1. Remove the battery from the vehicle as described in this chapter.
2. Connect the positive (+) lead from the charger to the battery's positive terminal.
3. Connect the negative (–) lead from the charger to the battery's negative terminal.

*CAUTION*

*Maintain electrolyte at the upper level while charging. Refill with distilled water as necessary.*

4. Remove all of the vent caps from the battery and check electrolyte level. Leave caps off while charging.
5. Set the charger to 12 volts and turn the charger ON.

*NOTE*

*Charge the battery at a slow charge rate of 1/10 of its given capacity. The standard charging rate is approximately 1.2 amps.*

6. The charging time depends upon the discharged condition of the battery. Use the chart in **Figure 5** to determine the approximate charge times at different specific gravity readings. For example, if the specific gravity of your battery is 1.180, the approximate charging time would be 6 hours.
7. After the battery has been charged for the predetermined time, turn the charger OFF, disconnect the leads and check the specific gravity of each cell as described in this chapter.

### Battery Installation

1. Make sure the rubber pad is in good condition, clean and correctly positioned in the bottom of the battery box before installing the battery.
2. Install the battery in the battery box (carrier) with the terminals facing as shown in **Figure 3**.
3. Connect and route the battery vent tube so that it is not kinked, pinched or plugged. Position the tube so that the hose outlet is located away from all metal components. Install a new vent tube if necessary.
4. Install the battery hold-down strap as shown in **Figure 3**.

*CAUTION*

*Be sure the cables are attached to the proper terminals on the battery. Connecting the battery backwards will reverse the polarity and damage the rectifier and ignition system.*

5. Attach the positive (+) battery cable to the positive battery terminal.
6. Attach the negative (–) ground cable to the negative battery terminal.
7. Coat the battery terminals and cable ends with dielectric grease or petroleum jelly.

### New Battery Installation

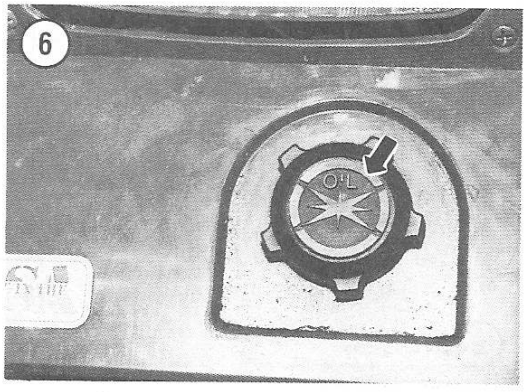
Before installing a new battery, check its electrolyte level and state of charge. Charge the battery as required before installing it, then check the specific gravity of the electrolyte. A hydrometer check should indicate the specific gravity of the electrolyte in each cell is 1.260-1.280. A new battery may be permanently damaged if the electrolyte level is too low when it is installed.

## FLUID CHECKS

Vital fluids should be checked daily or before each ride to assure proper operation and prevent severe component damage. Refer to **Table 1**. Checking the fluids frequently will help the operator gauge their normal use and prevent damage from operation with insufficient lubrication.

## BREAK-IN PROCEDURE

After extensive top end repair, such as boring, honing or new rings and major lower end work, the engine should be broken-in just as if it were new.



Refer to the *Break-In Procedure* described in Chapter Four or Chapter Five.

## PERIODIC LUBRICATION

*WARNING*

*Serious fire hazards always exist around gasoline and other petroleum products. Do not allow any smoking in areas where fuel is stored or while refueling your ATV. Always have a fire extinguisher, rated for gasoline and electrical fires, within reach just to play it safe.*

### Lubricating 2-Stroke Engines

Polaris 2-stroke engines are lubricated by oil injected into the intake manifold. This oil mixes with the incoming fuel charge and circulates through the crankcase and enters the combustion chamber where it is burned with the fuel. The internal engine components are lubricated by the oil as it passes through the crankcase and cylinder.

All Polaris 2-stroke engines are equipped with a variable-ratio oil injection system. The injection system automatically maintains the optimum fuel/oil ratio according to engine speed and load.

### Checking Oil Level (Models With 2-Stroke Engines)

The oil reservoir that supplies oil for the oil injection system is located at the front of the vehicle. Check the oil level in the reservoir (**Figure 6**) daily or each time the vehicle is refueled.


*CAUTION*

*Serious engine damage will occur if the oil system is allowed to run dry. If the oil lines are disconnected or if air has entered the oil line between the reservoir and the injection pump, refer to the **Oil Injection Pump Bleeding** procedure in this chapter.*

Use regular unleaded gasoline with a minimum octane rating of 87. Refer to **Table 4** for the recommended oil for use in the oil injection system on 2-stroke models.

### Lubricating 4-Stroke Engines

Polaris 4-stroke engines are equipped with a dry sump type lubrication system that contains 1.89 L (2 qts.) of oil. The oil reservoir (tank) located on the left side (**Figure 7**) must always be filled with the type (**Table 4**) and quantity of oil recommended by the manufacturer. The various components of the engine are lubricated by the oil as it circulates within the engine. The oil then returns to the reservoir. The oil is used over and over as the 4-stroke engine operates. Engine heat is transferred to the oil, then the oil is allowed to cool while it is in the reservoir. The oil also becomes contaminated as it circulates within the engine and a filter is used to trap some of the particles.

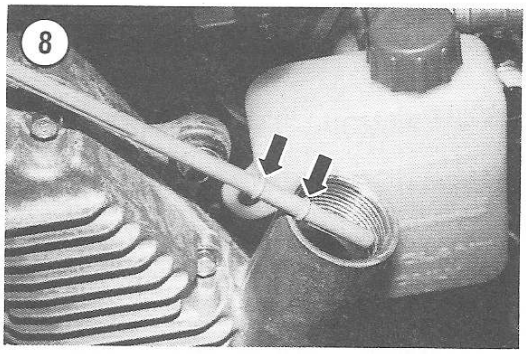
Regular oil and filter changes will contribute to the longevity of the engine. The recommended engine oil and filter change intervals are specified in **Table 3**. These change intervals assume the vehicle is operated in moderate climates, under moderate loads and at moderate speeds. The oil should be changed more frequently if the vehicle is operated in dusty, wet, hot or cold conditions with heavy loads or at high speeds. Use only a high-quality oil of the type as listed in **Table 4**.

Check the oil level in the reservoir (**Figure 7**) daily or each time the vehicle is refueled. Use regular unleaded gasoline with a minimum pump octane rating of 87 to prevent detonation and excessive combustion chamber deposits.

### Checking Oil Level (Models With 4-Stroke Engines)

A dipstick is attached to the oil fill cap (**Figure 7**). The oil level should be maintained between the marks on the dipstick (**Figure 8**).

If the oil level is low, pour in the required amount and type of oil specified in **Table 4** and **Table 5**. Fill the tank until the oil level is at the top (full) mark.




### Changing Engine Oil and Filter (Models With 4-Stroke Engines)

Regular oil and filter changes will contribute to engine longevity. The recommended engine oil and filter change intervals are specified in **Table 3**. These change intervals assume the vehicle is operated in moderate climates, under moderate loads and at moderate speeds. If the vehicle is operated in dusty or wet conditions, under heavy loads or at high speed, change the oil and filter more frequently. Refer to **Table 4** for the recommended type of lubricant.

To change the engine oil and filter you need the following:

a. Drain pan.
b. Funnel.
c. Opener or pour spout.
d. Wrench and sockets.
e. 2 qts. of oil.
f. New oil filter.

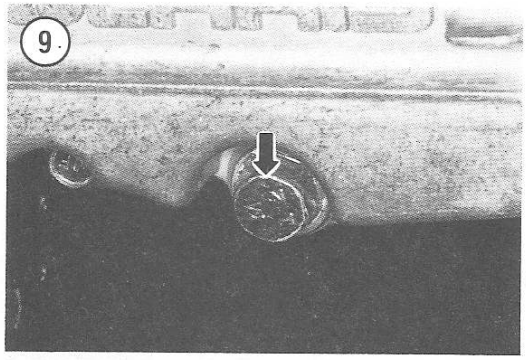
There are a number of ways to discard the old oil safely and legally. Some service stations and oil retailers will accept your used engine oil for recycling.

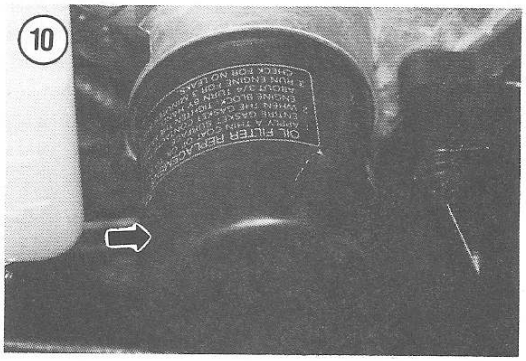
*NOTE*

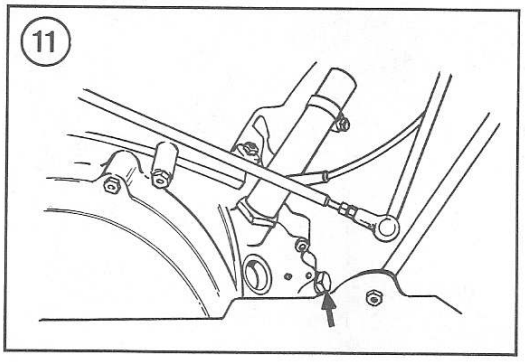
*Do not discard oil in your household trash or pour it onto the ground. Never add any other type of fluid, including brake fluid or other types of oil to the engine oil to be recycled. Most oil recyclers will not accept the oil if any other fluid has been combined with it.*

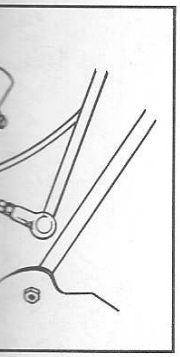
*NOTE*

*Running the engine before draining the oil allows the oil to heat up so that it will flow more freely. The warm, circulated oil will more easily carry contaminants and sludge buildup out when it is drained.*



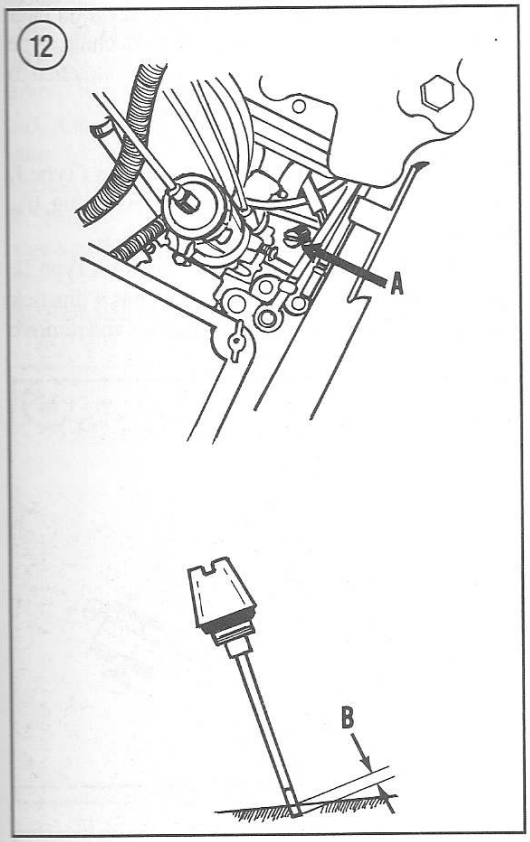



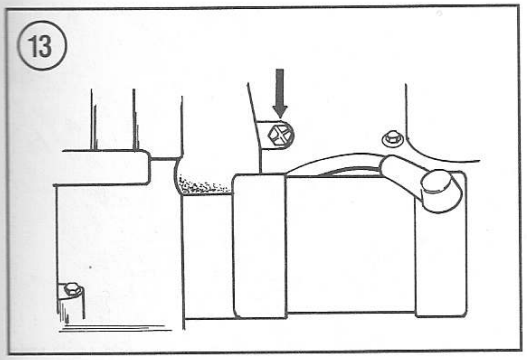







1. Start the engine and let it warm up approximately 2-3 minutes.
2. Place the vehicle on level ground and apply the parking brake.
3. Stop the engine and place a drain pan under the drain plug.
4. Remove the drain plug (**Figure 9**) and allow the engine oil to drain from the reservoir.




5. Remove the fill cap (**Figure 7**) to allow the oil to drain faster.
6. Allow the oil to drain for at least 15-20 minutes.
7. Reinstall the drain plug after all oil has drained.
8. Relocate the drain pan under the oil filter, then remove the filter (**Figure 10**).
9. Thoroughly clean the oil filter receptacle in the left crankcase. If necessary, clean any remaining oil sludge.
10. Install the new oil filter (**Figure 10**).
11. Make sure the drain plug is tight, then fill reservoir with 2 qts. of engine oil.
12. Start the engine, allow it to idle and check for oil leaks. If leakage is noted, stop the engine immediately and correct the leak.

*WARNING*

*Avoid prolonged contact with used oil. It is advisable to wash your hands thoroughly with soap and water as soon as possible after handling or coming in contact with engine oil.*

### Engine Counterbalancer (2-Stroke Engines So Equipped)

The 350L and 400L liquid cooled engines used by some models are equipped with a counterbalancer that is gear-driven by the crankshaft. The gears and shaft are lubricated by an oil bath. The oil should be changed every 100 hours of operation or once each year. Refer to **Table 4** for the correct type of oil.

1. Remove the bottom chain guard.

2A. Remove the fill plug (**Figure 11**) on 350L models.

2B. Remove the fill plug and dipstick (A, **Figure 12**) on 400L models.

3. Remove the drain plug (**Figure 13**) and allow the oil to drain.
4. Reinstall the drain plug.
5. Make sure vehicle is level, then fill the compartment with the correct type of oil.

6A. On 350L models, oil should be at the level of fill plug (**Figure 11**).

6B. On 400L models, oil level should be within the knurled area of the dipstick (B, **Figure 12**).

7. Install and tighten the fill plug.

### Control Cables and Levers

All of the cables and levers should be inspected for freedom of movement and lubricated twice each year or at least every 50 hours of operation. Refer to **Table 4** for the recommended lubricant.

The throttle and mechanical brake cables (of models so equipped) should be cleaned and lubricated at intervals indicated in **Table 3**. The cables should also be checked for kinks and signs of wear, fraying or any damage that cause cables to fail or stick. Cables will not last forever even under the best conditions and the need to replace cables should expected.

The most positive method of control cable lubrication involves the use of a cable lubricator like the one shown in **Figure 14**. A can of cable lube is also required. Use only the cable lubricant listed in **Table 4**. *Do not* use chain lube as a cable lubricant.

1. Loosen the cable adjuster at the handlebar and disconnect the cable from the lever.
2. Attach the cable lubricator to the end of the cable housing following its manufacturer's instructions (**Figure 14**).
3. Insert the lubricant can nozzle into the lubricator, press the button on the cap and hold it down until the lubricant begins to flow from the other end of the cable housing.

*NOTE*
*Place a shop cloth at the end of the cable to catch the excess oil as it drains out.*

4. Detach the lubricant can from the lubricator, then remove the lubricator from the cable housing.
5. Apply a light coat of grease to the cable ends before reattaching them.
6. Reattach the cables. Adjust the cables as described in this chapter.
7. Operate the controls (throttle and brake) and check for smooth operation. If the controls do not operate smoothly, correct the cause or install a new cable and housing. Controls must not bind.

### Transmission Oil

Oil contained in the transmission housing lubricates the chain and sprockets or gears. Different oil is recommended for models with a chain transmission (Type I, **Table 6**) than for models with a gear transmission (Type II, **Table 6**) or gear/chain transmission (Type III, **Table 6**). Refer to **Table 4** for the recommended lubricant type. If possible, always use one type and brand of oil. Different types or brands may vary slightly in their composition and a mixture of the two may not lubricate as well as either alone.

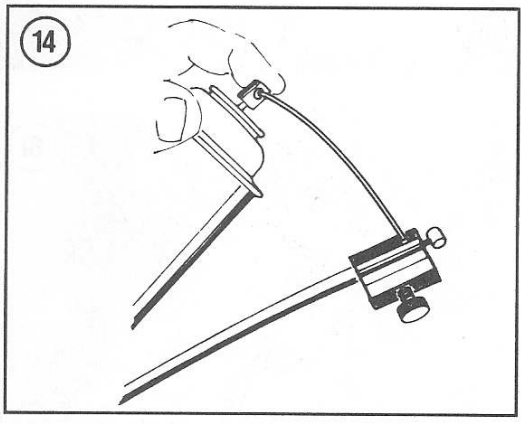
#### *Oil Level Check*

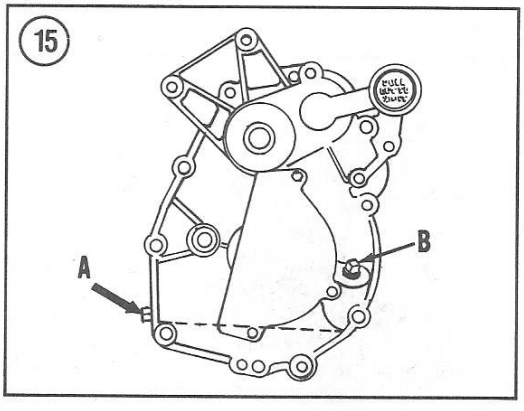
The oil level on models with a chain type (Forward-Reverse) transmission is checked by removing the level plug (A, **Figure 15**). The oil level on later models with a gear type or gear and chain type transmission is checked with the dipstick attached to the fill plug (A, **Figure 16** or A, **Figure 17**).

1. Park the vehicle on a level surface.

2A. On models with a chain transmission (Type I, **Table 6**), unscrew and remove the level plug (A, **Figure 15**) from the transmission housing.

2B. On models with a gear transmission (Type II, **Table 6**), the fill plug (A, **Figure 16**) has a dipstick attached. To check the oil level, unscrew and remove



the fill plug (A, **Figure 16**) from the transmission housing. Wipe the dipstick off and insert it back into the housing. Do not screw the fill plug back into the cover.

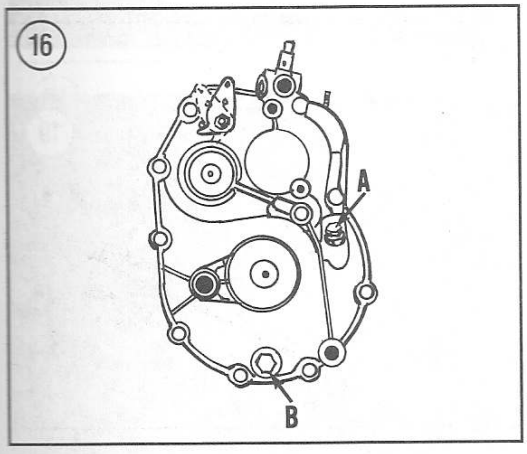
2C. On models with a gear and chain transmission (Type III, **Table 6**), the fill plug (A, **Figure 17**) has a dipstick attached. To check oil level, pull the fill plug (A, **Figure 17**) from the transmission housing. Wipe the dipstick off and insert it back into the housing.

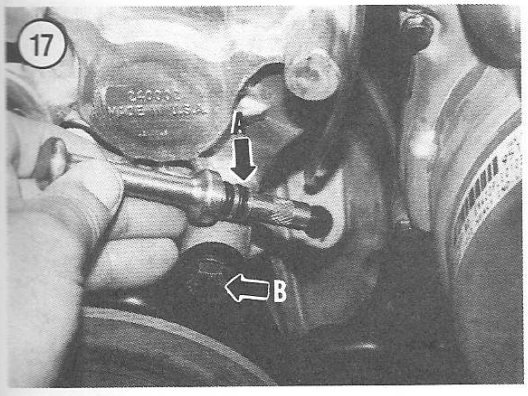
3A. On Type I models with the level plug (A, **Figure 15**), the oil level should be at the level of the removed plug.

3B. On models with a dipstick attached to the filler plug (A, **Figure 16** or A, **Figure 17**), the oil level should be within the knurled section of the dipstick.

4. If the oil level is low, top off with an oil recommended in **Table 4**. Do not overfill. Recheck the oil level.

5. Reinstall and tighten the removed plugs securely.




*Changing transmission oil*

Refer to **Table 3** for recommended oil change intervals and to **Table 4** for recommended type of oil.

1. Park the vehicle on a level surface.

2A. On models with a chain transmission (Type I, **Table 6**), unscrew and remove the level plug (A, **Figure 15**) and fill plug (B) from the transmission housing.

2B. On models with a gear transmission (Type II, **Table 6**), remove the fill plug (A, **Figure 16**) and drain plug (B) from the transmission housing.

2C. On models with a gear and chain transmission (Type III, **Table 6**), remove the fill plug (A, **Figure 17**) and drain plug (B, **Figure 17**) from the transmission housing.

3. Models with chain transmission (Type I, **Table 6**) are not equipped with a drain plug. Oil can be drained from these models by raising the front of the vehicle to allow most of the oil to drain from the level hole (A, **Figure 15**).

*NOTE*

*Oil is easily spilled when draining and refilling the transmission. Try to prevent as much spillage as possible, then clean as much of the spilled oil in the shop cloths as possible.*

*NOTE*

*Store the oil soaked shop cloths in a suitable container until they can be cleaned.*

4. If the drain plug was removed, proceed as follows:
   a. Inspect the magnet in the drain plug.
   b. Clean and reinstall plug.
5. Insert a funnel into the hole for the filler plug and fill the transmission housing with the correct type (**Table 4**) and quantity (**Table 5**) of oil.
6. Check the oil level as described in the previous procedure and reinstall the plugs.

### Rear Axle Housing

The bearings for the rear axle are lubricated by grease that can be injected through the fitting (A, **Figure 18**). Refer to **Table 4** for recommended type of lubricant. The bearing should be greased at least

every 50 hours or twice each year. If the vehicle is operated under severe service conditions or with heavy loads, perform this service more frequently.

### Suspension

Grease fittings are provided on some suspension components. Refer to **Table 4** for the recommended lubricant. Inject grease into the fittings every 50 hours of operation or at least twice each year. If the vehicle is operated under severe service conditions or with heavy loads, perform this service more frequently.

### Steering

Bushings for the steering shaft and tie rod ends should be greased every 50 hours of operation or at least twice each year. If the vehicle is operated under severe service conditions, perform this service more frequently. Refer to **Table 4** for the recommended lubricant.

### Front Hub Wheel Bearings (Not Driven)

The front wheel bearings on models without front wheel drive should be removed, cleaned and repacked every 50 hours of operation or at least twice each year. Refer to **Table 4** for the recommended lubricant. The wheels should be removed and bearings cleaned, then repacked with grease as soon as possible if water has entered the bearings. New seals should be installed when assembling. Refer to Chapter Twelve for service.

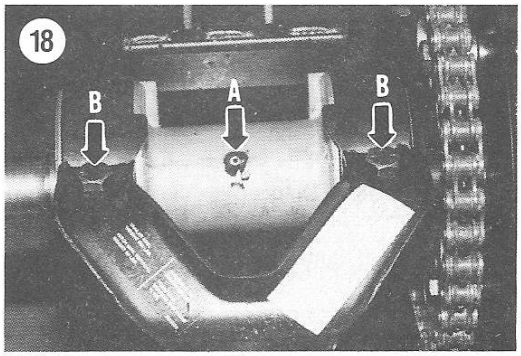
### Front Wheels (Driven)

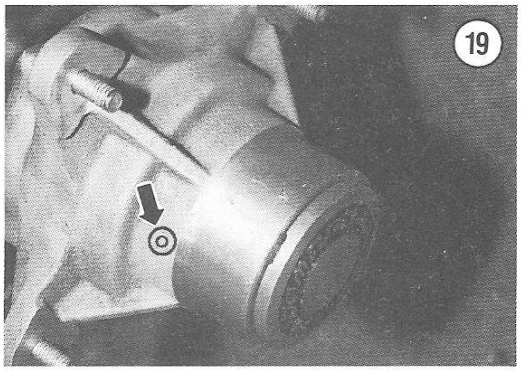
Refer to **Table 4** for the recommended lubricant for use in the driven front wheel hubs. The oil should be changed twice each year or at least every 50 hours of operation. If vehicle is operated in wet conditions, check frequently for signs of water contamination. Drain the oil, flush the hub and fill with new oil as soon as possible if contamination is noticed.

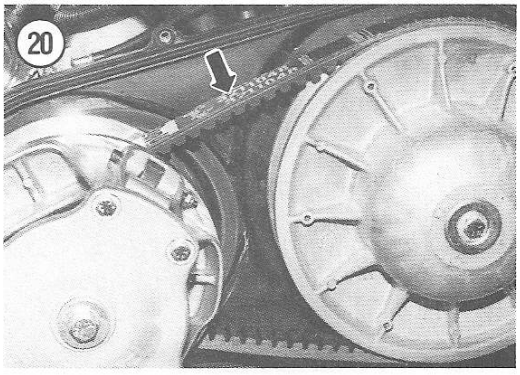
1. Remove the plug (**Figure 19**) and rotate it to bottom, then allow the oil to drain.
2. Turn the hub until the hole for the plug is at about the 4 o'clock position, then fill the hub with oil. Hub should be just over half full of oil.
3. Allow the oil to settle and recheck to be sure oil is at the 4 o'clock position, then reinstall plug.

## PERIODIC MAINTENANCE

Periodic maintenance intervals for specific items are listed in **Table 3**.



### Drive Belt Check

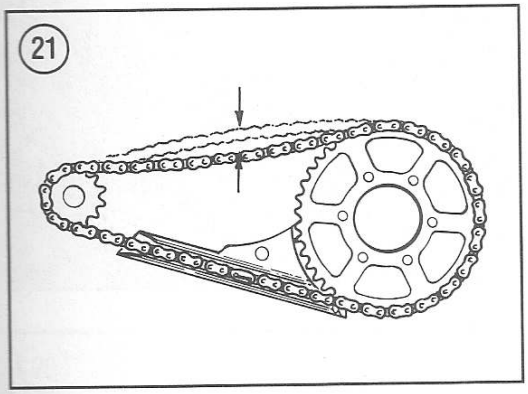
Check the drive belt (**Figure 20**) for cracks, fraying or unusual wear as described in Chapter Eight. Replace the drive belt if any damage is noted or if it is worn as noted in Chapter Eight.

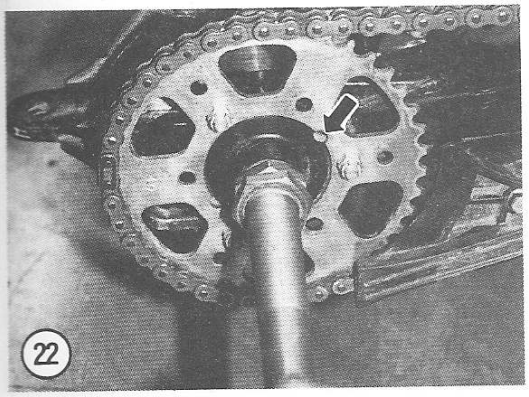
### Rear Drive Chain Adjustment (All Models Except Big Boss)

The rear drive chain should be inspected and adjusted periodically depending upon vehicle usage. Improper maintenance and neglect can cause premature failure of the chain and the sprockets.

To check the rear drive chain free play, the *suspension must be loaded* so the chain is at its tightest point in suspension travel. Measure chain free play midway between the sprockets, as shown in **Figure 21**. The rear drive chain should have 6.35 mm (1/4 in.) free play.

To adjust the rear drive chain free play, proceed as follows:




1. Loosen the rear axle clamp bolts (B, **Figure 18**).
2. Insert a pin (approximately 5/16 in. diameter) through the hole (**Figure 22**) in the rear sprocket hub and into the rear axle housing.
3. Move (rock) the vehicle so the pin forces the rear axle housing to rotate in its retaining clamps. The proper direction of rotation depends upon whether loosening or tightening is required.
4. Measure chain free play and adjust play as necessary.
5. When the chain free travel is correct, tighten the axle housing clamp bolts to the torque specified in **Table 7**.
6. Remove the pin and recheck chain free play.

### Rear Drive Chain and Axle-to-Axle Chain Adjustment (Models With 6 Wheels)

The rear drive chain connects the output sprocket of the transmission with the first of the 2 rear drive axles. An axle-to-axle drive chain connects the 2 rear axles, providing drive to the rearmost axle. Adjustment of the rear drive chain affects the tension of the axle-to-axle chain, so the rear drive chain should be adjusted first.

The rear drive chain should be inspected and adjusted periodically depending upon vehicle usage. Improper maintenance and neglect can cause premature failure of the chain and the sprockets.

#### *Rear drive chain*

To *check* the rear drive chain free play on models with 6 wheels, the *suspension must be unloaded.* Chain free play when measured midway between the sprockets should be 38 mm (1.5 in.) as shown in **Figure 21**.

To *adjust* the rear drive chain free play, proceed as follows:

1. Loosen the rear axle housing clamp bolts (B, **Figure 18**).
2. Insert a pin (approximately 5/16 in. diameter) through the hole (**Figure 23**) in the top of the rear axle housing.
3. Move the vehicle so the pin engages a hole in the sprocket hub (**Figure 22**, typical).
4. Move (rock) the vehicle so the pin forces the rear axle housing to rotate in its retaining clamps. The

proper direction of rotation depends upon whether loosening or tightening is required.

5. Measure the chain free play and adjust play as necessary.

6. When the chain free travel is correct, tighten the axle housing clamp bolts to the torque specified in **Table 7**.

7. Remove the pin and recheck chain free play.

*NOTE*

*Changing the adjustment of the rear drive chain will affect the adjustment of the rear axle drive chain.*

8. Check and adjust the free play of the axle-to-axle drive chain that connects the drive axle with the rearmost axle as described in the following steps.

### *Axle-to-axle chain*

The rear axle of all models with six wheels is driven by a chain connecting the rearmost (third) axle with the center (drive) axle. The axle-to-axle drive chain should be inspected and adjusted periodically depending upon vehicle usage. Improper maintenance and neglect can cause premature failure of the chain and sprockets. Refer to *Lubrication* section in this chapter.

Free play of the rear (axle-to-axle) drive chain should be 6.35 mm (1/4 in.) when measured midway between the sprockets.

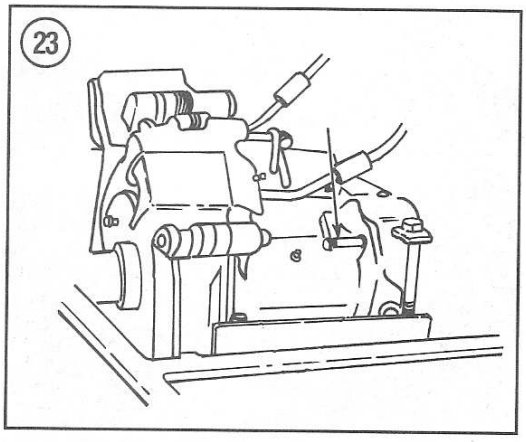
To *adjust* the rear (axle-to-axle) drive chain, proceed as follows:

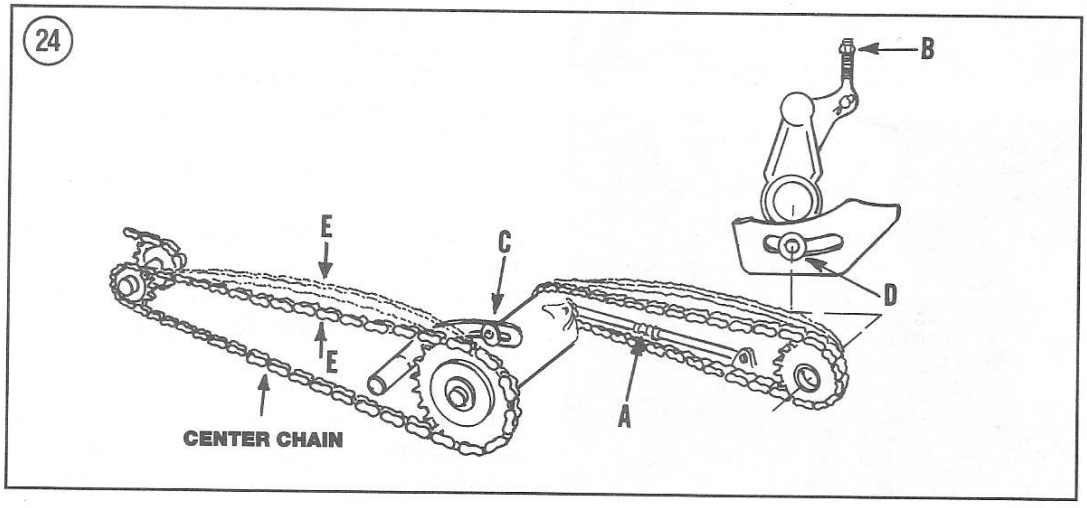
1. Loosen the rear axle clamp bolts (B, **Figure 18**).
2. Insert a pin through the rear sprocket (**Figure 22**) and into the axle center housing.

*NOTE*

*The proper direction of rotation depends upon whether loosening or tightening is required. Move the vehicle to the rear to tighten the chain.*

3. Move (rock) the vehicle so the axle center housing is forced to rotate as necessary to adjust the chain free play.
4. Install and tighten the clamp bolts (B, **Figure 18**).
5. Remove the pin, then recheck free play of the center drive chain.





6. When chain free play is correct, tighten the clamp bolts to the torque specified in **Table 7**.

### Center and Front Drive Chain Adjustment (1985-1987 Models With Front Wheel Drive)

The center and front drive chains should be inspected and adjusted periodically depending upon vehicle usage. Improper maintenance and neglect can cause premature failure of the chain and sprockets.

Free play of both the front and center drive chains should be 6.35 mm (1/4 in.) when measured midway between the sprockets E, **Figure 24**. The center drive chain must be adjusted first, because any changes to it will affect the free play of the front drive chain.


*Center drive chain adjustment*

1. Loosen the cap screw (C, **Figure 24**).
2. Change the length of the adjuster (A, **Figure 24**) as necessary to adjust the chain free play.
3. Tighten the cap screw (C, **Figure 24**).
4. Recheck free play after tightening the screw.

After correctly adjusting the free play of the center drive chain, check and adjust the free play of the front drive chain.

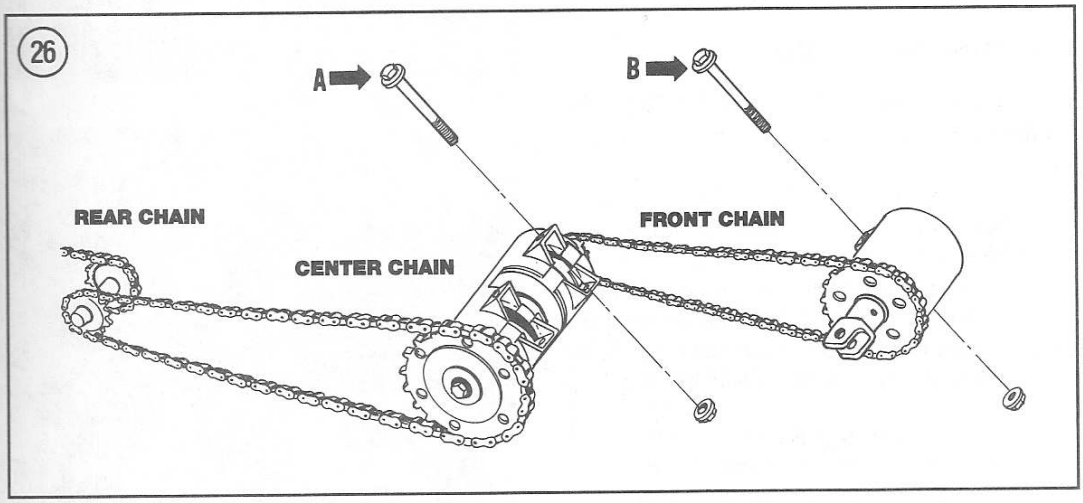
*Front drive chain adjustment*

1. Loosen the cap screw (D, **Figure 24** or **Figure 25**).
2. Turn the adjuster nut (B, **Figure 24**) as necessary to adjust the chain free play.
3. Tighten the cap screw (D, **Figure 24** or **Figure 25**).
4. Recheck free play after tightening the screw.

### Center and Front Drive Chain Adjustment (1988-on Models With Front Wheel Drive)

The center and front drive chains should be inspected and adjusted periodically depending upon vehicle usage. Improper maintenance and neglect can cause premature failure of the chain and sprockets. Refer to *Lubrication* section in this chapter.

Free play of both the front and center drive chains should be 6.35 mm (1/4 in.) when measured midway between the sprockets (Refer to **Figure 26**). The



center drive chain must be adjusted first, because any changes to it will affect the free play of the front drive chain.

### *Center drive chain adjustment*

1. Disconnect, then remove the brake pedal linkage.
2. Detach the front fender mud flap from the foot board.
3. Remove the center chain guard.
4. Remove the front chain guard.
5. Loosen the clamp bolts (A, **Figure 27**) that secure the chain drive eccentric housing.
6. Rock the vehicle until the hole (B, **Figure 27**) in the housing aligns with the hole in the sprocket (sprocket is removed in **Figure 27**), then insert a pin through the holes.

*NOTE*

*The proper direction of rotation depends upon whether loosening or tightening is required. Move the vehicle to the rear to tighten the center chain.*

7. Move (rock) the vehicle so the center drive eccentric housing is forced to rotate as necessary to adjust the chain free play.
8. Install and tighten the clamp bolts (A, **Figure 27**).
9. Remove the pin, then recheck free play of the center drive chain. When free play of the center drive chain is correct, check and adjust the free play of the front drive chain.

### *Front drive chain adjustment*

1. Loosen the clamp bolt (B, **Figure 26**) that clamps the front drive chain housing. Refer also to **Figure 28**.

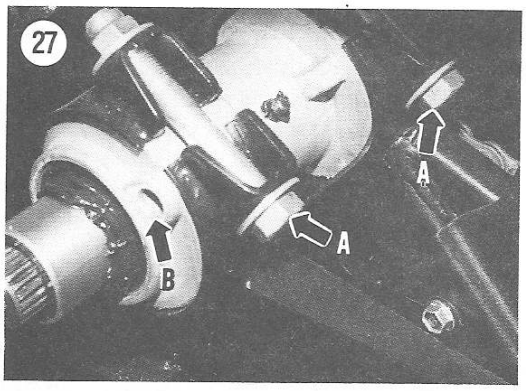
2A. If spanner shown in **Figure 29** is available, insert the pins of the spanner wrench in the holes and rotate the eccentric front chain housing.

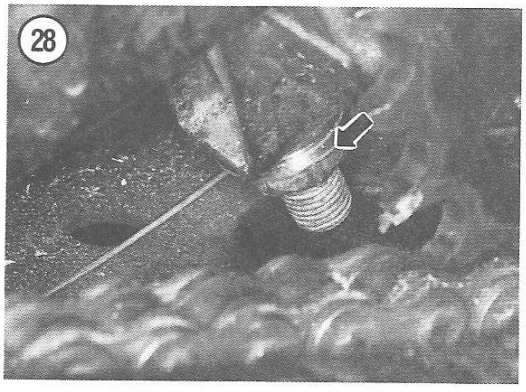
2B. If spanner is not available, align one of the holes in the front drive chain housing with a hole in the sprocket, then insert a pin through the holes. Rock the vehicle to turn the eccentric chain housing.

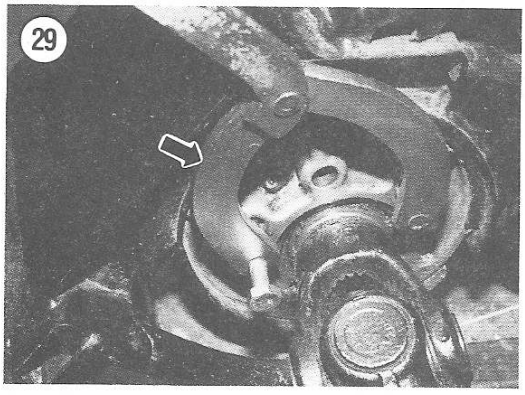
*NOTE*

*The proper direction of rotation depends upon whether loosening or tightening is required. Move the vehicle to the rear to tighten the chain.*

3. Turn the front drive chain housing as necessary to adjust the chain free play.
4. Install and tighten the clamp bolt (**Figure 28**).
5. Remove the pin, if used, then recheck free play of the front drive chain.



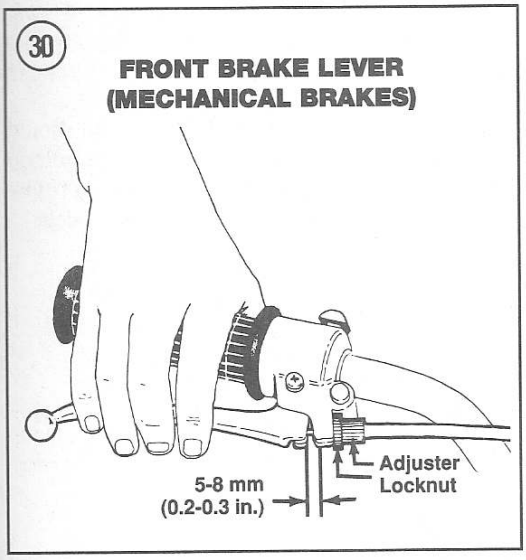



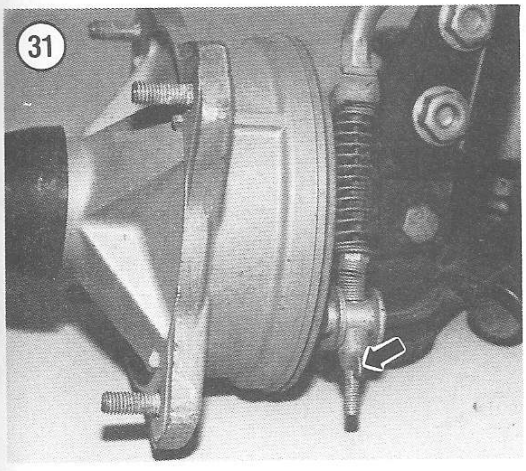
### Brake Inspection and Adjustment (Models With Mechanical Type)

*WARNING*

*The brake system is an important part of vehicle safety. If you are unsure about the condition of any brake component or assembly, have it checked by a Polaris dealer.*

Mechanical drum type brakes are used on the front wheels and a mechanical disc type brake is used on the rear wheels of 1985-1987 Trail Boss models without front wheel drive. Periodic inspection, service and adjustment will help ensure proper operation of the brakes.




#### *Front brakes*

Both front brakes must operate evenly and stop the vehicle without pulling to either side when operating the front brake lever mounted on the right side of the handlebar. The front brake lever should have 5-8 mm (0.2-0.3 in.) free play (**Figure 30**). Brake lever free play is adjusted by turning the cable adjuster after loosening the locknut.

Adjust the front brake cables at the wheel ends of the cable (**Figure 31**) as follows:

1. Raise and support the front of the vehicle so the front wheels are off the ground and can be rotated.
2. Loosen the lock nut and turn the cable adjuster (**Figure 30**) into the housing. At this point, the handlebar lever should have too much free play.
3. Tighten the adjusting nuts (**Figure 31**) located at the wheel ends of the cables until the brake just starts to drag, then back the adjuster nut off slightly.
4. Turn the cable adjuster out of the housing until handlebar lever free play (**Figure 30**) is 5-8 mm (0.2-0.3 in.).
5. Check the cable joint (A, **Figure 32**) to be sure the joint block is level when the brake is applied. If the block is on an angle when the brake is applied, turn the adjusters (**Figure 31**) as required to equalize brake pressure.

#### *Rear brake*

The rear wheels are actuated by the rear brake lever mounted on the left side of the handlebar. Operating the handlebar lever should stop the vehicle without excessive pressure. The rear brake lever must have 6.0-6.5 mm (0.24-0.26 in.) free travel (**Figure 33**). Brake lever free play is adjusted by turning the cable adjuster (**Figure 33**) after loosening the locknut.

The rear brake caliper and disc are located on the right side of the transmission. Check the brake disc visually for cracks, deep scoring, heat discoloration, checking or excessive wear. Refer to Chapter Fourteen for brake service. Rear brakes are equipped with a self-adjusting brake mechanism. To adjust the rear brake caliper, squeeze the brake lever strongly several times to actuate the self-adjusting mechanism. If adjustment cannot be corrected by squeezing the brake lever, check the brake assembly as described in Chapter Fourteen.

*NOTE*

*If brake adjustment is difficult or if you are unsure about its operation, refer adjustment to a Polaris dealer. Do not operate the vehicle without properly functioning brakes.*

### Brake System Inspection (Models With Hydraulic Caliper)

*WARNING*

*The brake system is an important part of machine safety. If you are unsure about the condition of any brake component or assembly, have it checked by a Polaris dealer.*

The brake system should be inspected periodically. The front and rear brake systems are operated by the same brake lever. The front brake discs and calipers are located at each of the front wheels. The rear wheel brake caliper and disc is attached to the transmission and stops rotation of the transmission output shaft. The handlebar mounted master cylinder incorporates an integral reservoir.

Check the brake disc visually for cracks, deep scoring, heat discoloration, checking or excessive wear. Inspect the brake pads for cracks, chips, evidence of overheating or excessive wear. Install new pads if worn past the service limit groove or if the remaining lining is less than 1.9 mm (0.075 in.) thick. Refer to Chapter Fourteen for brake service.

### Servicing Brake Fluid (Models With Hydraulic Caliper)

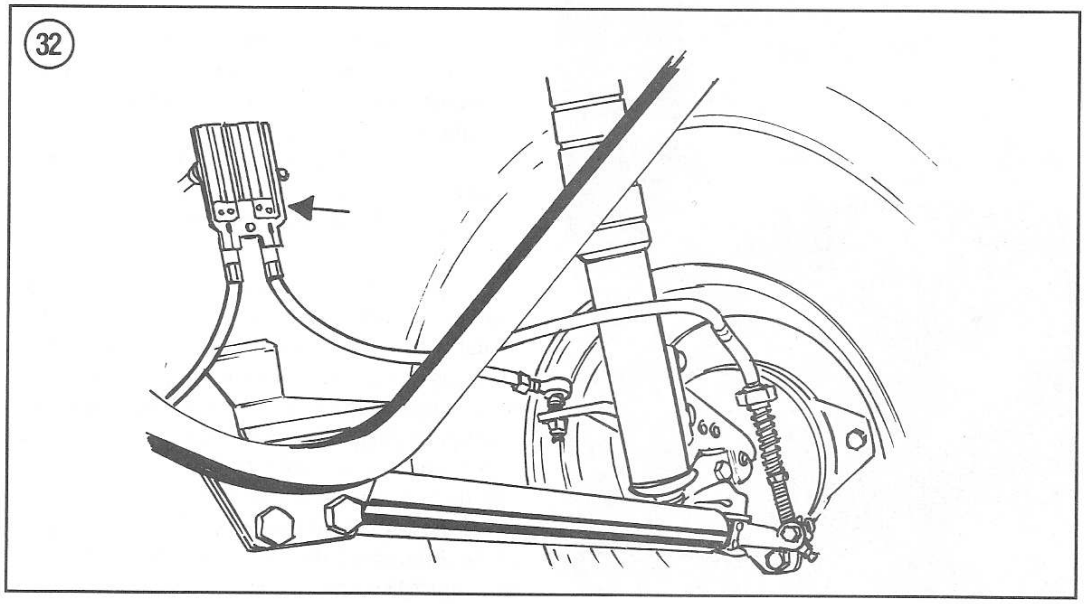
All models after 1987, and 1987 Trail Boss models with 4-wheel drive are equipped with hydraulically actuated front and rear brake systems. The condition and level of the hydraulic brake fluid is important to the operation of the brakes.

Proceed as follows to check the level and fill the reservoir with brake fluid:

1. Clean any dirt from the master cylinder reservoir cover.
2. Make sure the reservoir is level to prevent spilling brake fluid as the cover is removed. Remove the screws attaching the reservoir cover, then remove the cover and seal.
3. Check the level of the fluid. Brake fluid should be 3.2 mm (1/8 in.) below the top of the reservoir on 1987 and 1988 models or 6.35 mm (1/4 in.) below the top of the reservoir of 1989 and later models.

*WARNING*

*Use only brake fluid marked DOT 3 (specified for disc brakes). Other brake fluids may vaporize and cause brake failure. Do not mix different brands or types of brake fluid, because they may*



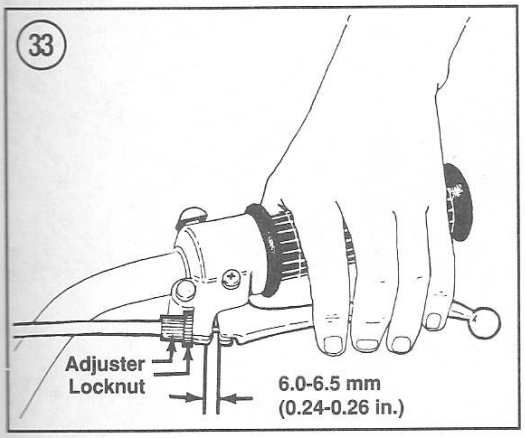
*not be compatible. Mixing silicone based (DOT 5) brake fluid with DOT 3 fluid may cause brake system failure.*

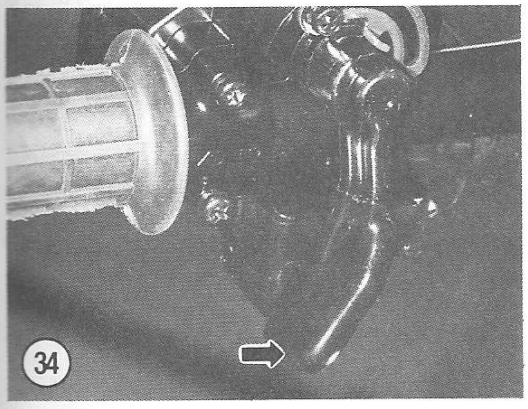
*CAUTION*

*Be careful when adding brake fluid. Spilled brake fluid on painted or plated surfaces may damage the finish. If brake fluid is spilled on a painted surface, wash the area immediately with soapy water and rinse thoroughly with clean water.*

4. Fill reservoir to the correct level, then install the cover.

Each time the reservoir cover is removed, a small amount of moisture and dirt can enter the brake system and be mixed with the brake fluid. The same thing can happen if a leak occurs or any part of the hydraulic brake system is loosened or disconnected. Dirt can cause unnecessary wear or clog the system. Water in the fluid can vaporize at high temperature and impair the brake's ability to stop. It is recommended that the brake fluid be drained and the system refilled with new fluid each year. To change the brake fluid, refer to *Bleeding the System* in Chapter Fourteen. Continue adding new fluid to the master cylinder until the brake fluid leaving the calipers is clean and free of contaminants.




### Throttle Cable Free Play Adjustment

On models with 2-stroke engines, the carburetor (throttle) cable and the oil pump control cable are both attached to and controlled by the handlebar mounted throttle lever. Adjustment of one cable affects the adjustment of the other cable. It is important to check and adjust the carburetor idle speed, adjust the throttle lever free play and synchronize the movement of the oil injection pump to be sure the carburetor throttle and the oil injection are both properly controlled.

All models require some throttle cable play to prevent changes in the idle speed when you turn the handlebars. The recommended amount of cable free play is 1.6 mm (1/16 in.) when measured at the end of the throttle lever. Refer to **Figure 34**, typical. In time the cable(s) will stretch and the free play will become excessive.

*NOTE*

*Check throttle cable free play at the handlebar lever. It is important that the throttle cable has the correct amount of play as described.*

1. Set the engine idle speed as described under *Idle Speed Adjustment* in this chapter.
2. Start the engine and allow it to idle in NEUTRAL. Make sure the handlebar mounted speed control lever is at its slowest speed position.
3. With the engine running at idle speed, push the throttle lever to increase engine speed and observe the amount of movement (free play) required to increase the engine speed.
4. If the free play is more than 1.6 mm (1/16 in.), adjust as follows.

*NOTE*

*Be careful not to remove all end play. The engine idle speed may be increased if no end play is present.*

a. Loosen the lock nut on the cable adjuster (**Figure 35**, typical) near the handlebar mounted throttle lever and turn the adjuster OUT to reduce the amount of free play. If additional adjustment is required, a similar adjuster is located at the carburetor. Be sure the cable is not damaged.

b. When free play is correct, tighten the adjuster locknut to maintain the correct setting. Recheck free play after tightening the locknut.

5. If the throttle cable has no free play, perform the following:

a. Loosen the lock nut on the cable adjuster (**Figure 35**, typical) near the handlebar mounted throttle lever and turn the adjuster IN to increase the amount of free play.

b. When free play is correct, tighten the adjuster locknut to maintain the correct setting. Recheck free play after tightening the locknut.

6. Check throttle operation after adjusting. The idle speed must quickly return to idle speed when the throttle lever is released. If the idle speed changes when the handlebar is turned, check to be sure the cable is routed properly.

7. On models with 2-stroke engines, check the *Oil Injection Pump Adjustment* as described in the following procedure.

### Oil Injection Pump Adjustment (Models With 2-Stroke Engines)

The oil pump injects lubricating oil into the engine. The amount of oil is determined by throttle position. Control cable adjustment is necessary because the cables will wear and stretch during normal use. Incorrect cable adjustment can cause too little or too much oil and may result in engine seizure and poor performance.

The oil pump cable adjustment should be checked once a year or whenever the throttle cable is adjusted, disconnected or replaced.

1. Adjust the carburetor as described under *Tune-Up* in this chapter.

*CAUTION*

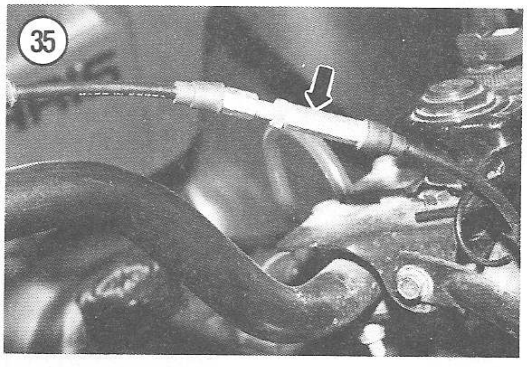
*If the carburetor is not adjusted before adjusting the oil pump, engine damage may occur. The oil injection pump operation must be synchronized with the carburetor opening.*

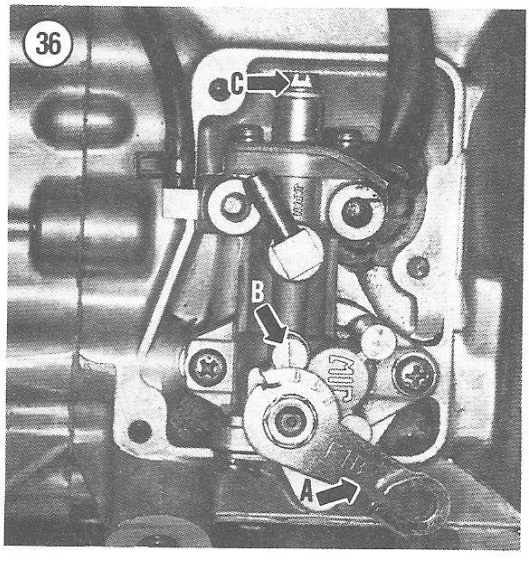
2. Adjust the *Throttle Cable Free Play* as described in the previous procedure.

*NOTE*

*The oil injection pump (**Figure 36**, typical) on 250 and 400 air-cooled models is located on the rear of the engine crankcase. The pump (**Figure 37**, typical) on 350L and 400L liquid-cooled models is located on the front of the engine crankcase.*

3. Move the throttle lever until free play is just removed from the cables and the carburetor throttle just begins to move. The cable to the oil injection pump should also just begin to move the pump lever (A, **Figure 36** or A, **Figure 37**) and the mark (B, **Figure 36** or B, **Figure 37**) on the lever must be aligned with the mark on the pump housing.



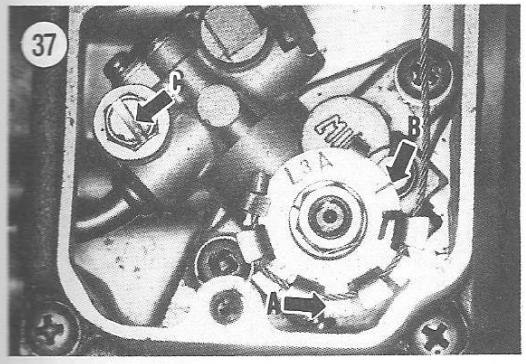
*CAUTION*

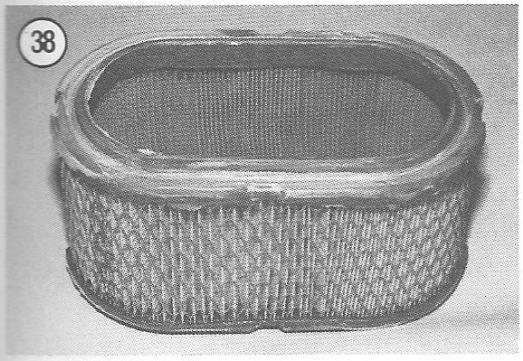
*It is important that all free play is removed from the cables, but the throttle should not move. If it is necessary to move the throttle to align the marks on pump, the oil injection control cable must be adjusted.*

4. If the adjustment marks do not align:
   a. Loosen the locknut on the cable adjuster located near the pump.
   b. Turn the cable adjuster until the 2 marks (B, **Figure 36** or B, **Figure 37**) align.
   c. Tighten the cable adjuster locknut and recheck the adjustment.

### Oil Filter Inspection/Replacement (Models With 2-Stroke Engines)

On models with 2-stroke engines, an inline oil filter is installed between the injection oil tank and the oil pump. A clamp is used on each end of the filter. The oil filter is installed to prevent contaminants from entering the pump and obstructing oil passages or causing the pump to stick.




*CAUTION*

*An oil filter that is contaminated and clogged will prevent oil from reaching the engine. Change the filter if contamination can be seen or is suspected. Engine seizure from lack of oil is more difficult to repair than installing a new filter.*

Inspect the oil filter frequently for contamination or other obstruction. If the oil filter is contaminated, replace it and check the reservoir for additional contaminants. The connecting lines and the oil system reservoir should be removed, cleaned, then checked for contamination or damage. After the system has been cleaned, install a new oil filter, fill the reservoir with new approved oil, and bleed the oil pump as described in this chapter to make sure oil is being delivered to the engine.

When replacing the oil filter, note the following:

a. Place a cloth underneath the oil filter to absorb oil spilled when the filter is removed.
b. Loosen or remove the hose clamps from the filter nipples.
c. Detach both hoses from the filter.
d. Check the hose clamps for fatigue or damage. Install new clamps if required.
e. Attach the hoses to the new filter.
f. Install the clamps over each hose and filter nipple. Tighten the clamps securely.
g. Fill the reservoir with new approved oil.
h. Bleed the oil injection pump as described in this chapter.
i. Remove and safely discard the cloth used to catch spilled oil.

### Oil Filter Replacement (Models With 4-Stroke Engines)

On models with 4-stroke engines, a cartridge type oil filter is attached to the left side of the engine, below the oil reservoir. Replace the filter cartridge each time the engine oil is changed.

To change the oil filter, refer to *Changing Engine Oil and Filter* in this chapter.

### Air Filter Servicing

Remove and clean the air filter element (**Figure 38**, typical) every 25 hours of operation. Install a new filter after every 50 hours of operation, under normal operating conditions, or if the filter is damaged.

*CAUTION*

*Operating the engine without the air filter or modifying the air intake system may result in engine damage. Any changes in the air intake system will also alter the fuel mixture adjustment.*

To remove the filter element, remove the seat and support bracket, if needed. Remove the wing nuts attaching the cover (A, **Figure 39** or 1, **Figure 40**), then remove the cover and element.

*CAUTION*

*Wear proper eye protection when cleaning the air filter using compressed air.*

Tap the element lightly on a solid surface to dislodge debris. Direct low-pressure (approximately 5.8 kPa [40 psi]) compressed air at the outside of the filter element toward the inside to blow dirt away. Grease the top and bottom surfaces of the element (**Figure 38**) and reinstall by reversing the removal procedure.

Some models have a foam pre-filter (B, **Figure 39** or 2, **Figure 40**) covering the inlet to the filter. If this pre-filter requires service, remove the fuel tank cover. Clean the pre-filter with solvent followed by hot soapy water. Then rinse the pre-filter with clean water and dry thoroughly. Apply foam filter oil to the pre-filter and squeeze out all excess. The wire support located under the foam pre-filter must be correctly positioned so the foam will not restrict the air flow. The darker foam is used as a splash guard and noise suppression. Do not allow the darker foam to restrict the air flow.

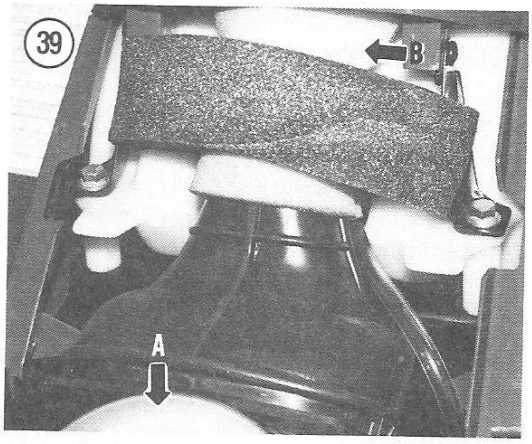
### Coolant Inspection and Change (Liquid Cooled Models)

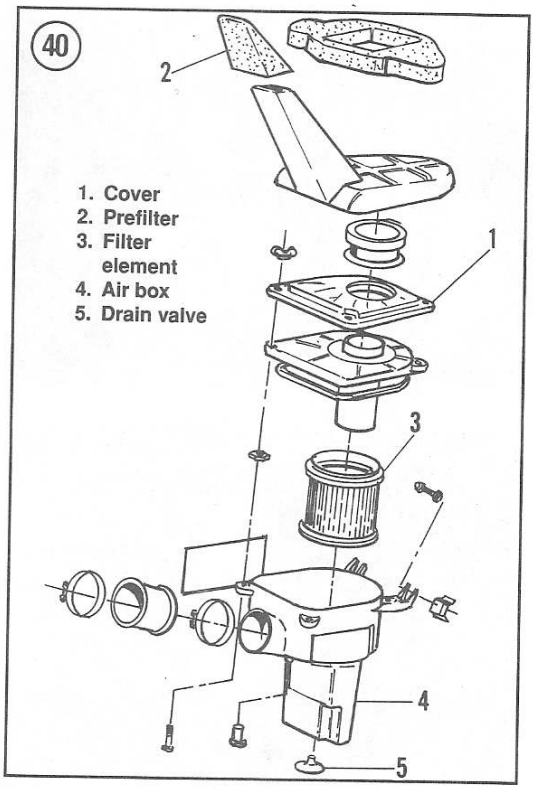
The engine of some models is cooled using a small amount of coolant, circulating pump and a radiator. The system components should be inspected frequently for fluid level, evidence of leaks, and condition of the hoses. Since the system contains so little fluid, it is important to identify and repair even small leaks quickly. Refer to **Table 5** for the fluid capacity of the cooling system.

*WARNING*

*Do not check, drain or otherwise service the liquid cooling system when the coolant is hot. The system is under pressure and serious burns can result from the hot liquid or steam contacting your body. Allow the engine to cool before removing the radiator cap, opening the drain or disconnecting any of the hoses.*

1. To drain coolant from the radiator, open the drain cock (**Figure 41**) and loosen the radiator cap (**Figure 42**). Some coolant will be trapped in the system and



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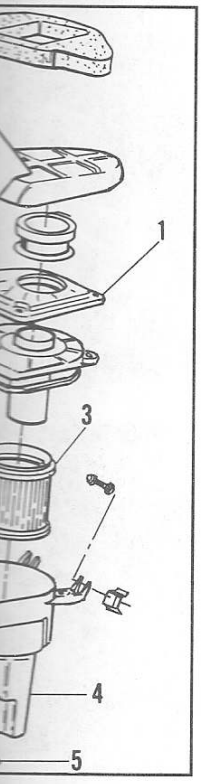
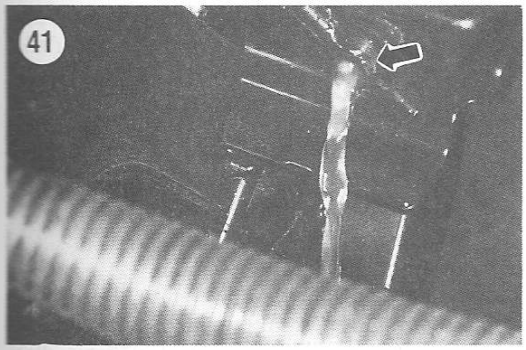
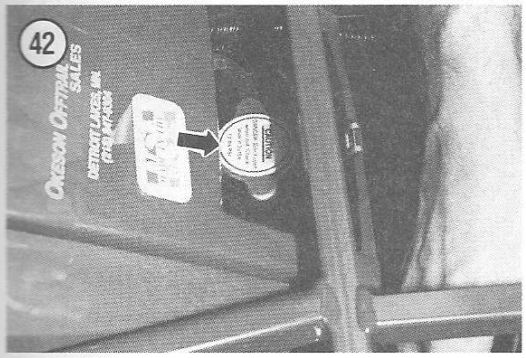
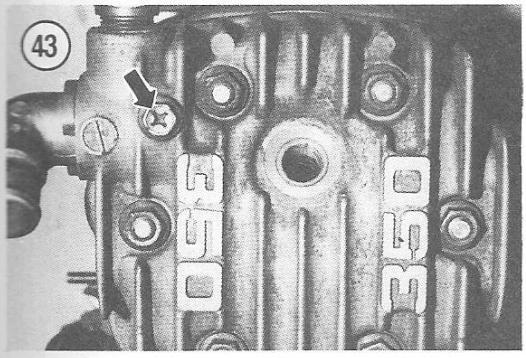
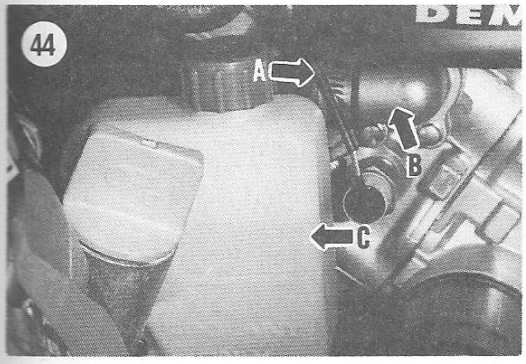





will be removed when the hoses or components are removed.

*WARNING*

*The EPA has classified ethylene glycol as an environmental toxic waste, which cannot be legally flushed down a drain or poured on the ground. Treat antifreeze that is to be discarded as you treat motor oil. Put it in suitable containers and dispose of it according to local regulations.*

*WARNING*

*Spilled antifreeze is very slippery on cement floors. Wipe up spilled antifreeze as soon as possible.*

2. The manufacturer recommends that only a mixture of 50 percent distilled water and 50 percent antifreeze be used in the cooling system. Use only antifreeze designated for use with aluminum engines and radiators.

3A. When filling the cooling system on 350L and 400L engines, it is necessary to remove the bleed screw (**Figure 43**) to allow air to escape from the cylinder head. Install the bleed screw when fluid without air is coming from the bleed screw hole.

3B. When filling the cooling system on 4-stroke Magnum models, be careful to fill the system completely. If the system is completely drained, loosen the clamp (A, **Figure 44**) on the hose to the thermostat housing (B, **Figure 44**). Pull the hose loose and fill the system with coolant at the radiator, while allowing air to escape from the loosened hose. When coolant begins to flow from the thermostat and hose connection, reattach the hose and tighten the clamp. Continue adding coolant to the radiator (**Figure 42**) and fill the reservoir (C, **Figure 44**).

4. Purge air from the cooling system on all models by squeezing the coolant hoses while filling with coolant.

5. Install the radiator cap (**Figure 42**) and fill the reservoir (C, **Figure 44**) before starting the engine.

*NOTE*

*After flushing the cooling system, the coolant level may drop when pockets of trapped air fill with coolant. To avoid operating the engine with a low coolant level, check the level at least once again before starting the engine. It may be necessary to allow the system to cool*

*and bleed the system once again as outlined in Step 3A or 3B.*

6. Operate the engine until it reaches normal temperature, then stop the engine. Allow the engine to cool then remove the cap from the reservoir and check the coolant level. Check the coolant level frequently.

### Oil Injection Pump Bleeding (Models With 2-Stroke Engines)

The engine is lubricated by oil injected into the engine. Serious engine damage will occur if the oil system is allowed to run dry. If the oil lines are disconnected or if air has entered the oil line between the reservoir and the injection pump, refer to the following procedure to bleed air from the oil pump and lines.

*CAUTION*

*Some other causes of improper lubrication are incorrect engine idle speed, maladjusted throttle cable free play or incorrect synchronization of the oil injection pump. Insufficient lubrication regardless of the cause can result in severe engine damage. The carburetor (throttle) cable and the oil pump control cable are both attached to and controlled by the handlebar mounted throttle lever and adjustment of one cable affects the other cable. Refer to* ***Tune-Up*** *procedure in this chapter for adjusting the idle speed. Refer to* ***Throttle Cable Free Play Adjustment*** *in this chapter to adjust the throttle cable. Refer to* ***Oil Injection Pump Adjustment*** *in this chapter to adjust the oil injection pump control cable.*

1. Fill the oil reservoir before starting the engine.
2. Loosen the bleed screw (C, **Figure 36** or C, **Figure 37**) one full turn and allow oil to flow from the loosened screw for about 10 seconds to bleed air from the delivery line to pump.

*CAUTION*

*Never allow the engine to run with the bleed screw loose.*

3. Tighten the bleed screw when oil is flowing steadily.
4. Start the engine and allow it to run at slow idle speed.

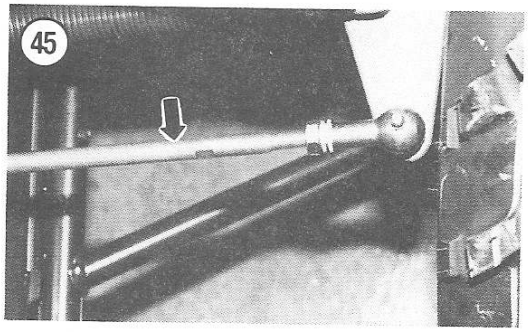
*NOTE*

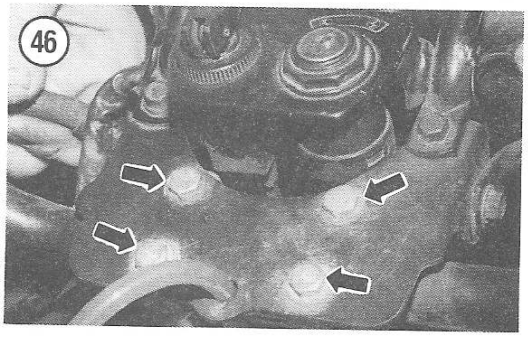
*All air should be removed from the pressure line within about 10-20 seconds. If air is not bled from the system quickly, stop the engine and determine the cause.*

5. With the engine at idle speed, turn the injection pump control lever (A, **Figure 36** or A, **Figure 37**) to deliver the maximum amount of oil for a short time.
6. Release the pump control lever and make sure the pump control cable is properly aligned.

### Steering System and Front Suspension Inspection

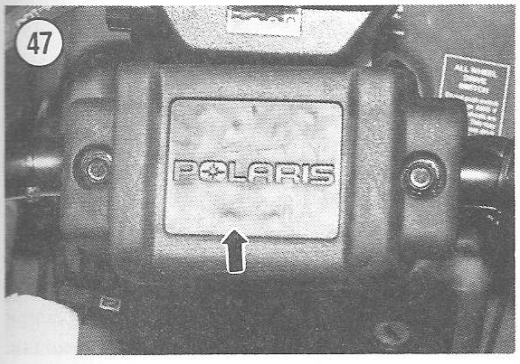
Check the steering system and front suspension at the intervals listed in **Table 3**, following any hard spill or collision or if proper operation is questioned.
1. Park the vehicle on level ground and set the parking brake.
2. Visually inspect all components of the steering and front suspension for obvious problems. Pay

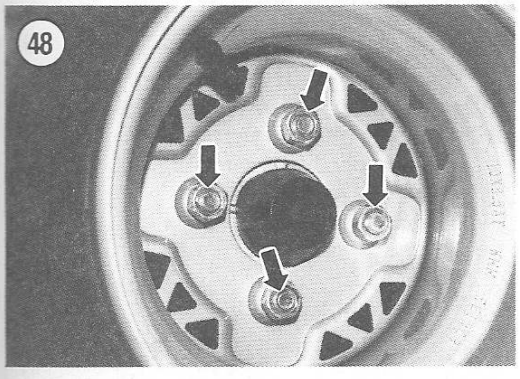


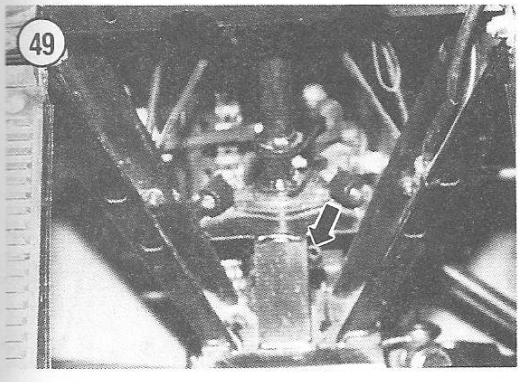



close attention to the tie rods (**Figure 45**), steering shaft and front struts (shock absorbers). Some suggested indicators of damage are:

a. Bent or broken components. Especially check areas where paint is flaking or missing.
b. Loose fasteners or locknuts.
c. Excessively loose components that are normally tight fitting.
d. Unable to move components that are normally free to move.




3. Check the handlebar holder bolts (**Figure 46**) for tightness. These screws are located under the cover (**Figure 47**).
4. Make sure the front wheel bolts (**Figure 48**) are tight.
5. Make sure all covers (caps) are in place on the front axle.
6. Make sure the front axle nut (models without front wheel drive) is tight and that the cotter pin is in place.
7. Check steering play as follows:
   a. To check the steering shaft for radial play, move the handlebar from side to side (without attempting to turn the wheels). If play is excessive, the upper bearings are probably worn and should be replaced.
   b. To check the steering shaft for axial (vertical) play, lift up and push down on the handlebar. If excessive play is noticed, check the cotter pin (**Figure 49**) located at the bottom of the steering shaft. If the cotter pin is in place and in good condition, check the thrust bearings located at the lower end of the steering shaft.
8. Turn the handlebar quickly from side to side and notice the following:
   a. If there is appreciable looseness at the tie rod ends, the ends may be worn.
   b. Observe the joint between the lower end of the strut and the A-arm. Noticeable looseness may indicate a worn ball-joint.
   c. Observe the joints at the inner ends of the A-arms. Noticeable looseness may indicate worn bushings.
   d. Check for missing cotter pins loose or missing fasteners.

### Front Wheel Toe-out

Toe-out is a condition where the front of the tires is further apart than the back. Toe adjustment is accomplished by changing the length of the tie rods. Check and adjust the toe-out periodically or when the steering is imprecise or unpredictable. Inspect the steering assembly for damage and wear before adjusting the toe-out. Inflate the tires to the pressure listed in **Table 2**, then check the tires and wheels for damage. If a wheel might be bent, raise that wheel and rotate it to check more carefully.

To check the toe adjustment, proceed as follows:

1. Position the vehicle on a flat, smooth surface and set the handlebar straight ahead.

2. Raise one front wheel, rotate the tire and use chalk to mark the centerline all around the tire. Lift the other front wheel and mark the centerline of that tire in the same way.

3. Use a tape measure to measure the distance between the centerline at the front, then at the rear of the tires. The distance between the centerlines of the tires should be 3.18-6.35 mm (1/8-1/4 in.) more at the front than at the rear. The tires should toe-out slightly and should not toe-in.

4. If the measured distance is incorrect, change adjustment as follows:

a. Loosen the inner and outer tie rod end lock nuts (A, **Figure 50**) on both tie rods. Both tie rods must be adjusted.

b. Rotate the tie rods (B, **Figure 50**) the same amount on both sides to establish the recommended toe-out. The distance between the ball ends of the two tie rods should be the same to center the steering.

c. Tighten the lock nuts (A, **Figure 50**) securely when adjustment is correct. Recheck to make sure toe-out is correct after tightening the lock nuts. Make sure the tie rod has full movement after tightening the lock nuts. The tie rod end should be square with each other (not cocked) after the lock nuts are tightened.

*CAUTION*

*The fasteners that attach the tie rod ends must be installed in a certain direction to prevent steering system interference and binding. In addition, the tie rod ends must be correctly positioned or interference can occur. If the inner tie rod end is attached with a through-bolt, the head of the through-bolt must face down and the nut must be on top. Furthermore, the threaded stud on the outer tie rod end must face up (nut on top). However, if both the inner and outer tie rod ends are attached with threaded studs, position the tie rod assembly so the threaded stud on the inner end is facing down (nut on the bottom) and the stud on the outer end is facing up (nut on top).*

### Front Hub Wheel Bearings (Models Without Front Wheel Drive)

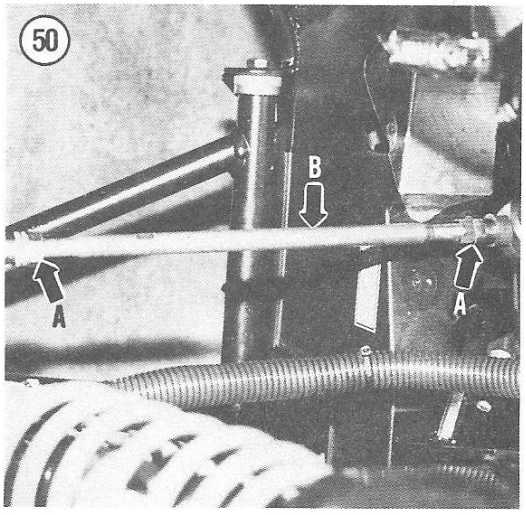
Inspect the front hub bearings for excessive wear or damage at the intervals specified in **Table 3**. Refer to *Front Hub Wheel Bearings* in the *Periodic Lubrication* section of this chapter for lubrication requirements. Refer to Chapter Twelve for removing and installing the bearings and seals.

1. Support the vehicle with both front wheels off the ground.
2. Turn both wheels by hand. The wheels should rotate smoothly with no roughness, excessive noise, excessive play or other abnormal conditions.
3. If necessary, service the front hub bearings as described in Chapter Twelve.

### Rear Axle Housing Bearings

The rear axle is supported by bearings contained in the rear axle center housing (**Figure 51**). Refer to *Rear Axle Bearings* in the *Periodic Lubrication* section of this chapter for lubrication requirements. Refer to Chapter Thirteen to remove and install the bearings and seals.

1. Support the vehicle with both rear wheels off the ground.
2. Turn the wheels by hand. The wheels should rotate smoothly with no roughness, excessive noise, excessive play or other abnormal conditions.
3. If necessary, service the bearings as described in Chapter Thirteen.



### Nuts, Bolts, and Other Fasteners

Check the tightness of fasteners, as listed in **Table 3**. Constant vibration can loosen many of the fasteners and all should be checked for tightness, especially:

a. Engine mounting hardware.
b. Engine covers.
c. Handlebar mounting.
d. Exhaust system.

### Spark Plugs

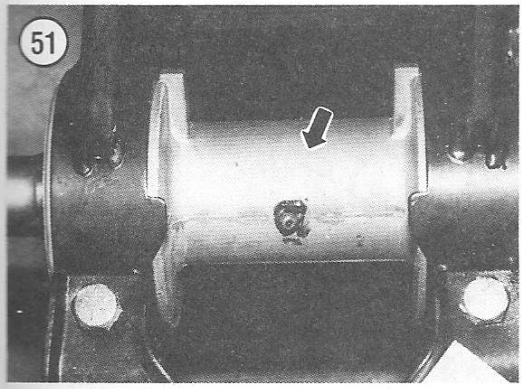
Periodically check the spark plugs for firing tip condition and the correct electrode gap. Refer to spark plug service under *Engine Tune-Up* in this chapter.

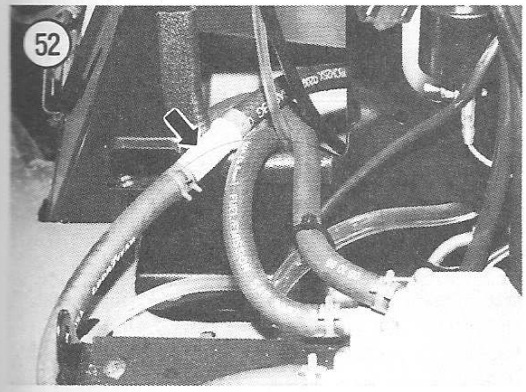
### Exhaust System

The exhaust system is a vital link to the performance and operation of the Polaris engine. Check the exhaust system from the exhaust port to the muffler for:

a. Damaged or leaking gaskets.
b. Loose or missing fasteners or retaining springs.
c. Cracked, dented or otherwise damaged components.

Refer to Chapter Six for cleaning, repair and other service to the exhaust system.




### Fuel Shut-Off Valve and Filter

An inline fuel filter (**Figure 52**) is located between the fuel tank and the carburetor. The fuel filter traps particles which might otherwise enter the carburetor. Minute particles can cause the float valve (fuel inlet needle) to stick or clog one of the jets.

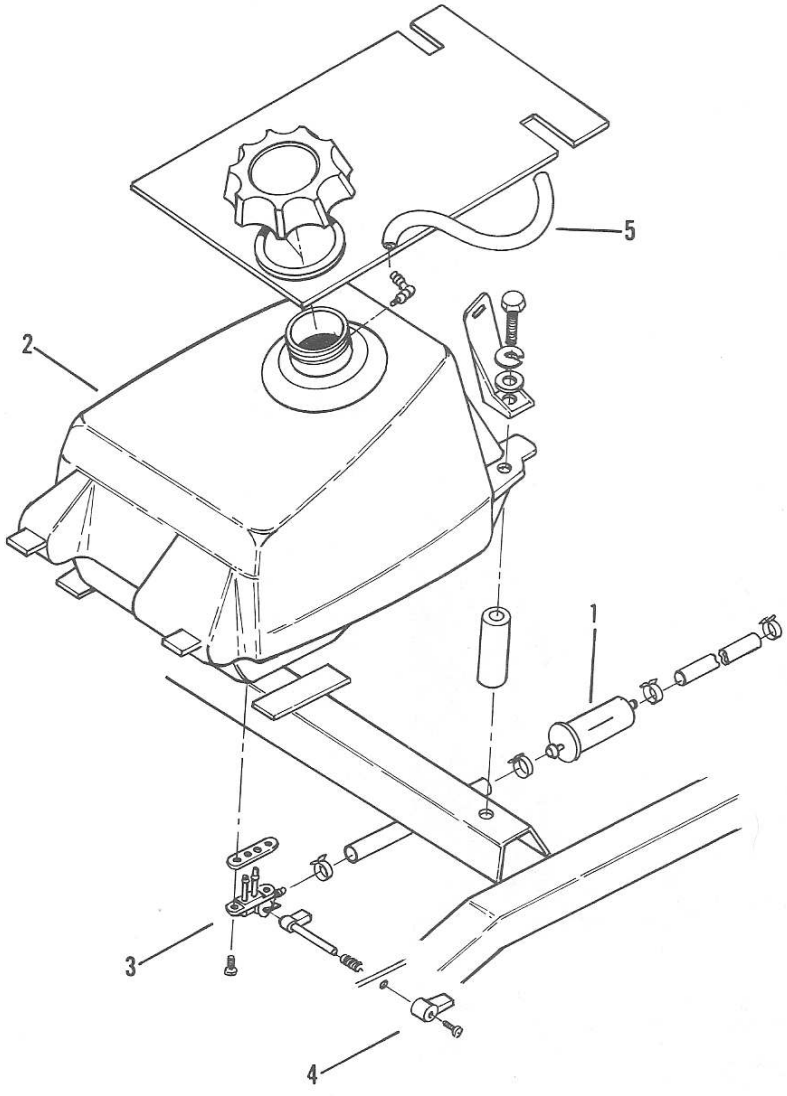
#### *Valve attached to fuel tank*

The fuel shut-off valve is attached to the bottom of the fuel tank (3, **Figure 53**) or in the fuel line below the bottom of the tank (3, **Figure 54**). To remove the valve from the bottom of the tank, proceed as follows:

1. Remove the seat.
2. Disconnect the ground cable from the battery on models so equipped.
3. Make sure the fuel valve is OFF or prepare to plug the fitting from the fuel tank, then loosen the hose clamp and disconnect the fuel line.
4. Open the shut-off valve and carefully drain all remaining fuel from the tank. If fuel can not be drained, siphon the fuel from the tank. The tank should be as empty as possible. Turn the shut-off valve to the OFF position when finished.
5. Unbolt and remove the fuel tank cover.
6. Remove the screw from the center of the shut-off handle (**Figure 55**), then remove the handle (4, **Figure 53**).
7. Unbolt and remove the fuel tank (2, **Figure 53**).
8. Remove the two screws attaching the shut-off valve (3, **Figure 53**) to the tank, then pull the shut-off valve assembly from the tank.
9. Install by reversing the removal procedure. Check for leaks after installing and filling with fuel.

(53)

**FUEL TANK**
**(FUEL VALVE ATTACHED TO TANK)**




1. Fuel filter
2. Fuel tank
3. Shut-off valve
4. Knob
5. Vent hose

*Valve connected inline with fuel hose*

To remove the valve from Xplorer and other models with the shut-off valve located in the fuel line below the tank, proceed as follows:

1. Remove side cover.
2. Loosen the clamps on the fuel supply lines (4, **Figure 54**) to the shut-off valve.
3. Pinch one of the two fuel supply lines to stop the fuel, detach the line from the shut-off valve, then plug the line to keep it from leaking.
4. Detach the second fuel supply line from the shut-off valve as described in Step 3.
5. Loosen the hose clamp, then detach the fuel outlet line from the fuel shut-off valve.
6. Remove screw from the center of the fuel shut-off knob (5, **Figure 54**), then pull the knob from the shaft.
7. Remove the attaching nut (6, **Figure 54**) to remove the valve assembly.

### Wire Harness, Control Cables and Hose Lines

Inspect all wiring, cables and hoses for proper routing. The spark plug wire for models with 300 cc engines should be held in place by routing the wire between the left frame and the brake line. The spark plug wire for 400L models should be routed directly to the front.

Secure loose components with cable ties. Secure hoses, cables and wires to the frame with cable ties. Tighten cable ties only enough to hold the components, but not tight enough to collapse the hoses.

Replace damaged wires, hoses and cables as required following the original routing. The original routing can sometimes be more easily followed by attaching a string to the old wire, cable or hose before withdrawing it. If carefully removed, the string can then be used to pull the new component through the same path as the old one.

### Drive Pulley Adjustment

Refer to Chapter Eight.

### Steering and Front Suspension Inspection

Check the steering assembly monthly. Wheel alignment cannot be maintained with bent or otherwise damaged steering components or with loose or missing fasteners.

1. Visually inspect all components of the steering. Pay close attention to the tie-rods (B, **Figure 50**) and steering shaft, especially after a hard spill or collision. If there is steering system damage, the steering components must be repaired as described in Chapter Twelve.
2. Check the handlebars for looseness. Tighten the clamp screws (**Figure 46**) or install new parts as required.
3. Check all bolts attaching steering and suspension parts for the correct tightness.
4. Refer to Chapter Twelve for additional checks.

### General Inspection

Refer to *General Inspection and Maintenance* in this chapter.

### Engine Mounts and Fasteners

Loose engine mounts will cause incorrect clutch alignment. Check the engine mounts and mounting screws to make sure they are tight. Check and tighten if necessary all accessible engine assembly fasteners.

*NOTE*

*If the engine mount screws are loose, check clutch alignment as described in Chapter Eight after retightening the fasteners.*

### Cylinder Head Torque

If the engine is a 2-stroke model, refer to Chapter Four. If the engine is a 4-stroke model, refer to Chapter Five.

### Ignition Timing

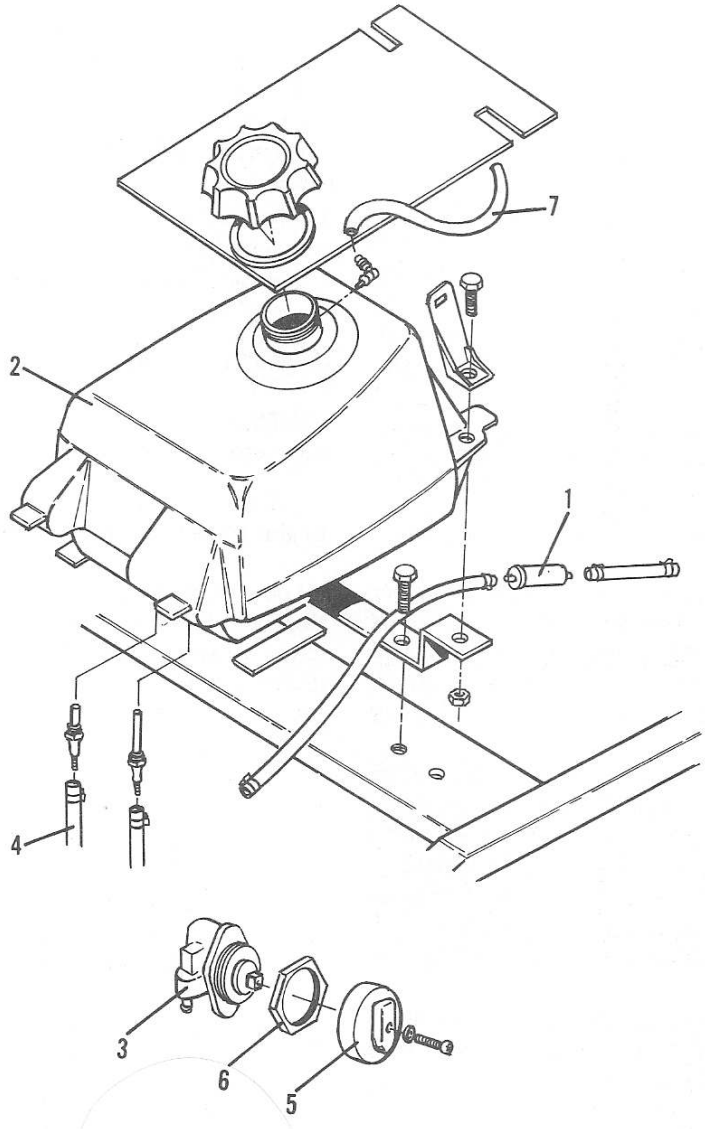
Refer to *Tune-Up* in this chapter.

### Carburetor Adjustment

Refer to *Tune-Up* in this chapter.

54

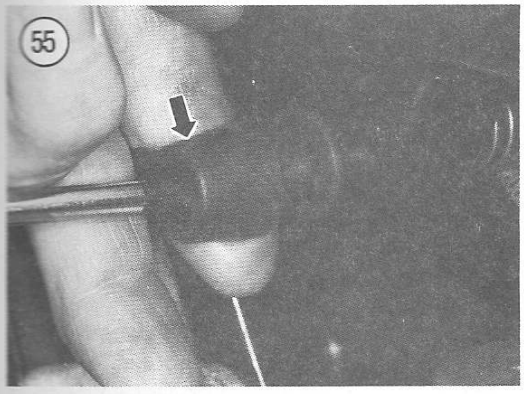
## FUEL TANK
## (FUEL VALVE IN FUEL HOSE)



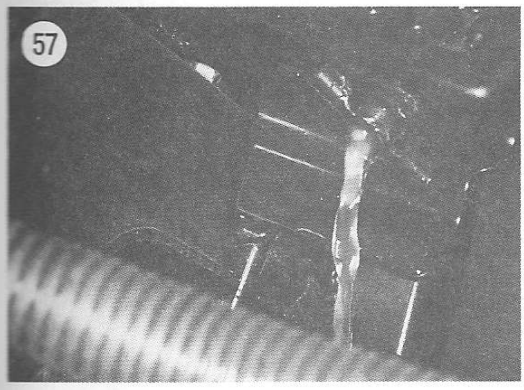

1. Fuel filter
2. Fuel tank
3. Shut-off valve
4. Hoses from tank to valve
5. Knob
6. Nut
7. Vent hose

### Throttle Cable Routing (Models With 2-Stroke Engines)

The single throttle cable that begins at the thumb control is attached to two cables by a junction block. The two branched cables are connected to the carburetor and the oil injection pump. Check the throttle cable from the thumb throttle to the carburetor and oil pump for proper routing. Check the cable ends for fraying or splitting that could cause the cable to stick in the housing or break.








### Headlight

Refer to Chapter Eleven.

### Cooling System Inspection (Liquid Cooled Models)

*WARNING*

*When performing any service work to the engine or cooling system, never remove the radiator cap (**Figure 56**), open the coolant drain (**Figure 57**) or disconnect any hose while the engine is hot. Scalding fluid and steam may be blown out under pressure and cause serious injury.*

Check the following items once a year, or whenever troubleshooting the cooling system. If you do not have the test equipment, the tests can be done by a Polaris dealer, radiator shop or service station.

1. Loosen the radiator cap to its first detent and release the system pressure, then turn the cap to its second detent and remove it from the radiator. See **Figure 56**.
2. Check the rubber washers on the radiator cap for tears or cracks. Check for a bent or distorted cap. Raise the vacuum valve and rubber seal and rinse the cap under warm tap water to flush away any loose rust or dirt particles.
3. Inspect the radiator cap neck seat on the coolant tank for dents, distortion or contamination. Wipe the sealing surface with a clean cloth to remove any rust or dirt.

*CAUTION*

*Do not exceed 89.6 kPa (13 psi) when performing Steps 4 and 5 or damage to the cooling system will occur.*

4. Have the radiator cap pressure tested. The specified radiator cap relief pressure is 69 kPa (10 psi). The cap must be able to sustain this pressure. Replace the radiator cap if it does not hold pressure.
5. Leave the radiator cap off and have the entire cooling system pressure tested. The entire cooling system should be pressurized to 69 kPa (10 psi). The

system must be able to hold this pressure. Replace or repair any components that fail this test.

6. Check all cooling system hoses for damage or deterioration. Replace any hose that is in questionable condition. Make sure all hose clamps are tight.

7. Check the radiator for leaks or other damage. Repair or replace the radiator as necessary.

### Coolant Check (Liquid Cooled Models)

Most models have a coolant recovery system that includes the coolant recovery reservoir (**Figure 58**). Normal service includes making certain that coolant in the recovery tank remains between the minimum and maximum marks (**Figure 58**). The cap of the recovery tank is vented and can be removed to add coolant while hot. When heated, the liquid coolant will normally expand and raise the level of fluid in the recovery tank. Then as the engine cools (after stopping the engine) the coolant from the recovery tank will be drawn back into the engine.

*WARNING*

*Do not remove the radiator cap (**Figure 56**) when the engine is hot. Scalding hot coolant may be expelled onto your skin.*

To check and service coolant in the engine as well as in the recovery tank, proceed as follows.

1. Park the vehicle on level ground.
2. Remove the cover.
3. Loosen the radiator cap (**Figure 56**) to its first detent and release the system pressure, then turn the cap to its second detent and remove it from the radiator.
4. Check the level in the radiator. If the radiator is not completely filled, add a sufficient amount of antifreeze and water (in a 50:50 ratio) through the radiator cap opening as described under *Coolant Inspection and Change* in this chapter.
5. Reinstall the radiator cap (**Figure 56**).
6. Remove the cap from the coolant recovery tank (**Figure 58**) and add an antifreeze and water mixture (in a 50:50 ratio) until the coolant is between the minimum and maximum marks on the recovery tank. The cap of the recovery tank is vented and can be removed to add coolant while the engine is hot.

### Coolant (Liquid Cooled Models)

Use only a high-quality ethylene glycol based coolant compounded for aluminum engines. Mix the coolant with water at a 50:50 ratio. Coolant capacity is listed in **Table 5**. When mixing antifreeze with water, make sure to use only soft or distilled water. Distilled water can be purchased at supermarkets in gallon containers. Do not use tap or saltwater because it will damage engine parts.

*CAUTION*

*Always mix coolant in the proper ratio for the coldest temperature in your area. Pure antifreeze is more likely to freeze at a higher temperature than a 50/50 mixture of antifreeze and water.*

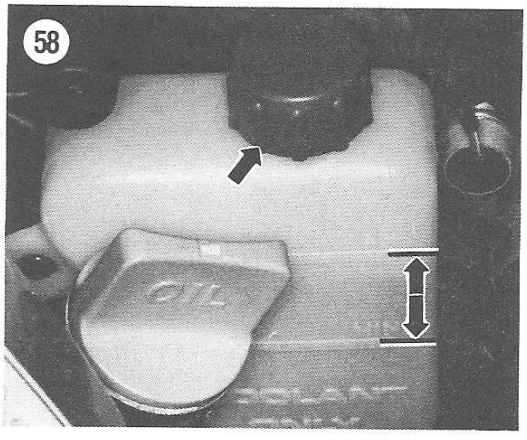
### Coolant Change (Liquid Cooled Models)

The cooling system should be completely drained and refilled once a year (preferably before off-season storage).

*CAUTION*

*Use only a high-quality ethylene glycol antifreeze specifically labeled for use with aluminum engines. Do not use an alcohol-based antifreeze.*

Follow the procedure described under *Coolant Inspection and Change* in this chapter while the engine is *cold*.



## GENERAL INSPECTION AND MAINTENANCE

### Recoil Starter

Pull out the starter rope and inspect it for fraying. If its condition is questionable, replace the rope as described in Chapter Four or Chapter Five.

Check the action of the starter. It should be smooth, and when the rope is released, it should return all the way. If the starter action is rough or if the rope does not return, service the starter as described in Chapter Four or Chapter Five.

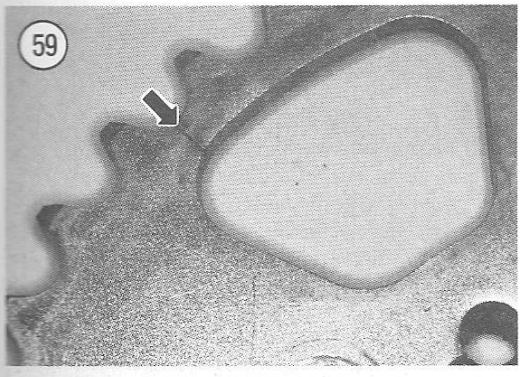
### Body Inspection

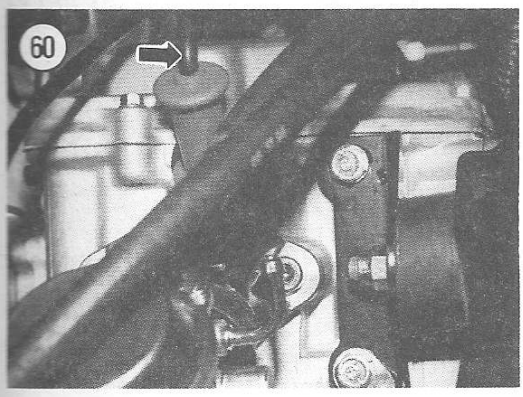
Repair or replace damaged body panels.

### Body Fasteners

Tighten any loose body fasteners. Replace loose rivets by first drilling out the old rivet and then installing a new one with a pop-riveter. This tool, along with an assortment of rivets, is available through many hardware and auto parts stores. Follow the manufacturer's instructions for installing rivets.

Welded joints should be checked for cracks and damage. Damaged welded joints should be repaired by a competent welding shop.




### Drive Axle Sprockets

Inspect the teeth on the drive axle sprockets for wear, cracks (**Figure 59**) and other damage. If the sprockets are damaged, replace them as described in the service section for the specific unit or system.

### Fuel Tank and Lines

Inspect the fuel tank for cracks and abrasions. If the tank is damaged and leaking, replace it. See Chapter Six.

### Oil Tank

Inspect the oil tank for cracks, abrasions or leaks. Replace the tank if its condition is in doubt.

### Electrical System

Check all of the switches for proper operation. Refer to Chapter Eleven.

### Electrical Connectors

Inspect the high-tension lead to the spark plug (**Figure 60**) for cracks and breaks in the insulation and replace the lead if it is not perfect. Breaks in the insulation allow the spark to arc to ground and will impair engine performance.

Check primary ignition wiring and lighting wiring for damaged insulation. Usually minor damage can be repaired by wrapping the damaged area with electrical insulating tape. If insulation damage is extensive, replace the damaged wires.

### Abnormal Engine Noise

Start the engine and listen for abnormal noises. Often the first indication of developing trouble is a change in sound. An unusual rattle might indicate a

loose fastener that can be easily repaired, or it could be the first indication of severe engine damage. After becoming familiar with the vehicle and with practice, you will be able to identify most new sounds. Periodic inspections and quick identification of abnormal engine noises can prevent a complete engine failure.

### Oil and Fuel Lines

Inspect the oil and fuel lines for loose connections and damage. Tighten all connections and replace any lines that are cracked or damaged.

## ENGINE TUNE-UP

The number of definitions of the term "tune-up" is probably equal to the number of people defining it. For the purposes of this book, a tune-up is general adjustment and maintenance to insure peak engine performance.

The following paragraphs discuss the different parts of a tune-up which should be performed in the order given. Have the new parts on hand before you begin.

To perform a tune-up on your vehicle, you need the following tools and equipment:

a. A spark plug wrench.
b. Socket wrench and assorted sockets.
c. Phillips head screwdriver.
d. Spark plug feeler gauge and gap adjusting tool.
e. Dial indicator.
f. Flywheel puller.
g. Compression gauge.

### Cylinder and Cylinder Head Nuts

The screws and nuts retaining the cylinder or cylinder head must be tight. If any are loose, the gasket may be damaged and leakage will continue even after tightening the fasteners. The engine must be at room temperature when tightening the retaining fasteners.

1. Remove any cowling necessary to access the cylinder and head fasteners.

2A. For models with 2-stroke engines, tighten each screw or nut retaining the cylinder and cylinder head in a crossing pattern to the torque listed in **Table 7.** Additional cylinder head service is described in Chapter Four.

2B. For Magnum models (4-stroke engine), tighten the screws and nuts retaining the cylinder head as described in Chapter Five. The cylinder head must be removed to tighten the cylinder retaining fasteners.

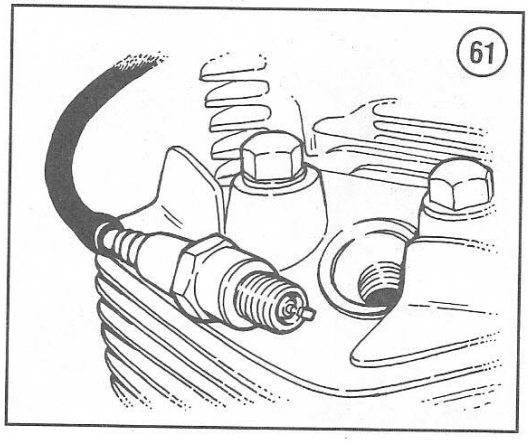
### Cylinder Compression

A compression check is one of the quickest ways to check the condition of the piston rings, valves, cylinder and head gasket. It's a good idea to check compression at each tune-up, record the compression of each cylinder, then compare the current compression with test results from earlier tune-ups. The first step is to write the measured compression of the cylinder and the date, so that it can be compared with tests recorded at the later tune-ups. A gradual change may indicate normal wear or may help you spot a developing problem.

1. Start and run the engine until it warms to normal operating temperature, then turn the engine off.

*CAUTION*

*To prevent expensive engine damage, use compressed air to blow dirt away from around the base of the spark plug. Dirt that accumulates around the plug may fall into the cylinder when the plug is removed and cause serious engine damage when the engine is restarted.*



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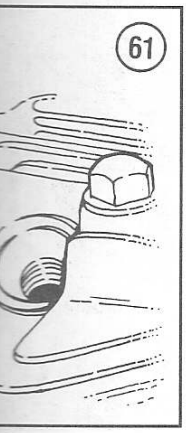
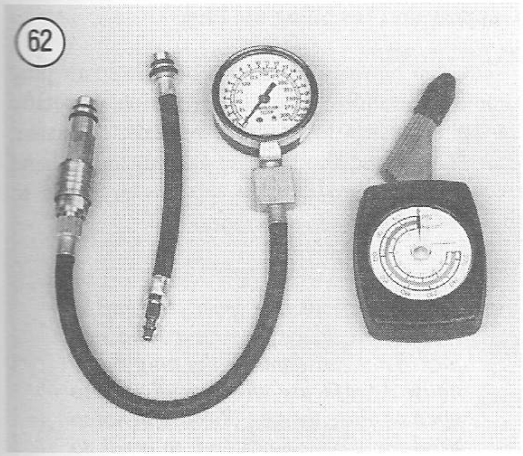
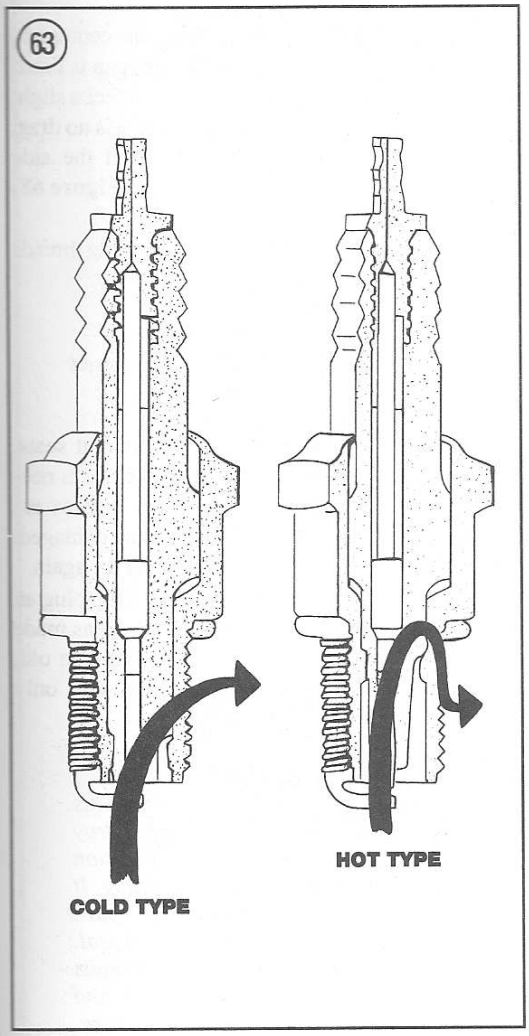





2. Remove the spark plug. Insert the plug in the cap, then ground the plug to the cylinder head or exhaust pipe. Refer to **Figure 61**.

*CAUTION*

*If the plug is not grounded during the compression test, the ignition could be damaged.*

3. Screw a compression gauge (**Figure 62**) into the spark plug hole or, if you have a press-in type gauge, hold it firmly in position.
4. Make sure the emergency cutout switch is in the OFF position.
5. Hold the throttle wide open and crank the engine several revolutions until the gauge gives its highest reading. Record the reading. Remove the compression gauge and release the pressure valve.
6. If the compression is very low, a ring could be broken or there may be a hole in the piston. On models with a 4-stroke engine, a valve may be stuck open or damaged.

### Correct Spark Plug Heat Range

The proper spark plug is very important in obtaining maximum performance and reliability. The condition of a used spark plug can tell a trained mechanic a lot about engine condition and carburetion.

Select a plug of the heat range designed for the loads and conditions under which the vehicle will be run. Use of a spark plug with the incorrect heat range can result in a seized piston, scored cylinder wall or damaged piston crown.

*CAUTION*

*Do not install a plug that is much different from that specified by the manufacturer. The terms "Hot" and "Cold" are relative and should not be considered literal, except as they relate to the specific engine and the type of service. Refer to **Figure 63**.*

In general, use a hot plug for low speeds and low temperatures. Use a cold plug for high speeds, high engine loads and high temperatures. The plug should operate hot enough to burn off unwanted deposits, but not so hot that it burns itself or causes preignition. The insulator of a spark plug that is the correct

heat range will be a light tan color after the engine has operated for awhile. See **Figure 64**.

The reach (length) of a plug is also important. A shorter than normal plug will cause hard starting, reduced engine performance and carbon buildup on the exposed cylinder head threads. A spark plug that is longer than normal might interfere with the piston or may cause overheating. Physical damage to the piston or overheating often results in severe engine damage. Refer to **Figure 65**. If a spark plug extends into the combustion chamber too far (**Figure 65**), carbon buildup on the exposed threads may prevent the spark plug from being removed. Forcing the spark plug out will probably damage the threads in the cylinder head.

The standard heat range spark plug for the various models is listed in **Table 8**. It may be desirable to install a spark plug of a slightly different heat range than listed to match specific operating conditions.

### Spark Plug Removal/Cleaning

1. Grasp the spark plug lead as near the plug as possible and pull it from the plug. If the spark plug cap (**Figure 66**) is stuck to the plug, twist the cap slightly to break it loose.

*CAUTION*

*Dirt could fall into the cylinder when the plug is removed, causing serious engine damage when the engine is started.*

2. Use compressed air to blow away any dirt that has accumulated next to the spark plug base.

*NOTE*

*If the plug is difficult to remove, apply penetrating oil, like WD-40 or Liquid Wrench, around the base of the plug and let it soak. If the plug is still difficult to remove, apply additional penetrating oil and let it soak into threads again.*

3. Remove the spark plug with a spark plug wrench.
4. Inspect the plug carefully. Look for a broken center porcelain, excessively eroded electrodes, and excessive carbon buildup or oil fouling. See **Figure 64**.

### Gapping and Installing the Plug

The gap between electrodes of new spark plug should be carefully set before installation. A specific gap is necessary to ensure a reliable, consistent spark. Use a special spark plug gapping tool to bend the ground electrode and a wire feeler gauge to measure gap between electrodes.

*NOTE*

*Never try to close the spark plug gap by tapping the spark plug on a solid surface. This can damage the plug internally. Always use the special tool to open or close the gap. Be careful not to bend the electrode enough to break to weaken it.*

1. Insert a wire feeler gauge between the center and side electrode (**Figure 67**). The correct gap is listed in **Table 8**. If the gap is correct, you will feel a slight drag as you pull the wire through. If there is no drag, or the gauge won't pass through, bend the side (ground) electrode with a gapping tool (**Figure 68**) to set the proper gap.
2. Apply an anti-seize compound to the plug threads before installing the spark plug.

*NOTE*

*Anti-seize compound can be purchased at most automotive parts stores.*

3. Screw the spark plug in by hand until it seats. Very little effort should be required. If force is necessary, the plug is cross-threaded, the threads are dirty or the threads in the cylinder head are damaged. Unscrew the plug, clean the threads and try again.
4. Use a spark plug wrench and tighten the plug an additional 1/4 to 1/2 turn after the gasket has made contact with the head. If you are installing an old, regapped plug and reusing the old gasket, only tighten an additional 1/4 turn.

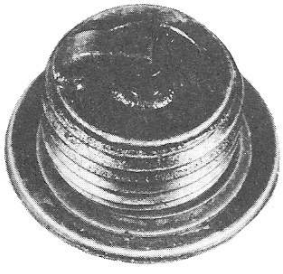
*CAUTION*

*Do not overtighten the spark plug. This will only squash the gasket and destroy its sealing ability, causing compression leakage around the base of the plug. It is also important to tighten the spark plug sufficiently to provide a good seal. If the plug is too loose, hot exhaust gasses will pass around the threads and eventually make the plug difficult to re-*

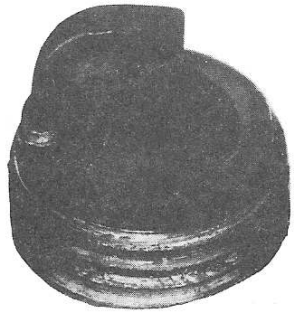
64

**SPARK PLUG CONDITIONS**

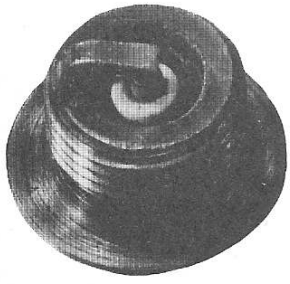
NORMAL USE



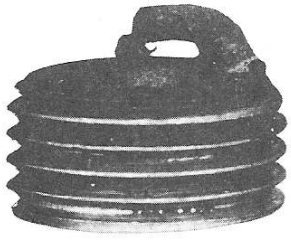
OIL FOULED



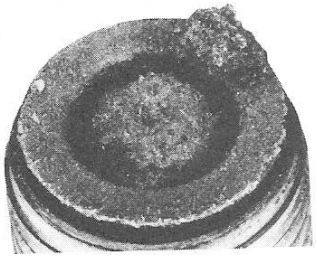
CARBON FOULED



OVERHEATED



GAP BRIDGED



SUSTAINED PREIGNITION

WORN OUT

*move without damaging the threads in the cylinder head.*

5. Install the spark plug wire. Make sure it snaps onto the top of the plug tightly.

*CAUTION*

*Make sure the spark plug wire is located away from the exhaust pipe. The spark plug wire on models with 300 cc engines should be held in place by routing the wire between the left frame and the brake line. The spark plug wire on 400L models should be routed directly to the front.*

### Reading Spark Plugs

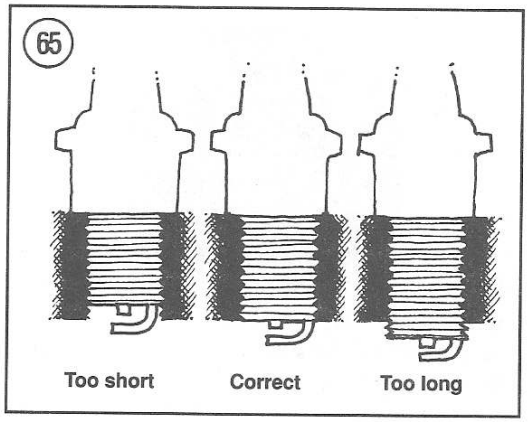
Much information about engine and spark plug performance can be determined by careful examination of the spark plug. Refer to **Figure 64**.

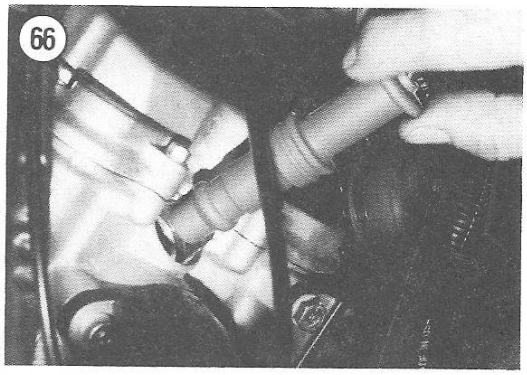
### Ignition Timing

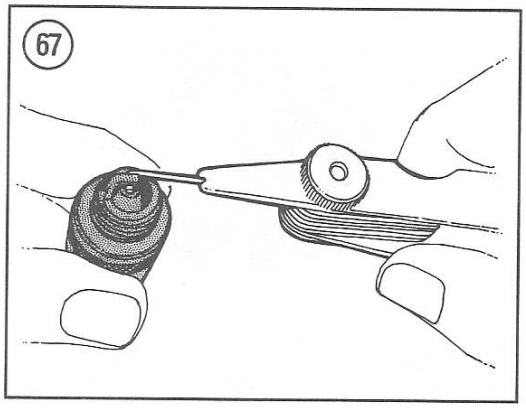
All models are equipped with a capacitor discharge ignition (CDI) and no breaker points are used. This ignition system is much less susceptible to failures caused by dirt, moisture and wear than conventional breaker-point ignition.

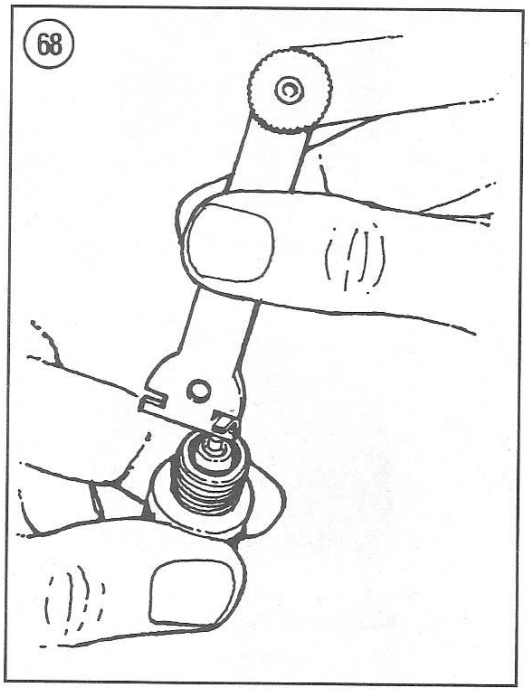
Check the dynamic ignition timing with the engine running at the rpm indicated in **Table 9**. The procedure for setting the *Dynamic Timing* is described in this chapter. When assembling the ignition system, refer to the *Initial Timing* procedure described in this chapter.

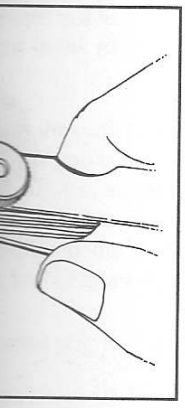
First check the static timing, then check the timing with the engine running (dynamic timing).

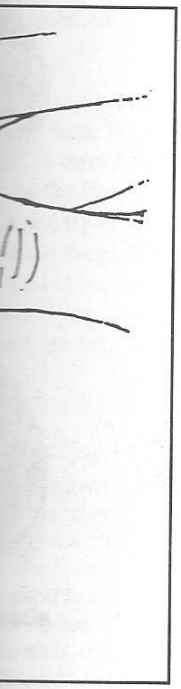






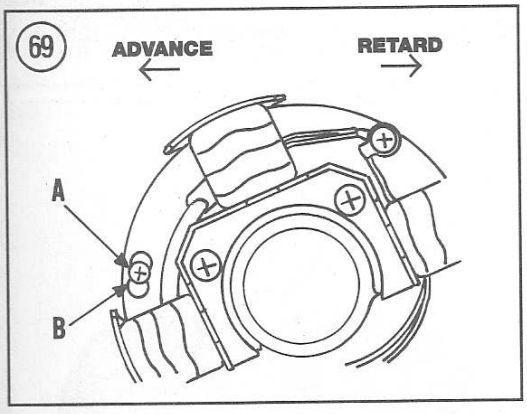


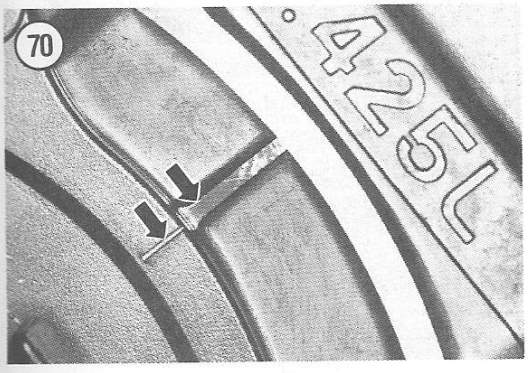
Static timing can be used to verify the flywheel timing marks before using a timing light to check the ignition timing with the engine running. The static timing procedure is used to:

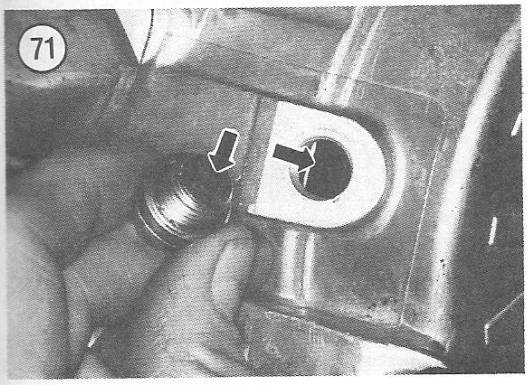
a. Find the correct flywheel timing mark to use.

b. Detect a broken or missing flywheel Woodruff key.

c. Detect a twisted crankshaft.




d. Scribe timing marks on a new flywheel.

Static timing requires the use of an accurate dial indicator to determine the piston position in relation to top dead center (TDC). Before making any timing adjustment, find exact TDC as described in the *Static Timing* paragraphs which follow in this chapter.

Dynamic engine timing uses a timing light connected to the spark plug lead. As the engine is cranked or run, the light flashes each time the spark plug fires. When the light is pointed at the moving flywheel, the mark on the flywheel appears to stand still. The correct mark on the flywheel should align with the stationary timing pointer on the engine.

The static timing and dynamic timing both depend upon operating parts and correct assembly. The initial timing procedure is used to assemble the parts close to the correct timing position.

### *Initial timing*

Ignition timing is changed by relocating the stator plate that is located under the engine flywheel. When disassembling, note that the holes for the stator plate attaching screws are elongated.

On 2-stroke engines, refer to **Figure 69**. When assembling, align the mark on the stator plate with the center of the mounting screw as shown (A, **Figure 69**) for all models except Cyclone. On Cyclone models, mark (B, **Figure 69**) should be centered on the screw.

On 4-stroke engines, refer to **Figure 70**. When assembling, align the mark on the stator plate with the mark on the crankcase as shown in **Figure 70**.

It may be necessary to move the stator plate slightly when timing dynamically as described in this chapter.

### *Static timing*

1. Remove any interfering cowling.
2. Remove the plug from the timing hole in the recoil starter (**Figure 71**, typical).
3. Remove the spark plug as described in this chapter.
4. Install a dial indicator and locate top dead center (TDC) as follows:
   a. Screw the extension onto a dial indicator and insert the dial indicator into the adapter.

b. Screw the dial indicator adaptor into the cylinder head (**Figure 72**). Do not lock the dial indicator in the adapter at this time.

c. Rotate the flywheel (by turning the drive pulley) until the dial indicator rises all the way up in its holder (piston is approaching top dead center). Then slide the indicator far enough into the holder to obtain a reading.

d. Tighten the set screw holding the dial indicator adaptor to the dial gauge lightly.

e. Rotate the flywheel until the dial on the gauge stops and reverses direction. This is top dead center. Zero the dial gauge by aligning the zero with the dial.

5. Look at the flywheel, through the timing plug hole. Some, (not all) models are equipped with a "T" mark indicating top dead center (A, **Figure 73**). Note the timing advance marks at B, **Figure 73**.

6. Rotate the crankshaft counterclockwise (viewed from the right-hand side) until the gauge needle has made approximately 3 revolutions. This will back the engine up sufficiently to remove all play.

7. Carefully turn the crankshaft clockwise until the gauge indicates that the piston is the correct distance before top dead center as indicated in **Table 9**.

8. View the timing marks through the hole in the crankcase (**Figure 74**). The correct mark on the flywheel should align with the pointer or boss on the magneto housing as shown. If they do not, perform the following:

a. Make a new temporary mark on the flywheel that aligns with the crankcase mark similar to the correct marks shown in **Figure 74**. This temporary mark can be used as the reference when using the timing light.

*NOTE*

*If the wrong flywheel is installed or if the flywheel is not correctly installed on the crankshaft, you will probably not be able to make the engine run until the correct flywheel is installed and correctly timed to the crankshaft.*

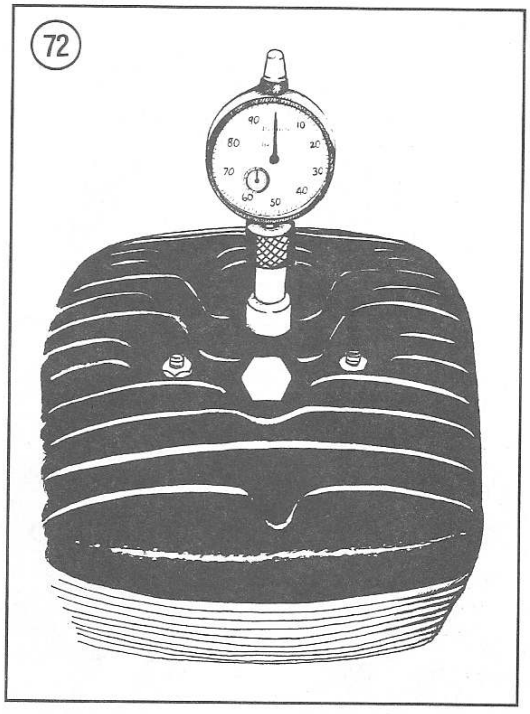
b. Repeat the timing procedure to check the accuracy of the new mark. It is also a good idea to remove the recoil starter and check the flywheel for other marks. If the engine does not run and the factory marks are far off, the flywheel key may be sheared or missing.

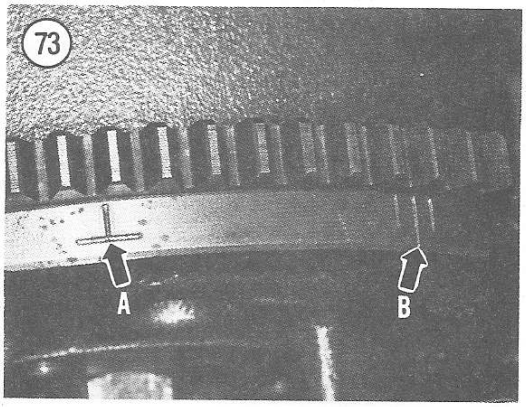
9. Remove the dial gauge and adapter. Install the spark plug and connect the spark plug high-tension lead.

10. Check the ignition *Dynamic Timing* as described in this chapter.

### *Dynamic timing*

Check ignition timing while the engine is cold, before warming to normal temperature. Timing may change as much as 2° when the engine warms.



1. Perform the *Static Timing Check* in this chapter to make sure flywheel is correctly installed and the timing mark is correctly positioned. It will also allow you to identify correctly the proper mark and to color it with white paint or chalk so that it will be easier to see.
3. Attach a stroboscopic timing light to the spark plug lead. Follow the instructions provided by the manufacturer of the timing light.
4. Attach a tachometer according to its manufacturer's instructions.
5. Block the position of the vehicle's wheels, so the ATV can not move, and shift the transmission to neutral.

*WARNING*

*Don't allow anyone to stand behind or in front of the vehicle when the engine is running, and take care to keep hands, feet and clothing away from the engine, belt and drive chains.*

*NOTE*

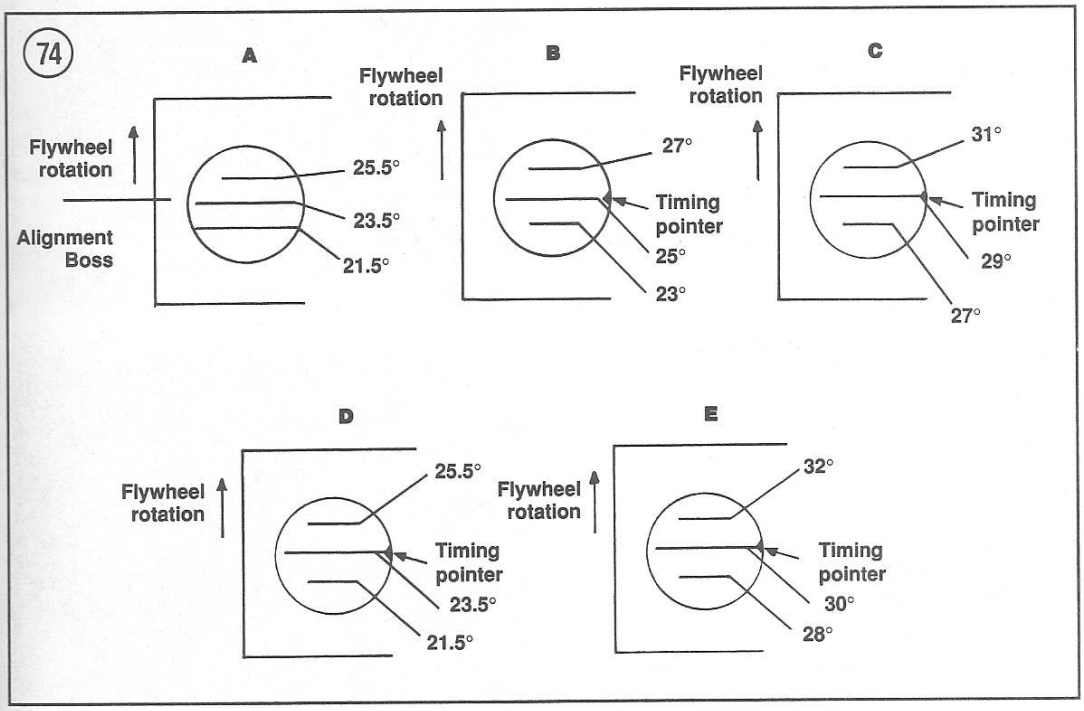
*Because ignition components are temperature sensitive, ignition timing should be checked, when the engine is cold.*

6. Start the engine, allow it to idle for approximately 10-15 seconds, then increase the engine speed to the correct test rpm listed in **Table 9**.
7. Point the timing light at the crankcase timing inspection hole (**Figure 71**) and observe the flywheel timing mark that appears to be stopped in line with the timing pointer or boss on the magneto housing.

*NOTE*

*The timing light will flash, appearing to stop the timing marks at the instant of ignition.*

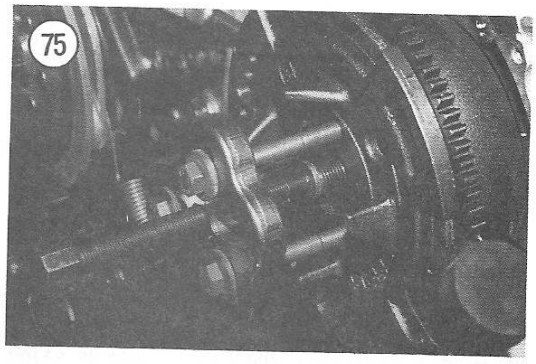
8. Increase the engine speed briefly and observe the timing mark that is aligned with the timing pointer or boss.
9. Refer to **Table 9** for the correct timing specifications. Compare the observed timing to the correct timing.
10. If timing is not correct, the ignition timing should be adjusted. Refer to *Setting Ignition Timing* in this chapter.
11. When timing is correct, turn the engine off, remove the timing light and tachometer. Install all of the covers that were removed.

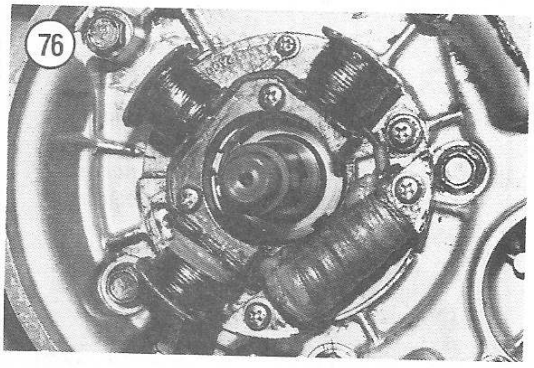


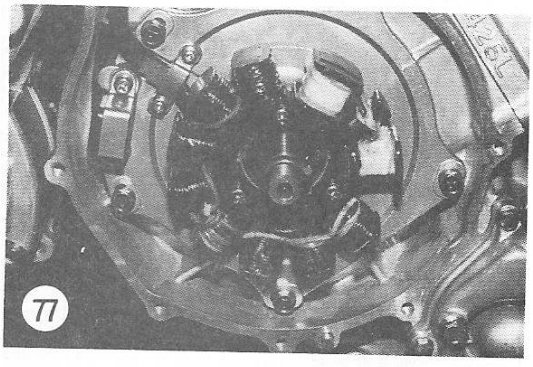
*Setting ignition timing*

The ignition must occur at a specific time for the engine to perform at its optimum. Refer to **Table 9** for the recommended timing for your specific model, then refer to the following procedure.

1. Before changing the ignition timing, refer to *Static Timing Check* in this chapter to make sure the timing marks are correctly located on the flywheel and the flywheel is correctly installed. After making sure the marks are correct, perform the *Dynamic Timing Check* as outlined in this chapter. Leave the timing light attached.
2. Remove the recoil starter assembly as described in Chapter Four (2-stroke engines) or Chapter Five (4-stroke engines).
3. Remove the flywheel as described in Chapter Four or Chapter Five. Refer to **Figure 75** for a typical flywheel puller attachment.
4. Ignition timing is changed by moving the stator plate (**Figure 76** or **Figure 77**). Observe the following:
   a. If the correct flywheel mark did not yet reach the timing pointer or boss, the ignition timing is advanced. To correct the timing, loosen the screws attaching the stator, then move the stator clockwise slightly.
   b. If the correct flywheel mark had passed the timing pointer or boss, the ignition timing is retarded. To correct the timing, loosen the screws attaching the stator, then move the stator counterclockwise slightly.
   c. Tighten the stator plate retaining screws.
   d. Reinstall the flywheel, starter pulley and recoil starter assembly.
5. Recheck the dynamic ignition timing. If timing is still not correct, repeat steps 3 and 4 until ignition timing is correct.
6. Install the timing hole plug and any removed covers.



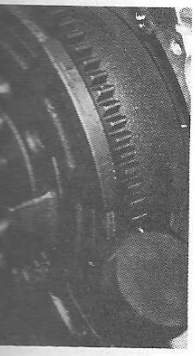



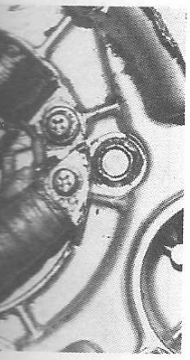





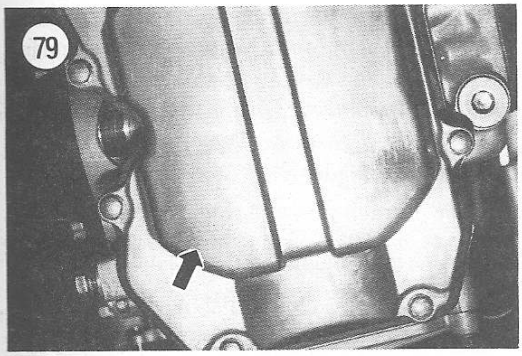
## Cam Chain Adjustment (4-Stroke Engines)

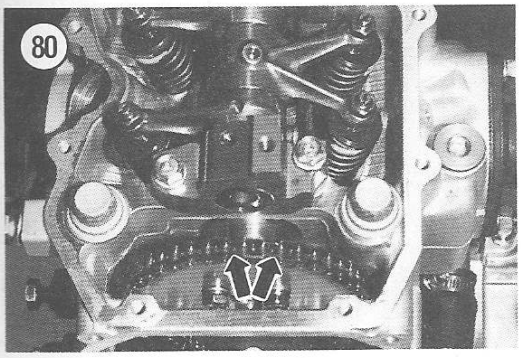
An automatic cam chain tensioner assembly is used and no manual adjustment is required.

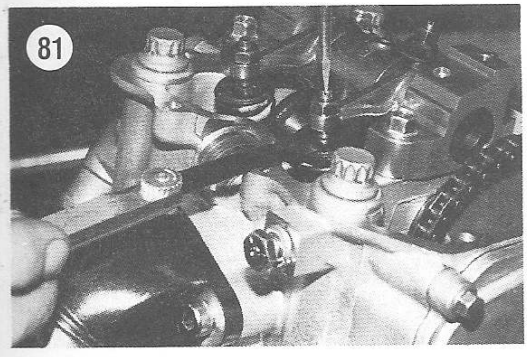










### Valve Clearance (4-Stroke Engine)

Check and adjust valve clearance with the engine cold. The exhaust valves are located at the front of the engine and the inlet valves are located the rear of the engine.

1. Place the ATV on a level surface and block the wheels to keep it from rolling.
2. Refer to Chapter Fifteen to remove the seat, side covers and fuel tank cover.
3. Shut the fuel off, disconnect the fuel lines, then unbolt and remove the fuel tank (**Figure 78**). Refer to Chapter Six.
4. Disconnect the spark plug high tension lead and remove the spark plug. Removing the spark plug will make it easier to rotate the engine.
5. Remove the screws attaching the cylinder head cover (**Figure 79**), then remove the cover.
6. Turn the engine until the two marked teeth (**Figure 80**) on the side of the cam sprocket are at the top. This will set the piston at (or near) Top Dead Center on the compression stroke and all of the valves will be closed. Check by moving each rocker arm by hand. There should be some side movement.
7. Check the clearance of both the intake valve and exhaust valves by inserting a flat feeler gauge between the rocker arm pad and the valve stem as shown in **Figure 81**. The correct valve clearances for the intake and exhaust valves are listed in **Table 10**. If the clearance is correct, there will be a slight resistance on the feeler gauge when it is inserted and withdrawn.
8. To correct the clearance, perform the following:
   a. Loosen the valve adjuster locknut.
   b. Use a screwdriver to turn the adjuster in or out so there is a slight resistance felt on the feeler gauge (**Figure 81**).
   c. Hold the adjuster to prevent it from turning and tighten the locknut to the torque specification listed in **Table 7**. An offset adapter must be used on the torque wrench as shown in **Figure 82**.
   d. Recheck the clearance to make sure the adjuster did not move when the locknut was tightened. Readjust the valve clearance if necessary.
9. Clean the gasket surfaces of the cylinder head and cover, then install a new gasket to the cylinder head cover.

10. Install the cylinder head cover and tighten the retaining screws to the torque listed in **Table 7**.
11. Complete assembly by reversing the disassembly procedure.

## Carburetor Adjustment

### *Idle mixture*

Adjustment of the pilot air screw controls the fuel and air mixture at idle speed. Turning the pilot air screw clockwise reduces the amount of air and richens the mixture.

1. Locate the pilot air screw.
   a. On 2-stroke engines, the pilot air screw (A, **Figure 83**) is on the right side of the carburetor.
   b. On 4-stroke (Magnum) engines, the pilot air screw is located on the bottom of the carburetor, nearest the engine (A, **Figure 84**).
2. Turn the pilot air screw in (clockwise) until it seats lightly.

*NOTE*
*Do not damage the seat or the tip of the pilot air screw by forcing it into its seat.*

3. Back the pilot air screw out the number of turns specified in **Table 11**. The standard setting should be nearly optimum for operation at air temperature of 15.6° C (60° F). The screw should be turned IN approximately 1/4 turn for each 30° below 60° F (or 1/4 turn for each 16° below 15.6° C). The pilot air screw should be turned OUT (counter-clockwise) about 1/4 turn for each 30° above 60° F (or 16° above 15.6° C).

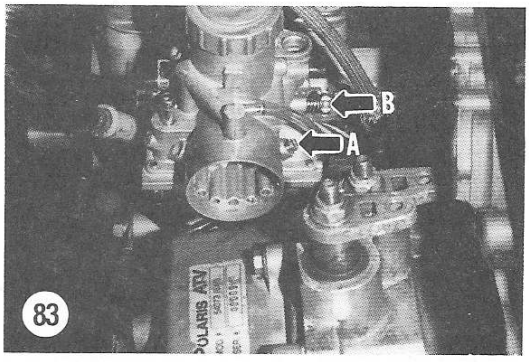
*CAUTION*
*Do not use the pilot air screw to change engine idle speed. The pilot air screw must be set as specified or a "too lean" mixture and subsequent engine damage may result.*

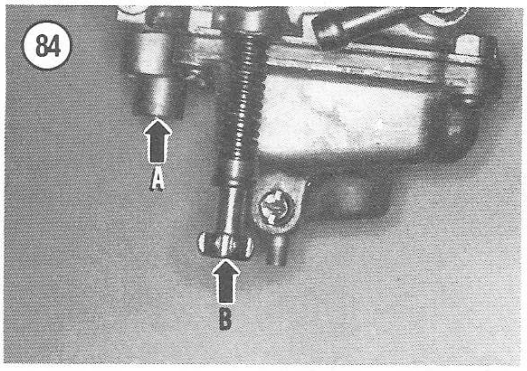
### *Throttle cable adjustment*

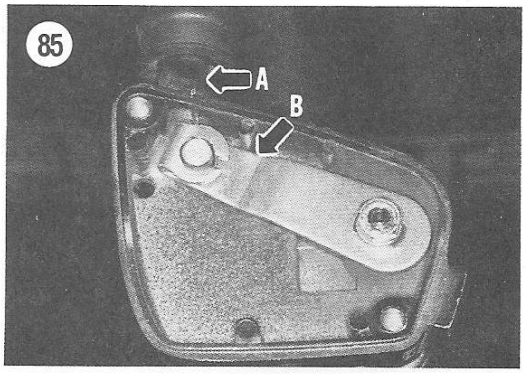
The throttle cable is attached to the handle bar mounted speed control (throttle) lever to change the engine speed by opening the carburetor's throttle valve. On models with a 2-stroke engine, the throttle also controls the amount of lubricating oil that the oil pump injects into the engine.

Maintaining correct cable free play is critical to proper speed control and to prevent cable damage. On models with a 2-stroke engine, it is also important to ensure correct engine lubrication.

1. Remove the cover from the handlebar housing (**Figure 85** or **Figure 86**).
2. Slide the rubber boot (A, **Figure 85** or A, **Figure 86**) away from the cable adjuster at the handlebar housing.
3. Lubricate the cable with Polaris Cable Lube.



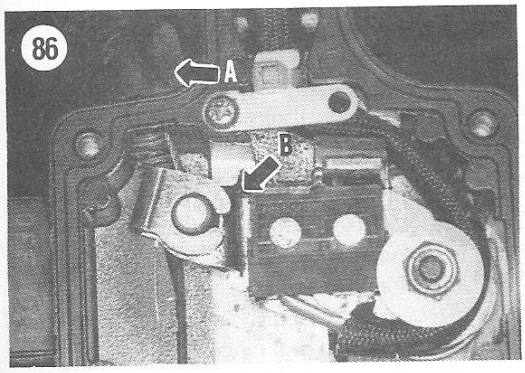



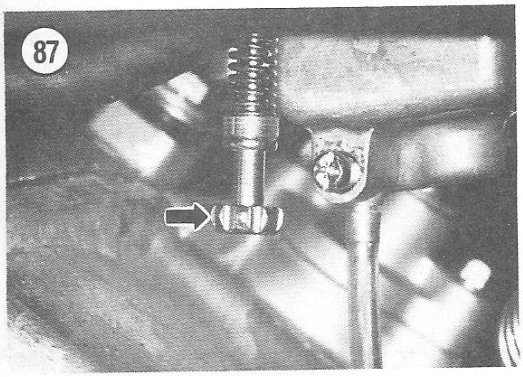



4. Start the engine and set the engine idle speed as described in this chapter.
5. Check the clearance between the internal lever and the boss (B, **Figure 85** or B, **Figure 86**) when the idle is set at the speed listed in **Table 11**.
6. If clearance is not 1.6 mm (1/16 in.), loosen the locknut, turn the adjuster into the handlebar housing, then tighten the locknut. If gap is incorrect, it may not be possible to set the engine idle speed or to maintain accurate control of the engine speed.
7. Another cable adjuster is located at the carburetor end of the cable, if additional adjustment is needed. On models with 2-stroke engines, it is necessary to adjust the oil pump if the position of the cable adjuster at the carburetor is changed. Refer to *Oil Injection Pump Adjustment* in this chapter.

### *Idle speed*

The idle speed stop screw is shown at B, **Figure 83** for models with 2-stroke engines. The idle speed stop screw on Magnum models (4-stroke engine) is located as shown in **Figure 87**.




*CAUTION*

*Do not use the pilot air screw (A, **Figure 83** or A, **Figure 84**) to change the engine idle speed. The pilot air screw must be set as described in this chapter or the engine may be damaged by excessively lean air/fuel mixture.*

1. Locate the throttle stop screw (B, **Figure 83** or B, **Figure 84**).
2. Connect a tachometer according to its manufacturer's instructions.
3. Set the idle speed by turning the throttle stop screw in to increase or out to decrease idle speed. Refer to **Table 11** for the correct idle speed for your model.

## STORAGE

Several months of inactivity can cause serious problems and a general deterioration of the ATV's condition. This is especially true in areas of weather extremes. During long period so of inactivity, it is advisable to prepare the vehicle for lay-up.

### Selecting a Storage Area

Most owners store ATV's in their home garages; however facilities for long term ATV storage are readily available for rent or lease. Consider the following points when selecting a building for storage.

1. The storage area must be dry. Heating is not necessary (even in cold temperatures) but the building should be well insulated to minimize extreme variations in temperature.
2. Buildings with large windows should be avoided, or the windows should be covered to prevent direct sunlight from falling upon the ATv. Covering windows is also a good security measure.

### Preparing Vehicle for Storage

Careful storage preparation will minimize deterioration and make it easier to restore the ATV to service later. Repair any known problems before storing the vehicle. The following is a satisfactory storage procedure.

1. Wash the vehicle completely. Make certain to remove all dirt from all of the hard-to-clean parts like

the cooling fins (on air cooled models) and the radiator (of liquid cooled models).

2. Operate the vehicle for about 20-30 minutes to warm the oil in the engine on 4-stroke models, balancer on 2-stroke models so equipped and the transmission on all models.

*NOTE*

*Oil should be changed immediately before storage, regardless of time since a scheduled oil change.*

3. While still warm, drain the oil from:
   a. The engine reservoir on 4-stroke models.
   b. The balancer on liquid cooled 2-stroke models.
   c. The transmission on all models.
4. Refill with the quantity and type of oil listed in **Table 4** and **Table 5**.
5. Drain all gasoline from the fuel tank, connecting hoses and the carburetor. It is especially important to make sure all fuel is removed since the blends of gasolines have changed in recent years.
6. Clean and lubricate all drive chains and control cables. Refer to the procedures in this chapter.
7. Remove the spark plug and pour about one teaspoon of engine oil into the cylinder. Reinstall the spark plug and crank the engine by hand slowly to distribute the oil in the cylinder.
8. Tape or tie a plastic bag over the end of the silencer to prevent the entry of moisture.
9. Check the tire pressure and inflate to the correct pressure if necessary. Refer to **Table 2**.
10. Raise the ATV and place it securely on a stand with all the wheels suspended off the ground.
11. Cover the ATV with a tarp or heavy drop cloth. This cover serves mainly as a dust cover and must not hold moisture inside. Do not wrap this cover tightly, because it may trap condensed moisture. Leave room for air to circulate around the ATV.

### Inspection During Storage

Try to inspect the vehicle at weekly intervals while in storage. Any deterioration should be corrected as soon as possible. For example, if corrosion is observed, coat it lightly with grease or silicone spray.

*CAUTION*

*Do not start the engine while it is in storage.*

If stored for an extremely long period, the engine should be cranked a couple of times to recoat the cylinder walls with oil.

### Restoring Vehicle to Service

A vehicle that has been properly prepared and stored in a suitable building should require only light maintenance before returning it to service. It is advisable, however, to perform a spring tune-up.

1. Remove the cover from the ATV and check for visible signs of damage. Mice and other animals sometimes select an ATV as a homesite.

*CAUTION*

*Tire pressure should be checked before lowering the ATV to the ground. Air loss during storage may have nearly flattened the tires.*

2. Check tire pressure and inflate to the proper pressure. Refer to **Table 2** for recommended pressure for standard tires.
3. Fill the fuel tank with fresh gasoline.
4. Remove the spark plug and install a fresh one of the correct type and heat range.
5. Perform the standard tune-up as described earlier in this chapter.
6. Check the operation of the engine stop switch. Oxidation of the switch during storage may make it inoperative.
7. Clean and test ride the vehicle.

**Table 1 DAILY INSPECTION**

| |
|---|
| Check fuel lines for leaks |
| Make sure that enough gasoline is in fuel tank |
| Check engine oil levels |
| Injection system oil level (2-stroke models) |
| Engine counterbalancer oil level (350 and 400 liquid cooled 2-stroke models) |
| Engine oil reservoir (4-stroke models) |
| Check transmission oil level |
| Inspect cooling system |
| Check coolant level (liquid cooled models) |
| Make sure that outside of radiator is clean and not obstructed |
| Make sure cooling fins are clean (air cooled models) |
| Check condition of air filter |
| Check brake fluid level (models with hydraulic brakes) |
| Check operation of front and rear suspension |
| Check drive chain(s) |
| Check tires for correct inflation |
| Check exhaust system for looseness or damage |
| Check front wheel drive oil (models with front wheel drive) |
| Check wheels for tightness |
| Check operation of lights and other electrical components |
| Check that all fasteners are tight |

**Table 2 TIRE SIZE AND PRESSURE**

| | Front tires kPa (psi) | Rear tires kPa (psi) |
|---|---|---|
| 1985 | | |
| Scrambler W857027 | | |
| Size | 22 × 11.00 × 8 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss W857527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 1986 | | |
| Scrambler W867027 | | |
| Size | 22 × 11.00 × 8 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss W867527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss W867627 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 1987 | | |
| Trail Boss W877527 | | |
| Size | 22 × 8.00 × 8 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Cyclone W877828 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 W878027 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 W878127 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |

(continued)

**Table 2 TIRE SIZE AND PRESSURE (continued)**

| | Front tires kPa (psi) | Rear tires kPa (psi) |
|---|---|---|
| 1987 (continued) | | |
| Trail Boss 4 × 4 W878327 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 1988 | | |
| Trail Boss 2 × 4 W887527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 W888127 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 250 R/ES X888528 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 250 R/ES W888528 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 1989 | | |
| Trail Boss W898527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2 × 4 W897527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 4 × 4 W898127 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Big Boss 4 × 6 X898627 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 34.5 (5) |
| Big Boss 4 × 6 W898627 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 34.5 (5) |
| 1990 | | |
| Trail Blazer W907221 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 250 W908527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2 × 4 W907527 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2 × 4 - 350L W907539 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 W908127 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 - 350L W908139 | | |
| Size | 25 × 8.00 × 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Big Boss 4 × 6 W908627 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |

(continued)

**Table 2 TIRE SIZE AND PRESSURE (continued)**

| | Front tires kPa (psi) | Rear tires kPa (psi) |
|---|---|---|
| 1991 | | |
| Trail Blazer W917221 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 250 W918527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2 × 4 W917527 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2 × 4 350L W917539 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 W918127 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 - 350L W918139 | | |
| Size | 25 × 8.00 × 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Big Boss 4 × 6 W918627 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |
| Big Boss 6 × 6 W918727 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |
| 1992 | | |
| Trail Blazer W927221 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 250 W928527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2 × 4 W927527 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2 × 4 350L W927539 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 W928127 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 25 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Trail Boss 4 × 4 350L W928139 | | |
| Size | 25 × 8.00×12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Big Boss 4 × 6 W928627 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |
| Big Boss 6 × 6 W928727 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |
| 1993 | | |
| Trail Blazer W937221 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss W938527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |

(continued)

**Table 2 TIRE SIZE AND PRESSURE (continued)**

| | Front tires kPa (psi) | Rear tires kPa (psi) |
|---|---|---|
| 1993 (continued) | | |
| Trail Boss W938527 (continued) | | |
| Pressure | 20.7 (3) | 20.7 (3) |
| Sportsman W938039 | | |
| Size | 25 × 8.00× 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 250 2 × 4 W937527 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| 350 2 × 4 W937539 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 250 4 × 4 W938127 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 350 4 × 4 W938139 | | |
| Size | 25 × 8.00× 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 250 6 × 6 W938727 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |
| 350 6 × 6 W938739 | | |
| Size | 25 × 8.00 × 10 | 25 × 12.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |
| 1994 | | |
| Trail Blazer 2W W947221 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss 2W W948527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Sport W948540 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Sportsman 4 × 4 W948040 | | |
| Size | 25 × 8.00× 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 300 2 × 4 W947530 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| 400 2 × 4 W947540 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| 300 4 × 4 W948130 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| 400 4 × 4 W948140 | | |
| Size | 25 × 8.00× 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 300 6 × 6 W948730 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |
| 400 6 × 6 W948740 | | |
| Size | 25 × 8.00× 12 | 25 × 12.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |

(continued)

**Table 2 TIRE SIZE AND PRESSURE (continued)**

| | Front tires kPa (psi) | Rear tires kPa (psi) |
|---|---|---|
| 1995 | | |
| Trail Blazer W957221 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| Trail Boss W958527 | | |
| Size | 22 × 8.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| 300 2 × 4 W957530 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 20.7 (3) | 20.7 (3) |
| 400 2 × 4 W95754 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 300 4 × 4 W958130 | | |
| Size | 22 × 8.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Scrambler W957840 | | |
| Size | 23 × 7.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Sport W958540 | | |
| Size | 23 × 7.00 × 10 | 22 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Sportsman 4 × 4 W958040 | | |
| Size | 25 × 8.00 × 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Xplorer 4 × 4 W959140 | | |
| Size | 25 × 8.00 × 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Magnum 2 × 4 W957444 | | |
| Size | 23 × 7.00 × 10 | 24 × 11.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| Magnum 4 × 4 W958144 | | |
| Size | 25 × 8.00× 12 | 25 × 12.00 × 10 |
| Pressure | 27.6 (4) | 20.7 (3) |
| 400 6 × 6 W958740 | | |
| Size | 25 × 8.00 × 12 | 25 × 12.00 × 10 |
| Pressure | 34.5 (5) | 34.5 (5) |

**Table 3 PERIODIC MAINTENANCE**

| | |
|---|---|
| **Every 6 months or after 50 hours of operation** | Grease the front wheel bearings (without front wheel drive)<br>Change front wheel drive oil (models with front wheel drive)<br>Change engine oil and filter (models with 4-stroke engines)<br>Grease the rear axle bearing<br>Grease swing arm bushings<br>Grease front ball-joints<br>Grease front A-arm shafts<br>Grease tie rod ends<br>Grease steering post bushings<br>Lubricate and check all control cables<br>Grease transmission output shaft<br>Check brake adjustment |

(continued)

**Table 3 PERIODIC MAINTENANCE (continued)**

| | |
|---|---|
| **Every 6 months or after 50 hours of operation (continued)** | Check spark plug condition and gap<br>Check and adjust tension of all drive chains<br>Install new air filter element<br>Visually inspect all wiring harness, control cable and hose assemblies for incorrect routing and missing fasteners<br>Check the drive pulley for correct adjustment<br>Visually check condition of tires<br>Check all suspension components for missing fasteners and excessive play<br>Check all steering components for missing fasteners and excessive play<br>Check steering adjustments and adjust if necessary<br>Check exhaust system for missing or damaged components and fasteners<br>Check all fasteners for tightness<br>Check all wiring for chafing or other damage<br>Check all electrical connectors for looseness or damage<br>Perform general inspection |
| **Once a year or every 100 hours of operation** | Change transmission oil (Chain and gear type transmissions)<br>Change counterbalancer oil (350 and 400 liquid cooled engines)<br>Change engine oil and filter (models with 4-stroke engines)<br>Check torque of engine mount bolts<br>Retorque cylinder head<br>Check all control cables for routing and damage<br>Check ignition timing<br>Adjust carburetor<br>Adjust oil injection pump (the carburetor must be adjusted before adjusting the oil injection pump)<br>Check headlight and aim beam<br>Check cooling system hoses for looseness or damage<br>Replace coolant (liquid cooled models) |
| **Once every 2 years** | Drain all brake fluid from the system, refill with new DOT 3* fluid and bleed system |

* Do not substitute any other type.

**Table 4 RECOMMENDED LUBRICANTS**

| Item | Lubricant type |
|---|---|
| Ball-joints | A |
| Brake fluid | B |
| Control cables (throttle, choke, etc.) | D |
| Engine counterbalancer (models so equipped) | E |
| Engine injection oil (2-stroke models) | F |
| Engine oil (4-stroke models) | G |
| Front A arm pivot shafts | A |
| Front axle bearings (without front wheel drive) | A |
| Rear axle bearings | A |
| Steering post bushings | A |
| Swing arm bushings | A |
| Tie rod ends | A |
| Transmission | |
| Chain type (Type I, Table 6) | D |

(continued)

**Table 4 RECOMMENDED LUBRICANTS (continued)**

| Item | Lubricant type |
|---|---|
| Transmission (continued) | |
| Gear type (Type II, Table 6) | H |
| Chain and gear type (Type III, Table 6) | D |
| Output shaft (with front wheel drive only) | A |
| EZ Shift selector (Type III, Table 6) | G |

A. Grease that conforms to NLG1NO.2, such as "Conoco Superlube M" or "Mobilgrease Special."
B. Brake fluid, Dot 3 Only.
C. Polaris Cable Lube (part No. 2870510).
D. Polaris Chain Lube (part No. 2870464).
E. SAE 10W/30 engine oil.
F. Polaris Injection Oil.
G. Polaris SAE 40 engine oil (part No. 2871271) is recommended. API type SE or SF with SAE 10W/40 viscosity may be used.
H. SAE 30 engine oil.

**Table 5 APPROXIMATE REFILL CAPACITY**

| | | |
|---|---|---|
| Oil injection reservoir | | |
| 2-stroke engines | 1.89 L | 2 qt. |
| Dry sump reservoir | | |
| 4-stroke engines | 1.89 L | 2 qt. |
| Liquid cooling system | | |
| 2-stroke engines (so equipped) | 1.89 L | 2 qt. |
| 4-stroke engines | 2.4 L | 2.25 qt. |
| Fuel tank | | |
| All 2-stroke models | 15.12 L | 4 gal. |
| 4-stroke models | 13.25 L | 3.5 gal. |
| Transmission | | |
| 1985-1986 chain type | 0.47 L | 0.5 qt. |
| 1987-1993 gear type | 0.47 L | 0.5 qt. |
| 1993-1995 gear & chain EZ shift | | |
| High-reverse shift | 0.47 L | 0.5 qt. |
| High/low/reverse shift | 0.59 L | 0.6 qt. |

**Table 6 TRANSMISSION APPLICATION**

| | Model No. | Transmission |
|---|---|---|
| 1985 and 1986 | Type I | Chain (15 links wide) |
| 1987 | | |
| Trail Boss W877527 | Type I | Chain (11 links wide) |
| Cyclone W877828 | Type I | Chain (11 links wide) |
| Trail Boss 4 × 4 W878027 | Type II | Gear (ME25P) |
| Trail Boss 4 × 4 W878127 | Type II | Gear (ME25P) |
| Trail Boss 4 × 4 W878327 | Type II | Gear (ME25P) |
| 1988 | | |
| Trail Boss 2 × 4 W887527 | Type II | Gear (ME25PR) |
| Trail Boss 4 × 4 W888127 | Type II | Gear (ME25P3) |
| T. B. 250 R/ES × 888528 | Type I | Chain (11 links wide) |
| T. B. 250 R/ES W888528 | Type I | Chain (11 links wide) |
| 1989 | | |
| Trail Boss W898527 | Type I | Chain (11 links wide) |
| Trail Boss 2 × 4 W897527 | Type II | Gear (ME25P6) |
| Trail Boss 4 × 4 W898127 | Type II | Gear (ME25P3A or ME25P5) |
| Big Boss 4 × 6 X898627 | Type II | Gear (ME25P6) |
| Big Boss 4 × 6 W898627 | Type II | Gear (ME25P6) |

(continued)

**Table 6 TRANSMISSION APPLICATION (contnued)**

| | Model No. | Transmission |
|---|---|---|
| 1990 | | |
| Trail Blazer W907221 | Type I | Chain (11 links wide) |
| Trail Boss 250 W908527 | Type II | Gear (ME25P10) |
| Trail Boss 2 × 4 W907527 | Type II | Gear (ME25P8) |
| T.B. 2 × 4 350L W907539 | Type II | Gear (ME25P10) |
| Trail Boss 4 × 4 W908127 | Type II | Gear (ME25P7) |
| T.B. 4 × 4 350L W908139 | Type II | Gear (ME35P1) |
| Big Boss 4 × 6 W908627 | Type II | Gear (ME25P8) |
| 1991 | | |
| Trail Blazer W917221 | Type II | Gear (ME25P10) |
| Trail Boss 250 W918527 | Type II | Gear (ME25P10) |
| Trail Boss 2 × 4 W917527 | Type II | Gear (ME25P8) |
| T.B. 2 × 4 350L W917539 | Type II | Gear (ME25P2) |
| Trail Boss 4 × 4 W918127 | Type II | Gear (ME25P7) |
| T.B. 4 × 4 350L W918139 | Type II | Gear (ME35P1) |
| Big Boss 4 × 6 W918627 | Type II | Gear (ME25P8) |
| Big Boss 6 × 6 W918727 | Type II | Gear (ME35P1) |
| 1992 | | |
| Trail Blazer W927221 | Type II | Gear (ME25P10) |
| Trail Boss 250 W928527 | Type II | Gear (ME25P10) |
| Trail Boss 2 × 4 W927527 | Type II | Gear (ME25P8) |
| T.B. 2 × 4 350L W927539 | Type II | Gear (ME25P2) |
| Trail Boss 4 × 4 W928127 | Type II | Gear (ME25P7) |
| T.B. 4 × 4 350L W928139 | Type II | Gear (ME35P1) |
| Big Boss 4 × 6 W928627 | Type II | Gear (ME25P8) |
| Big Boss 6 × 6 W928727 | Type II | Gear (ME35P1) |
| 1993 | | |
| Trail Blazer W937221 | Type II | Gear (ME25P10) |
| Trail Boss W938527 | Type II | Gear (ME25P10) |
| Sportsman W938039 | Type III | Gear/chain (1341136) |
| 250 2 × 4 W937527 | Type II | Gear (ME25P8) |
| 350 2 × 4 W937539 | Type II | Gear (ME25P2) |
| 250 4 × 4 W938127 | Type II | Gear (ME25P7) |
| 350 4 × 4 W938139 | Type II | Gear (ME35P1) |
| 250 6 × 6 W938727 | Type II | Gear (ME35P1) |
| 350 6 × 6 W938739 (w/o EZ Shift) | Type II | Gear (ME25P2) |
| Late 350 6 × 6 (with EZ Shift) | Type III | Gear/chain |
| 1994 | | |
| Trail Blazer 2W W947221 | Type III | Gear/chain (1341124) |
| Trail Boss 2W W948527 | Type III | Gear/chain (1341124) |
| Sport W948540 | Type III | Gear/chain (1341124) |
| Sportsman 4 × 4 W948040 | Type III | Gear/chain (1341136) |
| 300 2 × 4 W947530 | Type III | Gear/chain (1341125) |
| 400 2 × 4 W947540 | Type III | Gear/chain (1341123) |
| 300 4 × 4 W948130 | Type III | Gear/chain (1341136) |
| 400 4 × 4 W948140 | Type III | Gear/chain (1341146) |
| 300 6 × 6 W948730 | Type III | Gear/chain (1341136) |
| 400 6 × 6 W948740 | Type III | Gear/chain (1341146) |
| 1995 | | |
| Trail Blazer W957221 | Type III | Gear/chain (1341124) |
| Trail Boss W958527 | Type III | Gear/chain (1341124) |
| 300 2 × 4 W957530 | Type III | Gear/chain (1341125) |
| 400 2 × 4 W957540 | Type III | Gear/chain (1341123) |
| 300 4 × 4 W958130 | Type III | Gear/chain (1341136) |
| Scrambler W957840 | Type III | Gear/chain (1341140) |
| Sport W958540 | Type III | Gear/chain (1341124) |

(continued)

**Table 6 TRANSMISSION APPLICATION (contnued)**

| | Model No. | Transmission |
|---|---|---|
| 1995 (continued) | | |
| Sportsman 4 × 4 W958040 | Type III | Gear/chain (1341146) |
| Xplorer 4 × 4 W959140 | Type III | Gear/chain (1341146) |
| Magnum 2 × 4 W957444 | Type III | Gear/chain (1341139) |
| Magnum 4 × 4 W958144 | Type III | Gear/chain (1341132) |
| 400 6 × 6 W958740 | Type III | Gear/chain (1341146) |

**Table 7 MAINTENANCE TIGHTENING TORQUES**

| | N•m | ft.-lb. |
|---|---|---|
| 2-stroke engines | | |
| Cylinder head | 23-25 | 17-18 |
| Cylinder base | 34-39 | 25-29 |
| Crankcase | | |
| 6mm | 8-10 | 6-8 |
| 8mm | 22-23 | 17-18 |
| Crankshaft | | |
| Right side slotted nut | 39-60 | 29-44 |
| Left side pulley screw | 54 | 40 |
| Engine mounts | | |
| Exhaust screws or nuts | | |
| Flywheel nut | | |
| Air cooled | 60-84 | 44-62 |
| Liquid cooled | 39-60 | 29-44 |
| Other 6mm bolts | 8-10 | 6-8 |
| Magnum 4-stroke engines | | |
| Breather union | 8.97-15.2 | 6.5-11 |
| Cam drive sprocket nut | 48.3-70.4 | 35-51 |
| Cam driven sprocket screws | 6.9-8.28 | 5-6 |
| Cam chain tensioner slider | 6.9-8.28 | 5-6 |
| Cam chain tensioner plug | 19.3-26.2 | 14-19 |
| Carburetor flange | 16.6-19.3 | 12-14 |
| Coolant pump cover | 6.9-8.97 | 5-6.5 |
| Coolant pump impeller | 6.9-8.97 | 5-6.5 |
| Crankcase | | |
| 8mm | 19.3-20.7 | 14-15 |
| Crankcase drain bolt | 19.3-23.5 | 14-17 |
| Cylinder head bolts | | |
| 6mm | 8.29 | 6 |
| 11mm | See text for procedure | |
| Cylinder head cover | 8.28 | 6 |
| Cylinder base bolts | | |
| 6mm | 6.9-8.28 | 5-6 |
| 10mm | 62.1-67.6 | 45-49 |
| Flywheel | 80.0-99.4 | 59-73 |
| Oil delivery pipe bolts | 24.8-34.5 | 18-25 |
| Oil filter union | 49.7-59.3 | 36-43 |
| Oil hose union | 8.97-15.2 | 6.5-11 |
| Oil pressure blind plug | 8.97-15.2 | 6.5-11 |
| Oil pump mount bolts | 6.9-8.97 | 5-6.5 |
| One way valve plug | 19.26.2 | 14-19 |
| Recoil starter | 6.9-8.97 | 5-6.5 |
| Rocker arm support brackets | 11.0-12.4 | 8-9 |
| Rocker arm adjuster locknut | 8.28-9.66 | 6-7 |
| Rocker shaft locating screw | 8.28 | 6 |

(continued)