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General Information

**Periodic Maintenance** 

Engine / Transmission

Fuel / Lubrication / Cooling

Electrical System

**Drive System** 

Suspension

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Check the entire brake systems (fluid level, pads, etc.), all controls, headlights, taillight, brakelight, and headlight aim; adjust or replace as necessary. Install the seat. PR237 C. 29. The geometric center of the HIGH beam light zone is to be used for vertical and horizontal aiming. NOTE: Rotating the valve adjuster dial counter- clockwise will open the valve/tappet clearance by 0.05 mm (0.002 in.) per mark. 26. Remove the two nuts securing the right side of the cylinder to the right-side crankcase half. AF941A 4. Remove the front and rear racks (see Section 8). When servicing battery in enclosed space, keep the area well-ventilated. To bleed the brake system, use the following procedure. General Information 2. E-Ring 400/500 Automatic Transmission/ 650 H1/700 EFI 31. Always allow the engine to cool before filling the gas tank. 1-10 3. Headlight/Taillight- Brakelight Each time the ATV is used, lights should be checked for proper function. Place the shift lever in the R position; then remove the seat. Oxygenated gasolines containing up to 10% ethanol, 5% methane, or 5% MTBE are acceptable gasolines. Connect cables to the proper terminal (-). 1-10 4. The symbol AT THIS POINT directs the technician to certain and specific procedures to promote efficiency and to improve clarity. Only Arctic Cat approved gas- oline additives should be used. Always maintain proper tire inflation pressure. Rotate adjustment screw #1 counterclockwise until it stops. Install the wheel. Failure to maintain a sufficient amount of fluid in the reservoir will result in air in the sys- tem. Switch on the lights. 11. To adjust, proceed to Adjusting Shift Lever. G. Rotate the ignition switch to the lights position; the headlights and taillight should illuminate. MD1214 14. Match measured clearance in vertical column with current shim size in horizontal row to find recommended replacement size. Closely observe the note introducing each sub-section for this important information. 2-22 ...... 1-7 1 General Specifications\* (700 EFI) \* Specifications subject to change without notice. 1-9 Preparation For Storage....... In case of an electrical failure, check fuses, connections (for tightness, cor- rosion, damage), and/or .... 2-10 Gas/Vent Hoses ..... Checking/Replacing V-Belt. bulbs. 3-256 40. August 2006 ® Trademarks of Arctic Cat Inc., Thief River Falls, MN 56701 2. Start the engine and allow it to idle; then using Arctic Cat Engine Storage Preserver, rapidly inject the preserver into the air filter opening for a period of 10 to 20 seconds; then stop the engine. \*\* At the oil level plug threads. To service the center crankcase halves, the engine/transmission must be removed from the frame. Install the wiring harness connector. NOTE: If the differential/rear drive oil is contam- inated with water, inspect the drain plug, filler plug, and/or bladder. 1-5 General Specifications (650 H1/650 H1 TBX/650 ..... To remove and charge the battery, use the following procedure. Insert the bulb socket assembly into the housing and turn it clockwise to secure. Place the V-belt into position on the driven clutch and over the front shaft. AT THIS POINT To service cylinder, see the 700 EFI, proceed to step 9. 2-14 Tires .... Servicing Top-Side Components sub-section. 34. Rotate the shift rod end as necessary to align its threaded shaft with the hole in the upper shift axle. Valve/Tappet Clearance (Feeler Gauge Procedure) NOTE: For the 700 EFI, see Valve/Tappet Clear- ance (700 EFI) in this section. ! CAUTION Failure to inspect the air filter frequently if the vehi- cle is used in dusty, wet, or muddy conditions can damage the engine. Remove the timing inspection plug; then remove the tappet covers (for more detailed information, see Section 3 - Servicing Top-Side Components). 28. Make vertical marks which intersect the hori- zontal marks on the aiming surface directly in front of the headlights. 2-2 Lubrication . Coupling cracked, damaged, or worn. Inspect one-way drains beneath the main hous- ing for debris and for proper sealing. Ignition Timing NOTE: The 700 EFI rotor/flywheel does not have timing marks; therefore, timing cannot be verified. NOTE: To service valves, see Section 3. Pour 29.5 ml (1 fl oz) of oil into Points....

the spark plug hole, reattach the gauge, and retest compression. Note the timing marks for installing purposes; then drop the sprocket off the camshaft. Position the ATV on a level floor so the head-lights are approximately 6.1 m (20 ft) from an aiming surface (wall or similar aiming surface). Nut 15. 2-1 2 SECTION 2 - PERIODIC .... Remove the cap screws securing the V-belt cover noting the location of the differ- ent-lengthed cap screws for installing purposes; then using a rubber mallet, gently tap on the cover tabs to loosen the cover. 17. Verify that the brakelight illuminates MAINTENANCE/TUNE-UP TABLE OF CONTENTS Periodic Maintenance Chart..... when the hand lever is compressed or the brake pedal is depressed. CF172A 14. If there is any type of electrical system failure, always check the fuses first. AF637D PR377A NOTE: During the bleeding procedure, watch the reservoir sight glass very closely to make sure there is always a sufficient amount of brake fluid. Bend the washer tabs and remove the two cap screw securing the sprocket to the camshaft. CC546 CC547 4. AM600D 2. On the 400, remove the storage compartment assembly by elevating the rear of the compart- ment, moving it rearward, and lifting it off. 2-17 Shift Lever ..... ... Clean the seat cushion (cover and base) with a damp cloth and allow it to dry. 3-18 Right-Side Components...... Account for a gasket. Remove the oil level stick/filler plug. Inflate to recommended lubricant used in place of the recommended lubricant could cause serious front differential/rear drive damage. 2-5 2 2. ! WARNING Always use the size . 2. NOTE: The engine must be warm and the bat- tery must be fully charged for this test. Tighten the cap screws securely. Item Initial Service After Break-In (First Mo or 100 Mi) Every Day Every Month or Every 3 Months or Every 300 Miles Every 6 and type of tires specified. 2-15 Steering Components. 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) Throttle Cable I I C-L A-R Carburetor Float Chamber (Carbureted Models) D\* Engine Idle RPM (Carbureted Models) I I A Engine-Transmission Oil/Filter R R\* R Oil Strainer I I C Front Differential/Rear Drive Lubri- cant 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 A Ignition Timing I Headlight/Taillight-Brakelight I I R Switches I I R Shift Lever I A-L Recoil Starter (Except certain 650 H1 models) I C-R Handlebars Strews/Screws I I R Shift Lever I A-L Recoil Starter (Except certain 650 H1 models) I C-R Handlebars I I R Shift Lever I A-L Recoil Starter (Except certain 650 H1 models) I C-R Handlebars I I R Shift Lever I A-L Recoil Starter (Except certain 650 H1 models) I C-R Handlebars I I R Shift Lever I A-L Recoil Starter (Except certain 650 H1 models) I C-R Handlebars I I R Shift Lever I A-L Recoil Starter (Except certain 650 H1 models) I C-R Handlebars I I R Shift Lever I A-L Recoil Starter (Except certain 650 H1 models) I C-R Handlebar Starter (Except certai (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) 15. Some photo- graphs used in this manual are used for clarity purposes only and are not designed to depict actual conditions. Replace all loose rivets. Idle RPM Screw (Carburetor) (If Applicable) Battery The level of the battery fluid must be kept between the upper and lower level lines at all times. If thickness of either brake pad is less than 1.0 mm (0.039 in.), the brake pad is less than 1.0 mm (0.039 in.), the brake pad is less than 1.0 mm (0.039 in.) and adjustment screw #1 (forward) and adjustment screw #2 (rear-ward). securely. \*\* One inch below filler plug threads. Account for and note the orientation of the cylinder head plug; then remove the plug. Remove the spark plug cap/high tension lead; then using compressed air, blow any debris from around the spark plug. CARBURETOR Type Keihin CVK36 Main Jet 138 Slow Jet 40 Pilot Screw Setting (turns) 1 3/4 Jet Needle NFKG Idle RPM (engine warm) 1250-1350 Starter Jet 85 Float Arm Height 17 mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Gap 0.7-0.8 mm (0.028-0.032 in.) Spark Plug Cap 8000-12,000 ohms Ignition Coil Resistance (primary) (secondary) Less than 1 ohm (terminal to ground) 5200-7800 ohms (high tension - plug cap removed - to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) 5200-7800 ohms (high tension - plug cap removed - to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Ignition Coil Peak Voltage (primary Magneto Coil Peak Voltage (trigger) (source) 4.2-6.3 volts (green to blue) 0.40-0.62 volt (yellow to white) Stator Coil Out- put (no load) 60 AC volts @ 5000 RPM (black to black #1) (black to black #2) Magneto Output (approx) 325W @ 5000 RPM (black to black #1) (black to black #2) Magneto Output (approx) 325W @ 5000 RPM (black to black #1) (black to black #1) (black to black #1) (black to black #2) Magneto Output (approx) 325W @ 5000 RPM (black to black #1) (bla 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity 2.9 L (3.0 U.S. qt) Differential Capacity 2.9 L (3.0 U.S. qt) Coolant Capacity 2.9 L (3.0 U.S. qt) Gasoline (recommended) 87 Octane Regular Unleaded Engine Oil Capacity 2.9 L (3.0 U.S. qt) Coolant Capacity 2.9 L (3.0 U.S. qt) Differential Capacity 2.9 L (3.0 U.S. qt) Coolant Capacity 2.9 L (3.0 U.S. qt) Gasoline (recommended) 87 Octane Regular Unleaded Engine Oil Capacity 2.9 L (3.0 U.S. qt) Coolant Cap (recommended) SAE 5W-30 Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Brake Fluid DOT 4 Taillight/Brakelight 12V/8W/27W Headlight 12V/27W (2) 7. Periodic Maintenance/Tune-Up 3. ! CAUTION Do not charge the battery while it is in the ATV on level ground. Valve seat not .... FUEL INJECTION Type Electronic Throttle Body Idle RPM (engine warm) 1200-1400 Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Spark Plug Type NGK CR6E Spark Plug Gap 0.7-0.8 mm (0.028-0.032 in.) Spark Plug Cap 8000-12,000 ohms burned. 1-3 General Specifications (500 - Manual Transmission)...... Ignition Coil Resistance (primary) (secondary) Less than 1 ohm (terminal (+)) Ignition Coil (crankshaft position Resistance sensor) (charging) 150-250 ohms (blue to white) Less than 1 ohm (yellow to yellow) Crankshaft Position Sensor Peak Voltage 5.0 volts or more (blue to white) Stator Coil Output (no load) 75 AC volts @ 5000 RPM (yellow to yellow) CHASSIS Brake Type Hydraulic w/Brake Lever Lock and Auxiliary Brake Tire Size Front - 25 x 8-12 Rear - 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity (rated) 24.6 L (6.5 U.S. gal.) Coolant Capacity 2.9 L (3.0 U.S. qt) Differential Capacity 275 ml (9.3 fl oz)\*\* Rear Drive Engine Oil Capacity 2.45 L (2.6 U.S. qt) Gasoline (recommended) 87 Octane Regular Unleaded Engine Oil (recommended) 87 Octane Regular Unleaded Engine Oil Capacity 2.45 L (2.6 U.S. qt) Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Drive Belt Width (minimum) 35.6 mm (1.40 in.) Brake Fluid DOT 4 Taillight/Brakelight 12V/8W/27W Headlight 12V/27W (2) 10. 2-19 2 2. Repeat this proce- dure until no air bubbles are present. MD1167 10. 1-10 Back to TOC1-2 General Specifications\* (400/400 TRV - Automatic Transmission) \* Specifications subject to change without notice. Make sure the engine is at normal .. ! CAUTION Connect the positive battery cable first; then the negative. Testing Engine Compression To test engine compression, use the following pro- cedure. 3-18 Removing Left-Side Components ...... operating temperature before adjusting the idle RPM. 2-20 Burnishing Brake Pads..... . These oils meet all of the lubrication requirements of the Arctic Cat ATV engine. Valve/tappet clearance correct. 2-11 2 CF104 Gas/Vent Hoses Replace the gas hose every two years. E. Using two open-end wrenches, remove lock nut (B) securing the shift rod to the upper shift axle. Install the right-side footrest (see Section 8). 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). MD1261 MD1354A 3. Tighten to spec- ifications. If the glass is touched, it must be cleaned with a dry cloth before installing. Remove the 12 cap screws securing the valve cover to the head; account for the four rubber washers on the top side cap screws. Cotter pins not damaged or missing. 1-6 General Specifications (700 EFI) ...... . 33. Suspension 8. A used spark plug should be tightened 1/8 - 1/4 turn once the washer contacts the cylinder head. Remove the negative battery cable; then remove the positive cable and the battery vent tube. A. Using a new gasket, apply Three Bond Sealant to the camshaft end caps of the cylinder head cover gasket; then install the cylinder head cover gasket; then install the cylinder head cover gasket; then install the cylinder head cover gasket. bracket. FI059A FI010A 10. 2-24 Adjusting Differential Lock Cable NOTE: The following procedure does not include the 400 TRV model. If low, add SAE approved 80W-90 hypoid gear lube as necessary. Washer 19. CC038D 4. Auxiliary Brake Cable Ends D. Turn the idle adjustment screw clockwise one turn past the recommended RPM setting; then turn it counterclockwise to 1250-1350 RPM. Brake loss can result in severe injury. Using an appropriate bar, rotate the engine through two full revolutions; then rotate to TDC on the compression stroke and check the valve tappet clearance. Turn the engine off and wait approximately one minute. ! WARNING Failure to properly burnish the brake pads could lead to premature brake pad wear or brake loss. Install the air filter housing cover and secure with the retaining clips (400/500/650 H1) or wing-nuts (700 EFI). Such efficiency not only helps build consumer confidence but also saves time and labor. 3-7 3 Specifications\* (500 - Manual Transmission) VALVES AND GUIDES Valve Face Diameter (intake) (exhaust) 30.6 mm (1.20 in.) 27.0 mm (1.06 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.0012-0.002 in.) Valve Guide/Valve Stem Deflection (wobbl content of the conten deflection) (max) 0.35 mm (0.014 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.1959-0.1965 in.) Valve Stem End Length (min) 1.7 mm (0.067 in.) Valve Face/Seat Width 0.9-1.1 mm (0.035-0.043 in.) Valve Seat Angle (intake) (exhaust) 45° 45° Valve Face Radial Runout (max) 0.03 mm (1.53 in.) Valve Seat Angle (intake) (exhaust) 45° 45° Valve Face Radial Runout (max) 0.03 mm (1.53 in.) Valve Seat Angle (intake) (exhaust) 45° 45° Valve Face Radial Runout (max) 0.03 mm (1.53 in.) Valve Seat Angle (intake) (exhaust) 45° 45° Valve Face Radial Runout (max) 0.03 mm (1.53 in.) 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Camshaft Journal Oil Clearance (max) 0.15 mm (0.8645-0.8654 mm (0.8645-0.8654 mm (0.8645-0.8654 mm (0.8666-0.8671 in.) 17.512-17.525 mm (0.6894-0.6900 in.) Camshaft Journal Oil Clearance (max) 0.15 mm (0.8666-0.8671 in.) 17.512-17.525 mm (0.6894-0.6900 in.) Camshaft Journal Oil Clearance (max) 0.15 mm (0.8645-0.8654 mm (0.8645-0.8654 mm (0.8666-0.8671 in.) 17.512-17.525 mm (0.8666-0.8671 in.) 17.512-17.555 mm (0.8666-0.8671 in.) 17.512-17.555 mm (0.8666-0.8671 in.) 17.512-17.555 mm (0.8666-0.8671 in.) 17. in.) 17.466-17.484 mm (0.6876-0.6883 in.) Camshaft Runout (max) 0.10 mm (0.004 in.) Rocker Arm Inside Diameter 12.000-12.018 mm (0.4714-0.4718 in.) Cylinder Head Distor- tion (max) 0.05 mm (0.002 in.) Cylinder Head Cover Distortion (max) 0.05 mm (0.002 in.) CYLINDER, PISTON, AND RINGS Piston Skirt/Cylinder Clearance 0.030-0.040 mm (0.0011-0.0015 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.35 in.) 9.5 mm (0.37 in.) Bore x Stroke 87.500-87.515 mm (3.4448-3.4454 in.) Piston Diameter 15 mm (0.6 in.) From Skirt End 87.465-87.480 mm (3.4448-3.4454 in.) Piston Diameter 15 mm (0.6 in.) From Skirt End 87.465-87.480 mm (3.4448-3.4454 in.) Piston Diameter 15 mm (0.6 in.) From Skirt End 87.465-87.480 mm (3.4435-3.4440 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.37 in.) Bore x Stroke 87.500-87.515 mm (3.4448-3.4454 in.) Piston Diameter 15 mm (3.4448-3.4454 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.37 in.) Bore x Stroke 87.500-87.515 mm (3.4448-3.4454 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.37 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.37 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.37 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.37 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.37 in.) 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Piston Ring End Gap - Installed 0.35-0.63 mm (0.0476-0.0484 in.) 2.51-2.53 mm (0.0059 in.) Piston Ring Groove Width (1st) (2nd) (0.1101-1.03 mm (0.0476-0.0484 in.) 2.51-2.53 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0476-0.0484 in.) 2.51-2.53 mm (0.0059 in.) Piston Ring Groove Width (1st) (2nd) (0.1101-1.03 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.64 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.63 mm (0.0059 in.) Piston Ring End Gap - Installed 0.35-0.64 mm (0.0059 in.) Pisto mm (0.0988-0.0996 in.) Piston Ring Thickness (1st) (2nd) 0.97-0.99 mm (0.0382-0.0389 in.) 1.17-1.19 mm (0.046-0.047 in.) Piston Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- ter (min) 22.98 mm (0.907 in.) Pin Outside Diame- te 0.10-0.65 mm (0.0039-0.0256 in.) Connecting Rod (big end width) 24.95-25.00 mm (0.9822-0.9842 \text{ in.}) Connecting Rod (small end deflection) (max) 3 mm (0.12 in.) Crankshaft (web-to-web) 70.9-70.1 mm (2.796-2.804in.) Crankshaft (web-to-web) 70.9-70.1 mm (2.796-2.804in.) Crankshaft Runout (max) 0.08 mm (0.003 in.) Oil Pressure at 60°C (140°F) @ 3000 RPM (above) (below) 1.2 kg/cm<sup>2</sup> (17 psi) 1.6 kg/cm<sup>2</sup> (23 psi) 46. 3-26 Disassembling Crankcase Half ..... .... To adjust the cable, use the following procedure. 2-10 6. NOTE: The seat, heat shields, splash panels, front rack, and front fenders must be removed for this procedure (see Section 8). \*\*\* At the filler plug threads. Valve/Tappet Clearance (Valve Adjuster Procedure) NOTE: For the 700 EFI, see Valve/Tappet Clear- ance (700 EFI) in this section. Do not bend or obstruct the routing of the carburetor/throttle body vent hose. CC549 2. ! WARNING Wait until the muffler cools to avoid burns. Remove each oil fill plug. A white or dark insulator indicates that the engine may need to be serviced or the carburetor (if equipped) may need to be adjusted. Place the ATV on level ground. Remove the wiring harness connector from the back of the headlight. By sliding the rear of the engine out first, remove the engine of the following the rear of the engine of the engine of the engine of the engine of the following the rear of the engine of proce- dure. Brake switches — rear brakelight will illumi- nate. 2-9 2 FI051 A. Remove the two tappet covers. CC552 NOTE: At this point, the wedge can be removed from between the driven clutch faces. 2-12 Front Differential/Rear Drive Lubricant. (1.10 in.) Valve/Tappet Clearance (intake) (cold engine) (exhaust) 0.1016 mm (0.004 in.) 0.1524 mm (0.006 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/Stem (intake) Clearance (exhaust) 0.013 mm (0.0005 in.) Valve Guide/ Valve Stem Outside (intake) Diameter (exhaust) 4.972-4.987 mm (0.1957-0.1963 in.) Valve Face/Seat Width (intake) (exhaust) 2.25 mm (0.0886 in.) 2.60 mm (0.1024 in.) Valve Stem Runout (max) 0.1 mm (0.0906 in.) Valve Stem Runout (max) 0.1 mm (0.0906 in.) Valve Stem Runout (max) 0.1 mm (0.1957-0.1963 in.) Valve Stem Runout (max) 0.1 mm (0.0906 in.) Valve Stem Runout (max) 0.1 mm (0.1957-0.1963 in.) Valve Stem Runo Valve Seat Angle (intake) (exhaust) 45° 15'-45° 30' 45° 15'-45° 30' Valve Face Radial Runout (max) 0.2 mm (0.55 in.) 13.97 mm (0.55 in.) 13.97 mm (0.55 in.) 13.97 mm (0.55 in.) Camshaft Journal Oil (max) Clearance 0.04 mm (0.8654-0.8677 in.) 17.48-17.53 mm (0.8646-0.8654 in.) 17.47-17.48 mm (0.6878-0.6882 in.) Camshaft Journal (right & center) Outside Diameter (left) 21.98-22.04 mm (0.8654-0.8677 in.) 17.48-17.53 mm (0.6878-0.6882 in.) Camshaft Journal (right & center) Outside Diameter (left) 21.98-22.04 mm (0.8654-0.8677 in.) 17.48-17.53 mm (0.8654-0.8677 in.) 17.48-17.53 mm (0.8654-0.8677 in.) 17.48-17.53 mm (0.8654-0.8677 in.) 17.48-17.53 mm (0.8678-0.6882 in.) Camshaft Journal (right & center) Outside Diameter (left) 21.98-22.04 mm (0.8654-0.8677 in.) 17.48-17.53 mm (0.8678-0.6882 in.) Camshaft Journal (right & center) Outside Diameter (left) 21.98-22.04 mm (0.8678-0.8677 in.) 17.48-17.53 mm (0.8678-0.8678 in.) Camshaft Journal (right & center) Outside Diameter (left) 21.98-22.04 mm (0.8678-0.8678 in.) 17.47-17.48 mm (0.8678-0.8678 in.) 17.48-17.53 mm (0.8678-0.8678 in.) 17.53 mm (0.8678-0.8788 in.) 17.53 Runout (max) 0.05 mm (0.002 in.) Rocker Arm Inside Diameter 12.000-12.018 mm (0.4724-0.4731 in.) Rocker Arm Shaft Outside Diameter 11.97-11.98 mm (0.4713-0.4717 in.) Cylinder Head Distortion (max) 0.05 mm (0.002 in.) Cylinder Head Distortion (max) 0.05 mm (0.002 in.) Cylinder Head Distortion (max) 0.05 mm (0.002 in.) Cylinder Head Distortion (max) 0.05 mm (0.4713-0.4717 in.) Cylinder Head Distortion (max) 0.4713-0.4717 in.) Cylinder Head Distortion (max) 0.4713-0.4717 in.) Cylinder Head Distortion (max) 0.4714-0.4717 in.) C Clearance 0.045 mm (0.0018 in.) Cylinder Bore 98 mm (3.858 in.) Piston Diameter 15 mm (0.6 in.) from Skirt End 97.948-97.962 mm (3.856-3.857 in.) Piston Ring (1st ring) Free End Gap (2nd ring) 12.5 mm (0.492 in.) Piston Ring End Gap Installed 0.36 mm (0.014 in.) Piston Ring to Groove (1st) Clearance (max) (2nd) 0.03 mm (0.0012 in.) 0.03 mm (0.0012 in.) 1.202-1.204 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0776-0.0783 in.) 1.970-1.990 mm (0.0776-0.0783 in.) 1.970-1.990 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0776-0.0783 in.) 1.970-1.990 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0776-0.0783 in.) 1.970-1.990 mm (0.0776-0.0783 in.) 1.970-1.990 mm (0.0776-0.0783 in.) 1.970-1.990 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0776-0.0783 in.) 1.970-1.990 mm (0.0473-0.0474 in.) 2.01-2.03 mm (0.0473-0.0474 1.990 mm (0.0776-0.0783 in.) Piston Pin Bore (max) 23.0 mm (0.9055 in.) Piston Pin Outside (min) Diameter 22.99 mm (0.9051 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9063 in.) Connecting Rod (big end side-to-side) 0.6 mm (0.024 in.) Connecting Rod (big end width) 25 mm (0.9843 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9051 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting Rod (small end inside diameter) (max) 23.021 mm (0.9053 in.) Connecting 150 mm (5.9 in.) (small end deflection) (max) 0.3 mm (0.0118 in.) Crankshaft (web-to-web) 71 mm (2.79 in.) Crankshaft Runout (max) 0.03 mm (0.0012 in.) Oil Pressure at 60°C (140°F) @3000 RPM 1.40-2.46 kg/cm<sup>2</sup> (20-35 psi) Cooling Fan (off on) Thermo-Switch (on off) Operating Temperature 90°C (194°F) 75°C (167°F) Engine Coolant (off on) Thermo-Switch (on off) Operating Temperature (approx) 115°C (239°F) 108°C (226°F) 48. FI055 FI056 8. \*\*\* At the oil level plug threads. Remove the belly panel. 2-26 Intake Chart NOTE: Use this chart in conjunction with the procedure found in Valve/Tappet Clearance (700 EFI) in this section. Close the bleeder screw before releasing the brake lever. Loosen the clamp on the crankcase breather vent hose; then disconnect the hose and remove it. 2-16 Nuts/Bolts/Cap Screws... Any leak of this one-way drain will allow dirt into the engine intake causing severe engine damage. Remove the air filter housing cover and air filter. If brake fluid must be added, care must be taken as brake fluid is very corrosive to painted surfaces. DO NOT USE LOW BEAM. NOTE: It may be necessary to turn the handle- bar or rock the ATV forward and backward to align the differential lock splines and allow engagement. Remove the battery. ! CAUTION Do not use white gas. Install the timing inspection plug. 3-62 Installing Top-Side Components ...... After the completion of the break-in period, the engine oil and oil filter should be changed. ! CAUTION Water entering the outer end of the axle will not be able to enter the rear drive unless the seals are dam- aged. 2-22 Adjusting Differential Lock Cable... 0.6 kg-m (4.0 ft-lb). At the ignition coil, remove the cap screw, nut, and the two wire leads; then remove the coil. Knuckles not worn, cracked, or damaged. Install the fill plugs. 2-16 Switches..... .. Pour the specified amount of the rec- ommended oil in the filler hole. Carefully examine the element for tears before and after cleaning it. Troubleshoot the harness con- nectors, gear shift position connector, gear shift position switch, and LCD connector. Care should be taken not to damage the vent tube. Remove the four cylinder head cap screws and washers. Install the cover making sure the O-ring is prop- erly positioned; then secure with the screws. To properly adjust the idle RPM, a tachometer is necessary. FILLING GAS TANK ATV0049B Since gasoline expands as its temperature rises, the gas tank must be filled to its rated capacity only. Adjust each headlight by turning the adjuster knob clockwise to raise the beam or counter- clockwise to raise the beam. 17. VALVES AND GUIDES Valve Face Diameter (intake) (exhaust) 36.0 mm (1.42 in.) 33.0 mm (1.30 in.) Valve/Tappet Clearance (intake) (cold engine) (exhaust) 0.10-0.20 mm (0.004-0.0015 in.) 0.030-0.057 mm (0.0012-0.0022 in.) Valve Stem Deflection (max) (wobble method) 0.35 mm (0.014 in.) Valve Guide Inside Diameter 5.500-5.512 mm (0.2165-0.2170 in.) Valve Stem Outside (intake/exhaust) Seat Width 0.9-1.1 mm (0.035-5.470 mm (0.2148-0.2154 in.) Valve Face/ (intake/exhaust) Seat Width 0.9-1.1 mm (0.035-5.470 mm (0.2148-0.2154 in.) Valve Stem Runout (max) 0.05 mm (0.2148-0.2154 in.) Valve Stem Runout (max 0.043 in.) Valve Face Radial Runout (max) 0.03 mm (0.001 in.) Valve Spring Free Length (min) 46.1 mm (1.81 in.) Valve Spring Tension @ 36.35 mm (1.43 in.) 18.6-21.4 kg (41.0-47.2 lb) CAMSHAFT AND CYLINDER HEAD Cam Lobe Height (min) (intake) (exhaust) 36.03 mm (1.4185 in.) 35.00 mm (1.3780 in.) Camshaft Journal Oil (max) Clearance 0.150 mm (0.0059 in.) Camshaft Journal Holder Inside Diameter 22.012-22.025 mm (0.8666-0.8671 in.) Camshaft Journal Outside Diameter 21.972-21.993 mm (0.8650-0.8659 in.) Camshaft Runout (max) 0.10 mm (0.004 in.) Cylinder Clearance (max) 0.120 mm (0.0047 in.) Cylinder Bore 98 mm (3.858 in.) Piston Diameter 15 mm (0.6 in.) from Skirt End 102.000-102.015 mm (4.0157-4.0163 in.) Piston Ring End Gap (min) (2nd ring) 8.3 mm (0.33 in.) 11.4 mm (0.45 in.) Bore x Stroke 102 x 85 mm (4.016 x 3.350 in.) Cylinder Trueness (max) 0.05 mm (0.002 in.) Piston Ring End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Bore x Stroke 102 x 85 mm (4.016 x 3.350 in.) Cylinder Trueness (max) 0.05 mm (0.002 in.) Piston Ring End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) Free End Gap (min) (2nd ring) 8.3 mm (0.45 in.) Piston Ring (1st ring) 8.3 mm (0.45 in.) Piston Ring (1s Installed (min) 0.10 mm (0.004 in.) Piston Ring to Groove (1st) Clearance (max) (2nd) 0.180 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0327-0.0335 in.) 1.30-1.32 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0327-0.0335 in.) 1.30-1.32 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 1.08-0.85 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0398-0.0406 in.) 2 1.10 mm (0.0425-0.0433 in.) 0.970-0.990 mm (0.0382-0.0390 in.) Piston Pin Bore (max) 23.030 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9071 in.) Connecting Rod (max) (big end side-to-side) 1.0 mm (0.004 in.) Connecting Rod (big end side-to-side) 1.0 mm (0.0047 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9071 in.) Connecting Rod (max) (big end side-to-side) 1.0 mm (0.0047 in.) Connecting Rod (big end side-to-side) 1.0 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9071 in.) Connecting Rod (max) (big end side-to-side) 1.0 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9071 in.) Connecting Rod (max) (big end side-to-side) 1.0 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9071 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9071 in.) Piston Pin Outside (min) Diameter 22.98 mm (0.9067 in.) Pin Outside (min) Diameter 22.98 mm (0.9071 in.) Pin Outside (min) Diameter 22.98 mm (0.90 width) 25 mm (0.9843 in.) Connecting Rod @ 150 mm (5.9 in.) (small end deflection) (max) 0.3 mm (0.0118 in.) Crankshaft (web-to-web) 72.9-73.1 mm (2.87-2.88 in.) Crankshaft Runout (max) 0.08 mm (0.003 in.) Oil Pressure at 60°C (140°F) @ 3000 RPM 1.40-1.80 kg/cm<sup>2</sup> (20-26 psi) Cooling Fan (off on) Thermo-Switch (on off) Operating Temperature 93°C (199°F) 87°C (189°F) 49. MD1226A 13. Nuts/Bolts/Cap Screws Tighten all nuts, bolts, and cap screws. Replace if necessary. Each section covers a specific ATV component or system and, in addition to the standard service procedures, includes disassembling, inspecting, and assembling instructions. The cover is made of magne- sium and any contact with spark or electrical arc will severely pit the surface. 3-130 500 (Manual Transmission) Table of Contents ... . ATV-0047 3. Remove the vent plugs; then (if necessary) fill the battery with distilled water to the upper level indicated on the battery. Remove the exhaust pipe and account for the exhaust seal. Because Arctic Cat Inc. Shock absorber rods not bent, pitted, or dam- aged. 2-7 2 NOTE: On the TBX/500/650 H1, the seat, storage compartment cover assembly, compartment tox, air filter/filter housing, and left-side/right-side splash panels must be removed for this procedure. If compression is abnormally low, inspect the following items. 2-3 Fuses ! CAUTION The feeler gauge must be positioned at the same angle as the valve and valve adjuster for an accurate measurement of clearance. Loosen the front shift rod jam nut (1) (left-hand threads); then loosen the rear shift rod jam nut (2) (right-hand threads). Fill a wash pan larger than the filter with a non-flammable cleaning solvent; then dip the filter in the solvent and wash it. 16. General Information 2. Install the belly panel. Damage from aging may not always be visible. Lower front: One cap screw, nut, spacer, and washer. CLUTCH Clutch Release Screw 1/4-1/2 turn back Drive Plate (fiber) Thick- ness (min) 2.82 mm (0.1110 in.) Drive Plate (fiber) Tab (min) 2.9 mm (0.507 in.) Driven Plate (warpage) (max) 0.1 mm (0.004 in.) Clutch Spring Length (min) 35.6 mm (1.40 in.) Clutch Shoe No groove at any part Clutch Engagement RPM 1700 ± 200 Clutch Lock-Up RPM 3700 ± 300 Primary Reduction Ratio 2.032 (63/31) Secondary Reduction Ratio (1.133 (17/15) Final Reduction Ratio (front) (rear) 3.6 (36/10) Secondary Transmission Reduction Ratio (1.133 (17/15) Final Reduction Ratio (1.133 (17/15) Final Reduction Ratio (1.133 (12/23 x 27/17 x 43/27) 1.592 (43/27) Gear Ratios (1.131 (1.133 ( Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) Secondary Transmission Fork to Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) Shift Fork Groove Width (#1 and #2) 5.5-5.6 mm (0.217-0.220 in.) (secondary transmission) (reverse) 5.5-5.6 mm (0.217-0.220 in.) 5.0-5.1 mm (0.197-0.201 in.) Shift Fork Thickness (#1 and #2) 5.3-5.4 mm (0.209-0.213 in.) (secondary transmission) (reverse) 5.3-5.4 mm (0.209-0.213 in.) Thermostat Valve Lift Over 3 mm (0.12 in.) @ 90°C (194°F) Cooling Fan Thermo-Switch Operating Temperature (off on) (on off) 88°C (190°F) 82°C (180°F) (min) Engine Coolant Thermo-Switch Operating Temperature (off on) (on off) (approx) 115°C (239°F) 108°C (226°F) 47. ! WARNING Battery acid is harmful if it contacts eyes, skin, or clothing. NOTE: If the screen or gasket is damaged in any way, it must be replaced. 3-10 400 (Manual Remove the cam chain guide. Test the brakelight by compressing the brake lever. The recommended engine oil viscosity is SAE 5W-30. FI046 5. Attach the Timing Light (p/n 0644-296) to the spark plug high tension lead; then remove the timing inspection plug from the left-side crank-Transmission) Table of Contents ..... case cover. 2-19 Hydraulic Brake Systems ..... . If compression is now evident, service the piston rings (see Section 3). Secure with a new lock nut (B). ! CAUTION BRAKE PADS MUST BE BURNISHED TO ACHIEVE FULL BRAKING EFFECTIVENESS. Fuel/Lubrication/Cooling 5. Install the plug and tighten securely. 6. 1. 3-59 . Clean or replace as neces- sary. 3-15 3 2. Muffler/Spark Arrester The muffler has a spark arrester which must be peri- odically cleaned. Rubber damper not cracked, broken, or miss- ing. 1-4 General Specifications (500 - Automatic Transmission)...... Installing Left-Side Components ... . Remove the seat: then remove the appropriate reinstallable rivets securing the storage compart- ment. Expansion room must be maintained in the tank par- ticularly if the tank is filled with cold gasoline and then moved to a warm area. 738-420A AL681 2. 18. 8. Apply light oil to the upper steering post bush- ing and plungers of the shock absorbers. Remove the front and rear fender mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Cap 8000-12,000 ohms Ignition Coil Resistance (primary) (secondary) Less than 1 ohm (terminal to ground) 5200-7800 ohms (high tension plug cap removed - to ground) Ignition Coil Peak Voltage (primary/ CDI) 250-375 DC volts (terminal to ground) Magneto Coil Resistance (trigger) (source) 5.04-7.56 volts (green to blue) 0.7-1.05 volts (yellow to white) Stator Coil Out- put (no load) 60 AC volts @ 5000 RPM (black to black #1) (black to black #2) Magneto Output (approx) 220 W @ 5000 RPM (chassis Brake Type Hydraulic w/Brake Lever Lock and Auxiliary Brake Tire Size Front - 25 x 8-12 Rear - 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity (rated) 24.6 L (6.5 U.S. gal.) Rear Drive Capacity 250 ml (8.5 fl oz)\*\* Engine Oil (recommended) SAE 5W-30 Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Brake Fluid DOT 4x4) 275 ml (9.3 fl oz)\*\*\* Engine Oil (recommended) SAE 5W-30 Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Brake Fluid DOT 4x4) 275 ml (9.3 fl oz)\*\*\* Engine Oil (recommended) SAE 5W-30 Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Brake Fluid DOT 4x4) 275 ml (9.3 fl oz)\*\*\* Engine Oil (recommended) SAE 5W-30 Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Brake Fluid DOT 4x4) 275 ml (9.3 fl oz)\*\*\* Taillight/Brakelight 12V/8W/27W Headlight 12V/37W (2) 6. NOTE: To remove a fuse, compress the locking tabs on either side of the fuse case and lift out. 2-25 Intake Chart... If the reverse 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 con- nection may be loose or corroded, or the lever may need adjusting. Axle 8. 3-185 700 EFI Table of Contents.. . 2-14 Adjusting Clutch (400/500 Manual Transmission). Using an impact driver, remove the screws securing the cover and remove the cover. 1-6 General Specifications\* (650 H1/650 H1 TBX/650 mark but not higher than the illustrated "F" mark. Replace any one-way drain that is cracked or shows any signs of hardening or deterioration. 35. The symbol ! CAUTION identifies unsafe practices which may result in ATV-related damage. Detach the carburetor from the engine. 2-21 . Rotate the V-belt and clutches until the V-belt is flush with the top of the driven clutch. 3-26 Separating Crankcase Halves... . 36. 3-3 Specifications (400 - Manual Transmission)............. Brake Lever Pivot/Cable Ends C. F. TIRE INFLATION PRESSURE Front and rear tire inflation Coolant (500/650 H1/700 EFI) pressure should be 0.35 kg-cm<sup>2</sup> (5.0 psi). Start the engine (while the ATV is outside on level ground) and allow it to idle for a few min- utes. 3-11 Top-Side Components..... .... FI053 10. 37. Tighten the cap screws to specifications (see Section 10). Remove the cover. 3-11 400 (Automatic Transmission) Table of Contents . 32. Tighten the jam nut securely; then install the boot on the adjuster. To replace the headlight bulb, use the following pro- cedure. Check all control wires and cables for signs of wear or fraying. Measured tappet clearance from step 4 in ver- tical column on left. 3-17 3 MD1173 C. Adjusting Throttle Cable To adjust the throttle cable free-play, follow this procedure. Ball joints not worn, cracked, or damaged. If the rod is down inside the crankshaft is rotated, severe damage will result. AT THIS POINT If the technician's objective is to service/replace left-side cover oil seals (3), front output joint oil seal (1), rear output joint oil seal (1), and/or the oil strainer (from beneath the engine/ transmission), the engine/transmission does not have to be removed from the frame. Check the spark plug. 2-18 Frame/Welds/Racks ..... . Check the air pressure in all tires before each use of the ATV. MD1131 7. 22. On liquid cooled models, fill the cooling system to the bottom of the stand pipe in the radiator neck with properly mixed coolant. A new spark plug should be tightened 1/2 turn once the washer contacts the cylinder head. To service top-side, left-side, and right-side compo- nents, the engine/transmission does not have to be removed from the frame. Using the adjustable Oil Filter Wrench (p/n 0644-389) and a suitable wrench remove the old oil filter. CF176 22. Care must be taken that all calibrated nuts, cap screws, and bolts are tightened to specifications (see Section 10). 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.) 19. Install and secure the cover; then slowly compress the brake lever several times. Place the oil strainer into position beneath the crankcase and secure with the Phillips-head cap screws. Washer 14. CD078 NOTE: Note the location of the main engine ground wire for installing purposes. 3-7 Specifications (650 H1). . Adjust the auxiliary brake (if necessary). AF920D ! WARNING Adjust the idle to the correct RPM. 15. Lever 6. Do not under any circumstances substitute tires of a dif- ferent type or size. 2-11 Adjusting Throttle Cable.... Shock absorber eyelets not broken, bent, or cracked. NOTE: Some photographs and illustrations used in this section are used for clarity purposes only and are not designed to depict actual conditions. Nut 9. Preparation For Storage Arctic Cat recommends the following procedure to prepare the ATV for storage. When replacing the headlight bulb, do not touch the glass portion of the bulb. Clean the ATV thoroughly. Pour the appropriate amount of recommended oil into the filler hole. CHECKING/REPLACING PADS The clearance between the brake pads wear. Accelerate to 30 mph; then compress brake lever or apply the auxiliary brake to decelerate to 0-5 mph. While holding the shift rod with an open-end wrench, tighten the shift rod jam nuts securely. Throttle Lever Pivot/Cable Ends B. When using ethanol blended gasoline, it is not nec- essary to add a gasoline antifreeze since ethanol will prevent the accumulation of moisture in the fuel sys- tem. During the first 10 hours (or 200 miles) of operation, always use less than 1/2 throttle. 50. Using the Piston Pin Puller (p/n 0644-328), remove the piston pin. Account for an alignment pin. ! CAUTION Before removing a spark plug, be sure to clean the area around the spark plug. 3-29 Assembling Crankcase Half..... .. CD669 4. Skin oil residue on the bulb will shorten the life of the bulb. The ignition timing cannot be adjusted; however, verifying ignition timing can aid in troubleshooting other components. Remove the cloth from the exhaust system. Compress the brake lever/pedal several times to check for a firm brake. Make sure the steering moves the brake lever/pedal several times to check for a firm brake. two Allen-head cap screws securing the tensioner assembly and remove the battery is discharged, remove the battery from the ATV and charge the battery is discharged, remove the battery is dis dis discharged, remove the battery is discharged, re counterclockwise to ensure free move- ment without binding; then lock the jam nut securing adjustment screw #2. Fold a suitable towel and use it to plug the cam- shaft drive passageway; then using a magnet, remove the tappet and shim from the appropriate valve. Verify starter cranks engine over at normal speed (approximately 400 RPM). Repeat procedure five times until brakes are bur- nished. CARBURETOR Type Keihin CVK36 Main Jet 138 Slow Jet 40 Pilot Screw Setting (turns) 1 3/4 Jet Needle NFKG Idle RPM (engine warm) 1250-1350 Starter Jet 85 Float Arm Height 17 mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Type NGK CR6E Spark Plug Gap 0.7-0.8 mm (0.028-0.032 in.) Spark Plug Cap 8000-12,000 ohms Ignition Coil Resistance (primary) (secondary) Less than 1 ohm (terminal to ground) 5200-7800 ohms (high tension - plug cap removed - to ground) Ignition Coil Peak Voltage (primary/ CDI) 140-215 DC volts (terminal to ground) Magneto Coil Resistance (trigger) (source) (charging) 160-240 ohms (green to blue) Less than 1 ohm (yellow to white) Less than 1 ohm (black to black #1) (black to black #1) (black to black #2) Magneto Output (approx) 325W @ 5000 RPM CHASSIS Brake Type Hydraulic w/Brake Lever Lock and Auxiliary Brake Tire Size Front - 25 x 8-12 Rear - 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity (rated) 24.6 L (6.5 U.S. gal.) Coolant Capacity 2.9 L (3.0 U.S. qt) Differential Capacity 275 ml (9.3 fl oz)\*\* Rear Drive Capacity 250 ml (8.5 fl oz)\*\*\* Engine Oil Capacity 2.5 L (2.6 U.S. qt) Gasoline (recommended) 87 Octane Regular Unleaded Engine Oil (recommended) 87 Octane Regular Unleaded 87 Octane Regular Unleaded 87 Octane Regular Un 12V/27W (2) 8. Aids for Maintenance 11. ! CAUTION The ignition system. Disconnect the high tension lead from the spark plug. CLEANING AND INSPECTING FILTER 1. Controls/Indicators 10. 21. Install the engine drain plug and tighten to spec O-ring. Place the valve adjuster onto the jam nut secur- ing the tappet adjuster screw; then rotate the valve adjuster screw. Inspect the area around the drain plug and oil fil- ter for leaks. With the transmission in neutral, start the engine and warm it up to normal operating temperature. Rotate the crankshaft to the TDC position on the compression stroke, align the TDC line on the starter clutch with the index mark on the crank- case. PR376B NOTE: The brake pads should be replaced as a set. ! CAUTION Battery acid is harmful if it contacts eyes, skin, or clothing. Be sure no dirt enters the carburetor (if equipped). Repeat procedure on each brake system five times until brake pads are burnished. 3-4 Specifications (500 - Automatic Transmission)........ Drain the oil from beneath the engine/ transmission. The engine should always be warm when the oil is changed so the oil will drain easily and completely. 2-22 3. Do not pull a trailer or carry heavy loads during the 10-hour break-in period. 2-14 Front Differential/Rear Drive Lubricant According to the Periodic Maintenance Chart. Place the two tappet covers into position making sure the proper cap screws are with the proper cover Braking distance will be extended until brake pads are properly bur- nished. 2-10 Muffler/Spark Arrester ..... ....... Using an appropriate thickness gauge, measure and record the clearance of both intake valves; then measure and record the clearance of both exhaust valves. Ambient temperature should determine the correct weight .. For the 700 EFI, the compression should be within a range of 130-155 psi in the full-open throttle position. AL677C 3. Remove the cap screws securing the two tappet covers. NOTE: Refer to the appropriate specifications in Feeler Gauge Procedure sub-section for the proper valve/tappet of oil. 2-24 Exhaust Chart .. clearance. NOTE: Do not be reluctant to heat up the brake pads during the burnishing procedure. Remove the clamps securing the two oil cooler hoses. If the brake is not firm, the system must be bled. 3-9 Specifications (700 EFI) ..... ..... 12. Arctic Cat recommends the following procedure to prepare the ATV. CHECKING/ADJUSTING HEADLIGHT AIM The headlights can be adjusted vertically and hori- zontally. Handle 2. 1-5 1 General Specifications subject to change without notice. The only maintenance that is required is replacement of the brake pads when they show excessive wear. 27 WARNING Do not overflow gasoline when filling the gas tank. NOTE: The idle adjustment screw is located on the right-hand side of the carburetor. 30. CC163D 5. Remove the gasket, and account for two alignment pins. CARBURETOR Type Keihin CVK34 Main Jet 135 Slow Jet 38 Pilot Screw Setting (turns) 1 3/4 Jet Needle NAZG Idle RPM (engine warm) 1250-1350 Starter Jet 75 Float Arm Height 17 mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Gap 0.7-0.8 mm (0.028-0.032 in.) Spark Plug Cap 8000-12,000 ohms Ignition Coil Resistance (primary) (secondary) Less than 1 ohm (terminal to ground) 5200-7800 ohms (high tension - plug cap removed - to ground) Ignition Coil Resistance (trigger) (source) (charging) 160-240 ohms (green to blue) Less than 1 ohm (yellow to white) Less than 1 ohm (black to black) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to blue) 0.7-1.05 volts (green to black #2) Magneto Output (approx) 220W @ 5000 RPM (black to black # - 25 x 8-12 Rear - 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity (rated) 24.6 L (6.5 U.S. gal.) - TRV Rear Drive Capacity 3.08 L (3.25 U.S. qt) Gasoline (recommended) 87 Octane Regular Unleaded Engine Oil (recommended) SAE 5W-30 Differential/Rear Drive Belt Width 28.5 mm (1.12 in.) Brake Fluid DOT 4 Taillight/Brakelight 12V/37W (2) Back to TOC Back to Section TOC Next1-3 1 General Specifications\* (400 - Manual Transmission) \* Specifications subject to change without notice. To check and adjust valve/tappet clearance, use the following procedure. 3-9 3 Specifications\* (650 H1) \* Specifications subject to change without notice. Remove the two Phillips-head cap screws secur- ing the strainer. The reverse gear indicator light should be illuminated. Tighten securely. Using a suitable brush, clean the carbon deposits from the screen taking care not to damage the screen. Genuine Parts When replacement of parts is necessary, use only genuine Arctic Cat. 20. CD674 ! CAUTION Arctic Cat. 20. CD674 ! CAUTION A torn air filter can cause damage to the ATV engine. To service Manual • 2007 DVX/Utility 250 Service Manual • 2007 DVX 400 Service Manual • 2007 DVX/Utility 250 Service Manual • 2007 DVX/Utility 250 Service Manual • 2007 DVX/Utility 250 Service Manual • 2007 DVX 400 Service Manual • 2007 DVX/Utility 250 Service Manual • 2007 DVX/Utility 250 Service Manual • 2007 DVX/Utility 250 Service Manual • 2007 DVX 400 Service Manual • 2007 DVX/Utility 250 2006 Arctic Cat Inc. ! CAUTION Connecting cables in reverse (positive to negative to negative to negative to positive) can cause serious damage to the electrical system. Remove the valve cover. Put the filter in a plastic bag; then pour in air fil- ter oil and work the filter. 3-27 Servicing Components... . The symbol NOTE: identifies supplementary information worthy of particular attention. Be sure to follow the directive because it deals with the possibility of severe personal injury or even death. CARBURETOR Type Keihin CVK36 Main Jet 138 Slow Jet 40 Pilot Screw Setting (turns) 1 3/4 Jet Needle NFKG Idle RPM (engine warm) 1250-1350 Starter Jet 85 Float Arm Height 17 mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Cap 8000-12,000 ohms Ignition Coil Resistance (primary) (seco 1. Change the engine/transmission oil and filter. 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. Connect the negative cable last. Attach the compression Tester Kit (p/n 0444-213). Install the spark arrester assembly with gasket; then secure with the three cap screws. Shock absorber eyelet bushings not worn, deteriorated, cracked, or missing. Install the oil level stick/filler plug. Account for the O-rings. If the level in the sight glass, add DOT 4 brake fluid. Adjust the clutch, use the following procedure. Either drain the gas tank or add Fuel Stabilizer to the gas in the gas tank. 3-1 3 SECTION 3 -ENGINE/TRANSMISSION TABLE OF CONTENTS Engine/Transmission ..... . Shift the transmission into each of the remaining positions and verify that the appropriate icon is displayed for the selected gear shift position (H - High, L - Low, and R - Reverse). ! WARNING Make sure the ATV is solidly supported on the support stand to avoid injury. When using this manual as a guide, the technician should use discretion as to how much disassembly is needed to correct any given condition. Repeat step C until the brake lever is firm. \*\* One inch below plug threads. Remove the recoil starter assembly; then remove the valve timing inspection plug and the cylinder head cover. MN 56701 Back to TOCATVATV Service Manual 400 Automatic 500 Manual 500 Automatic 500 Manual 650 H1 700 EFI 2007 TABLE OF CONTENTS Foreword Click on the red text to go. While holding the valve adjuster dial in place, use the valve adjuster handle and loosen the jam nut; then rotate the tappet adjuster screw clock- wise until friction is felt. 3-16 6. Tighten the gas tank cap securely after filling the tank. NOTE: Critical torque specifications are located in Section 10. Remove the V-belt. 1-2 General Specifications are located in Section 10. Remove the V-belt. oil into a drain pan. Cylinder D. Charge the battery; then install. To check lubricant, remove the rear drive filler plug; the lubricant level should be 1 in. Remove the exhaust springs at the juncture in front of the muffler; then slide the muffler rearward off the mounting lugs. Account for the O-ring. ATV to 30 mph and to brake to a stop. PR377B E. When changing the lubricant, use approved SAE 80W-90 hypoid gear lube. MD1264 NOTE: Keep the mounting hardware with the covers for assembly purposes or thread them back into the head to keep them separated. Disconnect the fuel hose (1), carburetor vent hose (2), and the fuel pump vacuum hose (3) from the carburetor. 1-3 1 General Specifications\* (400 - Manual Transmission) \* Specifications subject to change without notice. Turn the bulb socket assembly counterclockwise and remove from the housing. CC091D 6. 2-6 Valve/Tappet Clearance (Valve Adjuster Procedure) ..... compartment and the steering post access panel (see Section 8). Tighten jam nut (A) to secure the adjustment. FI054 7. 2-3 2 Lubrication Points It is advisable to lubricate certain components peri-odically to ensure free movement. NOTE: Clean up any excess oil after removing the filter. 2-16 Ignition Timing. charging, check fluid level and fill with distilled water as necessary; then install vent plugs. AT THIS POINT To inspect cam chain guide, see Servicing Top-Side Components sub-section. 2-6 11. Spark Plug A light brown insulator indicates that a plug is cor-rect. Release the inner face. Install the new bulb into the housing and rotate it completely clockwise. 21. Check tire pressure. 9. Burnishing Brake Pads Brake pads (both hydraulic and auxiliary) must be burnished to achieve full braking effectiveness. Remove the face. Disconnect the battery cables; then remove the face. Disconnect the battery cables; then remove the face. area. If an electrical com- ponent needs to be tested for proper function, see Section 5. 12. CD560A 2. Discard the lock nut. Trickle charge the battery at 1.5 amps for 10 hours. Rod End 16. \*\*\* At the plug threads. Turn the adjuster (C) to achieve 6.35 mm (0.250 in.) of free-play measured at the end of the differen- tial lock lever. Shock absorber body not damaged, punc- tured, or leaking. The complete manual is designed to aid service personnel in service-oriented applications. Remove the left-side splash panel. CARBURETOR Type Keihin CVK34 Main Jet 135 Slow Jet 38 Pilot Screw Setting (turns) 1 3/4 Jet Needle NAZG Idle RPM (engine warm) 1250-1350 Starter Jet 75 Float Arm Height 17 mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Cap 8000-12,000 ohms Ignition Coil Resistance (primary) (secondary) Less than 1 ohm (terminal to ground) 5200-7800 ohms (high tension - plug cap removed - to ground) Ignition Coil Peak Voltage (primary/ CDI) 250-375 DC volts (terminal to ground) Magneto Coil Resistance (trigger) (source) 5.04-7.56 volts (green to blue) 0.7-1.05 volts (yellow to white) Stator Coil Output (no load) 60 AC volts @ 5000 RPM (black to black #2) Magneto Output (approx) 220W @ 5000 RPM CHASSIS Brake Type Hydraulic w/Brake Lever Lock and Auxiliary Brake Tire Size Front - 25 x 8-12 Rear - 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity (rated) 24.6 L (6.5 U.S. gal.) 20.8 L (5.5 U.S. gal.) - TRV Rear Drive Capacity 250 ml (8.5 fl oz)\*\* Differential Capacity (front - 4x4) 275 ml (9.3 fl oz)\*\*\* Engine Oil (recommended) 87 Octane Regular Unleaded Engine Oil (recommended) 87 Octane Regular Unleaded Engine Oil (recommended) 87 Octane Regular Unleaded Engine Oil (a commended) 87 Octane Regular Unleaded Engine Oil (recommended) 87 Octane Regular Unleaded Engine Regular Unleaded Engine Regular Unleaded Engine Regular Unle Drive Belt Width 28.5 mm (1.12 in.) Brake Fluid DOT 4 Taillight/Brakelight 12V/8W/27W Headlight 12V/8W/27W Headlight 12V/37W (2) 5. Make sure rivets holding components together are tight. Other maintenance after break-in should include checking of all prescribed adjustments and tightening of all fasteners. On the 400/500, remove the oil filter plug from the filter mounting boss (located on the front side of the transmission case) and allow the fil- ter to drain completely. Unsnap the four spring-clip fasteners (400/500/650 H1) or remove two wing-nuts (700 EFI); then remove the air filter cover. 3-14 CF175 B. 3-66 Installing Engine/Transmission... .. Tie rods not bent or cracked. Install the spark plug cap/high tension lead, front fenders, front rack, and splash panels; then install the heat shields and seat making sure the seat locks securely. Remove the splag not ground the plug and ground the plug .. O-Ring 12. Dirt could enter engine when removing or installing the spark plug. Use the fol- lowing procedure to remove the filter and inspect and/or clean it. All materials and specifications are subject to change without center and slide the spacer and movable drive face onto the driveshaft. 2-4 Air Cleaner/Filter . notice. Remove the four cap screws securing the rear output joint to the transmission and push the shaft rearward as far as possible. Burnish the brake pads in this section). Lower rear: One cap screw and nut with flat washer. On liquid cooled models, check the coolant level and add properly mixed coolant as necessary CF005 2. ! WARNING Do not over-fill the gas tank. Remove the storage compartment. 3-22 Removing Right-Side Components..... . Slow disc-speed hydraulic brakes must be properly burnished in order to achieve maximum stopping power. Proper operation during this break-in period will help assure maximum life and performance from the ATV. To check and/or bleed a hydrau- lic brake system, use the following procedure. Reattach the filter screen. Clean the engine. Cylinder Head NOTE: Remove the spark plug and timing inspection plug; then using the recoil starter, rotate the crankshaft to top-dead-center of the compression stroke. Return the differential lock selector to the UNLOCK position and listen for the front drive actuator to operate. 3-2 Engine/Transmission. On the 700 EFI, remove the left-side engine cover and the left-front inner fender panel. Tires TIRE SIZES The ATV is equipped with low-pressure tubeless tires of the size and type listed (see Section 1). Remove the engine/transmission mounting fasteners in the following sequence: A. The symbol ! WARNING identifies personal safety-related information. ! CAUTION If the interior of the air filter housing is dirty, clean the area before starting the engine NOTE: Arctic Cat recommends the use of new gaskets, lock nuts, and seals and lubricating all internal components when servicing the engine/transmission. 2-21 2 INSPECTING HOSES Carefully inspect the hydraulic brake hoses for cracks or other damage. Use the following list for reference. FOREWORD This Arctic Cat Service Manual containssion. information for certain 2007 Arctic Cat ATV models (see cover). Remove the pinch screw and lock nut securing the gear shift lever; then remove the gear shift lever; then remove the gear shift lever; then remove the gear shift lever from the shaft on the engine. ! WARNING Avoid spillage and contact with skin, eyes, and clothing. MD1219 NOTE: Support the con with rubber bands to avoid damaging the rod or install the Connecting Rod Holder (p/n 0444-006). 18. On the 700 EFI, install the left-front inner fender panel. Severe burns may result. NOTE: It is advisable to remove the oppo- site-side circlip prior to using the puller. 2-20 Hydraulic Brake Systems CHECKING/BLEEDING The hydraulic brake systems have been filled and bled at the factory. ! CAUTION Never exceed the standard charging rate. To maintain a hot, strong spark, keep the plug free of carbon. Remove the air filter/filter screen assembly and separate the foam filter from the screen. Turn the adjuster until the throttle cable has proper free-play of 3-6 mm (1/8-1/4 in.) at the lever. While the cooling system is being filled, air pockets may develop; therefore, run the engine off, and then fill the cooling system to the bottom of the stand pipe in the radiator neck. ! WARNING Do not attempt sudden stops or put the ATV into a situation where a sudden stop will be required until the brake pads are properly burnished. When replacing with new rings, replace as a complete set only. With the master cylinder in a level position, check the fluid level in the reservoir. Valve Cover B. Once a lock nut has been removed, it must be replaced with a new lock nut. CD714A Switches Each time the ATV is used, switches should be checked for proper operation, 16, 3-4 Specifications\* (400 - Manual Transmission) VALVES AND GUIDES Valve Face Diameter (intake) (exhaust) 0.05-0.10 mm (0.002-0.004 in.) 0.22-0.27 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.002-0.004 in.) 0.22-0.27 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.002-0.004 in.) 0.22-0.27 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.002-0.004 in.) 0.22-0.27 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.002-0.004 in.) 0.22-0.27 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.002-0.004 in.) 0.22-0.27 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.009-0.011 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.011 in.) Valve/Tappet Clearan Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.004-0.0015 in.) 0.030-0.057 mm (0.0012-0.0022 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.1969-0.1973 in.) Valve Stem Deflection (wobble deflection) (max) 0.35 mm (0.012-0.0022 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.1969-0.1973 in.) Valve Guide/Valve Stem Deflection (wobble deflection) (max) 0.35 mm (0.012-0.0022 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.1969-0.1973 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.012-0.0022 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.1969-0.1973 in.) Valve Guide/Valve Stem Deflection (wobble deflection) (max) 0.35 mm (0.012-0.0022 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.1969-0.1973 in.) Valve Guide Inside Diameter 5.000-5.012 mm (0.1969-4.955-4.970 mm (0.1951-0.1957 in.) Valve Stem Runout (max) 0.05 mm (0.002 in.) Valve Head Thickness (min) 0.5 mm (0.02 in.) Valve Stem End Length (min) 2.3 mm (0.09 in.) Valve Stem Runout (max) 0.05 mm (0.001 in.) Valve Stem Spring Free Length (min) 38.8 mm (1.53 in.) Valve Spring Tension @ 32.5 mm (1.28 in.) (outer) 18.6-21.4 kg (41-47 lb) CAMSHAFT AND CYLINDER HEAD Cam Lobe Height (min) (intake) (exhaust) 32.830 mm (1.293 in.) Camshaft Journal Oil Clearance (max) 0.15 mm (0.0059 in.) Camshaft Journal Holder Inside (right & center) (left) 22.012-22.025 mm (0.8666-0.8671 in.) 17.512-17.525 mm (0.6894-0.6900 in.) Camshaft Journal Outside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.6876-0.6883 in.) Camshaft Runout (max) 0.10 mm (0.004 in.) Rocker Arm Inside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.6876-0.6883 in.) Camshaft Runout (max) 0.10 mm (0.004 in.) Rocker Arm Inside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.6876-0.6883 in.) Camshaft Runout (max) 0.10 mm (0.004 in.) Rocker Arm Inside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.8645-0.8654 in.) Rocker Arm Inside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.8645-0.8654 in.) Rocker Arm Inside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) Rocker Arm Inside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) Rocker Arm Inside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) 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Cylinder Head Cover End 81.930-81.945 mm (3.2256-3.2262 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 8.9 mm (0.3504 in.) 8.3 mm (0.3268 in.) Piston Ring End Gap - Installed 0.33-0.61 mm (0.013-0.024 in.) Piston Ring to Groove Clearance (max) (1st) (2nd) 0.180 mm (0.0071 in.) 0.150 mm (0.0398-0.0406 in.) Piston Ring Groove Width (1st) (2nd) (oil) 1.01-1.03 mm (0.0398-0.0406 in.) 1.01-1.03 mm (0.0398-0.0406 in.) Piston Pin Outside Diameter (min) 19.98 mm (0.787 in.) CRANKSHAFT Connecting Rod (small end inside diameter) (max) 20.04 mm (0.7889 in.) Connecting Rod (big end width) 21.95-22.00 mm (0.8642-0.8661 in.) Connecting Rod (small end inside diameter) (max) 3 mm (0.12 in.) Crankshaft (web-to-web) 59.9-60.1 mm (2.358-2.366 in.) Crankshaft Runout (max) 0.08 mm (0.003 in.) Oil Pressure at 60°C (140°F) @ 3000 RPM (above) (below) 0.6 kg/cm<sup>2</sup> (14 psi) Cooling Fan Thermo-Switch Operating Temperature (off on) (on off) 120°C (248°F) 110°C (230°F) Engine Oil Thermo-Switch Operating Temperature (off on) (on off) 160°C (320°F) 140°C (284°F) 43. Piston NOTE: Steps 1-11 in the preceding sub-section must precede this procedure. 3-5 3 \* Specifications subject to change without notice. Bushing 18. ATV-0075 0735-505 3. NOTE: There should be an average operating load on the ATV when adjusting the headlight aim. Connect the bat- tery cables. All Arctic Cat ATV publications and decals display the words Warning, Caution, Note, and At This Point to emphasize important information. FOREWORD This Arctic Cat Service, maintenance, and troubleshooting information for certain 2007 Arctic Cat Service Manual contains service, maintenance, and troubleshooting information. the location of each ring for proper installation. Troubleshooting 1 2 3 4 5 6 7 8 9 10 111-1 1 SECTION 1 - GENERAL INFORMATION TABLE OF CONTENTS General System 6. This lubrication requirements of the Arctic Cat ATV front differentials and rear drives. Remove the battery hold-down bracket. Push Clip 3. 2-11 Adjusting Engine RPM (Idle) ... Store the ATV indoors in a level position. MD1132 NOTE: Loop the chain over the cylinder and secure it with a wire to keep it from falling into the crankcase. If the level drops below the lower level line, add only dis- tilled water until it reaches upper level line. VALVES AND GUIDES Valve Face Diameter (intake) (exhaust) 30.6 mm (1.20 in.) 27.0 mm (0.002-0.004 in.) 0.17-0.22 mm (0.007-0.009 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0004-0.0015 in.) 0.030-0.057 mm (0.0012-0.0022 in.) Valve Guide/Valve Stem Deflection (wobble deflection) (max) 0.35 mm (0.1959-0.1965 in.) 4.975-4.990 mm (0.1959-0.1965 in.) 4.955-4.970 mm (0.1951-0.1957 in.) Valve Stem Runout (max) 0.05 mm (0.002 in.) Valve Head Thickness (min) 0.5 mm (0.02 in.) Valve Stem End Length (min) 2.3 mm (0.09 in.) Valve Face/Seat Width 0.9-1.1 mm (0.035-0.043 in.) Valve Face/Seat Width 0.9-1.1 mm (0.035-0.043 in.) Valve Face Radial Runout (max) 0.03 mm (0.001 in.) Valve Spring Free Length (min) 38.8 mm (1.53 in.) Valve Spring Tension @ 31.5 mm (1.24 in.) (outer) 18.6-21.4 kg (41-47 lb) CAMSHAFT AND CYLINDER HEAD Cam Lobe Height (min) (intake) (exhaust) 33.13 mm (1.304 in.) 33.20 mm (1.304 in.) 33.20 mm (1.307 in.) Camshaft Journal Outside Diameter (right & center) (left) 21.959-21.980 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.6876-0.6883 in.) Camshaft Runout (max) 0.10 mm (0.004 in.) Rocker Arm Shaft Outside Diameter 11.973-11.984 mm (0.4714-0.4718 in.) Cylinder Head Distortion (max) 0.05 mm (0.002 in.) Cylinder Head Cover Distortion (max) 0.05 mm (0.002 in.) CYLINDER, PISTON, AND RINGS Piston Skirt/Cylinder Clearance 0.030-0.040 mm (0.0011-0.0015 in.) From Skirt End 87.465-87.480 mm (3.4435-3.4440 in.) Piston Ring Free End Gap (min) (1st Ring) (2nd Ring) 9.0 mm (0.35 in.) 9.5 mm (0.37 in.) Bore x Stroke 87.5 x 82 mm (3.40 x 3.22 in.) Cylinder Trueness (max) 0.05 mm (0.002 in.) Piston Ring to Groove Clearance (max) (1st) (2nd) 0.180 mm (0.0071 in.) 0.150 mm (0.0059 in.) Piston Ring Groove Width (1st) (2nd) (oil) 1.01-1.03 mm (0.0398-0.0406 in.) 1.21-1.23 mm (0.0476-0.0484 in.) 2.51-2.53 mm (0.0988-0.0996 in.) Piston Pin Bore (max) 23.03 mm (0.907 in.) Piston Pin Outside Diameter (min) 22.98 mm (0.905 in.) CRANKSHAFT Connecting Rod (small end inside diameter) (0.0382-0.0389 in.) 1.17-1.19 mm (0.046-0.047 in.) Piston Pin Bore (max) 23.03 mm (0.907 in.) (max) 23.04 mm (0.9070 in.) Connecting Rod (big end side-to-side) 0.10-0.65 mm (0.0039-0.0256 in.) Connecting Rod (big end width) 24.95-25.00 mm (0.9822-0.9842 in.) Crankshaft Runout (max) 0.08 mm (0.003 in.) Oil Pressure at 60°C (140°F) @ 3000 RPM (above) (below) 1.3 kg/cm<sup>2</sup> (18 psi) 1.7 kg/cm<sup>2</sup> (24 psi) Cooling Fan Thermo-Switch Operating Temperature (off on) (on off) (approx) 115°C (239°F) 108°C (226°F) 45. NOTE: An E (Error) in the gear position icon .. D. Turn the ignition switch to the OFF position. While holding the valve adjuster handle in place, rotate the valve adjuster dial counter- clockwise until proper valve/tappet clearance is attained. Hi/Lo switch indicates no signal or a poor ground wire connec- tion in the circuit. 2-4 Valve/Tappet Clearance (Feeler Gauge Procedure) ..... - headlight beam bright and dim. Preparation After Storage Taking the ATV out of storage and correctly prepar- ing it will assure many miles and hours of trouble- free riding. 3-72 Removing Engine/Transmission Many service procedures can be performed without removing the engine/transmission from the frame. STRAINER To check the oil strainer, use the following proce- dure. Throttle lever in the full-open position. thick) between the faces. Tighten to speci- fications (see Section 10). 2-16 Headlight/Taillight-Brakelight .... . 25. RECOMMENDED ENGINE/ TRANSMISSION OIL The recommended oil to use is Arctic Cat 4-Cycle Engine Oil or an equivalent oil which is rated SE, SF, or SG under API service classification. Using the Tachometer (p/n 0644-275), start the engine and run at 1500 RPM; ignition timing should be 10° BTDC. 2-6 Valve/Tappet Clearance (700 EFI)... ... Rotate adjustment screw #1 clockwise 1/8 turn; then lock the jam nut securing adjustment screw #1. Replace the element with a new one if it is torn. Remove the three cap screws securing the spark arrester assembly to the muffler; then loosen and remove the arrester. These oils can adversely affect clutch operation. Align the valve adjuster handle with one of the marks on the valve adjuster handle with one of the marks on the valve adjuster dial. 13. NOTE: Care should be taken not to drop the C-ring down into the crankcase. Product Service and Warranty Department Arctic Cat Inc. ! WARNING Never shift the ATV is moving as it could cause the ATV to stop sud- denly throwing the operator from the ATV. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils. Install the new brake pads. Grasp the bulb housing turn it counterclock- wise, and remove the bulb. VALVE/TAPPET CLEARANCE (700 EFI) Intake 0.10-0.20 mm (0.004-0.008 in.) Exhaust 0.20-0.30 mm (0.008-0.012 in.) AT THIS POINT If valve clearance is within specifications, proceed to step 12. B. NOTE: For the 400, the compression should be within a range of 95-115 psi in the full-open throttle position. NOTE: Steps 2-8 are for all models except the 700 EFI. Remove the E-clip securing the reverse/high/low shift linkage; then remove the linkage; then remove the linkage. If found, the brake hoses must be replaced. MD1163 11. Loosen shift rod end jam nut (A). ! CAUTION Before installing the battery, make sure the ignition switch is in the OFF position. Tighten all nuts, bolts, cap screws, and screws. 2-18 Shift Lever CHECKING ADJUSTMENT CF150B CF238A CF130A Stop the ATV completely and shift the transmission into the R position. The service technician should become familiar with the operation and construction of each component or system by carefully studying the complete manual. If the differential or differential lock system has been serviced, the differential lock cable should be checked and/or adjusted for proper free-play. Install the oil level stick until the threads touch engine case. Varying the engine RPM during the break-in period allows the compo- nents to "load" (alding the mating process) and then "unload" (allowing components to cool). Driveshaft/Coupling The following drive system components should be inspected periodically to ensure proper operation. ! CAUTION Do not over-fill the engine with oil. This manual will assist the service technician in becoming more aware of and efficient with servicing procedures. Note the location of two alignment pins. CARBURETOR Type Keihin CVK34 Main Jet 135 Slow Jet 38 Pilot Screw Setting (turns) 1 3/4 Jet Needle NAZG Idle RPM (engine warm) 1250-1350 Starter Jet 75 Float Arm Height 17 mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Gap 0.7-0.8 mm (0.028-0.032 in.) Spark Plug Cap 8000-12,000 ohms Ignition Coil Resistance (primary) (secondary) Less than 1 ohm (terminal to ground) 5200-7800 ohms (high tension - plug cap removed - to ground) S200-7800 ohms (green to blue) Less than 1 ohm (yellow to white) Less than 1 ohm (black to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to blue) 0.7-1.05 volts (yellow to white) Stator Coil Out- put (no load) 60 AC volts @ 5000 RPM (black to black #1) (black to black #2) Magneto Output (approx) 220 W @ 5000 RPM (black to black #1) (black to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to blue) 0.7-1.05 volts (green to blue) 0.7-1.05 volts (green to blue) 0.7-1.05 volts (green to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to blue) 0.7-1.05 volts (green to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to black #1) (black to black #1) (black to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to black #1) (black to black #1) (black to black #2) Magneto Coil Peak Voltage (trigger) (source) 5.04-7.56 volts (green to black #1) (black to bla Hydraulic w/Brake Lever Lock and Auxiliary Brake Tire Size Front - 25 x 8-12 Rear - 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity (front - 4x4) 275 ml (9.3 fl oz)\*\*\* Engine Oil Capacity 3.08 L (3.25 U.S. qt) Gasoline (recommended) 87 Octane Regular Unleaded Engine Oil (recommended) SAE 5W-30 Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Brake Fluid DOT 4 Taillight/Brakelight 12V/37W (2) Back to TOC Back to Section TOC NextBack1-4 General Specifications\* (500 - Manual Transmission) \* Specifications subject to change without notice. HANDLE WITH CARE. AT THIS POINT To service oil strainer, see Section 3. ! CAUTION Any oil used in place of the recommended oil could cause serious engine damage. Remove the clamp securing the air intake hose to the carburetor; then remove the housing. Tighten securely. ATV2152A 38. Gauge functioning properly. Remove the negative cable from the battery; then remove the positive cable. Measure the thickness of each brake pad. Failure to measure the valve com- ponent damage. Always wear safety glasses. 4. 1-4 General Specifications\* (500 - Manual Transmission) \* Specifications subject to change without notice. While holding the adjuster dial at the proper clearance setting, tighten the jam nut securely with the valve adjuster handle. Care must be taken whenever handle. Care must be taken whenever handle. Care must be taken whenever handle. cable from the starter motor. O-Ring 10. CC935 13. Clean any dirt or debris from inside the air cleaner. MD1213 15. Gasoline - Oil - Lubricant RECOMMENDED GASOLINE The recommended gasoline to use is 87 minimum octane regular unleaded. 14. TO PROPERLY BURNISH THE BRAKES, USE FOL- LOWING PROCEDURE: • Choose an area sufficiently large to safely accel- erate ATV to 30 mph and to brake to a stop. CARBURETOR Type Keihin CVK36 Main Jet 132 Slow Jet 40 Pilot Screw Setting (turns) 1 1/4 Jet Needle NFKS Idle RPM (engine warm) 1250-1350 Starter Jet 85 Float Arm Height 17 mm (0.7 in.) Throttle Cable Free-Play (at lever) 3-6 mm (1/8-1/4 in.) ELECTRICAL Ignition Timing 10° BTDC @ 1500 RPM Spark Plug Gap 0.7-0.8 mm (0.028-0.032 in.) Spark Plug Cap 4000 ohms (high tension - plug Cap removed - to ground) Ignition Coil Peak Voltage (primary/ CDI) 142.4-213.6 DC volts (terminal to ground) Magneto Coil Resistance (trigger) (source) 4.2-6.3 volts (green to blue) Less than 1 ohm (black to black) Magneto Coil Peak Voltage (trigger) (source) 4.2-6.3 volts (green to blue) 0.40-0.62 volt (yellow to white) Less than 1 ohm (black to black #1)

(black to black #2) Magneto Output (approx) 325W @ 5000 RPM CHASSIS Brake Type Hydraulic w/Brake Lever Lock and Auxiliary Brake Tire Size Front - 25 x 10-12 Tire Inflation Pressure 0.35 kg/cm<sup>2</sup> (5 psi) MISCELLANY Gas Tank Capacity (rated) 24.6 L (6.5 U.S. gal.) - TBX/ TRV Coolant Capacity 2.9 L (3.0 U.S. qt) Differential Capacity 275 ml (9.3 fl oz)\*\* Rear Drive Capacity 250 ml (8.5 fl oz)\*\*\* Engine Oil (recommended) SAE 5W-30 Differential/Rear Drive Lubricant SAE Approved 80W-90 Hypoid Belt Width 35.5 mm (1.40 in.) Brake Fluid DOT 4 Taillight/Brakelight 12V/8W/27W Headlight 12V/27W (2) 9. 41. ! CAUTION When removing camshaft holders, use extreme care not to drop alignment pins into the engine. For the 500/650 H1, the compression should be within a range of 70-85 psi in the full-open throttle position. ! WARNING Anytime service is performed on a battery, the fol- lowing must be observed: keep sparks, open flame, cigarettes, or any other flame away. Secure the caliper to the knuckle and/or axle housing with the cap screws. Account for the washers. Remove the piston. If clearance is not within specifica- tions, loosen the jam nut and rotate the tappet adjuster screw until the clearance is within specifica- tions. TABLE OF CONTENTS Foreword Click on the red text to go. 2-26 14. ATV0082A 737-651B 4. 2-12 Engine/Transmission Oil - Filter - Strainer OIL - FILTER Change the engine oil and oil filter at the scheduled intervals. DO NOT SMOKE while filling the gas tank. Secure the drive face with a nut. Remove the seat. CC550 NOTE: The arrow on the V-belt should point for- ward. Remove the right-side footrest (see Section 8). Drive System 7. FI039A 3. 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. 1-8 Break-In Procedure A new ATV and an overhauled ATV engine require a "break-in" period. 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. below the threads of the plug. ! CAUTION If the camshaft passageway is not plugged, tappet shims could fall into the engine crankcase. Using the measurements obtained in step 2, make horizontal marks on the aiming surface. Spline lateral movement (slop). Using compressed air, blow any debris from around the spark plug. 10. The technician should use discretion and sound judgment. Arctic Cat offers additional publications (when they become available) to aid in servicing other ATV models. Rotate the shift rod (4) until the shifter is directly aligned with the Neutral position on the shift gate. 1-9 1 OILCHARTC RECOMMENDED FRONT DIFFERENTIAL/REAR DRIVE LUBRICANT The recommended lubricant is Arctic Cat Gear Lube or an equivalent gear lube which is SAE approved 80W-90 hypoid. ! WARNING Always fill the gas tank in a well-ventilated area. 0411-828 0411-837 1411-502 1411-311 Air Cleaner/Filter The air filter inside the air filter housing must be kept clean to provide good engine power and gas mileage. CC007DB 4. ! 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. 2-19 Electrical . Observe each headlight beam aim. Secure the ATV on a support stand to elevate the wheels. 39. To adjust idle RPM, use the following procedure. • Accelerate to 0-5 mph. Disconnect the crankcase vent hose from the air cleaner housing. A fire hazard could Connections materialize. If the ATV is used under normal condi- tions, service the filter at the intervals specified. Refer to the appropriate Illustrated Parts Manual for the cor- rect part number, quantity, and description. 1-1 1 SECTION 1 - GENERAL INFORMATION TABLE OF CONTENTS General Specifications (400/400 TRV - Automatic Transmission). Wipe any accumulation of oil or gas from the filter housing and one-way drains. Dirt and dust may get inside the engine if the ele- ment is torn. Plug the exhaust hole in the exhaust system with a clean cloth. 1-8 Genuine Parts ..... . Remove the high tension lead from the spark plug. Checking/Replacing V-Belt REMOVING CAUTION Do not allow the connecting rod to go down inside the crankcase. MC1192 9. Shift Lever Cable End E. TAILLIGHT-BRAKELIGHT To replace the taillight-brakelight bulb, use the fol- lowing procedure. VALVES AND GUIDES Valve Face Diameter (intake) (exhaust) 30.6 mm (1.20 in.) 27.0 mm (1.06 in.) Valve/Tappet Clearance (cold engine) (intake) (exhaust) 0.05-0.10 mm (0.002-0.004 in.) 0.22-0.27 mm (0.009-0.011 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) Valve Guide/Stem Clearance (intake) (exhaust) 0.010-0.037 mm (0.0012-0.0022 in.) 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Valve Stem Runout (max) 0.05 mm (0.0 45° 45° Valve Face Radial Runout (max) 0.03 mm (0.001 in.) Valve Spring Free Length (min) 38.8 mm (1.23 in.) Valve Spring Tension @ 32.5 mm (1.28 in.) (outer) 18.6-21.4 kg (41-47 lb) CAMSHAFT AND CYLINDER HEAD Cam Lobe Height (min) (intake) (exhaust) 32.830 mm (1.293 in.) 32.830 mm (1.293 in.) Camshaft Journal Oil Clearance (max) 0.15 mm (0.0059 in.) Camshaft Journal Holder Inside (right & center) (left) 22.012-22.025 mm (0.8666-0.8671 in.) 17.512-17.525 mm (0.8645-0.8654 in.) 17.466-17.484 mm (0.6876-0.6883 in.) Camshaft Runout (max) 0.10 mm (0.004 in.) Rocker Arm Inside Diameter 12.000-12.018 mm (0.472-0.473 in.) Rocker Arm Shaft Outside Diameter 11.973-11.984 mm (0.4714-0.4718 in.) Cylinder Head Distortion (max) 0.05 mm (0.002 in.) Cylinder Head Distortion (max) 0.05 m Bore 82.000-82.015 mm (3.2283-3.2289 in.) Piston Diameter 15 mm (0.6 in.) from Skirt End 81.930-81.945 mm (0.3266 in.) Bore x Stroke 82 x 71.2 mm (3.29 x 2.80 in.) Cylinder Trueness (max) 0.05 mm (0.002 in.) Piston Ring End Gap - Installed 0.33-0.61 mm (0.013-0.024 in.) Piston Ring to Groove Clearance (max) (1st) (2nd) 0.180 mm (0.0398-0.0406 in.) 1.01-1.03 mm (0.0398-0.0406 in.) 2.01-2.03 mm (0.0791-0.0799 in.) Piston Ring Thickness (1st) (2nd) 0.97-0.99 mm (0.0381-0.0389 in.) 0.97-0.99 mm (0.0381-0.0389 in.) Piston Pin Bore (max) 20.03 mm (0.789 in.) Piston Pin Outside Diameter (min) 19.98 mm (0.787 in.) CRANKSHAFT Connecting Rod (big end width) 21.95-22.00 mm (0.8642-0.8661 in.) Connecting Rod (small end deflection) (max) 3 mm (0.12 in.) Crankshaft (web-to-web) 59.9-60.1 mm (2.358-2.366 in.) Crankshaft Runout (max) 0.08 mm (0.003 in.) Oil Pressure at 60°C (140°F) @ 3000 RPM (above) (below) 1.1 kg/cm<sup>2</sup> (16 psi) 1.5 kg/cm<sup>2</sup> (21 psi) Cooling Fan Thermo-Switch Operating Temperature (off on) (on off) 120°C (248°F) 110°C (230°F) Engine Oil Thermo-Switch Operating Temperature (off on) (on off) 160°C (320°F) 140°C (284°F) 42. 51. Protect skin and clothing when han- dling a battery. Remove a front wheel. To verify ignition timing, use the following procedure. CC937 NOTE: After disconnecting the oil cooler hoses, plug them to prevent leakage from the cooler. Install the tappet on the appropriate valve; then install the camshaft. With the differential lock selector in the UNLOCK position, slide one end of the ring out of the ring out of the ring-groove. Stamped Nut 5. To replace the brake pads, use the following pro- cedure. 55. ! CAUTION Avoid storing outside in direct sunlight and avoid using a plastic cover as moisture will collect on the ATV causing rusting. Check the thickness of each of the brake pads as follows. Place the filter assembly in the air filter housing making sure it is properly positioned and prop- erly seated with the filter screen down. 2-23 2 CC550 INSTALLING 1. 2-8 FI041A NOTE: Rotating the engine ensures that any trapped oil is squeezed from the tappets and tap- pet shims. Note that the two cap screws on the left (spark plug) side. Also, the coolant level should be checked periodically. CF145C CD710C 400/400 TRV/500 Auto 400/500 Manual 650 H1 TBX/650 H1 TBX/650 H1 TRV 700 EFI ! CAUTION Always replace a blown fuse with a fuse of the same type and rating. NOTE: Install a new O-ring each time the filter is replaced. 3-14 Removing Top-Side Components ..... Although it is essential to place some stress on the engine components during break-in, care should be taken not to overload the engine will stop. 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. Apply oil to a new filter O-ring and check to make sure it is positioned correctly; then install the new oil filter. Remove the battery from the ATV. CF143A 3. Engine/Transmission 4. Account for the bushing and washer. 2-15 Driveshaft/Coupling. .. The first 10 hours (or 200 miles) are most critical to the life of this ATV. Identify the valves that are not within specifica- tions; then remove the corresponding camshaft (see Section 3 - Removing Top-Side Compo- nents). ! WARNING Always wear safety glasses when using compressed air. E-Ring 400/500 Manual Transmission KEY 1. ! CAUTION Prior to storing the ATV, it must be properly serviced to prevent rusting and component deterioration. On the 500/650 H1/700 EFI, raise the storage compartment cover; then slide the cover forward and off the compartment. Spring 7. 13. 3-10 Specifications\* (700 EFI) \* Specifications subject to change without notice. Remove the cap screws securing the caliper holder to the knuckle; then remove the pads. 3-2 Specifications (400 - Automatic Transmission)....... Ignition switch — engine will start. If operated in dusty, wet, or muddy conditions, inspect and service the filter more frequently. Keep this manual accessible in the shop area for reference. NOTE: At this point, the rocker arms and adjuster screws must not have pressure on them. CC119D 15. Valve clearance must be within specifications. Drain the oil into a drain pan by removing in turn the drain plug from each. ATV-0070C 7. 1-4 General Specifications (500 - Automatic Transmission)..... .....1-5 General Specifications (650 H1/650 H1 TBX/650 H1 TRV)..... . In many areas, oxygenates (either ethanol or MTBE) are added to the gasoline. ! CAUTION This hydraulic brake system is designed to use DOT 4 brake fluid only. • This procedure burnishes the brake pads. 2-17 2 CF135A 2. Pull the bulb straight out of the socket; then insert a new bulb. DO NOT get water into any part of the engine or air intake. Electrical Connections The electrical connections should be checked peri- odically for proper function. CF105A 2. ! CAUTION When removing the cylinder, be sure to support the piston to prevent damage to the crankcase and pis- ton. Take care not to drop it into the crankcase. Shock absorber spring not broken or sagging. 2-13 2 ATV-0100 14. 2-3 ... NOTE: At this point the clutch should be adjusted correctly. NOTE: The oil level stick should not be threaded into the case for checking the oil level. Install the timing inspection plug. Cap Screw 13. KX045A 2. Use a feeler gauge to check the gap. Clean the ATV thoroughly Battery. by washing dirt, oil, grass, and other foreign matter from the entire ATV. Using an awl, rotate the C-ring in its groove until it is out of the cylinder head; then remove the C-ring. If replacement or repair constitutes removal, see Sec- tion 8. 3-13 3 CC120D NOTE: Use cable ties or tape to secure the car- buretor assembly above the handlebar to keep it from interfering with the removal procedure. If ignition timing cannot be verified, the rotor may be sheared, the trigger coil/CKP sensor bracket may be faulty. On carbureted models, drain the carbureted models, drain the carbureted models of the trigger coil/CKP sensor bracket may be faulty. (fiber) Thickness (min) 2.62 mm (0.103 in.) Drive Plate (fiber) Tab 13.25-13.95 mm (0.52-0.55 in.) Driven Plate (warpage) (max) 0.1 mm (0.004 in.) Clutch Shoe No groove at any part Clutch Engagement RPM 1700 ± 200 Clutch Lock-Up RPM 3400 - 4000 Primary Reduction Ratio (1.33 (17/15) Final Reduction Ratio (1.33 (17/15) Fina 1.095 (23/21) 0.913 (21/23) 2.833 (34/12) Engine Fork to Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) Secondary Transmission Fork to Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) Secondary Transmission Fork to Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) Secondary Transmission Fork to Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) Secondary Transmission Fork to Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) Secondary Transmission Fork to Groove (side clearance) 0.1-0.3 mm (0.004-0.012 in.) 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Disconnect the speed sensor lead from the wiring harness. Add coolant as necessary. Secure the front fender to the footrest with the two cap screws. During the break-in period (or whenever the brake pads are replaced), the hydraulic brake pads are replaced), the hydraulic brake pads are replaced until brake pads are replaced. removed prior to removing the air cleaner housing. AR600D AR604D 19. When the sight glass changes from dark to light, refill the reservoir before the bleeding procedure is continued. Dry the filter. Note the AT THIS POINT information in each sub-section. Remove the cover and fill the reservoir with DOT 4 Brake Fluid. Handlebar not bent, cracked and has equal and complete full-left and full-right capabil- ity. 1-8 Gasoline - Oil - Lubricant ..... . Tighten all nuts, bolts, cap screws, and screws making sure all calibrated nuts, cap screws, and bolts are tightened to specifications (see Section 10). Spread the faces of the driven .... 2-9 Spark Plug.. ..... 1-9 Preparation After Storage..... clutch by pushing the inner face toward the engine while turning it counterclockwise; then when the faces are sepa- rated, insert a wedge (approximately 3/8 in. 1-7 Break-In Procedure ...... .. ! CAUTION On the 700 EFI, do not ground the spark plug on the cylinder head .. 23 3-8 \* Specifications subject to change without notice. Note the three digit number on the surface of the tappet shim; then refer to the appropriate tappet shim; then refer to the appropriate tappet shim selection table at the end of this section for the correct replacement. most intense beam is centered on the vertical mark 5 cm (2 in.) below the horizontal mark on the aiming surface. Account for the opposite-side circlip. Using a feeler gauge, check each valve/tappet clearance. Removing Top-Side Components A. Install the valve timing inspection plug and tighten securely: then install the recoil starter assembly and secure with the four cap screws coated with blue Loctite #242. Make sure bat- tery venting is not obstructed. Make certain that the vent hose is securely connected to the carburetor/throttle body and the opposite end is always open. 3-3 3 Specifications\* (400 - Automatic Transmission) \* Specifications subject to change without notice. Make sure rivets holding components together are tight. Account for the spacer. NOTE: Rotating the engine ensures that any excess oil is squeezed from the tappets and tappet shims. 7. Turn the ignition switch to the ON position; then move the shift arm (3) until the Neutral icon (N) appears on the LCD. ! WARNING Do not attempt to remove the bulb when it is hot. Using an awl, remove one piston-pin circlip. Handlebar grips not worn, broken, or loose. Measure the distance from the floor to the mid-point of each headlight. AT THIS POINT To service valves and cylinder head, see Servicing Top-Side Components sub-section. 3-56 Joining Crankcase Halves...... . AL611D 2. Adjusting Engine RPM (Idle) NOTE: The idle RPM is not adjustable on the 700 EFI. At the intervals shown in the Peri- odic Maintenance Chart, clean the spark arrester using the following procedure. 2-25 2 Exhaust Chart NOTE: Use this chart in conjunction with the procedure found in Valve/Tappet Clearance (700 EFI) in this section. 11. Apply light oil to the components using the following list as reference. Do not idle the engine for excessively long periods of time. Steering/Frame 9. To properly burnish the brake pads, use the following procedure. CD003 CC934 12. NOTE: Never reuse a lock nut. 2-2 Periodic Maintenance Chart A = Adjust I = Inspect C = Clean L = Lubricate D = Drain R = Replace \* Service/Inspect more frequently when operating in adverse conditions. Tighten the nut to specifications (see Section 10). Steering post bearing assembly/bearing hous- ing not broken, worn, or binding. 733-441A 4. Place the strainer cap into position on the strainer making sure the O-ring is properly installed; then secure with the cap screws. ATV-0051 Adjust the gap to 0.7-0.8 mm (0.028-0.032 in.) for proper ignition. ATV-0109 6. The brakelight should illuminate. CC940 Top-Side Components which need to be addressed and to service only those components. Troubleshooting 1 2 3 4 5 6 7 8 9 10 11 3. CF178A 8. MD1136 MD1137 54. CC091D 3. ! CAUTION The one-way drain to the right is the clean air sec- tion of the filter housing. 3-6 Specifications\* (500 - Automatic Transmission) \* Specifications subject to change without notice. HEADLIGHT NOTE: The bulb portion of the headlight is frag- ile. They are precision- made to ensure high quality and correct fit. See the following viscosity chart for details. While holding the chain, slide the sprocket and camshaft out of the cylinder head. Do not use oils which contain graphite or molybdenum additives. Remove the cam chain tensioner by lifting it from the ... Remove the cam chain tensioner pivot cap screw and washer. 2-16 Suspension/Shock Absorbers/Bushings The chain cavity; then remove the two lower nuts securing the cylinder head to the cylinder, one in front and one in rear. The front drive actuator should operate engaging four-wheel drive. 3-14 Left-Side Components ..... following suspension system components should be inspected periodically to ensure proper operation. If the piston rings must be removed, remove them in this sequence. Always make sure that the oil level is above the "L" mark but not higher than the "F" mark. Allow the ATV to dry thoroughly. Tighten the jam nut against the throttle cable adjuster securely; then slide the rubber boot over the adjuster. AT THIS POINT To service any one specific components may be necessary. CC163D 4. Lift the cylinder off the crankcase taking care not to allow the piston to drop against the crankcase. 5. When filling the cooling system, use premixed Arc- tic Cat Antifreeze. Valve/Tappet Clearance (700 EFI) To check and adjust valve/tappet clearance, use the following procedure. Shift Plate 4. 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. 3-11 3 Table of Contents (400 - Manual Transmission) Removing Engine/Transmission..... . Steering Components The following steering components should be inspected periodically to ensure safe and proper operation. Present shim size horizontal row at the top. Install the storage compartment; then secure with the reinstallable rivets. Valve not bent or burned. Linkage 17. Mark the valve tappets in order to return them to the proper position during assembly. 2-4 Fuses The fuses are located in a power distribution module under the seat. Push the upper shift axle down completely. Follow the direcparts of the ATV. Never add fuel to the ATV gas tank near any open flames or with the engine running. Oil trapped in these areas could result in a false valve clearance reading. At the time of publication, all information, photographs, and illustrations were technically correct. 3.

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