

Yamaha YTM 200/225

MODEL COVERAGE

YTM 200K-N
YTM 200 EK/EL/ERN Yamahauler
YTM 225 DX K/L/N

INDEX

SERIAL NUMBER LOCATIONS	1112	ENGINE AND TRANSMISSION	1118
MAINTENANCE	1112	Engine Removal and Installation	1118
Lubrication	1112	Top End	1118
Engine Oil	1112	Cylinder Head	1119
Checking Oil Level	1112	Cylinder and Piston	1121
Changing Oil and Filter	1112	Crankcase Cover Components	1121
Filter Screen	1112	Recoil Starter	1121
Gearbox Oil	1112	Magneto	1123
Chassis Lubrication	1113	Clutch	1123
Service Checks and Adjustments	1113	Lower End and Transmission	1124
Throttle Cable	1113	Middle Case Gear	1126
Clutch	1113	Engine Specifications	1128
Brake	1113	Engine Torque Specifications	1129
Headlight Adjustment	1114	FUEL SYSTEM	1129
Fuel System	1114	Carburetor	1129
Air Filter	1114	ELECTRICAL SYSTEM	1132
Carburetor	1114	Lighting System	1133
Chassis Inspection	1114	Bulb Specifications	1132
Recommended Lubricants	1115	Electric Start System	1133
Cam Chain Adjustment	1116	Wiring Diagrams	1135-1136
Compression Test	1117	CHASSIS	1137
TUNE-UP	1116	Front Wheel	1137
Periodic Maintenance Intervals	1115	Front Wheel Bearings	1137
Maintenance Data	1116	Rear Wheels	1137
Valve Adjustment	1116	Rear Brakes	1139
Ignition Timing	1117	Front Forks	1140
Carburetor	1117	Steering Stem	1142
Float Level	1117	Chassis Torque Specifications	1144
Idle Mixture and Idle Speed	1117	General Torque Specifications	1144
Tune-Up Specifications	1117		

Yamaha YTM 200/225

SERIAL NUMBER LOCATION

In order to prevent possible confusion when purchasing parts, always refer to the engine and frame serial numbers on the machine.

The frame serial number is stamped into the right side of the steering head lug.

The engine serial number is located on the top of the crankcase at the right side rear of the engine.

MAINTENANCE

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

LUBRICATION

Motor Oil

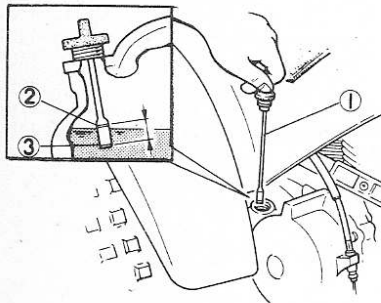
When average air temperature is above 41°F (5°C), use Yamalube 4-Cycle or SAE 20W-40, service rating "SE" or "SF."

When the air temperature is consistently below freezing, use SAE 10W-30, service rating "SE" or "SF."

All manufacturers recommend a certain grade and viscosity of motor oil for their engines, and this recommendation should be followed to ensure long engine life.

Checking Oil Level

1. A dipstick is provided to check oil level.
2. The machine should be parked on level ground.



Checking oil: dipstick (1); maximum and minimum level marks (2,3)

3. Let the engine run for a few minutes then shut it off.

4. Unscrew and remove the dipstick from the right side of the engine. Wipe it off.

5. Reinsert the dipstick, allowing the cap to rest on the threads of the hole.

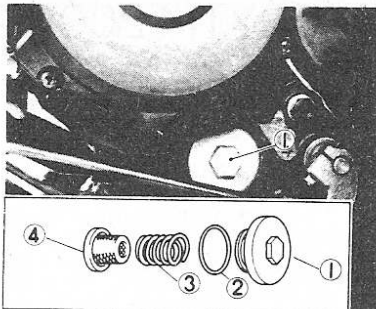
6. Pull it out. Oil level should be between the maximum and minimum marks on the dipstick. If level is too low, add enough of the recommended oil to bring it up to the specified level. Do not overfill.

7. When level is correct, screw the dipstick in and tighten it securely.

Changing Oil

1. The recommended change interval is every 6 mos. after initial break-in is over.

2. Oil should be changed when the engine is warm. This ensures more complete drain-



Draining oil: drain plug (1); O-ring (2); spring (3); strainer (4)

ing and makes it more likely that the oil will carry off any particulates with it.

3. Place a suitably-sized container (over 2 qts. capacity) beneath the drain plug on the left side of the engine.

4. Remove the dipstick.

5. Remove the drain plug. When it is removed, the O-ring, compression spring and strainer will come out as well. Take care that they are not misplaced.

6. On the right side of the engine, remove the oil filter cover drain bolt which is the lowest of the three bolts on the cover.

7. If the filter is to be cleaned, see "Oil Filter/Oil strainer," below.

8. When the oil has drained completely, install the filter cover drain bolt. Install the oil strainer, compression spring, and drain plug with O-ring.

9. Tighten the filter cover drain bolt to about 7 ft. lbs. Tighten the drain plug to 31 ft. lbs.

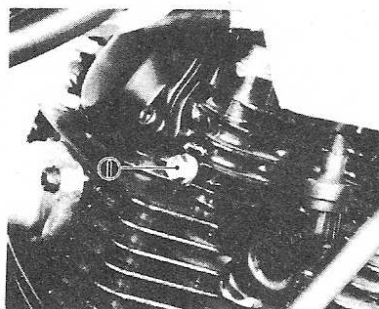
10. Add about 1.6 qts. of the recommended oil to the crankcase. Check level with the dipstick. When level seems correct, start the engine and let it run for a few minutes, then shut it off and check again after it has been sitting for a short period. Top up if necessary.

Check Oil Flow

CAUTION: This procedure should be done after every oil change.

1. Change the oil and check for proper level of refill as outlined above.

2. Loosen the oil passage bolt at the top of the cylinder head on the right side of the engine. A slight loosening is all that is required.



Oil passage bolt (1)

3. Start the engine.

4. After about a minute, oil seepage at the bolt should be noted, showing that the head is getting lubricant.

5. If no oil appears, shut the engine off immediately and determine the cause.

6. Tighten the oil passage bolt to 5 ft. lbs.

Oil Filter/Oil Strainer

1. These components should be serviced at every other oil change or once a year.

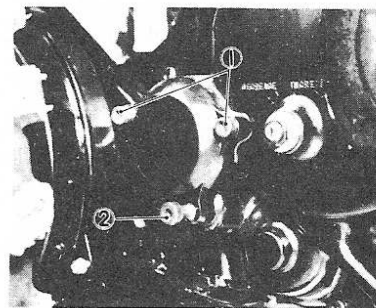
2. Drain the oil as outlined in the "Changing Oil" procedure.

3. Remove the oil filter cover drain bolt and the two remaining filter cover bolts. Remove the cover and take out the filter element.

4. Clean both the filter element and the strainer screen in clean solvent and dry.

5. Check for damage such as punctures or excessively clogged pores. Replace the element or strainer if any defect is apparent.

6. Check condition of the O-rings and replace them if chipped, deformed or otherwise damaged.



Filter cover bolts (1); filter cover drain bolt (2)

7. Carefully refit the strainer, compression spring and drain plug with O-ring.

8. Install the filter element, cover and bolts.

9. Tighten the drain bolt on the cover and the cover bolts to 7 ft. lbs.

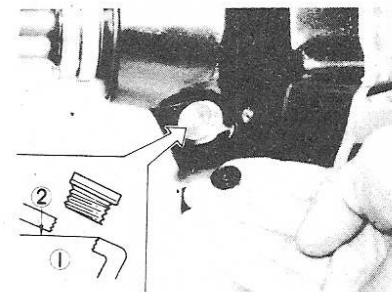
10. Tighten the drain plug to 31 ft. lbs.

11. Add oil. It may be necessary to add a bit more than the 1.6 qts. called for in the oil change procedure, above.

12. Check level and oil flow as outlined in the prior procedures.

Final Gearbox

1. Oil level should be checked periodically and changed once a year.



Final gearbox level plug: oil (1); level (2)

2. The gearbox uses SAE 80 API "GL-4" hypoid gear oil or SAE 80W90 hypoid gear oil.

CHECKING GEARBOX OIL

1. The machine should be parked on a level surface. The engine should be cold.

2. Remove the level plug on the left side of the gearbox.

3. Oil level should be the top of the threads at the lower part of the plug hole. In other words, it should just be about to seep out.

4. If level is too low, top up with the recommended oil.

5. Check gasket condition before fitting level plug.

CHANGING GEARBOX OIL

1. The machine should be parked on a level surface.

2. Place a drain pan beneath the gearbox.

3. Remove the level plug.

4. Remove the drain plug.

5. Check drain plug gasket condition.

6. After the oil has had several minutes to drain, install the drain plug and tighten it to 17 ft. lbs.

7. Add the recommended oil to the gearbox. Capacity is about 0.14 qts. Wait of few minutes after adding to give the thick oil a change to find its level. The oil should cover the threads at the lower part of the level plug hole.

8. When level is correct, fit the level plug and tighten it securely.

Front Forks

Fork oil should be changed every year after the initial break-in period. Removal of the forks is required. Refer to the "Chassis" section.

Chassis Lubrication

1. Wheel and steering head bearings should be lubricated with medium weight wheel bearing grease. The service interval is one year for the wheels and two years for the steering head. See "Chassis" for procedures.

2. The brake lever and brake cams should be lubricated with lithium-based grease. The service interval is 6 months. Refer to "Chassis" for brake service procedures.

Drive Chain

1. Drive chains require lubrication at 1 month intervals.

2. The chain can be cleaned at lubricated through the inspection hole on the chain case.

3. The chain uses O-ring seals between the plates. Commercial chain lubes should never be used as they may cause damage. Use only motor oil, such as SAE 20-50 or similar grades, to lubricate the chain.

4. Before lubricating the chain, wipe it off with kerosene if it appears dirty. Never use gasoline or other solvents.

5. Keep steam cleaning and spray car wash wands away from the chain.

SERVICE CHECKS AND ADJUSTMENTS

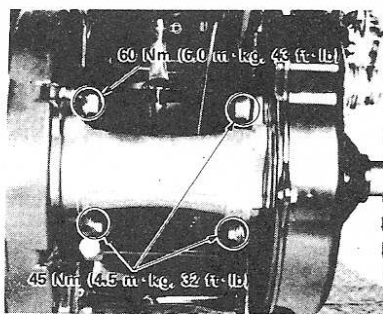
Drive Chain

On models with chain drive, adjust as follows:

1. The chain should have about 10-15mm (0.4-0.6 in.) of free-play when checked at the inspection hole.

2. When checking, the rear wheels must be on the ground.

3. The chain should be cleaned and lu-



Wheel hub bolts and tightening torques

bricated before checking free-play. Dirty chain tend to get tight.

4. If a way can be found to safely support the wheels off the ground, rotate them and check the chain at several places for tight spots. If a tight spot exists, chain tension should be adjusted to the proper value at that point. Note, however, that such a condition is indicative of a worn chain and/or worn sprockets and replacement will probably be required in the near future.

5. If the chain needs adjustment, loosen the four rear wheel hub bolts.

6. Turn the chain adjuster puller in or out until tension is correct.

7. Tighten the rear wheel hub bolts. Re-check tension.

8. The upper left hand hub bolt should be tightened to 43 ft. lbs. The other three should be tightened to 32 ft. lbs.

NOTE: "Left" and "right" are referenced from the rear of the machine.

Clutch

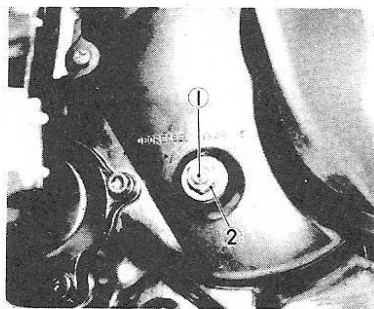
1. Locate the clutch adjuster on the right side of the engine near the oil filter cover.

2. Loosen the locknut slightly.

3. Carefully turn the adjuster screw counterclockwise until resistance is felt; then turn it 1/8 turn clockwise.

4. As marked on the crankcase cover, turning the adjuster screw CCW will decrease lever play and vice-versa.

5. Tighten the locknut to 11 ft. lbs.



Clutch adjuster (1); locknut (2)

Throttle Cable

1. The throttle lever should have 3-5mm (0.12-0.20 in.) of free movement before the throttle slide begins to open.

2. Make this adjustment with the adjuster near the top of the throttle cable. Loosening the adjuster locknut and turning it in or out will affect lever free-lay.

3. Start the engine and turn the forks slowly from lock-to-lock. Idle speed must not

increase. If it does, the throttle cable has insufficient free-play, is incorrectly routed, or is binding at some point. Find the trouble before riding.

Starter Lever

On models equipped with a starter lever, adjust as follows:

1. Pull the starter lever up by hand until resistance is felt and check the gap between the bottom of the lever and the lever holder.

2. It should be 1-2mm (0.04-0.08 in.).

3. Adjust, if required, with the cable adjuster.

Brakes

FRONT

1. The brakes should be adjusted so that the lever has 5-8mm of free movement measured between the lever and the lever holder before the linings contact the drum.

2. The brake can be adjusted with either the cable adjuster at the brake plate or with the adjuster on the handle bar. Loosen the locknut and turn the hand lever adjuster out to decrease lever free-play. At the brake plate, turning the wing nut in will accomplish the same thing.

3. It is recommended that major adjustments be made at the brake plate and finer adjustments with the handle bar adjuster.

4. After adjustment, lift the front wheel slightly and check that it can spin freely.

5. Apply the brake and check that the wear indicator on the brake plate is in the safe zone.

REAR

1. Pump the brake pedal and hand lever several times before adjustment.

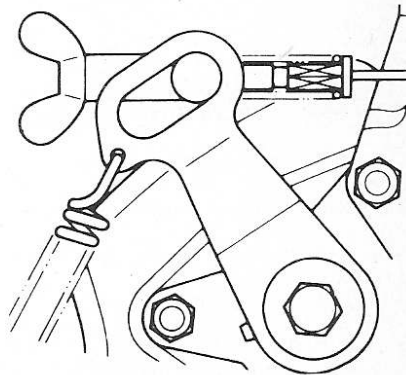
2. At the hand lever, loosen the adjuster locknut and screw in the adjuster to give maximum cable freeplay.

3. Loosen the brake pedal wing nut and the brake hand lever wing nut at the caliper.

4. Loosen the locknut and adjusting bolt.

5. Screw in the brake hand lever wing nut so that the caliper lever can be positioned as shown in the illustration.

6. Slowly screw the adjusting bolt in by hand until resistance is felt, then back it off 1/4 turn.



Rear brake preliminary position

7. Hold the adjusting bolt with a wrench so that it doesn't move. Tighten the locknut.

8. Screw in the brake pedal cable adjuster until the pin just touches the upper end of the lever slot. Clearance between the pin and the brake lever should be 0-1mm (0-0.04 in.).

Yamaha YTM 200/225

9. Support the rear wheels off the ground and check that they spin freely. If they are tight, or if noise is heard, repeat the adjustment procedure.

10. Check free-play at the brake pedal. It should be less than 50mm (2.0 in.) Use the adjuster at the pedal to make this adjustment. On average, freeplay should be about 25mm (1.0 in.)

11. Check free-play at the rear brake hand lever. It should be about 5mm (0.2 in.). Use the cable adjuster at the hand lever to make this adjustment.

CAUTION: Both pedal and lever should be adjusted when performing rear brake adjustments. Do not adjust one without checking the other.

REAR PAD WEAR

When the head of the adjusting bolt comes close to touching its locknut, replace the brake pads.

Headlight Adjustment

Vertical adjustment of the headlight can be made by turning the screw below the lamp.

Turning the screw clockwise will move the beam higher.

Turning the screw counterclockwise will lower the beam.

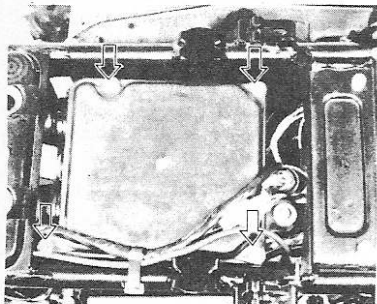
FUEL SYSTEM

The fuel system consists of the carburetor, fuel petcock and air cleaner.

These items should be serviced about every six months under normal operating conditions.

Air Cleaner

1. A wet-foam air filter element is used.
2. Loosen the rear carrier knob, if fitted, and pull the carrier back.



Air cleaner case cover bolts (arrows)

3. Remove the seat/rear cowling assembly.
4. Remove the air cleaner case cover (four bolts).
5. Pull out the air filter element.
6. Remove the wing bolt and plate and separate the elements from the frame.
7. Clean the elements thoroughly in a safe solvent.
8. Dry the elements after cleaning by squeezing. Do not wring them out as the pores may be damaged.
9. Soak the elements in SAE 10W30 motor oil.
10. Squeeze off the excess oil. Elements should be wet, but not dripping with oil.

11. Assemble the filter elements on the frame and install the plate and wing bolt.

12. Clean the inside of the air cleaner case if it is wet or dirty.

13. Fit the air cleaner to the case. Be sure that the carburetor side of the air cleaner mates perfectly with the case surface to prevent unfiltered air from entering the engine.

14. Check air passages in the intake system for condition. The inlet to the case must be free of obstructions. The hose running to the carburetor from the case must have a tight seal at both the case and the carb.

15. Inspect the hose at the bottom of the air cleaner case. Remove the hose cap and drain off any water which may have collected.

Petcock

1. The petcock has filter screens inside the tank which should be cleaned periodically- about every 6 mos. under normal conditions.

2. Remove the gas tank.

3. Drain the gas.

4. Remove the lines from the petcock.

5. Remove the petcock securing screws and pull the assembly out of the tank.

6. Check gasket condition. Replace it if it appears damaged leaking prior to removal.

7. Remove the filter screens and clean them in a safe solvent.

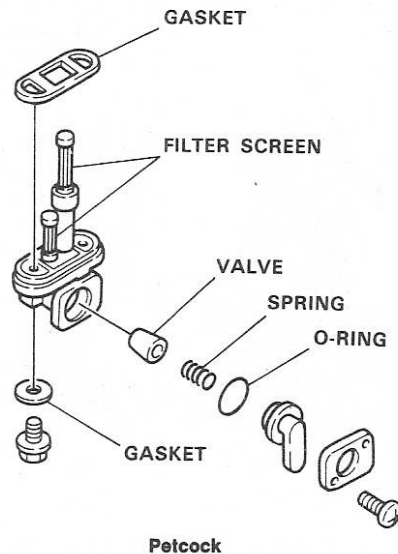
8. If foreign matter cannot be removed, or if the screens are punctured, crushed, otherwise damaged, replace them.

9. Check the petcock mating surface. Replace the unit if any is noted.

10. Flush out the gas tank before installing the petcock to get rid of any residual dirt.

11. When fitting the petcock to the tank, be sure the gasket is in place.

12. After gas is added, check for leaks before operation. Be sure that all lines are tightly connected.



Carburetor

1. Carburetor service procedure are detailed in the "Fuel System" section.

2. Carburetor float bowls are fitted with a drain screw which can be used periodically to remove water or any other foreign matter

which may have passed through the system. Before draining float bowls, be sure that the petcock is "off," and that the fuel will be collected in a suitable container.

CHASSIS INSPECTIONS

Steering Head Bearings

1. Support the front wheel off the ground.

2. Grasp the lower end of the forks and try to move them back and forth in line with the machine.

3. If any looseness is felt, adjust the steering head bearings.

4. Turn the forks slowly from lock-to-lock. Movement should be smooth. If rough or binding, adjust the bearings.

5. Loosen the upper and lower triple clamp pinch bolts. Loosen the carrier bolts, if one is fitted.

6. Loosen the steering stem bolt on the upper triple clamp.

7. Use a pin wrench on the bearing adjuster nut beneath the upper triple clamp and turn the nut to remove any looseness from the bearings.

8. Tighten the lower triple clamp pinch bolts to 22 ft. lbs.

9. Tighten the upper triple clamp pinch bolts to 14 ft. lbs. Tighten carrier bolts to 11 ft. lbs.

10. Tighten the steering stem bolt on the upper triple clamp to 61 ft. lbs.

Wheel Bearings

1. Wheel bearing problems may make themselves known by a rumbling sound which increases with speed.

2. Support the wheel you are checking off the ground.

3. Spin the wheel and listen for any unusual noise. Place your hand on the front forks or the rear hub while the wheel is turning.

4. If you feel any vibration, suspect wheel bearing damage.

5. Refer to "Chassis" for disassemble procedures.

Tires

1. Special low pressure tires require special consideration.

2. Tire pressures are critical. The pressure must be maintained at the recommended pressure as shown on the stickers on the machine.

3. Pressure should be checked with a suitable low-pressure tire gauge.

4. Never allow pressure to fall below 2 psi. The tire can separate from the rim if pressure is too low.

5. Maximum allowable pressure is 10 psi. Overinflation is dangerous.

6. When adding air to tires, do so very slowly and carefully. Unregulated service station air lines should not be used. Rapid inflation can cause the tire to burst.

7. Be sure that pressure at all three tires is equal.

8. Check pressures when tires are cold.

9. Tires should be replaced when the tread depth at any point falls below 3mm (0.12 in.).

10. Rear tires should be replaced in pairs. **CAUTION:** Replacement tires must always meet manufacturer's size and performance specifications.

PERIODIC MAINTENANCE INTERVALS^①

Before each ride
Safety items
Lights
Chain adjustment (if equipped)
Control cable adjustment
Tightness of critical fasteners

Monthly
Clean and lubricate drive chain (if equipped)
Check chain tension (if equipped)

Every 3 Months
Check brake system

Every 6 Months
Tune-up engine
Service fuel system
Check battery level
Check tire pressure
Check wheel bearings
Check steering head bearings
Change engine oil
General chassis lubrication

Annually
Clean oil filter and strainer
Change fork oil
Repack wheel bearings
Change gearbox oil (if equipped)

Every 2 Years
Check/repack steering head bearings

① Based on normal usage after initial service and break-in are completed.

RECOMMENDED LUBRICANTS

Engine

Above 41°F (5°C): Yamalube 4-Cycle
or SAE 20W-40, service rating "SE"
of "SF"

Below freezing: SAE 10W-30, service
rating "SE" or "SF"

Final Gearbox

SAE 80 API "GL-4" hypoid gear oil
SAE 80W90 hypoid gear oil

Wheel/Steering Head Bearings

Medium weight wheel bearing grease

Brake Components/Throttle Twist grip

Lithium-based grease

Front Forks

Yamaha Fork Oil
SAE 10W motor oil

Drive Chain

Medium weight motor oil

Yamaha YTM 200/225

RECOMMENDED LUBRICANTS

Control cables
Light motor oil
Graphite-based lubricants
Commercial cable lubes

Air Clean Elements
SAE 10W30 motor oil

MAINTENANCE DATA

Fuel Capacity	2.4 gal./9 L
Engine Oil	
When changing	1.6 qts./1.5 L
After rebuilding	1.9 qts./1.8 L
Final Gearbox Oil	
Level	Check by level plug
Capacity	0.14 qt./0.13 L
Front Fork Capacity (each leg)	
DX	4.0 oz./117 cc
Other models	6.5 oz./193 cc
Tire pressure (f/r)	2.2 psi
Battery (if used)	12 v/14 ah

TUNE-UP

NOTE: Common tune-up procedures are explained in detail in the "General Information" section. This includes a full description of spark plug service and analysis.

REQUIRED MATERIALS

In addition to common hand tools, the procedures detailed in this section require:

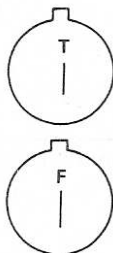
- A set of feeler gauges for valve adjustment;
- A compression gauge for the compression test;
- A tachometer for idle speed adjustments 2nd ignition timing check;
- A stroboscopic timing light for ignition timing.

Connection of the tachometer and timing light will depend on make and/or model.

VALVE ADJUSTMENT

NOTE: Valves must be adjusted when the engine is cold.

- If a carrier is fitted, loosen the knob and pull it backward.
- Remove the seat/rear cowling assembly.
- Remove the intake and exhaust valve covers.
- Remove the timing window plug from the left crankcase cover.
- Slowly pull the recoil starter knob until the "T" mark on the flywheel aligns with the stationary timing mark.
- Check for clearance at both valves. If both are not free, rotate the engine 360° until the "T" mark appears again and check for



TOP DEAD CENTER

IGNITION TIMING MARK

Flywheel timing marks

clearance. Valves are adjusted when the engine is at Top Dead Center on the compression stroke.

7. With the proper thickness feeler gauge, check clearance. Clearances are:

Intake: 0.05-0.09mm/0.002-0.004 in.

Exhaust: 0.11-0.15mm/0.004-0.006 in.

8. If the valve is correctly adjusted, the gauge blade will be a light slip fit. If fit is too tight or loose, adjust the valve(s).

9. Loosen the valve adjuster locknut.

10. With the feeler gauge blade between the valve adjuster and the valve, turn the adjuster and the valve, turn the adjuster in or out until the blade is a light slip fit.

11. Hold the adjuster in place and tighten the locknut.

Torque: 10 ft. lbs.

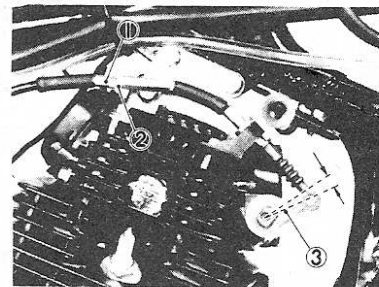
12. Install the valve covers. Fit the covers so that the ribs on the inside are at the top.

13. On models with a compression release, adjust the cable (see below).

14. Install timing window plug, and seat/rear cowling assembly.

COMPRESSION RELEASE

NOTE: This adjustment must be made any time the valves are adjusted.



Compression release lever (3); adjuster and locknut (1,2)

1. With the seat/rear cowling assembly and the timing window plug removed, check that the piston is at TDC on the compression stroke: the "T" flywheel mark must be aligned with the stationary timing mark with clearance at both valves.

2. Pull the recoil starter knob, if necessary, to achieve alignment.

3. Check for free-play at the compression release lever on the engine. It should move 2-3mm (0.08-0.12 in.) before contacting the rocker arm.

4. Use the cable adjuster at the engine to effect this adjustment.

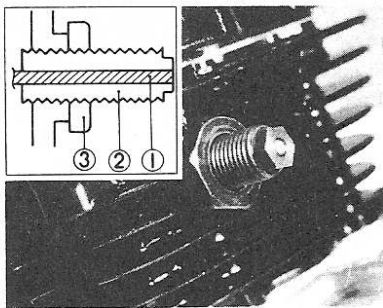
5. When free-play is correct, tighten the adjuster locknut.

6. Fit the timing window plug, seat/rear cowling assembly, etc.

CAM CHAIN ADJUSTMENT

1. Remove the timing window plug from the left crankcase cover.

2. Pull the recoil starter knob to align the "T" mark on the flywheel with the stationary timing mark on the crankcase.



Cam chain adjuster: pushrod (1); adjuster (2); locknut (3)

3. Locate the cam chain adjuster behind the cylinder. Remove the adjuster cap.
4. Loosen the adjuster locknut a few turns.
5. Turn the adjuster in until the pushrod inside is flush with the adjuster end.
6. Start the engine.
7. Observe pushrod movement. The rod should move slightly when the engine is idling. If it does not, loosen the adjuster slightly until movement is noted.
8. Stop at this point and tighten the locknut (torque: 22 ft. lbs.).
9. Install the adjuster cap. Install timing window plug.

COMPRESSION TEST

Refer to the "General Information" section under "Tune-Up" for compression test procedures.

1. The compression test should be made after valves and compression release (if fitted) are adjusted.
2. Engine should be run for several minutes before the test.
3. Remove the spark plug. Connect the plug to its cap and ground it against the engine case to prevent sparking during the test.
CAUTION: Be sure the plug is properly grounded when cranking the engine.
4. Screw-in type compression gauges need a 12mm thread for these machines.
5. Hold the throttle open while cranking the engine.
6. Compression should be about 128 psi. This is the standard value. The upper and lower limits are 142 psi and 114 psi.
7. If compression is too low, check that the valves are properly adjusted and that the compression release is not holding the exhaust valve open.

IGNITION TIMING

Ignition timing is not adjustable. A strobe timing light and a tachometer are needed to make this check.

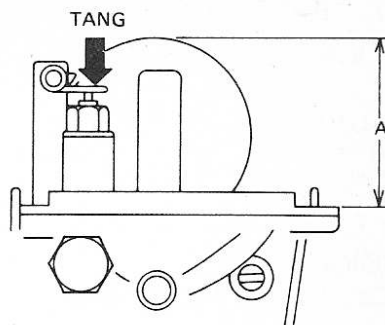
1. Remove the timing window plug from the left crankcase cover.
2. Connect the tach and timing light according to the manufacturer's instructions.
3. Start the engine and let it run at the specified idle speed (1,400 ± 50 rpm).
4. Aim the light through the timing window. At idle, the "F" mark on the flywheel should appear to be aligned with the stationary timing mark on the crankcase cover.
5. If alignment is not correct, check the pickup coil for looseness on its mount.

CARBURETORS

Carburetor adjustments to be made during a tune-up include float height, idle speed and mixture.

Float Height

1. Float height determines the level of gasoline in the float bowl during operation. While it is a critical setting, it will not normally need frequent attention once it is properly set. Although it need not be done at every tune-up, it should be checked from time to time.
2. The machine must be parked on a level surface.
3. Place a stand or jack under the engine and raise it until the carburetor is positioned vertically.
4. Disconnect the drain line from the bottom of the float bowl and connect a transparent vinyl tube (6mm/0.24 in. inside diameter) to the bowl fitting.
5. Set the petcock "ON" and start the engine, letting it run for a few minutes.
6. Hold the vinyl tube alongside the carburetor body. Open the drain screw. Gasoline will flow into the tube.
7. Shut the engine off.
8. Note the level of the gasoline in the tube relative to the carburetor body. The gas should be 3.0mm/0.12 in. below the edge of the carb body. The tolerance is ±0.1mm/0.04 in.
9. If correct, close the drain screw and disconnect the tube. Reconnect the drain line.
10. If not correct, disassemble and check float height as follows:
 - a. Remove the carburetor from the engine. Refer to "Fuel System" for procedures.
 - b. Remove the float bowl. Remove the float bowl gasket.
 - c. With the carburetor positioned vertically, lower the float until the float arm tang just touches, but does not depress the float needle tip.
 - d. Float height is the distance from the top of the float to the float bowl mating surface ("A" in the illustration).
 - e. The specification is 21.5mm/0.85 in. for all models.



Carburetor float level (A)

- f. The tolerance is ±0.5mm/0.02 in. If adjustment is necessary, push out the float pivot pin and remove the float assembly.
- g. Carefully bend the tang on the float arm to adjust height. Bending the tang away from the carb body will decrease float height, and vice-versa.
18. After adjustment, recheck fuel level as outlined in the beginning of this procedure.
19. After adjustment, check for leaks and proper operation of the machine before riding.

Idle Speed and Mixture

NOTE: These adjustments must be made when the engine is at operating temperature. They should also be made after all other tune-up procedures have been carried out, if a full tune-up is intended.

1. Turn the pilot screw in carefully until it is lightly seated. Back it out the number of turns shown in the "Tune-Up Specifications" chart for your machine.
2. Fit a tachometer. Use the idle adjustment screw on the carburetor until engine speed is 1,400 rpm.
3. Smooth out idle, if necessary, by fine adjustments to the pilot air screw. About 1/2 turn in either direction from the specification should produce a good, smooth idle. If it doesn't, there may be a carburetor or engine fault.
4. Check the throttle cable adjustment. Turn the handle bars from side to side. If idle speed changes when this is done, the cable is too tight.

TUNE-UP SPECIFICATIONS

COMPRESSION	
Standard (psi)	128
Allowable range (psi)	114-142
VALVE CLEARANCE	
Intake (mm/in.)	0.05-0.09/0.002-0.004
SPARK PLUGS	
OEM (standard)	NGK/ND
Type (NGK/ND)	D-7EA/X22ES-U
Gap (mm/in.)	0.6-0.7/0.0240.028
Torque (ft. lbs.)	14
CARBURETOR	
Fuel level (mm/in.)	3.0/0.12
Float height (mm/in.)	21.5/0.85
Pilot screw setting (turns out)	①
Idle speed (rpm)	1,400

① Tri-Moto 200: 2 1/4 ± 1/2; Yamahauler: 2 ± 1/2; 225 DX: 1 1/2 ± 1/2.

Yamaha YTM 200/225

ENGINE AND TRANSMISSION

NOTE: Common engine rebuilding techniques and inspection procedures are outlined in detail in the "General Information" section.

Engine

REMOVAL AND INSTALLATION

YTM 200K-N

NOTE: Top end components can be removed with the engine still in the frame.

1. Clean the machine thoroughly before engine removal.
2. Remove the rear seat/cowling assembly.
3. Remove the gas cap and fuel tank cover bracket bolts. Remove the cover.
4. Remove the gas tank bolt at the front of the tank.
5. Shut the petcock off and disconnect the lines.
6. Disengage the rubber band at the rear of the tank and remove the gas tank.
7. Remove the exhaust pipe flange bolts at the engine.
8. Remove the muffler bolts on the frame.
9. Remove the exhaust system.
10. Loosen the shift linkage pinch bolt and pull the lever off the splined shaft on the engine.
11. Loosen the drive chain tensioner to give as much chain free-play as possible.
12. Remove the engine sprocket cover.
13. Remove the engine sprocket bolts (3); remove the lock plate. Remove the sprocket.
14. Disconnect the carburetor lines.
15. Remove the carburetor from the engine.
16. Disconnect the spark plug cable from the plug.
17. Disconnect the CDE leads at the connector near the ignition coil. Disengage them from the strain reliefs and arrange the wiring so that it will be out of the way when the engine is removed.
18. Disconnect the foot brake cable at the pedal.
19. Remove the bolt which secures the rear brake cable holder on the clutch cover.
20. Disconnect the compression release cable at the cylinder head.
21. Disconnect the vent pipe from the crankcase.
22. Remove the rear engine mounting bolts (upper and lower).
23. Remove the mounting brackets at the front of the engine.
24. Remove the cylinder head bracket.
25. Remove the engine from the right side of the frame.
26. Installation is basically the reverse of the removal procedure. Note the following points.
27. Place the engine on a suitable stand and lower the frame over it.
28. Install the rear upper and lower engine mounting bolts. Do not tighten them fully just yet. Bolts should be inserted from the right side of the machine.
29. Locate the front engine mounting

brackets. Note that they differ (the left side bracket is flat). Fit the brackets on the proper side. Install the bolts and keep nuts only finger tight at this point.

30. Install the cylinder head bracket.
31. Tighten all engine mounting bolts now:
 - Cylinder head bracket: 24 ft. lbs.
 - Front brackets: 24 ft. lbs.
 - Rear mounting bolts: 32 ft. lbs.
32. Remaining torques which should be noted are:
 - Exhaust pipe at engine: 7 ft. lbs.
 - Muffler at frame: 19 ft. lbs.
 - Engine sprocket: 7 ft. lbs.

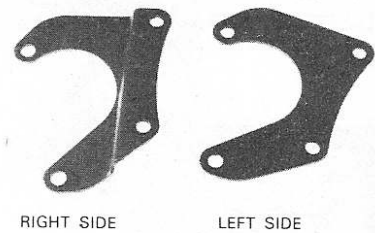
33. Be sure that all cables are properly adjusted, all fasteners correctly tightened and all connections tight before attempting operation.

CAUTION: Do not forget to add engine oil.

Other Models

NOTE: Top end components can be removed with the engine still in the frame.

1. Clean the machine thoroughly before engine removal.
2. Loosen the rear brake cable adjusters at the caliper lever.
3. Disconnect the cables from the lever, brake pedal, holder and guides.
4. Jack the rear end of the machine off the ground using standard safety precautions and remove the rear wheels.
5. Remove the trailer hitch bracket, if fitted.
6. Disconnect the final gear breather pipe from the housing.
7. Remove the four nuts and two bolts which secure the housing.
8. Remove the wheel housing bolts.
9. Remove the rear wheel assembly.
10. Disconnect the negative lead from the battery; then disconnect the positive lead.
11. Loosen the rear carrier knob and pull the carrier back.
12. Remove the rear seat/cowling assembly.
13. Remove the gas cap. Remove the gas tank cover bracket bolts. Remove the cover.
14. Remove the tank bolt at the front of the tank.
15. Shut off the petcock. Disconnect the lines at the tank.
16. Remove the gas tank after disengaging the rubber band at the rear.
17. Remove the muffler bolts at the cylinder head. Remove the bolts on the frame. Remove the exhaust system.
18. Disconnect the fuel line from the cylinder head clamp.
19. Remove the carburetor and manifold.
20. Disconnect the spark plug lead from the plug.
21. Disconnect the CDI leads at the connector near the ignition coil. Disengage the wiring from the strain reliefs and arrange wiring so that it will not be damaged when the engine is removed.
22. Disconnect the compression release at the cylinder head, if fitted.
23. Disconnect the vent pipe from the top of the crankcase.
24. Loosen the shift linkage pinch bolt and pull the lever off the splined engine shaft.
25. Disconnect the foot brake pedal return spring.



Front engine mounting brackets

26. Remove the four starter motor/bracket screws. Remove the bracket.
 27. Disconnect the starter motor high tension cable from the motor. Remove the starter motor.
 28. Remove the rear engine mounting bolts, upper and lower.
 29. Remove the front engine mounting brackets.
 30. Remove the cylinder head bracket.
 31. Remove the engine from the right side of the frame.
 32. Installation is basically the reverse of the removal procedure. Note the following points.
 33. Place the engine on a suitable stand and lower the frame over it.
 34. Install the upper and lower rear mounting bolts. Do not tighten the bolts yet.
 - NOTE: All engine mounting bolts should be inserted from the right side of the frame.
 35. Note that the two front mounting brackets are different. They must be installed on the correct sides. Refer to the illustration to identify them. Install the brackets and nuts and bolts. Do not tighten the fasteners yet.
 36. Install the cylinder head brackets.
 37. Install the coupling gear joint into the bearing housing. Engage it with the coupling gear.
 38. Install the rear wheel assembly.
 39. Install the final gear housing. Tighten the nuts to 17 ft. lbs. and the bolts to 32 ft. lbs.
 40. Tighten the engine mounting nuts and bolts as follows:
 - Cylinder head bracket: 24 ft. lbs.
 - Front brackets: 24 ft. lbs.
 - Rear mounting bolts: 32 ft. lbs.
 41. Tighten the wheel hub bolts evenly and torque to 36 ft. lbs.
 42. The remainder of the procedure is the reverse of removal. Important torque settings are:
 - Upper tow hitch: 11 ft. lbs.
 - Lower tow hitch: 22 ft. lbs.
 - Manifold-to-engine: 8.7 ft. lbs.
 - Carburetor-to-manifold: 5.8 ft. lbs.
 - Exhaust pipe at engine: 7.2 ft. lbs.
 - Muffler at frame: 19 ft. lbs.
 43. When fitting the gear shift linkage, align the punch mark on the shaft with the slot on the lever.
 44. Be sure that all cables are correctly routed and properly connected. Be sure that all fasteners are tight. Check all electrical wiring connections. Check that fuel system lines are tight.
- CAUTION: Be sure to add engine oil.

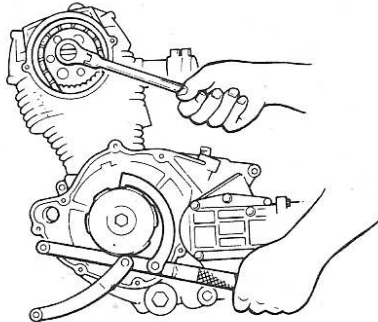
TOP END

Cylinder head, cylinder and piston can be removed with the engine in the frame.

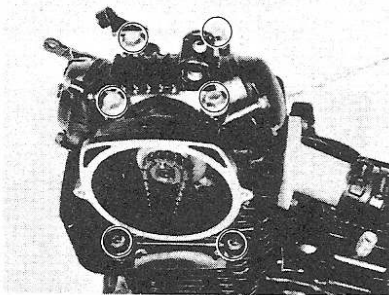
Cylinder Head

REMOVAL

1. Disconnect the spark plug lead and remove the plug.
2. Remove the seat/rear cowling.
3. Remove the tank cover.
4. Remove the gas tank.
5. Disconnect and remove the ignition coil on the frame.
6. Disconnect the compression release at the cylinder head, if fitted.
7. Remove the carburetor.
8. Remove the cam chain tensioner cap.
9. Loosen the tensioner locknut.
10. Unscrew and remove the tensioner assembly. Note the locations of all parts.
11. Remove the cam sprocket cover screws.
12. Remove the cam sprocket cover.
13. Remove the neutral switch lead (if fitted) and the recoil starter assembly.
14. Remove the cam sprocket bolt. The crankshaft will have to be held with a special tool to do this in most cases. Secure the crank with a holder on the rotor.
15. Disengage the cam sprocket from the cam chain and remove it. Secure the chain so that it does not fall into the crankcase.
16. Take the pin out of the camshaft.
17. Gradually loosen the cylinder head bolts. When they are all loose, remove them.
18. Remove the cylinder head.



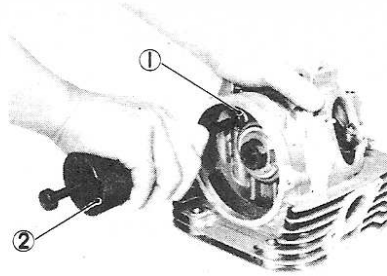
Removing the cam sprocket bolt



Cylinder head bolts

DISASSEMBLY

1. Remove the valve covers.
2. Bend down the lock tabs on the cam bearing retainer. Remove the bolts. Remove the retainer.
3. Thread a suitably sized bolt into the rocker arm shafts and pull the shafts out of the head. Mark the rocker arms for position. Do not mix shafts and rocker arms.



Removing the rocker arm shafts (1) with a slide hammer (2)

4. Thread a 10mm bolt into the camshaft and pull it out.
5. Remove the valve assemblies with a spring compressor.

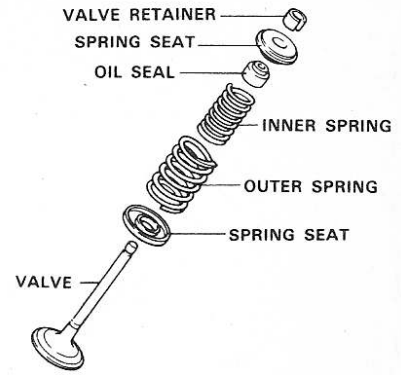
INSPECTION

NOTE: Refer to "General Information" for a guide to engine component inspection procedures. Engine specifications for these machines are summarized in a chart at the end of this section.

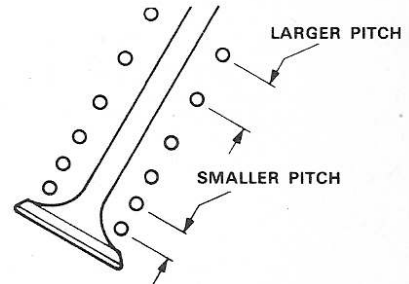
1. Check valve condition.
2. Measure valve stem diameter and valve guide inside diameter. Subtract the readings for valve-to-guide clearance.
3. Check valve run-out.
4. Check valve seat width in the head.
5. Use a machinist's dye to check the width and position of the valve seat. Apply the dye to the valve's beveled seating area and a very small amount of grinding compound to the valve seat in the head. Spin the valve back and forth against the seat for several seconds, then remove the grinding compound and inspect the pattern of the seat, from which the dye will have been removed.
6. The valve seat should be about 1.0mm (0.04 in.) wide and even in width all around the valve. The maximum acceptable seat width is 1.5mm (0.06 in.).
7. If the seat is uniform in width but is too wide (A), use a flat cutter, the a 30° cutter to reduce the seat width to within specification.
8. If the seat is centered on the valve face, but is too narrow (B), use a 45° cutter to increase the width to the proper specification.
9. If the seat is too narrow, and is towards the top edge of the face (C), first use a flat cutter, and then the 45° cutter.
10. If the seat is too narrow and positioned towards the bottom edge of the face (D), use a 30° cutter first, then a 45° cutter.
11. Check valve spring condition and free length.
12. Measure rocker arm shaft diameters and the inside diameters of the rocker arm bores.
13. Visually inspect the camshaft and replace it if damage is noted. Measure the cam lobe height.
14. Check the camshaft bushing for wear.
15. Check cam sprocket condition.

ASSEMBLY

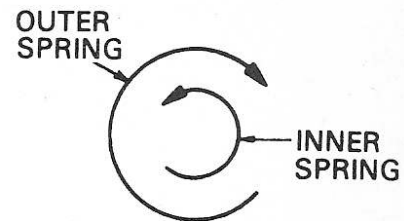
1. Be certain that all parts are reinstalled in their original locations.
2. Valve springs are progressively wound. Install the close coils against the cylinder head. Note direction of winding.
3. Oil valves before installation. Use new valve seals.



Valve spring assembly



Install springs with close coils against the head



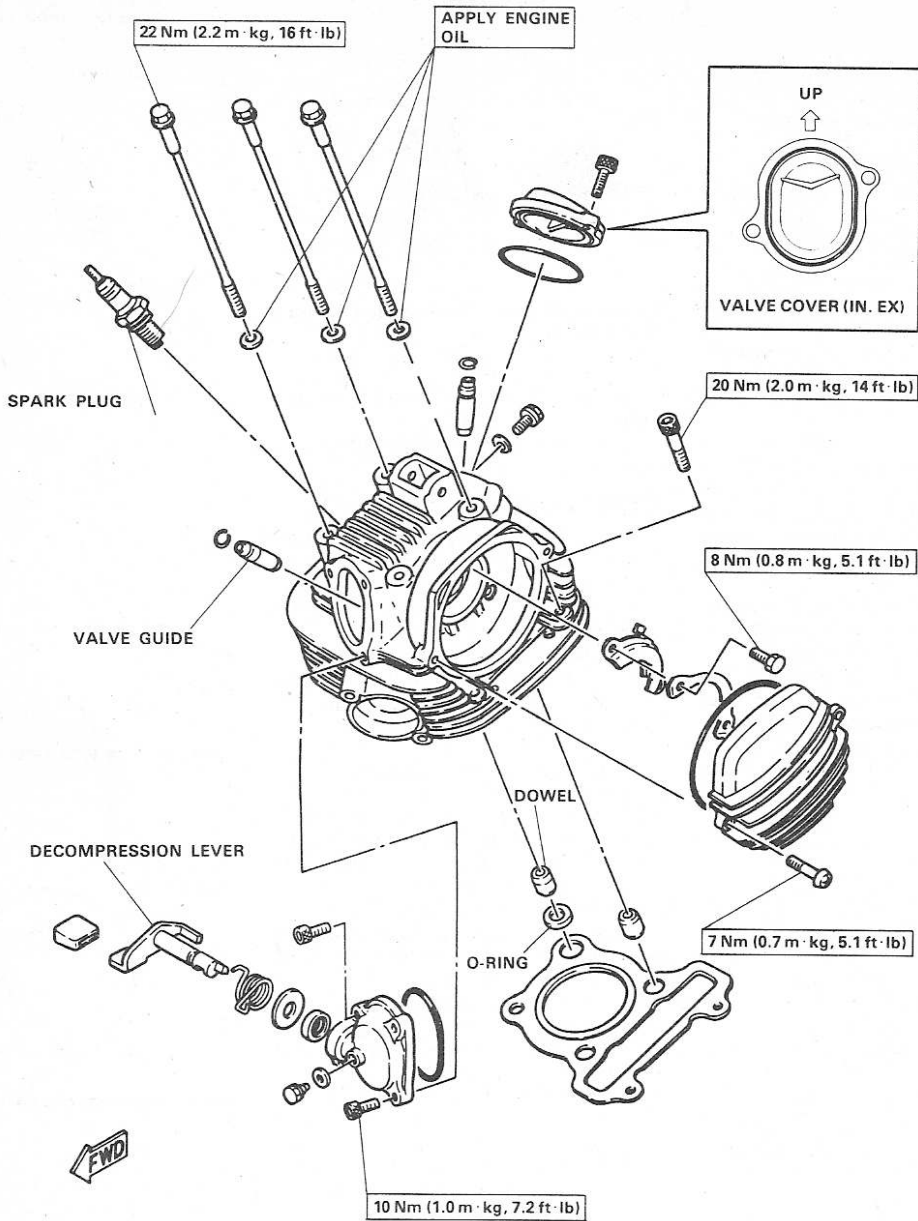
Spring winding directions when viewed from top

4. After valves are fitted, rap the stem once with a plastic mallet to seat the keepers.
5. Be sure that rocker arms and shafts are fitted to their original locations. Lubricate the shafts before insertion.
6. Rocker arm shafts must be installed with the threaded end facing out.
7. The intake rocker shaft is the longer of the two. It should be installed so that the bevel at the end of the shaft is positioned to clear the cylinder head bolt hole.
8. Lubricate the camshaft and bushings before installation. Install the cam and turn it so that the timing pin aligns with the mark on the cylinder head.
9. The camshaft bushing cutout must be flush with the cylinder head. Install the retainer plate and tighten the bolts to 7.2 ft. lbs.

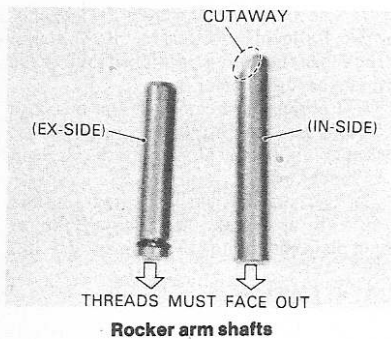
INSTALLATION

1. Be sure that the three dowel pins and the O-ring are in place on the cylinder mating surface.
2. Fit a new cylinder head gasket.
3. Fit the cylinder head, pulling the cam chain through the head as this is done.
4. Lightly oil the cylinder head bolt cop-

Yamaha YTM 200/225



Cylinder head components

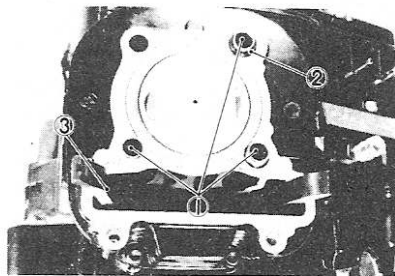


per washers and the bolt seat near the compression release.

5. Install the cylinder head bolts and washers.

6. Properly torque the cylinder head bolts

1120



Cam chain guide (3); dowel pin (1) and O-ring (2) positions

is 16 ft. lbs. for the long ones and 14 ft. lbs. for the short ones.

7. Tighten the bolts gradually and in a cross pattern until the correct torque values are reached.

8. Remove the timing window plug from the left crankcase cover.

9. Align the "T" mark on the flywheel with the mark on the crankcase.

10. Check that the timing pin is installed in the end of the camshaft. Align it with the head timing mark.

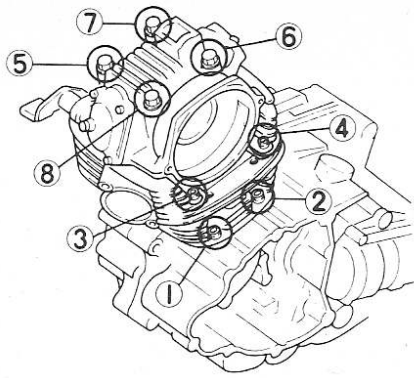
11. Install the cam sprocket. Pull the sprocket so that the front run of the chain is taut. Slip the sprocket onto the end of the camshaft, engaging the hole with the timing pin.

12. Check that the flywheel "T" mark is still lined up.

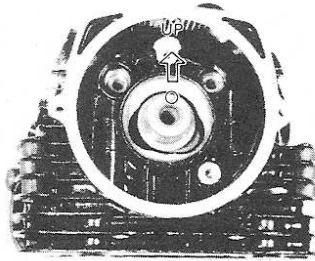
13. The line scribed on the sprocket must align with the mark at the very top of the cylinder head.

14. If timing is correct, install the cam bolt and tighten it to 43 ft. lbs.

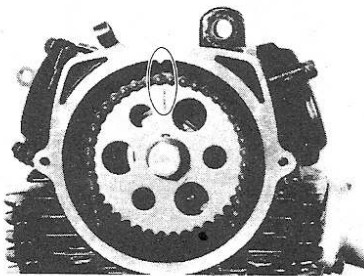
15. Install the sprocket cover. Note that



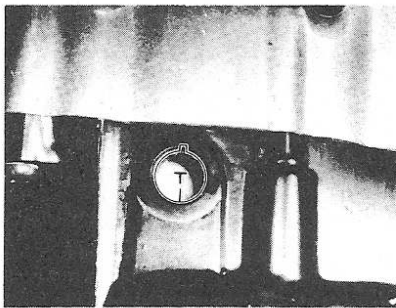
Cylinder head bolt tightening sequence



Position cam pin upwards before fitting sprocket



Align sprocket mark with head timing mark



Timing is set with flywheel "T" mark aligned with stationary timing mark

the fuel line clamp goes towards the rear of the cylinder head, if one is fitted.

16. Install the cam chain adjuster and set it as outlined in "Maintenance."

17. Install the valve covers so that the ridge is towards the top.

18. The remainder of the procedure is straight forward.

Cylinder and Piston

REMOVAL

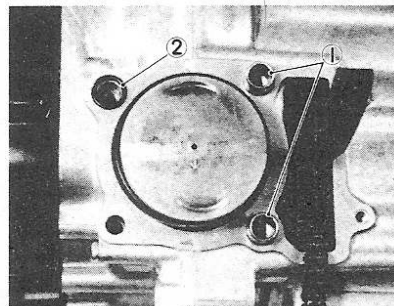
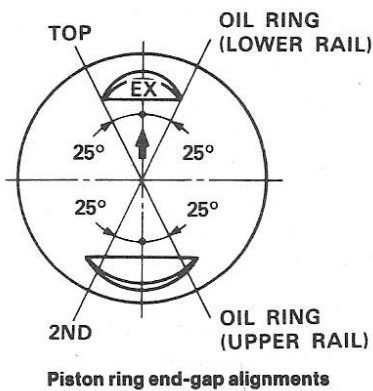
1. Remove the cylinder head.
2. Remove the two securing bolts on the left side of the cylinder head.
3. Lift off the cylinder.
4. Remove the base gasket.
5. Account for all dowel pins and O-rings between the cylinder and the head and between the cylinder and crankcase.
6. Remove the piston wrist pin circlips. Push out the wrist pin. Remove the piston.

INSPECTIONS

1. Measure the diameter of the cylinder bore at three places front-to-rear and side-to-side. Compare the readings with each other and with the specifications at the end of this section. Maximum allowable variation between any two readings is 0.005mm (0.0002 in.). Reboring is necessary in the event of any greater variation.
2. Measure piston diameter 7.5mm (0.3 in.) above the edge of the skirt.
3. Check piston ring side clearance and end-gap.
4. Check all components for visible signs of wear.
5. If reboring is necessary, piston clearance is 0.025-0.045mm (0.0010-0.0018) in.

INSTALLATION

1. Install the piston so that the arrow on the crown points towards the exhaust port.
2. Press in the wrist pin. It may be necessary to heat the piston crown gently so that the pin can be pushed in.
3. Use new circlips for the wrist pin. Be certain they are properly seated.
4. Stagger the ring end-gaps around the piston as shown in the illustration. Manufacturer's marks on the rings must face up.



Cylinder dowel pin (1) and o-ring (2) positions

5. Check that the dowel pins and O-ring are in place in the cylinder base.
6. Use a new base gasket.
7. Coat piston and rings with oil before the cylinder is installed.
8. Compress the rings and install the cylinder.
9. Install the two cylinder bolts. Do not tighten the bolts until the cylinder head bolts are torqued. At that time, tighten them to 14 ft. lbs.

CRANKCASE COVER COMPONENTS

Recoil Starter (Yamahauler, DX)

REMOVAL AND DISASSEMBLY

1. Remove the recoil starter assembly from the crankcase by removing the cover screws.
2. Pull the starter knob out about a foot and hold the sheave drum in place. Fit the rope into the but-out in the drum. Allow the drum to wind back gradually.
3. Remove the starter knob cap.
4. Pull out the rope and untie the knot. Remove the knob.
5. Remove the drive housing securing nut.
6. Remove the housing, drive pawl and drive pawl spring.
7. Remove the sheave drum from the case.
8. Remove the starter spring.

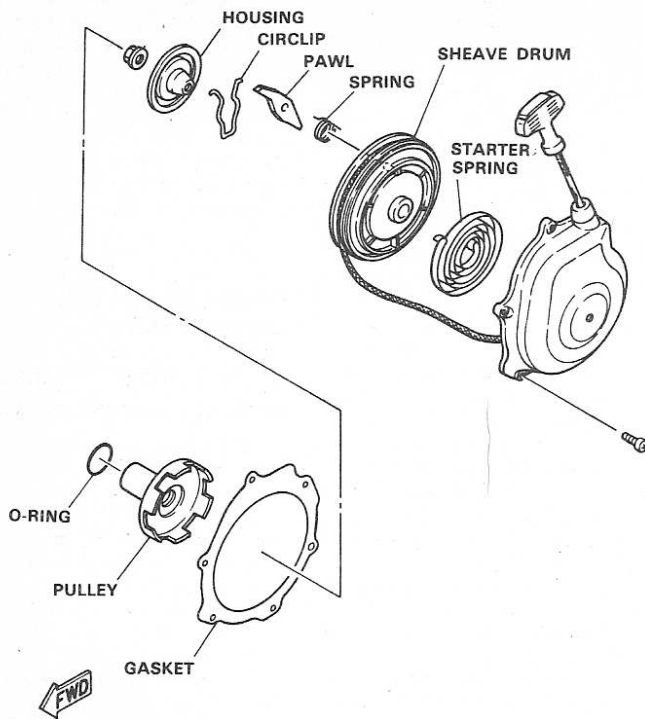
INSPECTIONS

Check all parts for wear and replace as required.

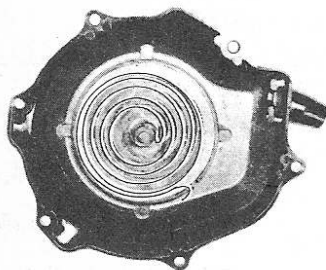
ASSEMBLY AND INSTALLATION

1. Install the starter spring.
2. Wind the spring clockwise to fit inside the retaining posts. Hook the loop on the outer end of the spring onto the spring hook on the case.
3. Grease the spring thoroughly with a waterproof grease.
4. Insert the end of the rope into the sheave drum hole. Knot the end.
5. Wind the rope around the drum as shown in the illustration. When you have about 16 inches of rope left, hook it into the drum cut-out.
6. Install the sheave drum into the starter case. Be sure the inner hook in the spring engages the cutout in the drum.
7. When first placed in the case, the sheave drum will be resting on the spring. Rotate the drum until it drops slightly, then rotate it clockwise until spring tension is felt.
8. Insert the rope end into the case hole.
9. Install the knob and knot the rope.
10. When installing the drive pawl spring, note that the longer end of the spring is inserted into the hole in the sheave drum.
11. Carefully install the drive pawl onto the spring so that the spring end fits a notch in the drive pawl.
12. Rotate the drive pawl one turn CCW to preload the spring, then push the drive pawl into the cutout in the sheave drum.
13. Install the spring clip onto the drive housing. Tighten the nut to 7.2 ft. lbs.
14. Rotate the drum four turns CW.
15. Check operation. The sheave drum should rotate clockwise and the drive pawl

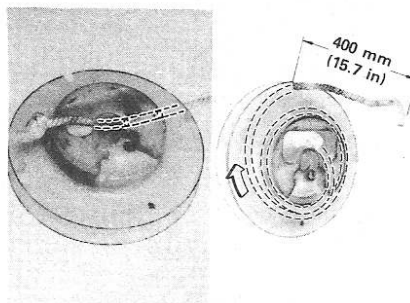
Yamaha YTM 200/225



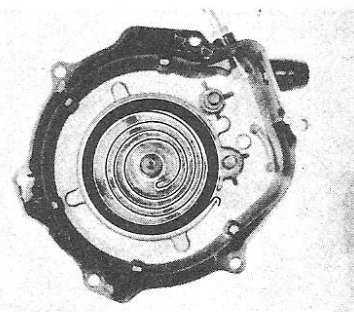
Recoil starter (Yamahauler, DX)



Starter spring installation



Rope installation



Starter spring installation

should emerge from the sheave drum when the rope is pulled.

Recoil Starter (Tri-Moto)

REMOVAL AND DISASSEMBLY

1. Remove the recoil starter assembly from the crankcase by removing the cover screws.
2. Remove the knob cap.
3. Untie the knot in the rope and remove the knob.
4. Remove the drive housing securing nut.
5. Remove the housing, drive pawl and drive pawl spring.
6. Remove the sheave drum and starter spring from the case.
7. Remove the circlip, washer and compression release linkage.

NOTE: Springs are not identical. Mark them so that they can be installed in their original locations.

10. Remove the starter spring guide and starter spring from the case.

INSPECTION

Check all parts for wear or damage and replace as required.

ASSEMBLY AND INSTALLATION

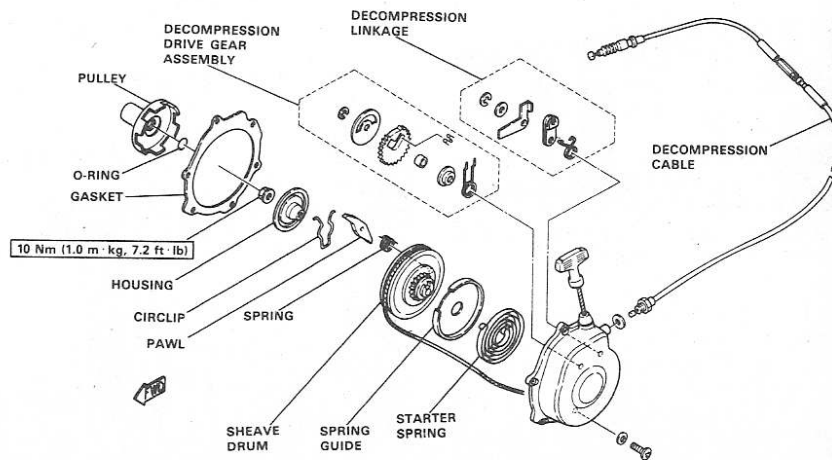
1. Install the starter spring in the case, hooking the outer end of the spring on the post provided.
2. Wind the spring clockwise to fit inside the retaining posts.
3. Grease the spring thoroughly with a waterproof grease after installation.
4. Install the stopper spring.
5. Install the spring retainer, compression release gear assembly, washer and circlip.
6. Connect the compression release cable to the linkage.
7. Install the linkage in the case.
8. Insert one end of the rope into the hole in the sheave drum. Knot the end.
9. Wind the rope clockwise around the drum.
10. When there is about 26 in. of rope left, engage it with the drum cut-out.
11. Install the sheave drum in the case.
12. Be sure the inner hook in the spring engages the cutout in the sheave drum.
13. When first installed, the drum will be resting on the spring. Rotate the drum until it drops slightly, then rotate it clockwise until spring tension is felt.
14. Insert the end of the rope into the hole in the starter case. Fit the free end through the starter knob and knot it. Install the knob cap.

15. Install the drive pawl spring and drive pawl.

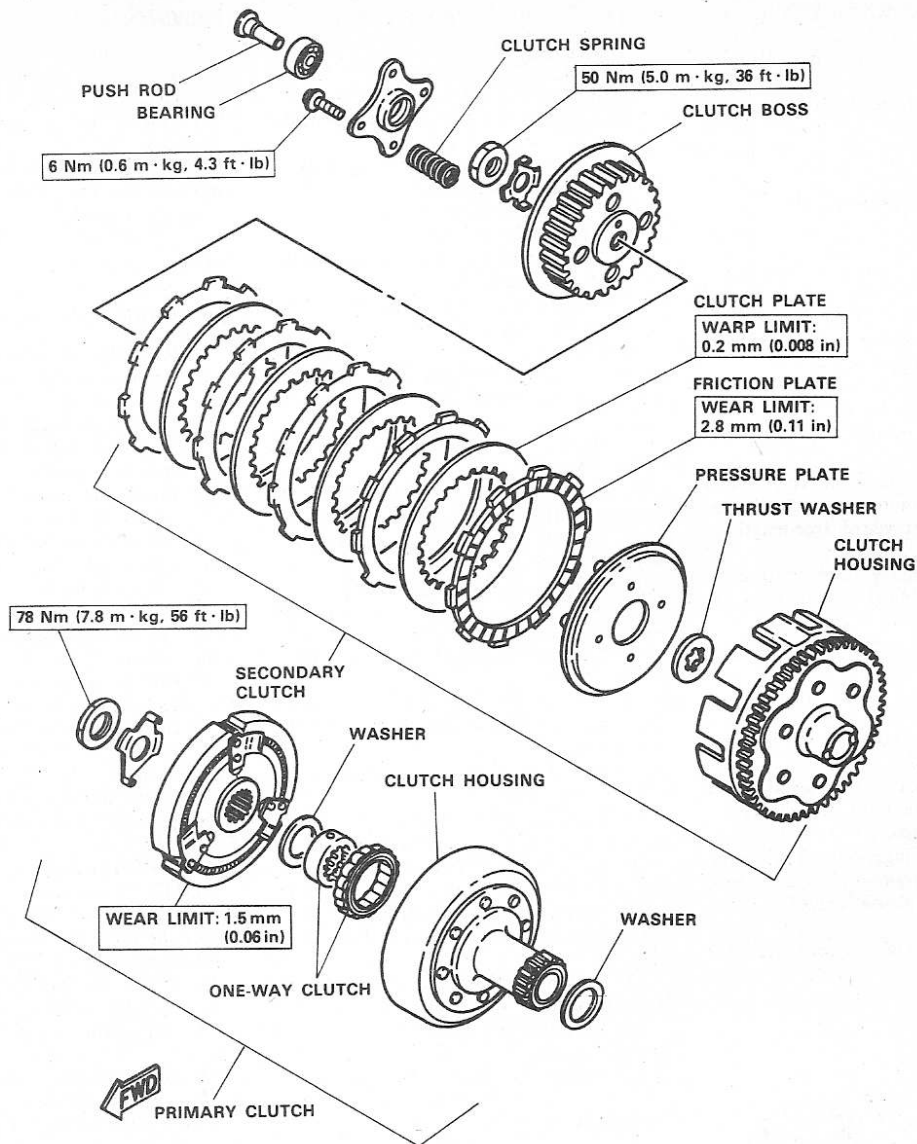
16. The longer end of the spring should be inserted into the hole in the sheave drum.

17. Carefully install the drive pawl onto the spring so the spring end fits a notch in the drive pawl.

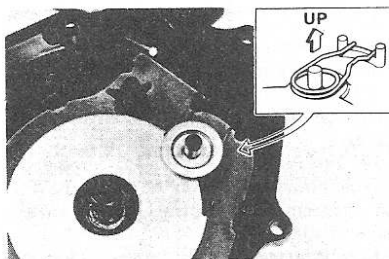
18. Rotate the drive pawl one turn CCW



Recoil starter (Tri-Moto 200)



Clutch assemblies



Pawl spring installation

to preload the spring, then push the drive pawl into the cutout in the sheave drum.

19. Install the spring clip onto the drive housing.

20. Tighten the drive housing securing nut to 7.2 ft. lbs.

21. Rotate the drum four turns CW to preload the spring.

22. Check operation of the starter. The sheave drum should rotate clockwise and the drive pawl should emerge from the drum when the rope is pulled.

Magneto

REMOVAL

1. Remove the recoil starter assembly.
2. Remove the recoil starter pulley bolt. It may be necessary to hold the pulley steady with a special tool to do this.
3. Remove the pulley.
4. Remove the left side crankcase spacer screws.
5. Remove the spacer, noting the dowel pins in the crankcase.
6. Use a puller to remove the magneto flywheel from the crankshaft.
7. Remove the woodruff key.

INSTALLATION

1. Installation is the reverse of removal.
2. Use a new crankcase spacer gasket.
3. Tighten the pulley bolt to 36 ft. lbs.

Clutches

REMOVAL

1. Drain the engine oil

2. Remove the oil filter cover bolts.
3. Remove the filter cover, filter and O-rings.

4. Remove the clutch adjuster locknut, washer and O-ring.

5. Remove the clutch cover screws.

6. Tap around the cover carefully with a plastic mallet to break it free, then remove it.

7. Note the dowel pins in the crankcase.

8. Remove the clutch lever spring, the clutch lever, shift guide No. 1, the pawl holder and shift guide No. 2.

9. Flatten the lock tab on the primary clutch nut.

10. Hold the clutch and remove the nut and washer.

11. Turn the secondary clutch so that one of the clearance notches will allow the primary gear to pass. Then remove the primary clutch assembly.

12. Note that there is a washer beneath the primary gear. Locate it and place in a safe location.

13. Remove the pushrod and bearing from the secondary clutch spring plate.

Yamaha YTM 200/225

14. Remove the clutch spring bolts, loosening them gradually and evenly.

15. Remove the clutch spring plate and the springs.

16. Flatten the tab securing the secondary clutch hub nut.

17. Hold the housing and remove the nut and lockwasher.

18. Remove the clutch assembly.

INSPECTION

1. Check all parts for evidence of unusual wear.

NOTE: Refer to the "General Information" section for detailed engine component inspection procedures.

2. Minimum allowable friction plate thickness is 2.8mm (0.11 in.).

3. Maximum allowable steel plate warpage is 0.2mm (0.008 in.).

4. Clutch springs should be replaced as a set if any measures more than 1.0mm (0.04 in.) less than the standard free-length of 34.9mm (1.37 in.).

5. Check the primary clutch housing and shoe assembly for bluish discoloration indicating heat damage.

6. Maximum allowable clutch shoe wear is 1.5mm (0.06 in.).

INSTALLATION

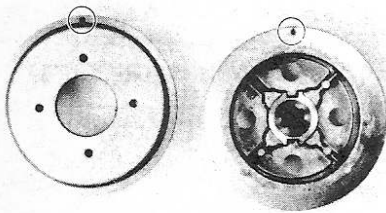
1. Install the secondary clutch housing. Install the thrust washer.

2. Install a friction plate. Then alternate steel and friction plates until all are fitted.

3. Install the pressure plate and springs. Tighten the bolts finger tight at this point.

NOTE: When installing the clutch boss, align the arrow marks on the boss and pressure plate.

4. The remainder of the procedure is the



Align pressure plate and hub marks when installing

reverse of disassembly. Note the following points:

a. Tighten the secondary clutch hub bolt to 36 ft. lbs. Be sure to bend up the lock tab.

b. Tighten the spring bolts to 4.3 ft. lbs.

c. When installing the one-way assembly of the primary clutch, ensure that the flange side faces inward.

d. Torque the primary clutch nut to 56 ft. lbs.

e. When installing the shift linkage, the slot in shift guide No. 1 must engage the shift shaft projection, and the shift guide No. 2 slot must engage the projection of the right-side spacer.

f. Be sure that the two dowel pins are in place before fitting the cover.

Lower End and Transmission

DISASSEMBLY

1. Remove the engine from the frame.

2. Remove the top end components: cylinder head, cylinder and piston.

3. Remove the recoil starter assembly.

4. Remove the magneto.

5. Remove the clutches.

6. Remove the shift linkage.

7. On electric-start models, remove the starter gearing (left side).

8. Remove the cam chain guide.

9. Remove the cam chain.

10. Remove the three screws securing the right side crankcase spacer. Remove the spacer. Remove the dowel pins in the crankcase.

11. Remove the oil pump cover screws and take off the oil pump assembly.

12. Remove the circlip and washer from the shift shaft.

13. Pull the shift shaft out from the right side of the engine.

14. Remove the shift lever assembly.

15. Remove the stopper lever assembly with the torsion spring.

16. Use a torx driver to remove the end of the shift drum.

17. Remove the circlip, oil pump drive gear and washer from the right side of the crankshaft.

18. Flatten the locking tab and remove the balancer shaft nut.

19. Lock up the drive and driven gears with a rag or other soft material.

20. Remove the driven gear nut, washer and key.

21. Remove the balancer drive gear. Note the location of the six springs and the three pins.

22. Loosen the crankcase screws gradually and evenly.

23. Separate the crankcase halves with the puller.

24. Remove the crankcase components.

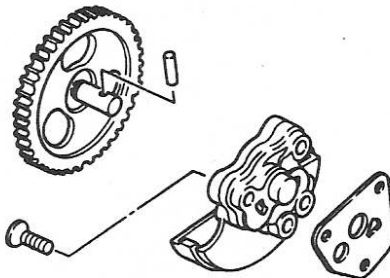
Inspection

OIL PUMP

1. Rotor bore in the body must not exceed 6mm (0.24 in.).

2. Inner-to-outer rotor clearance must not exceed 0.15mm (0.0059 in.).

3. If either specification is not met, the pump must be replaced.



Oil pump assembly

CRANKSHAFT

1. Refer to the "Engine Specifications" chart at the end of this section.

2. The crankshaft should be inspected for rod play, run-out and bearing condition.

TRANSMISSION

1. Check the gears for heat damage.

2. Check for wear to the teeth, pitting or other obvious signs of damage.

3. Check that the shift fork shafts are straight.

4. Check the shift drum grooves for wear and check the pins on the shift forks which engage them as well.

5. Check the shift fork fingers for damage.

Assembly

1. Press the crankshaft bearing and the transmission bearings into the right crankcase half.

2. Bearing ID marks should face towards the inside of the case. Apply pressure to the outer races only.

3. Install the crankshaft into the right side crankcase half, long side first.

4. Install the woodruff key in the crankshaft keyway. Oil the bearings and taper.

5. Install the washer and buffer boss onto the crankshaft.

NOTE: The punch mark on the buffer boss must face outwards.

6. Install the second, fourth and third-gear wheels onto the shaft.

7. Install the transmission shafts.

8. Install the shift drum in the right crankcase half.

9. Install the No. 1 shift fork onto the second pinion gear; install the No. 2 shift fork onto the fifth pinion gear the the No. 3 shift fork on the fourth gear.

NOTE: The numbers on the shift forks must face the left crankcase half. Be sure that the fork pins are seated in the shift drum grooves.

10. Fit the shift fork shaft.

11. Install the balancer shaft with the unthreaded end on the right side of the crankcase.

12. Install the three dowel pins on the crankcase mating surface.

13. Coat the mating surface with Yamaha Bond No. 4.

14. Join the case halves.

15. Tighten the screws gradually and in a cross pattern. When all are tight, torque them to 5 ft. lbs.

16. Install the balancer drive gear:

a. Insert a spring into the buffer boss, then insert a spring with a pin in it.

b. Align the punch marks on the buffer boss and drive gear and install the drive gear.

17. Install the washer and oil pump drive gear on the crankshaft. Fit the circlip. Be sure that the pump gear tab engages the washer and buffer boss slots.

18. Fit the balancer driven gear. Align the punch marks on the two gears.

19. Fit the key to the balancer shaft.

20. Install the washer and the nut.

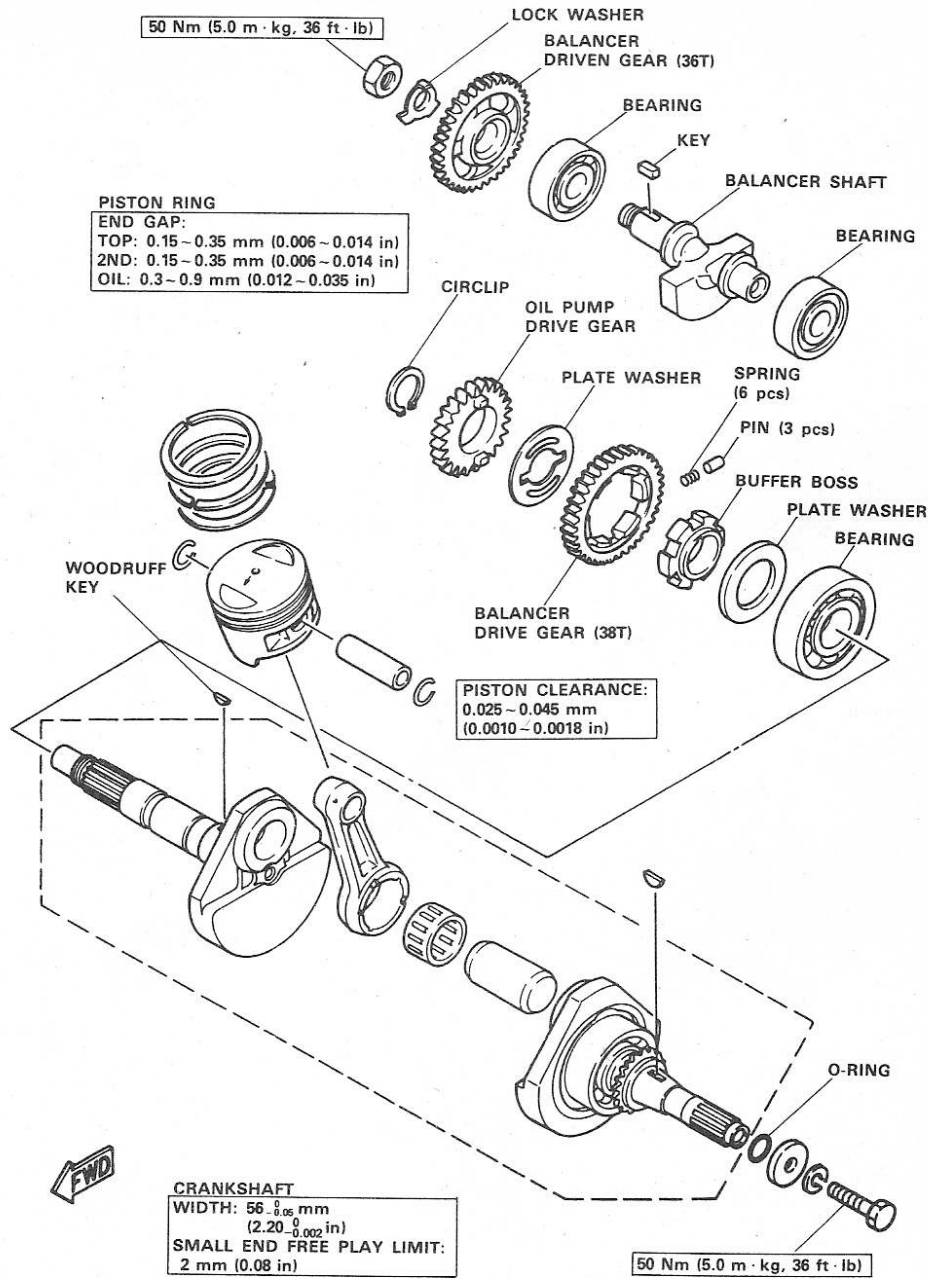
21. Lock the gears in place and tighten the nut to 36 ft. lbs.

22. Use a non-permanent thread-locking compound on the shift drum end plate. When installing the plate, align the match mark with the longer pin.

23. Tighten the torx bolt to 8.7 ft. lbs.

24. Lightly grease the lips of the shift shaft oil seal.

25. Install the shaft. Hook the spring onto the crankcase boss provided. Be sure that the



Crankshaft assembly

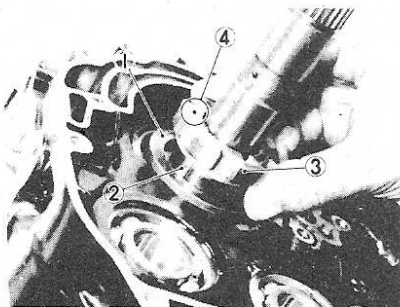
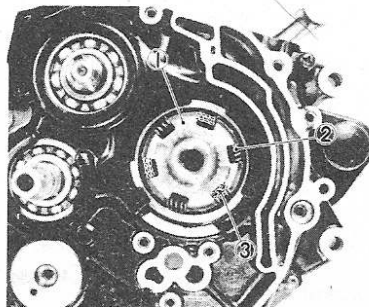
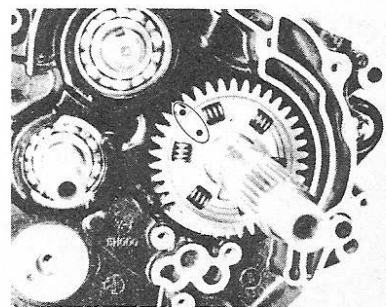


Plate washer (1); key (2); buffer boss (3); punch mark (4)

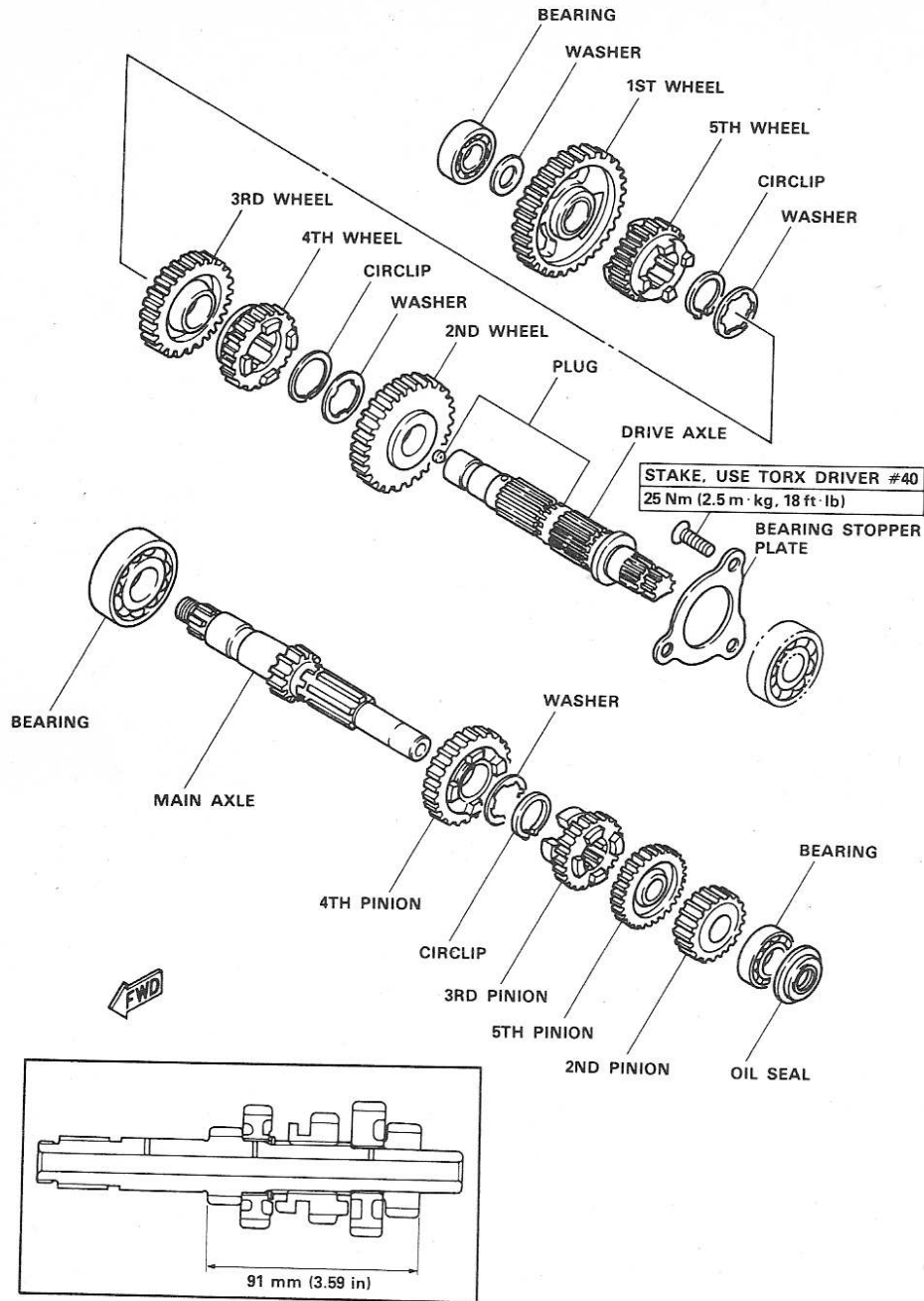


Buffer boss (1); springs (2); pins (3)

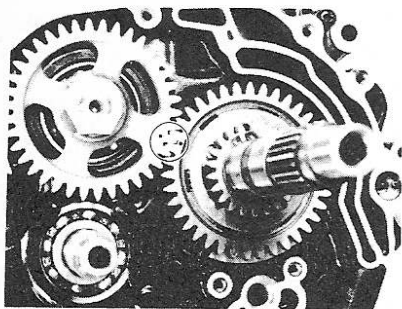


Drive gear alignment marks

Yamaha YTM 200/225



Transmission assembly



Drive and driven gear alignment marks

shift lever correctly engages the shift drum pins.

26. Install the shift shaft washer and circlip.

27. Install the oil pump, using a new gasket. Tighten the bolts to 5 ft. lbs.

28. Remaining procedures are contained in the relevant component sections.

MIDDLE GEAR CASE

Removal

1. Remove the engine from the frame.
2. Remove the middle gear case cover

bolts and the middle drive shaft bearing housing bolts.

3. Remove the middle drive shaft assembly from the crankcase.

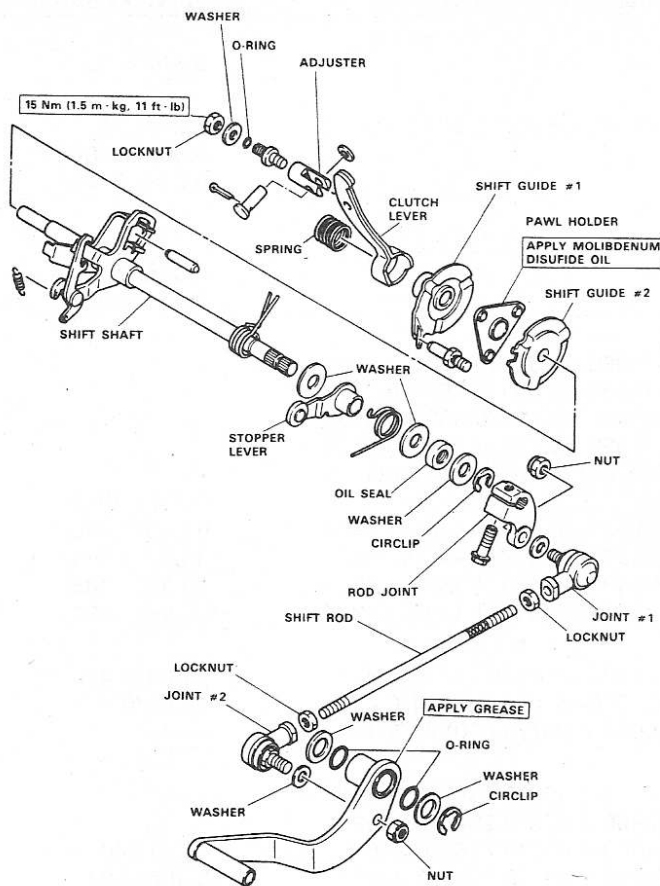
4. Remove the middle drive gear nut.

5. Remove the middle drive gear.

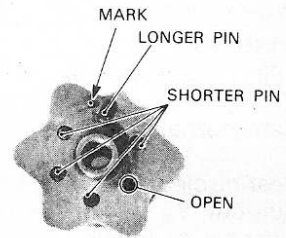
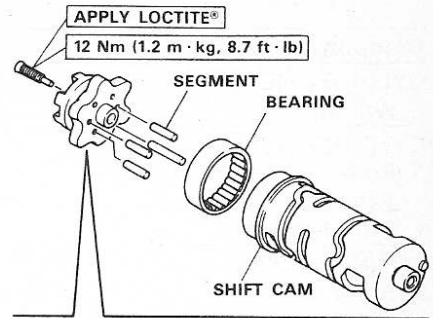
Remove the shims from the shaft and place them aside. The number and thickness of the shims is critical.

Disassembly

1. Remove the coupling gear nut.
2. Remove the washer, coupling gear and middle drive shaft subassembly.
3. Remove the washers and the collapsible collar from the middle drive axle.



Shift assembly



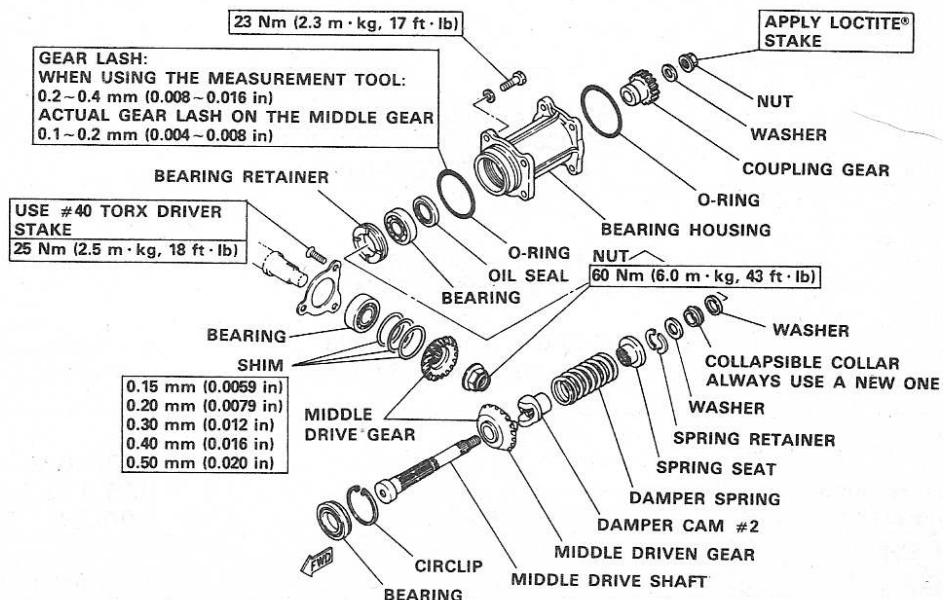
Shift drum plate installation

Inspection

1. Check all parts for wear or damage. Further disassembly requires special tools and should only be entrusted to trained specialists.

Assembly And Installation

1. Reverse the previous procedures.
2. Be sure that all of the original shims are installed behind the middle drive gear.
3. Tighten the middle drive gear nut to 43 ft. lbs.
4. Refer to the exploded view of the middle gear assembly for additional information.



Middle drive gear assembly

Yamaha YTM 200/225

ENGINE SPECIFICATIONS

Component	Standard (mm/in.)	Service Limit (mm/in.)
CYLINDER HEAD		
Warpage	—	0.3/0.0012
CYLINDER (200)		
Bore	66.070-66.080/2.6011-2.6015	66.9/2.63
Taper	—	0.005/0.0002
Out-of-round	—	0.01/0.0004
CYLINDER (225)		
Bore	69.97-70.02/2.7547-2.7567	—
Taper	—	0.005/0.0002
Out-of-round	—	0.01/0.0004
CAMSHAFT		
Cylinder bearing dia.	25.000-25.021/0.9843-0.9851	—
	20.000-20.021/0.7874-0.7882	—
Cam journal dia.	24.960-24.980/0.9827-0.9835	—
	19.998-19.999/0.7873-0.7874	—
Bearing clearance	0.020-0.061/0.008-0.0024	—
Run-out	—	0.03/0.0012
Lobe height, intake	36.537-36.637/1.4385-1.4424	36.58/1.440
Lobe height, exhaust	36.577-36.677/1.440-1.444	36.62/1.441
Base circle dia., intake	30.131-30.231/1.1863-1.1902	30.18/1.188
Base circle dia., exhaust	30.214-30.314/1.1895-1.1935	30.26/1.191
ROCKER ARMS		
Rocker arm shaft OD	11.985-11.991/0.4718-0.4721	11.94/0.470
Rocker arm ID	12.000-12.018/0.4724-0.4731	12.03/0.474
Arm-shaft clearance	0.009-0.037/0.0004-0.0015	—
VALVES		
Stem OD, intake	5.975-5.990/0.2353-0.2358	—
Stem OD, exhaust	5.960-5.975/0.2346-0.2352	—
Guide ID, in & ex	6.000-6.012/0.2362-0.2367	6.1/0.240
Stem-to-guide clearance, intake	0.010-0.037/0.0004-0.0015	0.10/0.004
Stem-to-guide clearance, exhaust	0.025-0.052/0.0010-0.0020	0.12/0.05
Run-out	—	0.03/0.0012
Head dia., intake	33.9-34.1/1.3346-1.3425	—
Head dia., exhaust	28.4-28.6/1.1181-1.1260	—
Seat width	0.9-1.1/0.0354-0.0433	1.6/0.063
VALVE SPRINGS		
Tilt	—	1.6/0.063
Free length, inner	—	35.5/1.40
Free length, outer	—	37.2/1.46
PISTON		
Diameter (200)	66.935-66.985/2.635-2.637	—
Diameter (225)	69.935-69.985/2.7533-2.7553	—
Piston-cylinder clearance	0.025-0.045/0.0010-0.0018	—
PISTON RINGS		
End-gap		
Top, second	0.15-0.30/0.0059-0.0118	0.75/0.0295
Oil	0.3-0.9/0.0118-0.0354	—
Side clearance		
Top	0.03-0.07/0.0012-0.0028	0.1/0.004
Second	0.02-0.06/0.0008-0.0024	0.9/0.035
Oil	0	—
CRANKSHAFT		
Run-out	—	0.03/0.012
Big end side clearance	—	0.35-0.65/0.0138-0.0256
Small end lateral play	0.8-1.0/0.03-0.04	2.0/0.08
PRIMARY CLUTCH		
Shoe thickness	2.0/0.079	1.5/0.0591

ENGINE SPECIFICATIONS

Component	Standard (mm/in.)	Service Limit (mm/in.)
SECONDARY CLUTCH		
Friction plate thickness	3.0/0.12	2.8/0.11
Steel plate thickness	1.6/0.06	—
Steel plate warp limit	—	0.2/0.008
Spring free length	34.9/1.37	33.9/1.33
TRANSMISSION		
Shaft run-out	—	0.08/0.0031
Middle gear lash	—	0.1-0.2/0.004-0.008
Final gear lash	—	0.1-0.2/0.004-0.008

ENGINE TORQUE SPECIFICATIONS

Part	Torque (ft lbs)
Cylinder head bolts	
Long	16.0 (oiled)
Short	14.0 (oiled)
Cam sprocket cover	5.1
Valve covers	7.2
Rocker arm shafts	5.8
Spark plug	14.0
Cylinder bolts	7.2
Balancer shaft nut	36.0
Starter pulley bolt	36.0
Valve adjuster nut	10.0
Cam sprocket bolt	43.0
Cam chain tensioner nut	22.0
Cam chain tensioner cap nut	3.6
Chain guide #2 retainer	5.8
Oil drain plug	31.0
Filter cover bolts	7.2
Crankcase screws	5.1
R/H bearing retainer	7.2
Primary clutch nut	56.0
Clutch springs	4.3
Clutch hub nut	36.0
Clutch adjuster	11.0
Middle gear case cover	7.2
Drive axle bearing retainer	18.0 (staked in place)
Housing bearing retainer	43.0
Bearing housing	17.0
Starter clutch screw	22.0 (staked in place)

FUEL SYSTEM

NOTE: For carburetor theory and operation, refer to the "General Information" section.

GAS TANK

Removal And Installation

1. If a rear carrier is fitted, remove the carrier securing knob and pull the carrier backwards.
2. Remove the seat/rear cowling assembly.
3. Remove the gas cap. Remove the tank cover bracket bolts at the sides. Remove the cover.
4. Be sure the petcock is "OFF." Disconnect the lines at the petcock and tank.
5. Remove the tank mounting bolt at the

front of the tank. Disconnect the band at the rear of the tank. Remove the gas tank.

6. Installation is the reverse of removal. Be sure that all fuel lines are tightly connected before operating the machine.

CARBURETOR

Removal And Installation

TRI-MOTO 200

1. Remove the gas tank as outlined above.
2. Fold back the carburetor's rubber cap.
3. Unscrew the cap and carefully pull out the throttle slide assembly, watching that the needle is not damaged during the removal procedure.
4. If throttle slide service is required, disengage the cable from the slide. If not, wrap the assembly in a clean cloth and position it out of the way to prevent damage to it.

5. Unscrew and remove the starter plunger from the carburetor body.

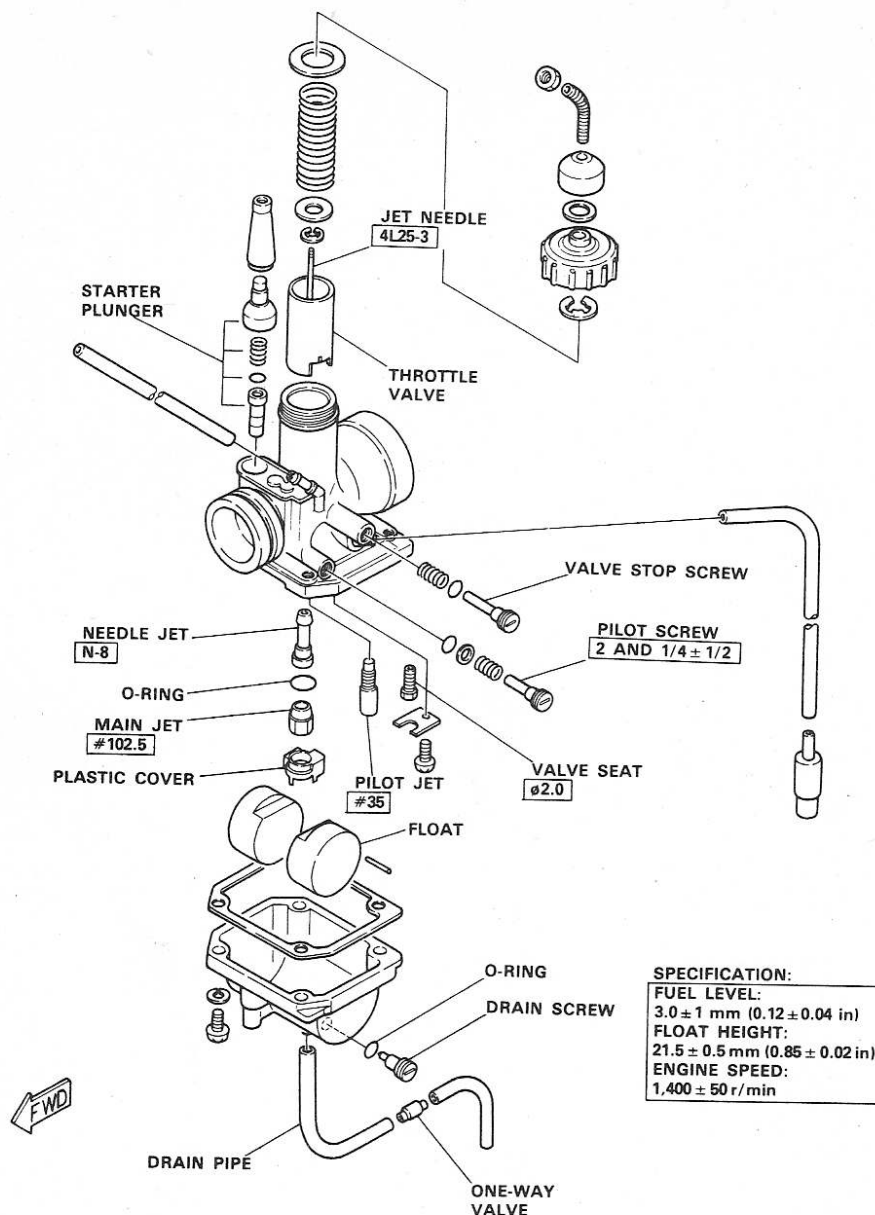
6. Disconnect the overflow line from the carburetor body. Disengage the fuel line from the clamp on the cylinder head.

7. Loosen the air cleaner and engine side clamp screws and carefully pull the carb free. CAUTION: Drain gasoline into a suitable container and dispose of properly.

8. Installation is the reverse of removal. Be sure that the carburetor is correctly mounted in the hoses on both air cleaner and engine side and that they are not folded or partially obstructing the intake or outlets of the carb.

9. Position the carb straight up. Be sure it is not tilted. Tighten the clamp screws.

10. Carefully insert the throttle slide assembly. Be sure the needle enters the needle jet without forcing it. Check that the slide enters the carb body easily and that the movement is free.



Carburetor (Tri-Moto 200)

11. Tighten the cap. Position the rubber cap so that foreign matter cannot enter. Check for proper throttle action.

12. Screw in and tighten the starter plunger.

13. Connect the overflow line to float bowl. Secure the fuel line with the clamp on the cylinder head.

14. Install the gas tank and connect all lines. Be sure that gas and vacuum lines are securely connected.

15. Turn on the fuel and check for air or gas leaks before operating the machine.

16. Start the engine and check for proper operation of starter plunger and throttle and for proper idle speed before riding.

YAMAHAULER, 225 DX

1. Remove the gas tank as outlined above.

2. Fold back the carburetor's rubber cap.

3. Unscrew the cap and carefully pull out the throttle slide assembly, ensuring that the needle is not damaged during the removal procedure.

4. If throttle slide service is required, disengage the cable from the slide and separate the components. If not, wrap the assembly in a clean cloth and position it out of the way.

5. Unscrew and remove the starter plunger from the carburetor body.

6. Disconnect the overflow line from the float bowl. Disengage the fuel line clamp on the cylinder head.

7. Loosen the air cleaner hose clamp.

8. Remove the carburetor mounting nuts.

9. Pull the carburetor free of the manifold and remove it.

CAUTION: Drain gasoline into a suitable container and dispose of properly.

10. Installation is the reverse of removal. Be sure that the carb mounting O-ring is

secure in its groove and that it is not lost, damaged or moved out of the proper position when the carb is fitted to the manifold.

11. Tighten manifold nuts gradually and evenly.

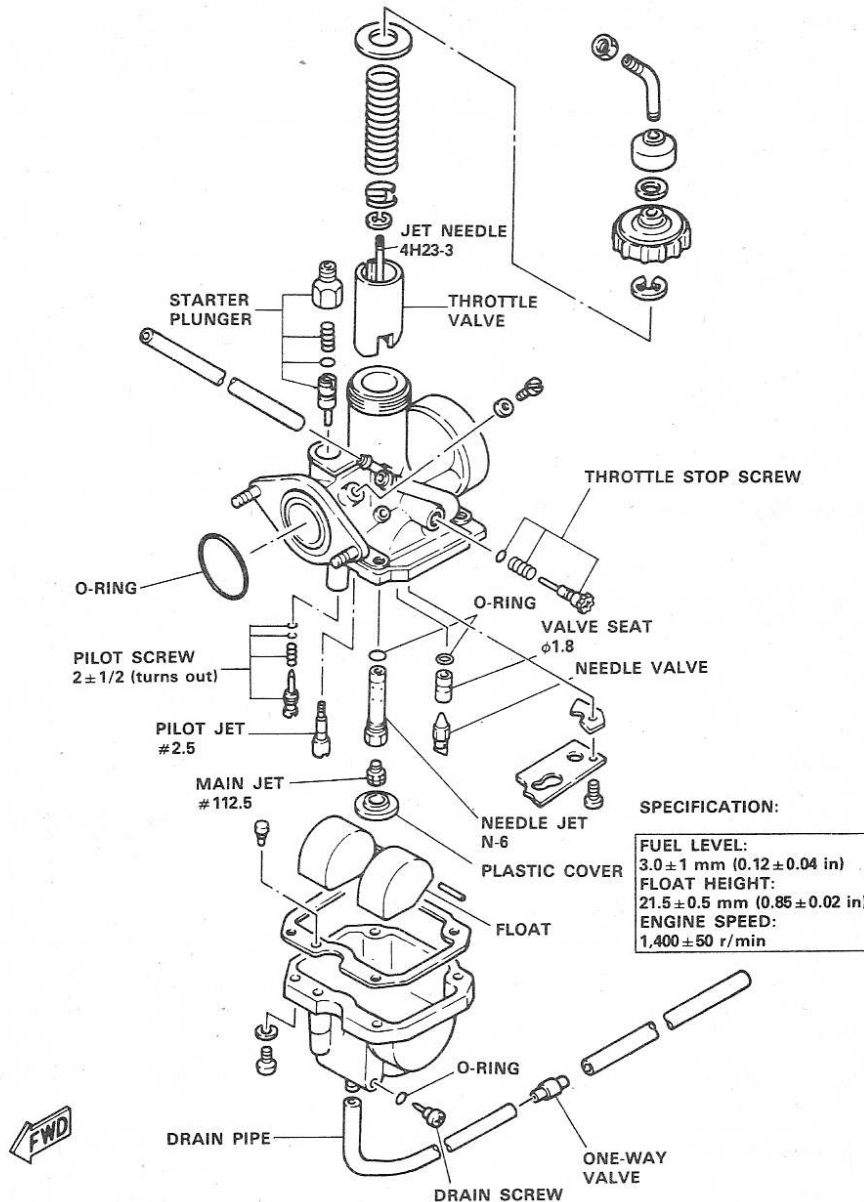
12. Check that the air cleaner hose is properly fitted over the carb intake and not folded or partially obstructing the intake. Tighten the clamp.

13. Carefully insert the throttle slide assembly. Be sure that the needle enters the needle jet without forcing it. Check that the slide enters the carb body easily and that the movement is free.

14. Tighten the cap. Position the rubber cap so that foreign matter cannot enter. Check for proper throttle action.

15. Screw in and tighten the starter plunger.

16. Connect the overflow line to the float bowl. Secure the fuel feed line with the clamp on the cylinder head.



Carburetor assembly (Yamahauler, 225 DX)

17. Install the gas tank and connect all lines. Be sure that gas and vacuum lines are securely connected.

18. Turn on the fuel and check for air or gas leaks before operating the machine.

19. Start the engine and check for proper operation of the starter plunger and throttle and for proper idle speed. Before all systems are in normal working order before riding.

Disassembly

ALL MODELS

1. To disassembly the throttle slide, pull the spring out of the slide and compress it while disengaging the cable from the slide. Shake out the needle and clip. Some models have a keeper clip which must be removed before the cable will come out.

CAUTION: Do not remove the clip from the needle. Position is critical. See the "Carburetor Specifications" chart.

2. Turn the carb upside down and remove the four float bowl screws.

3. Carefully remove the float bowl and the gasket. If the bowl will not come off, rap the sides with the screwdriver handle, but hold the bowl while you do this so it doesn't come off and hit the float assembly. When the bowl is free, lift it off carefully.

4. Push out the float pivot pin and lift out the float and needle assembly.

5. Remove the plastic cover from the main jet.

6. Unscrew and remove the main jet.

7. Unscrew and remove the pilot jet.

8. On some models, the needle jet can be unscrewed for removal. On others, it must be pushed out from the top of the carburetor with a wooden dowel. Note any O-rings which may be on the jets or in the carburetor body.

9. Unscrew and remove the pilot screw and the throttle stop screw. Note spring and O-ring(s). Remember that adjustment of

these components is required when assembling.

10. Needle valve seats are secured by keeper plates held by screws. If removal is required, remove the screws and take out plate and seat.

11. Disconnect fuel feed and vacuum lines from the carburetor body.

12. Remove the manifold O-ring, if one is fitted.

13. Unscrew and remove the drain screw from the float bowl. Note the O-ring.

Inspection

ALL MODELS

1. Refer to the "General Information" section for carburetor inspection tips.

2. Clean the body and other metal parts in a clean, non-caustic solvent intended for carburetor cleaning.

3. Blow air and fuel passages clear with

Yamaha YTM 200/225

CARBURETOR SPECIFICATIONS

	Tri-Moto 200	Yamahauler EK/EL	Yamahauler ERN	225 DX
Type	VM22	VM22	VM22SH	VM22
ID Mark	21V00	24W00	24W01	29U00
Main jet	102.5	112.5	112.5	112.5
Main air jet	1.5	1.7	1.7	1.6
Jet needle ^①	4L25-3	4H23-3	4H23-3	5L10-3
Needle jet	N-8	N-6	N-6	N-8
Throttle slide cutaway	3.5	4.0	4.0	3.5
Pilot jet	35	25	25	20
Pilot air jet	1.3	130	130	60
Pilot screw (turns out)	2¼ ± ½	2 ± ½	2 ± ½	1½ ± ½
Float needle seat	2.0	1.8	1.8	1.8
Starter jet	65	65	85	65
Fuel level (mm/in.)	3.0/0.12	3.0/0.12	3.0/0.12	3.0/0.12
Float height (mm/in.)	21.5/0.85	21.5/0.85	21.5/0.85	21.5/0.85
Idle speed (rpm)	1400	1400	1400	1400

① Last digit indicates clip position, counting from top of needle.

low pressure air. Do not insert wire or metal objects into carburetor or jet bores to clear them. Bores are calibrated and easily damaged.

4. Use all new O-rings and gaskets as a matter of safety.

5. Check the condition of all fuel lines and vacuum lines. Replace hoses with abrasion or age damage such as cracking or hardening.

6. Check for splitting at the ends of the hoses. Replace if damaged.

7. Check the starter plunger for wear and replace it if the plunger is scored.

8. Check for wear on the throttle slide and the carburetor bore.

Assembly

1. Be sure that all jets and screws which are equipped with O-rings have them in the proper positions.

2. Refer to the exploded views of the carburetors for assembly help.

3. Install jets carefully. They can be easily damaged. Be sure they are secure, but do not overtighten.

4. When installing the float assembly, carefully lower the needle into the seat with the floats attached. Position the float so the pivot pin can be inserted. Check for free movement.

6. Install a new manifold O-ring, on models so equipped. Be sure that the O-ring is pushed into the groove and firmly seated.

7. When installing the pilot screw, turn it in very carefully until resistance is felt, then back it out the number of turns shown in the "Carburetor Specifications" chart.

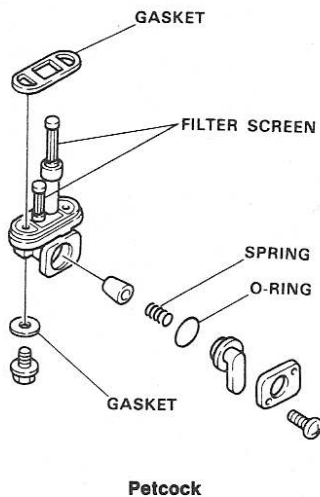
CAUTION: Do not overtighten this screw when installing it. Stop turning it the moment some resistance is felt. Otherwise, it will be damaged.

8. After the carburetor is installed, check float level and adjust idle speed and mixture. These procedures are outlined in the "Tune-Up" section.

FUEL PETCOCK

All Models

1. The fuel petcock has filter screens inside the tank which should be cleaned



Petcock

periodically—about every 6 mos. under normal conditions.

2. Remove the gas tank as outlined above.

3. Drain the gas.

4. Remove the lines from the petcock.

5. Remove the petcock securing screws and pull the assembly out of the tank.

6. Check the gasket condition. Replace it if it appears damaged or if it was leaking prior to removal.

7. Remove the filter screens and clean them in a safe solvent.

8. If foreign matter cannot be removed, or if the screens are punctured, crushed, or otherwise damaged, replace them.

9. Check the petcock mating surface for damage. Replace the unit if any is noted.

10. Flush out the gas tank before installing the petcock to get rid of any residual dirt.

11. If the petcock does not operate properly, remove the two screws which secure the lever plate. Remove the plate, lever, O-ring, gaskets, spring and diaphragm.

12. Check the diaphragm for damage. Replace the unit if any is noted.

13. Clean all metal parts thoroughly in solvent. If corrosion cannot be removed from the petcock body, the unit must be replaced.

14. Use new gaskets and O-ring when assembling.

15. When the petcock is fitted to the tank, be sure the gasket is in place.

16. After gas is added to the tank, check for leaks. Allow the machine to sit for several minutes before operation. Be sure that all fuel lines are tightly connected.

ELECTRICAL SYSTEM

The electrical system may vary depending on the type of equipment fitted. Refer to the wiring diagrams at the end of this section for full schematics of the specific machines.

BULB SPECIFICATIONS

These machines use the following bulbs:

Headlight: 45W/45W

Taillight: 8W

Neutral indicator: 3.4W

Reverse indicator: 3.4W

CHARGING SYSTEM

Battery-equipped models have a charging system which consists of a 12 V battery, a regulator/rectifier unit and charging coils in the CDI magnet.

System Check

1. Connect a DC voltmeter across the battery terminals.

2. Start the engine and run it up to 5,000 rpm.

3. The meter should show 14-15 V across the battery terminals.

4. If the voltage is not within this specification, determine the cause. Check battery condition; check wiring connections for corrosion. Check other system components as outlined below.

CAUTION: Never disconnect the battery from the system when the engine is running. Charging system components will be damaged.

Charging Coil

1. Remove the seat/cowling assembly.
2. Locate and disconnect the CDI magneto wiring at the plastic connector.
3. Check the resistance of charging coil across the white lead and ground on engine or frame.
4. Resistance should be 0.4 ohms.
5. If the reading obtained is not within 10% of this specification, the charging coil must be replaced.

Regulator/Rectifier

1. This unit can be checked with an ohmmeter.
2. Locate and disconnect the regulator/rectifier wiring at the plastic connector.
3. Connect the ohmmeter across the red and white leads (low range on meter) and note reading.
4. Reverse the meter leads and note reading.
5. There should be continuity in one direction only.
6. If the ohmmeter shows continuity in both directions, or neither direction, the unit must be replaced.

CAUTION: The regulator/rectifier can be damaged by careless handling. Be sure that the battery connections are never reversed. Be sure that the engine is never run with the battery disconnected.

LIGHTING SYSTEM

1. The output of the lighting coil (AC) can be checked between any point in the lighting circuit and ground. This procedure checks output at the headlight.
2. Disconnect the yellow and black wires at the headlight.
3. Connect an AC voltmeter set to the 20 V AC range (or equivalent) to the leads. Yellow is positive.
4. Start the engine.
5. Voltage should be 12-18 V AC with engine speeds 3000-8000 rpm. Voltage increases gradually with speed.
6. Locate the lighting coil wiring beneath the seat/cowling and disconnect it at the plastic connector.
7. Connect an ohmmeter across the coil wires: positive meter lead to yellow/red and negative meter lead to ground.
8. Resistance should be 0.78 ohms for machines without a battery and 0.34 ohms for battery-equipped machines.
9. If the reading is not within 10% of this specifications, the lighting coil must be replaced.
10. If the lighting coil resistance is correct, but system voltage is not, the problem is probably with the voltage regulator (fitted to battery-equipped machines only).

SWITCHES

1. Switch operation can be checked with an ohmmeter set to the low scale or with a simple continuity tester (self-powered).
2. Disconnect the switch you wish to test at the plastic connector to isolate it.

Engine Stop Switch

1. There should be continuity between

black and black/white wires when the switch is in either of the "OFF" or "STOP" positions.

2. There should be no continuity when the switch is in the "RUN" position.

Starter Button

1. On machines equipped with an electric starter, check for continuity across the red/white and brown switch leads.
2. There should be continuity when the starter button is pushed: No continuity when the button is released.

Main Switch

1. When in the "OFF" position, there should be continuity only between the black/white and black leads.
2. In the "ON" position, there should be continuity only between the red and brown leads and between the blue/black and blue leads.
3. When switched to "LIGHT," there should be continuity between the black/white and black leads and between the red and blue/black leads.
4. Any other continuities indicate a defective switch.

Dimmer Switch

1. At least two types are fitted, depending on whether the machine is fitted with a battery.
2. On machines without a battery, there should be no continuity between switch leads when it is "OFF." In the "LO" position, there should be continuity across green, blue and yellow/red. In the "HI" position, there should be continuity across yellow, blue and yellow/red.
3. On battery equipped machines, there should be no continuities when the switch is in the "OFF" position. When in the "LO" position, there should be continuity across yellow red and blue and across blue/black and green. In the "HI" position, there should be continuity across blue/black and yellow and between yellow/red and blue.

IGNITION SYSTEM

The major components of the ignition system are the CDI magneto, the CDI unit, the ignition coil and the spark plugs.

Ignition Coil

1. The ignition coil is located beneath the gas tank and can be accessed by removing the engine mounting bracket cover from the front of the cylinder.
2. Disconnect the ignition coil wires (orange).
3. Check primary coil resistance across orange wire and chassis ground. It should be 0.85 ohms.
4. Check secondary coil resistance across orange wire and high tension lead. It should be 5.9 ohms.
5. If both readings are not within 10% of these values, the ignition coil must be replaced.

Pickup Coil

1. Remove the seat/cowling assembly.
2. Disconnect the CDI magneto lead.

3. Check resistance across the pickup coil leads (magneto side of the connector).
4. Resistance between the white/green and white/red leads should be 196 ohms.
5. If the reading is not within 10% of this figure, replace the pickup coil.

Charge Coil

1. The charge coil leads are brown and black and are accessed by disconnecting the plastic CDI magneto connector as outlined for the pickup coil, above.
2. Resistance across the brown and black leads should be 381 ohms.
3. If the reading is not within 10% of this specification, replace the unit.

ELECTRIC START SYSTEM

Operation

The electric start system consists of a starter motor, located on the front of the engine, a starter solenoid, neutral switch, and starter circuit cut-off relay.

When the main switch is on, the starter motor will operate only if the transmission is in neutral. The cut-off relay prevents starting in gear.

If the engine stop switch is in the "OFF" position, the starter motor will turn the engine over, but the ignition will not be on in any case.

Testing

If the starter will not operate, switch on the headlight and observe its intensity. If it is dim when the starter is not being operated, check the battery connections and recharge the battery. If the headlight doesn't light, check the fuse, the battery connections, the ignition switch and its connections, and check the continuity of the wire between the ignition switch and the battery.

If the headlight is normally bright, press the starter button and observe any changes. If the headlight dims when the button is pushed, it indicates that the starter motor is drawing current. If it does not dim (i.e. nothing happens), the starter motor is probably not getting any current. In this case, suspect the starter solenoid.

To check the solenoid and starter button, the easiest test is to bypass the unit completely by disconnecting the battery lead from the solenoid and connecting it directly (with the aid of a high-tension jumper cable) to the starter motor terminal. If the starter motor works, the solenoid or starter button is defective and must be replaced.

If the motor still fails to work, the motor itself may be the cause of the trouble.

Starter motor faults are rare, but several things can go wrong.

If the starter spins freely, but the engine doesn't turn over, suspect the starter motor clutch.

If the engine will turn over only very slowly and without a great degree of predictability, some possible causes include: a low or almost dead battery, oil which is too thick for weather conditions (extreme cold), or bad bearings in the motor itself. Worn bearings could cause the armature to contact the field coils which will effectively short out the starter. Usually, repeated attempts at starting will result in the starter motor getting very

Yamaha YTM 200/225

hot. Other possible causes of starter motor trouble include worn brushes, a worn or dirty commutator, or a defective armature.

Starter Solenoid

The solenoid is located beneath the seat on the left side of the frame.

1. If the battery is in reasonably good condition, and nothing at all happens when the starter button is pushed, check the solenoid.

2. Disconnect the starter cable at the solenoid. When the button is pushed, there should be an audible "click" which indicates that the solenoid is opening.

3. If further testing is necessary, remove the solenoid from the machine.

CAUTION: Be sure to disconnect the cables at the battery before disconnecting the solenoid terminals.

4. Connect a fully charged 12-volt battery across the solenoid low-tension leads and check for continuity across the high-tension terminals with an ohmmeter or self-contained test light. If there is no continuity, replace or repair the solenoid.

5. Check for continuity across the low-tension terminals with an ohmmeter or self-powered test light. Resistance should be 3.5 ohms. If there is no continuity, the primary winding of the solenoid is broken, and the unit must be replaced.

6. If starter trouble began just after the starter button housing was disassembled or moved for any reason, check the connections at the switch as they may have come adrift.

Starter Motor

REMOVAL

1. Disconnect the high tension lead at the starter motor.

2. Disconnect the brake pedal return spring.

3. Remove the starter motor bracket screws (4) and take off the bracket.

4. Remove the starter motor.

INSPECTION

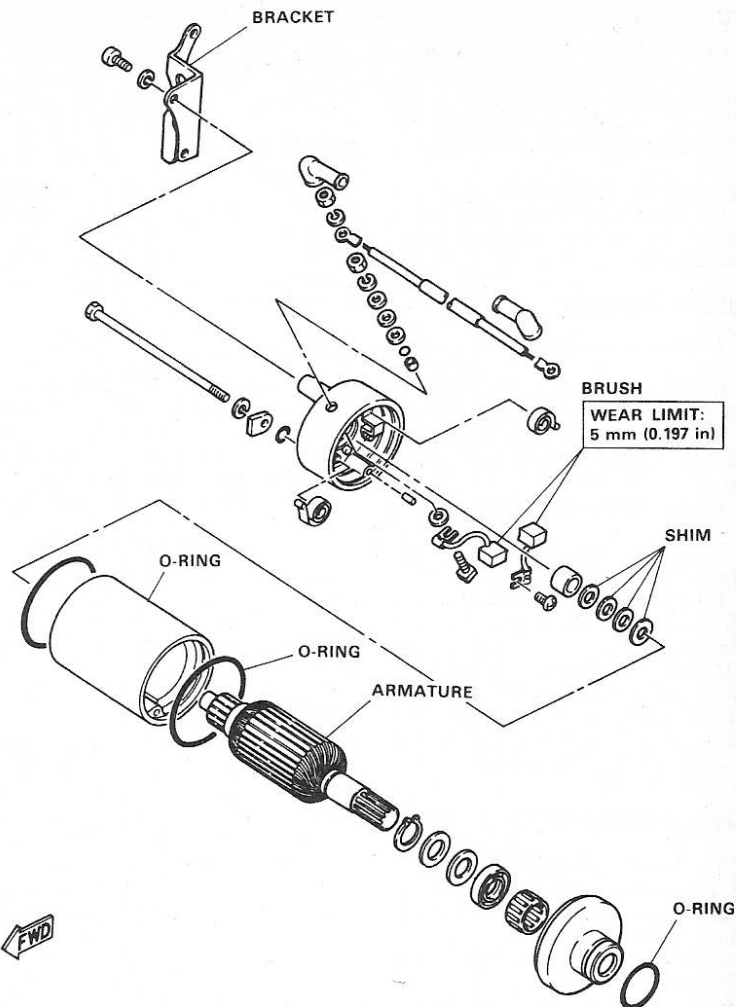
1. Take out the two screws and remove the starter side cover.

2. Check electrical continuity between the commutator and armature core using a multimeter or test light and battery. If continuity exists, the armature coil is grounded and the complete starter motor unit must be replaced.

3. Check for continuity between all of the commutator segments. Continuity must exist in each case (maximum allowable resistance: 0.023 ohms).

4. Check continuity between the brush that is wired to the stator coil and the starter motor cable. Lack of continuity indicates an open circuit in the stator coil, and the starter motor unit should be replaced. Resistance should not exceed 0.05 ohms.

5. Examine the carbon brushes for



Electric starter motor

damage to the contact surfaces and measure their length. Replace the brushes as a set if either one measures less than 5.0mm (0.2 in.), or if they are damaged in any way.

6. Brush spring tension should be measured with a small pull-scale. Replace the springs if they have weakened to less than 400g tension.

7. The mica undercut of the commutator should be maintained at 0.7mm (0.027 in.). Any carbon deposits should be cleaned out of the commutator grooves, and a piece of hacksaw blade or the like used to increase the undercut depth if necessary.

8. Polish the commutator with fine emery cloth and then clean it thoroughly before installing.

9. Measure the diameter of the commutator. The armature should be replaced if the measurement is less than 22mm (0.87 in.).

10. Check the condition of the armature bearings and replace them as a set if any damage is noted.

11. Check the condition of the oil seal and replace it if the seal lips are cracked or worn.

12. Unsealed bearings should be lubricated with 20W or 30W motor oil before assembly. Coat the lips of the oil seal with white grease before assembly.

INSTALLATION

1. When installing the starter motor, be sure that the O-ring is not damaged.

2. Tighten the mounting screws to 5 ft. lbs.

Cut-Off Relay

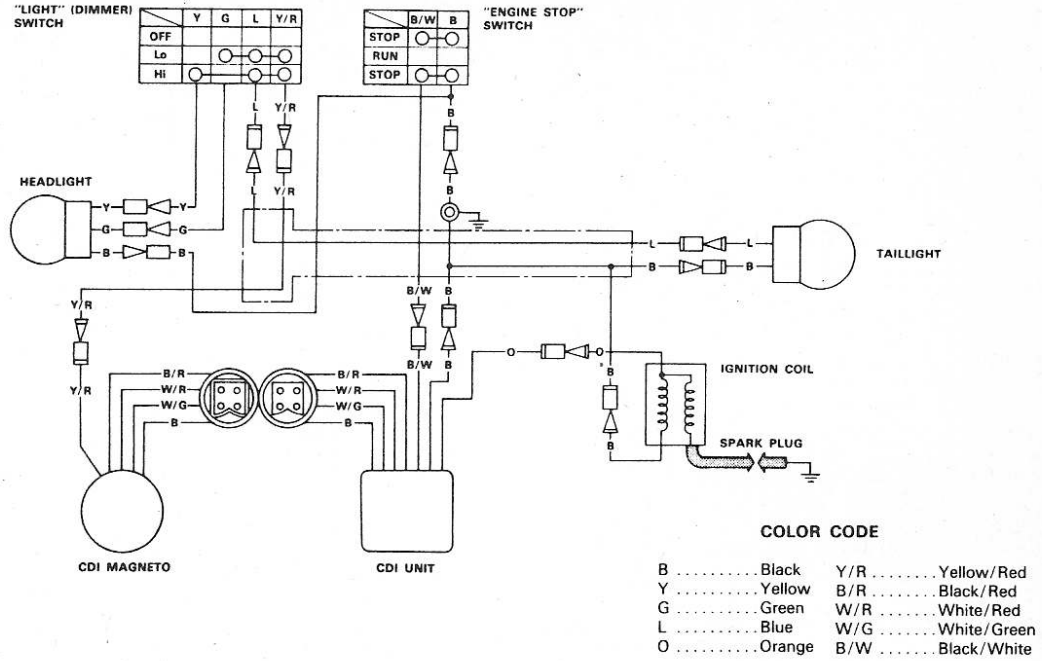
The relay is located beneath the seat/cowl on the right side of the frame.

1. Remove the relay from the rubber clamp. Disconnect the wiring at the plastic connector.

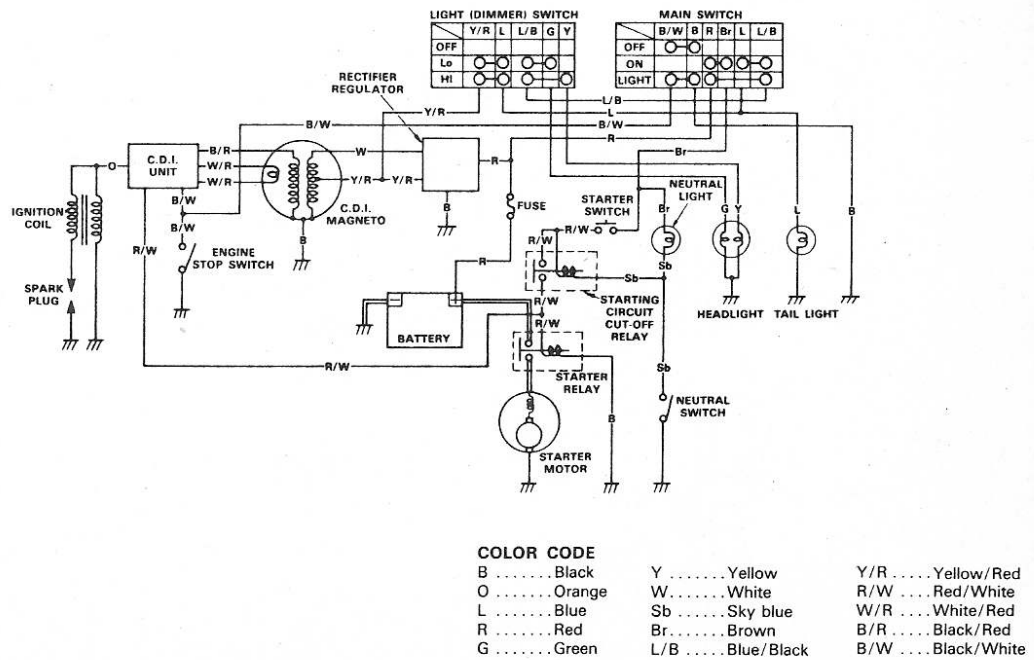
2. Check the resistance of the relay windings. Reading should be about 75 ohms. If reading is not correct, replace the relay.

3. Put 12 VDC across the windings. Make a voltage reading as shown. If the voltmeter does not show 12 V, replace the relay.

Yamaha YTM 200/225

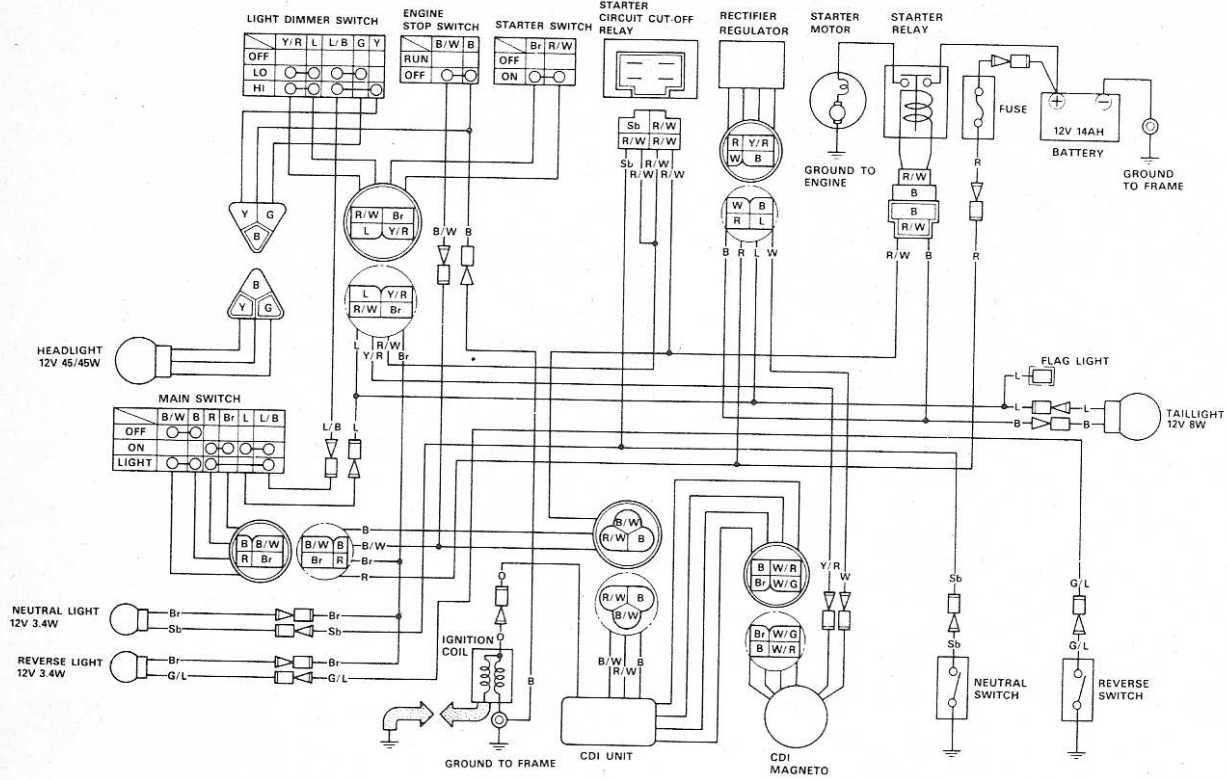


YTM 200K-N

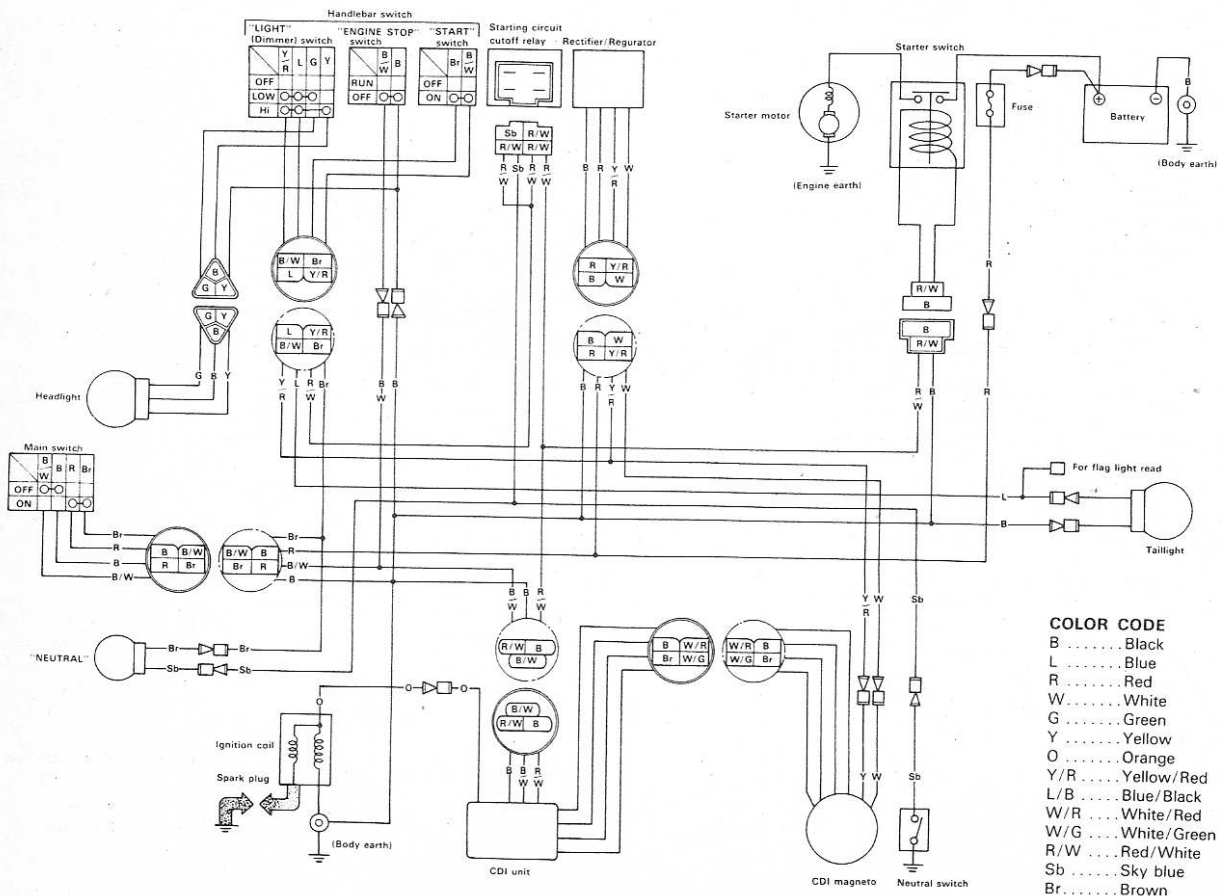


YTM 200EK, EL, EN

Yamaha YTM 200/225



YTM 200ERN



YTM DXK, DXL, DXN

CHASSIS

FRONT WHEEL

Removal

1. Place safety stands or similar devices beneath the engine to support the front wheel a few inches off the ground.
2. Disconnect the brake cable by running the adjuster at the hand lever all the way in and the wing nut. Disconnect the cable from the hand lever and then from the brake plate.
3. Remove the cotter pin from the axle nut.
4. Remove the axle nut.
5. Support the wheel to take the weight off the axle and pull the axle out.
6. Remove the wheel from the forks.

Inspection

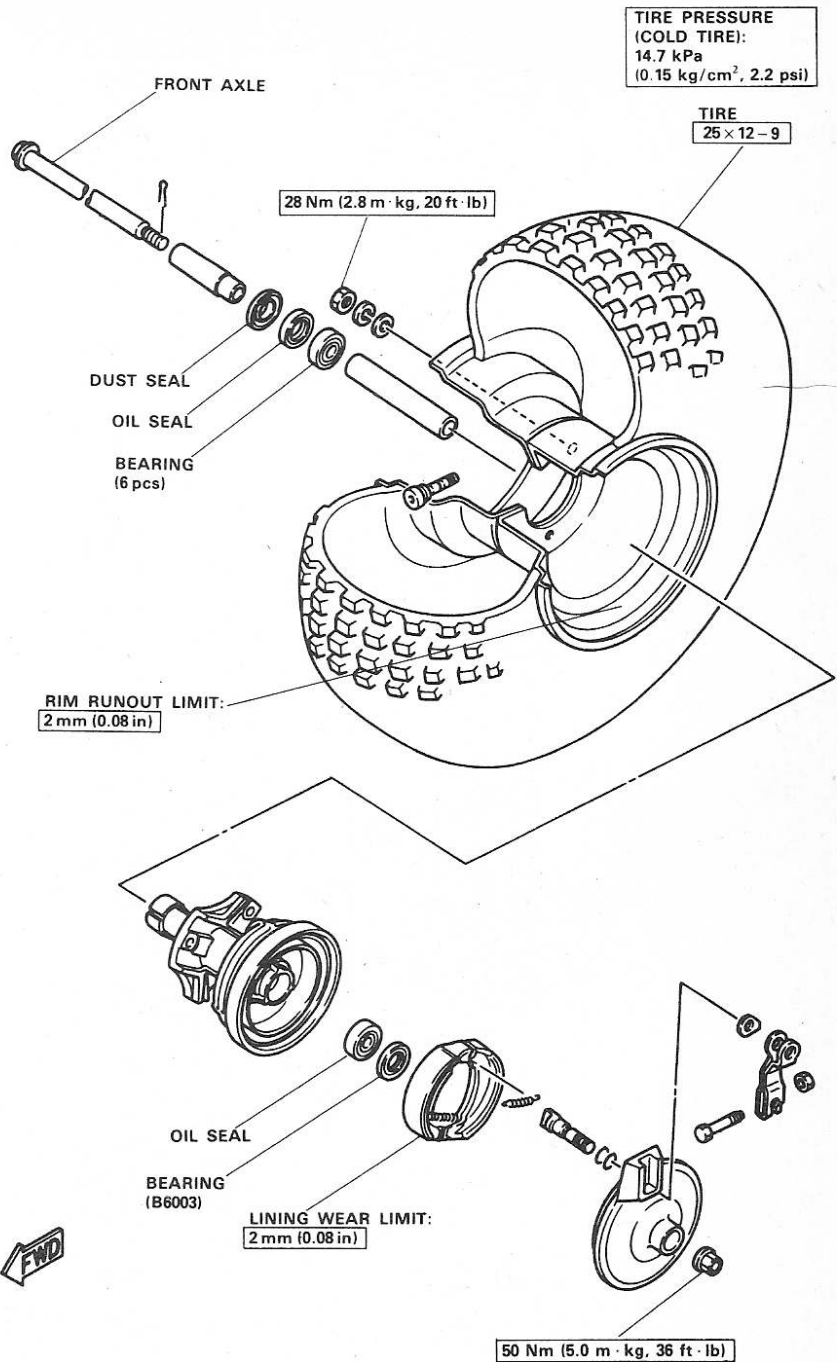
1. Remove any rust or corrosion from the axle with fine emery cloth.
 2. Check axle run-out. If there is any at all, replace the axle.
- CAUTION:** Do not attempt to straighten a bent axle. Replace it.
3. Check the rim for damage.
 4. Check wheel run-out. Maximum allowable run-out in both vertical (up and down) and lateral (side-to-side) directions is 2.0mm (0.08 in.).
 5. Replace any rim which is damaged or which exceeds run-out limits.

Installation

1. Put a light coating of lithium-based soap grease on the lips of the wheel grease seals.
2. Install the wheel in the forks, engaging the brake anchor with the lug on the forks.
3. Install the axle.
4. Tighten the axle nut to 36 ft. lbs.
5. Install a new cotter pin.
6. Connect the brake cable and adjust lever play as outlined in "Maintenance."

FRONT BRAKE

1. Take the brake plate assembly out of the wheel.
 2. Check the thickness of the brake shoe linings at the middle and the ends. If less than 2mm (0.08 in.) at any point, both shoes should be replaced.
 3. Check the linings for scoring or other evidence of unusual wear. Damaged linings must be replaced. If the linings are scored, check the brake drum as well.
 4. Linings should be sandpapered to remove any glaze or dirt, then cleaned thoroughly prior to installation.
- CAUTION:** Do not allow any type of solvent or lubricant to contact the linings.
5. The linings can be removed from the brake plate by pulling them off together.
 6. Check the spring for damage, rust and corrosion, etc.
 7. After removing the shoes, the brake cam can be removed from the brake plate.
 8. Remove any old grease with solvent, then remove any rust or corrosion with medium grade sandpaper.
 9. Lubricate the cam with a lithium-based grease before installation.



Front wheel assembly

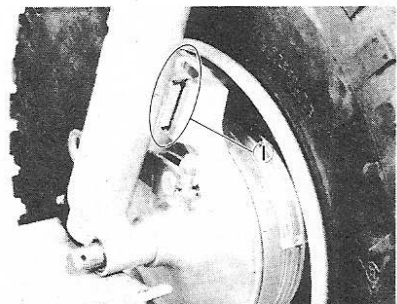
10. Check that the brake drum surface is smooth and featureless. If scoring is noted, the drum should be turned down on a lathe.

3. Pry out the grease seals on both sides of the hub.

FRONT WHEEL BEARINGS

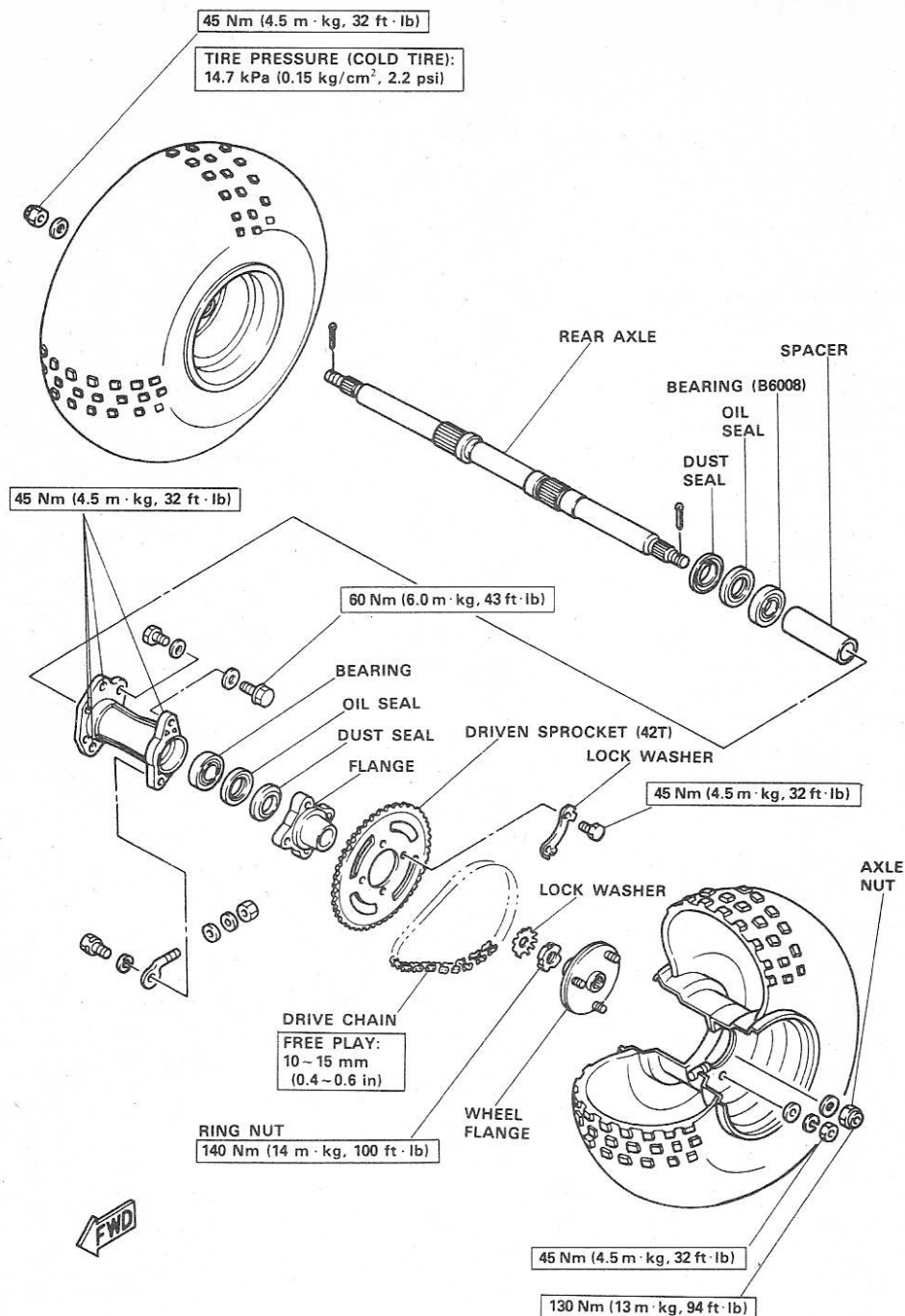
Removal

1. Wheel bearings should be checked before removal is attempted. Rotate the wheel and listen for unusual noise. Place your hand on the fork tube and see if you can feel any vibration while the wheel is spinning.
2. After removing the wheel from the machine, remove the brake plate.



Front wheel brake anchor

Yamaha YTM 200/225



Rear wheel assembly (chain drive)

4. Reach through the hub with a suitable punch. Move the wheel bearing spacer as far as possible to one side to achieve a purchase on the wheel bearing and drive it out.

5. Remove the spacer.

6. Remove the other bearing in the same manner.

Inspection

1. Wash the wheel bearings thoroughly in a solvent to remove all of the old grease.

2. Inspect the general condition of the bearings. There should be not rust, pitting, or obvious signs of wear or damage on either balls or races.

3. Slowly rotate the bearings. Rotation should be smooth, noiseless, and free of binding or unevenness. If any of the above conditions exist, both bearings should be replaced.

4. Place each bearing on a flat surface and hold the inner race firmly in place. Attempt to move the outer race up and down. If any play is evident, the bearings should be replaced.

5. If equipment is available, a dial gauge can be used to check bearing run-out. Pass the axle through each bearing in turn and check the axial and diametrical run-out with the gauge. If axial run-out exceeds 0.1mm (0.004 in.) or if diametrical run-out is greater than

0.05mm (0.002 in.), the bearings should be replaced.

Installation

Assembly is the reverse of the above. Note the following points:

a. Pack the bearings with a good grade of wheel bearing grease. Put a small handful of the grease in the hub as well.

b. Do not forget to install the spacer in the hub before installing the bearing.

c. Bearings may be driven into place using a suitably sized socket or a bearing driver. If one side of the bearing is sealed,

install it with the sealed side facing outward.

d. Use new grease seals and lubricate them with oil to make installation easier.
CAUTION: Do not strike the center race when installing bearings. The driver should contact the outer race only. Be sure that the bearings are driven straight into the hub and not cocked or tilted.

REAR WHEELS

Removal

1. Block the front tire so the machine won't move.
2. Apply the parking brake.
3. Jack up the rear wheel you wish to remove so that it is an inch or so off the ground.
4. Remove the lug nuts.
5. Pull off the wheel.

Installation

1. If three lug nuts are used on the wheel, tightening torque is 32 ft. lbs.
2. If four lug nuts are used, tightening torque is 20 ft. lbs.

REAR BRAKE

Removal

1. Block the front wheel so that the machine cannot move.
2. Raise the rear of the machine so that the rear wheel are off the ground.
3. Back off the rear brake cable adjuster wing nuts.
4. Disconnect the rear brake cables and springs from the caliper lever.
5. Remove the caliper securing nuts.
6. Remove the caliper lever assembly and outer pad from the caliper body.
7. Remove the brake cover securing screws and take off the brake cover.
8. Remove the caliper securing bolts.
9. Pull out the disc plate.
10. Remove the caliper body from the rear wheel hub.

Pad Inspection

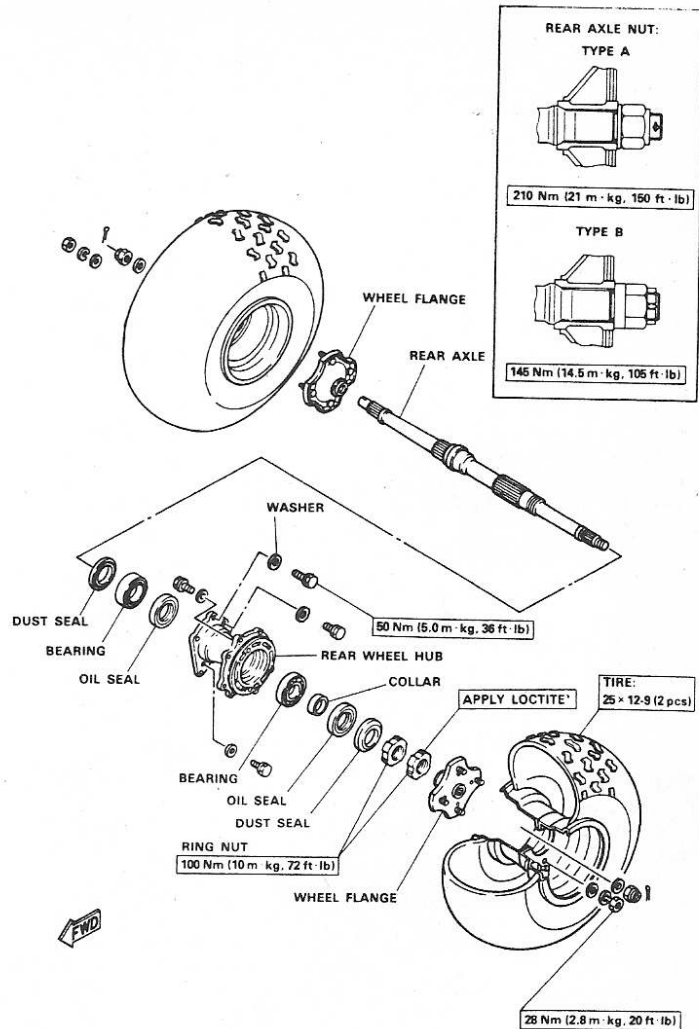
1. Replace the pads as a set if either is worn to a thickness of 1.5mm (0.06 in.) or less.

Brake Inspection

1. Inspect the caliper piston and replace it if it is rusted or otherwise damaged.
2. Check the brake disc. If there are score marks on the surface, the disc can be turned down, but only if the minimum thickness of 3mm (0.12 in.) is maintained.
3. Check disc thickness. If it is worn below 3mm (0.12 in.), it must be replaced.
4. Check disc run-out. Maximum allowable run-out is 0.5mm (0.02 in.).

Installation

1. Installation is the reverse of removal. Note the following torques.
CAUTION: When installing the caliper, be sure that bolts are installed in their original locations. The longer body bolt is installed in the higher position.



Rear wheel assembly (shaft drive)

2. Tighten the caliper body bolts to 32 ft. lbs.
3. Tighten the caliper nuts to 6.5 ft. lbs.
4. Adjust the brake after installation as outlined in "Maintenance."

REAR AXLE (CHAIN DRIVE)

1. Block the front wheel to prevent movement.
2. Jack the rear wheels a few inches off the ground using standard safety procedures to ensure that the machine is properly supported and stable. Apply the parking brake.
3. Remove the rear wheels.
4. Remove the axle nuts.
5. Remove the wheel flanges.
6. Remove the sprocket bolts after bending down the lock tabs which secure them.
7. Remove the axle ring nut.
8. Remove the chain cover. Disconnect the drive chain, or remove the engine sprocket cover and take off chain and both sprockets together.
9. Remove the sprocket and sprocket flange.
10. Disconnect the brake cables at the caliper.

11. Remove the rear brake assembly and brake disc.
12. Tap the left end of the axle with a plastic mallet and remove it from the hub.
13. To remove bearings from the hub, move the spacer aside and tap around the inner race with a suitable drift. Remove one bearing, the spacer and the remaining bearing.
14. Bearing inspection procedures are detailed under "Front Wheel Bearings," above.
15. Bearing installation is basically the same as outlined for the front wheel bearings.
16. Check rear axle run-out. Replace it if run-out exceeds 1.5mm (0.06 in.).
17. Assembly is the reverse of disassembly. Note the following points:
 - a. Use new cotter pins and lockwashers and lock tabs.
 - b. Tighten the axle ring nut to 100 ft. lbs.
 - c. Tighten the brake caliper bolts to 32 ft. lbs.
 - d. Tighten the sprocket bolts to 32 ft. lbs.
 - e. Tighten the axle nut to 94 ft. lbs.
18. Adjust the drive chain and brakes. See "Maintenance."

Yamaha YTM 200/225

REAR AXLE (SHAFT DRIVE)

1. Block the front wheel to prevent movement.

2. Jack the rear wheels a few inches off the ground using standard safety procedures to ensure that the machine is properly supported and stable.

3. Apply the parking brake.

4. Remove the rear wheels.

5. Remove the axle nuts.

6. Remove the wheel flanges.

7. Remove the trailer hitch bracket, if fitted.

8. Remove the rear axle ring nuts.

9. Release the parking brake and disconnect the rear brake cables and return spring from the caliper lever.

10. Remove brake covers, rear brake assembly and brake disc.

11. Tap the left end of the axle with a plastic hammer and remove it from the hub.

12. Remove the final gear housing securing bolts and nuts.

13. Remove the breather pipe and rear hub securing bolts.

14. Remove the final gear assembly and the coupling gear.

15. Pry out dust seals and oil seals.

16. Drive out the bearings as outlined under "Front Wheel Bearings," above. Inspection and installation procedures are basically the same as those detailed in that section.

17. Check rear axle run-out. Replace the axle if run-out exceeds 1.5mm (0.06 in.).

18. To assemble the rear axle, install the coupling gear into the housing.

19. Install the final gear assembly.

20. Tighten the gear housing nuts to 17 ft. lbs.

21. Tighten the gear housing bolts to 32 ft. lbs.

22. Tighten the rear wheel hub securing bolts to 36 ft. lbs.

23. Insert the axle from the right side, again tapping with a plastic mallet as on removal.

24. Grease and install the hub dust seals.

25. Install the rear axle ring nuts finger tight.

26. Install and adjust the rear brake assembly. See "Maintenance" for adjustment procedures.

NOTE: Caliper body bolts are tightened to 36 ft. lbs. The nuts are tightened to 6.5 ft. lbs. Be sure that the long body bolt is installed in the upper position.

27. Apply the parking brake.

28. Tighten the inside ring nut to 71 ft. lbs.

29. Using a non-permanent thread-locking compound on the threads of the outer ring nut, tighten it to 72 ft. lbs. as well.

NOTE: Do not use thread-lock on the inner ring nut. Hold the inside ring nut with a wrench while the outer is tightened.

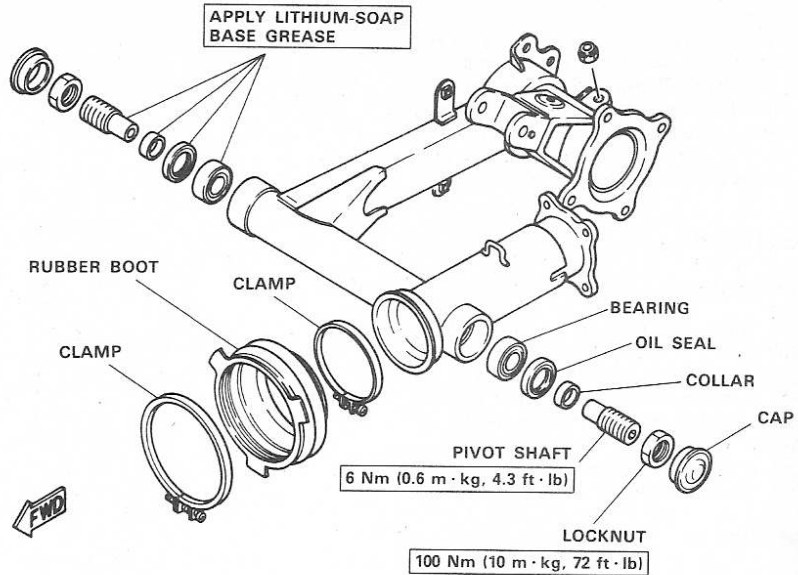
30. Install and tighten the rear axle nuts to 150 ft. lbs. (Type A) or 105 ft. lbs. (Type B). See illustration to distinguish types. Use new cotter pins.

31. Tighten the wheel lug nuts to 20 ft. lbs.

SWING ARM (DX)

Bearing Adjustment

1. The swing arm is mounted on tapered



Swing arm

bearings which should be checked for play periodically and adjusted if necessary.

2. Raise the rear wheels off the ground. Be sure that the machine is safely supported.

3. Remove the rear wheels.

4. Disconnect the shock absorber from the swing arm by removing the pivot shaft cotter pin and knocking out the pivot shaft.

5. Grasp the end of the swing arm and attempt to move it from side to side. There should be no noticeable play.

6. Move the swing arm up and down in the normal operating motion. Movement should be smooth and effortless.

7. Any lateral play, or tightness, noise or binding when moving vertically, calls for bearing adjustment.

8. Remove the rubber caps from the pivot on left and right sides of the swing arm.

9. Loosen the pivot shaft locknut on the right side.

10. Loosen the pivot shaft locknut on the left side.

11. Tighten the left side pivot shaft adjuster to 4.3 ft. lbs.

12. Hold the adjuster in place and tighten its locknut to 72 ft. lbs.

13. Repeat the procedure on the right side.

14. Check bearing action again as outlined above. If no improvement is noted, replace the bearings.

Removal

NOTE: The entire rear axle assembly may be removed along with the swing arm. If no service is required, this is the easiest way to take the rear end of the machine off.

1. Disconnect the shock absorber from the swing arm.

2. Loosen the locknuts and unscrew the pivot shaft adjusters.

3. Remove the swing arm assembly.

Inspection

1. Remove the bearing oil seal collars.
2. Remove the bearings.
3. Check for wear or damage. Bearings must be replaced in pairs.

4. Use lithium soap-based grease to lubricate the bearings.

5. Use new oil seals.

Installation

1. Reverse the removal procedure.

2. Tighten the bearings and check operation as outlined above.

Disassembly

Disassembly of the swing arm is basically the same as described for "Rear Axle (Shaft Drive)", above.

FRONT FORKS

DX Models

REMOVAL

1. Use safety stands or the like to support the front wheel a few inches off the ground.

2. Remove the front wheel.

3. Remove the fender.

4. Loosen the upper and lower triple clamp pinch bolts.

5. Pull each fork leg out of the triple clamps.

DISASSEMBLY

1. Loosen the rubber boot clamp screws and remove the boot from each leg.

2. Remove the rubber cap from the top of the fork.

3. Remove the circlip beneath the cap. This is done by pressing down on the spring seat and prying the circlip out of its groove with a small screwdriver.

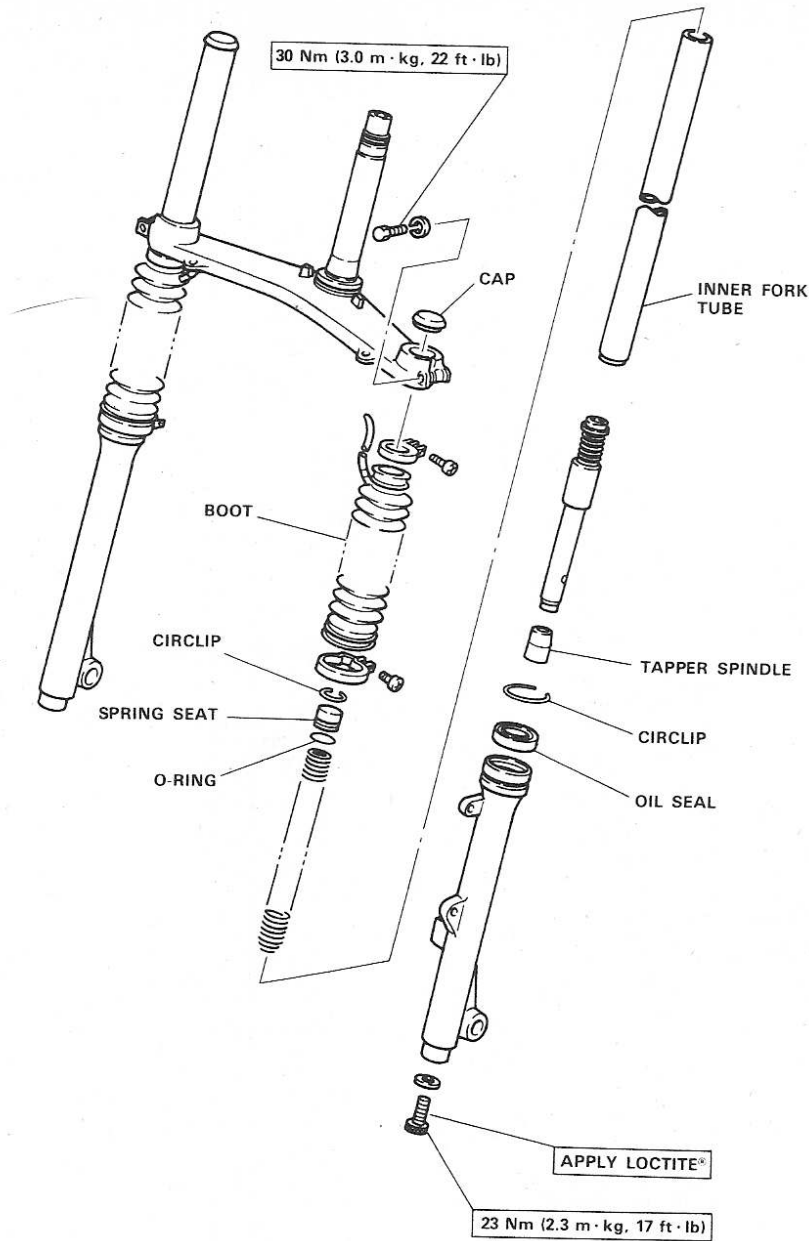
CAUTION: Discard the circlips once removed. New ones must be used when assembling the forks.

4. When the circlip is removed, the spring seat and fork spring can be taken out.

5. Pour off the old fork oil.

6. Remove the Allen bolt from the bottom of the fork leg.

7. Take out the damper rod assembly.



Front forks (DX)

8. Remove the oil seal retainer from the fork slider.

9. Pry out the slider oil seal. New seals must be used on reassembly.

INSPECTION

1. Check the fork tube for a bent condition. If bent, the fork tube must be replaced.

WARNING: Do not attempt to straighten bent fork tubes.

2. Check the fork slider for dents or other damage. Replace as required.

3. Check the fork tubes for corrosion or rust, especially in the area on which the slider oil seal rides. Remove any deposits with fine emery cloth.

4. Check fork spring free length. Replace springs, as a set, if either is less than 501.1mm (19.73 in.) in length.

5. Check the spring seat O-ring. Replace it if knicked or otherwise damaged.

ASSEMBLY

1. Clean all metal parts in a solvent.

2. Using new slider oil seals, press each into its slider with a large socket. Ensure that the seal is driven straight in and that it is fully seated.

3. Install the oil seal retainer. Be sure it is seated in the groove provided.

4. Lightly grease the lips of the slider oil seal and insert the fork tube into the slider.

5. Install the taper spindle and damper rod assembly.

6. Secure the damper rod with the Allen bolt at the bottom of the slider. Do not forget the copper washer. The Allen bolt should be secured with a non-permanent threadlocking compound. Bolt torque is 71 ft. lbs.

7. Add 4.0 oz. (117cc) of Yamaha fork oil or SAE 10 motor oil to each fork leg.

8. Install the fork spring. Note that the spring is installed so that the close coils are at the top of the fork.

9. Fit the spring seat.

10. Press down on the spring seat and install the circlip. Be sure it is properly seated.

CAUTION: A new circlip should always be used.

11. Install the boots. Install the rubber caps.

INSTALLATION

1. Push the fork legs into the triple clamps.

2. Align the top of each fork leg with the top of the upper triple clamp.

3. Tighten the lower triple clamp pinch bolts to 22 ft. lbs.

4. Tighten the upper triple clamp pinch bolts to 14 ft. lbs.

5. Tighten the boot clamps.

6. Install the front fender. Be sure that the breather tubes are correctly routed.

7. Install the front wheel.

Other Models

REMOVAL

1. Use safety stands or the like to support the front wheel a few inches off the ground.

2. Remove the front wheel.

3. Remove the front fender.

4. Loosen the upper and lower triple clamp pinch bolts/carrier bolts.

5. Pull the fork legs down and out of the triple clamp and remove the carrier, if fitted.

DISASSEMBLY

1. Loosen the clamp screws and take the boot off each fork leg.

2. Remove the rubber cap from the top of the fork tube.

3. Press down on the spring seat and pry out the retaining circlip with a small screwdriver.

NOTE: New circlips must be used during final assembly.

4. Remove the spring seat and the fork spring.

5. Remove the fork slider oil seal circlip and washer.

6. Position the inner tube about 2 in. from the end of its travel range.

7. Fill the fork completely with a suitable fork oil. The purpose of this procedure is to use the oil pressure to force out the fork seals.

8. Install the spring seat and circlip.

9. Slowly press the inner tube into the fork slider until the oil seal comes out.

CAUTION: Apply pressure slowly and gradually.

10. Remove the oil seal and guide bush.

11. Separate fork tube and slider.

12. Pour off the old oil.

13. Separate the components.

INSPECTION

1. Check the fork tubes for a bent condition. If bent, the tubes must be replaced.

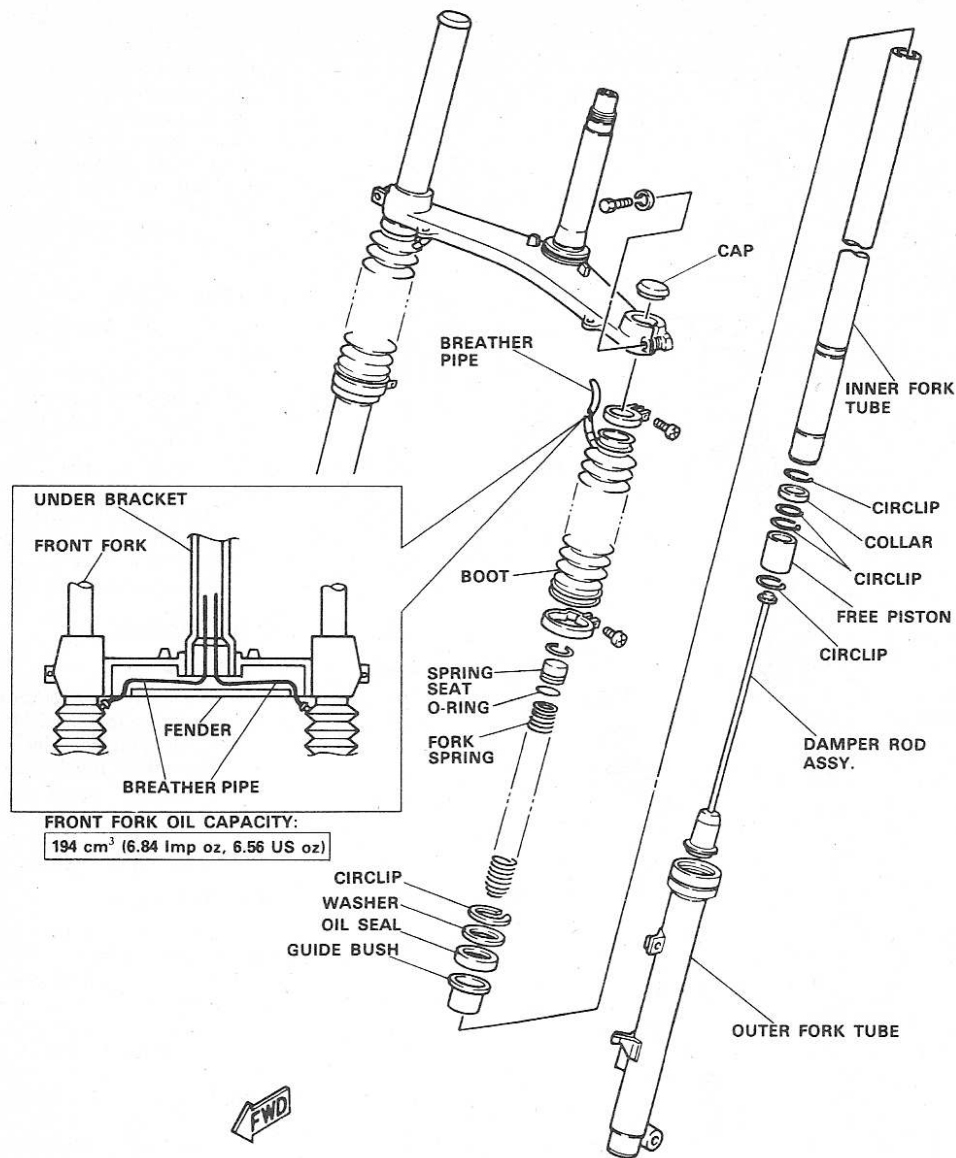
CAUTION: Do not attempt to straighten bent fork tubes.

2. Check the fork slider for dents or other damage. Replace as required.

3. Check the guide bush for wear or scoring. Replace it if it shows signs of damage.

4. Check the fork tubes for rust or corro-

Yamaha YTM 200/225



Front forks (except DX)

sion, especially in those areas on which the slider oil seal and the guide bush ride. Remove any deposits with fine emery cloth.

5. Check fork spring free length. Replace the fork springs as a set if either measures less than 395.1mm (15.56 in.).

6. Check the spring seat O-ring. Replace it if knicked or otherwise damaged.

ASSEMBLY

1. Clean all metal parts in a suitable solvent.
2. Insert the damper rod into the fork slider.
3. Install the guide bush and the slider oil seal on the fork tube.
4. Position the tube in the slider.
5. Press the oil seal into the slider.
6. Install the slider washer.
7. Install the seal circlip. Ensure that it is properly seated.
8. Pour 6.6 oz. (194cc) of fork oil into each fork leg. Use Yamaha fork oil or

equivalent, such as SAE 10 or 10W30 motor oil.

9. Install the fork spring. Note that the tapered end of the spring goes at the lower end of the fork.

10. Install the spring seat.

11. Fit the spring seat circlip. New circlips must always be used. Be sure the circlip is properly seated.

12. Install the boot on each fork leg.

INSTALLATION

1. Push each fork leg up into the triple clamps, positioning the carrier in its place, if one is fitted.
2. Position the fork legs so that the top of the fork tube is 9mm (0.35 in.) above the surface of the upper triple clamp.
3. Tighten the lower triple clamp bolts to 22 ft. lbs.
4. Tighten the upper triple clamp bolts to 14 ft. lbs.

5. Tighten carrier bolts, if equipped, to 11 ft. lbs.

6. Install the fork rubber caps.

7. Install the front fender. Be sure the breather tubes are correctly routed.

8. Install the front wheel.

STEERING STEM

Adjustment

Refer to "Maintenance" for steering stem bearing adjustment.

Removal

1. Remove the front panel/headlight securing bolts.
2. Disconnect headlight wiring at the connector.
3. Remove the front wheel.
4. Remove the fender.
5. Remove the front forks.

6. Remove the upper triple clamp steering stem bolt.

7. Take off the upper triple clamp.

8. While supporting the steering stem assembly with one hand, carefully unscrew the ring nut.

CAUTION: The uncaged balls are liable to come out as this is done.

9. Lower the steering stem until clear of the frame lug. Note the uncaged balls in the frame lug and the steering stem.

Inspection

1. Check all of the bearing balls after washing them thoroughly in solvent.

2. The balls should be replaced if rusted, pitted, dented, or scored.

3. Inspect the condition of the ball races checking for pitting, a rippled surface, or dents.

4. Replace all of the balls if any wear or damage is noted, and the races as well.

The bearing races in the frame lug are a press-fit and should not be removed unless replacement is necessary. If replacement is necessary, the old races can be removed by reaching through the frame lug with a suitable punch and tapping the race evenly around its circumference to remove it from the inside of the frame lug. Be sure that the race does not become cocked in its seat upon removal.

New races are installed with a suitably sized bearing driver, i.e., one which will drive the race squarely into its seat. Be certain that the race goes straight in.

These races can also be installed using a block of hard wood or a large socket of sufficient size to cover the race in place of a bearing driver.

Assembly

1. The steering stem bearing specifications are:

Upper race: $\frac{1}{4}$ in., 22 ea.

Lower race: $\frac{3}{16}$ in., 19 ea.

2. Use a good grade, medium-weight bearing grease for lubrication.

3. Apply a coating of grease to the steering stem race. Imbed 19 of the $\frac{3}{16}$ in. bearing balls in it.

4. Grease the race in the frame lug. Place 22 of the $\frac{1}{4}$ in. balls in it.

5. Slip the steering stem up into the frame lug.

6. Once in place, hold it so none of the balls can slip out.

7. Install the upper bearing cover.

8. Thread the ring nut on. Screw it on as far as possible by hand, then adjust it to take all the play out of the steering stem. The bearing adjustment procedure is outlined in "Maintenance."

9. The remainder of the procedure is the reverse of disassembly.

NOTE: The handle bar clamps are installed with the gap towards the rear. Tighten the forward most bolts first (14 ft. lbs.).

REAR SHOCK ABSORBER

Removal

1. Place a suitable stand beneath the engine and raise the rear wheels a few inches off

the ground. Block the front wheel so that the machine cannot move. Be sure that the machine is secure and safely supported.

2. Remove the seat and rear fender.

3. Remove the upper shock absorber mounting bolt.

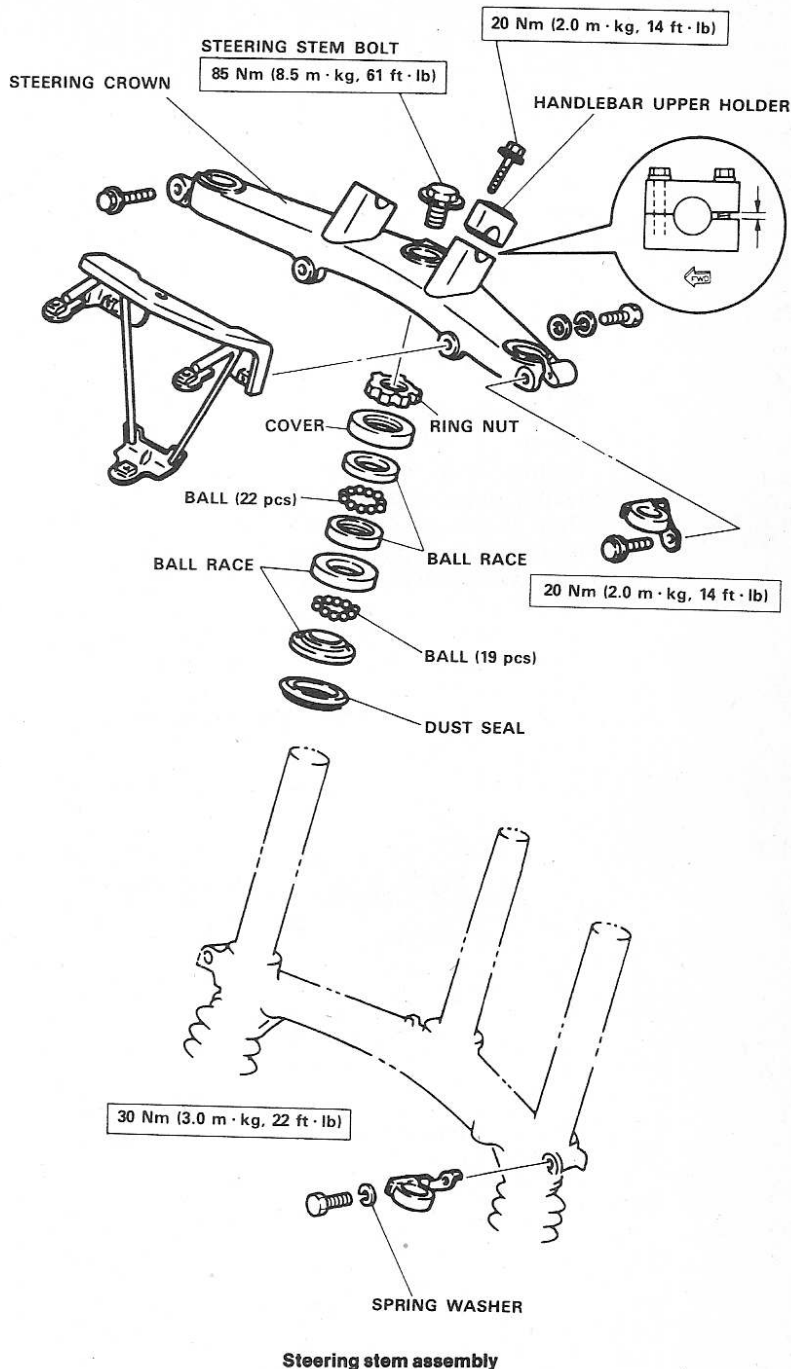
4. Remove the cotter pin on the lower shock absorber mount.

5. Drive out the pivot shaft.

6. Disengage the shock absorber from the swing arm and remove it from the machine.

Inspection

Repair is not possible. If the shock absorber leaks or has been damaged, it must be replaced.



Steering stem assembly

CAUTION: Gas filled shocks must be de-pressurized before disposal. This procedure must be left to qualified service personnel.

Installation

1. Grease the pivot shaft and upper mounting bolt lightly with lithium soap-based lubricant.

2. Tighten the upper mounting bolt to 18 ft. lbs.

Adjustment

1. Spring pre-load can be adjusted by turning the adjuster at the lower end of the unit.

Yamaha YTM 200/225

2. Loosen the adjuster locknut.
3. Turn the adjuster CW to increase pre-load, CCW to decrease it.
CAUTION: Do not decrease pre-load from standard position.
4. One turn of the adjuster decreases spring length by 1mm (0.04 in.). Changes should be made in 10mm (0.4 in.) increments, or 10 turns at a time.
5. Standard setting positions the adjuster 57.8mm (2.28 in.) above the centerline of the pivot pin (punch mark).
6. Maximum allowable distance is 67.8mm (2.67 in.).

CHASSIS TORQUE SPECIFICATIONS

Part	Torque (ft lbs)
Front axle nut	36
Rear wheel lug nuts (4)	20
Rear wheel lug nuts (3)	32
Brake cams	6.5
Lower triple clamp pinch bolts	22
Upper triple clamp pinch bolts	14
Steering stem bolt	65
Handlebar bolts	14
Front engine mounting brackets	24
Upper engine mounting brackets	24
Rear engine mounting brackets	32
Rear axle shaft nuts (chain drive)	94
Rear axle shaft nuts (shaft drive)	150 (Type A) 105 (Type B)
Rear axle shaft ring nut (shaft drive)	72
Rear axle shaft ring nut (chain drive)	100
Rear hub to frame bolts	36
Rear brake caliper body (shaft drive)	36
Rear brake caliper body (chain drive)	32
Footpegs	24

GENERAL TORQUE SPECIFICATIONS^①

Nut ^②	Bolt ^③	Torque (ft lbs)
10	6	4.3
12	8	11
14	10	22
17	12	40
19	14	61
22	16	94

① Unless otherwise noted.

② Wrench size.

③ Thread diameter.