

'91 - '93

OWNER'S MANUAL

Updated 02/2015

250/406

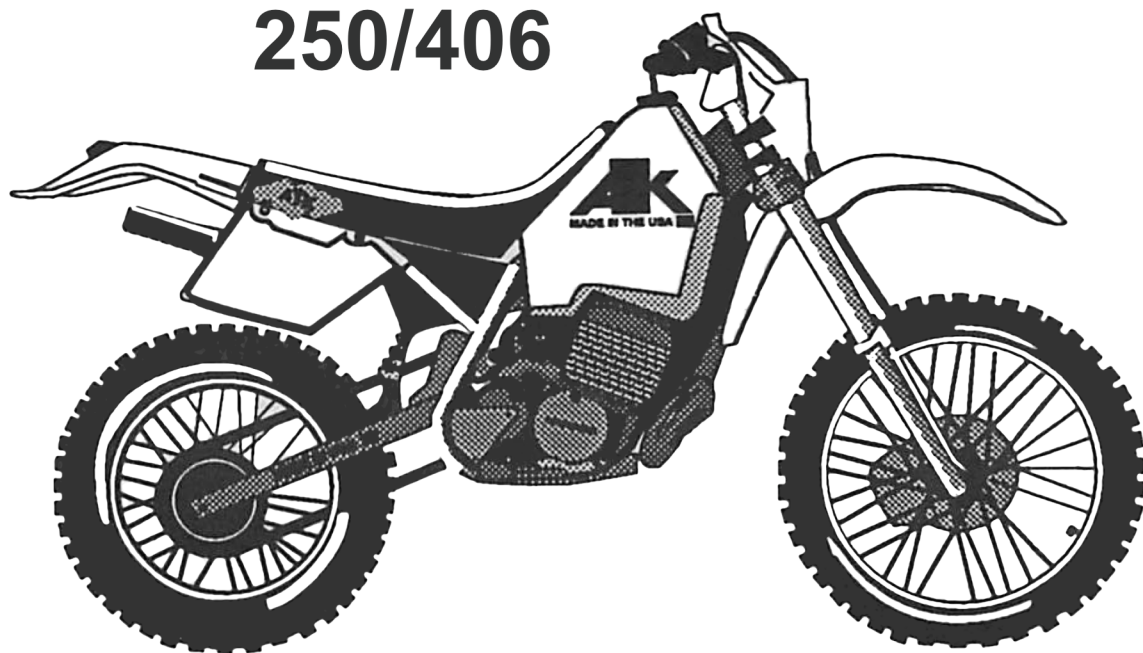


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Before You Ride

Pre-Ride Inspection

Before jumping on your machine and ***“blasting”*** around, take caution and check the condition of some important items.

- 1) Be sure the throttle is free-moving and snaps back to a closed position when desired
- 2) With the engine running, see if the KILL button stops the motor.
- 3) Check to see if the brakes stop the wheels.
- 4) Check to see if the chain is adjusted correctly.
- 5) Check the air pressure in the tires. The front tire should have 14 psi and the rear should have 10-12 psi.
- 6) Turn the fuel petcock lever on the **ON** position.
- 7) Read the remainder of this **Owner's Manual!!!**

Break-In Period

Taking a little bit of care in the way you treat your motorcycle during the initial operation will reward you with extended life and increased performance.

In the first three hours of operation, the engine should not be subjected to excessive and prolonged RPM or extreme loads. In other words -

Don't lug the motor down or rev for extended periods!

During the break-in period, adjustments may be necessary to the clutch, throttle, spokes, drive chain, and nuts and bolts.

Both front and rear brakes require a “seating-in” process.

Fuel and Oil

Operate your ATK with the best fuel you can obtain. We recommend unleaded premium (92 octane) at the correct oil mixing ratio.

Never experiment with methanol, naphtha, or similar products. Avoid octane boosters completely. For best results, use a 50/50 mix of *Race* or *Aviation* fuel and unleaded premium.

When selecting an oil to mix with your gas, use a high quality 2-cycle oil. Mix the oil according to the manufacturers recommendations.

Carburetion

Your ATK is jetted rich for break-in purposes. Supplied with the bike is an assortment of jets that will enable you to dial your bike into almost any condition. After the break-in period and your bike won't idle, it is probably too rich on the bottom. Try the next size up needle (Example: change a 56 to 57). Changing the needle is like changing a pilot jet. The clip position on the needle will control the midrange. Typically, going up on the needle from stock (changing to a 57) will clean up the bottom to where it will idle and run well in most areas of the country. Consult your dealer as to what jetting works best in your area after break-in period.

White Power Upside -Down Forks

Routine Maintenance

To achieve optimum performance from your White Power 4054 front forks, follow these maintenance procedures:

- 1) After riding sessions, loosen the breather plugs (located on top of the upper fork cap) a few turns to release any air pressure build up.
- 2) Also, pull the fork wipers down and clean around the seal area after a build-up of dirt occurs.
- 3) After every fifty (50) hours of riding, or when damping becomes erratic, change the fork oil.

Oil Replacement

To replace the fork oil, loosen the breather plugs to release any air pressure built up in the fork. Loosen both the upper fork cap and lower fork cap approximately one turn. Remove the front wheel, brake caliper assembly and brake line guides, and lay them aside the machine. Do not remove the brake line from the caliper.

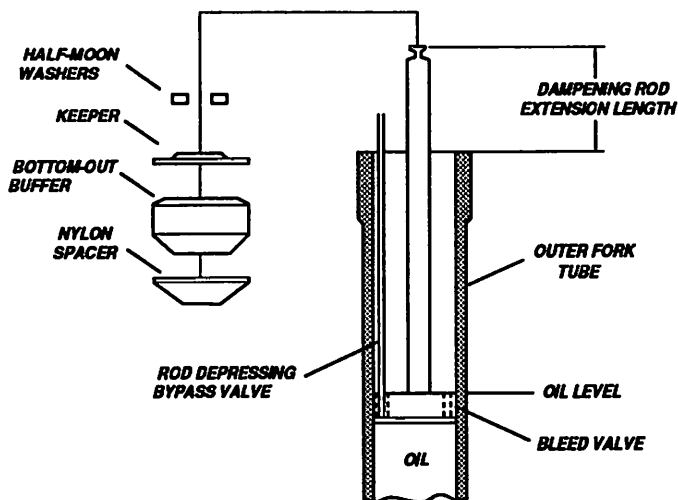
Remove the fork tube from the triple clamps and turn the fork upside down. The bottom fork cap should be facing up. Unscrew the bottom fork cap and remove the preload spacer and fork spring. Drain the fork oil and pump the fork a few times to drain the remaining oil. Replace the fork spring and preload spacer, and screw on the fork cap. Turn the fork over and unscrew the top cap and compress the fork slightly to remove the half-moon washers. Pull out the keeper by pressing on one side and compressing the fork. Remove the bottom-out buffer and nylon spacer. Turn the fork over and drain the remaining oil.

Next, compress the fork so you can see the bypass valve. Take a thin rod (1/8" or less O.D.) and lightly depress in one of the six holes in the valves as shown in *Figure 1* (page 5). This will allow the oil to drain down to the lower fork leg when poured. The standard oil level measurement location in the White Power 4054 fork is where the oil comes up flush with the distance between the top of the dampening rod to the top of the outer fork top, as shown in *Figure 1*.

We recommend the oil level be flush with the top of the bleed valve when the dampening rod is extended 4-5/8" (120mm) from the fork tube.

The quantity of oil in the fork - 18 to 21 ounces of 10 weight oil only affects the last fifty percent of travel. The more oil in the fork, the less the fork will have a tendency to bottom out. Never exceed an oil level height of 5-1/16" (130mm) and never go below 3-15/16" (100mm).

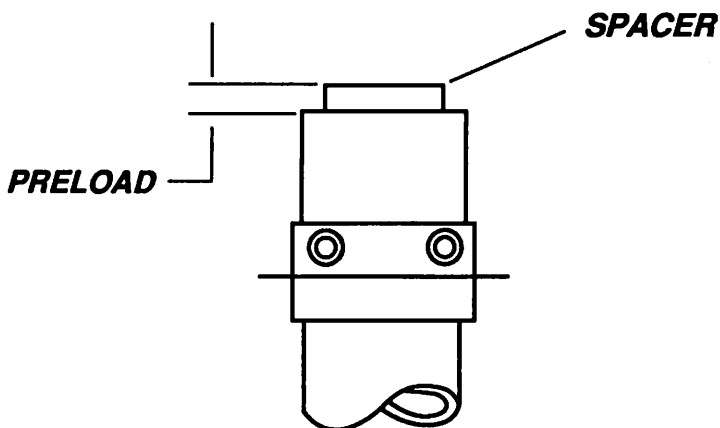
Figure 1



Preload Adjustment

To change the initial stage of travel in the fork, decrease or extend the length of the preload spacer. By decreasing the length of the preload, the initial travel will be softer. See *Figure 2* for preload measurement.

Figure 2



Example

Dampening Rod Length From Oil Level

3-15/16" (120 mm)
5-1/8" (140 mm)
5-11/16" (150 mm)

Fork Action

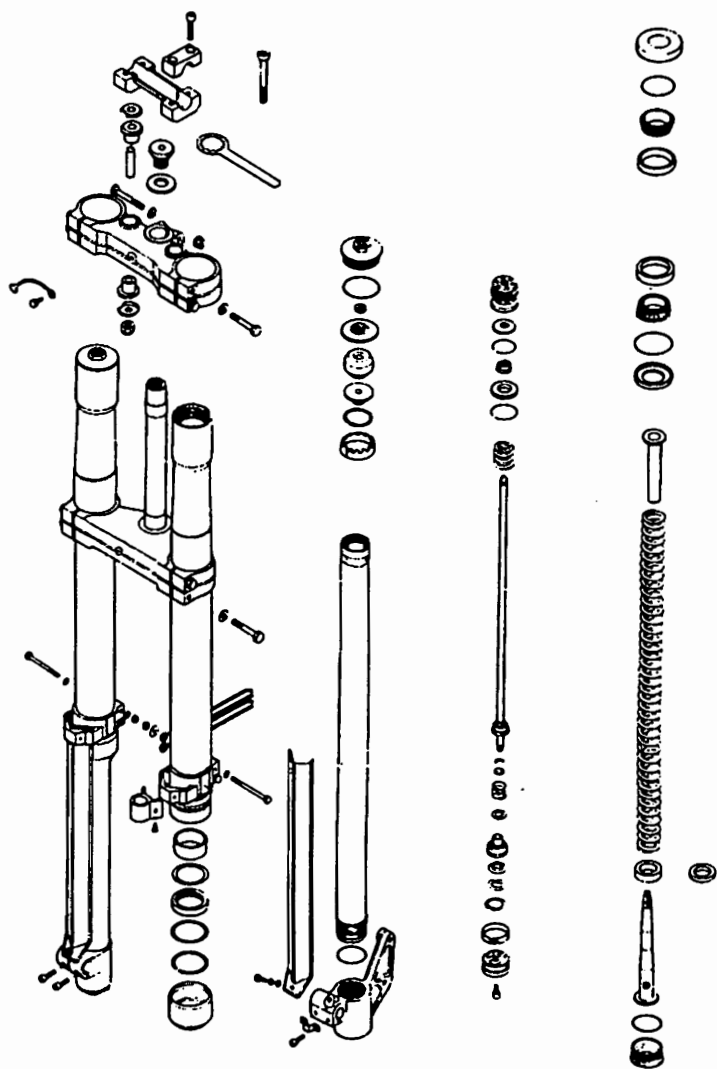
Soft
Medium
Hard

Spring Rate

If increased bottoming is noticed, then the front fork springs are too light. An optional ATK Multi-Rate Fork Spring Kit is available in a 23 to 25 lb. range through your ATK dealer.

Figure 3

Front Fork Schematic



REAR SHOCK

Rear Suspension Sag

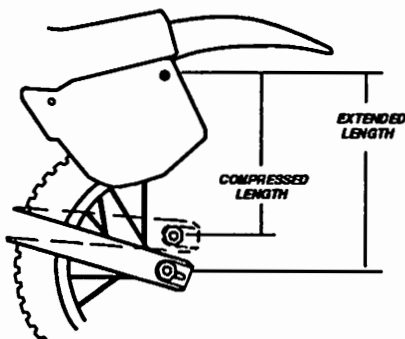
The rear suspension should sag 2" - 3" (51 - 76mm) when sitting on the bike in normal riding position. This small sag requirement is due to the A-Track Chain Torque Eliminator, which increases the usable rear suspension. From our experience, we recommend that for motorcross racing, 2" to 2-1/2" (51 - 64mm) of sag is best; for trail riding use up to 3" (76mm).

Prop the bike up on a center stand so the rear wheel is off the ground, thus unloading the rear spring of the bike's weight. Measure the distance between the center of the axle to the center of the left side number plate's rear attachment screw (as shown in *Figure 4*). This distance is the extended travel length.

Take the bike off the stand and sit on it in your normal riding position. Measure the new distance between the center of the axle to the center of the left side number plate's rear attachment screw. The distance is the usable travel length. Subtract the usable travel length from the extended travel length. The difference between the two equals the suspension sag.

$$(\text{Extended Travel Length} - \text{Usable Travel Length}) = \text{Suspension Sag}$$

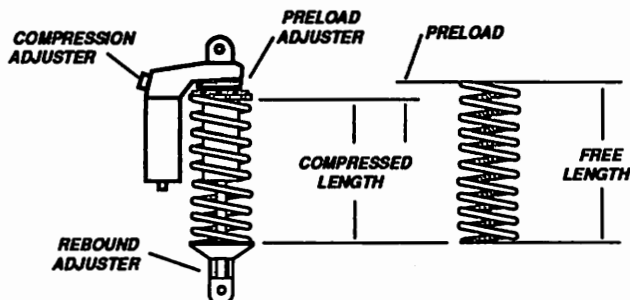
Figure 4



To achieve your desired suspension sag it will be necessary to adjust the rear shock's preload. The preload is equal to the free length of the rear spring minus the compressed length of the spring.

$$(\text{Free Length} - \text{Compressed Length}) = \text{Preload}$$

Figure 5



The standard free length of the rear spring is approximately 8-11/16" (220mm). This length can vary slightly from spring to spring. The preload should be adjusted between 0" and 1/2". The preload must never exceed 1/2". If the preload falls out of the 0" - 1/2" dimensional boundary while obtaining the 2" - 3" of suspension sag, a heavier or lighter spring rate is necessary.

Example

<u>Sag</u>	<u>Preload</u>	<u>Comments</u>
2" (50 mm)	1/8"	Good
3" (76 mm)	0"	Good
3" (76 mm)	5/8"	Heavier spring rate needed
2" (50 mm)	0"	Lighter spring rate needed

Spring Rates Available

Kg/mm	7.8	8.2	8.7	9.2	9.7
lb./in.	435	460	485	515	540

Compression Dampening

The compression dampening adjustment knob is shown in *Figure 5*. There are seven (7) compression settings from which to choose. Turn the knob counterclockwise until it stops; at this position the compression dampening is set at the softest rate. To increase dampening, turn the adjustment knob clockwise one setting (click) at a time.

There is no standard setting for the compression dampening; this is determined by track conditions and each rider's ability. From our racing experience, we recommend you set the compression dampening between one (1) and four (4).

Rebound Dampening

The rebound dampening adjustment wheel is located under the spring retainer as shown in *Figure 4*. There are eleven (11) rebound settings from which to select. Setting one (1) is the weakest absorption - the shock absorber extends fast after compression. Setting eleven (11) is the strongest absorption - the shock extends slowly after compression. Like the compression dampening, the rebound dampening does not have a standard setting. From our racing experience, we recommend you set the rebound dampening between four (4) and seven (7).

DRIVE CHAIN

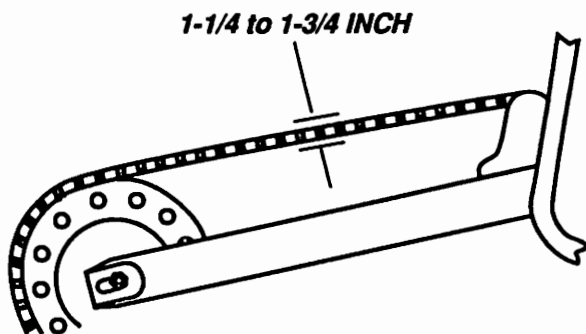
Chain Tension

Shift the transmission into neutral. Check the slack in the upper drive chain midway between the A-Trak's top roller and the rear sprocket. Drive chain slack should be adjusted to allow 1 - 1/4" to 1 - 3/4" (29 - 46mm) vertical movement by and as illustrated in *Figure 6*. The minimal slack requirement is due to the design characteristics of the A-Trak Chain Torque Eliminator, which keeps the chain at a near constant tension throughout the suspension travel.

Chain Maintenance

The drive chain should be checked, cleaned and lubricated after every ride. Never use an engine degreaser or solvent on the chain to clean it! This may damage the rubber O rings. When lubricating the chain, always use a lube designed for O ring chains. The A-Trak Chain Torque Eliminator rollers should be inspected every 15 hours of riding.

Figure 6



Chain Torque Eliminator Sprocket Inspection and Maintenance

The Chain Torque Eliminator (CTE) Sprockets should be inspected every 15 hours of operation (sooner if a pressure washer is used or the motorcycle has been operated in severe muddy conditions). To inspect, remove the sprockets from the swingarm and check to see that the bearings spin freely and smoothly. While you have them off, use a small penknife and pry out the seals of the bearing(s), rinse out with clean gasoline or contact cleaner, and repack with quality grease. Be sure to assemble with the wave washers on both sides of the sprocket (upper) to ensure proper clearance with the CTE plates.

Air Filter

We recommend using a foam filter oil designed for foam filters for use in our ATK. A good quality foam filter oil will be thin and easy to apply to the filter at first, then will tack up and get quite sticky after a few minutes and be resistant to dripping off. To apply, pour a liberal amount of oil into the filter (it is OK to leave the spring in) and massage oil into the foam being sure to coat the entire filter. Be sure to clean the airbox before installing the filter.

BRAKES

Rear Brakes

Brake Adjustment

The countershaft rear disc brake is the most effective stopping system ever designed. Applying the rear brake has no effect on the suspension. Therefore, those riders who steer with the rear brake or drag the rear brake will cause the brake fluid to heat up and the pads to wear excessively.

NOTE: Don't drag the brake - Use it for S-L-O-W-I-N-G!

Pedal height is important. Adjust the pedal tip low enough below the operator's boot so it will not be applied unknowingly.

Free play adjustment between the master cylinder piston and the actuating rod should always exist, from 1/16" to 1/8".

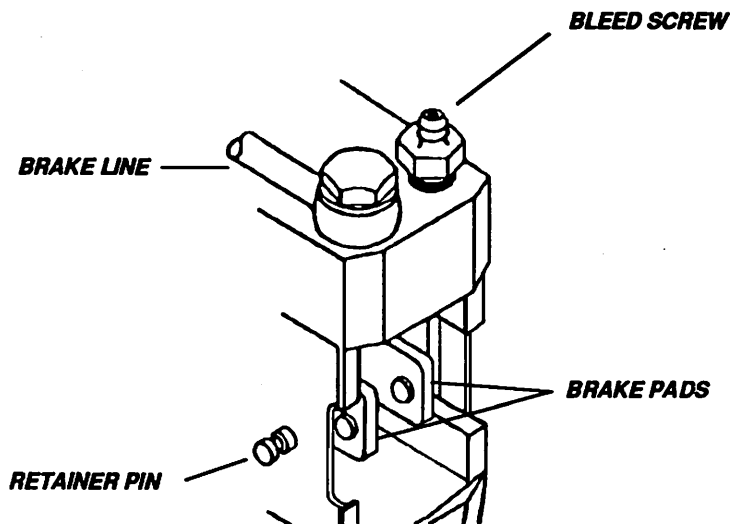
Brake Fluid Level

Fluid level should be approximately 1/8" (3mm) below the edge of the reservoir when refilling. Never let the fluid level get below the visual indicator.

Brake Pads

The brake pads should be checked before every race or ride. To check, pry off the plastic cover of the rear brake caliper to expose the pads and pin. If the pad lining thickness is less than 1/16", replace the pads. Remove the hitch clip from the retainer pin and remove the pin. When removing pads, slide each pad up to about half way out and use them to pressure the caliper piston back inside the caliper before removing them all the way. This will allow you to slide in a new set of pads without disrupting the ceramic spacers located in the pistons of the caliper. Once the new pads are in place, be sure to reinstall the spacer between the pads as you slide in the retainer pin. Be sure to operate the brake several times until the brake returns to normal pressure.

Figure 7



Front Brakes

Brake Fluid Level

Fluid level should be approximately 1/8" (3mm) below the edge of the reservoir when refilling. Never let the fluid level get below the visual indicator.

Brake Pads

The brake pads should be checked after every race or ride. To check the pad thickness, remove the plastic cover shown in *Figure 7* by popping off with a small screwdriver. Pad thickness should be no less than 1/16", replace. Remove the cotter pin from the retainer pin located on the backside of the caliper. Pull the retainer pin. The pad may now be replaced. When re-installing the retainer pin, use a new cotter pin and secure properly.

Caution: There are ceramic insulators in brake piston

Bleeding the Brake

If air is sucked into the hydraulic system due to low fluid level, or a rupture in the brake line occurs, it is necessary to bleed the system in order to purge out the air.

Check the fluid level in the reservoir and "top up" if required. Remove the dust cap from the bleed screw. Attach a rubber hose with an internal diameter of 14" (6mm) and approximately 24" (610mm) in length to the bleed screw. Place the end of the hose in a glass jar filled with approximately 1" (25mm) of hydraulic fluid. Make sure the end of the hose stays submerged in the hydraulic fluid throughout the entire bleed process.

Actuate the brake lever several times and hold in the braked position. Open the bleed screw 1/2 turn and depress the brake lever. Close the bleed screw after the brake lever has reached its maximum position. Continue this operation until no air bubbles can be seen coming from the hose immersed in the hydraulic fluid. At intervals, make certain the reservoir is kept topped up, otherwise air will again enter the system.

ENGINE MAINTENANCE

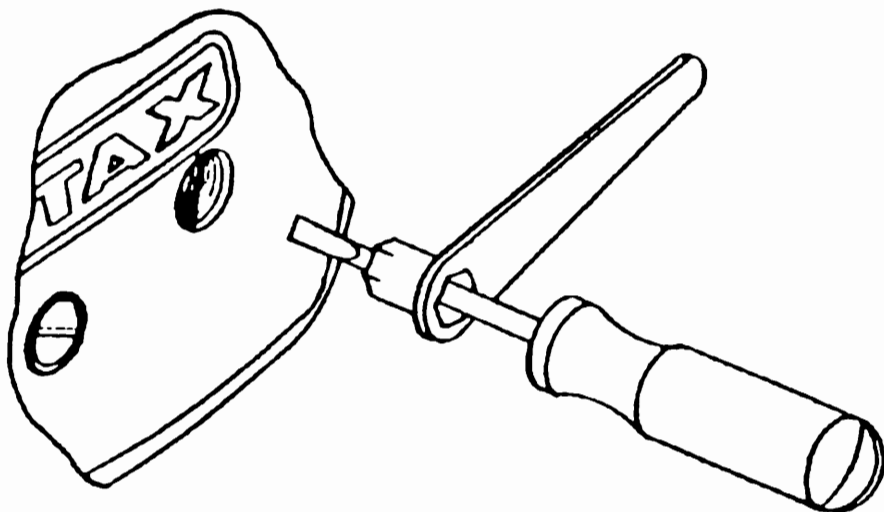
Clutch Adjustment

If you feel major adjustment is required, loosen the clutch adjustor at the handlebar to provide maximum slack to the cable.

Remove the clutch adjustment access plug on the left sidecover. There is a 11mm lock nut and a slotted adjusting screw. Note that a special wrench is provided in the tool kit for this lock nut, as detailed in *Figure 8*.

Turn the slotted adjusting screw in, until contact is made with the release bearing. Then turn out $1/8$ to $1/4$ turn from the contact point. Carefully re-tighten the 11mm lock nut to secure the clutch adjustment. Replace the access plug.

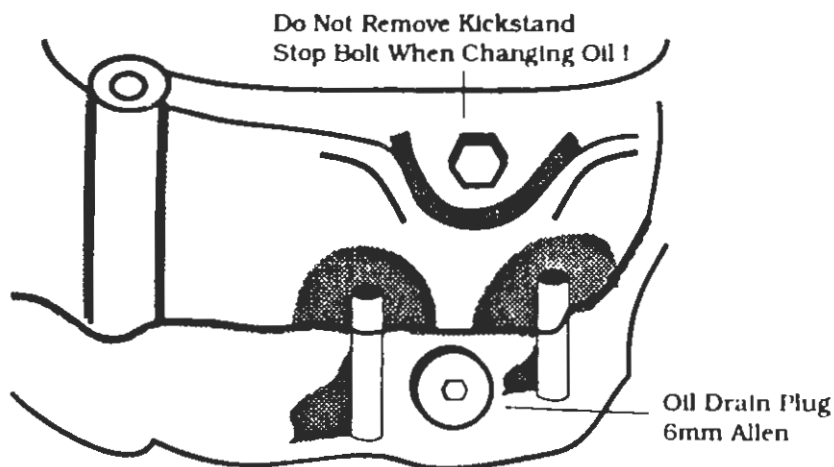
Figure 8



Transmission Oil Change

Start the engine and allow it to warm up briefly. Remove the 6mm Allen Head bolt from the bottom of the engine and completely drain the oil. *Do Not Remove* the 17mm bolt head kickstart spring retaining bolt (Refer to *Figure 9*). The drain plug tip is magnetized and should not be cleaned of metal particles before installing the drain plug. Remove the filler/vent plug and refill the transmission with 1000cc (32 U.S. ounces) of transmission lubricant until the oil reaches the oil level inspection hole (at the 6mm Allen bolt). The level plug is located behind the gear change lever.

Figure 9



Ignition Timing

Your motorcycle is equipped with a capacitor discharge ignition which consists of a magneto, an electrical control unit, and a *Kill* button.

Check the electrical connections for dirt or corrosion on a regular basis. Apply a dielectric grease to all connectors and the high tension lead, when necessary.

Timing of the engine can only be done with a stroboscopic lamp. Although timing marks can be verified by using a dial indicator. Static timing figures marks can be verified by using a dial indicator.

<u>ATK model</u>	<u>Timing Figure</u>
250	14° +/- 1, 1.07mm (0.042 in.)
406	18° +/- 1, 2.26mm (0.089 in.)

On all machines, remove the timing inspection plug from the magneto cover and connect the timing light pickup to the high tension lead. Point the light beam straight into the inspection hole and rev the engine to 2500 RPM for a brief instant. If the timing is correct, the magneto cover mark and the flywheel mark will align with each other.

If the timing was incorrect, remove the magneto cover. Loosen the stator retaining screws then move the stator plate in the "advance" or "retard" direction to correct the misalignment. Tighten the stator plate screws.

Start the engine to recheck the alignment of the timing marks with the timing light.

Spark Plugs

We recommend the following spark plugs for use with your ATK motorcycle:

<u>ATK Model</u>	<u>Manufacturer / Part Number</u>		
	<u>NGK</u>	<u>Bosch</u>	<u>AutoLite</u>
250/406	B8ES	W275T2	4053

Check the condition of your spark plug tips for the following:

A ***brownish*** tip indicates correct jetting and plug range

A ***black*** tip warns you of too lean an operating temperature

A ***grey*** tip warns you of too lean an operating temperature

Advanced ignition timing, engine overheating, too lean a fuel mixture, clogged carburetor jetting, wrong spark plug heat range, or a leaking seal or gasket may be the cause of this condition.

Engine Clearance

Piston Ring End Gap

<u>ATK Model</u>	<u>Standard</u>	<u>Service Limit</u>
250	0.20mm (0.008") to 0.35mm (0.014")	1.0mm (0.040")
406	0.25mm (0.100") to 0.40mm (0.016")	1.2mm (0.047")

Piston to Cylinder Clearance

<u>ATK Model</u>	<u>Standard</u>	<u>Service Limit</u>
250	0.06mm (0.002") to 0.08mm (0.003")	0.14mm (0.005")
406	0.08mm (0.003") to 0.09mm (0.0035")	0.18mm (0.007")

Increased performance can be obtained by changing compression ratios on the 250 and 406 models. The following chart may be used as a guide to your fuel needs.

<u>ATK 250</u>	<u>Compression Ratio</u>	<u>Fuel Requirement</u>
2 ea. 0.2mm shims	12.5:1	Stock Unleaded Regular
Remove 1 head shim	13.0:1	Mod. Unleaded Prem
Remove 2 head shims	13.5:1	Mod. 100 LL Aviation

<u>ATK 406</u>	<u>Compression Ratio</u>	<u>Fuel Requirement</u>
4 ea. 0.2mm shims	10.0:1	Stock Unleaded Regular
Remove 3 shims	10.8:1	Mod. Unleaded Prem
Remove 4 shims	11.0:1	Mod. 100 LL Aviation

Torque Specifications

<u>Part Description</u>	<u>Torque (Ft.lbs.)</u>
Front Axle	30
Front Axle Pinch	6-8
Rear Axle Nut	65-75
Swing Arm Pivot	65-75
Triple Clamp Allens	15-20
Engine Mount	25-30
Flywheel Nut	65-75
Clutch Hub Nut	60-70
Primary Drive Nut	60-70
Countershaft Nut	40-50
Cylinder Head Nuts, 8mm	16-18
Cylinder Head Nuts, 10mm	26-28
Shock Eye Bolts	30-35














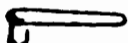



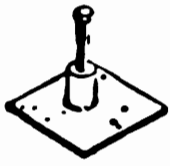

The table below, which relates tightening torque to thread diameter and pinch, lists the basic torque for the nuts and bolts on ATK motorcycles.

<u>Diameter (mm)</u>	<u>Torque (Ft.lbs.)</u>
5	2.5 - 3.5
6	4.5 - 5.5
8	10 - 13.5
10	19 - 25
12	30 - 40
14	55 - 75
16	80 - 120
18	120 - 160
20	160 - 240

Technical Data

<u>Specification</u>	<u>ATK 250</u>	<u>ATK 406</u>	
		<u>MX</u>	<u>(both) CC</u>
Displacement	248.4cc	399cc	
Bore and Stroke	72 x 61 mm	84 x 72mm	
Gear Ratios:			
1st	3,000:1	2,384:1	3,000:1
2nd	2,070:1	1,769:1	2,070:1
3rd	1,571:1	1,400:1	1,571:1
4th	1,353:1	1,118:1	1,353:1
5th	1,222:1	913:1	1,222:1
6th	1,150:1		1,150:1
Compression Ratio	12.5:1	10.0:1	
C/S Rear SProcket	15/50	15/48	15/44
Ignition	Motoplat	Motoplat	
Carburetor	Mikuni	Mikuni	
Chain	520	520	
Oil Capacity	1 Quart	1 Quart	
Air Filter	Uni	Uni	
Weight	210 lbs.	216 lbs.	
Steering Angle	27°	27°	
Wheelbase	57"	57"	
Seat Height	37"	37"	
Ground Clearance	14"	14"	
Fuel Capacity	2.4/3.7 Gal	2.4/3.7 Gal	
Front Fork	11.8"	11.8"	
Rear Shock	12.0"	12.0"	
Front Brake	4-piston caliper disc	same	
Rear Brake	2-piston caliper C/S disc	same	
Front Tire	3.00 -21 inch	3.00 - 21inch	
Rear Tire	110-100 x 1	110-100 x 18	
Fork Capacity	650 cc/SAE 10	650 cc/SAE 10	
Shock Pressure	180 lbs.	180 lbs.	

Special Tools

 <p>Seal Insertion Jig (Clutch Cover)</p>	 <p>Seal Insertion Jig (Tranny Main Shaft 406)</p>	 <p>Seal Insertion Jig (Tranny Main Shaft 250)</p>	 <p>Seal Insertion Jig (Crankshaft Clutchside 250)</p>
 <p>Plastic Ring Insertion Jig Clutch Side</p>	 <p>Plastic Ring Insertion Jig Mag Side</p>	 <p>Puller Assembly</p>	 <p>Clutch hub Locking Tool (old style)</p>
<p>Protection Cap</p> 	<p>Guide Sleeve for oil seal (main shaft)</p> 	<p>Crankshaft Locking Bolt</p> 	<p>Flywheel Puller</p> 
 <p>Clutch Hub Locking Tool (new style)</p>			 <p>Clutch Adjustment Wrench</p>
 <p>Hexagonal Screw</p>	<p>Allen Bolts</p>	 <p>Crankcase Separator Puller w/ Slotted Head Screws</p>	
 <p>Bearing Puller</p>	<p>Ring For Puller</p>	 <p>Puller Plate Assembly (Crankshaft)</p>	
 <p>Half Ring for Puller</p>			