH	230	——	O—6	4J13-2	2.0	25	2	40	21.0
DT175A/B	VM24SS	160	0.5	O—2	5G4-3	2.0	25	1¾	40	21.0
DT175C	VM24SS	160	0.5	O—2	5G4-3	2.0	25	1½	40	21.0
DT1	VM26SH	150	0.5	O—2	5D1-3	2.5	35.0	1½	60	14.1
DT1B, DT1S, DT1C	VM26SH	160	0.8	O—2	5D1-3	2.5	35	1½	60	14.1
DT1E	VM26SH	160	——	O—2	5D1-3	2.5	35	1½	60	14.1
DT2, DT3	VM26SH	160	——	N—8	5DP7-3	1.5	30	1¼	60	14.1
RT1	VM32SH	240	——	O—4	6DP1-3	1.5	30	1¼	60	14.1
RT1B	VM32SH	240	——	O—4	6CF1-2	1.5	30	1¾	60	21.4
RT2, RT3	VM32SH	230	2.0	P—0	6DH3-3	3.0	45	1½	60	21.4
DT250A	VM28SS	140	2.5	O—0	5DP7-3	2.0	60	1½	60	17.3
DT250B/C	VM28SS	150	2.5	O—4	5F21-4	3.0	50	1¾	60	17.3

Electrical Systems

General Magneto/ Alternator Service

Procedures for the removal and installation of the magneto flywheel and the individual magneto/alternator components are in the "Engine and Transmission" section. Removal of one or more of these components may be necessary to carry out some of the electrical system tests outlined below.

1. Examine the contact breaker points, if equipped, for pitted, burned, or worn contact surfaces. Dress the points with a small file or a wet stone, or replace them if necessary.

2. The contact breaker return spring tension should be about 24–32 oz on road/trail models, and about 35 oz on competition machines. Take careful note of the point rubbing block. The points should be replaced if the heel of the breaker assembly is excessively worn.

3. A test light or ohmmeter will be useful for testing circuit continuity and checking for current.

4. The areas of the magneto backing plate where the coil cores and other components are mounted should be cleaned with sandpaper to assure good electrical contact.

5. Be sure that the coil core ends are not contacting the inner (magnet) surfaces of the flywheel rotor. If they are, check the crankshaft for up-and-down movement which would indicate worn crankshaft bearings.

6. Check the flywheel for cracks or fractures, and replace it if necessary.

Component Tests

GENERATOR MODELS

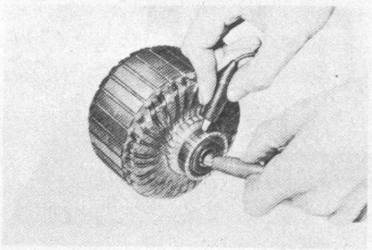
DC Voltage Output Test, Check and Remedies

This is a test to see if the generator is producing any current.

Carburetor Specifications (cont.)

Model	Type① (Mikuni)	Main Jet	Air Jet	Needle Jet	Jet③ Needle	Cut Away	Pilot Jet	Air Screw	Starter Jet	Float Level
DT360A	VM30SS	180	2.5	O—8	5EJ8-3	3.0	50	1½	60	17.3
DT400B/C	VM32SS	160	2.5	O—8	6DH2-3	3.0	50	1½	60	17.3

① The numbers in the carburetor type indicate the venturi diameter in millimeters
② Float level not adjustable
③ The last number in the needle designation is the clip position on the needle counting from the top groove

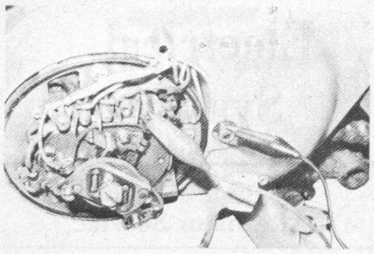


Checking for continuity between the commutator segments and the armature core (Courtesy Yamaha Int. Corp.)

1. Disconnect the white or red wire from the A (armature) terminal, and the green or black wire from the F (field) terminal.

2. Ground the F terminal to the E (black) terminal with a jumper wire.

3. Connect a voltmeter; positive voltmeter lead to the A terminal and the negative lead to ground.



Voltmeter connections for generator output test (Courtesy Yamaha Int. Corp.)

4. Start the engine, but do not rev the engine upon starting. *Slowly* speed the engine up to 2,000–2,500 rpm. Check the output on the voltmeter; 6-volt systems should produce 7.2–8.2 volts and 12-volt systems should put out 13.2–14.5 volts. If output is low, the generator must be checked. See Step 5 for further diagnostic checks. If output is normal and the system still fails to charge, check for loose or frayed wiring, bad regulator, bad battery connections, or poor connections at connecting blocks. If output is too high, check the regulator.

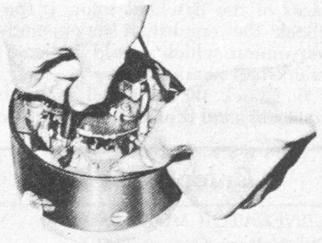
5. Check all brush wire connections. Check brush length. The limit line is marked. Replace brushes worn to the limit line. Make sure that the positive carbon brush is properly insulated.

NOTE: *Disconnect the negative brush before checking for a positive brush shorting.*

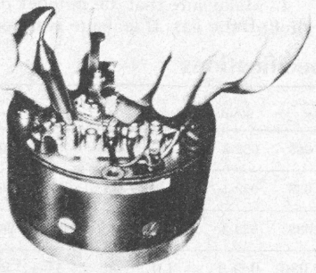
a. Check for any dirt, oil, or contamination;

b. Check for proper continuity between the armature and field windings, terminals M, A, and F. If there is no continuity (an ohmmeter will read infinity), the coil is broken;

NOTE: *Lift the carbon brushes off the commutator before checking field winding resistance.*



Checking positive brush insulation (Courtesy Yamaha Int. Corp.)



Checking field coils for continuity (Courtesy Yamaha Int. Corp.)

c. Check field winding insulation with an ohmmeter set at the highest scale. Readings between the yoke housing and terminal "A" and the yoke housing and terminal "F" should be infinite (3 megohms or more).

6. If the preceding tests didn't reveal the problem, perform the following checks on the armature:

a. Make sure that the mica gaps are free from any carbon dust that could short out the individual bars;

b. Make sure that the commutator surface is clean. If necessary, clean it up with a piece of fine emery cloth. Remember to remove the dust;

c. Check for continuity between the commutator segments and armature core. The readings should be infinite. There must be a completely open circuit;

d. Make sure that continuity exists between all the commutator segments;

e. If the insulation and continuity are good, the armature may be short-circuited and must be checked on a growler.

Starter Generator Brushes and Coil

1. Disconnect the negative starter brush and check the positive brush for insulation.

2. Disconnect the voltage regulator wiring and lift the positive brushes off the commutator. Make sure that there is continuity between terminals "A" and "M." No reading indicates a broken starter winding.

3. Disconnect the heavy motor winding wire from the positive brush and make sure that the windings are insulated.

4. With the heavy motor winding wire still disconnected from the positive brush, make sure that there is an open circuit between the "M" terminal and ground (at least 3 megohms).

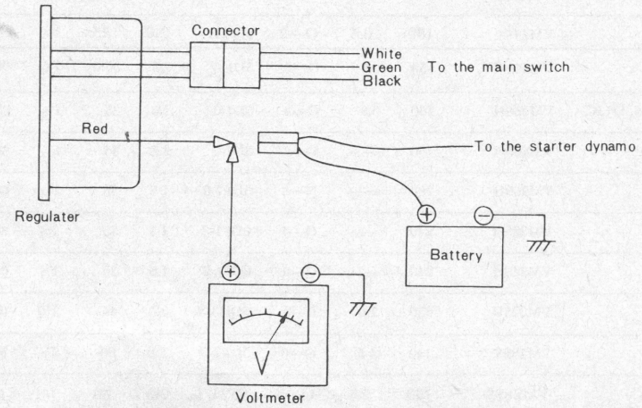
Voltage Regulator Relay Test

NOTE: *If isolating a problem source, first check the generator as previously described, then check this relay.*

1. Check for any loose connections, broken solder, dirty points, etc.

2. Connect the correct voltage battery to the regulator coil as shown in the illustration, then insert a flat piece of steel into the electromagnetic field. If the steel is attracted by the field, the coil is OK.

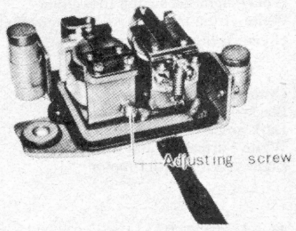
3. Check the shunt resistors by connecting an ohmmeter positive lead to the "A" terminal and the negative lead to the "F" terminal. Manually operate the relay—each of the shunt positions should show a different resistance. If any of the positions indicate infinite resistance, one of the shunts is open.



Voltmeter connections for voltage regulator tests (Courtesy Yamaha Int. Corp.)

4. Check the yoke, core, and point gap with specifications. Adjust if necessary.

5. Check the regulator no-load voltage by starting the engine, disconnecting the wire at regulator terminal "B," connecting the positive lead of a voltmeter to the terminal and the negative lead to ground. Increase engine speed to the specified rpm and check the reading against specifications. The voltage can be adjusted by bending the spring hook or turning the



Voltage regulator adjusting screw (Courtesy Yamaha Int. Corp.)

adjusting screw so that the point pressure is increased or decreased.

NOTE: *Increasing the pressure raises the voltage.*

Voltage Cut-Out Relay

NOTE: *Check the cut-out relay if the generator and voltage regulator relay are in good condition.*

1. Check the relay magnetic field as previously described.

2. Check and adjust yoke, core, and point gap as previously described.

3. Check the relay cut-out voltage in the same manner as the voltage regulator relay. If necessary, bend the point spring hook so that the cut-out voltage meets specifications.

MAGNETO AND CDI MODELS

Magneto Assembly

1. Make sure that all connections are tight.

2. Check all parts for any oil or water spots.

3. The flywheel magnets eventually weaken. If the points and condenser are good, but lighting and spark are weak, replace the flywheel or have the magnets recharged.

4. Check the ignition and lighting coils for any signs of having burnt out, i.e., no continuity.

5. Make sure that the lighting coil wires all have continuity with each other.

Alternator Output

NOTE: *"Alternator" refers to the magneto/CDI charging coil.*

1. Connect the negative lead of an ohmmeter to ground and the positive lead to the yellow, green or green/yellow, and green/red wires from the magneto in turn.

2. Turn the key to the daytime riding position and start the engine

CAUTION: *Never run an alternator equipped model with the battery disconnected. Never disconnect the battery when the engine is running.*

3. Run the engine at 2,000 rpm and note the voltage reading. On 6V models, the reading should be 7.0–8.0 volts. On 12V models, the reading should be 13–14 volts.

4. Run the engine to 7,000–8,000 rpm and note the voltage readings. 6V models should read about 8 volts. 12V models should read about 14 volts.

5. If readings are low, continue with component tests. If the components test OK, it is possible to increase the charging rate (except on some 1973 and all later models) by disconnecting the magneto green wire from its wiring harness connection, and reconnecting the previously unused magneto white wire to the green wiring harness wire.

Alternator Average Amperage Check

1. Disconnect the rectifier red wire.

2. Connect a DC ammeter positive lead to the red wire and connect the ammeter negative lead to the red wire connector.

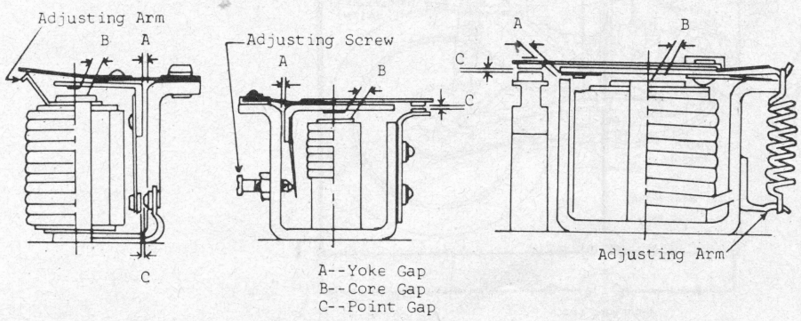
3. Output at 3,000 rpm should be 2.8 ± 0.5A—day position; 1.5 ± 0.5A—night position. At 5,000 rpm, 3.2 ± 0.5A—day position, and 1.3 ± 0.5A—night position.

Charging Coil Resistance Check

1. Connect the negative lead of an ohmmeter to ground and the positive lead to the yellow, green, and green/red wires from the magneto in turn.

2. Read the resistance of the coil windings. The ohmmeter selector switch should be set to the low scale.

3. Resistance will vary according to model, but will generally be less than one ohm. Infinite resistance indicates a broken wire, while no resistance may mean a short.



Cutout relay adjustments (Courtesy Yamaha Int. Corp.)

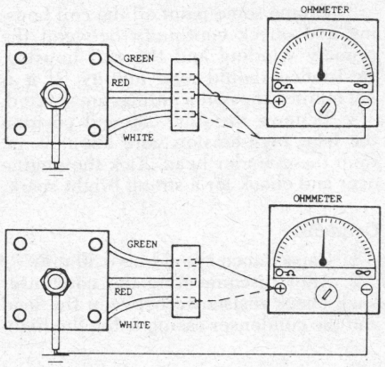
Rectifier

CAUTION: *The silicon rectifier can be ruined if it is subjected to overcharging or reverse battery polarity. Never reverse the battery connections and be careful not to inadvertently short the battery. Do not connect the rectifier directly to the battery to make a continuity check.*

Silicon Diode Rectifier (3-Wire) Continuity Check

1. Connect the positive lead of an ohmmeter to the red rectifier lead. Connect the negative lead to the green and then the white rectifier leads. The ohmmeter should show continuity (about 10 ohms resistance). Reverse the meter leads and there should be no continuity (several hundred ohms resistance).

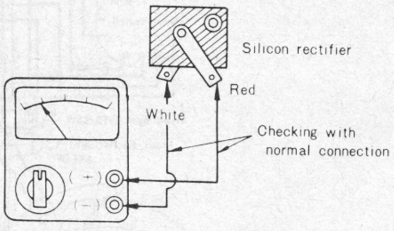
2. Repeat the above with the ohmmeter connected to ground and the green, then the white rectifier leads.



Checking the three-wire rectifier (Courtesy Yamaha Int. Corp.)

Selenium Rectifier (2-Wire) Continuity Check

Connect an ohmmeter to the rectifier wire leads, then reverse the meter leads. There should be continuity one way, but not the other. Continuity in both directions or neither signifies a bad rectifier.



Checking a two-wire rectifier (Courtesy Yamaha Int. Corp.)

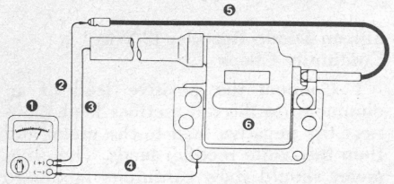
Ignition Coil

1. On battery-ignition machines, check primary winding resistance between the two primary terminals. It should be about 4 ohms.

On magneto-ignition models, primary winding resistance is checked between the primary wire and the coil bracket. Resistance should be 0.6 ohms for the 250 models, and about 1 ohm for other bikes.

2. On battery-ignition machines, check secondary winding resistance between one of the primary terminals and the spark plug lead. It should be about 10K ohms.

Other magneto-ignition machines, check secondary winding resistance between the spark plug lead and the coil bracket. It should be about 6K ohms.



Checking ignition coil resistance (Courtesy Yamaha Int. Corp.)

1. Ohmmeter
2. Primary coil resistance value
3. Secondary coil resistance value
4. Ground
5. Primary lead wire
6. Ignition coil

3. Scrape some paint off the coil housing and check continuity between the primary winding and the coil housing. Resistance should read infinity. If it is not infinity, the coil windings are shorted.

4. Remove the plug cap and position the bare high-tension wire about ¼ in. from the cylinder head. Kick the engine over and check for a strong bright spark.

Condenser

1. Capacitance should be 0.30 mF.

2. After disconnecting the condenser lead, check resistance between the lead and the condenser casing using the highest available scale on the ohmmeter. Resistance must be infinite (more than 3 megohms).

Electric Starter Relay

If the starter motor does not function check the following:

1. Check for proper continuity in the starter relay core windings.

2. Check relay points for cleanliness.

3. When the points are closed, make sure that there is continuity between the battery and motor windings.

NOTE: *The starter relay is located either on the frame, as a separate unit, or within the voltage regulator housing.*

Pulser Coil (CDI Ignition)

The resistance between the white, red/white, and green pulser leads and ground is 90 ohms.

CDI Unit

The CDI unit or black box cannot be tested without the use of a special testing unit designed for the purpose. Do not attempt to disassemble the CDI unit. There are no serviceable parts in the unit. Do not subject the CDI unit to shock. If either the CDI unit or the ignition coil are relocated, place them in a dry, well-ventilated location on the machine.

Electrical Wiring Color Codes

Chassis

Red—battery
Brown—current source wire
Dark blue—lighting, switches
Green (in headlight shell)—low beam
Yellow (in headlight shell)—high beam
Pink—horn
Light blue—neutral light
Yellow—stoplight switch
Green/Yellow—front stoplight switch
Blue/White—starter solenoid
Brown/White—turn signal switch
Dark brown—left turn signal
Green—right turn signal

Magneto

Black—ignition (not ground)
Yellow—lighting
Green—daytime charging
Green/Red—nighttime charging
White—ignition switch to rectifier
White (from magneto)—no connection
Green/Yellow—battery charging

Starter/Generator

Orange—ignition
Black—ground
Dark green—fields
White—armature and charging light
Light green—starter motor

Mechanical Regulator Specifications

No Load Adj—15.6–16.5 volts at 2500 rpm
Yoke Gap (mm)—0.6–0.7
Core Gap (mm)—0.4–0.7
Point Gap (mm)—0.4–0.5
Coil Resistance—11.2 ohms

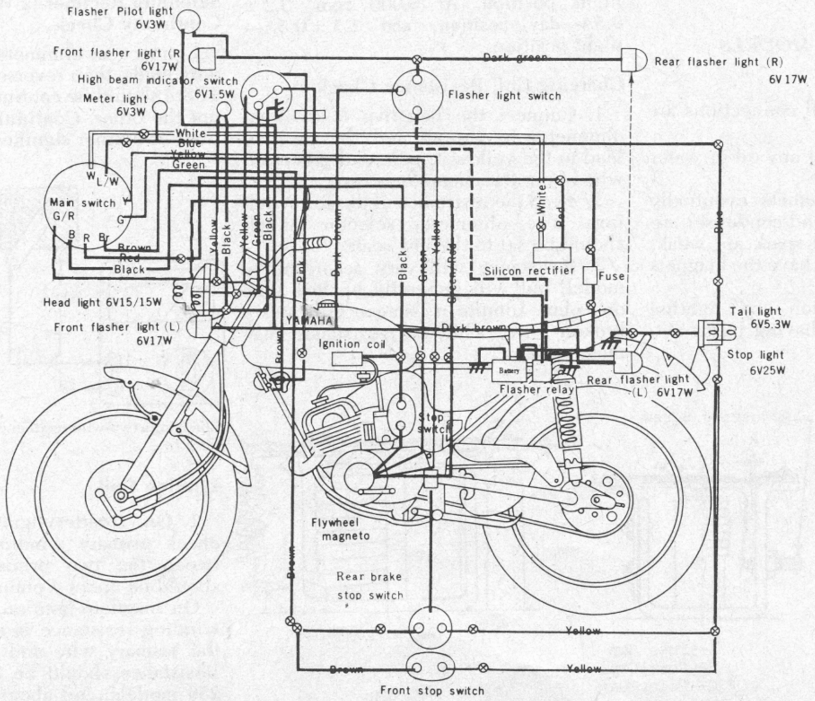
Cut-Out Relay Specifications

Cut-In Voltage—13 volts
Yoke Gap (mm)—0.2
Core Gap (mm)—0.8–1.0
Point Gap (mm)—0.6–0.8

Starter Relay Specifications

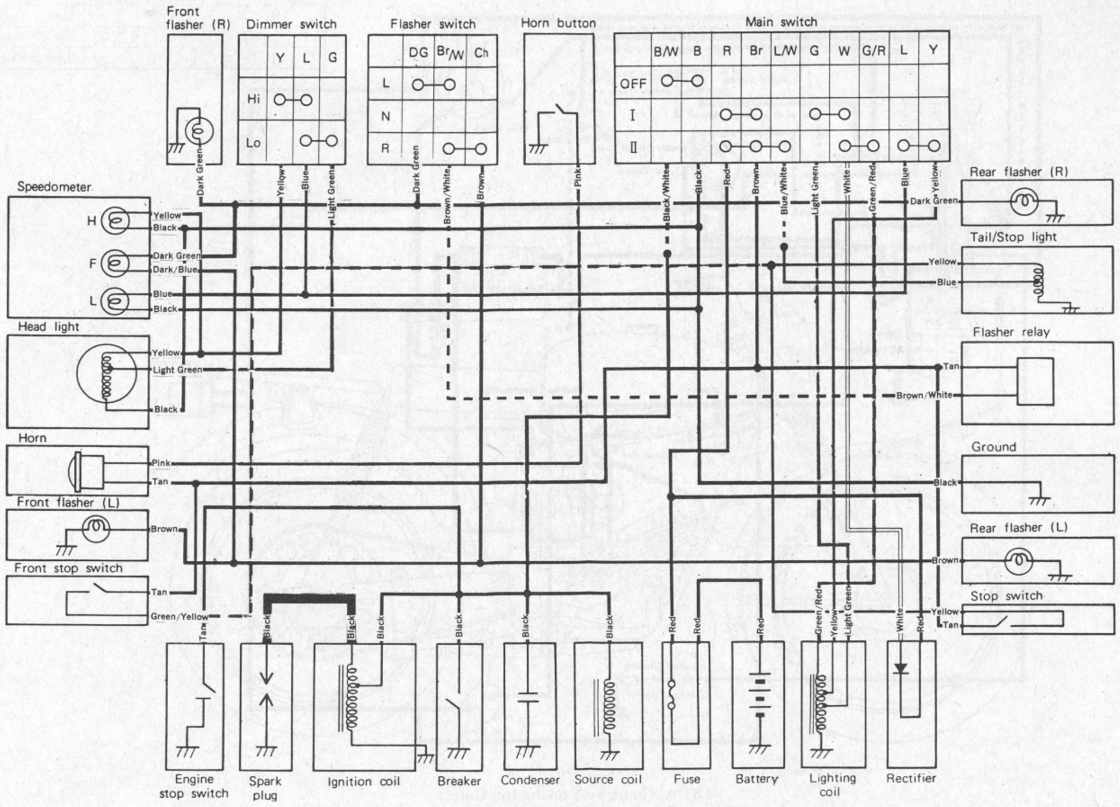
Core Gap (mm)—1.3–1.4
Point Gap (mm)—1.5
Winding Resistance—4.5 ± 15% ohms
Activating Voltage—10 volts (minimum)

Wiring Diagrams

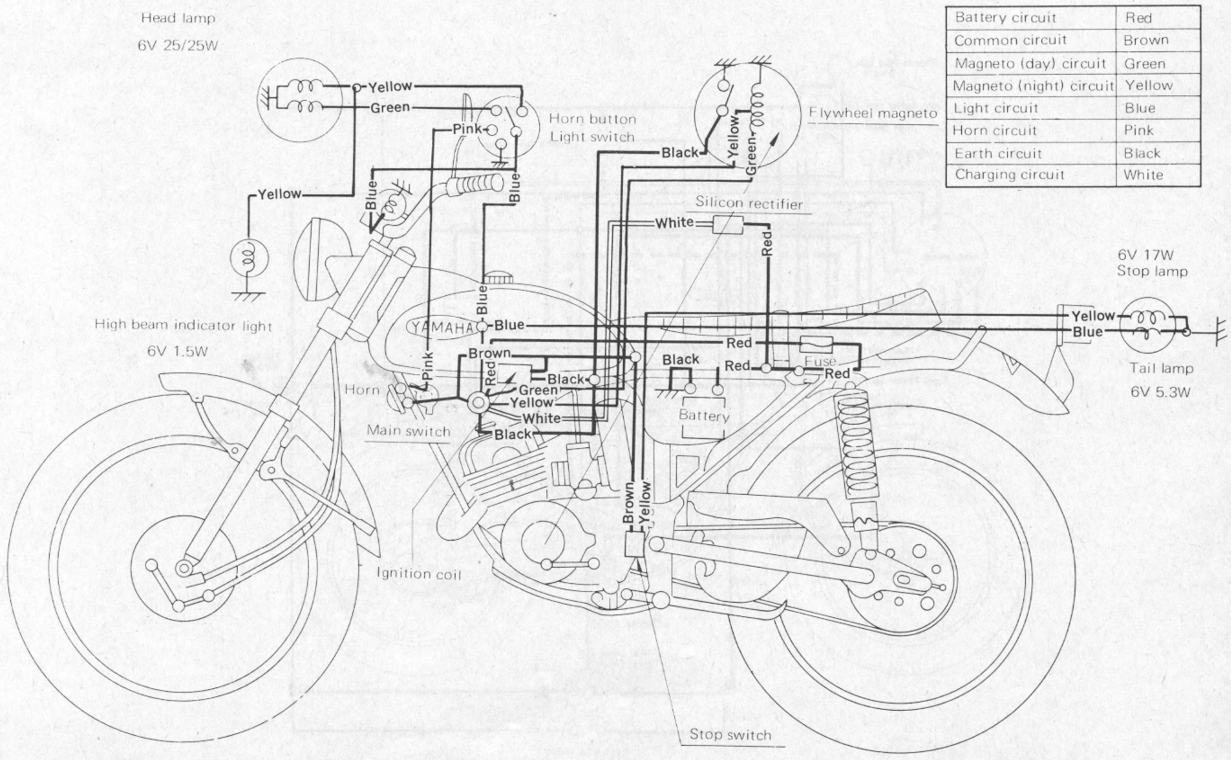


GT1 (Courtesy Yamaha Int. Corp.)

Wiring Diagrams



GT80B/C



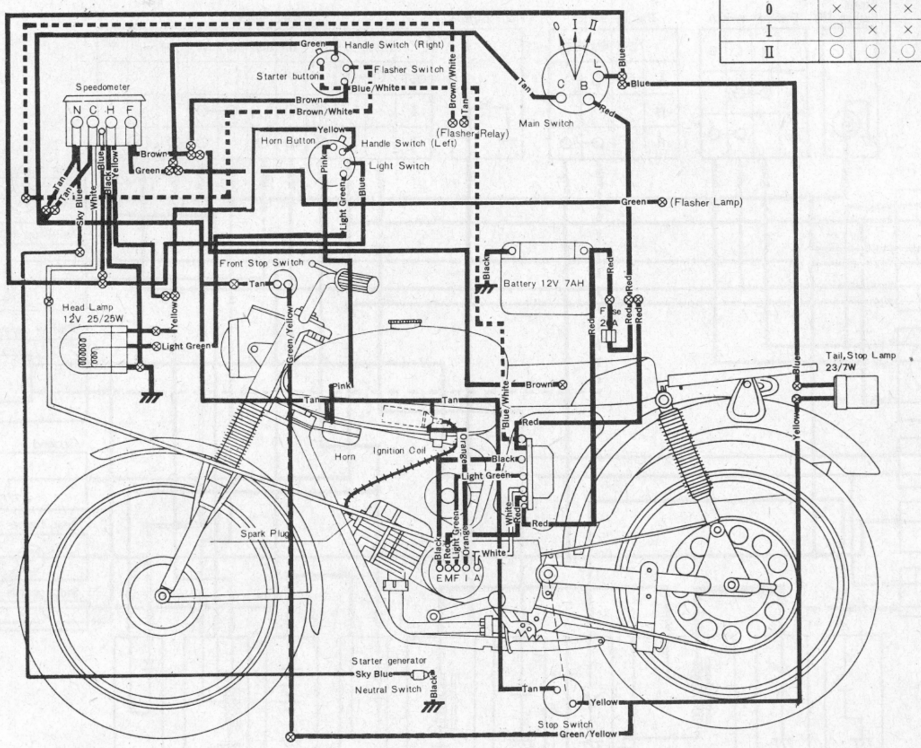
Battery circuit	Red
Common circuit	Brown
Magneto (day) circuit	Green
Magneto (night) circuit	Yellow
Light circuit	Blue
Horn circuit	Pink
Earth circuit	Black
Charging circuit	White

HT1 (Courtesy Yamaha Int. Corp.)

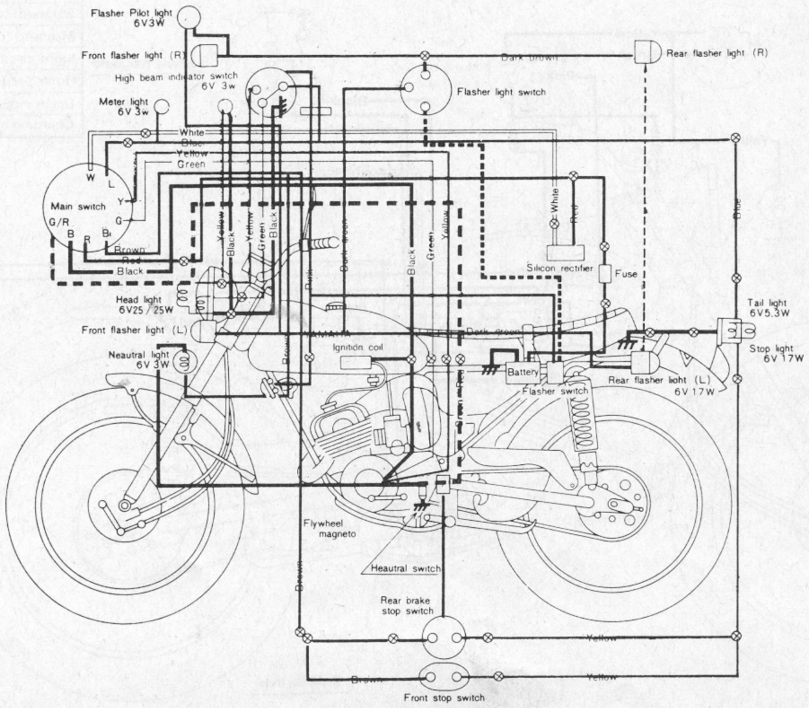
Wiring Diagrams

Main switch connecting

Key position	B-C	B-L	B-T	A-C	
0	×	×	×	×	Stop
I	○	×	×	×	Day driving
II	○	○	○	○	Night driving

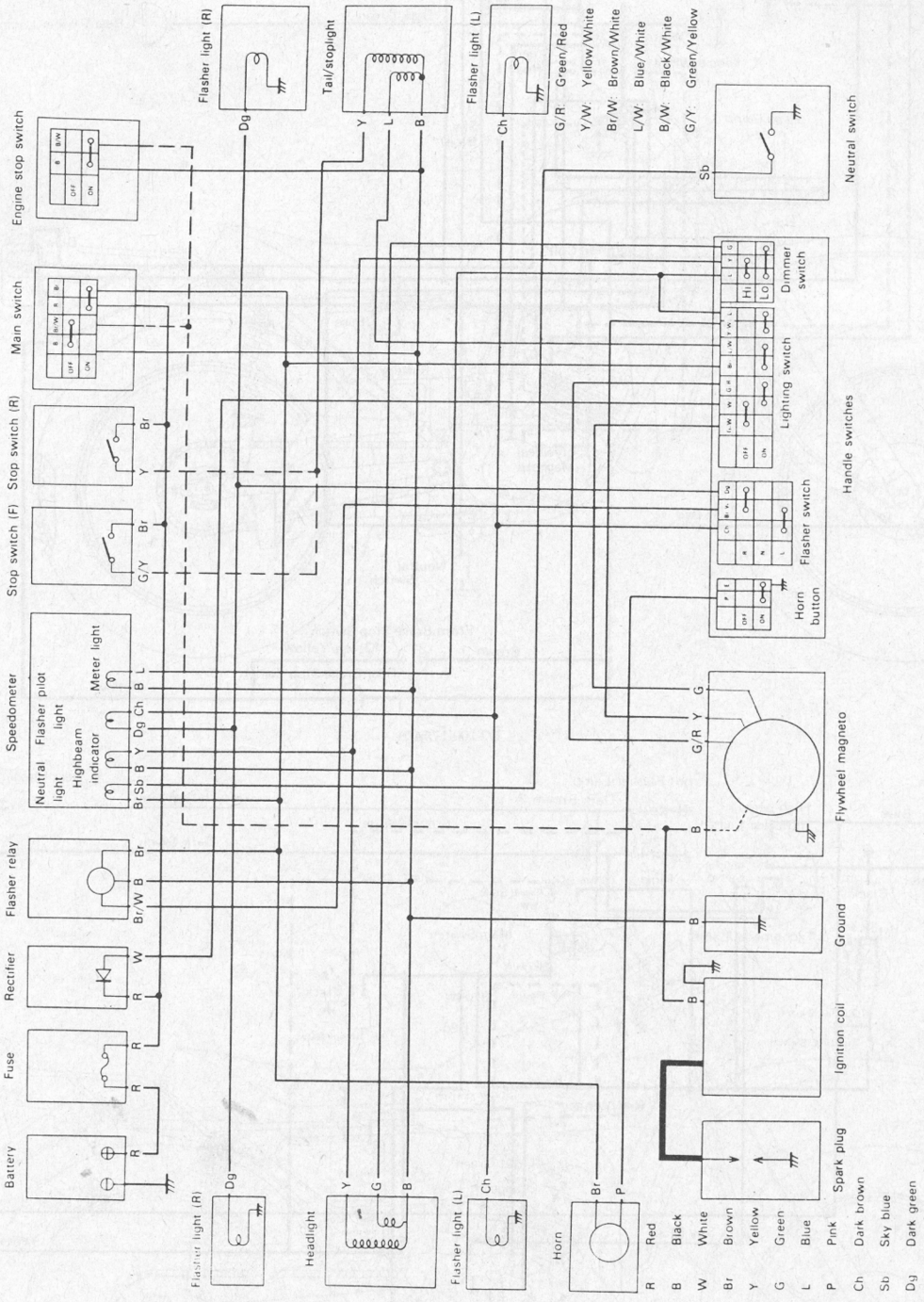


L5T/A (Courtesy Yamaha Int. Corp.)



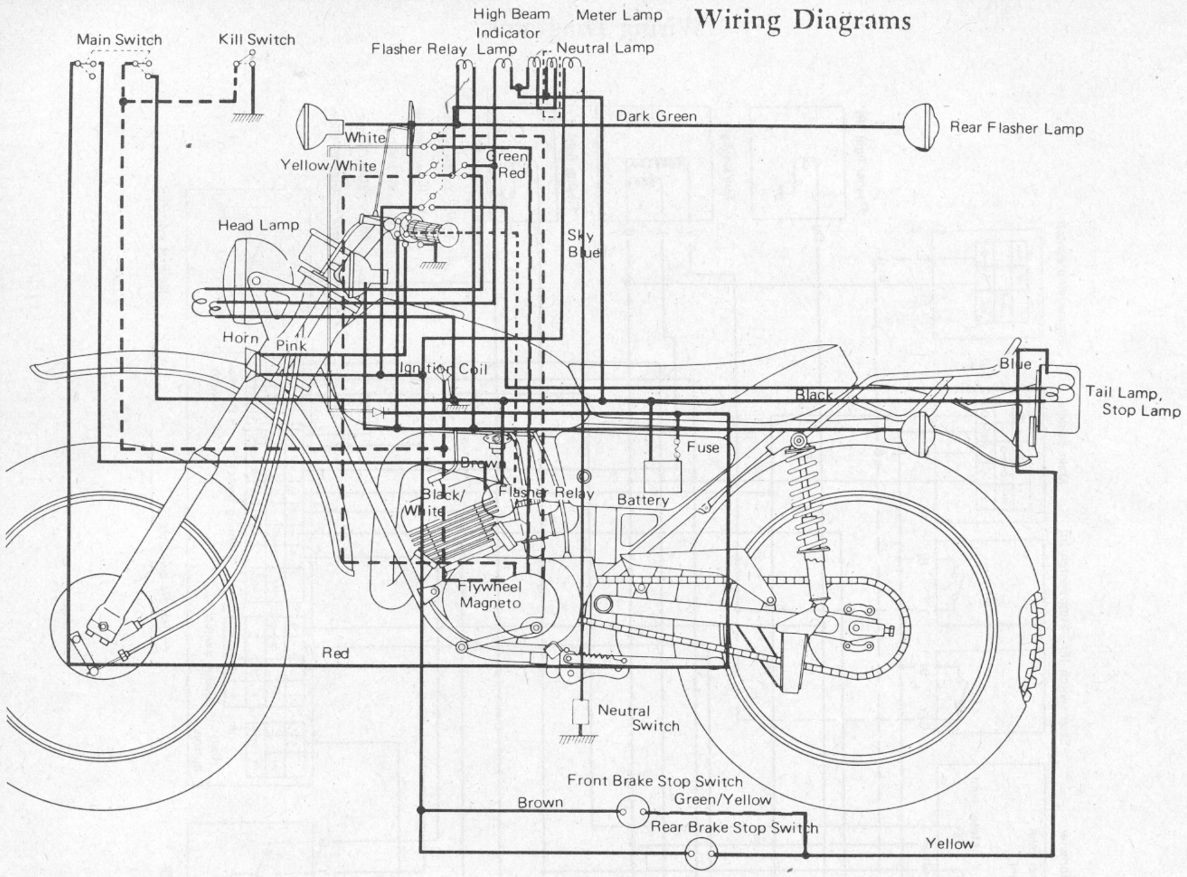
LT2/LT3 (Courtesy Yamaha Int. Corp.)

Wiring Diagrams

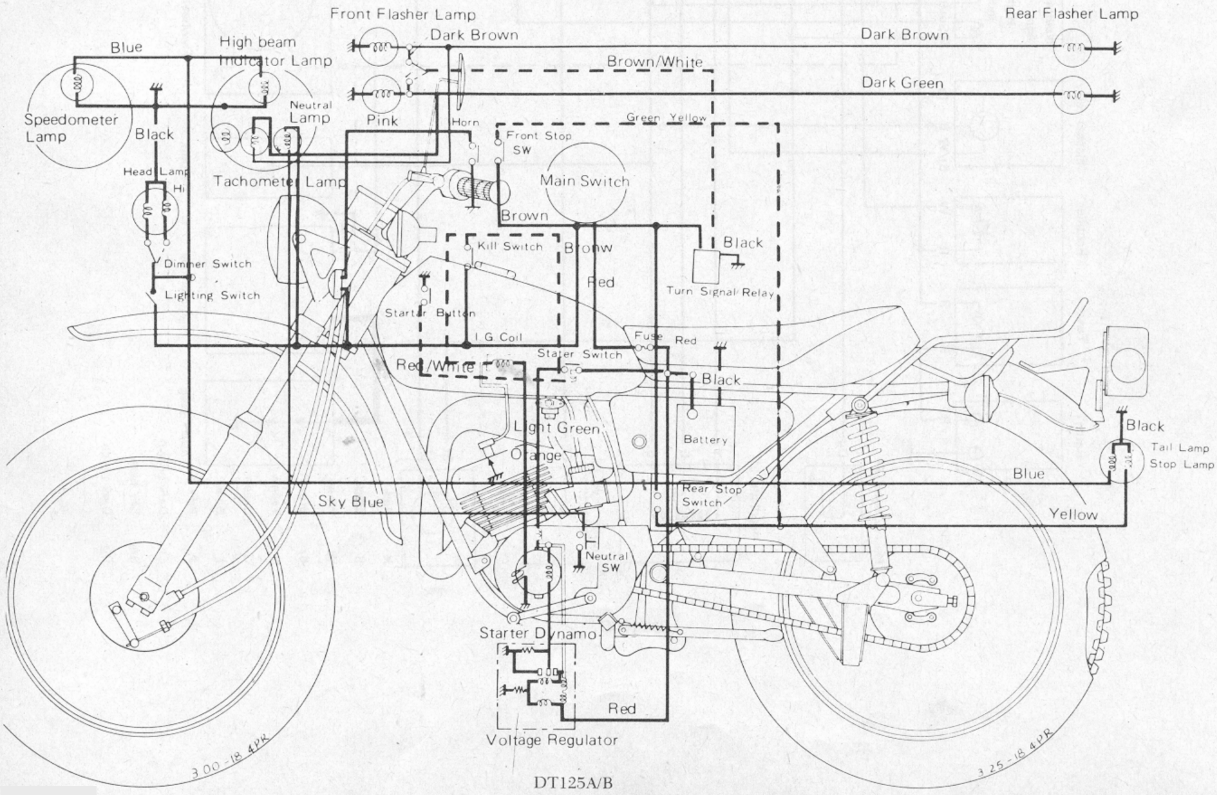


DT100C

Wiring Diagrams

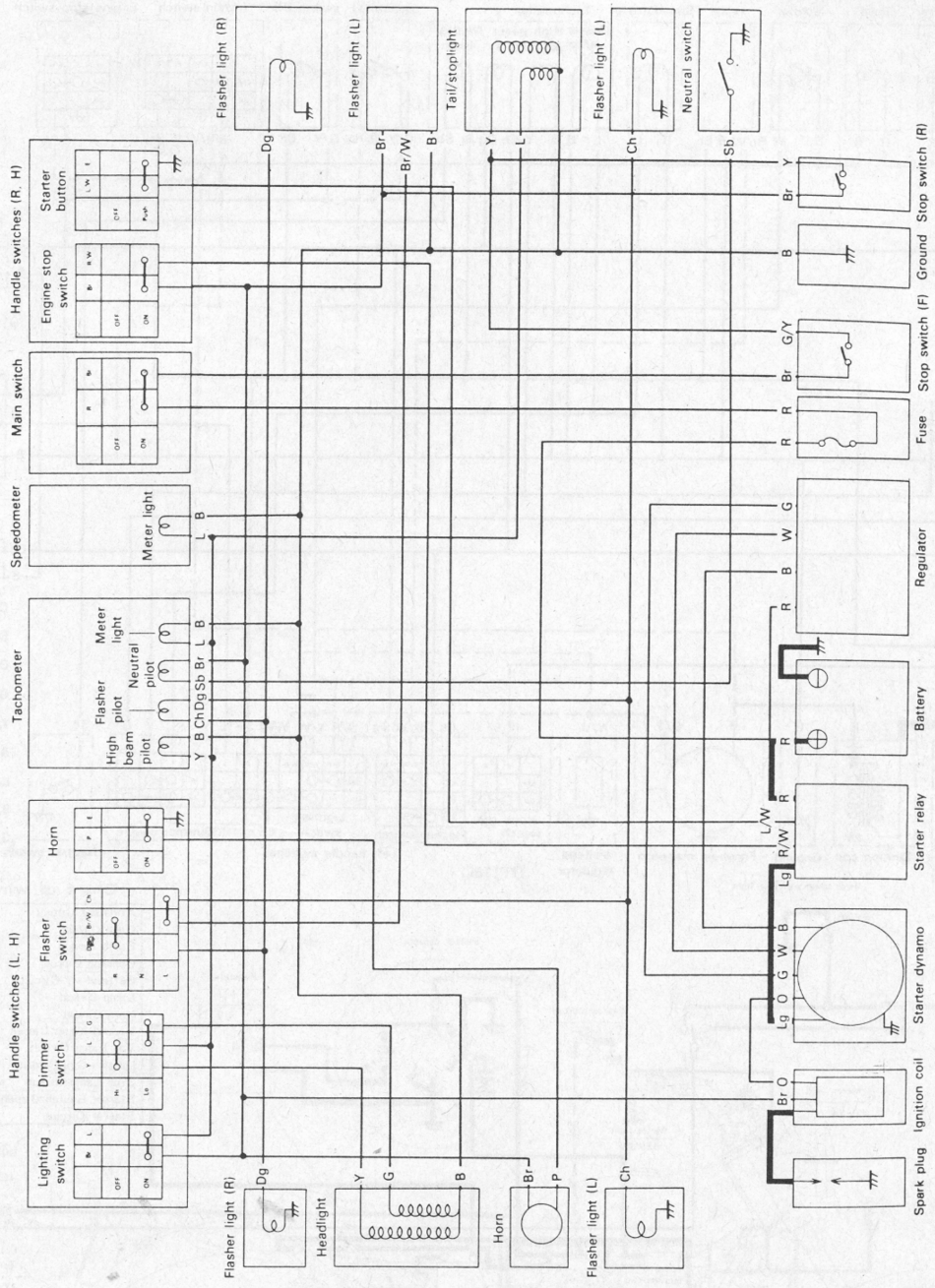


DT100/175A/B



DT125A/B

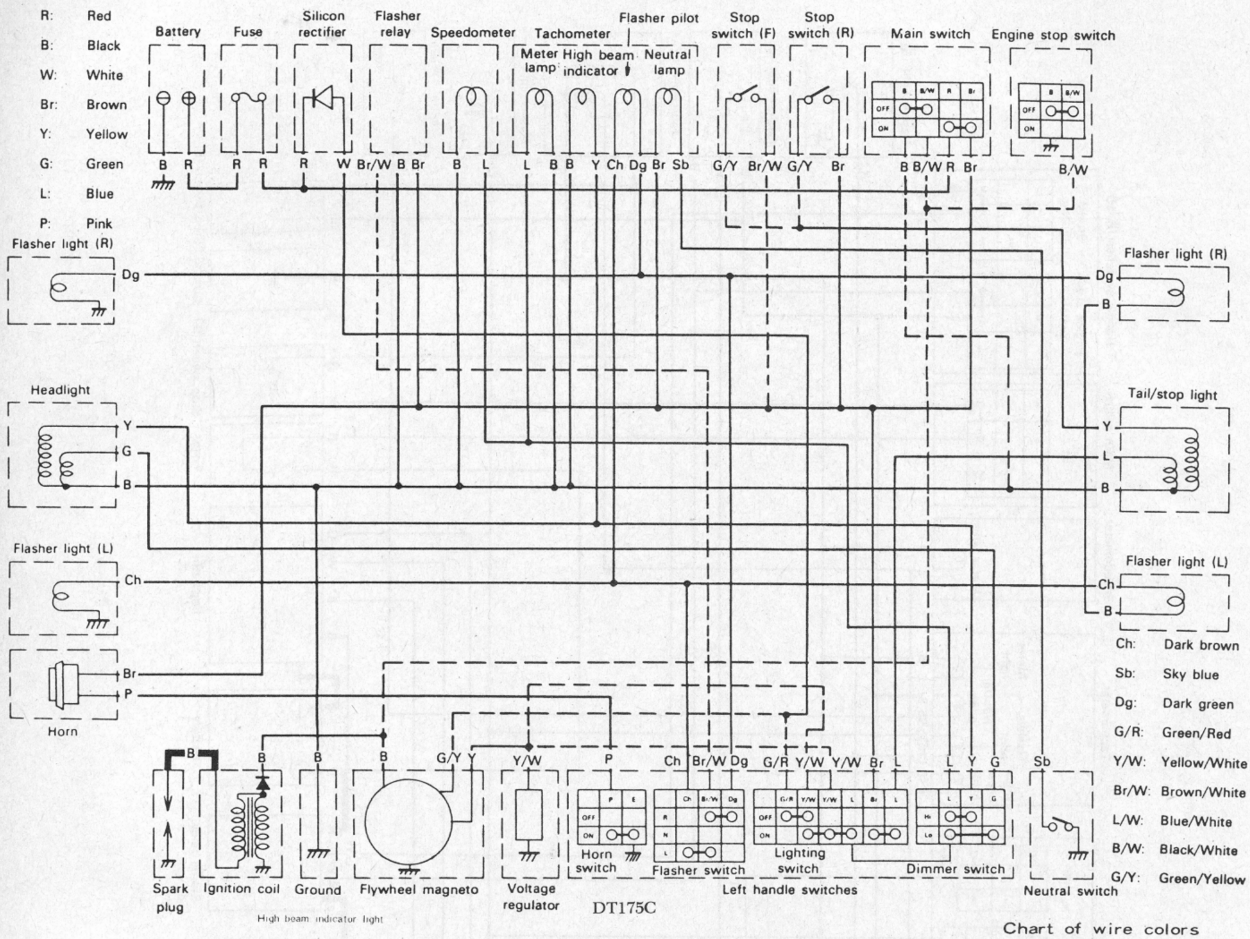
Wiring Diagrams



R:	Red	Ch:	Dark brown
B:	Black	Sb:	Sky blue
W:	White	Dg:	Dark green
Br:	Brown	G/R:	Green/Red
Y:	Yellow	Y/W:	Yellow/White
G:	Green	Br/W:	Brown/White
L:	Blue	L/W:	Blue/White
P:	Pink	B/W:	Black/White
		G/Y	Green/Yellow

DT125C

Wiring Diagrams



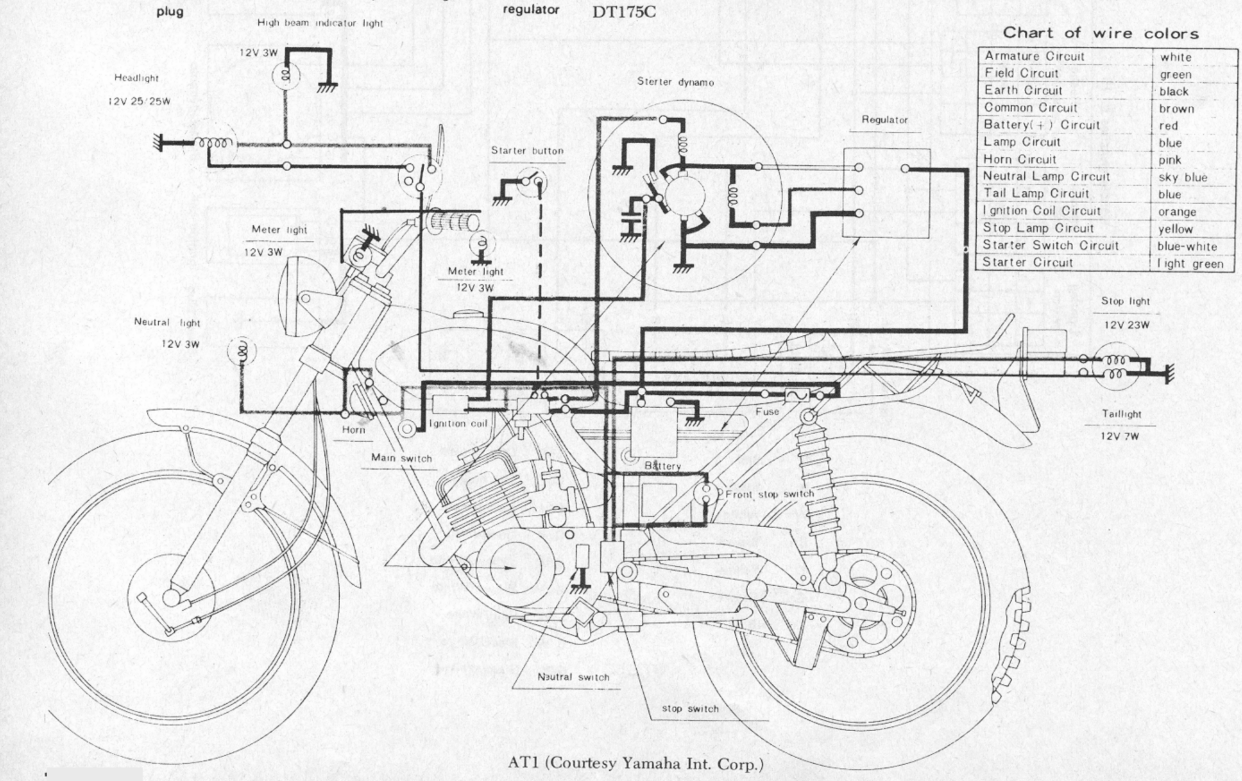


Chart of wire colors

Armature Circuit	white
Field Circuit	green
Earth Circuit	black
Common Circuit	brown
Battery(+) Circuit	red
Lamp Circuit	blue
Horn Circuit	pink
Neutral Lamp Circuit	sky blue
Tail Lamp Circuit	blue
Ignition Coil Circuit	orange
Stop Lamp Circuit	yellow
Starter Switch Circuit	blue-white
Starter Circuit	light green

AT1 (Courtesy Yamaha Int. Corp.)

Wiring Diagrams

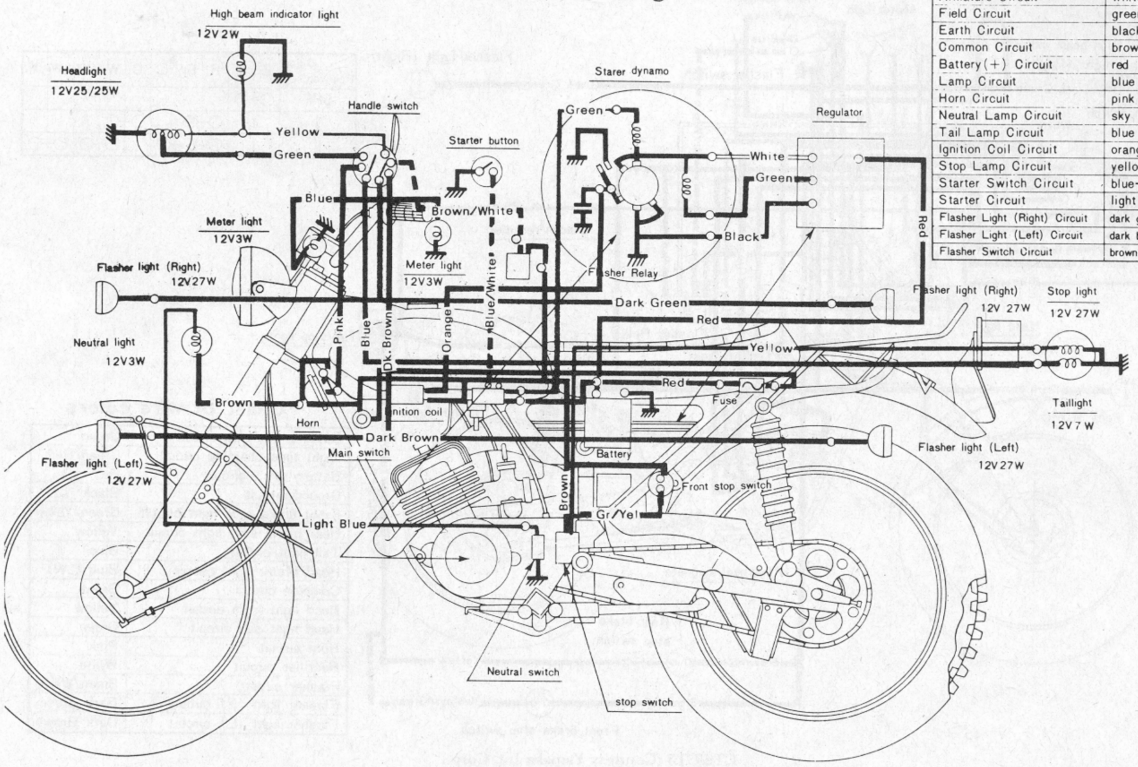
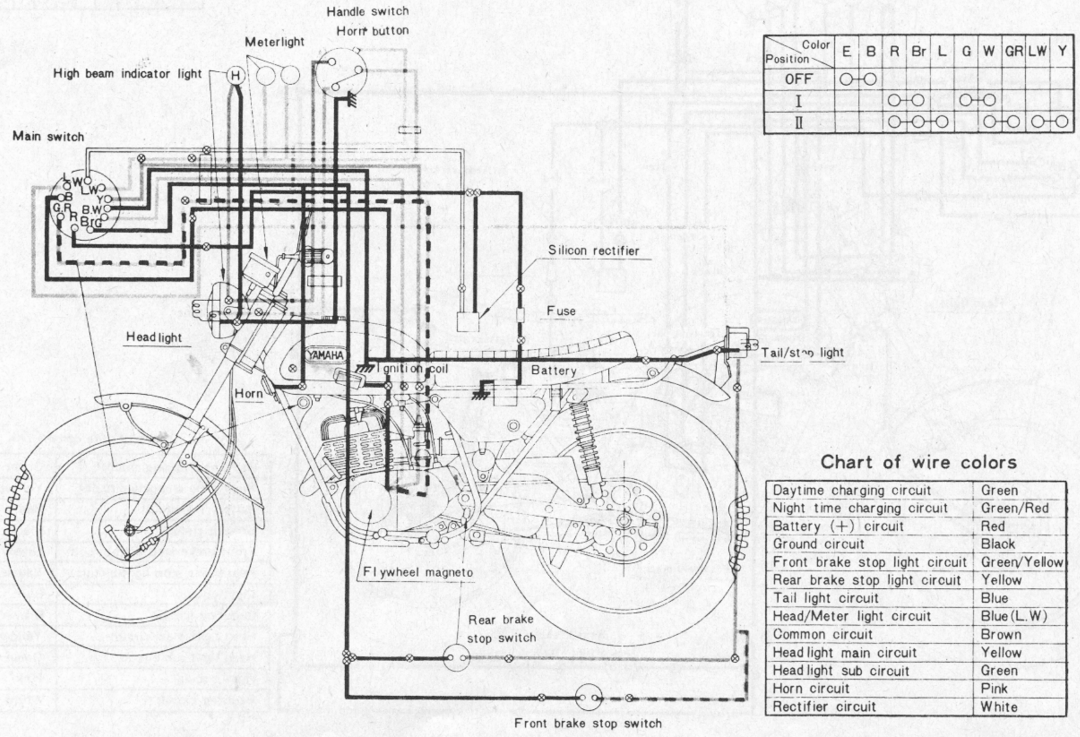


Chart of wire colors

Armature Circuit	white
Field Circuit	green
Earth Circuit	black
Common Circuit	brown
Battery (+) Circuit	red
Lamp Circuit	blue
Horn Circuit	pink
Neutral Lamp Circuit	sky blue
Tail Lamp Circuit	blue
Ignition Coil Circuit	orange
Stop Lamp Circuit	yellow
Starter Switch Circuit	blue-white
Starter Circuit	light green
Flasher Light (Right) Circuit	dark green
Flasher Light (Left) Circuit	dark brown
Flasher Switch Circuit	brown-white

AT2/AT3 (Courtesy Yamaha Int. Corp.)



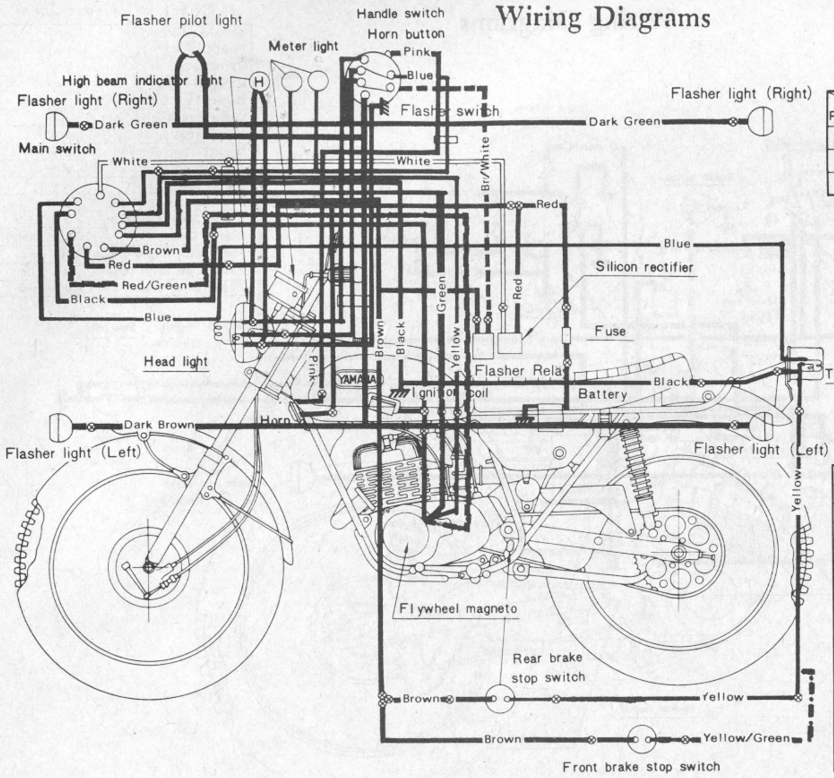
Color / Position	E	B	R	Br	L	G	W	GR	LW	Y
OFF	○	○								
I			○	○		○	○			
II			○	○	○		○	○	○	

Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Green/Red
Battery (+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Tail light circuit	Blue
Head/Meter light circuit	Blue (L.W)
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White

CT1 (Courtesy Yamaha Int. Corp.)

Wiring Diagrams

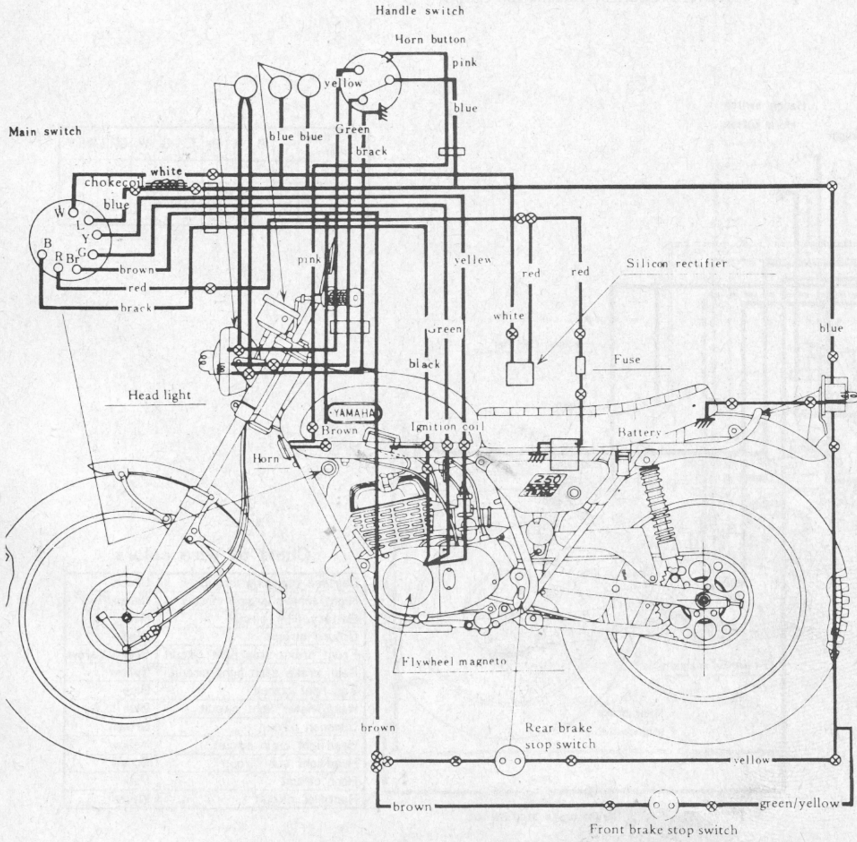


Position \ Color	E	B	R	Br	L	G	W	GR	LW	Y
OFF	○	○								
I			○	○		○	○			
II			○	○	○		○	○	○	○

Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Green/Red
Battery (+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Tail light circuit	Blue
Head/Meter light circuit	Blue (L.W)
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White
Flasher circuit	Brown/White
Flasher light (R) circuit	Dark Green
Flasher light (L) circuit	Dark Brown

CT2/CT3 (Courtesy Yamaha Int. Corp.)



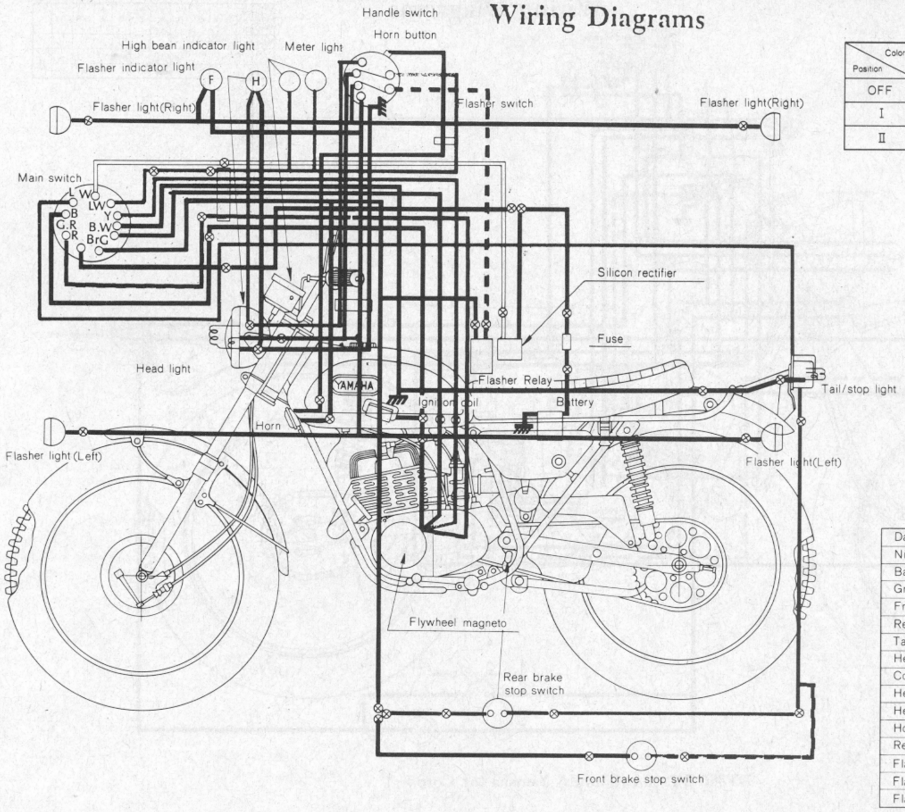
Position \ Color	E	B	R	Br	G	W	Y	L
OFF	○	○						
I			○	○	○	○		
II			○	○		○	○	○

Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Yellow
Battery (+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Light circuit	Blue
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White

DT1/DT1B (Courtesy Yamaha Int. Corp.)

Wiring Diagrams

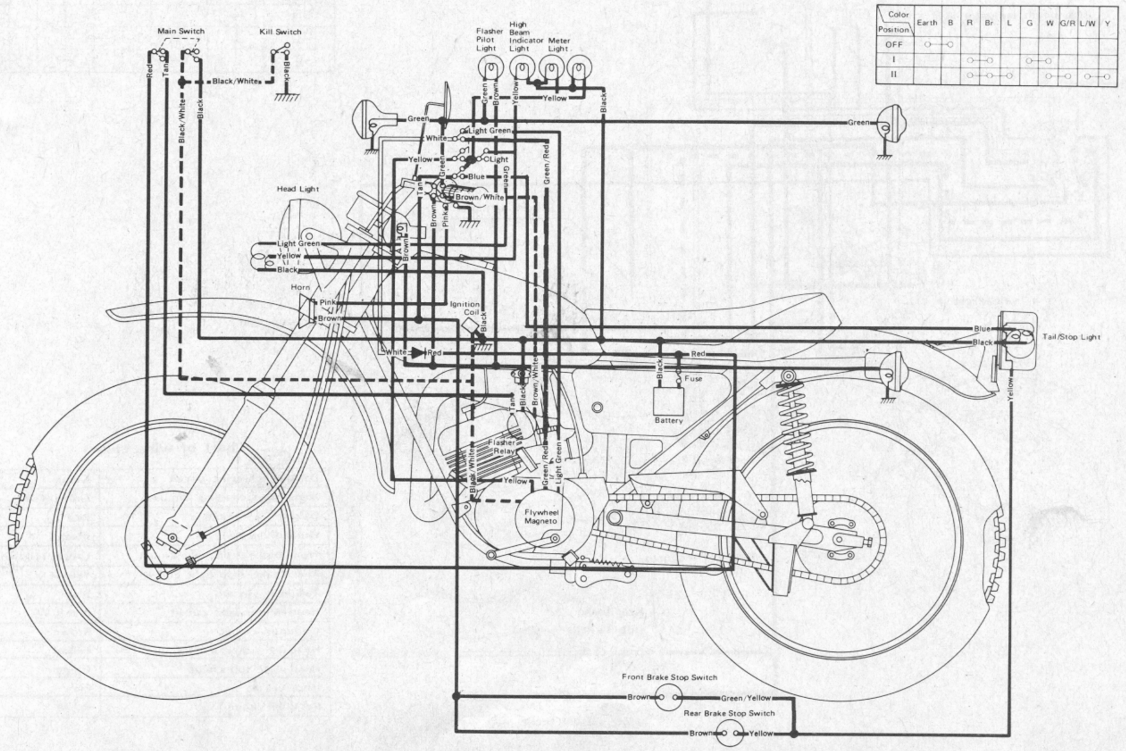


Position \ Color	E	B	R	Br	L	G	W	GR	LW	Y
OFF	○—○									
I			○—○		○—○					
II			○—○—○				○—○	○—○		

Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Green/Red
Battery(s+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Tail light circuit	Blue
Head/Meter light circuit	Blue(L.W)
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White
Flasher light(Right)circuit	Dark green
Flasher light(Left)circuit	Dark Brown
Flasher relay circuit	Brown/White

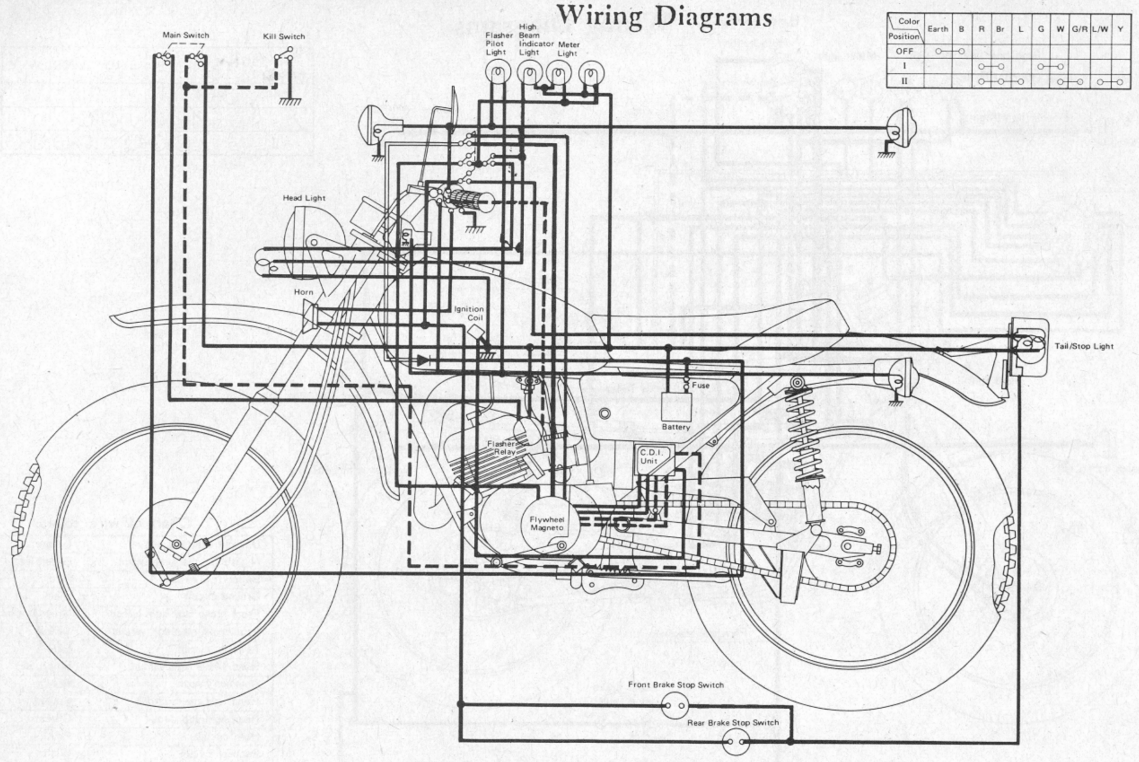
DT1E/DT2/DT3/RT1B/RT2/RT3 (Courtesy Yamaha Int. Corp.)



Position \ Color	Earth	B	R	Br	L	G	W	G/R	L/W	Y
OFF	○—○									
I				○—○			○—○			
II				○—○—○			○—○		○—○	

DT250/DT250A (Courtesy Yamaha Int. Corp.)

Wiring Diagrams



DT360/DT360A (Courtesy Yamaha Int. Corp.)

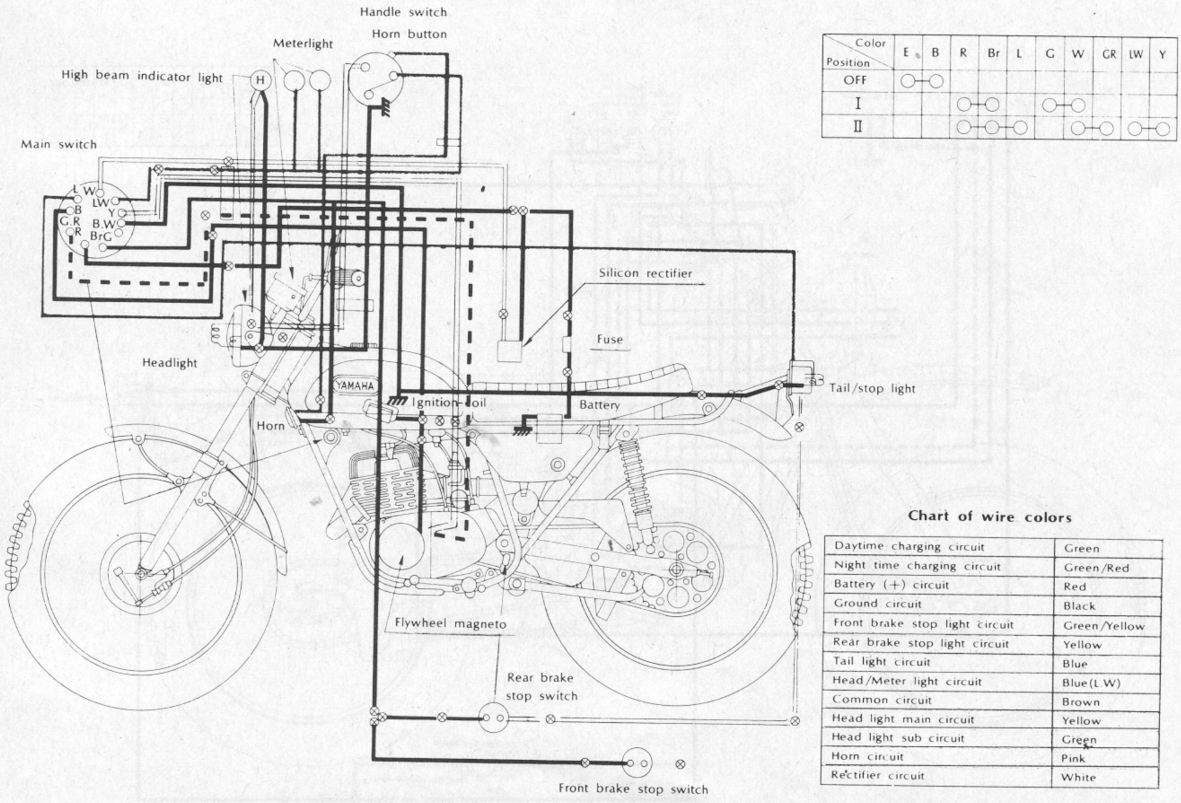


Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Green/Red
Battery (+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Tail light circuit	Blue
Head/Meter light circuit	Blue(L W)
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White

RT1 (Courtesy Yamaha Int. Corp.)

Chassis

Wheels and Brakes

FRONT WHEEL REMOVAL AND INSTALLATION

Procedure will vary according to the type of forks fitted.

1. Support the front wheel several inches off the ground by placing a crate or the like beneath the motorcycle if necessary.

2. Disconnect the brake cable from the handlebar lever, and then from the lever on the brake plate. Detach the cable from the adjuster if the adjuster is equipped with a slot for this purpose. If not, unscrew the adjuster from the brake plate.

3. Remove the bolt or screw which secures the speedometer cable, and pull the cable out of the hub, ensuring that the rubber O-ring on the end of the cable is not damaged as this is done.

4. The front wheel is secured in a number of ways depending on model. On most lightweights, the axle is held only by the axle nut. On others, a pinch-bolt is fitted to one fork slider. On larger models, an axle cap (secured by two small nuts) is used.

5. Remove the axle nut cotter pin if fitted. Then remove the axle nut. Loosen the slider pinch-bolt (if so equipped), and/or remove the axle capnuts and the axle cap.

6. Insert a phillips head screwdriver or similar tool into the axle and pull it with a twisting motion out of the sliders.

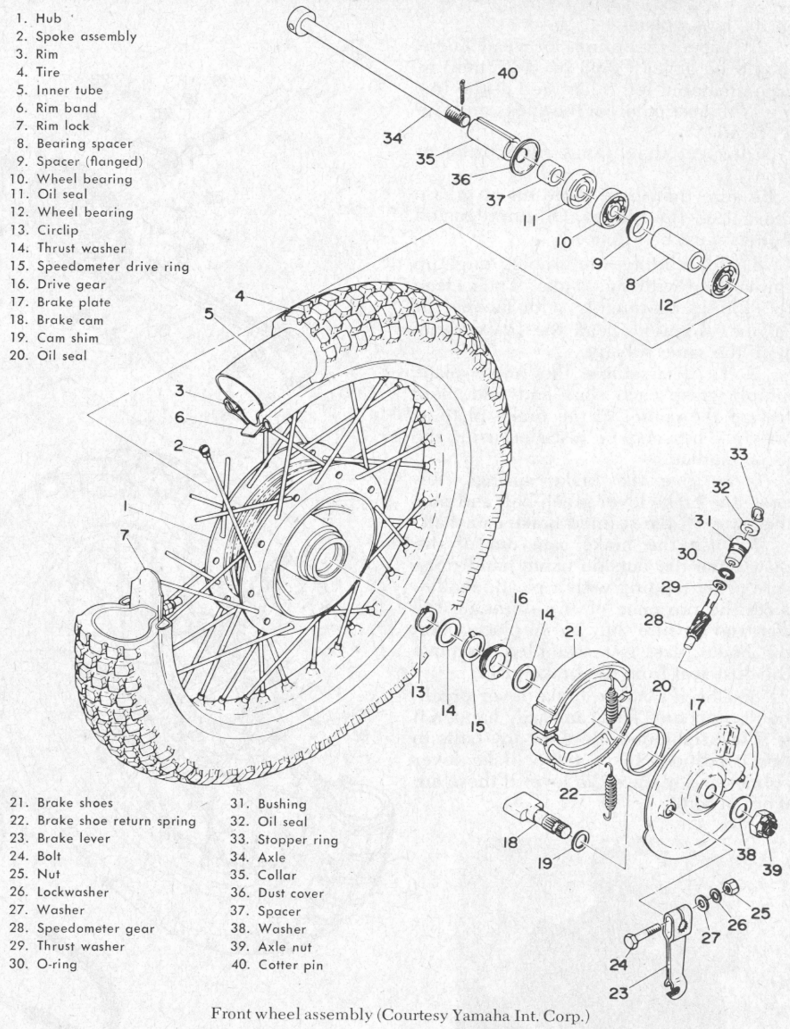
7. Remove the wheel from the forks. On some lightweight models, an axle spacer on the left-side of the hub protrudes about an inch out of the oil seal. This spacer should be oiled lightly and then taken out of the seal using a twisting motion. If a dust cover is fitted to the hub, remove it now to avoid loss during handling of the wheel.

8. Refer to the wheel component service sections below if necessary. Installation is the reverse of the removal procedure. Ensure that the brake anchor cast into the brake plate is engaged with the slot on the fork slider. Tighten the axle nut securely. Refer to the "Chassis Torque Specifications" chart at the end of this section. Using a new axle nut cotter pin is recommended.

After tightening the axle nut, secure the pinch-bolt or axle capnuts. Tighten the capnuts evenly so there are even gaps on both sides of the axle.

REAR WHEEL REMOVAL AND INSTALLATION

Two types of rear wheel assembly are fitted. On most models the sprocket and the rear wheel are removed together. On some models, the sprocket hub assembly is separate and can remain in place on the swing arm when the rear wheel is removed. This latter type is fitted to such machines as the LT2, DT100, and HT1, and is identifiable since a large sprocket nut is fitted which secures the sprocket assembly to the swing arm.



Front wheel assembly (Courtesy Yamaha Int. Corp.)

1. On machines with sprockets bolted to the wheel, disconnect the drive chain.

2. Remove the brake anchor cotter pin. Remove the brake anchor nut and bolt and detach the anchor from the brake plate.

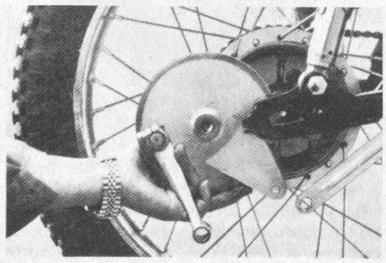
3. Unscrew and remove the brake rod adjuster nut. Depress the brake lever and disconnect the brake rod from the brake plate lever. Remove the spring and place it along with the adjuster nut and clevis pin fitting in a safe place.

4. Loosen the nut on each chain adjuster. Back off the chain adjuster bolts or nuts to allow some free-play in the rear wheel.

5. Remove the rear axle nut cotter pin, the rear axle nut, and tap out the axle using a plastic mallet or pull it out with a twisting motion.

6. After the axle is removed, remove the axle spacer on the right-side of the wheel, and the right-side chain adjuster. Pull off the brake plate and remove it from the machine. Pull the wheel as far as possible to the right and remove it. On some models it may be necessary to lean the motorcycle to the left while removing the wheel.

7. Installation is the reverse of the removal procedure. On models with separate sprockets, ensure that the driving tabs on the sprocket assembly are engaged with the slots in the hub's rubber dampers. On other models, install the chain masterlink spring clip facing the direction of chain rotation. Adjust chain tension and the rear brake in that order. Tighten the axle nut securely. Torque the axle nut to the values given in the "Chassis Torque Specifications" chart at the end of this section.



Remove the brake plate (Courtesy Yamaha Int. Corp.)

BRAKE SERVICE

Front and Rear Brakes

1. Brakes can be inspected in place

on the brake plate.

2. Inspect the linings for wear. There should be at least 0.03 in. (0.77 mm) of lining material left (measured at the lining's thinnest point) or the shoes must be replaced.

3. Inspect the linings for scoring or grooves.

Be sure that there is no oil or grease present on the linings. Oil-impregnated linings must be replaced.

4. If the linings are usable, rough up the surface with sandpaper. Then clean the linings thoroughly with alcohol or lacquer thinner. Clean the brake drum with the same solvent.

5. To disassemble the brake plate, simply grasp each shoe and fold them toward the center of the brake plate as shown. They may be installed using the same method.

6. Remove the brake springs. Remove the brake lever pinch-bolt and pull the lever off the splined brake camshaft.

7. Push the brake cam out of the plate from the outside using hand pressure or by tapping with a plastic mallet. Note the presence of any shims on the cam and be sure they are in place when the brake plate is ressembled. Remove the dust seal from the brake plate.

8. Check that the brake lever pinch-bolt is not bent. This can easily happen if it is overtightened. Replace any bolts in this condition. Inspect the brake lever splines and replace the lever if these are worn or torn.



Removing the brake shoes from the brake plate

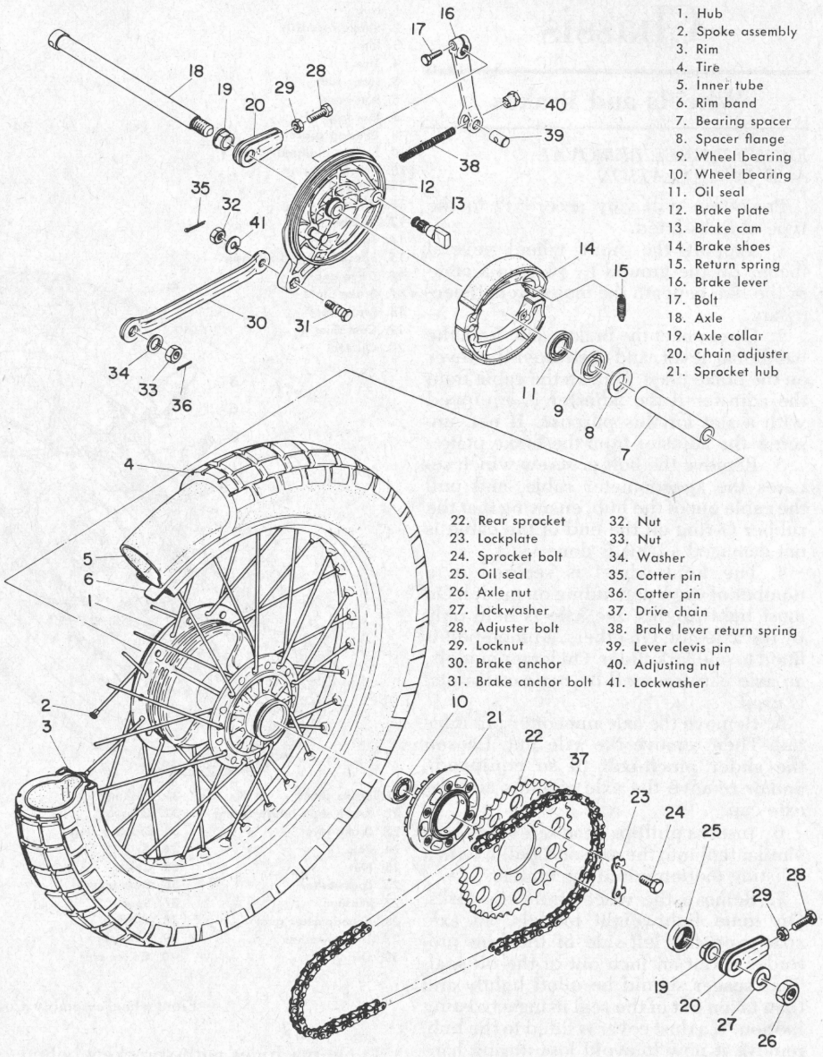
9. Inspect the splines on the brake cam. These should be in good condition. Check that the brake cam is not bent and that it can rotate freely in the brake plate passage. If it will not, use a fine grade of sandpaper on the camshaft and the surface of the brake plate passage.

10. Clean the cam thoroughly in a solvent to remove any old grease, rust or corrosion. Use sandpaper or emery cloth to polish the cam. Clean off any residue; before reassembly, smear the cam with chassis grease.

11. Inspect the brake plate for cracks or fractures, and replace it if necessary.

12. Check the condition of the brake springs, noting any twisted or fatigued hooks. Replace any broken, rusted, or old springs with new ones.

13. Clean all parts thoroughly with a suitable solvent, making a special effort to remove the dust and built-up dirt from the brake plate.



Rear wheel assembly (Courtesy Yamaha Int. Corp.)

14. When reassembling the hub, note the following points:

a. Ensure that the brake cam is lubricated with chassis grease and that any shims which were on the cam are in place;

b. The use of new dust seals is recommended;

c. Lubricate the brake shoe pivot points with a little grease;

d. Install the shoes as on removal. Hook them together with the springs, and fold them down over the brake cam and pivot.

Brake Drums

1. Upon disassembly of the hub, inspect the brake drum surface for condition. The drums must be clean and free from score marks or rust.

2. Rust can be removed from the drum surface with sandpaper. Polish the surface until it is shiny, then clean it thoroughly.

3. Alcohol or lacquer thinner can be used to remove dirt or deposits from the drum.

4. The drum should be checked for concentricity. An out-of-round condition is usually noticeable as an on-off-on feeling when the brake is applied while riding. With the wheel assembly mounted on the machine, spin the wheel while applying the brake very lightly. The rubbing noise of the brakes against the drum should be heard for the entire revolution of the wheel.

5. An out-of-round condition and most scoring can be removed by having the drum turned on a lathe.

SPROCKET ASSEMBLY

The rear sprocket assembly consists of the sprocket, sprocket hub, bearing, and rubber dampers.

Removal and Disassembly

On models with the type of sprocket assembly which remains on the swing arm when the wheel is removed, proceed as follows:

1. Disconnect the drive chain. Unscrew the large sprocket hub nut and remove the assembly from the swing arm.

2. Bend down the tabs on the sprocket bolt locking plates. Unscrew the bolts, and remove the sprocket from the hub.

3. To remove the hub bearing, first remove the sprocket shaft by tapping it out from the sprocket side of the hub. Use a plastic mallet or wood block so that the sprocket shaft threads will not be damaged when struck.

4. Take off the sprocket shaft collar by hand, then the dust seal (fitted to late models).

5. Use an elbow-shaped tool to pry out the oil seal. If the oil seal is damaged on removal, as is likely, a new one must be fitted.

6. Remove the circlip on the inside of the hub. Drive the bearing out toward the sprocket side of the hub with a suitable drift.

On models in which the sprocket assembly and rear wheel are removed together:

1. Pull the sprocket assembly out of the rear wheel.

2. Bend down the locking tabs on the sprocket bolts and remove the bolts.

3. Remove the sprocket from the hub.

4. Remove the sprocket hub dust seal. Pull out the collar.

5. Pry out the oil seal out with a screwdriver or elbow-shaped tool.

6. Remove the large circlip from the wheel side of the sprocket hub.

7. Drive out the sprocket hub bearing.

Inspection

1. For bearing inspection and lubrication, refer to "Wheel Bearings," below.

2. Check the condition of the sprocket. If the sprocket is warped, or if the sprocket teeth are worn or hooked, the sprocket should be replaced along with the chain and the engine sprocket.

3. Check the condition of the sprocket bolts and the locking plates. Replace any bolts with rounded heads, stripped threads, or those which are bent or cracked. Bolts must be tightened securely upon installation. It is also recommended that they be secured with a thread locking compound. The locking plates must not have fatigued or cracked edges, since these are used to lock the bolts in place. Replace the plates if damaged in any way.

4. Check the condition of the oil seal and replace it if the lips are damaged.

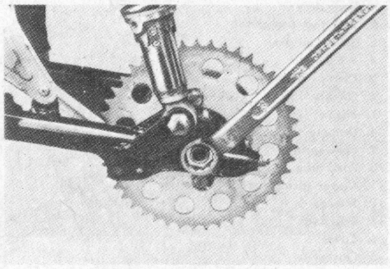
5. Inspect the sprocket shaft for broken or stripped threads.

6. Check the condition of the rubber dampers in the wheel hub. These take up any driveline shocks when the clutch is released and have an important effect on chain and sprocket life. Replace any damper which is crushed or damaged. In instances where the damper is a tight fit in the hub, some engine oil or dishwashing liquid can be used to facilitate removal and installation.

Assembly

1. Assembly is the reverse of the disassembly procedure.

2. Lubricate the bearing as described in "Wheel Bearings," below. The bearing should be driven into place with a bearing driver or a suitable substitute.

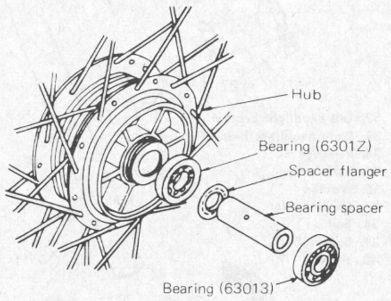


Removing the sprocket hub assembly (Courtesy Yamaha Int. Corp.)

3. Grease the lips of the oil seal before installation. The seal should be pressed into the hub with care.

WHEEL BEARINGS

Removal of the wheel bearings necessitates removing the hub oil seals. These should be replaced with new ones upon reassembly. In addition, a drift with a hooked end should be used to remove the bearings. Refer to the illustration. Clean the outside of the hub before removing the bearings.



Wheel bearing assembly (Courtesy Yamaha Int. Corp.)

Disassembly

1. Remove the wheel and take out the brake plate.

2. Remove the speedometer drive mechanism from the hub if fitted. Remove any dust covers, seals, or axle spacers fitted to either side of the hub.

3. Pry out the hub oil seals using a small screwdriver, or, preferably, an elbow-shaped tool.

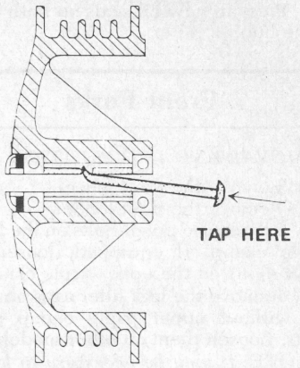
4. Using the bearing removal tool, or a suitable substitute, engage the hole drilled into the bearing spacer. Striking the removal tool with a hammer will drive out one wheel bearing. Alternately, a straight punch may be used to remove the bearing. Move the spacer to one side as shown in the illustration and tap out the bearing.

5. Take out the bearing spacer and spacer flange. Drive out the other bearing.

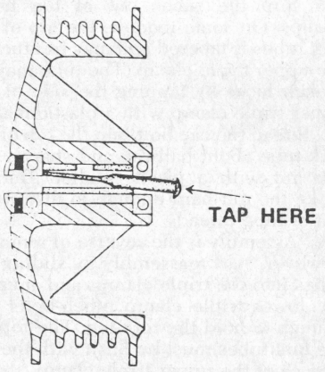
NOTE: *On some models, especially high mileage machines, the hub should be heated gently with a propane torch in the vicinity of the bearing bosses to facilitate removal.*

Inspection

NOTE: *The following bearing inspection checks refer to the sprocket hub bearing as well as wheel bearings.*



Hooked tool used for removing wheel bearings (Courtesy Yamaha Int. Corp.)



A straight punch can also be used to remove the bearings (Courtesy Yamaha Int. Corp.)

1. Clean the bearings, washers and spacer tube in a suitable solvent, removing all of the old grease. At this point, it would be wise to clean out the hub as well.

2. Check the bearing bosses in the hub for scuffs, cracks, or distortion. If they are in any way damaged, the hub must be replaced.

3. Check the condition of the steel washers and the spacer and replace if damaged.

4. Apply a few drops of light oil to the bearing, and spin it. The bearing must rotate smoothly and freely. Any roughness or binding in rotation will necessitate a new bearing

5. Note that bearings must be replaced in pairs.

Assembly

1. Obtain a good grade of wheel bearing grease to lubricate the wheel bearings.

2. Pack the grease in the bearing.

3. Heat either side of the wheel hub with a propane torch as on removal of the bearings. Place one of the bearings in the hub, and make sure that it is seated. Use a bearing driver or a block of wood to install the bearing. Center the bearing in the bearing boss, then strike the drift sharply until the bearing is seated.

NOTE: *Bearing must be driven straight into the hub. Do not attempt to force in a cocked bearing.*

4. Fit the spacer flange and spacer, and install the other wheel bearing.

5. Press in new oil seals on both sides of the hub.

Front Forks

REMOVAL AND INSTALLATION

1. Remove the front wheel.
2. Remove the front fender.
3. Loosen the pinch-bolts on the lower triple clamp. If equipped, loosen the pinch-bolts on the upper triple clamp.
4. Remove the fork filler caps on models without upper triple clamp pinch bolts. Loosen them on other models.

NOTE: *It may be necessary to loosen and pivot the handlebars out of the way for clearance.*

5. Slip the tubes out of the triple clamps. On some models, the top of the fork tubes is tapered and may be stuck in the upper triple clamp. The tube may be broken loose by tapping the side of the upper triple clamp with a plastic mallet. Or, thread the cap bolt into the top of the fork tube about halfway and sharply rap the nut with a plastic mallet. Do not strike the nut hard enough to distort the nut or tube threads.
6. Assembly is the reverse of removal; however, start reassembly by sliding the tubes into the triple clamps and snug up the lower triple clamp pinch-bolts just enough to hold the fork leg. The tops of the fork tubes must be flush with the top surface of the upper triple clamp.
7. Tighten the lower triple clamp pinch-bolts and then the upper pinch bolts. Secure the filler caps.

DISASSEMBLY

Enduro-Type Forks

1. Remove the fork legs.
2. Remove fork filler caps, the fork spring(s) and spacers from the top of the fork tube. Drain the fork oil into a container.
3. Remove the allen bolt from the bottom of the fork slider. It may be necessary to use an impact driver on these bolts.

If the allen bolts turn, but do not come out, the damper inside is turning as well. Temporarily reinstall the fork spring(s) and filler cap which will usually serve to hold the damper so that the allen bolt can be broken free.

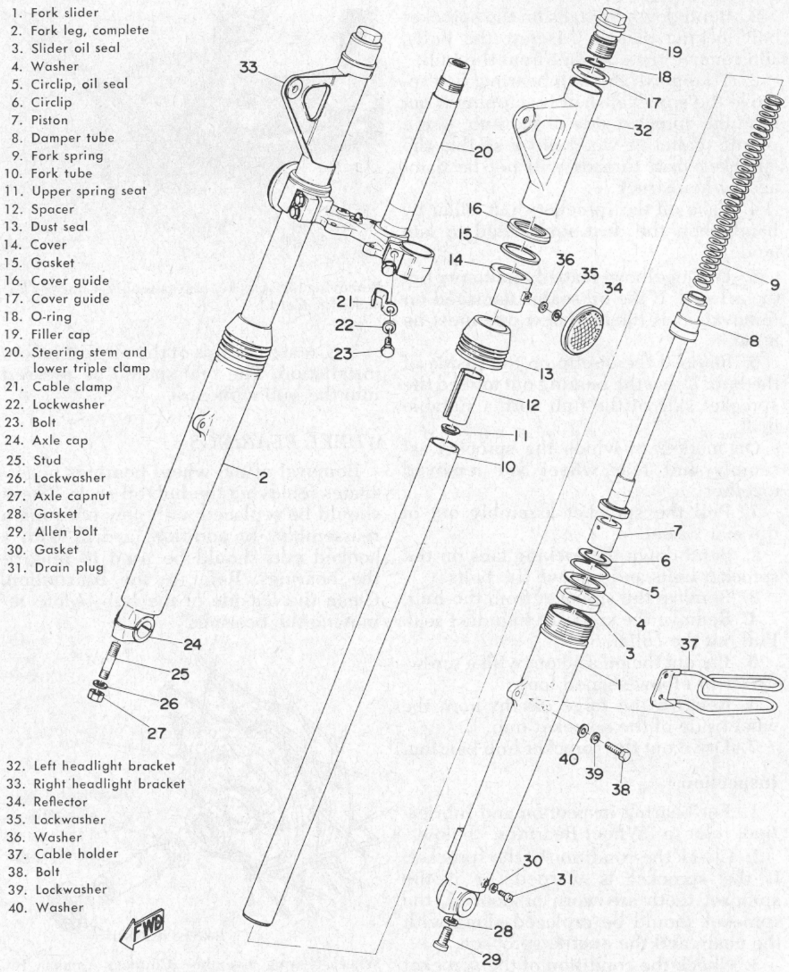
On models such as the DT100, a large circular nut is fitted to the top of the fork slider. Lift the dust cover off the slider, and unscrew and remove the slider nut as described in Steps 5 and 6 under "Standard Telescopic-Type Forks," following.

4. Pull the fork slider off the fork leg.
5. Remove the circlip from the bottom of the fork tube and take out the damper components.
6. Remove the dust cover from the top of the slider. Remove the snap-ring, dust seal and washer (if fitted). The oil seal is pried out of the slider with a small screwdriver as illustrated. Protect the slider lip with a cloth.
7. Remove the sliding bushing from the fork tube, if fitted.

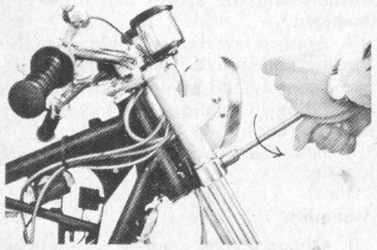
Standard Telescopic-Type Forks

1. Remove the fork legs from the machine.

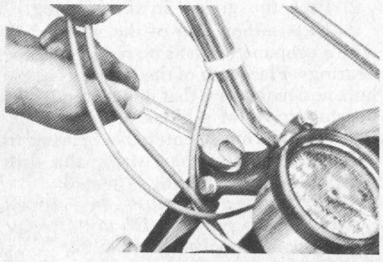
1. Fork slider
2. Fork leg, complete
3. Slider oil seal
4. Washer
5. Circlip, oil seal
6. Circlip
7. Piston
8. Damper tube
9. Fork spring
10. Fork tube
11. Upper spring seat
12. Spacer
13. Dust seal
14. Cover
15. Gasket
16. Cover guide
17. Cover guide
18. O-ring
19. Filler cap
20. Steering stem and lower triple clamp
21. Cable clamp
22. Lockwasher
23. Bolt
24. Axle cap
25. Stud
26. Lockwasher
27. Axle capnut
28. Gasket
29. Allen bolt
30. Gasket
31. Drain plug
32. Left headlight bracket
33. Right headlight bracket
34. Reflector
35. Lockwasher
36. Washer
37. Cable holder
38. Bolt
39. Lockwasher
40. Washer



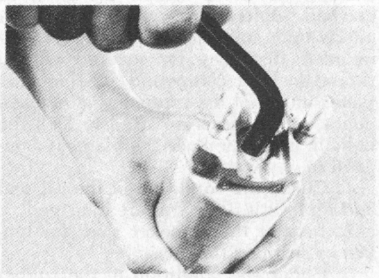
Fork assembly (DT250/360/400) (Courtesy Yamaha Int. Corp.)



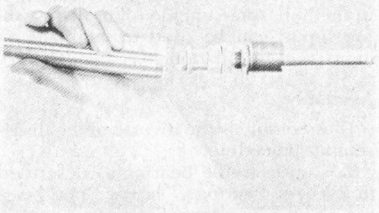
Loosening a lower triple clamp pinch-bolt (Courtesy Yamaha Int. Corp.)



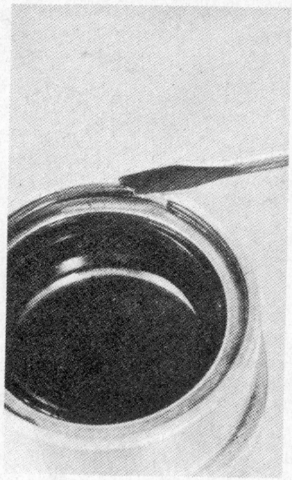
Removing a fork filler cap (Courtesy Yamaha Int. Corp.)



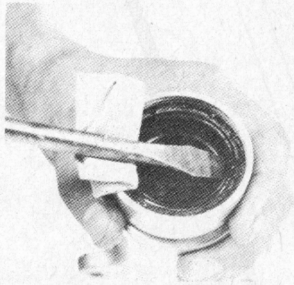
Removing the fork slider allen bolt (Courtesy Yamaha Int. Corp.)



Removing the damper components from the fork tube (Courtesy Yamaha Int. Corp.)

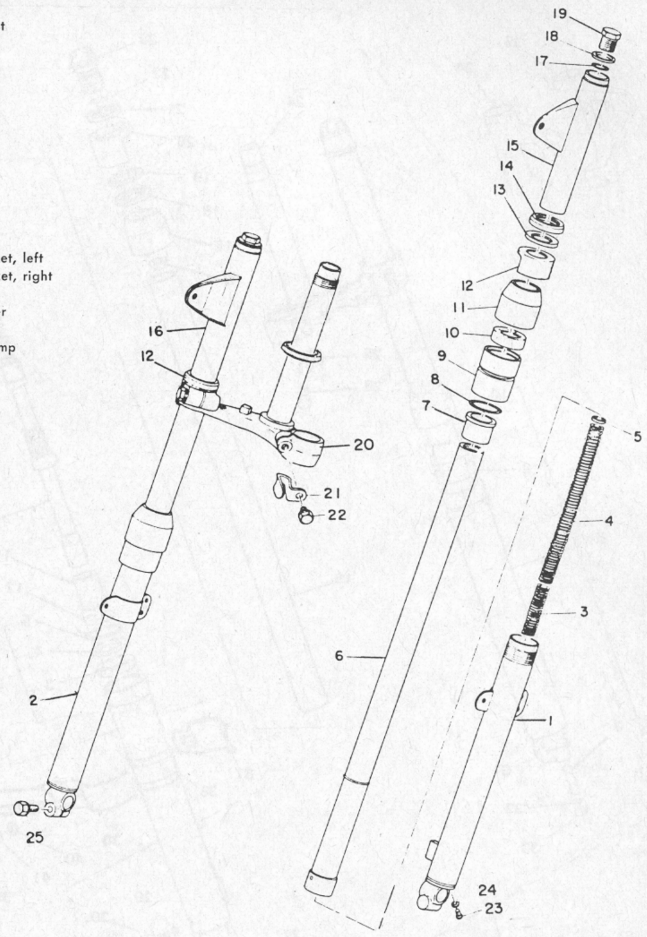


Removing the fork seal retaining snap-ring (Courtesy Yamaha Int. Corp.)

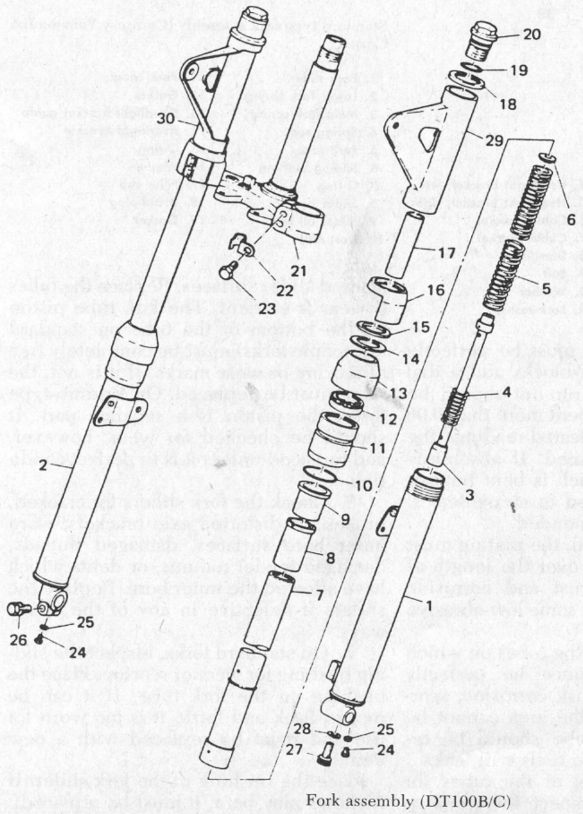


Prying out the slider oil seal. Note the use of the rag to prevent damage to the slider (Courtesy Yamaha Int. Corp.)

1. Fork slider, left
2. Fork slider, right
3. Lower spring
4. Upper spring
5. Spring seat
6. Fork tube
7. Sliding bushing
8. O-ring
9. Circular nut
10. Oil seal
11. Dust cover
12. Cover
13. Grommet
14. Bracket guide
15. Headlight bracket, left
16. Headlight bracket, right
17. O-ring
18. Filler cap washer
19. Filler cap
20. Lower triple clamp
21. Cable bracket
22. Bolt
23. Drain plug
24. Gasket
25. Pinch bolt



Fork assembly (DT100A)



Fork assembly (DT100B/C)

1. Fork slider, left
2. Fork slider, right
3. Damper components
4. Rebound spring
5. Spring
6. Spring seat
7. Fork tube
8. Spacer
9. Sliding bushing
10. O-ring
11. Circular nut
12. Oil seal
13. Dust cover
14. Grommet
15. Washer
16. Cover
17. Spacer
18. Grommet
19. O-ring
20. Filler cap
21. Lower triple clamp
22. Cable bracket
23. Bolt
24. Drain plug
25. Gasket
26. Pinch bolt
27. Allen bolt
28. Gasket
29. Headlight bracket, left
30. Headlight bracket, right

2. Remove the fork filler cap, washer, and O-ring.

3. Remove the fork boot (external spring forks), spring seats, and spring from the fork leg.

4. Drain the oil out of the top of the fork tube into a suitable container.

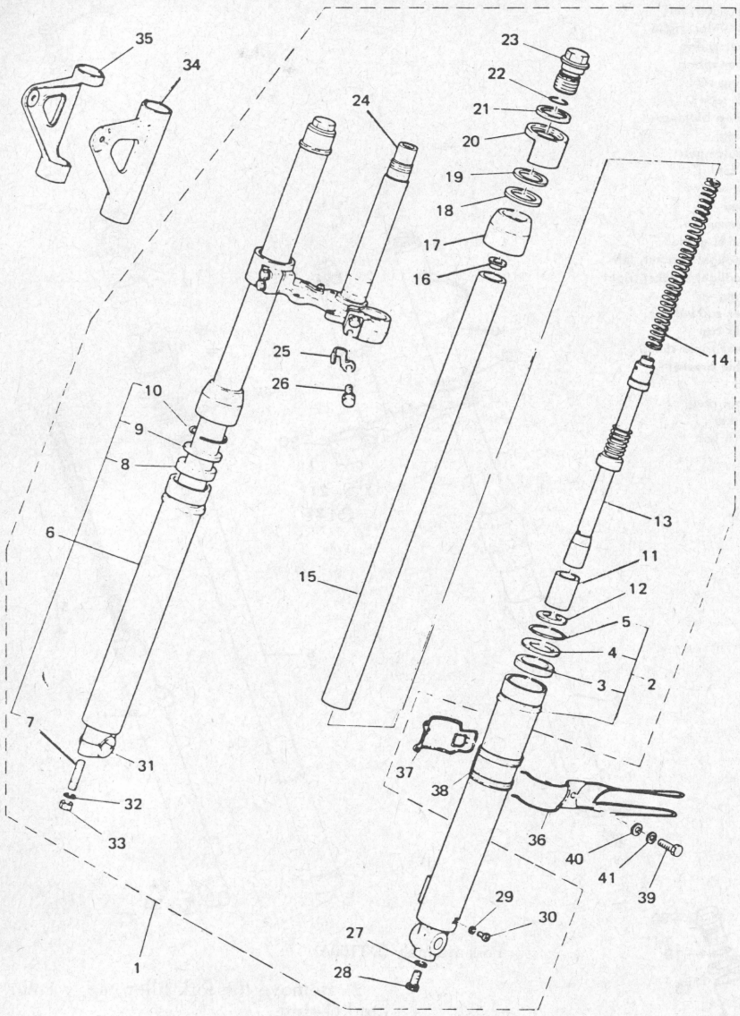
5. To disassemble the fork leg, a device must be used to clamp the slider nut so that it can be turned. In many cases, a large heater hose clamp will work. Tighten the heater hose clamp around the slider nut; a piece of old inner tube should be used beneath the clamp to protect the chrome. Clamp the slider in a vise, preferably by the axle lug. Unscrew the slider nut and remove the slider from the fork tube.

An alternative method requires clamping the slider nut in a vise (protected with rubber padding or the like), and unscrewing the slider from it as shown in the illustration.

A strap wrench on the slider nut, if one is available, is the easiest method.

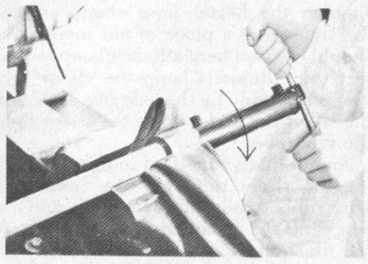
6. Remove the slider nut with the oil seal by the top of the fork tube, followed by the O-ring (if fitted) and sliding bushing.

7. The oil seal, which must be replaced, can be pried out of the circular nut with a small screwdriver or hooked tool.



Fork assembly (DT125/175B/C)

1. Fork assembly
2. Fork slider assembly, left
3. Oil seal
4. Washer
5. Circlip
6. Fork slider assembly, right
7. Axle cap stud
8. Oil seal
9. Washer
10. Circlip
11. Piston
12. Circlip
13. Damper
14. Spring
15. Fork tube
16. Spring seat
17. Dust cover
18. Washer
19. Grommet
20. Cover
21. Grommet
22. O-ring
23. Filler cap
24. Steering stem
25. Cable bracket
26. Bolt
27. Gasket
28. Allen bolt
29. Gasket
30. Drain plug
31. Axle cap
32. Lockwasher
33. Nut
34. Headlight bracket, left
35. Headlight bracket, right
36. Cable bracket
37. Cable bracket
38. Damper
39. Bolt
40. Washer
41. Lockwasher



Unscrewing the slider nut by clamping the fork leg in a vise (Courtesy Yamaha Int. Corp.)

INSPECTION

All Models

Inspection procedures are applicable to all types of forks, with allowances for the type of components fitted.

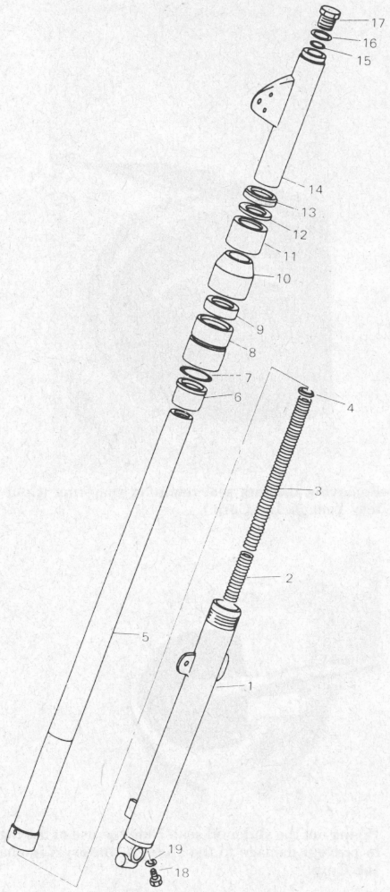
1. Clean all metal parts in a suitable solvent.

2. The fork tubes must be perfectly straight. If a set of V-blocks and a dial gauge are available, run-out should be checked. If a tube is bent more than 0.06 in. (1.5 mm) (true indicated reading), the tube should be replaced. If absolutely necessary, a tube which is bent but not kinked can be pressed to straighten it, but this is not recommended.

3. If chrome plated, the plating must be in good condition over the length of the fork tube. All rust and corrosion should be removed by some low-abrasive method.

4. That portion of the tubes on which the oil seals ride must be perfectly smooth and free of rust, corrosion, scoring, or scratches. If the area cannot be smoothed out, the tube should be replaced. Otherwise, the seals will leak.

5. Check the tops of the tubes for damaged threads. Inspect for worn or scuffed slider surfaces. Replace the tubes if wear is evident. The fork tube piston (at the bottom of the tube on standard telescopic forks) must be completely free of scoring or wear marks. If it is not, the tube must be replaced. On Enduro-type forks, the piston is a separate part. It should be checked for wear, however, and replaced unless it is in perfect condition.



Standard-type fork assembly (Courtesy Yamaha Int. Corp.)

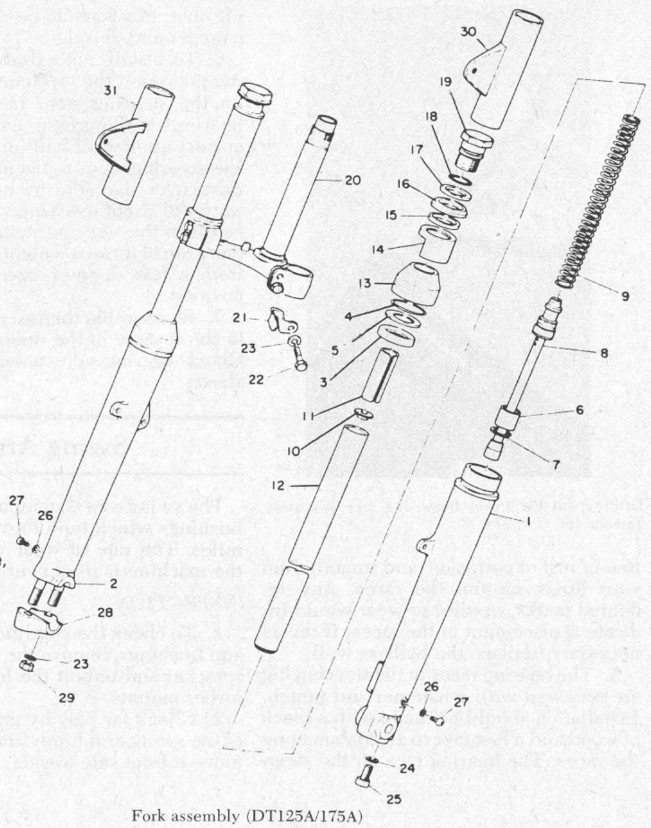
1. Fork slider
2. Lower fork spring
3. Main fork spring
4. Spring seat
5. Fork tube
6. Sliding bushing
7. O-ring
8. Slider nut
9. Slider oil seal
10. Dust seal
11. Fork cover
12. Gasket
13. Headlight bracket guide
14. Headlight bracket
15. O-ring
16. Washer
17. Filler cap
18. Drain plug
19. Gasket

6. Check the fork sliders for cracked, broken, or distorted axle brackets, worn inner bore surfaces, damaged threads, damaged fender mounts, or dents which have affected the inner bore. Replace the sliders if defective in any of the above ways.

7. On standard forks, inspect the sliding bushing for wear or scoring. Place the bushing on the fork tube. If it can be rocked back and forth, it is too worn for use and must be replaced with a new item.

Place the bushing in the fork slider. If it shows play here, it must be replaced.

1. Fork slider, left
2. Fork slider, right
3. Oil seal
4. Circlip
5. Washer
6. Piston
7. Circlip
8. Damper
9. Spring
10. Spring seat
11. Spacer
12. Fork tube
13. Dust cover
14. Cover
15. Grommet
16. Grommet
17. Washer
18. O-ring
19. Filler cap
20. Steering stem
21. Cable bracket
22. Bolt
23. Lockwasher
24. Gasket
25. Allen bolt
26. Gasket
27. Drain plug
28. Axle cap
29. Nut
30. Headlight bracket, left
31. Headlight bracket, right



Fork assembly (DT125A/175A)

8. Check the circular nut for distortion, damaged threads, or a damaged oil seal seat.

9. On Enduro-type forks, check the damper for any scoring or other damage. Replace if necessary.

10. Check the fork springs for cracks or other obvious damage. The two fork springs must be with ¼ in. of equal length, or both should be replaced.

Assembly and Installation

ALL MODELS

1. Assembly is the reverse of the disassembly procedure. Note the following points.

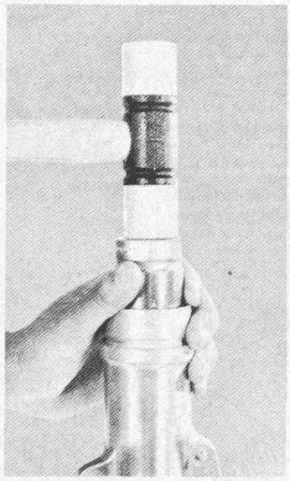
2. All O-rings, oil seals, and felt washers must be replaced.

3. Slider oil seals should be pressed directly into the slider or circular nut (depending on fork type) with a suitable drift, such as a large socket, which will cover the whole seal. This will minimize chances of distorting the seal when installing it and will allow it to be fully seated. The old oil seal can sometimes be used to drive in a new one.

4. Grease the lips of the oil seals before installing on the fork tubes. After installing the slider on the fork tube, check that it can move smoothly up and down.

5. When installing the tubes in the triple clamps, ensure that the top of the tubes are flush with the top surface of the upper triple clamp.

6. Refill each fork leg with the proper viscosity and quantity of oil.



Installing the slider oil seal using a suitable socket for a drift (Courtesy Yamaha Int. Corp.)

Steering Stem

BEARING ADJUSTMENT

1. The steering stem bearings are uncaged 3/16 in. or ¼ in. balls. They are adjusted by means of a ring nut beneath the upper triple clamp.

2. To check bearing adjustment, support the front wheel off the ground. Grasp the fork sliders.

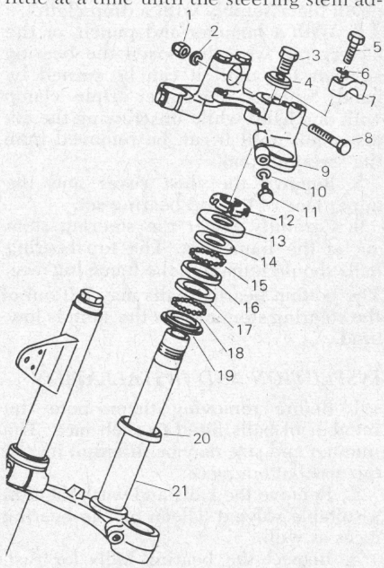
3. Attempt to move the forks by pushing and pulling on the sliders. If play or movement can be felt the bearings are too loosely adjusted or worn.

4. Turn the forks slowly from lock-to-lock. Movement should be smooth, silent, and effortless. If any binding or uneven movement is felt, the balls and races are either too tightly adjusted or are worn. If the steering feels uniformly stiff, the bearings are too tightly adjusted. If any noise is noted, the bearings are damaged, or some are missing.

5. With the front wheel off the ground, release the front forks from a few degrees off the centered position. The forks should fall freely to either side of their own weight. If they will not, the bearings are too tightly adjusted, the steering stem is bent, the races are extremely worn, or some of the balls are missing. At the centered-fork position, check that there is no detent in the bearing movement. This is caused by damaged races.

6. Bearings on most models can be adjusted with a hammer and blunt punch on the adjuster nut with the upper triple clamp still in place. However, the triple clamp pinch-bolts, fork filler caps, and triple clamp crown nut should be loosened to allow movement of the adjusting nut.

7. Tighten or loosen the adjuster nut a little at a time until the steering stem ad-



Triple clamp assembly (Courtesy Yamaha Int. Corp.)

1. Capnut, triple clamp pinch-bolt
2. Lockwasher
3. Steering stem nut
4. Washer
5. Handlebar clamp bolt
6. Washer
7. Handlebar clamp
8. Triple clamp pinch-bolt
9. Upper triple clamp
10. Lockwasher
11. Upper triple clamp pinch-bolt
12. Bearing adjuster nut
13. Bearing race cover
14. Upper bearing race (steering stem)
15. Ball bearings
16. Upper frame lug race
17. Lower frame lug race
18. Ball bearings
19. Lower bearing race (steering stem)
20. Dust seal
21. Steering stem and lower triple clamp

justment conforms to that outlined above.

8. If proper adjustment is not possible, the bearings and races will probably need to be replaced.

REMOVAL

1. Disconnect the cables, remove the electrical switches from the handlebars; unbolt and remove the handlebars from the motorcycle.

2. Unbolt the instruments from the upper triple clamp and lay them carefully aside. Unbolt the headlight from the brackets and allow it to hang by the wiring harness.

3. Remove the front wheel, fender, and remove both fork legs from the triple clamps.

4. Loosen the steering stem pinchbolt. Then remove the steering stem nut, the spring on models with a steering damper, and the large washer.

5. The upper triple clamp can now be removed. Tap upward on the underside of the triple clamp with a plastic mallet until it is free.

6. Remove the headlight brackets. Since the steering head ball bearings are uncaged, it is likely that some will drop out of the races when the steering stem is lowered. Therefore, if the bearings are going to be reused, cover the ground beneath the assembly with a drop cloth.

7. With a hammer and punch, or the factory pin wrench, loosen the bearing adjuster nut until it can be turned by hand. Support the lower triple clamp with one hand while unscrewing the adjuster nut until it can be removed from the steering stem.

8. Remove the dust cover and the upper race of the top bearing set.

9. Carefully lower the steering stem out of the frame lug. The top bearing balls should remain in the frame lug race. The bottom bearing balls may fall out of the steering stem race as the stem is lowered.

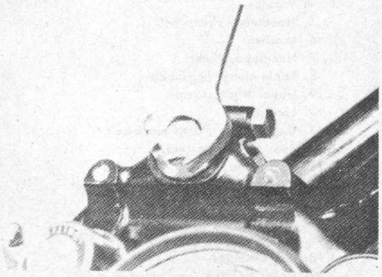
INSPECTION AND INSTALLATION

1. Before removing them, note the number of balls fitted to each race. The number and size may be different for the top and bottom races.

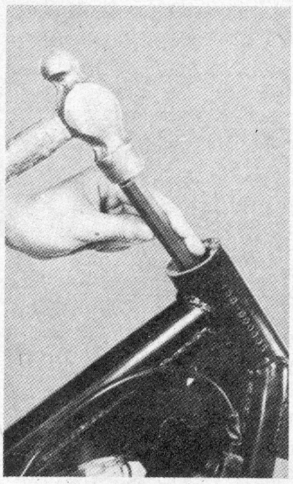
2. Remove the balls and wash them in a suitable solvent. Clean off the bearing races as well.

3. Inspect the bearing balls for rust, pitting, indentations, flat spots, or cracks. Rather than replacing individual damaged balls, both ball sets should be replaced, and the races as well.

4. The bearing race surfaces should be



Removing the triple clamp nut (Courtesy Yamaha Int. Corp.)



Drifting out the lower frame lug race (Courtesy Yamaha Int. Corp.)

free of rust or corrosion, and smooth. Run your finger around the races. Any indented marks, ripples, or wear would indicate replacement of the races. If this is necessary, replace the balls as well.

5. The bearing races in the steering lug are removed with a hammer and punch. Installation should be made with a block of wood and a hammer to avoid damaging the races. The bearing race on the steering stem may have to be removed with a hammer and chisel.

6. To install, put a thick layer of bearing grease on the top frame lug race and on the steering stem race. Embed the bearings in the grease, ensuring that the correct number of balls are fitted. Install the steering stem replacing the top race, dust cover, and adjuster nut. Tighten the nut until slight resistance is felt, then adjust it so the steering stem will fall to either side of its own weight when released from a few degrees from the centered position.

7. Reassemble the rest of the front end in the reverse of the removal procedure. Check bearing adjustment as described above.

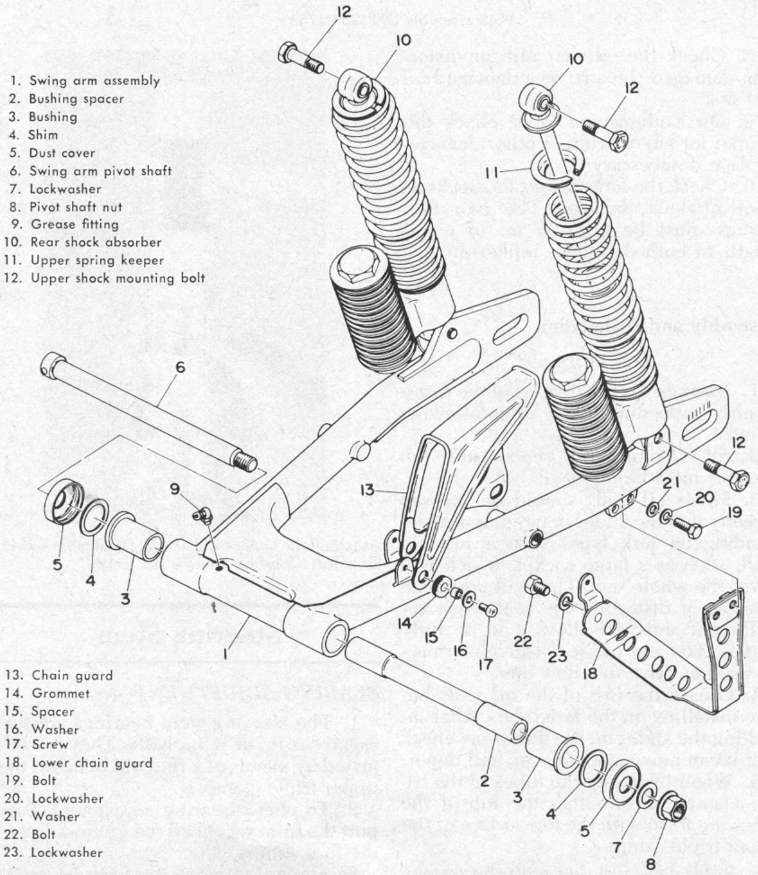
Swing Arm

The swing arm is mounted by means of bushings which tend to wear after many miles. The rate of wear will increase if the machine is used over rough terrain.

INSPECTION

1. To check the condition of the swing arm bushings, remove the rear wheel and sprocket and unbolt the lower shock absorber mounts.

2. Check for play by grasping the end of the swing arm firmly and attempting to move it from side-to-side. Play should be



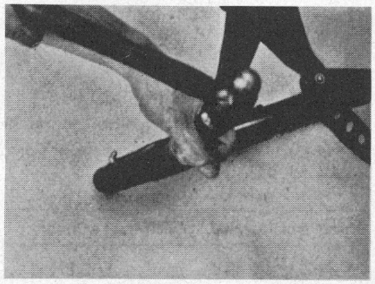
Swing arm assembly (Courtesy Yamaha Int. Corp.)

nil. If there is more than 0.3–0.4 mm (0.012–0.016 in.) measured at the end of the swing arm, the swing arm should be removed and the bushings replaced.

3. Measure the distance between the top and bottom shock absorber mounts on both sides. The two measurements must be identical, or the swing arm will have to be replaced or fixed.

4. Check that the rear wheel mounting plates are parallel.

The swing arm is most likely to be damaged if the machine is operated for any length of time with a broken or otherwise defective shock absorber.



Drifting out swing arm bushings with a punch (Courtesy Yamaha Int. Corp.)

REMOVAL AND INSTALLATION

1. Remove the rear wheel, sprocket hub, and chain guard. Unbolt the shock absorbers from the swing arm.

2. Remove the swing arm pivot shaft nut. Push or tap out the shaft; turn the swing arm sideways, and remove it from the machine.

3. Remove the dust covers from the ends of the swing arm tube if fitted. Note the location and number of any shims beneath the dust covers.

4. Drive out the long bushing spacer (if fitted); tap out the bushings with a punch and hammer. Once the bushings are removed, they should be replaced. Check the spacer for wear and replace it if there is any evident.

5. Lubricate new bushings with a good chassis grease. Drift in bushings with a block of wood and a hammer.

6. Install the swing arm on the machine. After tightening the swing arm pivot shaft nut, move the swing arm up and down to ensure that movement is smooth and effortless.

Rear Shock Absorbers

1. Shock absorbers are sealed units which cannot be disassembled. If defective, they must be replaced.

2. If a shock leaks oil from the shaft seal or is damaged in an accident (such as bent shaft, dented body, etc.), replace it.

3. To check a shock which is removed from the machine, place the bottom end on the ground and use the weight of your body to compress it as much as possible. Release the shock and note the rebound behavior. If the shock returns quickly at first, then slowly returns to the normal length, it is serviceable. If it returns to its normal length all at once, it should be replaced. Note that shock absorbers should always be replaced in pairs.

4. For "Thermal Flow" shock absorber service, refer to the "Maintenance" section.

Chassis Torque Specifications

Part	*Torque (ft lbs)*
JT, GT-Series	
Triple clamp pinch bolts	25–29
Axle nut, front	29–32
Axle nut, rear	29–35
Steering stem bolt	25–29
Countershaft sprocket nut	29–32
Rear sprocket bolts	15
90–175cc	
Front axle pinch bolt	6–8
Axle cap nuts	6–8
Axle nut, front	38–62
Axle nut, rear	48–76
Fork filler caps	11–22
Triple clamp pinch bolts	
single bolt	12–17
double bolts	10–15
Steering stem bolt	30
Steering stem bolt pinch bolt	8–13
Handlebar mounting bolts	10–16
Rear shock absorber mounts	22–35
Swing arm pivot shaft	48–76
250–400	
Axle cap nuts	15
Axle nut, front	72–86
Axle nut, rear	72–86
Countershaft sprocket nut	50–65
Rear sprocket bolts	15–19
Fork filler caps	72
Triple clamp pinch bolts	6–9
Steering stem bolt pinch bolt	12–17
Handlebar mounting bolts	8–13
Swing arm pivot shaft	72–80