



SECTION 2 - PERIODIC MAINTENANCE/TUNE-UP

TABLE OF CONTENTS

Periodic Maintenance Chart..... 2-2

Lubrication Points..... 2-3

Battery..... 2-3

Fuses 2-4

Air Cleaner (250/300)..... 2-5

Air Cleaner/Filter (400 FIS/ACT) 2-9

Air Cleaner/Filter (TBX/500/650 H1/650 V-Twin)... 2-11

Valve/Tappet Clearance
(Feeler Gauge Procedure) 2-13

Valve/Tappet Clearance
(Valve Adjuster Procedure)..... 2-14

Valve/Tappet Clearance (650 V-Twin -
Feeler Gauge Procedure)..... 2-15

Valve/Tappet Clearance (650 V-Twin -
Valve Adjuster Procedure)..... 2-16

Testing Engine Compression 2-17

Spark Plug..... 2-17

Muffler/Spark Arrester 2-18

Gas/Vent Hoses 2-18

Adjusting Throttle Cable 2-18

Adjusting Choke Cable (650 V-Twin)..... 2-19

Adjusting Engine RPM (Idle)..... 2-19

Engine/Transmission Oil - Filter - Strainer
(250/300) 2-20

Engine/Transmission Oil - Filter - Strainer
(400/500/650 H1/650 V-Twin) 2-22

Front Differential/Rear Drive Lubricant..... 2-24

Adjusting Clutch (250/300)..... 2-25

Adjusting Clutch
(400/500 Manual Transmission) 2-26

Tires 2-26

Steering Components 2-27

Driveshaft/Coupling..... 2-27

Suspension/Shock Absorbers/Bushings 2-27

Nuts/Bolts/Cap Screws..... 2-27

Ignition Timing..... 2-27

Headlight/Taillight-Brakelight..... 2-28

Switches..... 2-29

Reverse Shift Lever 2-29

Frame/Welds/Racks 2-33

Electrical Connections..... 2-33

Hydraulic Brake Systems 2-34

Auxiliary Brake (250/300/400 ACT)..... 2-36

Burnishing Brake Pads 2-38

Coolant (500/650 H1/650 V-Twin) 2-38

Checking/Replacing V-Belt
(400/500/650 H1) 2-38

Checking/Replacing V-Belt
(650 V-Twin) 2-40

Periodic Maintenance Chart

A = Adjust

I = Inspect

C = Clean

L = Lubricate

D = Drain

R = Replace

Item	Initial Service After Break-In (First Mo or 100 Mi)	Every Day	Every Month or Every 100 Miles	Every 3 Months or Every 300 Miles	Every 6 Months or Every 500 Miles	Every Year or Every 1500 Miles	As Needed
Battery	I		I				C
Fuses				I			R
Air Filter/Drain Tube	I	I	C*				R
Valve/Tappet Clearance	I				I		A
Engine Compression						I	
Spark Plug	I			I			R (4000 Mi or 18 Mo)
Muffler/Spark Arrester					C		R
Gas/Vent Hoses	I	I					R (2 Yrs)
Gas Tank Valve (250/300/400 ACT/FIS)						I	C
Throttle Cable	I	I			C-L		A-R
Carb Float Chamber				D*			
Engine RPM (Idle)	I				I		A
Engine-Transmission Oil Level		I					A
Engine-Transmission Oil/Filter	R			R*			R
Oil Strainer	I				I		C
Front Differential/Rear Drive Lubricant	I						R (4 Yrs)
Clutch (Manual)	I				I		A
Tires/Air Pressure	I			I			R
Steering Components	I	I		I			R
V-Belt (Automatic)	I				I		R
Suspension (Ball joint boots, drive axle boots front and rear, tie rods, differential and rear drive bellows)	I			I*			R
Nuts/Cap Screws/Screws	I			I	I		A
Ignition Timing						I	
Headlight/Taillight-Brakelight	I	I					R
Switches	I	I					R
Reverse Shift Lever					I		A-L
Choke Cable (250/300/650 V-Twin)	I			I	C-L		R
Recoil Starter		I					C-R
Handlebar Grips		I					R
Handlebars	I	I					R
Gauges/Indicators	I	I					R
Frame/Welds/Racks	I		I		I		
Electrical Connections					I		C
Complete Brake System (Hydraulic & Auxiliary)	I	I		C			L-R
Brake Pads	I			I*			R
Brake Fluid	I			I			R (2 Yrs)
Brake Hoses	I			I			R (4 Yrs)
Coolant/Cooling System	I		I				R (2 Yrs)

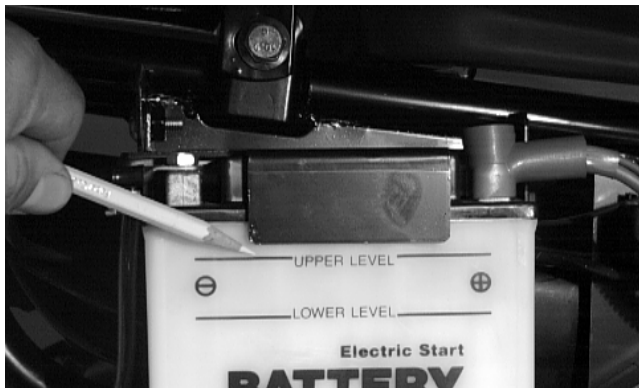
* Service/Inspect more frequently when operating in adverse conditions.

Lubrication Points

It is advisable to lubricate certain components periodically to ensure free movement. Apply light oil to the components using the following list as reference.

- A. Throttle Lever Pivot/Cable Ends
- B. Brake Lever Pivot/Cable Ends
- C. Auxiliary Brake Cable Ends
- D. Choke Cable Upper End (250/300/400)
- E. Reverse Lever Cable End (If applicable)
- F. Idle RPM Screw (Carburetor)

Battery



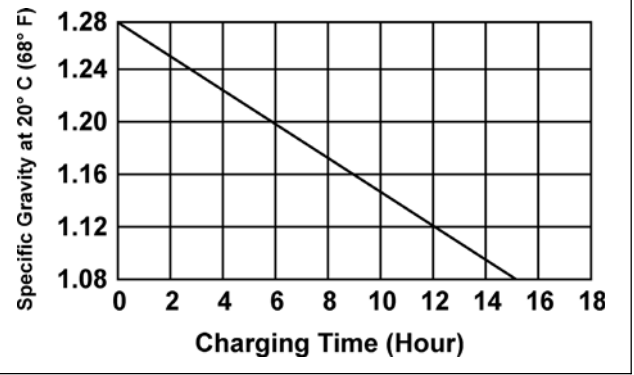
AF879D

The level of the battery fluid must be kept between the upper and lower level lines at all times. If the level drops below the lower level line, add only **distilled water** until it reaches upper level line.

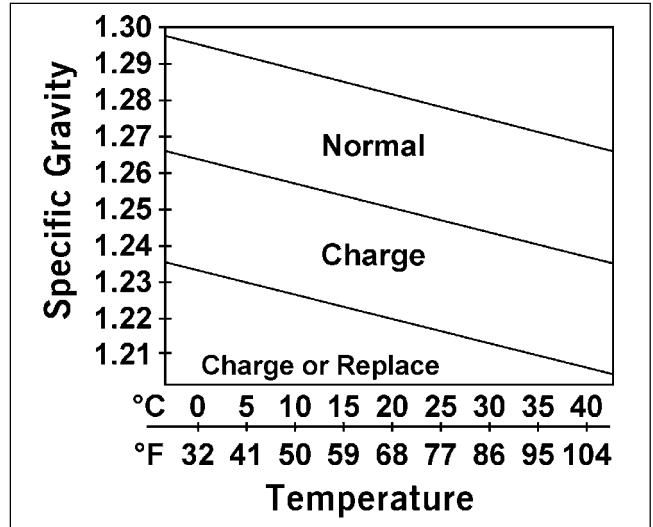
WARNING

Battery acid is harmful if it contacts eyes, skin, or clothing. Care must be taken whenever handling a battery.

If the battery is discharged, remove the battery from the ATV and charge the battery at the standard charging rate of 1.4A x 10 hr.



CHARGTIM



CHARGE

2

To remove and charge the battery, use the following procedure.

WARNING

Anytime service is performed on a battery, the following must be observed: keep sparks, open flame, cigarettes, or any other flame away. Always wear safety glasses. Protect skin and clothing when handling a battery. When servicing battery in enclosed space, keep the area well-ventilated. Make sure battery venting is not obstructed.

1. Remove the battery hold-down bracket.
2. Remove the negative battery cable; then remove the positive cable and the battery vent tube. Remove the battery from the ATV. Care should be taken not to damage the vent tube.

WARNING

Avoid spillage and contact with skin, eyes, and clothing.

CAUTION

Do not charge the battery while it is in the ATV with the battery terminals connected.

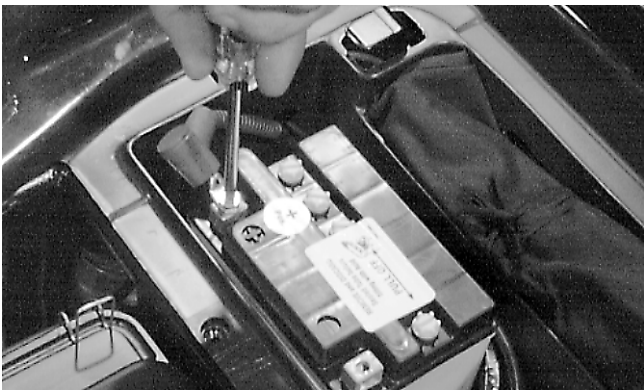
- Remove the vent plugs; then (if necessary) fill the battery with **distilled water** to the upper level indicated on the battery.
- Trickle charge the battery at 1.4 amps for 10 hours.

CAUTION
Never exceed the standard charging rate.

- After charging, check fluid level and fill with distilled water as necessary; then install vent plugs.

CAUTION
Before installing the battery, make sure the ignition switch is in the OFF position.

- Place the battery into position in the ATV and secure with the hold-down bracket.
- Attach the vent tube and check the vent tube to make sure it is not crimped or obstructed in any way and that it is properly routed through and secured to the frame.
- Connect cables to the proper terminals: positive cable to the positive terminal (+) and negative cable to the negative terminal (-). Connect the negative cable last.



AF733D

CAUTION
Connecting cables in reverse (positive to negative and negative to positive) can cause serious damage to the electrical system.

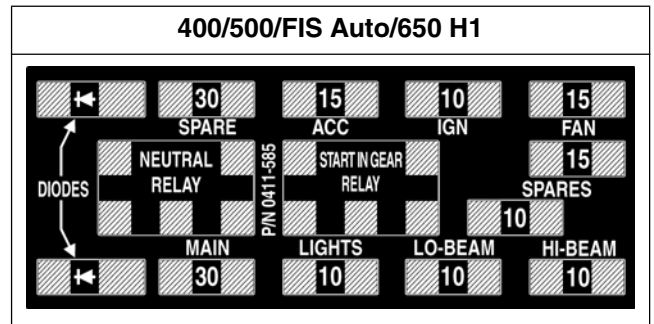
FUSES

The main fuse (on the 400 ACT) is located in a fuse block on the frame near the right rear tire and protected by a snap-on cover. The main fuses are located in a fuse block under the center cover in the front fender assembly (on the 250/300), under the seat (on the 400 TBX/500/650 H1/650 V-Twin), or under a cover above the right rear tire (on the 400 FIS).

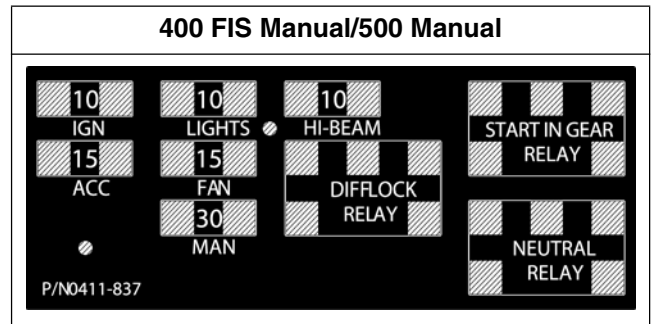
If there is any type of electrical system failure, always check the fuses first.

■ **NOTE:** To remove the fuse, compress the locking tabs on either side of the fuse case and lift out.

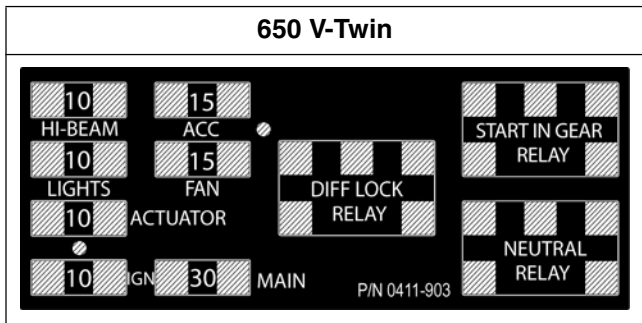
250/300	400 ACT
10 A IGN	10 A LIGHTS
15 A LIGHTS	10 A HIGH
10 A ACC	10 A LO
10 A SPARE	10 A IGN
	15 A FAN
	15 A ACC



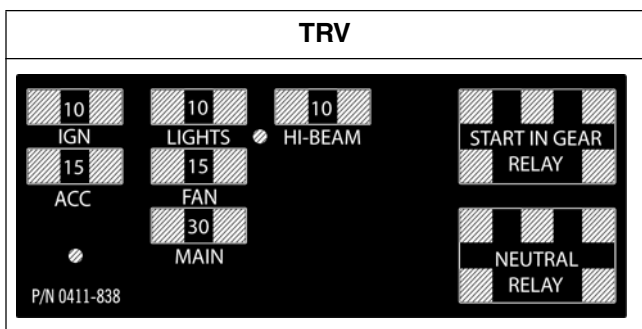
411-585A



0411-837



0411-903



0411-838

⚠ CAUTION

Always replace a blown fuse with a fuse of the same type and rating.

Air Cleaner (250/300)

The air filter inside the air cleaner must be kept clean to provide good engine power and gas mileage. If the ATV is used under normal conditions, service the filter at the intervals specified. If operated in dusty, wet, or muddy conditions, inspect and service the filter more frequently.

CLEANING AND INSPECTING FILTER

⚠ CAUTION

Failure to inspect the air filter frequently if the ATV is used in dusty, wet, or muddy conditions can damage the ATV engine.

1. Remove the seat.
2. Remove the two machine screws securing the air cleaner housing cover.



CH044D

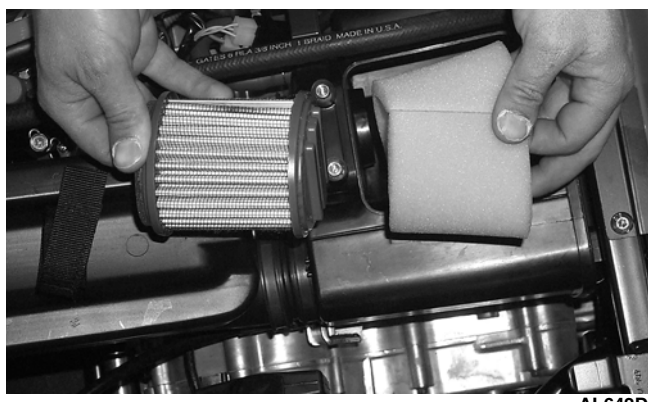
3. Pull the retainer out and remove the filter with foam wrap.

2



CH045D

4. Remove the foam wrap from the filter.



AL642D

5. Wash the polyester filter and the foam wrap with warm soapy water and rinse.

6. Allow the foam wrap to air dry thoroughly.

■ NOTE: Either allow the polyester filter to air dry or blow dry using low-pressure compressed air. Direct the compressed air through the filter from the opposite direction as normal operation air flow.

⚠ CAUTION

Do not put oil on either the filter or the foam wrap.

7. Place the foam wrap around the air filter; then install the filter with wrap into the air cleaner making sure it is properly in position and properly seated and secure with the retainer.



CH046D



CH045D

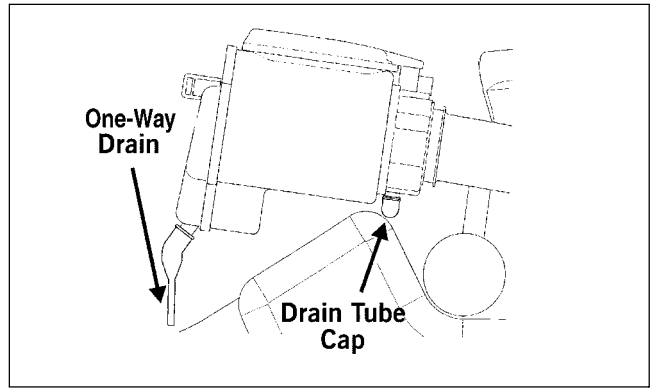
8. Install the air cleaner housing cover and secure with the machine screws; then install the seat making sure the seat is properly secured.



CH044D

9. Check the drain tube for gasoline or oil accumulation. If noticed, remove the drain tube cap from beneath the cleaner, drain the gasoline or oil into a suitable container, and install and secure the tube cap.

10. Inspect one-way drain beneath the air cleaner for debris and sealing.



733-715C

REMOVING AIR CLEANER

1. Remove the seat; then remove the air-intake snorkel.



CH040D



CH041D

2. Remove the two machine screws securing the air cleaner housing cover.



CH044D

3. Pull the retainer out and remove the filter with foam wrap.



CH045D

4. Remove the machine screws securing the air cleaner to the frame.



CH047D



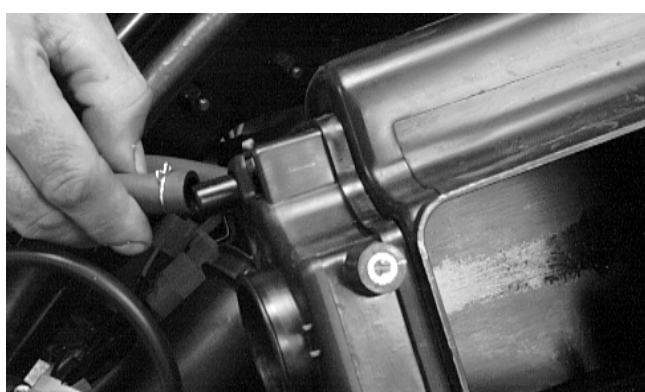
CH048D

5. Loosen the clamp securing the air cleaner to the carburetor boot.



CH049D

6. Remove the crankcase breather hose from the air cleaner.

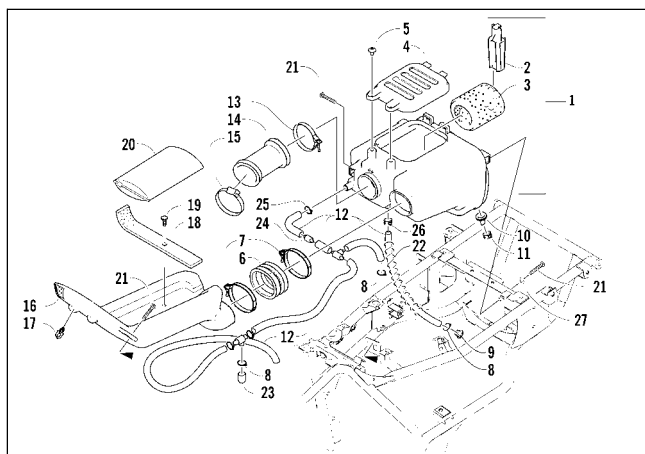


CH050D

7. Remove the air cleaner from the frame.

2

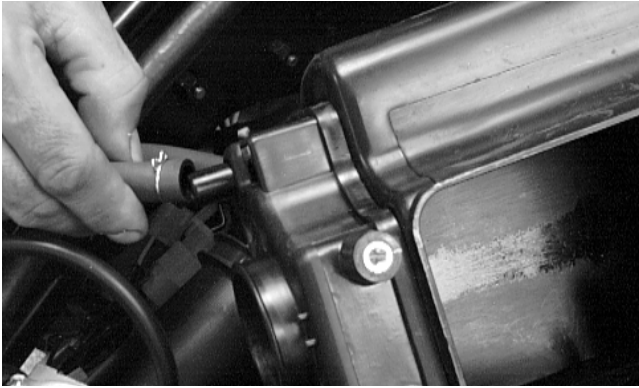
INSTALLING AIR CLEANER



KEY

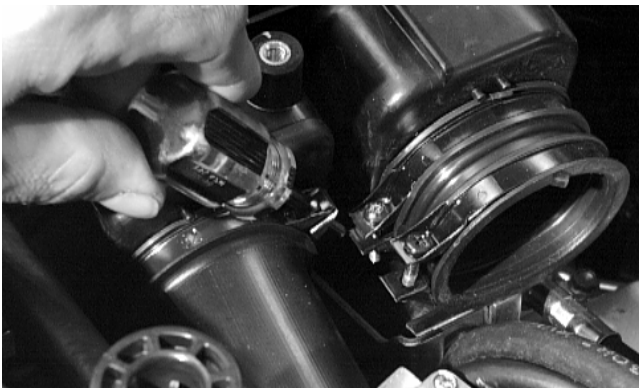
1. Air Cleaner Assy	10. Valve	19. Plug
2. Retainer Slider	11. Clamp	20. Tool Kit
3. Filter	12. Breather Hose	21. Cap Screw
4. Cap	13. Clamp	22. Spring
5. Cap Screw	14. Boot	23. Plug
6. Joint	15. Clamp	24. Check Valve
7. Clamp	16. Snorkel	25. Clip
8. Clip	17. Clip	26. Clamp
9. Drain Plug	18. Strap	27. Lock Washer

1. Place the air cleaner into the frame; then connect the crankcase breather hose.



CH050D

2. Secure the carburetor boot to the air cleaner.



CH049D

3. Install the machine screws securing the air cleaner to the frame.



CH048D



CH047D

4. Install the filter with foam wrap into the air cleaner; then secure with the retainer.



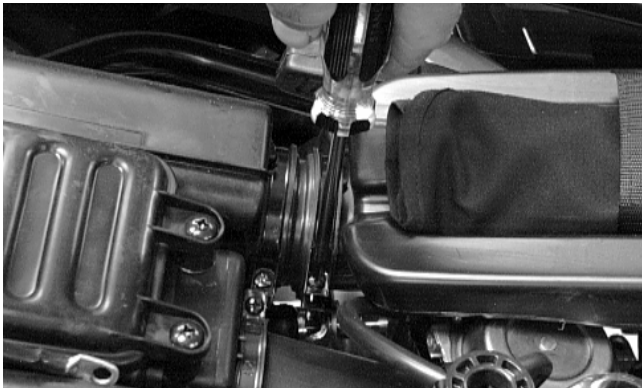
CH045D

5. Install the air cleaner housing cover and secure with the machine screws.



CH044D

6. Install the air-intake snorkel.



CH041D



CH040D

7. Install the seat making sure it is properly secured.

Air Cleaner/Filter (400 FIS/ACT)

The air filter inside the air filter housing must be kept clean to provide good engine power and gas mileage. If the ATV is used under normal conditions, service the filter at the intervals specified. If operated in dusty, wet, or muddy conditions, inspect and service the filter more frequently. Use the following procedure to remove the filter and inspect and/or clean it.

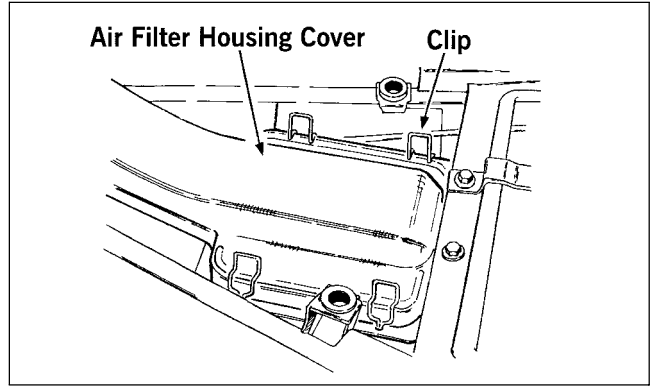
CLEANING AND INSPECTING FILTER

CAUTION

Failure to inspect the air filter frequently if the vehicle is used in dusty, wet, or muddy conditions can damage the engine.

1. Remove the seat.

2. Remove the air filter housing cover from the retaining clips.



733-444A

3. Loosen the clamp; then remove the filter.

2



AF640DA



CD087

4. Fill a wash pan larger than the filter with a non-flammable cleaning solvent; then dip the filter in the solvent and wash it.

■ **NOTE:** Foam Filter Cleaner (p/n 0436-194) and Foam Filter Oil (p/n 0436-195) are available from Arctic Cat.

5. Dry the filter.

- Put the filter in a plastic bag; then pour in air filter oil and work the filter.

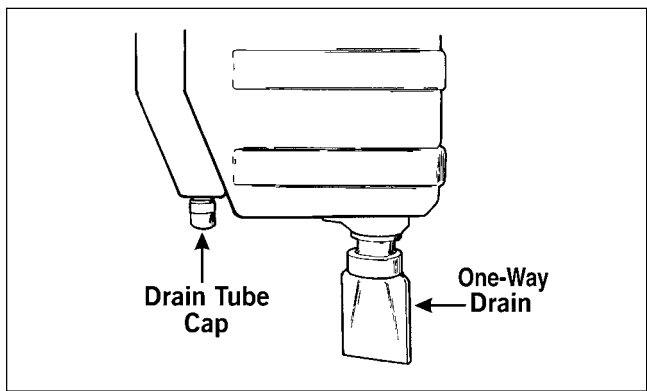
CAUTION

A torn air filter can cause damage to the ATV engine. Dirt and dust may get inside the engine if the element is torn. Carefully examine the element for tears before and after cleaning it. Replace the element with a new one if it is torn.

- Clean any dirt or debris from inside the air cleaner. Be sure no dirt enters the carburetor.
- Place the filter in the air filter housing making sure it is properly in position and properly seated and secure with the clamp.
- Install the air filter housing cover and secure with the retaining clips; then install the seat making sure the seat is properly secured.

CHECKING/DRAINING DRAIN TUBE

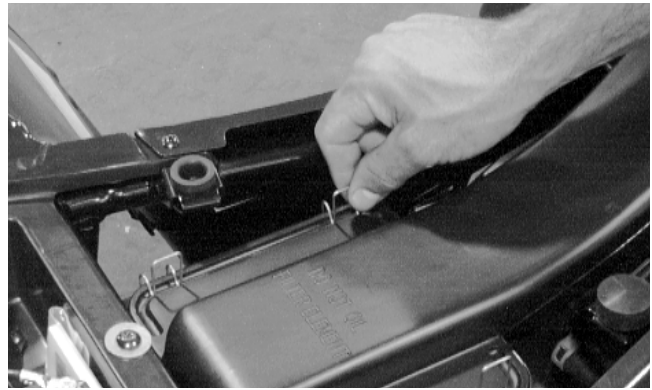
- Periodically check the drain tube for gasoline or oil accumulation. If noticed, remove the drain tube cap from beneath the front housing, drain the gasoline or oil into a suitable container, and install and secure the tube cap.
- Inspect one-way drain beneath the main housing for debris and for proper sealing.



ATV0087A

REMOVING AIR CLEANER

- Remove the seat.
- Remove the air cleaner cover from the retaining clips.



AL645D

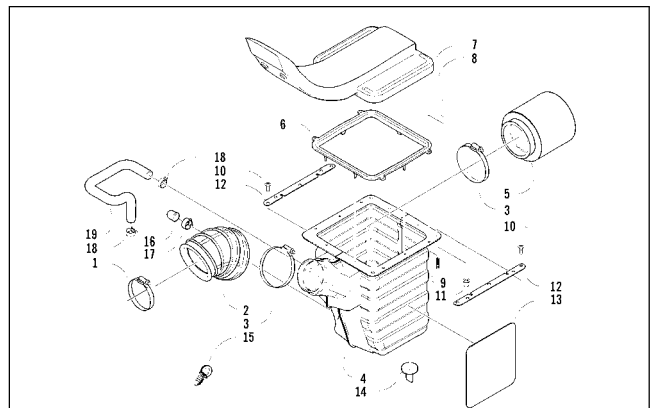
- Loosen the clamp and remove the filter.



AF640DA

- Loosen the clamp securing the air cleaner to the front boot; then loosen the clamp securing the air cleaner to the rear filter sleeve.
- Remove the machine screws securing the air cleaner to the flange support and frame.
- Remove the air cleaner from the frame.

INSTALLING



- KEY**
- | | | |
|------------|-------------------|---------------|
| 1. Clamp | 8. Clamp | 15. Clip |
| 2. Boot | 9. Spring | 16. Drain Cap |
| 3. Clamp | 10. Machine Screw | 17. Clamp |
| 4. Housing | 11. Expansion Nut | 18. Clamp |
| 5. Filter | 12. Support | 19. Vent Hose |
| 6. Gasket | 13. Heat Shield | |
| 7. Snorkel | 14. Valve | |

0738-385

1. Place the air cleaner into the frame.
2. Install the machine screws securing the air cleaner to the flange support and frame.
3. Install the rear filter sleeve onto the air cleaner; then tighten the clamp securely.
4. Install the front boot onto the air cleaner; then tighten the clamp securely.
5. Install the filter with foam wrap into the air cleaner; then tighten the clamp securely.



AF640DA

6. Place the air cleaner cover into position and secure with the retaining clips.



AL645D

7. Install the seat making sure the seat is properly secured.

Air Cleaner/Filter (TBX/500/650 H1/650 V-Twin)

The air filter inside the air filter housing must be kept clean to provide good engine power and gas mileage. If the ATV is used under normal conditions, service the filter at the intervals specified. If operated in dusty, wet, or muddy conditions, inspect and service the filter more frequently. Use the following procedure to remove the filter and inspect and/or clean it.

CLEANING AND INSPECTING FILTER

CAUTION

Failure to inspect the air filter frequently if the vehicle is used in dusty, wet, or muddy conditions can damage the engine.

2

1. Remove the two reinstallable rivets at the rear of the steering post cover; then unlock the storage compartment lid.



CD710A



CD668

2. Lift the rear of the steering post cover and slide the storage compartment assembly forward; then lift and remove the cover assembly from the storage compartment.

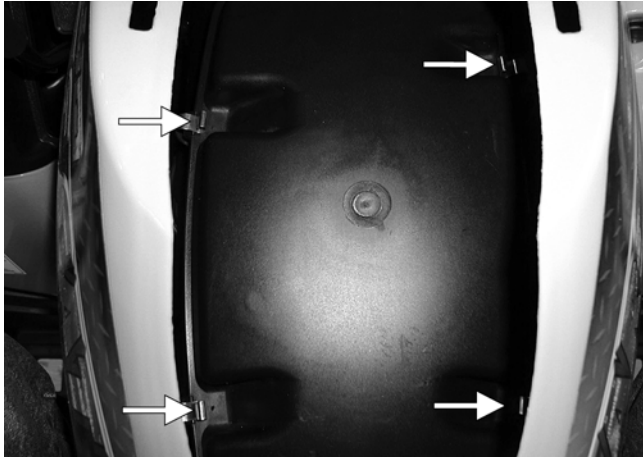


CD669

3. Lift out the storage compartment box; then unsnap the four spring-clip fasteners and remove the air filter cover.



CD671

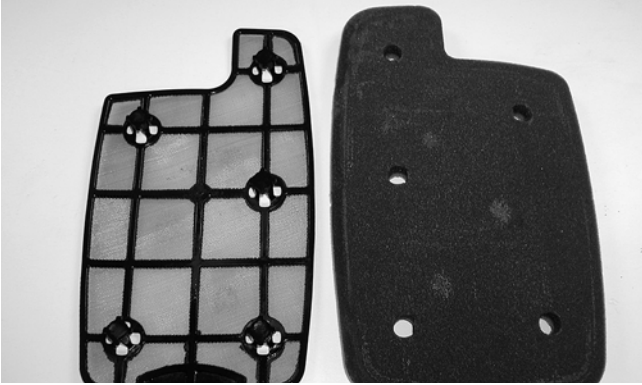


CD675A

4. Remove the air filter/filter screen assembly and separate the foam filter from the screen.



CD674



CD747

5. Fill a wash pan larger than the filter with a non-flammable cleaning solvent; then dip the filter in the solvent and wash it.

■ **NOTE:** Foam Filter Cleaner (p/n 0436-194) and Foam Filter Oil (p/n 0436-195) are available from Arctic Cat.

- 6. Dry the filter.
- 7. Put the filter in a plastic bag; then pour in air filter oil and work the filter. Reattach the filter to the filter screen.

⚠ CAUTION

A torn air filter can cause damage to the ATV engine. Dirt and dust may get inside the engine if the element is torn. Carefully examine the element for tears before and after cleaning it. Replace the element with a new one if it is torn.

8. Clean any dirt or debris from inside the air cleaner. Be sure no dirt enters the carburetors.



CD746

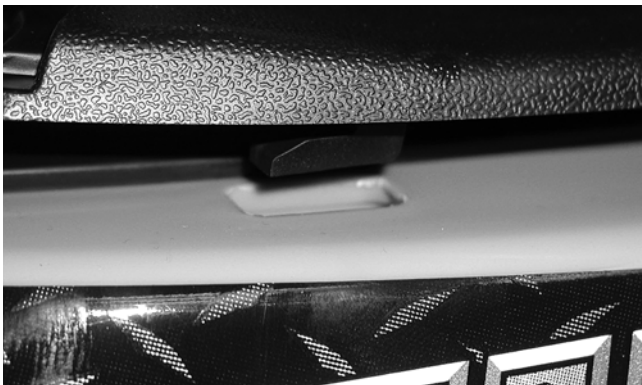
9. Place the filter assembly in the air filter housing making sure it is properly positioned and properly seated with the filter screen down.



CD674

10. Install the air filter housing cover and secure with the retaining clips; then install the storage compartment box.

11. Install the storage compartment cover assembly making sure the two lugs engage the slots; then secure the steering post cover with the reinstallable rivets.



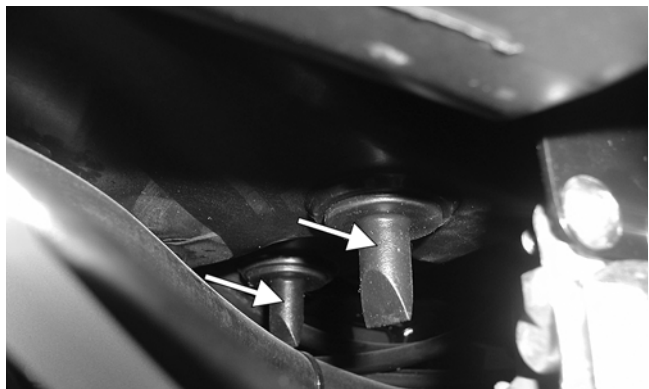
CD670



CD710A

CHECKING AND CLEANING DRAINS

1. Inspect one-way drains beneath the main housing for debris and for proper sealing.



KX045A

2. Replace any one-way drain that is cracked or shows any signs of hardening or deterioration.

CAUTION
<p>The one-way drain to the right is the clean air section of the filter housing. Any leak of this one-way drain will allow dirt into the engine intake causing severe engine damage.</p>

3. Wipe any accumulation of oil or gas from the filter housing and one-way drains.

**Valve/Tappet Clearance
(Feeler Gauge Procedure)**

■ **NOTE:** For the 650 V-Twin, see Valve/Tappet Clearance (650 V-Twin) in this section.

To check and adjust valve/tappet clearance, use the following procedure.

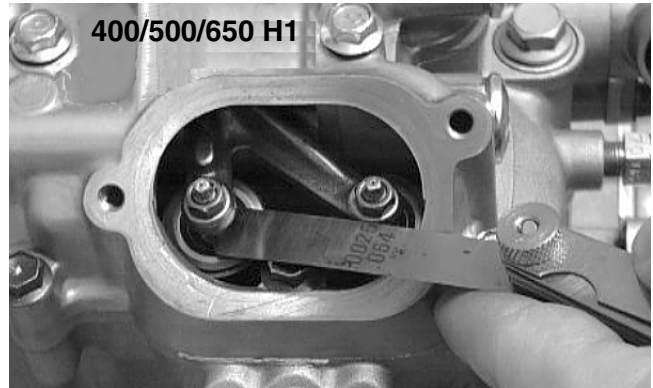
■ **NOTE:** On the 250/300, the seat and air-intake snorkel must be removed for this procedure.

■ **NOTE:** On the 400 FIS/ACT, the seat assembly, side panels, and gas tank must be removed for this procedure.

1. Remove the timing inspection plug; then remove the tappet covers (for more detailed information, see Section 3 - Servicing Top-Side Components).
2. Rotate the crankshaft to the TDC position on the compression stroke.

■ **NOTE:** At this point, the rocker arms and adjuster screws must not have pressure on them.

3. Using a feeler gauge, check each valve/tappet clearance. If clearance is not within specifications, loosen the jam nut and rotate the tappet adjuster screw until the clearance is within specifications. Tighten each jam nut securely after completing the adjustment.



CC007DA

4. Install the timing inspection plug.
5. Place the two tappet covers into position making sure the proper cap screws are with the proper cover. Tighten the cap screws securely.

CAUTION

The feeler gauge must be positioned at the same angle as the valve and valve adjuster for an accurate measurement of clearance. Failure to measure the valve clearance accurately could cause valve component damage.

VALVE/TAPPET CLEARANCE (250)

Intake	0.03-0.08 mm (0.001-0.003 in.)
Exhaust	0.08-0.13 mm (0.003-0.005 in.)

VALVE/TAPPET CLEARANCE (300)

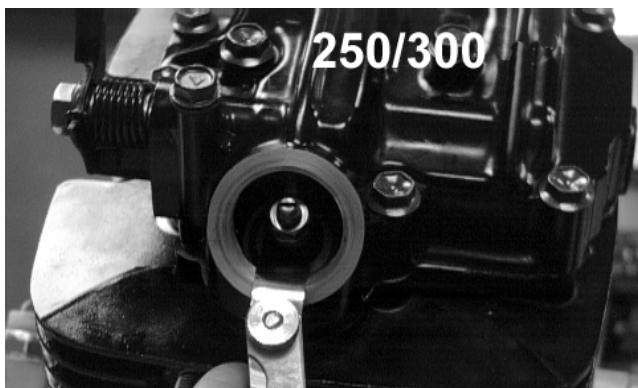
Intake	0.03-0.08 mm (0.001-0.003 in.)
Exhaust	0.17-0.22 mm (0.007-0.009 in.)

VALVE/TAPPET CLEARANCE (400/500)

Intake	0.05-0.10 mm (0.002-0.004 in.)
Exhaust (400)	0.22-0.27 mm (0.009-0.011 in.)
Exhaust (500)	0.17-0.22 mm (0.007-0.009 in.)

VALVE/TAPPET CLEARANCE (650 H1)

Intake	0.1016 mm (0.004 in.)
Exhaust	0.1524 mm (0.006 in.)



CC409DA

Valve/Tappet Clearance (Valve Adjuster Procedure)

■ **NOTE:** For the 650 V-Twin, see Valve/Tappet Clearance (650 V-Twin) in this section.

To check and adjust valve/tappet clearance, use the following procedure.

■ **NOTE:** On the 250/300, the seat and air-intake snorkel must be removed for this procedure.

■ **NOTE:** On the 400 FIS/ACT, the seat assembly, side panels, and gas tank must be removed for this procedure.

■ **NOTE:** On the TBX/500/650 H1, the seat, storage compartment cover assembly, compartment box, air filter/filter housing, and left-side/right-side splash panels must be removed for this procedure.

1. Remove the timing inspection plug; then remove the tappet covers (for more detailed information, see Section 3 - Servicing Top-Side Components).
2. Rotate the crankshaft to the TDC position on the compression stroke.

■ **NOTE:** At this point, the rocker arms and adjuster screws must not have pressure on them.

■ **NOTE:** Use Valve Gap Adjuster (p/n 0444-092) for the 250/300 or Valve Clearance Adjuster (p/n 0444-078) for the 400/500/650 H1 for this procedure.

3. Place the valve adjuster onto the jam nut securing the tappet adjuster screw; then rotate the valve adjuster dial clockwise until the end is seated in the tappet adjuster screw.

4. While holding the valve adjuster dial in place, use the valve adjuster handle and loosen the jam nut; then rotate the tappet adjuster screw clockwise until friction is felt.
5. Align the valve adjuster handle with one of the marks on the valve adjuster dial.
6. While holding the valve adjuster handle in place, rotate the valve adjuster dial counterclockwise until proper valve/tappet clearance is attained.

■ **NOTE:** Refer to the appropriate specifications in Feeler Gauge Procedure sub-section for the proper valve/tappet clearance.

■ **NOTE:** Rotating the valve adjuster dial counterclockwise will open the valve/tappet clearance by 0.05 mm (0.002 in.) per mark.

7. While holding the adjuster dial at the proper clearance setting, tighten the jam nut securely with the valve adjuster handle.
8. Place the two tappet covers with O-rings into position; then tighten the covers securely.



CC366D

9. Install the spark plug; then install the timing inspection plug.



CC411D

Valve/Tappet Clearance

(650 V-Twin - Feeler Gauge Procedure)

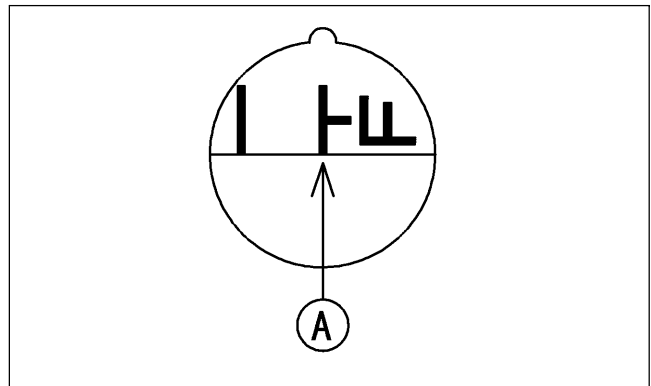
To check and adjust valve/tappet clearance, use the following procedure.

■ **NOTE:** The seat, air filter housing, front fenders, front inner covers, and side panels must be removed for this procedure.

1. Remove the cap screws securing the recoil starter; then remove the recoil starter assembly.
2. Remove the timing inspection plug; then remove the four tappet covers (for more detailed information, see Section 3 - Servicing Top-Side Components).
3. Rotate the crankshaft counterclockwise to the TDC position on the compression stroke indicated by the TF mark (A) on the flywheel. TF is top dead center front.

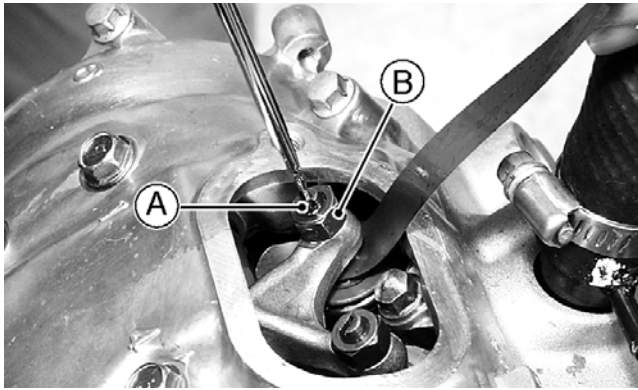
2

■ **NOTE:** At this point, the rocker arms and adjuster screws on the front cylinder must not have pressure on them.



ATV2057B

4. Using a feeler gauge, check each valve/tappet clearance. If clearance is not within specifications, loosen jam nut (B) and rotate the tappet adjuster screw (A) until the clearance is within specifications. Tighten each jam nut to specifications after completing the adjustment.



KX227

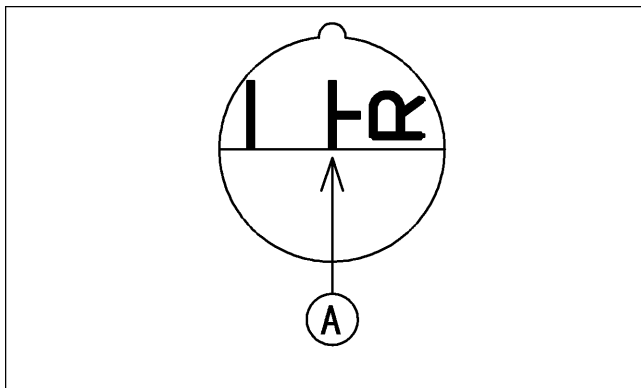
CAUTION

The feeler gauge must be positioned at the same angle as the valve and valve adjuster for an accurate measurement of clearance. Failure to measure the valve clearance accurately could cause valve component damage.

VALVE/TAPPET CLEARANCE (650 V-Twin)

Intake	0.10-0.15 mm (0.0039-0.0059 in.)
Exhaust	0.20-0.25 mm (0.0079-0.0098 in.)

5. Rotate the crankshaft counterclockwise until the TR mark (A) aligns in the timing hole. Repeat steps 3-4 for the rear cylinder.



ATV2058B

6. Install the timing inspection plug.
7. Place the four tappet covers into position. Tighten the cap screws securely.
8. Install the recoil starter assembly and tighten the cap screws securely.
9. Install the air filter housing, front inner covers, front fenders, and side panels; then install the seat and make sure it locks securely.

Valve/Tappet Clearance (650 V-Twin - Valve Adjuster Procedure)

To check and adjust valve/tappet clearance, use the following procedure.

■ **NOTE: The seat, air filter housing, front fenders, front inner covers, and side panels must be removed for this procedure.**

1. Remove the cap screws securing the recoil starter; then remove the recoil starter assembly.
2. Remove the timing inspection plug; then remove the four tappet covers (for more detailed information, see Section 3 - Servicing Top-Side Components).
3. Rotate the crankshaft counterclockwise to the TDC position on the compression stroke indicated by the TF mark on the flywheel. TF is top dead center front.

■ **NOTE: At this point, the rocker arms and adjuster screws must not have pressure on them.**

■ **NOTE: Use Valve Gap Adjuster (p/n 0444-092) for this procedure.**

4. Place the valve adjuster onto the jam nut securing the tappet adjuster screw; then rotate the valve adjuster dial clockwise until the end is seated in the tappet adjuster screw.
5. While holding the valve adjuster dial in place, use the valve adjuster handle and loosen the jam nut; then rotate the tappet adjuster screw clockwise until friction is felt.
6. Align the valve adjuster handle with one of the marks on the valve adjuster dial.
7. While holding the valve adjuster handle in place, rotate the valve adjuster dial counterclockwise until proper valve/tappet clearance is attained.

■ **NOTE: Refer to the appropriate specifications in Feeler Gauge Procedure sub-section for the proper valve/tappet clearance.**

■ **NOTE: Rotating the valve adjuster dial counterclockwise will open the valve/tappet clearance by 0.07 mm (0.003 in.) per mark.**

8. While holding the adjuster dial at the proper clearance setting, tighten the jam nut securely with the valve adjuster handle; then tighten the jam nuts to specifications.
9. Rotate the crankshaft counterclockwise until the TR mark aligns in the timing hole; then repeat steps 4-8 for the rear cylinder.

10. Install the timing inspection plug; then install the four tappet covers and tighten securely.
11. Install the recoil starter assembly and tighten the cap screws securely.
12. Install the air filter housing, front inner covers, front fenders, and side panels; then install the seat and make sure it locks securely.

Testing Engine Compression

To test engine compression, use the following procedure.

1. Remove the high tension lead from the spark plug.
2. Using compressed air, blow any debris from around the spark plug.

⚠ WARNING

Always wear safety glasses when using compressed air.

3. Remove the spark plug; then attach the high tension lead to the plug and ground the plug on the cylinder head well away from the spark plug hole.
4. Attach the Compression Gauge (p/n 0444-096).

■ **NOTE:** The engine must be warm and the battery must be fully charged for this test.

5. While holding the throttle lever in the full-open position, crank the engine over with the electric starter until the gauge shows a peak reading (five to 10 compression strokes).

■ **NOTE:** For the 250/300, the compression should be within a range of 157.5-192.5 psi in the full-open throttle position. For the 400/500/650 H1, the compression should be within a range of 63-77 psi in the full-open throttle position. For the 650 V-Twin, the compression should be within a range of 47-81 psi in the full-open throttle position.

6. If compression is abnormally low, inspect the following items.

- A. Verify starter cranks engine over.
- B. Gauge is functioning properly.
- C. Throttle lever in the full-open position.
- D. Valve/tappet clearance correct.
- E. Valve bent or burned.
- F. Valve seat burned.

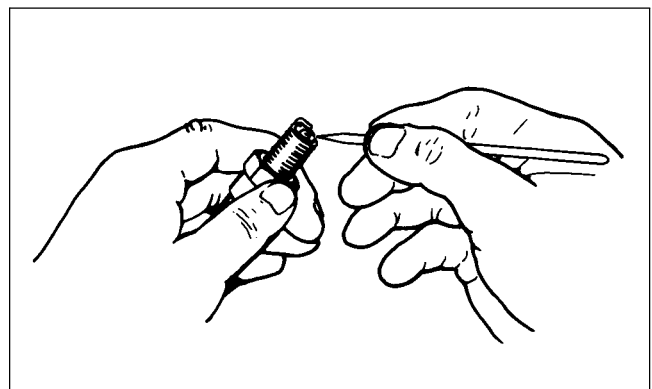
■ **NOTE:** To service valves, see Section 3.

7. Pour 29.5 ml (1 fl oz) of oil into the spark plug hole, reattach the gauge, and retest compression.
8. If compression is now evident, service the piston rings (see Section 3).

2

Spark Plug

A light brown insulator indicates that the plug is correct. A white or dark insulator indicates that the engine may need to be serviced or the carburetor may need to be adjusted. To maintain a hot, strong spark, keep the plug free of carbon.

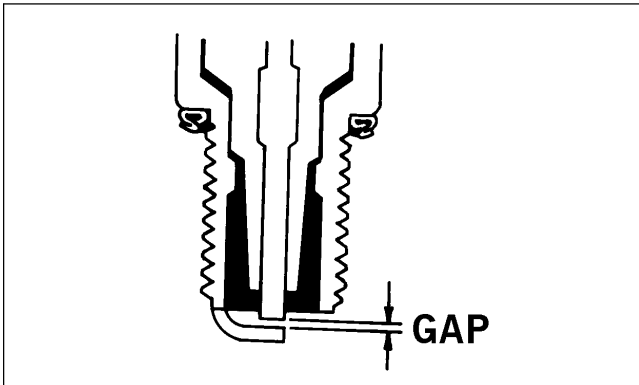


ATV-0051

⚠ CAUTION

Before removing the spark plug, be sure to clean the area around the spark plug. Dirt could enter engine when removing or installing the spark plug.

Adjust the gap to 0.6 - 0.7 mm (0.024 - 0.028 in.) on the 250/300 or to 0.7 - 0.8 mm (0.028 - 0.032 in.) on the 400/500/650 H1/650 V-Twin for proper ignition. Use a feeler gauge to check the gap.



ATV0052B

When installing the spark plug, be sure to tighten it securely. A new spark plug should be tightened 1/2 turn once the washer contacts the cylinder head. A used spark plug should be tightened 1/8 - 1/4 turn once the washer contacts the cylinder head.

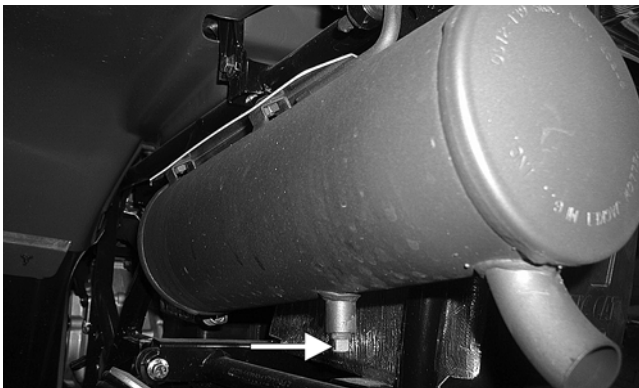
Muffler/Spark Arrester

The muffler has a spark arrester which must be periodically cleaned. At the intervals shown in the Periodic Maintenance Chart, clean the spark arrester using the following procedure.

WARNING

Wait until the muffler cools to avoid burns.

1. Shift the transmission into neutral and set the brake lever lock.
2. Elevate the front of the ATV on a safety stand until the muffler is horizontal.
3. Remove the plug from the bottom of the muffler.



CD451A

4. Start the engine and increase RPM to "blow out" the accumulated carbon particles.
5. Stop the engine. Wait until the muffler cools; then install the plug and tighten securely.

Gas/Vent Hoses

Replace the gas hose every two years. Damage from aging may not always be visible. Do not bend or obstruct the routing of the carburetor vent hose. Make certain that the vent hose is securely connected to the carburetor and the opposite end is always open.

Adjusting Throttle Cable

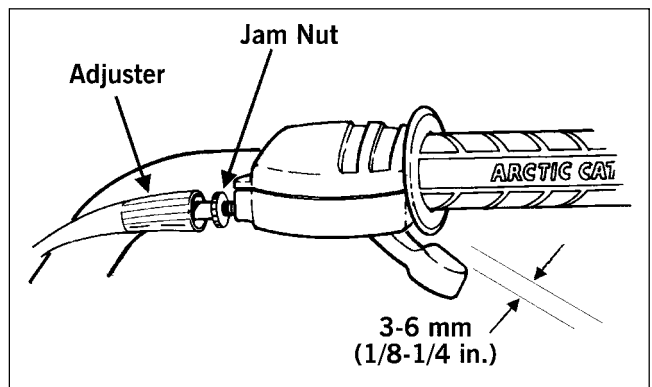
To adjust the throttle cable free-play, follow this procedure.

1. Slide the rubber boot away; then loosen the jam nut from the throttle cable adjuster.



AL611D

2. Turn the adjuster until the throttle cable has proper free-play of 3-6 mm (1/8 - 1/4 in.) at the lever.



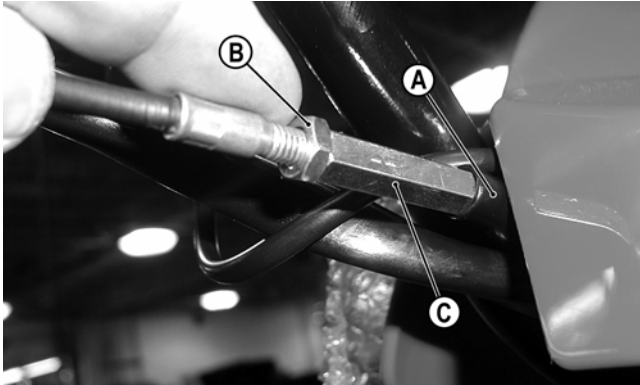
ATV-0047

3. Tighten the jam nut against the throttle cable adjuster securely; then slide the rubber boot over the adjuster.

Adjusting Choke Cable (650 V-Twin)

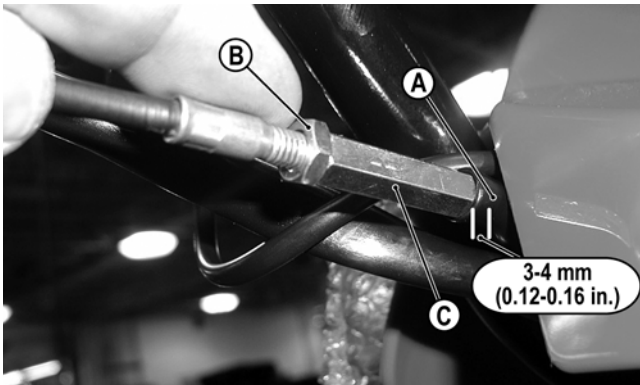
To adjust the choke cable for proper free-play, follow this procedure.

1. Slide the rubber boot (A) off the choke cable; then loosen jam nut (B).



CD560A

2. Turn the adjuster (C) until proper free-play of 3-4 mm (0.12-0.16 in.) is attained at the end of the adjuster.



CD560B

3. Tighten the jam nut securely against the end of the adjuster; then slide the rubber boot over the adjuster.

Adjusting Engine RPM (Idle)

To properly adjust the idle RPM, a tachometer is necessary. To adjust idle RPM, use the following procedure.

■ **NOTE:** To access the idle adjustment screw, it will be necessary to remove the seat on the 250/300 models. The idle adjustment screw is located on the right-hand side of the carburetor on the 400/500/650 H1/650 V-Twin models.

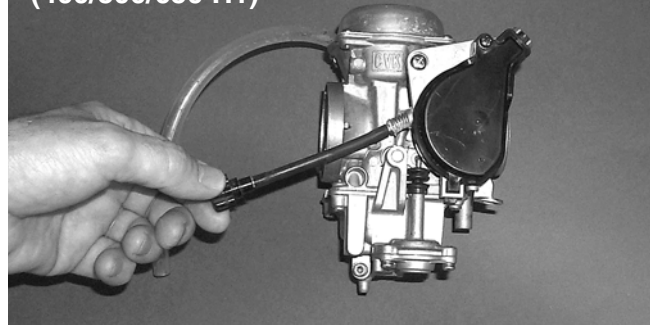
1. With the transmission in neutral, start the engine and warm it up to normal operating temperature.
2. Turn the idle adjustment screw clockwise one turn past the recommended RPM setting; then turn it counterclockwise to the correct RPM setting.



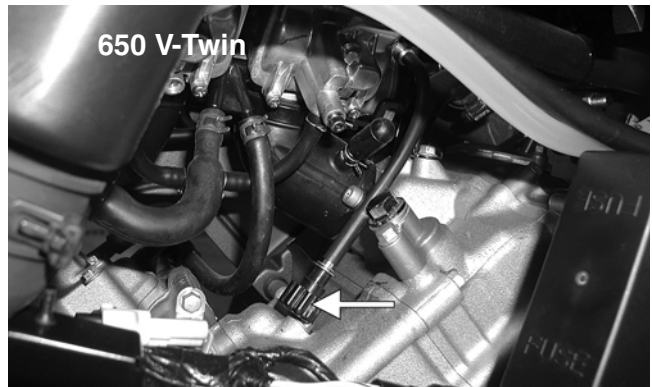
CC795B

2

Adjustment Screw (400/500/650 H1)



AF920C



KX029A

IDLE RPM	
MODEL	RPM
250/300/400/500/650 H1	1250-1350
650 V-Twin	1050-1150

WARNING

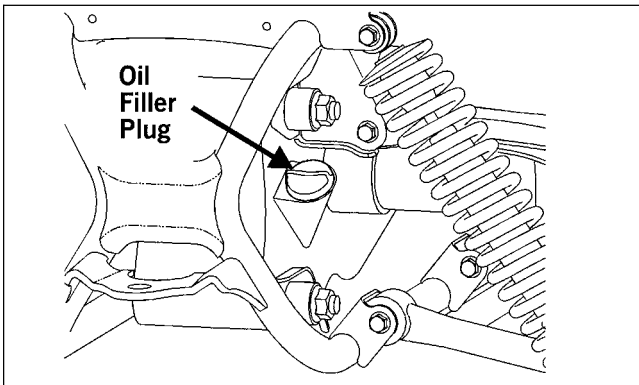
Adjust the idle to the correct RPM. Make sure the engine is at normal operating temperature before adjusting the idle RPM.

Engine/Transmission Oil - Filter - Strainer (250/300)

OIL - FILTER

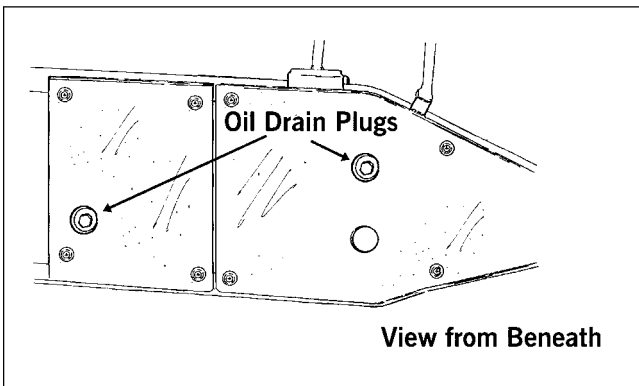
Change the engine oil and oil filter at the scheduled intervals. The engine should always be warm when the oil is changed so the oil will drain easily and completely.

1. Park the ATV on level ground.
2. Remove the oil filler plug.



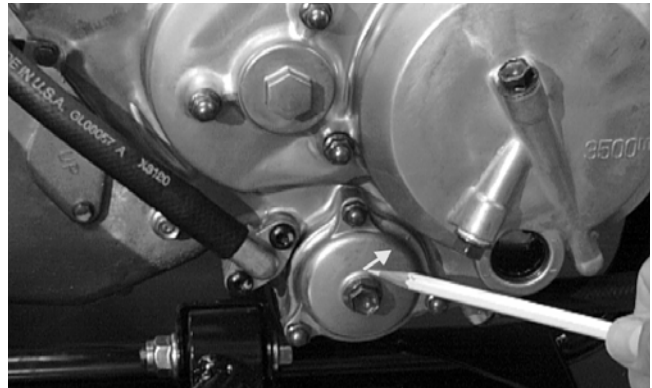
733-714A

3. Remove both drain plugs from the bottom of the engine and drain the oil into a drain pan.



733-441C

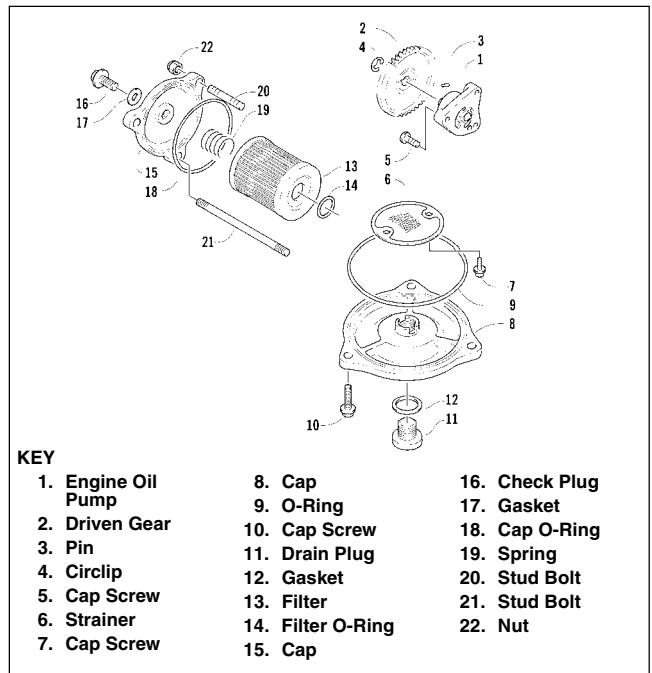
4. Remove the nuts securing the filter cover.
5. Remove the filter cover; then pull out the oil filter element and properly discard. Remove and properly discard the O-ring from the filter cover.



CH080DA

■ **NOTE:** Clean up any excess oil after removing the filter.

6. Apply oil to a new cover O-ring and check to make sure it is positioned correctly in the cover. With the open end of the filter element directed toward the center of the engine, slide the element into position.



KEY

- | | | |
|--------------------|-------------------|----------------|
| 1. Engine Oil Pump | 8. Cap | 16. Check Plug |
| 2. Driven Gear | 9. O-Ring | 17. Gasket |
| 3. Pin | 10. Cap Screw | 18. Cap O-Ring |
| 4. Circlip | 11. Drain Plug | 19. Spring |
| 5. Cap Screw | 12. Gasket | 20. Stud Bolt |
| 6. Strainer | 13. Filter | 21. Stud Bolt |
| 7. Cap Screw | 14. Filter O-Ring | 22. Nut |
| | 15. Cap | |

0733-752

CAUTION

If the oil filter element is inserted backwards, engine damage will occur due to lack of oil flow.

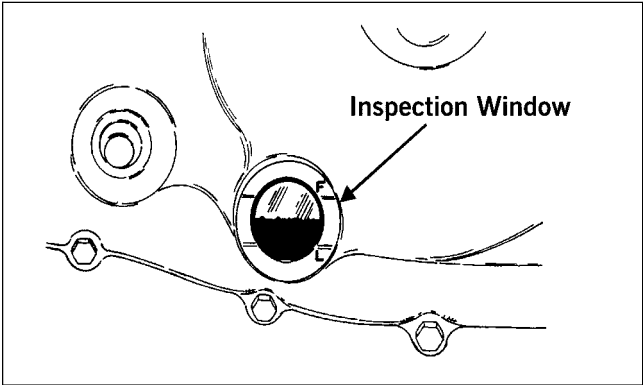
7. Place the filter cover in position and secure with the nuts. Tighten securely.

8. Install the engine drain plugs and tighten to specifications. Pour 3.5 L (3.7 U.S. qt) of the recommended oil in the filler hole; then install the filler plug.

CAUTION

Any oil used in place of the recommended oil could cause serious engine damage. Do not use oils which contain graphite or molybdenum additives. These oils can adversely affect clutch operation. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils.

9. Start the engine (while the ATV is outside on level ground) and allow it to idle for a few minutes.
10. Turn the engine off and wait approximately one minute. Recheck the oil level in the engine oil inspection window. The oil level should be visible through the window. If oil is not visible, add recommended oil until the oil level is visible between the lines of the window.



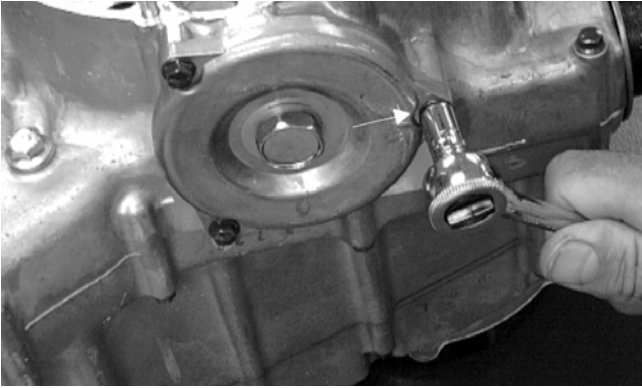
ATV-0074

11. Inspect the area around the drain plug and oil filter for leaks.

STRAINER

To check the oil strainer, use the following procedure.

1. Remove the skid plate.
2. Remove the Phillips-head cap screws securing the oil strainer cap; then remove the cap. Note the directional arrow on the cap for assembly purposes.



CC442DA

3. Remove the Phillips-head screws securing the strainer; then remove the strainer.



CC443D

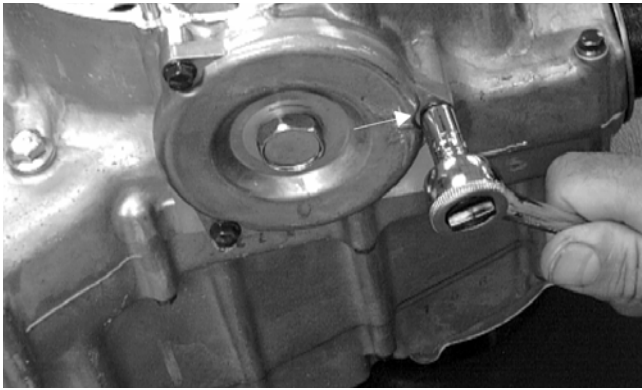
■ **NOTE:** To service the oil strainer, see Section 3.

4. Place the oil strainer into position and secure with the Phillips-head screws.



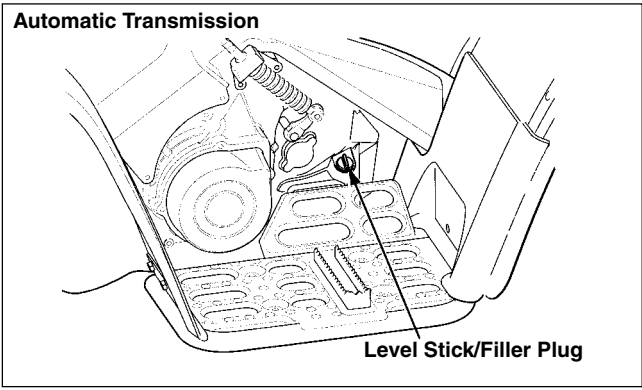
CC443D

5. Place the strainer cap into position on the crankcase; then secure with the Phillips-head cap screws (coated with red Loctite #271). Tighten securely.



CC442DA

6. Install the skid plate.



0735-505

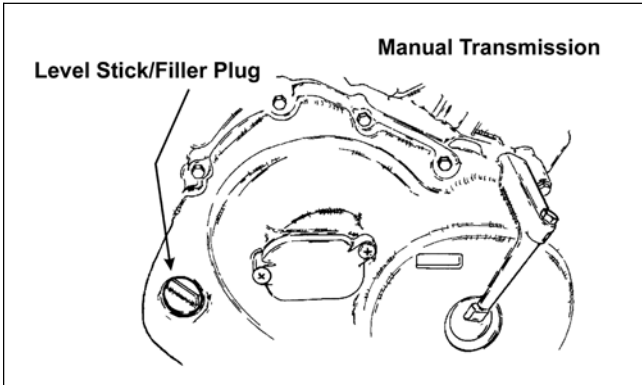
3. Remove the drain plug from the bottom of the engine and drain the oil into a drain pan.

Engine/Transmission Oil - Filter - Strainer (400/500/650 H1/650 V-Twin)

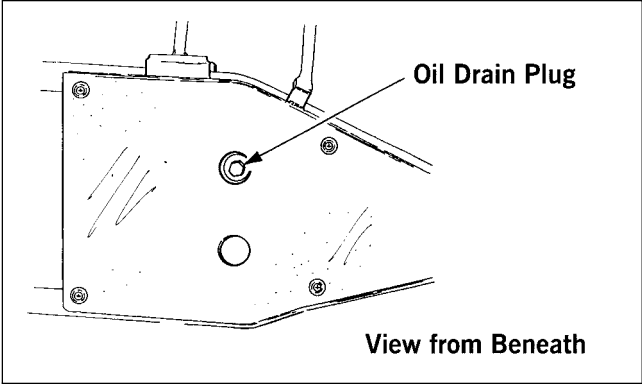
OIL - FILTER

Change the engine oil and oil filter at the scheduled intervals. The engine should always be warm when the oil is changed so the oil will drain easily and completely.

1. Park the ATV on level ground.
2. Remove the oil level stick/filler plug.



ATV-0075



733-441A

4. Remove the oil filter plug from the filter mounting boss (located on the front-right side of the transmission case) and allow the filter to drain completely.
5. Using the Oil Filter Wrench (p/n 0444-042) and a ratchet handle (or a socket or box-end wrench), remove the old oil filter.

■ **NOTE:** Clean up any excess oil after removing the filter.

6. Apply oil to a new filter O-ring and check to make sure it is positioned correctly; then install the new oil filter. Tighten securely.

■ **NOTE:** Install a new O-ring each time the filter is replaced.

7. Install the oil filter drain plug and tighten securely.

8. Install the engine drain plug and tighten to specifications. Pour the specified amount of the recommended oil in the filler hole. Install the oil level stick/filler plug.

CAUTION

Any oil used in place of the recommended oil could cause serious engine damage. Do not use oils which contain graphite or molybdenum additives. These oils can adversely affect clutch operation. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils.

9. Start the engine (while the ATV is outside on level ground) and allow it to idle for a few minutes.
10. Turn the engine off and wait approximately one minute.
11. Unscrew the oil level stick and wipe it with a clean cloth.
12. Install the oil level stick until the threads touch engine case.

■ **NOTE:** On the 400 auto/500 auto/650 H1, the oil level stick should not be threaded into the case for checking the oil level.

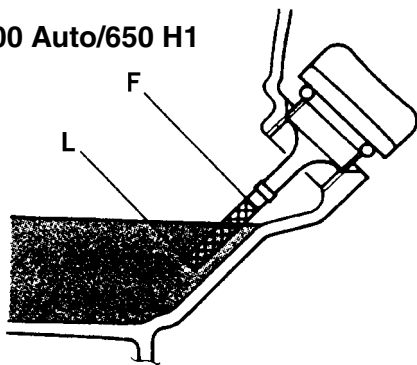
■ **NOTE:** On the 650 V-Twin, the oil level stick should be threaded into the case for checking the oil level.

13. Remove the oil level stick; the engine oil level should be above the illustrated “L” mark but not higher than the illustrated “F” mark.

CAUTION

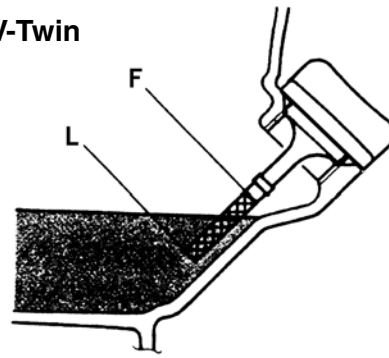
Do not over-fill the engine with oil. Always make sure that the oil level is above the “L” mark but not higher than the “F” mark.

400 Auto/500 Auto/650 H1



ATV-0100

650 V-Twin



ATV0100A

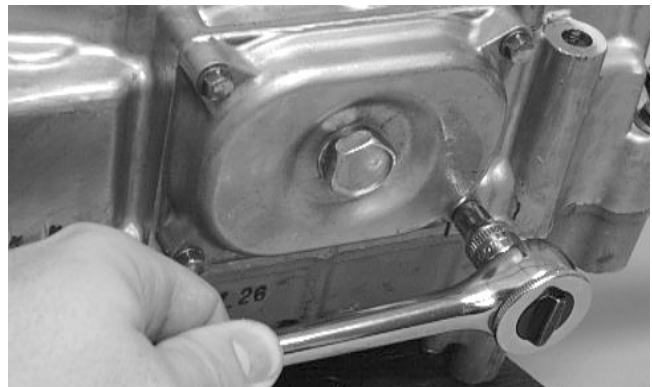
14. Inspect the area around the drain plug and oil filter for leaks.

STRAINER (250/300/400/500/650 H1)

■ **NOTE:** For servicing the oil strainer on the 650 V-Twin, see Center Crankcase Components in Section 3.

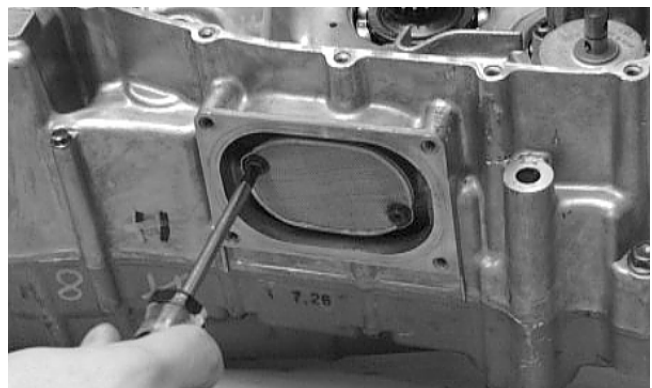
To check the oil strainer, use the following procedure.

1. Remove the skid plate.
2. Remove the cap screws securing the oil strainer cap; then remove the cap. Account for the O-ring.



CC091D

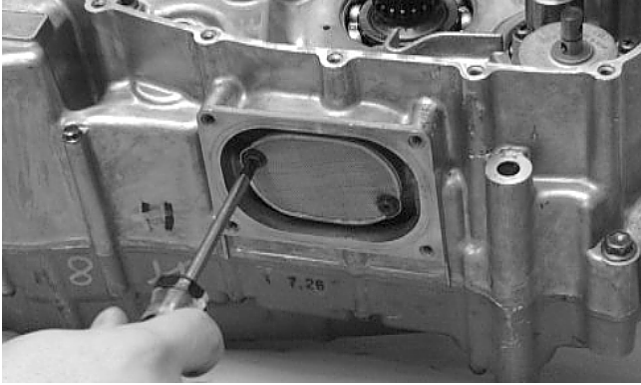
3. Remove the two Phillips-head cap screws securing the strainer.



CC163D

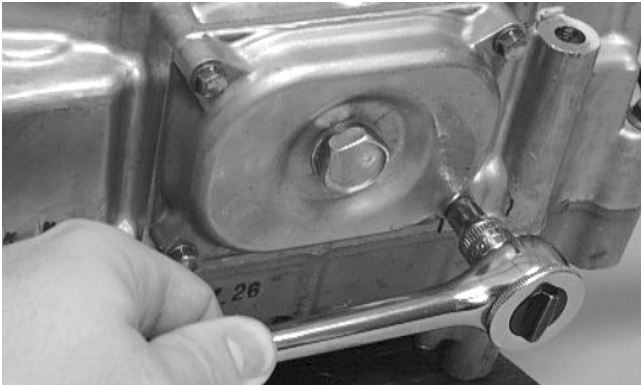
■ **NOTE:** To service oil strainer, see Section 3.

- Place the oil strainer into position beneath the crankcase and secure with the Phillips-head cap screws. Tighten securely.



CC163D

- Place the strainer cap into position on the strainer making sure the O-ring is properly installed; then secure with the cap screws. Tighten securely.



CC091D

- Install the skid plate.

Front Differential/Rear Drive Lubricant

Check and change the lubricant according to the Periodic Maintenance Chart. When changing the lubricant, use approved SAE 80W-90 hypoid gear lube. To check lubricant, use the following procedure.

- On FIS models, remove the rear drive filler plug; the lubricant level should be 1 in. below the threads of the plug. If low, add SAE approved 80W-90 hypoid gear lube as necessary.
- On ACT models, remove the rear drive inspection plug; the lubricant level should be at the threads of the plug. If low, add SAE approved 80W-90 hypoid gear lube as necessary.



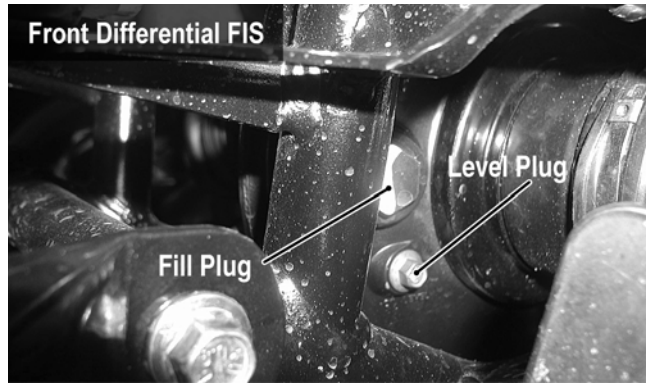
Rear Drive Inspection Plug

ACT

AF923A

To change the lubricant, use the following procedure.

- Place the ATV on level ground.
- Remove each oil filler plug.

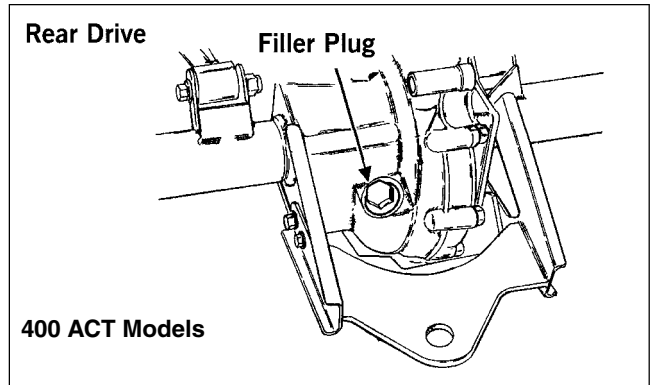


Front Differential FIS

Level Plug

Fill Plug

AL677A

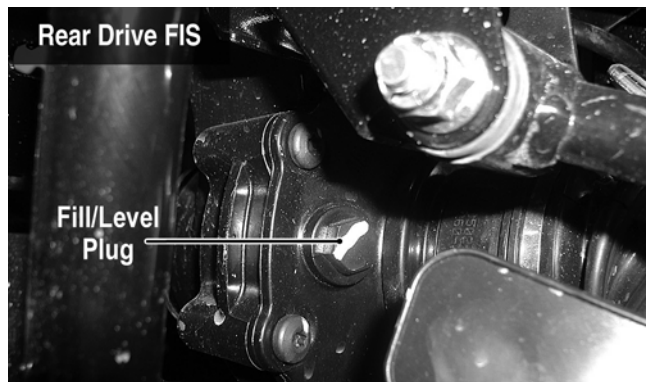


Rear Drive

Filler Plug

400 ACT Models

ATV-0077

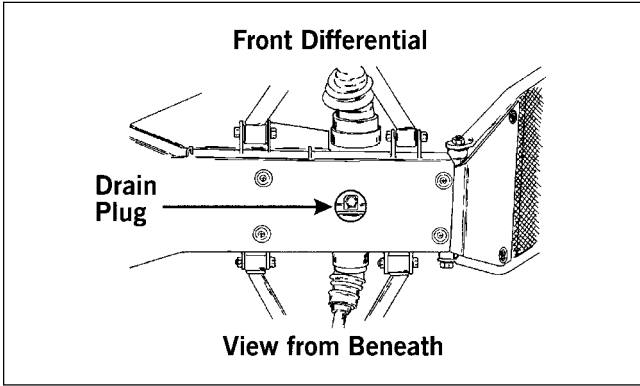


Rear Drive FIS

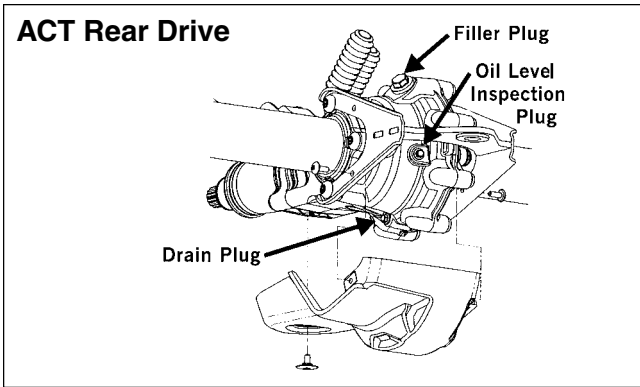
Fill/Level Plug

AL678A

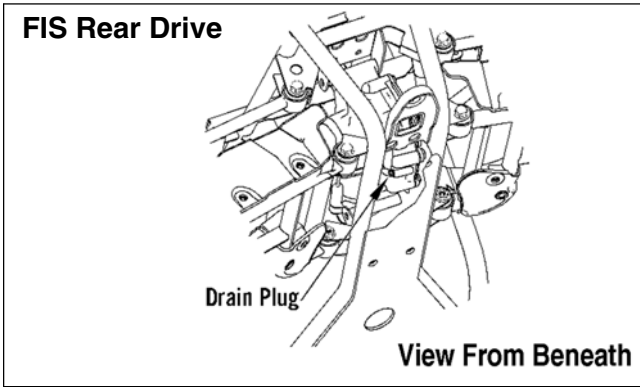
3. Drain the oil into a drain pan by removing in turn the drain plug from each.



ATV0082A



ATV-1096



737-651A

4. After all the oil has been drained, install the drain plugs and tighten to specifications.
5. Pour the appropriate amount of recommended oil into the filler hole.
6. Install the filler plugs.

■ **NOTE:** If the differential/rear drive oil is contaminated with water, inspect the drain plug, filler plug, and/or bladder.

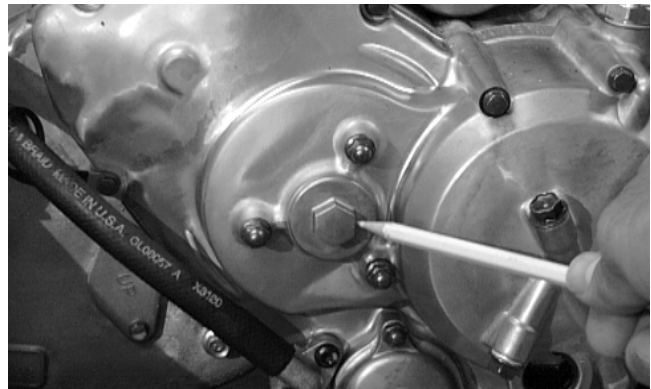
CAUTION
Water entering the outer end of the axle will not be able to enter the rear drive unless the seals are damaged.

Adjusting Clutch (250/300)

To adjust the clutch, use the following procedure.

1. Using an impact driver, remove the cover. Account for the O-ring.

2



CH081D

2. Loosen the jam nut securing the adjustment screw.

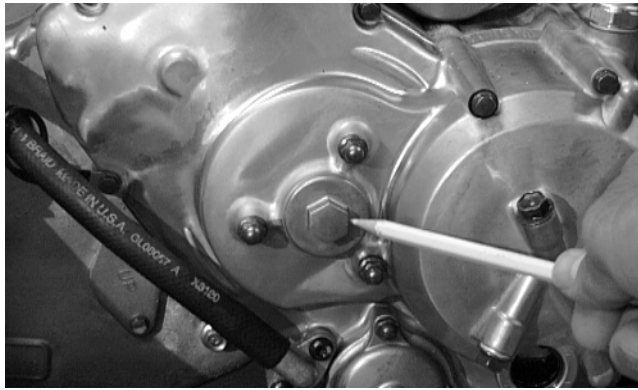


CH086D

3. Rotate the adjustment screw clockwise until it stops.
4. Rotate the adjustment screw counterclockwise 1/8 turn; then lock the jam nut securing the adjustment screw.

■ **NOTE:** At this point the clutch should be adjusted correctly. Test ride the ATV to ensure accurate adjustment.

5. Secure the cover making sure the O-ring is properly positioned.

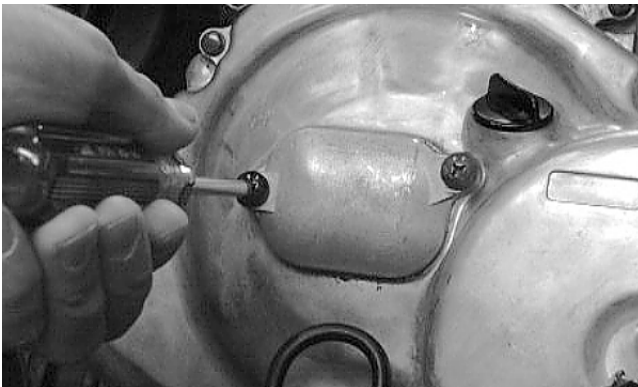


CH081D

Adjusting Clutch (400/500 Manual Transmission)

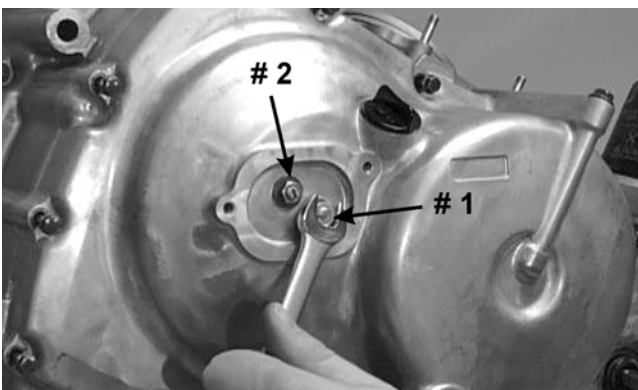
To adjust the clutch, use the following procedure.

1. Using an impact driver, remove the screws securing the cover and remove the cover. Account for the O-ring.



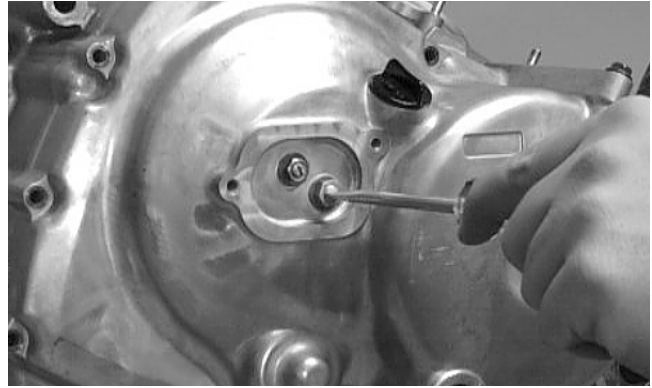
AM600D

2. Loosen the jam nuts securing adjustment screw #1 (forward) and adjustment screw #2 (rearward).



CC037D

3. Rotate adjustment screw #1 counterclockwise until it stops.



CC038D

4. Rotate adjustment screw #2 alternately clockwise and counterclockwise to ensure free movement without binding; then lock the jam nut securing adjustment screw #2.

5. Rotate adjustment screw #1 clockwise 1/8 turn; then lock the jam nut securing adjustment screw #1.

■ **NOTE:** At this point the clutch should be adjusted correctly. Test to ensure accurate adjustment.

6. Install the cover making sure the O-ring is properly positioned; then secure with the screws.

Tires

TIRE SIZES

The ATV is equipped with low-pressure tubeless tires of the size and type listed. Do not under any circumstances substitute tires of a different type or size.

WARNING

Always use the size and type of tires specified. Always maintain proper tire inflation pressure.

TIRE INFLATION PRESSURE

Front and rear tire inflation pressure should be 0.35 kg-cm² (5.0 psi).

A low-pressure gauge is provided in the tool kit to measure the air pressure in the tires. Check the air pressure in all tires before each use of the ATV.

F. Shock absorber spring broken or sagging.

Steering Components

The following steering components should be inspected periodically to ensure safe and proper operation.

- A. Handlebar grips not worn, broken, or loose.
- B. Handlebar not bent, cracked, and has equal and complete full-left and full-right capability.
- C. Steering post bearing assembly/bearing housing not broken, worn, or binding.
- D. Ball joints not worn, cracked, or damaged.
- E. Tie rods not bent or cracked.
- F. Knuckles not worn, cracked, or damaged.
- G. Cotter pins not damaged or missing.

Driveshaft/Coupling

The following drive system components should be inspected periodically to ensure proper operation.

- A. Spline lateral movement (slop).
- B. Coupling cracked, damaged, or worn.

Suspension/Shock Absorbers/Bushings

The following suspension system components should be inspected periodically to ensure proper operation.

- A. Shock absorber rods bent, pitted, or damaged.
- B. Rubber damper cracked, broken, or missing.
- C. Shock absorber body damaged, punctured, or leaking.
- D. Shock absorber eyelets broken, bent, or cracked.
- E. Shock absorber eyelet bushings worn, deteriorated, cracked, or missing.

Nuts/Bolts/Cap Screws

Tighten all nuts, bolts, and cap screws. Make sure rivets holding components together are tight. Replace all loose rivets. Care must be taken that all calibrated nuts, bolts, and cap screws are tightened to specifications. For proper torque values, see Section 10.

Ignition Timing

2

■ **NOTE:** On the 650 V-Twin to verify ignition timing, see Ignition Timing (650 V-Twin) in Section 5.

The ignition timing cannot be adjusted; however, verifying ignition timing can aid in troubleshooting other components. To verify ignition timing, use the following procedure.

1. Attach the Timing Light (p/n 0644-197) to the spark plug high tension lead; then remove the timing inspection plug from the left-side crankcase cover.
2. Using the Arctic Cat Engine Tachometer (p/n 0644-275), start the engine and run at the recommended RPM; ignition timing should be the recommended degrees BTDC.

IGNITION TIMING	
MODEL	TIMING/RPM
250	5° BTDC below 1800 35° BTDC above 3800
300	5° BTDC @ 1800 30° BTDC @ 3800
400	10° BTDC @ 1500
500	10° BTDC @ 1500
650 H1	10° BTDC @ 1500

3. Install the timing inspection plug.

If ignition timing cannot be verified, the rotor may be damaged, the key may be sheared, the trigger coil bracket may be bent or damaged, or the CDI unit may be faulty.

Headlight/Taillight-Brakelight

Each time the ATV is used, lights should be checked for proper function. Rotate the ignition switch to the lights position; the headlights and taillight should illuminate. Test the brakelight by compressing the brake lever. The brakelight should illuminate.

HEADLIGHT

■ **NOTE:** The bulb portion of the headlight is fragile. HANDLE WITH CARE. When replacing the headlight bulb, do not touch the glass portion of the bulb. If the glass is touched, it must be cleaned with a dry cloth before installing. Skin oil residue on the bulb will shorten the life of the bulb.

⚠ WARNING

Do not attempt to remove the bulb when it is hot. Severe burns may result.

To replace the headlight bulb, use the following procedure.

1. Remove the wiring harness connector from the back of the headlight.
2. Grasp the bulb housing, turn it counterclockwise, and remove the bulb.
3. Install the new bulb into the housing and rotate it completely clockwise.
4. Install the wiring harness connector.

TAILLIGHT-BRAKELIGHT

To replace the taillight-brakelight bulb, use the following procedure.

1. Remove the two screws and remove the lens cover.
2. Push the bulb in and turn it counterclockwise.
3. Install the new bulb by turning it clockwise while pushing in.
4. Install the lens cover.

⚠ CAUTION

Tighten the lens cover screws only until they are snug.

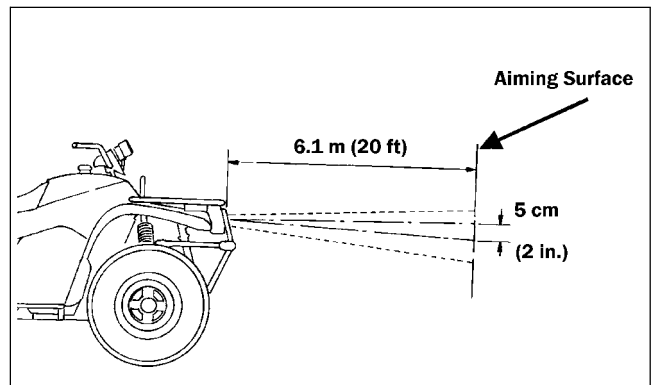
CHECKING/ADJUSTING HEADLIGHT AIM

The headlights can be adjusted vertically and horizontally. The geometric center of the HIGH beam light zone is to be used for vertical and horizontal aiming.

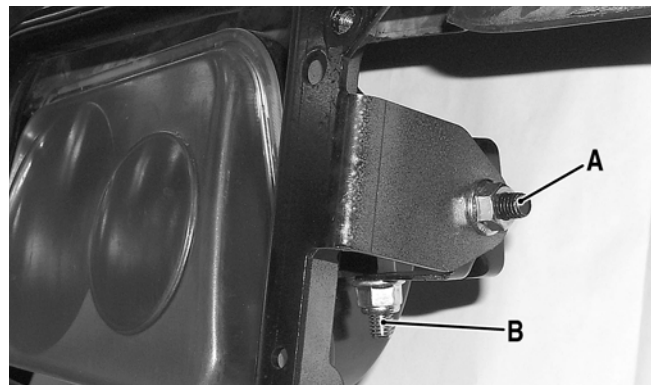
1. Position the ATV on a level floor so the headlights are approximately 6.1 m (20 ft) from an aiming surface (wall or similar aiming surface).

■ **NOTE:** There should be an average operating load on the ATV when adjusting the headlight aim.

2. Measure the distance from the floor to the mid-point of each headlight.
3. Using the measurements obtained in step 2, make horizontal marks on the aiming surface.
4. Make vertical marks which intersect the horizontal marks on the aiming surface directly in front of the headlights.
5. Switch on the lights. Make sure the HIGH beam is on. DO NOT USE LOW BEAM.
6. Observe each headlight beam aim. Proper aim is when the most intense beam is centered on the vertical mark 5 cm (2 in.) below the horizontal mark on the aiming surface.



ATV-0070C



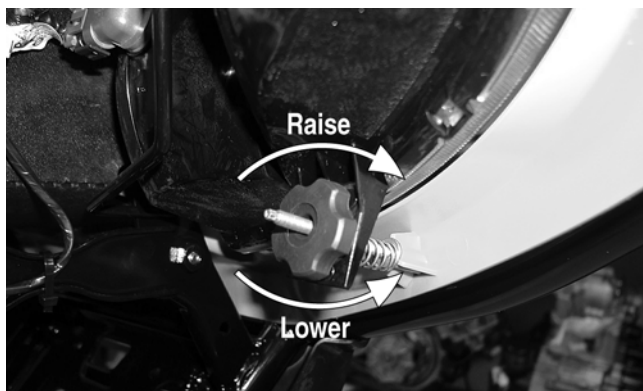
AF926A

■ **NOTE:** On the 250/300/400 FIS/ACT, it will be necessary to remove the two machine screws securing the grille and removing it for steps A and B.

7. Adjust each headlight until correct aim is obtained.

■ **NOTE:** Steps A and B are for the 250/300/400 FIS/ACT; step C is for the 400 TBX/500/650 H1/650 V-Twin.

- A. Horizontal — Loosen nut (A) and adjust for proper aiming. Tighten the nut securely.
- B. Vertical— Loosen nut (B) and adjust for proper aiming. Tighten the nut securely.
- C. Turn the knob counterclockwise to lower the beam or clockwise to raise the beam.



CD714A

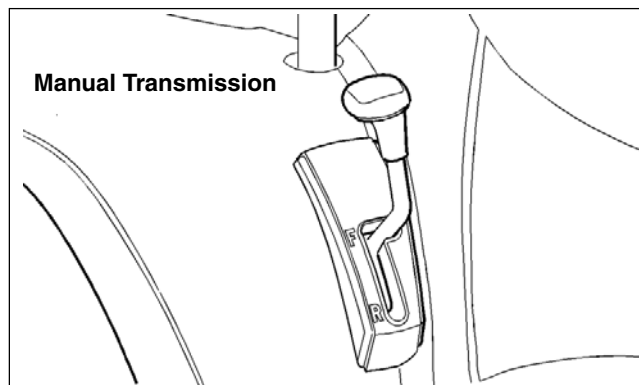
Switches

Each time the ATV is used, switches should be checked for proper operation. Use the following list for reference.

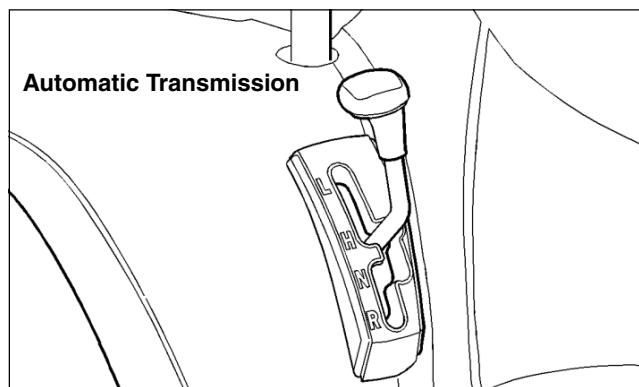
- A. Ignition switch — engine will start.
- B. Emergency stop switch — engine will stop.
- C. Reverse switch — reverse indicator light illuminates.
- D. Hi/Lo switch — headlight beam bright and dim.
- E. Brake switches — rear brakelight illuminates.

Reverse Shift Lever

CHECKING ADJUSTMENT



0736-566



0736-565

2

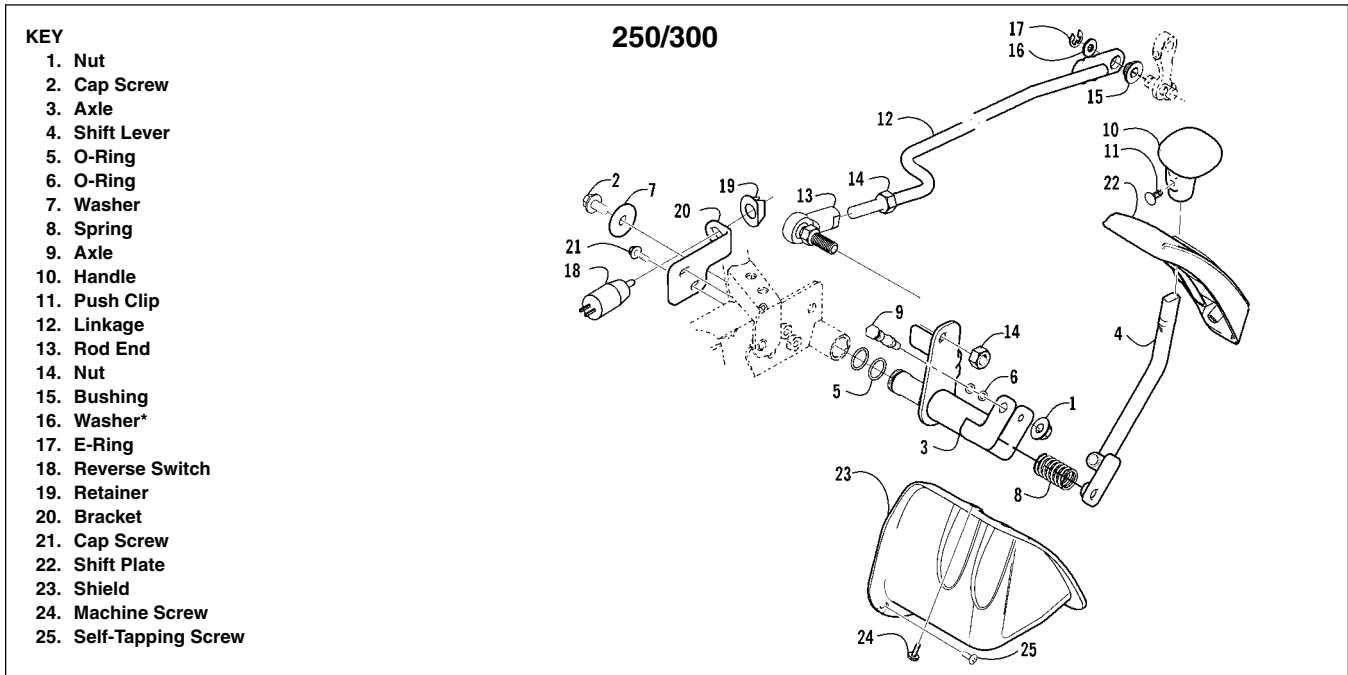
Stop the ATV completely and shift the transmission into the R position. The reverse gear indicator light should be illuminated.

WARNING

Never shift the ATV into reverse gear when the ATV is moving as it could cause the ATV to stop suddenly throwing the operator from the ATV.

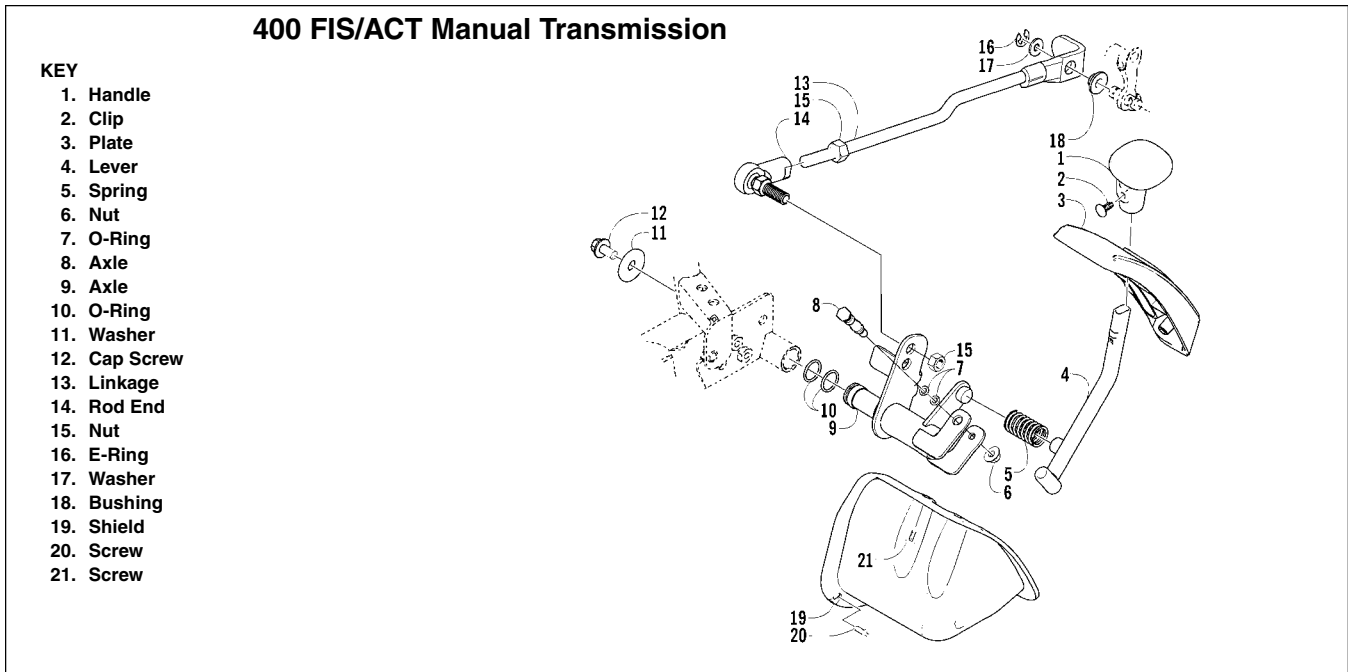
If the reverse lever light does not illuminate when shifted to the reverse position, the switch may be faulty, the fuse may be blown, the bulb may be faulty, a connection may be loose or corroded, or the lever may need adjusting. To adjust, proceed to Adjusting Shift Lever.

ADJUSTING SHIFT LEVER



* 250

0736-908

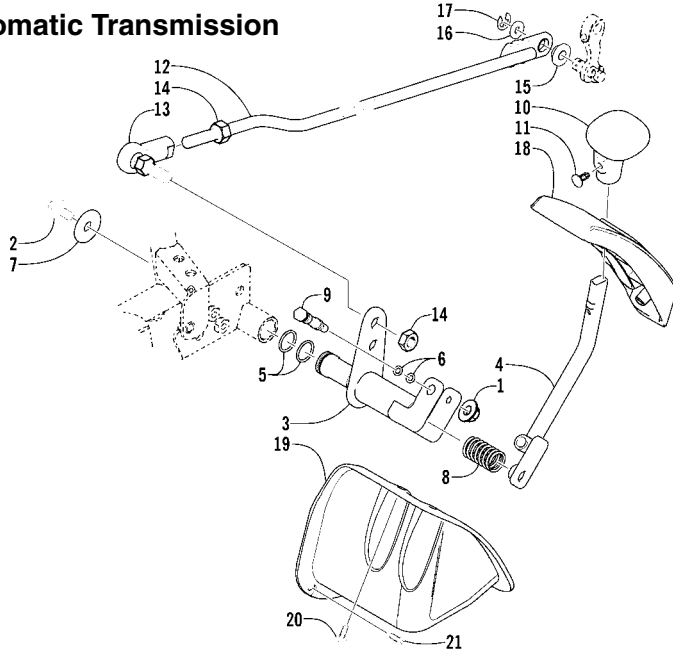


0738-827

KEY

400 FIS/ACT/TRV Automatic Transmission

- 1. Nut
- 2. Cap Screw
- 3. Axle
- 4. Lever
- 5. O-Ring
- 6. O-Ring
- 7. Washer
- 8. Spring
- 9. Axle
- 10. Handle
- 11. Push Clip
- 12. Linkage
- 13. Rod End
- 14. Nut
- 15. Bushing
- 16. Washer
- 17. E-Ring
- 18. Plate
- 19. Shield
- 20. Machine Screw
- 21. Self-Tapping Screw



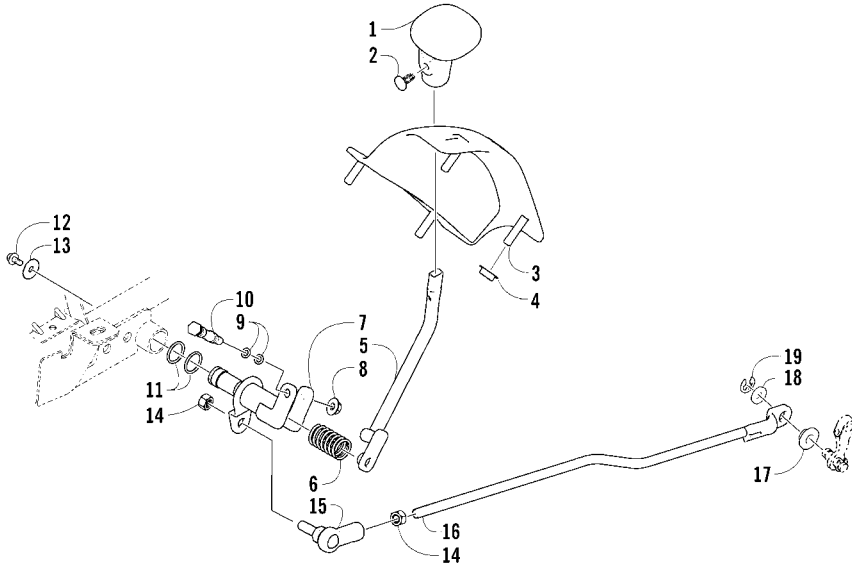
0737-070

2

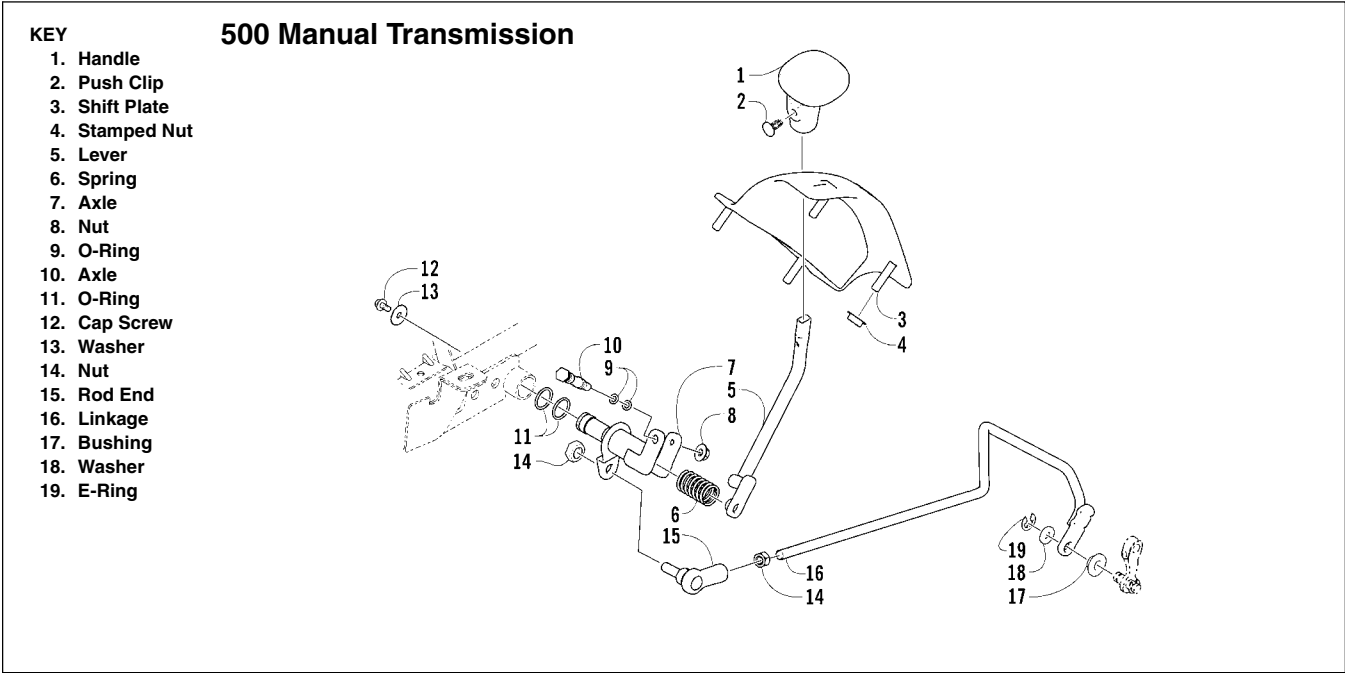
KEY

TBX/500 Automatic Transmission/650 H1

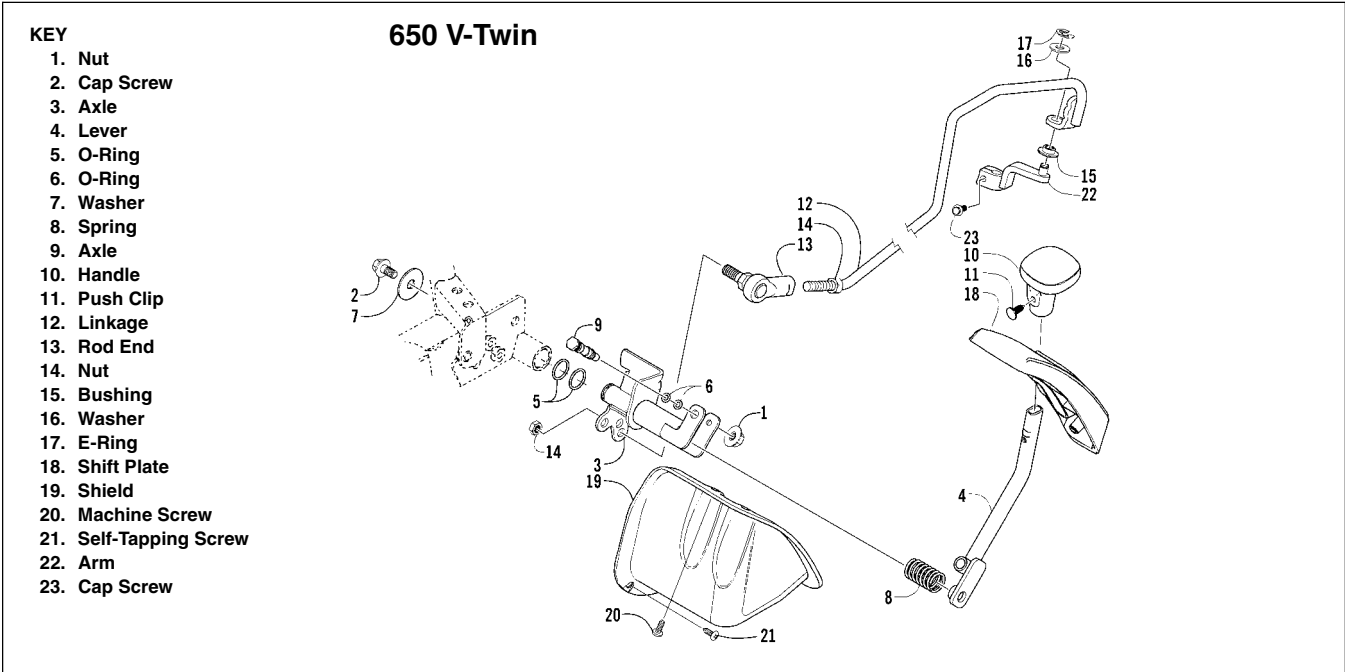
- 1. Handle
- 2. Push Clip
- 3. Shift Plate
- 4. Stamped Nut
- 5. Lever
- 6. Spring
- 7. Axle
- 8. Nut
- 9. O-Ring
- 10. Axle
- 11. O-Ring
- 12. Cap Screw
- 13. Washer
- 14. Nut
- 15. Rod End
- 16. Linkage
- 17. Bushing
- 18. Washer
- 19. E-Ring



0739-701



0739-739



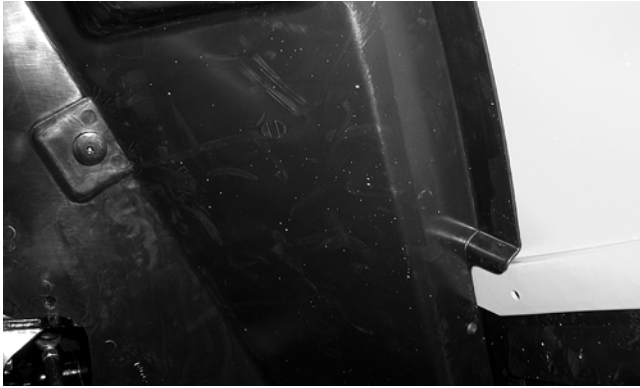
0739-083

1. Place the shift lever in the R position.
 2. Remove the seat.
- **NOTE:** Step 3 is for all models except the 650 V-Twin. For the 650 V-Twin, proceed to step 4.
- 3A. On the 250/300/400 FIS/ACT, remove the three machine screws securing the gear shift linkage cover to the fender; then remove the cover.



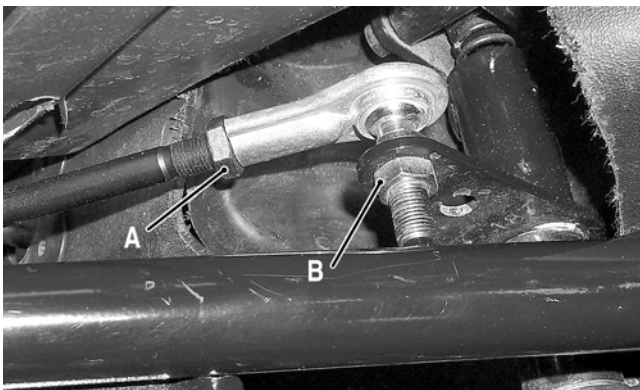
CC851

- B. On the TBX/500/650 H1, remove the left-side splash panel.



CD685

- C. Loosen shift rod end jam nut (A).



AF941A

- D. Using two open-end wrenches, remove lock nut (B) securing the shift rod to the upper shift axle. Discard the lock nut.

■ **NOTE:** Never reuse a lock nut. Once a lock nut has been removed, it must be replaced with a new lock nut.

- E. Push the upper shift axle down completely.
- F. Rotate the shift rod end as necessary to align its threaded shaft with the hole in the upper shift axle. Secure with a new lock nut (B). Tighten securely.
- G. Tighten jam nut (A) to secure the adjustment.
- H. On the 250/300/400 FIS/ACT, install the gear shift linkage cover; then secure with the three machine screws.
- I. On the TBX/500/650 H1, install the left-side splash panel.
- J. Install the seat.
- 4A. On the 650 V-Twin, loosen the two torx-head screws on the slotted section of the linkage.



CD717

- B. Hold the shift lever in the R position and make sure the shift arm is in the full-forward detent position; then tighten the two torx-head screws securely.

2



CD716A

- C. Verify correct shifting operation; then install the seat.

Frame/Welds/Racks

The frame, welds, and racks should be checked periodically for damage, bends, cracks, deterioration, broken components, and missing components. If replacement or repair constitutes removal, see Section 8.

Electrical Connections

The electrical connections should be checked periodically for proper function. In case of an electrical failure, check fuses, connections (for tightness, corrosion, damage), and/or bulbs. If an electrical component needs to be tested for proper function, see Section 5.

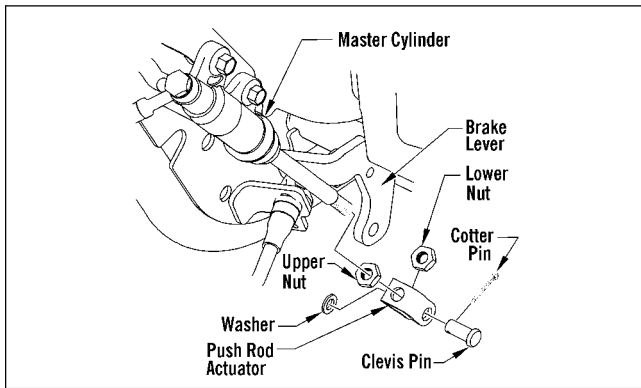
Hydraulic Brake Systems

ADJUSTING LINKAGE

■ **NOTE:** Prior to attempting to bleed the hydraulic auxiliary brake (remote reservoir type), the linkage must be checked for proper adjustment.

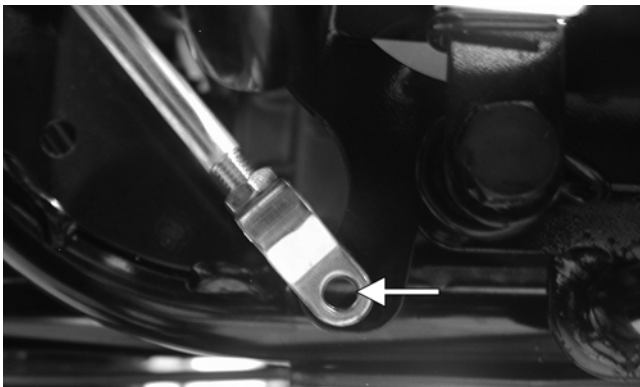
To adjust linkage, use the following procedure.

1. Remove the cotter pin and washer; then remove the clevis pin.



0739-542

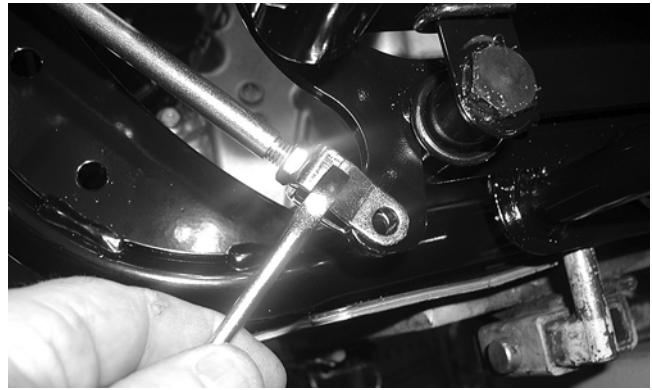
2. Making sure the brake pedal is fully released and against the stop, check that the holes in the push-rod actuator align with the hole in the pedal lever.



CD473A

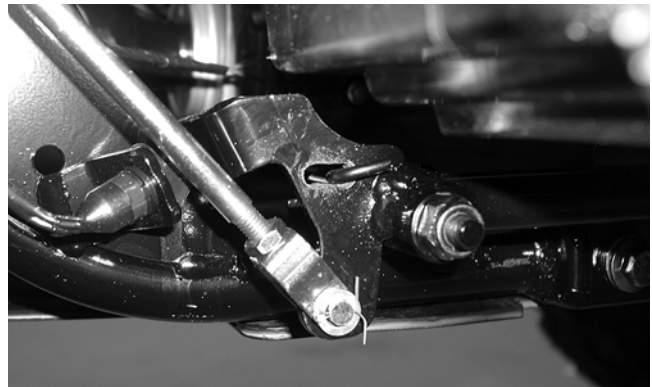
■ **NOTE:** If the holes align, no adjustment is necessary; proceed to step 4.

3. If the holes are not aligned, loosen the upper nut and rotate the push-rod and lower nut until the holes align; then hold the actuator and lower nut and tighten the upper nut securely.



CD476

4. Verify proper alignment; then install the clevis pin, washer, and a new cotter pin.

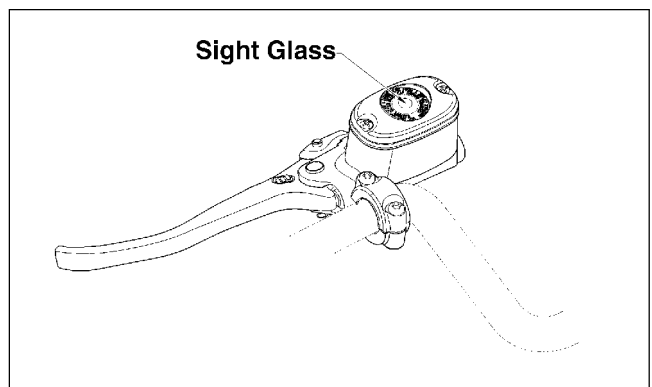


CD713

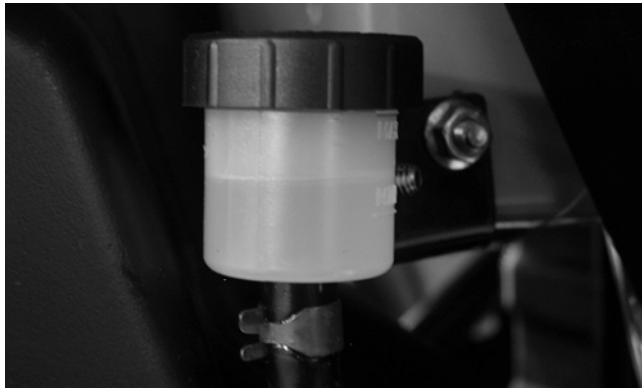
CHECKING/BLEEDING

The hydraulic brake systems have been filled and bled at the factory. To check and/or bleed a hydraulic brake system, use the following procedure.

1. With the master cylinder in a level position, check the fluid level in the reservoir. If the level in the reservoir is not visible in the sight glass, add DOT 4 brake fluid.

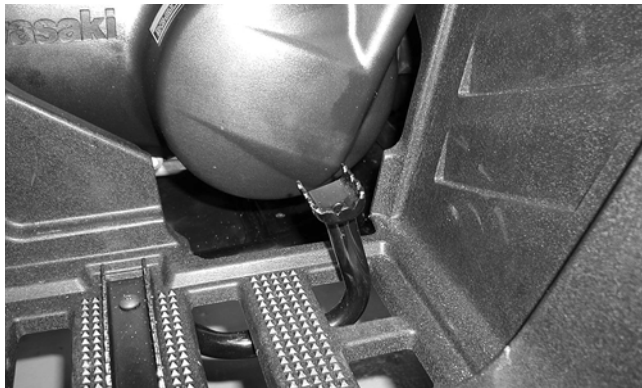


738-420A



AL681

2. Compress the brake lever/pedal several times to check for a firm brake. If the brake is not firm, the system must be bled.



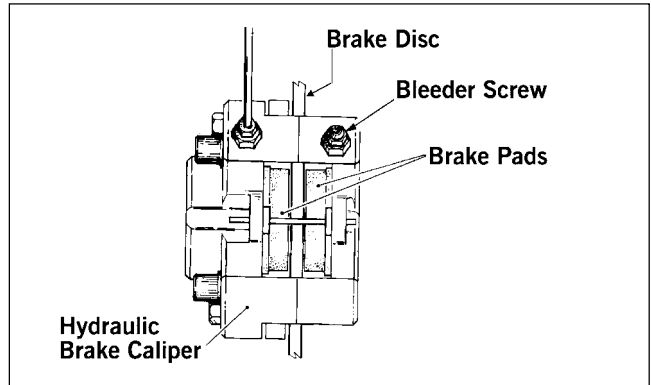
CD711

3. To bleed the brake system, use the following procedure.

- A. Remove the cover and fill the reservoir with DOT 4 Hi-Temp Brake Fluid (p/n 1639-799).
- B. Install and secure the cover; then slowly compress the brake lever several times.
- C. Remove the protective cap, install one end of a clear hose onto one FRONT bleeder screw, and direct the other end into a container; then while holding slight pressure on the brake lever, open the bleeder screw and watch for air bubbles. Close the bleeder screw before releasing the brake lever. Repeat this procedure until no air bubbles are present.



AF637D



730-434B

■ **NOTE:** During the bleeding procedure, watch the reservoir sight glass very closely to make sure there is always a sufficient amount of brake fluid. When the sight glass changes from dark to light, refill the reservoir before the bleeding procedure is continued. Failure to maintain a sufficient amount of fluid in the reservoir will result in air in the system.

2

- D. Repeat step C until the brake lever is firm.

- E. At this point, perform step B, C, and D on the other FRONT bleeder screw; then move to the REAR bleeder screw and follow the same procedure.

4. Carefully check the entire hydraulic brake system that all hose connections are tight, the bleed screws are tight, the protective caps are installed, and no leakage is present.

CAUTION

This hydraulic brake system is designed to use high-temperature DOT 4 brake fluid only. If brake fluid must be added, care must be taken as brake fluid is very corrosive to painted surfaces.

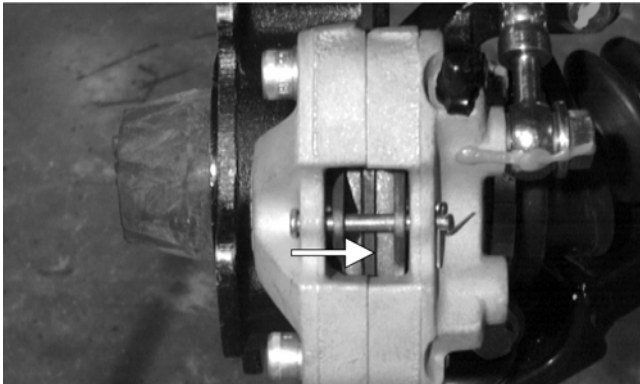
INSPECTING HOSES

Carefully inspect the hydraulic brake hoses for cracks or other damage. If found, the brake hoses must be replaced.

CHECKING/REPLACING PADS

The clearance between the brake pads and brake discs is adjusted automatically as the brake pads wear. The only maintenance that is required is replacement of the brake pads when they show excessive wear. Check the thickness of each of the brake pads as follows.

1. Remove a front wheel.
2. Measure the thickness of each brake pad.

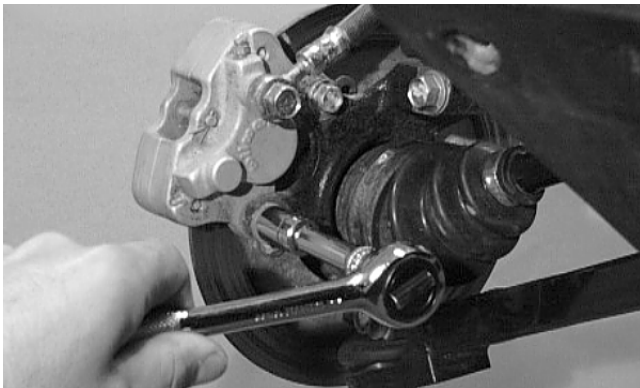


AF739DB

3. If thickness of either brake pad is less than 3.2 mm (0.125 in.), the brake pads must be replaced.

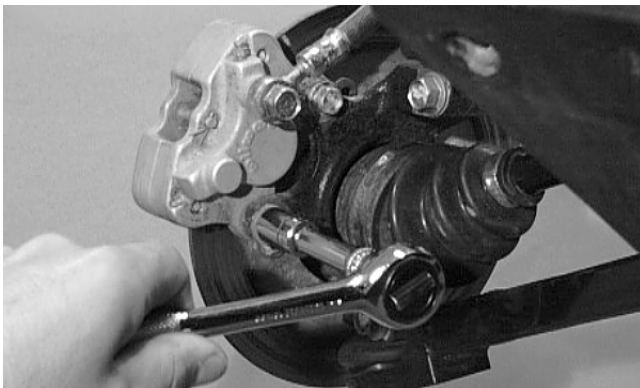
■ **NOTE:** The brake pads should be replaced as a set.

4. To replace the brake pads, use the following procedure.
 - A. Remove the wheel.
 - B. Remove the cap screws securing the caliper to the bracket; then remove the cotter pin securing the pads and remove the pads.



AF615D

- C. Install the new brake pads; then secure with the pin and cotter pin. Spread the cotter pin.
- D. Secure the caliper to the knuckle and/or axle housing with the cap screws. Tighten to specifications.



AF615D

- E. Install the wheel. Tighten to specifications.

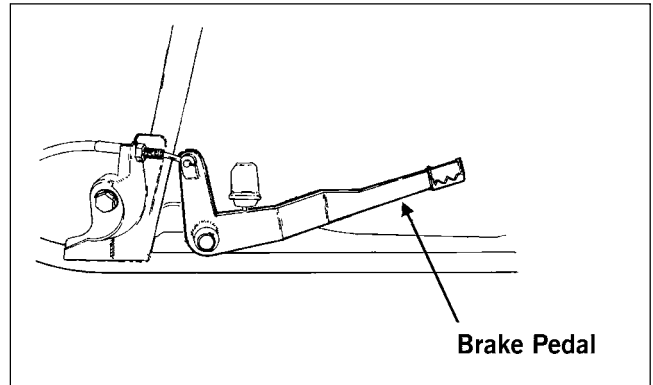
5. Burnish the brake pads (see Burnishing Brake Pads in this section).

Auxiliary Brake (250/300/400 ACT)

CHECKING

Although the auxiliary brake has been adjusted at the factory, the brake should be checked for proper operation. The brake must be maintained to be fully functional.

1. With the engine off, transmission in neutral, and the reverse lever in the forward position, press the brake pedal and attempt to move the ATV.



ATV0088D

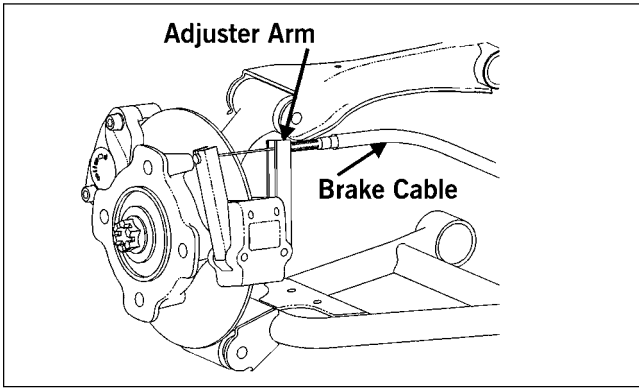
2. If the rear wheels are locked, it is adjusted properly.
3. If the rear wheels are not locked, it must be adjusted (set up).

ADJUSTING

To adjust (set up) the auxiliary brake, use the following procedure.

■ **NOTE:** Removal of the right, rear wheel enhances access to the brake components.

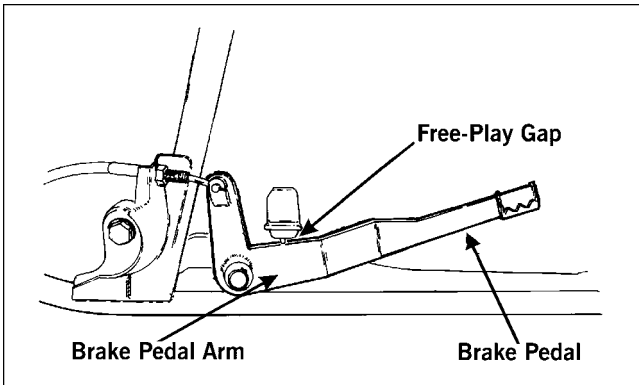
1. Loosen the right-hand jam nut (wheel-side when viewing from behind) of the adjuster arm.



733-730B

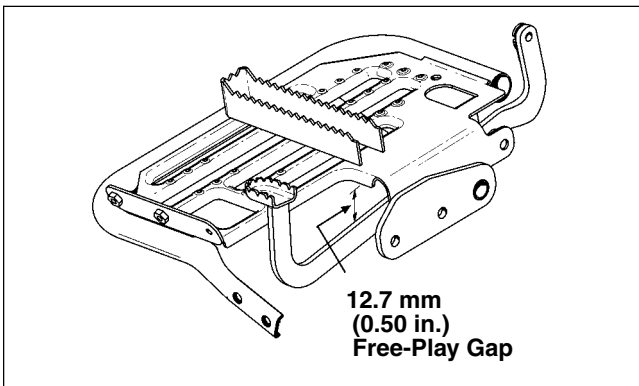
2. Pull the brake cable to the left and push the adjuster arm to the right.
3. While holding the cable and adjuster arm in this position, finger-tighten the left-hand jam nut until it contacts the adjuster arm; then loosen it one turn.
4. Tighten the right-hand jam nut securely against the adjuster arm.

■ **NOTE:** On the 250/300, there should be 3.2 mm (1/8 in.) free-play gap between the brake pedal arm and the brake pedal bracket.



ATV0088E

■ **NOTE:** On the 400, there should be 12.7 mm (1/2 in.) free-play gap between the pedal and the foot-rest.



736-569A

5. If the free-play gap is not within tolerance, readjust the jam nuts of the adjuster arm in 1/4 turn increments until the correct free-play gap is attained.

■ **NOTE:** Apply the brake a number of times to ensure the wheels lock and the brakelight illuminates properly.

6. If the rear cable adjustment is inadequate to attain the proper brake pedal arm free-play gap, make adjustment at the front cable adjuster jam nuts.

CAUTION

If adjusting the rear cable at both ends does not attain proper brake pedal arm free-play, the brake pads must be replaced.

2

MEASURING/REPLACING BRAKE PADS

Removing

1. Support the ATV on a suitable stand.
2. Remove the right rear wheel and account for the cap screws.
3. Loosen the rear cable adjuster jam nuts; then remove the cap screws securing the auxiliary brake to the axle housing.
4. Remove the brake pads from the caliper.

Inspecting and Measuring

1. Inspect the pads for gouges, chips, or wear.
2. Inspect the disc for gouges, grooves, cracks, and warpage.
3. Using a calipers, measure the thickness of each brake pad.
4. If the thickness of either brake pad is less than 3.2 mm (0.125 in.), the brake pads must be replaced.

■ **NOTE:** The brake pads should be replaced as a set.

Installing

1. Place the brake pads into the caliper.

■ **NOTE:** The metal backing of the pad will be facing the adjuster arms when installed properly.

2. Slide brake caliper assembly over the brake disc and into position on the knuckle; then secure the caliper with the cap screws tightened to specifications.
3. Install the wheel and secure. Tighten to specifications.

4. Adjust the brake (see Adjusting in this sub-section).
5. Remove the ATV from the support stand.

■ **NOTE:** Whenever installing new pads, the new pads must be burnished (see Burnishing Brake Pads in this section).

Burnishing Brake Pads

Brake pads (both hydraulic and auxiliary) must be burnished to achieve full braking effectiveness. Braking distance will be extended until brake pads are properly burnished. To properly burnish the brake pads, use the following procedure.

⚠ WARNING

Failure to properly burnish the brake pads could lead to premature brake pad wear or brake loss. Brake loss can result in severe injury.

1. Choose an area large enough to safely accelerate the ATV to 30 mph and to brake to a stop.
2. Accelerate to 30 mph; then compress brake lever or apply the auxiliary brake to decelerate to 0-5 mph.
3. Repeat procedure on each brake system five times until brake pads are burnished.
4. Adjust the auxiliary brake (if necessary).
5. Verify that the brakelight illuminates when the hand lever is compressed or the brake pedal is depressed.

Coolant (500/650 H1/650 V-Twin)

The cooling system should be inspected daily for leakage and damage. Also, the coolant level should be checked periodically.

When filling the cooling system, use premixed Arctic Cat Antifreeze (p/n 0638-395). While the cooling system is being filled, air pockets may develop; therefore, run the engine for five minutes after the initial fill, shut the engine off, and then fill the cooling system to the bottom of the stand pipe in the radiator neck.



AN604D

⚠ CAUTION

After operating the ATV for the initial 5-10 minutes, stop the engine, allow the engine to cool down, and check the coolant level. Add coolant as necessary.

Checking/Replacing V-Belt (400/500/650 H1)

REMOVING

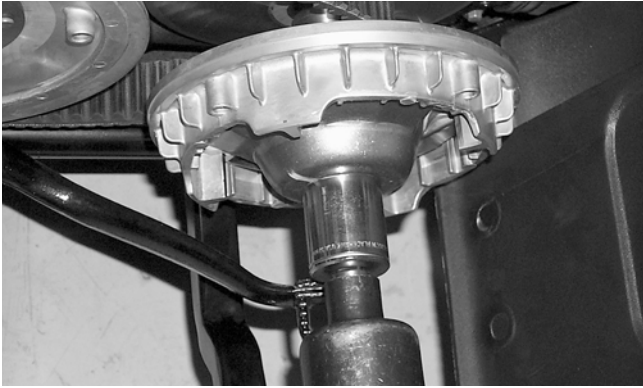
1. Remove the right-side footrest (see Section 8).
2. Remove the cap screws securing the V-belt cover noting the location of the different-lengthed cap screws for installing purposes; then using a rubber mallet, gently tap on the cover tabs to loosen the cover. Remove the cover.

■ **NOTE:** Note the location of the main engine ground wire for installing purposes.

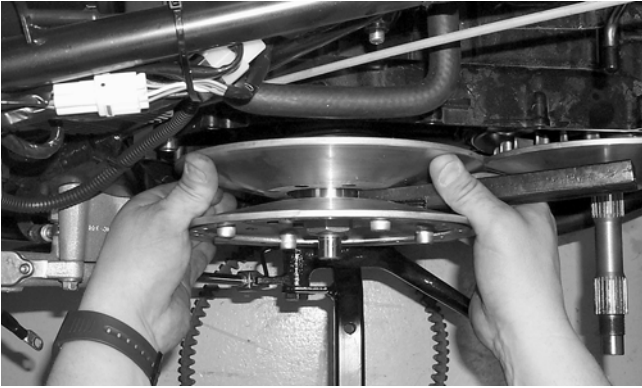


CD078

3. Remove the nut securing the movable drive face; then remove the face. Account for the spacer.

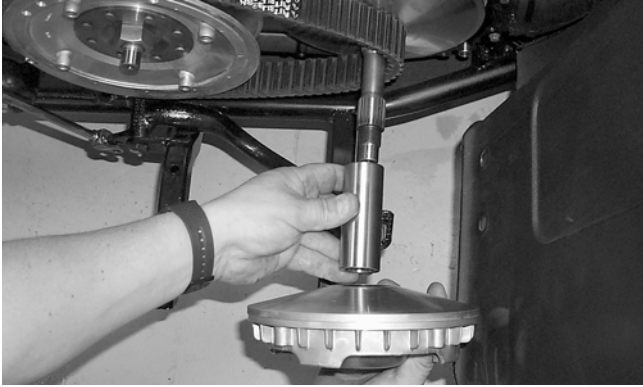


CC546



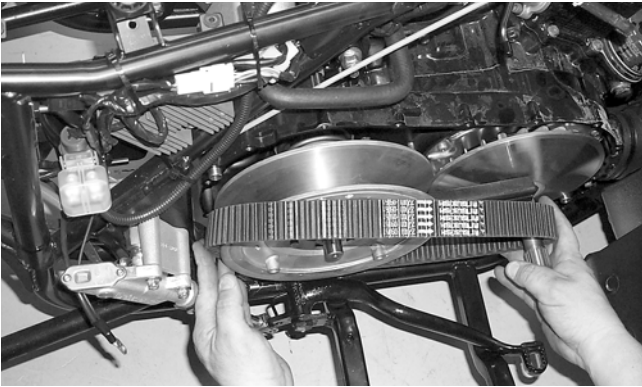
CC549

2. Place the V-belt into position on the driven clutch and over the front shaft.



CC547

4. Remove the V-belt.

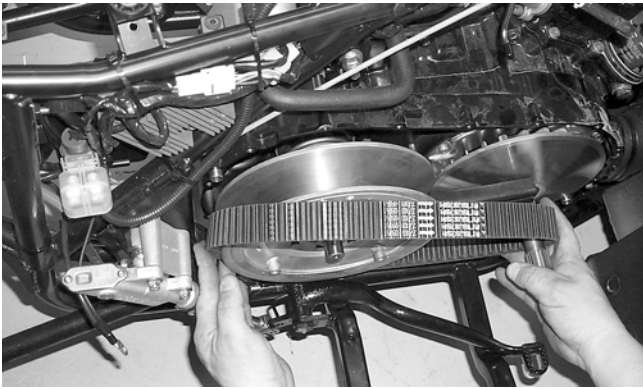


CC550

2

■ **NOTE:** The arrow on the V-belt should point forward.

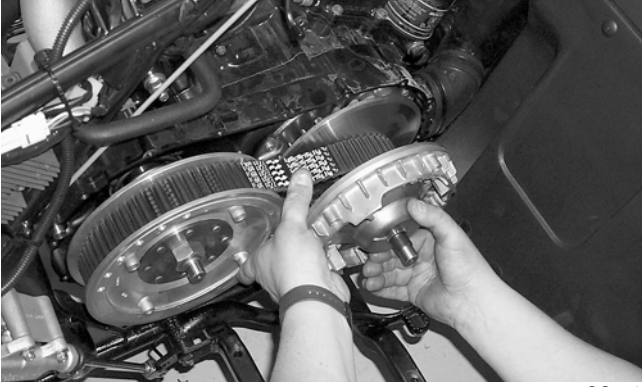
3. Pinch the V-belt together near its center and slide the spacer and movable drive face onto the driveshaft. Secure the drive face with a nut. Tighten the nut to specifications.



CC550

INSTALLING

1. Spread the faces of the driven clutch by pushing the inner face toward the engine while turning it counterclockwise; then when the faces are separated, insert a wedge (approximately 3/8 in. thick) between the faces. Release the inner face.



CC552

■ **NOTE:** At this point, the wedge can be removed from between the driven clutch faces.

4. Rotate the V-belt and clutches until the V-belt is flush with the top of the driven clutch.

- Place the V-belt cover gasket into position; then install the cover and secure with the cap screws making sure the different-lengthed cap screws are in their proper location. Tighten the cap screws to specifications.



CD083

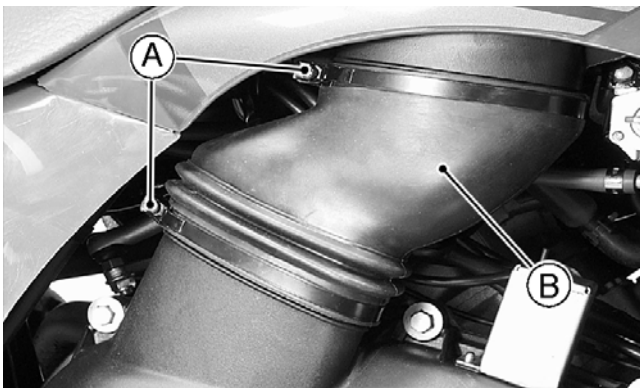
NOTE: Make sure the main engine ground wire is installed and secured in the proper location.

- Secure the front fender to the footrest with the two cap screws. Tighten securely.
- Install the right-side footrest (see Section 8).

Checking/Replacing V-Belt (650 V-Twin)

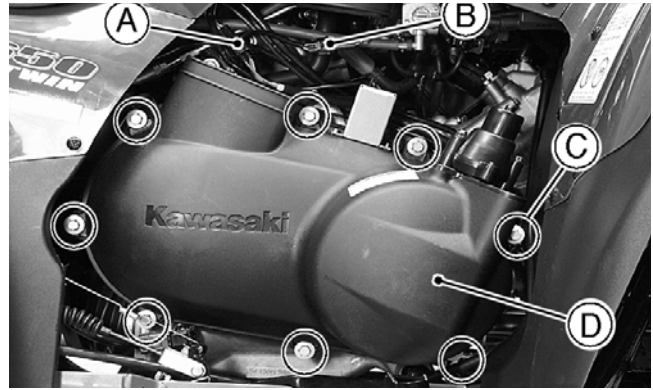
REMOVING

- Make sure that the ignition switch is in the off position; then remove the clamps (A) and air duct (B).



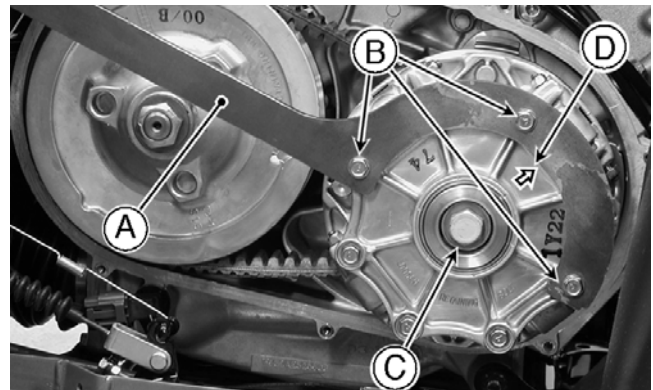
KX229

- Remove the actuator lead (A) and the Belt Failure Detection Switch lead (B); then remove the cap screws (C) securing the V-belt cover. Remove the cover (D).



KX230

- Remove the three cover bolts (B) in the positions shown and install an appropriate drive clutch holder (A) as shown. Note the holder's relative position to the arrow mark (D).

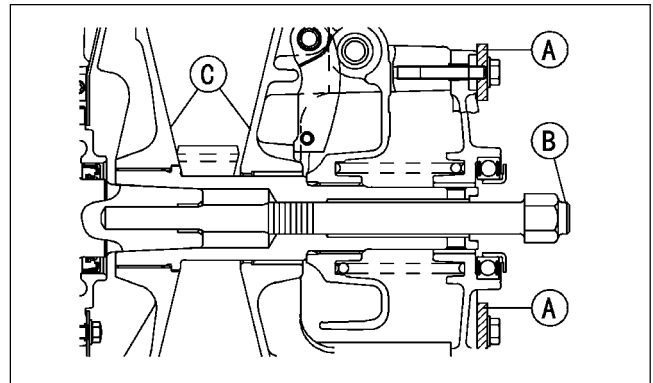


KX231

CAUTION

Be sure to install the three bolts in the specified positions or the tapped holes will be damaged.

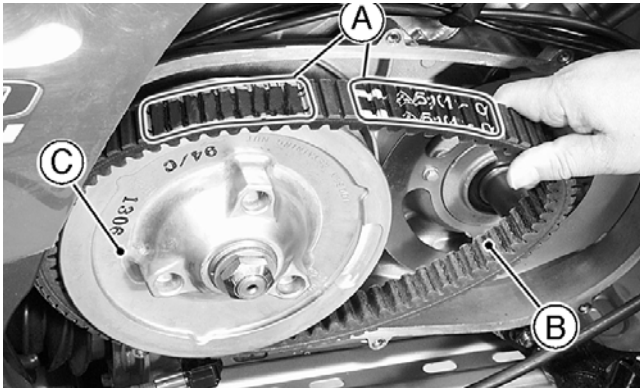
- Remove the drive clutch cap screw (C) (left-hand threads) and account for two washers and a stepped washer.
- Remove the drive clutch (C) from the crankshaft using an appropriate clutch puller tool (B) and turning it clockwise while holding the drive clutch with the drive clutch holder (A).



ATV2059

■ **NOTE:** Before removing the belt, note the markings (A) (or mark the belt using tape or marker) in order to reinstall in the same direction as previously installed.

- Lift the belt (B) off the driven pulley (C).

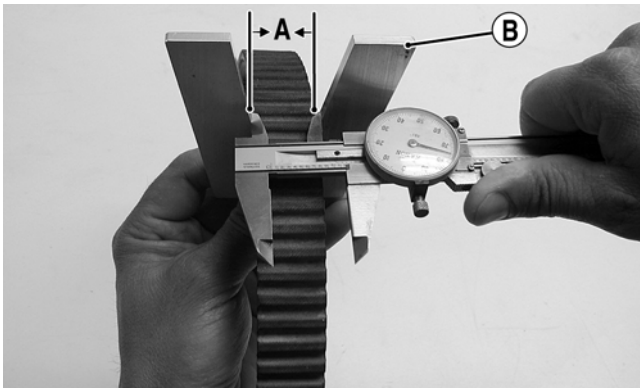


KX232

■ **NOTE:** Inspection of the belt is required every 100 hours or 1100 miles. More frequent inspection is required if the ATV is operated in adverse conditions.

INSPECTING

- Measure the belt width (A) at several locations using Drive Belt Gauge (p/n 0444-177) (B) and a calipers.



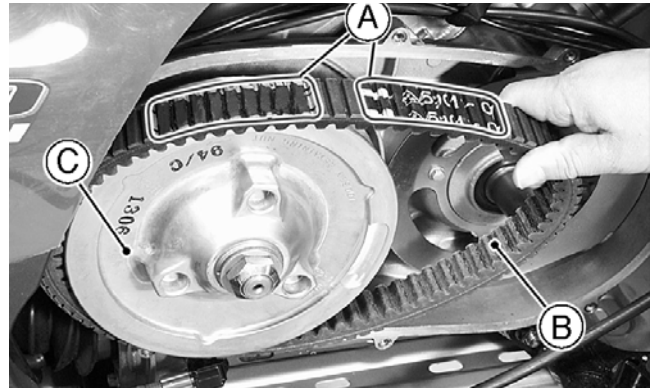
KX583A

- If belt width is below the service limit of 28.8 mm (1.13 in.) or there is damage to the belt, it must be replaced.

INSTALLING

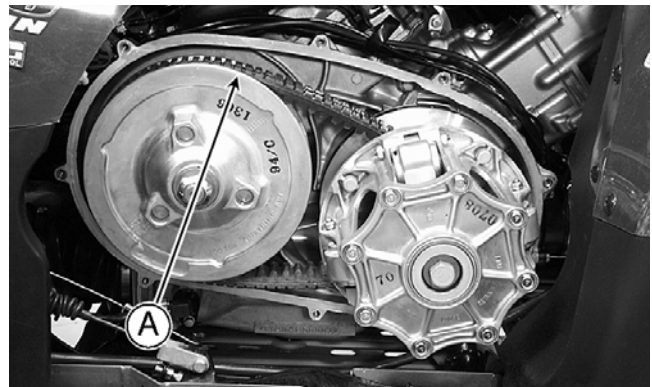
■ **NOTE:** Be sure to install the belt in the same direction as originally installed. When installing a new belt, direct the top of the lettering (A) toward the engine.

- Loop the belt (B) over the driven pulley (C); then install the drive clutch and tighten to specifications.



KX232

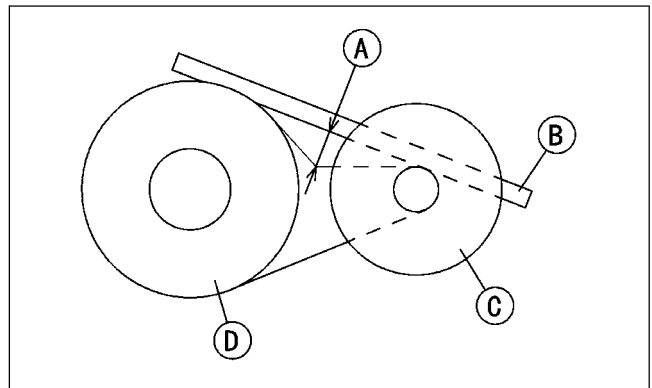
■ **NOTE:** Make sure the belt is at the top of the driven pulley (A) before checking belt deflection.



KX233

2

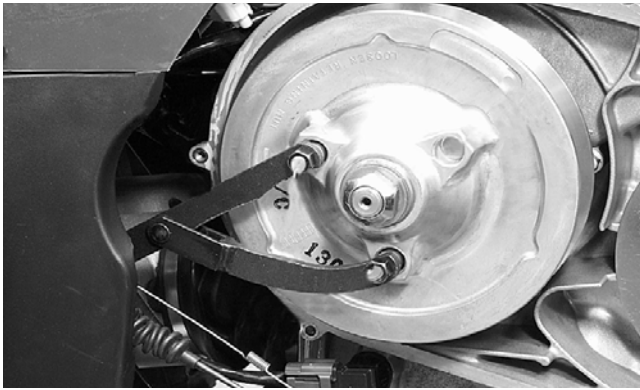
- Place a straightedge (B) on top of the belt between the drive clutch (C) and the driven pulley (D); then using a ruler, check the belt deflection (A). Use a maximum force of 6 kg (13 lb) on the ruler. Standard belt deflection is 22-27 mm (0.87-1.06 in.).



ATV2061

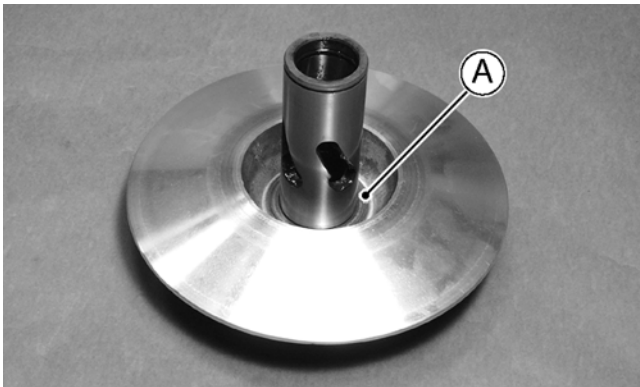
■ **NOTE:** If belt deflection is out of specifications, proceed to step 3. If belt deflection is within specifications, proceed to step 8.

- Using an appropriate holder, hold the driven pulley; then remove the driven pulley nut and the driven pulley.



KX246A

4. Disassemble the driven pulley. See Section 3, Servicing Right-Side Components, steps 1-5.
5. Remove the shims (A) and measure the shim pack thickness.



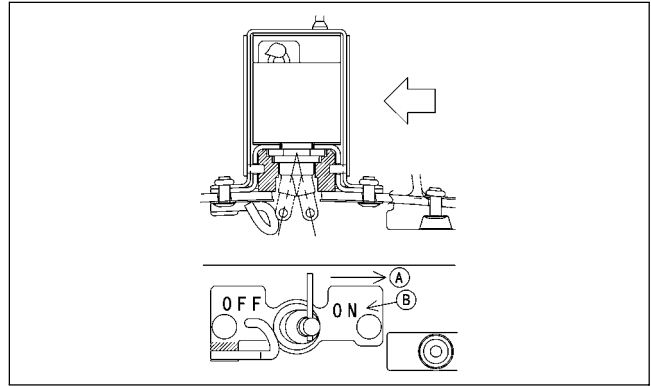
KX568

6. Increase the shim pack thickness to increase belt deflection and decrease the shim pack thickness to decrease belt deflection.

■ **NOTE:** For each 0.1 mm (0.004 in.) of shim pack change, belt deflection will change by approximately 1.45 mm (0.057 in.). Shims are available in the following sizes: 0.6 mm (0.024 in.), 0.8 mm (0.031 in.), 1.0 mm (0.039 in.), and 1.4 mm (0.055 in.).

7. Assemble the driven pulley (see Section 3, Servicing Right-Side Components, steps 1-5); then install the driven pulley, V-belt, and drive clutch and verify that belt deflection is within specifications.

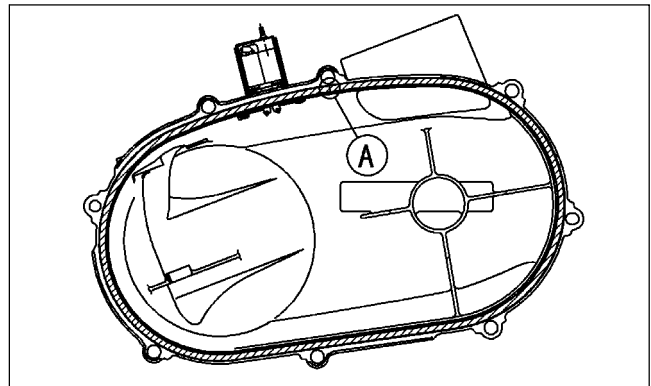
8. Check the position of the Belt Failure Detection Switch (A) and reset to the ON position (B).



ATV2062A

■ **NOTE:** If the Belt Failure Detection Switch has been tripped to the OFF position, the V-belt cover and switch assembly must be replaced and the V-Belt Failure Mode Clearing procedure (see Section 5) must be performed.

9. Install the cover seal into the V-belt cover with the glue joint (A) as shown; then install the V-belt cover and tighten the cap screws to specifications.



ATV2063

10. Connect the actuator lead and the Belt Failure Detection Switch lead; then install the air duct and secure with the clamps.