2003 CH2

Owners / Service Manual

“CHAMPIONS START HERE”

For **parts orders** contact your local dealer

To locate your closest Cobra dealer
log on to
www.cobramotorcycle.com
or call
(330) 549-9600

If you need **technical assistance**
contact your local dealer or call
the Cobra Technical Support Hotline at
(330) 549-9603

Cobra Motorcycle MFG., Inc.
11511 Springfield Road
North Lima, Ohio 44452

MCCH2003.1

DISCLAIMER OF WARRANTY

This motorcycle is sold "as is" with all faults, obvious or not. There are no warranties expressed or implied, including any warranty of merchantability and warranty of fitness for any particular purpose.

"WARNING"

THE COBRA CH2 IS A COMPETITION MODEL ONLY AND IS NOT MANUFACTURED FOR, NOR SHOULD IT BE USED ON PUBLIC STREETS, ROADS OR HIGHWAYS.

THE USE OF THIS BIKE SHOULD BE LIMITED TO PARTICIPATION IN SANCTIONED COMPETITION EVENTS UPON A CLOSED COURSE BY A SUFFICIENTLY SKILLED RIDER AND SHOULD NOT BE USED FOR GENERAL OFF-ROAD RECREATIONAL RIDING.

IMPROPER USE OF THIS MOTORCYCLE CAN CAUSE INJURY OR DEATH.

THIS BIKE IS INTENDED FOR EXPERIENCED RACERS ONLY AND NOT FOR BEGINNERS.

IT IS YOUR RESPONSIBILITY AS THE OWNER OF THIS COBRA MOTORCYCLE OR AS THE PARENT, OR LEGAL GUARDIAN OF THE OPERATOR, TO KEEP THIS COBRA MOTORCYCLE IN PROPER OPERATING CONDITION.

THIS BIKE WAS DESIGNED FOR RIDERS THAT WEIGH LESS THAN 80 LBS WITH FULL RIDING GEAR AND SHOULD NOT BE OPERATED BY RIDERS THAT WEIGH MORE THAT.

BE SURE THAT THE RIDER ALWAYS WEARS ADEQUATE SAFETY GEAR EVERYTIME HE OR SHE RIDES THEIR COBRA MOTORCYCLE.

IMPORTANT SAFETY NOTICE

⚠ WARNING

Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

CAUTION:
A CAUTION indicates special precautions that must be taken to avoid damage to the machine.

NOTE:
A NOTE provides key information to make procedures easier or clearer.

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General Information

Specifications - General

Items	CH2
Dimensions	
Wheelbase	41” (1040 mm)
Wheel size	10” (254 mm) rear, 12” (305 mm) front
Seat height	26” (660 mm)
Engine	
Type	2-stroke, single cylinder, reed valve
Cooling system	Liquid-cooled
Displacement	49.8 cc
Bore and stroke	39 mm x 41.7 mm
Ignition system	Digital Electronic
Spark plug	Champion C53, NGK B11EGV
Gap	0.023” – 0.025” (0.58 – 0.64 mm)
Fuel type	*Sunoco MO2$_X$* or 93 octane pump gasoline
	OTHER RACE FUELS ARE NOT RECOMMENDED
Oil type	*Cobra Venom 2-cycle Race Oil*
Fuel / oil mix ratios	Between 32:1 and 40:1 (after engine Break-In is complete)
Ignition timing	Fixed
Carburetion	19 mm Dell’Orto PHBG - PS
Main jet	90
Slow (Pilot) jet	48
Float height	16mm $\pm$ 0.5mm (0.63” $\pm$ 0.020”
Transmission	
Speed	Single
Clutch	3 shoe centrifugal
Final drive ratio	10/39 T
Transmission / clutch oil type	*Cobra Venom 3 Shoe Clutch Milk,* or Dexron III
Quantity	250 ml (8.5oz)

Chassis	
Front tire	2.50 - 12
Pressure	15 psi minimum
Rear tire	2.75 - 10
Pressure	15 psi min. (20 psi for hard pack or rocky conditions)
Front fork	Marzocchi 32mm
Fork oil type	SAE 20 weight
Fork oil amount	200 ml (6.8 oz) oil change, 220 ml (7.4 oz) rebuild
Fork oil height	70 mm (2.75”) collapsed from top with spring (no spacer)

Break-In Procedure

Your Cobra CH2 is a close-tolerance high performance machine and break-in time is very important for maximum life and performance. The CH2 can be ridden hard after the first ½ hour break-in time but it is recommended that no adjustments are made to the carburetion or suspension until the full 8 hours of bike break-in has elapsed. Also, after the engine, transmission, and drive train have been broken-in for the full 8 hours, the bike will be faster!

Fill the fuel tank with 93 octane pump gas, or *Sunoco* $MO2_X$ without oil. Also, fill the oil injection reservoir with Cobra's specially formulated *Cobra Venom 2-cycle Race Oil*. (Part # MCMUOL02)

CAUTION:
Failure to use proper fuel or oil may result in premature engine wear, or damage to the machine.

Adhering to the following break-in schedule will result in long lasting high performance machine.

- First ½ hour of operation
  - Follow the starting procedure listed in this manual.
  - Avoid prolonged operation at Wide Open Throttle.
- After 1 hour of operation
  - Check for loose bolts and nuts on the bike and retighten as necessary (proper toque values are listed under Specifications).
  - Clean the carburetor bowl.
  - Change the transmission / clutch lubricant.
- After 8 hours of operation
  - Change the fork oil.
  - Have a Certified Cobra Mechanic change the shock oil.
- Your bike is now ready for the highest level of competition!

Starting Procedure

Before starting the machine inspect the following:

- Fill the 2-stroke injector oil reservoir with Cobra's specially formulated *Cobra Venom 2-cycle Race Oil*.
- Insure that the fuel tank contains an adequate volume of fuel to complete the distance required. (*Sunoco MO2X* or 93 octane pump gas).
- Check for proper tire pressure in both tires.
- Observe the chain tension and adjust if necessary.
- Observe the coolant level and fill if necessary.
- Verify that the chain rollers do not have improper wear.
- Inspect the frame for;
  - Cracks in the metal.
  - Cracking paint which might indicate overly stressed material.
- Verify that the handlebars are tight.
- Check the throttle for;
  - Smooth operation and sound closing.
  - Frayed strands of the cable inside the throttle housing.
- Check for loose bolts and nuts, and re-torque as necessary.
- Verify that the air filter is clean and properly saturated with oil.
- Turn the fuel on by rotating the fuel petcock knob to the vertically downward position (reserve position is horizontally forward).

CAUTION:
For best results from your Cobra Motorcycle use only the recommended fuels. Testing has shown that most 'race' fuels actually degrade performance.

When your pre-ride inspection is complete the bike may be started. For a cold engine follow this procedure.

1. Place the motorcycle on a stand of sufficient strength that positions the motorcycle in a level upright position with the rear wheel off the ground.
2. On the carburetor, flip the black choke knob upward from the right side of the bike.
3. Kick start the engine by kicking the lever forward.
4. Rev the engine in short spurts, turning the throttle no more than 1/4 open until the engine will run without the choke.
5. Verify a functional engine shut-off switch by shutting off the engine.
6. Restart the engine and proceed with riding when the engine is sufficiently warm (i.e. the side of the cylinder is warm to touch).

CAUTION:
Never rev an engine full throttle when it's cold or slightly warmed up. Cobra recommends that you tell your child to take it easy the first couple of minutes in practice until the engine comes up to full operating temperature. Make sure your engine is properly warmed up before racing.

General Tips

1. Always wear a helmet and other protective riding gear.
2. Cobra recommends that you tell your child to take it easy the first couple of minutes in practice until the engine comes up to full operating temperature.
3. Make sure your riders' foot is not resting on the foot brake while they are riding.
4. Evaluate the bikes jetting only after it has been warmed up to race temperatures.
5. A properly maintained machine is safer, faster, and more fun to ride.
6. When washing the bike, be careful to not directly aim the hose at the bottom edge of the seat, or water is apt to enter the airbox.

Maintenance

Schedule & Tips

It is important that you adhere to this maintenance schedule so as to promote the longevity of your Cobra Motorcycle.

- Between each ride
  - Fill the 2-stroke injector oil reservoir.
  - Check the air filter (clean and re-oil as necessary).
  - Insure the smooth operation of the throttle cable (throttle soundly 'clacks' shut).
  - Check for frayed strands of the throttle cable inside the throttle housing and replace if necessary.
  - Check for adequate tire pressures and adjust if necessary.
  - Check all nuts and bolts for proper torque and re-torque if necessary.
  - Spray all moving parts with WD40 or other light oil.
  - Check drive chain for
    - Proper tension and adjust if necessary.
    - Adequate lubrication and lubricate if necessary.
  - Insure that the ignition stator and rotor are clean and dry.
  - Check the frame for cracks in the metal or cracks in the paint that might indicate that the metal has been stressed beyond it's safe limits. Replace or get properly rewelded as necessary.
  - Fill the 2-stroke injector oil reservoir with Cobra's specially formulated *Cobra Venom 2-cycle Race Oil*.
- Every 2 hours of operation
  - Replace the transmission oil.
- Every 10 hours of operation
  - Replace the fork oil.
  - Have the shock oil replaced by a Certified Cobra Mechanic.

CAUTION:

1. If you ever need to weld anything on the bike, disconnect the spark plug cap, unplug the ignition, disconnect the kill switch, scrape the paint bare near the area to be welded and put the ground clamp as close to the area to be welded as possible.

⚠ WARNING

Be sure the fuel tank and carburetor have been removed and safely located away from the welding process.

2. The frame is 4130 Chrome Moly and it is important to weld it with the proper rod and heat settings set as light as possible. Cobra recommends replacing the frame with a new one if the old one becomes damaged.

M1: Replacing Transmission / Clutch Lubricant

Tools needed:

- 250 ml (8.5oz) *Cobra Venom 3 Shoe Clutch Milk* (Part # MCMUGF01) or Dexron III Automatic Transmission Fluid
- #3 Phillips screwdriver
- large flat blade screwdriver or coin

Procedure:

1. Begin this procedure with a bike that has been ridden more than 5 minutes but less than 10 minutes. It is desired to have the engine warm enough so that the oil 'runny' but not so hot that there is risk of being burned by the engine or the oil.

⚠ WARNING

Hot oil and hot components on the motorcycle may cause burns.

2. Lean bike against something or set on stand with oil drain hole.
3. Using Phillips screwdriver, remove the oil drain bolt located on the right side of the engine (figure 1).

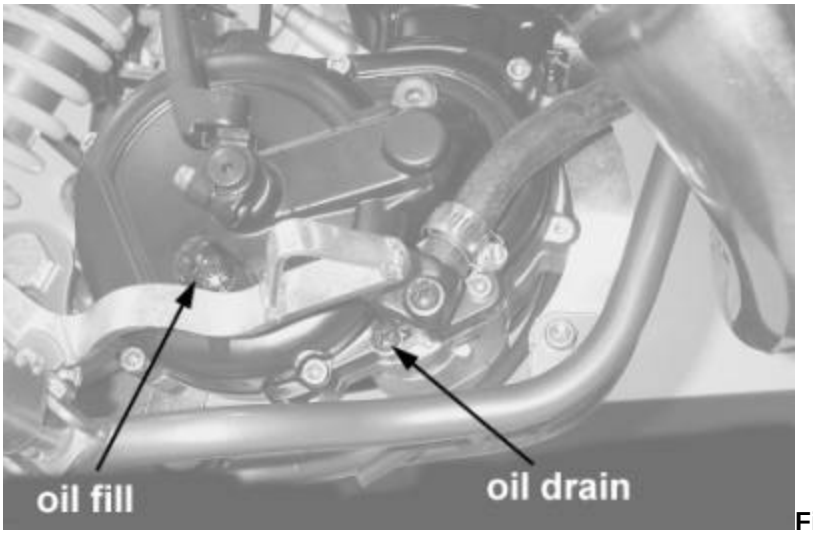


Figure 1

NOTE: You may need to adjust the brake pedal (up or down) to gain access to the drain bolt.

4. After it has drained, reinstall the drain screw with gasket.
5. Refill oil from oil fill plug 250 ml (8.5oz) *Cobra Venom 3 Shoe Clutch Milk* (Part # MCMUGF01), or Dexron III Automatic Transmission Fluid, thru the fill plug.

NOTE: Leaning the bike over onto it's left hand side will facilitate the oil filling procedure.

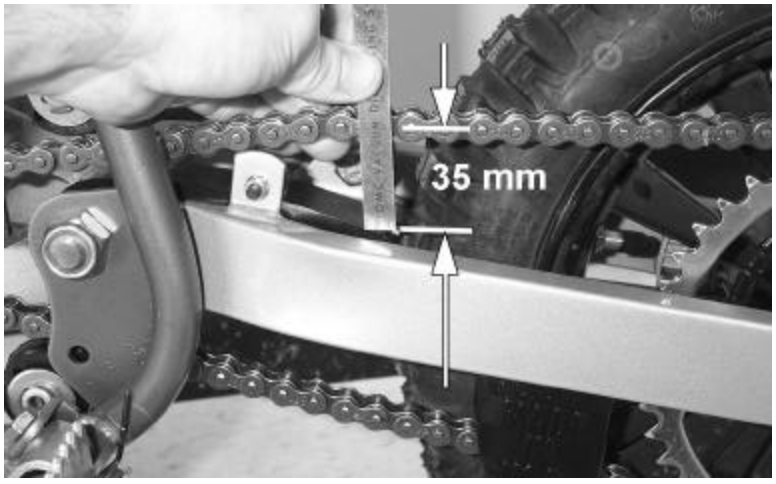
6. Reapply the oil fill screw, securely, being sure the gasket is in place.

CAUTION:
Cobra has spent considerable time and money developing the proper lubrication to handle the harsh environment of the automatic clutch and transmission of this motorcycle. Cobra was forced to put forth this effort because the other available options and not adequate. Cobra's specially developed *Cobra Venom 3 Shoe Clutch Milk* (Part # MCMUGF01) is the recommended lubricant for your CH2 motorcycle.

M2: Chain adjustment

Tools required for chain adjustment

- Two 19 mm wrenches or sockets
- 13 mm wrench or socket



1. Make sure that the rear wheel is aligned properly.
2. For proper adjustment, the chain should have 35 mm (1 3/8") free movement just behind the chain block with no load on the bike (figure 2)

Figure 2

CAUTION:
Verify that the chain has a minimum of 6mm (1/4") free movement when the suspension is collapsed.

3. If the chain requires adjusting, loosen the axel with a pair of 19 mm wrenches and tighten the chain by rotating the adjuster bolts clockwise (CW) or loosen the chain by rotating the adjuster bolts (CCW).
4. Retighten the axel bolt to 25 ft-lb (34 Nm).

Figure 3

M3: Fork Oil Replacement

Tools required

- 5 & 6 mm Allen wrench
- 19 mm wrench or socket (two required)
- Spring clip remover

Disassembly

1. Remove the front wheel.
2. Remove the fork legs from the triple clamps.
3. Perform the following on one leg at a time.
4. Using your hands, remove the black rubber plug from the top of the fork leg exposing the white plastic cap.
5. Secure the fork leg assembly in a vice by gripping the leg across the flats through which the axle bolt goes through.
6. Depress the white plastic cap inwards (down) and remove the wire spring clip from its groove.
7. Remove the white cap, the fork spring preload sleeve, and the fork spring.

NOTE: Depressing the fork leg will facilitate removing the white cap.

8. The fork can now be turned upside down and drained.

Assembly

1. Fill the leg with 200 cc (6.8 oz) 20 wt fork oil.
2. Standard fork oil level is 70 mm (2.75”) from the top edge with the fork collapsed.

NOTE: Remove the preload sleeve but leave the spring in for the measurement.

3. Install the preload sleeve.
4. Install and depress the white cap while installing the spring clip.
5. Fork may be reinstalled.

M4: Clutch Adjustment

Tools required

6 mm hex key (Allen wrench)
large flat blade screw driver

Process

1. Remove the clutch adjustment access plug (6mm hex key).

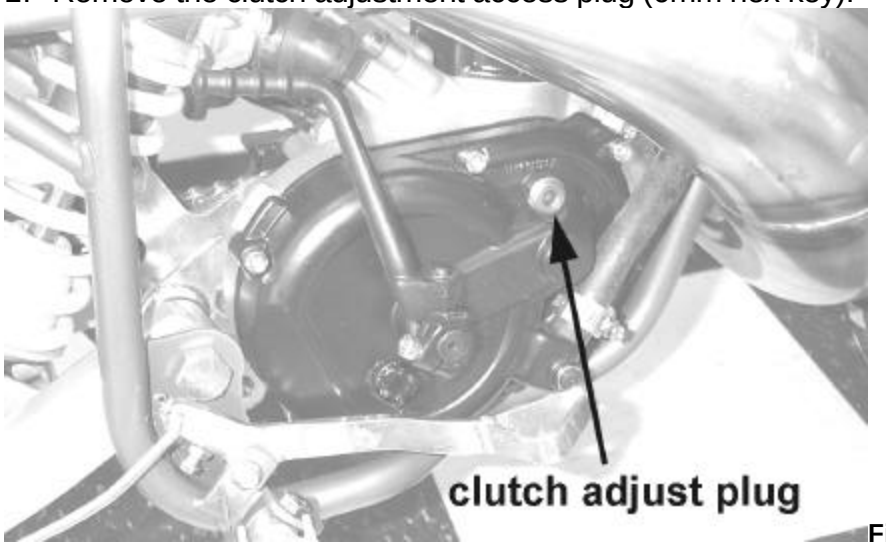


Figure 4

2. Using the kick lever, turn the engine over (rotate the crank) until one of the large flat head screws is visible through the access hole (this flat head screw is one of the three adjusters).

NOTE: Turning the adjusting screw Counter Clock Wise (CCW) will allow the shoe to engage at a lower RPM, this is the direction you should adjust to compensate for shoe wear. Alternatively, a Clock Wise (CW) adjustment of the screw will allow the clutch to engage at a higher RPM.

3. Subsequently use the kick lever to rotate the crank and expose the other two clutch shoe adjusters and adjust them by the same amount.

CAUTION:
Be sure to adjust each of the three shoe adjustors by the same amount.

4. Reinstall the clutch adjust access plug (10 ft-lb, 14 Nm).

Engine Service / Parts

Factory trained technicians with precision gauging and proper assembly fixtures carefully assemble all Cobra engines to specific clearances. If you feel you have the skills, and the appropriate tools, to perform the following service tasks please follow the instructions closely. The part numbers are listed throughout to help you when ordering parts from your local Cobra dealer.

If you don't feel comfortable with the service work, simply take your engine out of the frame and sent it to:

Cobra Precision Engines
11511 Springfield Road
North Lima, Ohio 44452

Cobra's technicians will go through the entire engine, replacing gaskets, bolts, any old part that is worn. The engine will be rebuilt using the same precision gauging and assembly fixtures as when it was assembled new. Before leaving, the engines performance will be measured on a dynamometer to ensure that your engine is operating at its highest potential. All this for one low nominal fee, plus cost of parts. Call (330) 549-9603 for details.

ES1: Top End Parts

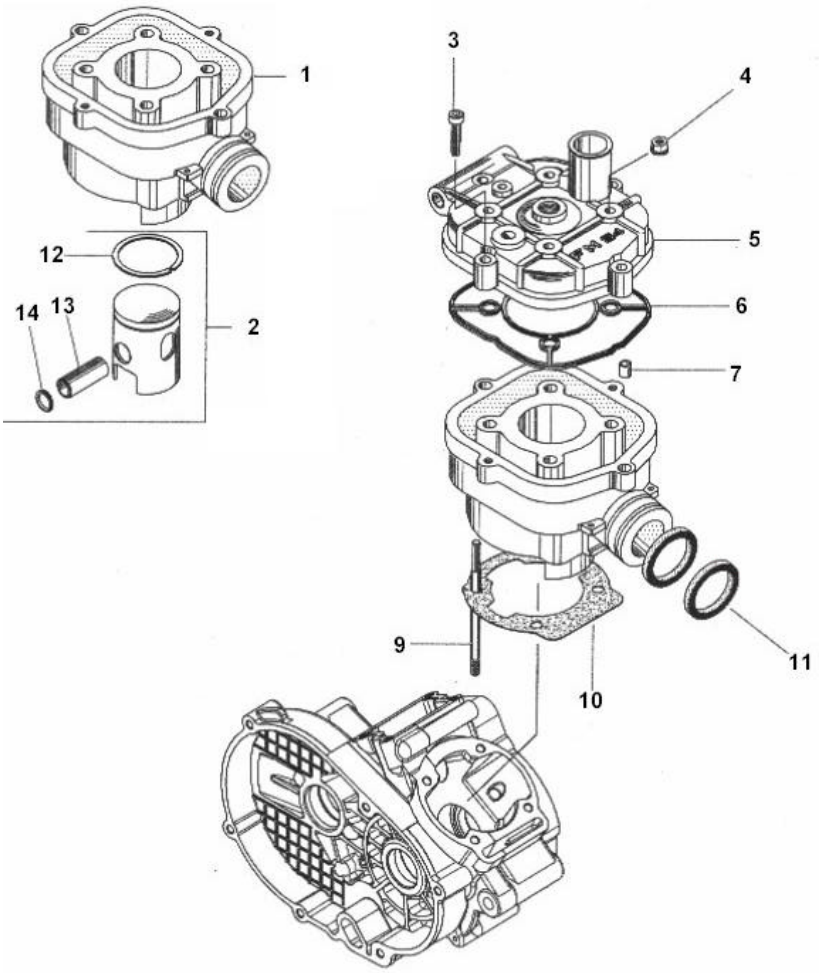


Figure 5, Top End Components

REF NO	PART NO	DESCRIPTION
1	ECMOTE01	CYLINDER - CHROME
2	ECMOTE02	PISTON KIT - SINGLE RING
3	HCBC0603	6X30 CAP SCREW
4	HCNF0601	FLANGED NUT 6MM
5	ECMOTE05	CYLINDER HEAD
6	ZCMOTE06	CYLINDER HEAD O-RING
7	ECMU0026	6MM DOWEL
9	ECMOTE09	CYLINDER HEAD STUD BOLT 6MM
10	ZCMOTE10	BASE GASKET
11	ZCMOTE11	O-RING - EXHAUST FLANGE
12	ECMU0056	PISTON RING - CAST
13	ECMU0076	WRIST PIN
14	ECMUSR04	SNAP RING-FRANCO PISTON

ES2: Bottom end & transmission

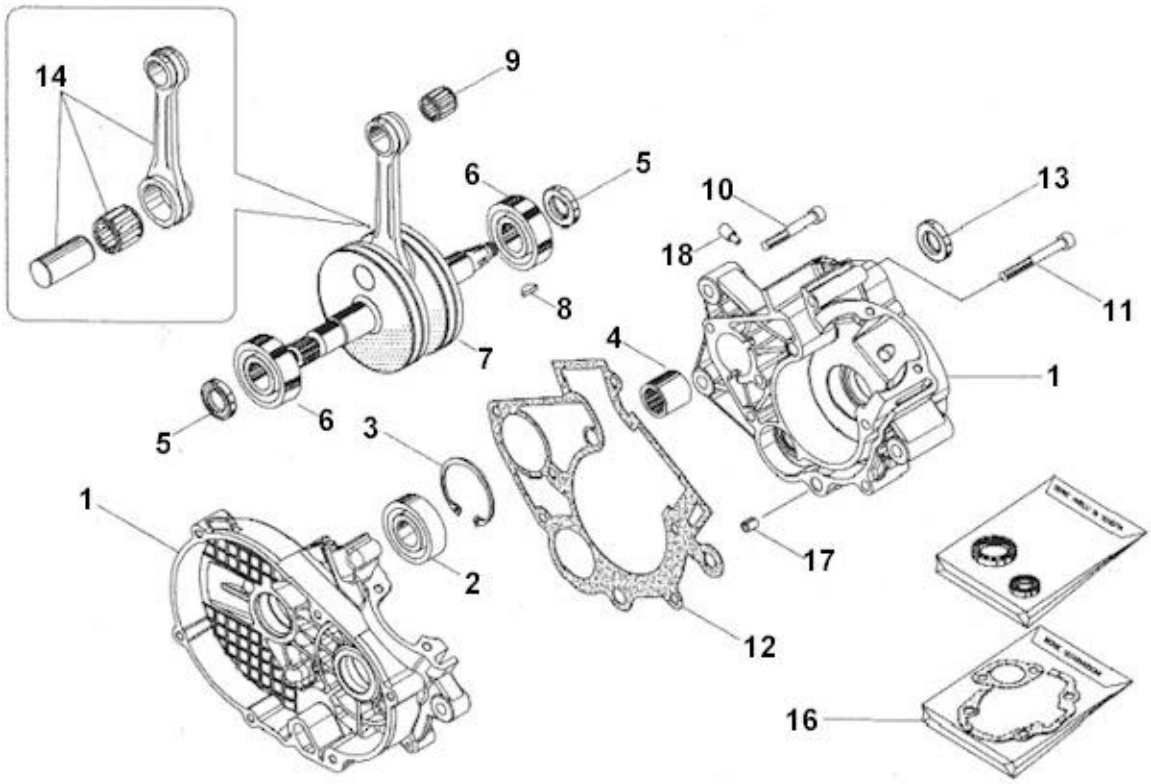


Figure 6, bottom end components

REF NO	PART NO	DESCRIPTION
1	ECMCBE01	CASES - COMPLETE SET
2	ECMOBE02	OUTPUT BEARING
3	ECMOBE03	OUTPUT BEARING - SNAP RING
4	ECMOBE04	PRECISION BEARING
5	ECMOBE05	CRANK SEAL
6	ECMU0016	CRANK BEARING
7	ECMOBE07	CRANKSHAFT COMPLETE
8	ECMOBE08	FLYWHEEL KEY
9	ECMU0077	WRIST PIN BEARING
10	HCBC0660	6X60 CAP SCREW
11	HCBC0607	6X50 CAP SCREW
12	ZCMOBE12	CRANKCASE GASKET
13	ECMOBE13	OUTPUT SEAL
14	ECMOBE14	ROD WITH WRIST PIN AND BEARING
15		S6 V/EC.+COM. SET OF SEAL
16	ZKMOBE16	GASKET KIT
17	ECMOBE17	DOWEL PIN - CASE
18	ECMOBE18	CASE VENT PIPE

Kick lever mechanism

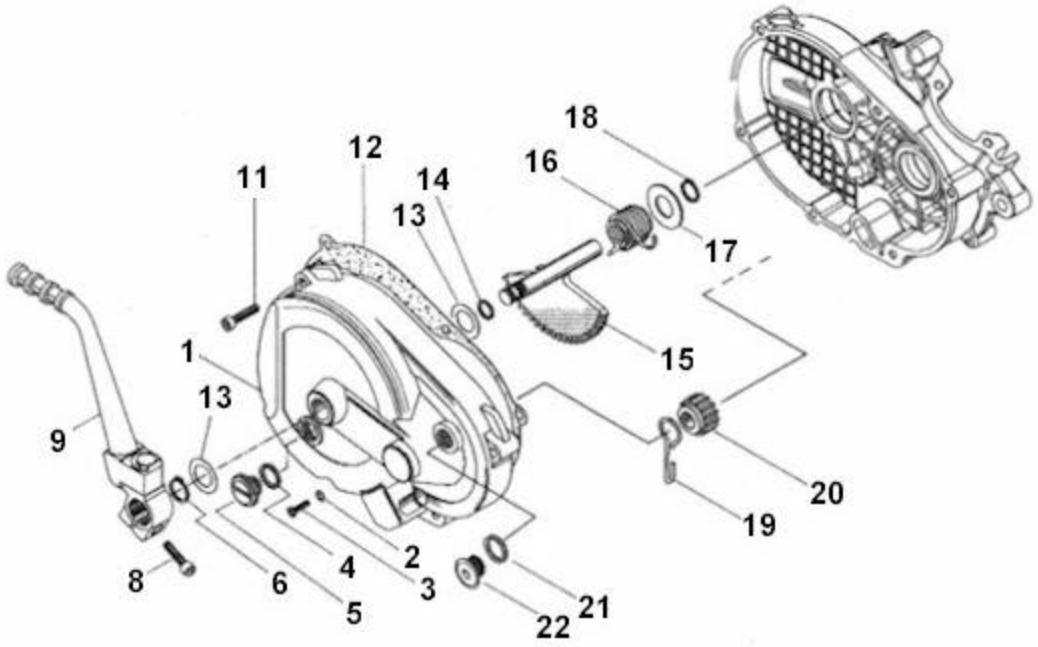


Figure 7, kick mechanism

REF NO	PART NO	DESCRIPTION
1	ECMOKS01	CLUTCH COVER
2	ECMOKS02	CRUSH WASHER - WATER DRAIN PLUG
3	ECMOKS03	WATER DRAIN PLUG - 6X8
4	ZCMU0001	OIL FILL PLUG GASKET
5	ECMU0037	OIL FILL PLUG
6	ECMOKS06	RETAINER CLIP - THRUST WASHER
8	HCBC0625	6X25 CAP SCREW
9	ECMCKS09	KICK START LEVER
11	HCBC0603	6X30 CAP SCREW
12	ZCMOKS12	CLUTCH COVER GASKET
13	ECMOKS13	THRUST WASHER
14	ECMOKS14	SEAL - KICK START SHAFT
15	ECMOKS15	KICK START SHAFT WITH GEAR
16	ECMOKS16	KICK START SPRING
17	ECMOKS17	WASHER - RETURN SPRING RETAINER
18	ECMOKS18	RETAINER CLIP - RETURN SPRING
19	ECMOKS19	J-SPRING KICK START
20	ECMOKS20	DOG GEAR
21	ECMOKS21	GASKET - ADJUSTING PLUG
22	ECMOKS22	ADJUSTING PLUG

ES3: Clutch

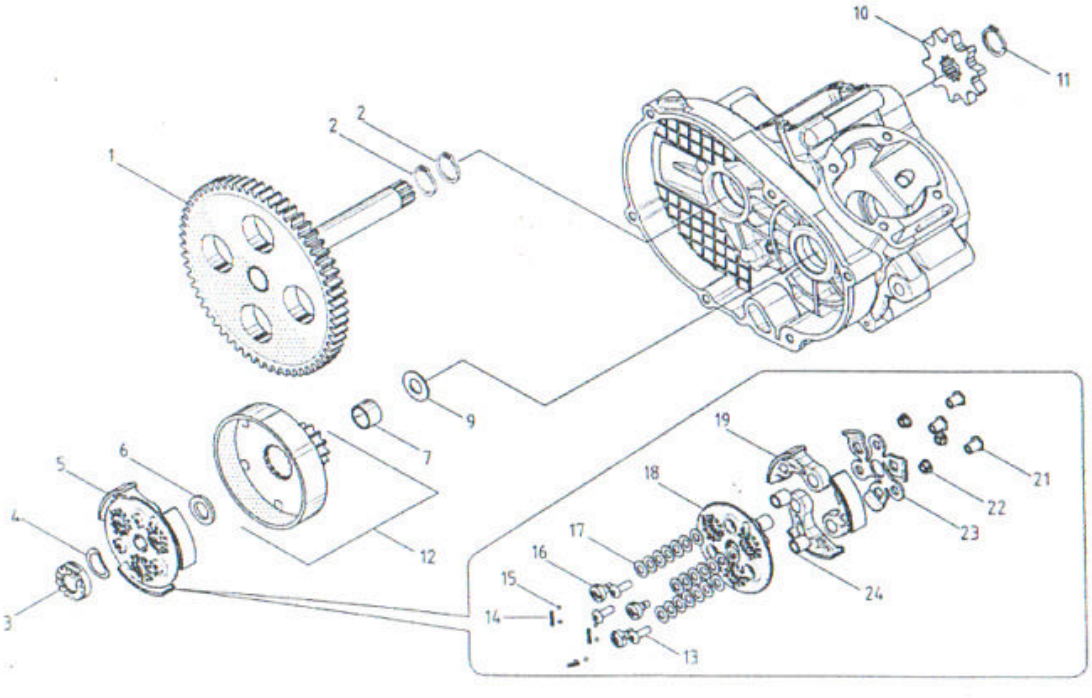


Figure 8 Clutch components

REF NO	PART NO	DESCRIPTION
1	ECMOCL01	GEAR - DRIVE
2	ECMCCL02	SNAP RING
3	ECMOCL03	CLUTCH START NUT - LH THREAD
4	ECMOCL04	WASHER - CLUTCH NUT BACK UP
5	ECMOCL05	CLUTCH COMPLETE
6	ECMOCL06	SPACER - CLUTCH TO HUB
7	ECMOCL07	BUSHING - CLUTCH HUB
9	ECMOCL09	WASHER - CLUTCH BASKET BACK UP
10	PCMOCL10	SPROCKET - 10 TOOTH
11	ECMOCL11	SNAP RING - OUTPUT SHAFT
12	ECMOCL12	CLUTCH BASKET WITH GEAR
13	ECMOCL13	S6 TCBEI M5X14 SCREW FOR MASS.
14	ECMOCL14	ADJUSTING SPRING
15	ECMOCL15	S6 D.2,5 BALL
16	ECMOCL16	S6 SPECIAL-SCREW
17	ECMOCL17	FEDER ATAZZA 6.2X12X0.6 DIN 2093
18	ECMOCL18	CLUTH WASHER
19	ECMOCL19	CLUTCH SHOE
21	ECMOCL21	S6 CLUTCH PAWL
22	ECMOCL22	CLUTCH SCREW COUPLING
23	ECMOCL23	S6 CLUTCH SPRIG
24	ECMOCL24	BUSH

ES4: Ignition

CAUTION:

- Make sure ground wires are secure. If the bike is not grounded it will not run.
- Make sure connections are free of dirt.

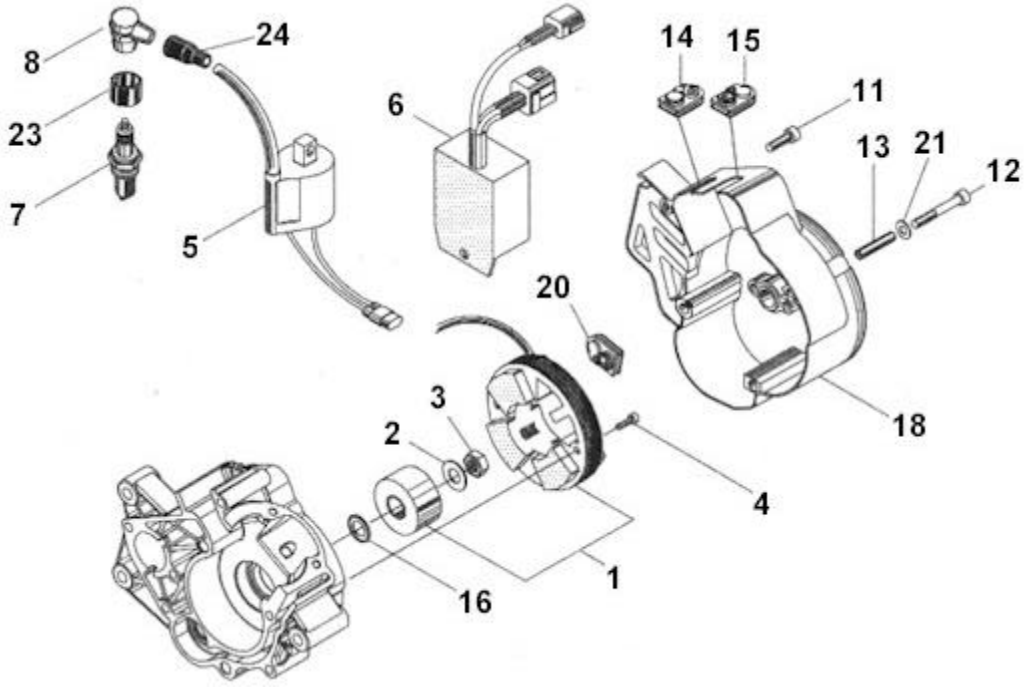


Figure 9, ignition components

REF NO	PART NO	DESCRIPTION
1	ECMOIG01	FLYWHEEL
2	HCWF0801	8MM WASHER
3	HCNS0801	8MM NUT
4	HCBC0401	4X10 CAP SCREW
5	ECMOIG05	COIL WITHOUT SPARK PLUG CAP
6	ECMOIG06	CDI BOX
7	ECMOIG07	SPARK PLUG
8	ECMOIG08	SPARK PLUG CAP
9	ECMOIG09	RUBBER FOR CONTROL UNIT
11	HCBC0502	5X20 CAP SCREW
12	HCBC0550	5X50 CAP SCREW
13	ECMOIG13	7MM DOWEL
14	ECMOIG14	IGNITION COVER GROMMET - OPEN
15	ECMOIG15	IGNITION COVER GROMMET - CLOSED
16	ECMOIG16	SPACER - FLYWHEEL
18	ECMOIG18	IGNITION COVER
20	ECMOIG20	FLYWHEEL GROMMET
21	HCWF0501	5MM WASHER
23	ECMOIG23	SPARK PLUG RUBBER
24	ECMOIG24	SPARK PLUG BOOT

ES5: Cooling System

Water pump

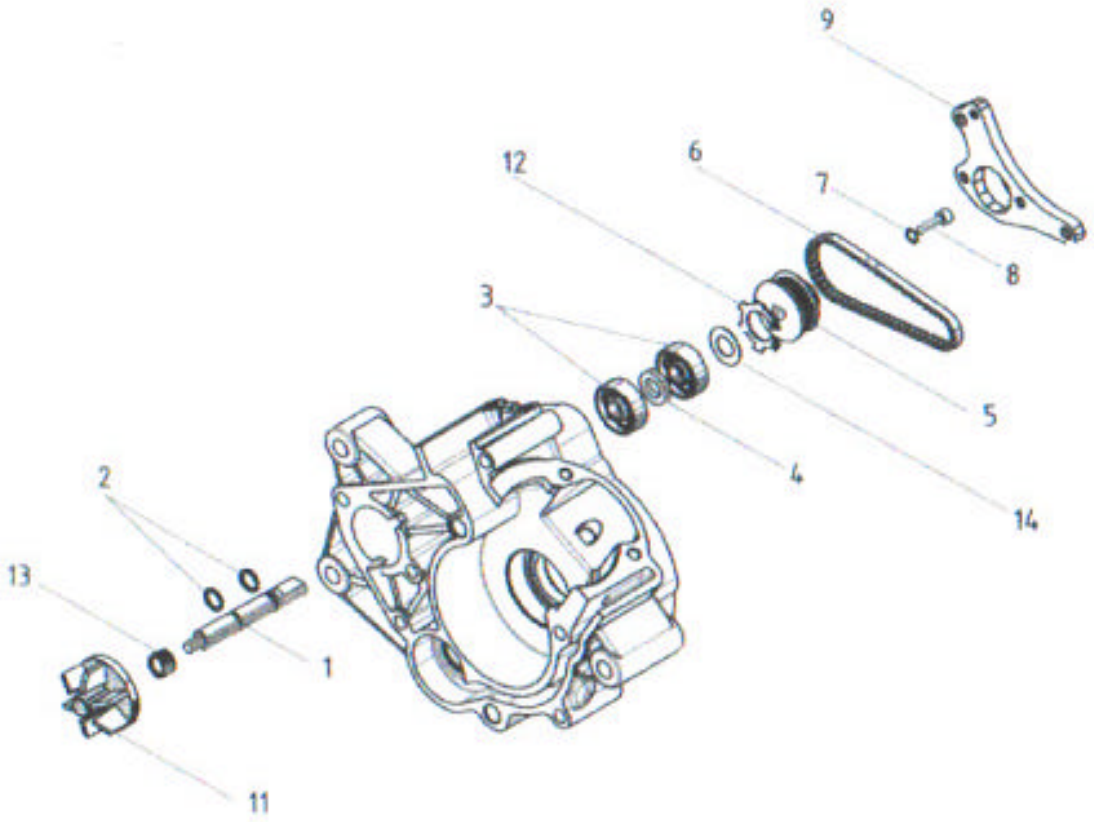


Figure 10 water pump

REF NO	PART NO	DESCRIPTION
1	ECMOWP01	WATER PUMP SHAFT
2	ECMOWP02	RETAINER CLIP - WATER PUMP BEARING
3	ECMOWP03	BEARING WATER PUMP
4	ECMOWP04	SPACER - WATER PUMP BEARING
5	ECMOWP05	CRANK PULLEY
6	ECMOWP06	WATER PUMP BELT
7	ECMPWP07	CLAMP FOR OIL TUBE
9	ECMPWP09	OIL INJECTOR MOUNT PLATE
11	ECMOWP11	WATER PUMP IMPELLER
12	ECMOWP12	SNAP RING - TOOTHED
13	ECMOWP13	WATER PUMP SEAL
14	ECMOWP14	WASHER - BEARING RETAINER
15	ECMPWP15	DOWEL PIN

ES6: Fuel & Air System

Intake system

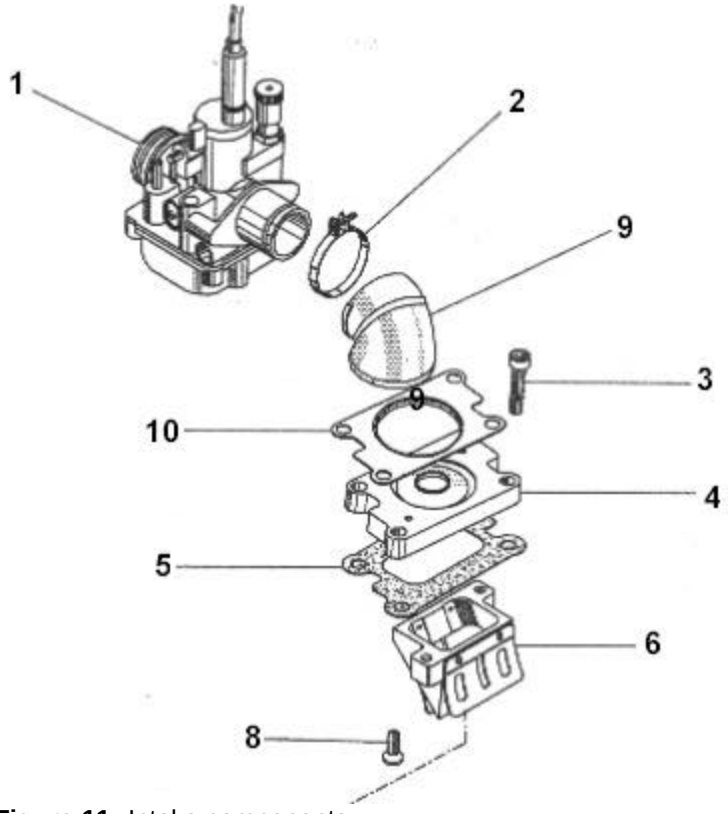


Figure 11, Intake components

REF NO	PART NO	DESCRIPTION
1	RCMU0018	19MM Dell'Orto PHGB CARBURETOR
2	ECMOIN02	CLAMP
3	HCBC0625	6X25 CAP SCREW
4	ECMOIN04	REED SPACER PLATE
5	ZCMOIN05	REED VALVE GASKET
6	ECMOIN06	REED VALVE ASSEMBLY
8	ECMOIN08	SCREW - REED CAGE TO SPACER PLATE
9	ECMOIN09	RUBBER INTAKE BOOT
10	ECMOIN10	INTAKE RETAINING PLATE

Reeds

- The reeds must lay flat on the reed cage.
- If the reed tips aren't lying flat, replace them immediately.
- The reeds must have a tight seal on the reed cage.
- If the reed is damaged in any way, replace it. This means cracks, chips, and ruptures. Anything abnormal, replace the reeds.

Take the reed cage out and hold it up to the light and look in through the cage. If you see light between the reed pedals and the frame, then replace the reeds. If you do not see light, then the reeds should be ok. (See figure 25)

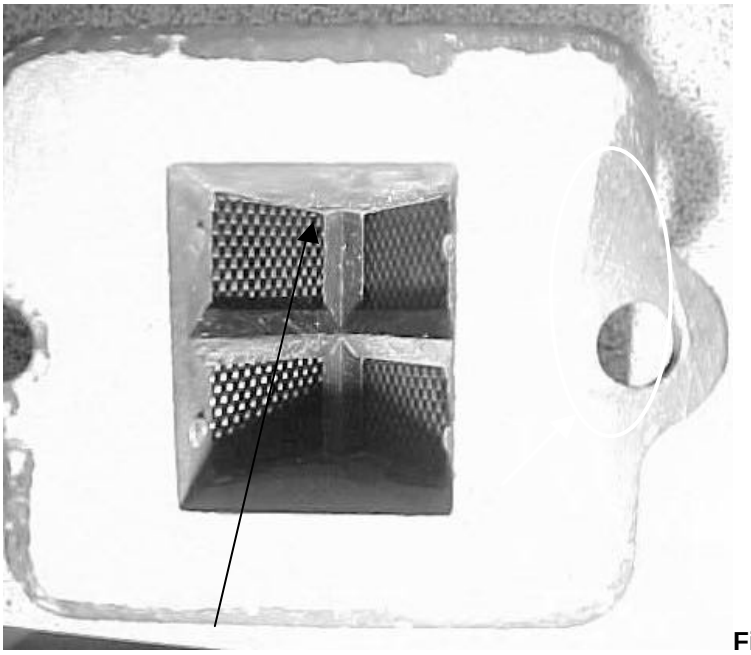
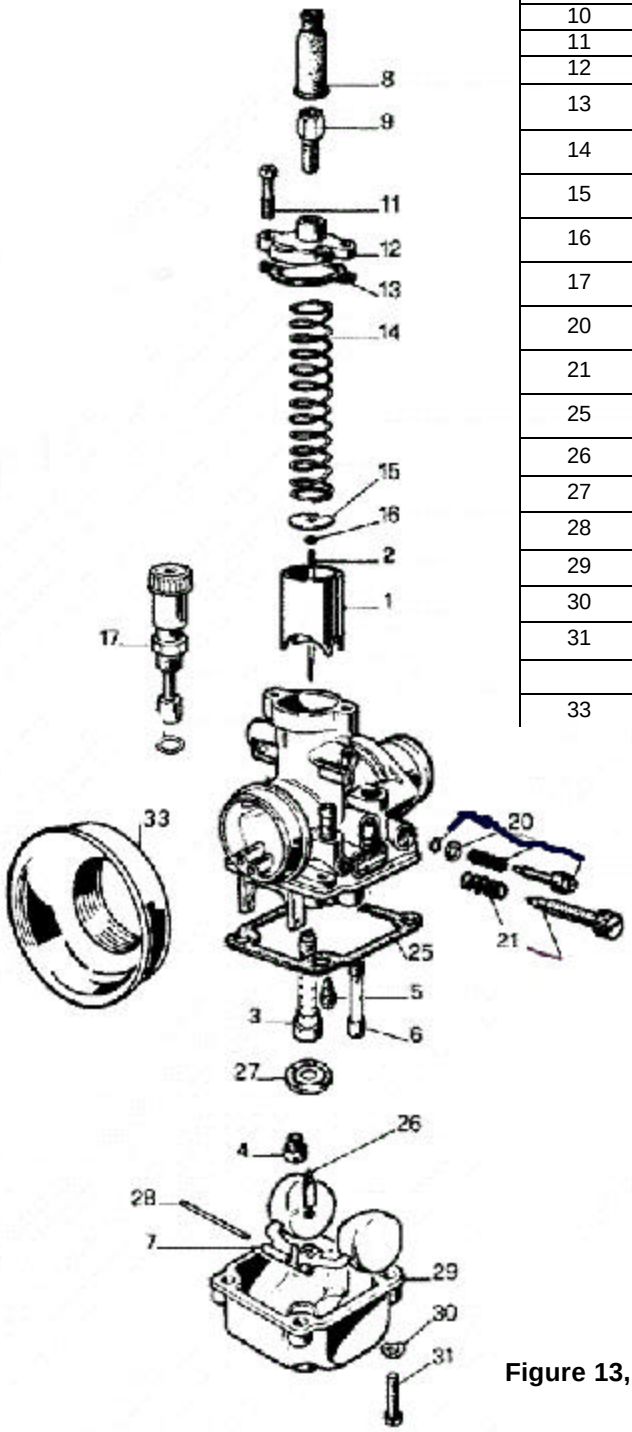


Figure 12

The presence of light indicates that the reeds should be replaced, or possibly turned over.

Carburetor



CH2 Carburetor Ref. Drawing		
REF. #	**PART #**	**DESCRIPTION**
1	RCMU0305	CARB SLIDE
2	RCMU0601	NEEDLE
3	RCMU0002	ATOMIZER
4	RCMU0090	MAIN JET (STOCK 90)
5	RCMU0048	PILOT JET (STOCK 48)
6		CHOKE JET
7	RCMU0301	FLOAT
8	RCMU0102	RUBBER CABLE CAP SEAL
9	RCMU0003	CABLE ADJUSTER
10		
11	RCMU0006	TOP CARB SCREW
12	RCMU0106	CARB TOP
13	ZCMU0007	TOP CARB GASKET
14	RCMU0004	SLIDE SPRING
15	RCMU0205	NEEDLE RETAINER PLATE
16	RCMU0007	NEEDLE CLIP
17	RCMU0204	CHOKE ASS'Y. 2001 CM
20	RCMU0009	FUEL MIXTURE SCREW
21	RCMU0011	IDLE ADJUSTMENT SCREW
25	RCMU0103	FLOAT BOWL GASKET
26	RCMU0107	FLOAT NEEDLE
27	RCMU0012	DIFFUSER
28	RCMU0016	FLOAT RETAINER PIN
29	RCMU0106	FLOAT BOWL
30	RCMU0201	BOTTOM FLOAT SCREW
31		
33	RCMU0269	VELOCITY STACK

Figure 13, carburetor

Your Cobra is equipped with an adjustable carburetor. Some fine-tuning may be needed according to weather condition and altitude. Proper jetting is ***very*** important for engine performance and engine life. Serious damage to the engine can occur if not properly adjusted.

IDLE ADJUSTMENT:
On the left side of the carburetor, there are 2 adjustment screws. The larger screw with the knurled head is the idle adjustment screw. To raise the idle, turn the screw in clockwise (in 1/4 turn increments) and rev the engine after each adjustment. To lower the idle, turn the screw counter-clockwise.

TOP END JETTING:
Indications that the engine is running too rich (too much fuel for the air) are:
- Engine not revving out or blubbering at high RPMs.
- Engine will not 'clean out'
- Wet or black spark plug

NOTE: Before changing jetting be sure that the air filter is properly cleaned and has the usual amount of air filter oil. An overly dirty air filter can cause the engine to run rich.

NOTE: Also before changing jetting, insure that your carburetor has a proper float height of 5

If the engine is running rich on the top end it should be leaned out. Leaning it out can be done by:
1. Changing the main jet to a smaller number.
2. Raising the needle clip (this lowers the jet needle) one notch at a time on the slide.

Indications that the engine is running too lean are:
- Engine cutting out on top end.
- Engine overheating and ultimately seizure.
- White spark plug

CAUTION:
It is much safer to operate the engine slightly rich as opposed to slightly lean. This is because an overly rich engine will just run poorly while an overly lean engine will seize, potentially causing an expensive top end rebuild and a DNF.

To richen the carburetor:
1. Change the main jet one number at a time (larger).
2. Lower the needle clip (raising the jet needle) one notch at a time until the engine starts to blubber on the top end, then move the clip back up one notch or until you get the blubber out.

FUEL MIXTURE SCREW
The smaller brass screw that is towards the front of the engine is a fuel mixture

screw. This screw will also richen and lean your engine more on the bottom and mid-range. In warmer conditions, turn the screw in. In colder conditions, turn the screw out. Be sure to keep the carburetor very clean and make sure you don't have water or dirt in the carburetor bowl. Use automotive carburetor cleaner or WD-40 to clean the carburetor inside and out.

STOCK CARBURETOR SETTINGS

The 2003 PW3 stock carburetor settings from the factory are:

- 48 pilot jet
- 90 main jet

Cleaning the carburetor:

⚠ WARNING

Clean the carburetor in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area; this includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or low flash-point solvent to clean the carburetor.

1. Make sure the fuel is shut off.
2. Remove the carburetor.
3. Drain the fuel in the carburetor.
4. Disassemble the carburetor.

CAUTION:

Do *not* use compressed air on an assembled carburetor. Or the pressure may deform the float. Do not use a strong carburetor cleaning solution, which could attack the parts of the carburetor; instead, use a mild high cleaning solution safe for plastic parts.

5. Immerse all the metal parts in a carburetor cleaning solution.
6. Rinse the parts in water.
7. After the parts are cleaned, dry them with compressed air.
8. Blow out the fuel passages with compressed air.
9. Assemble the carburetor
10. Install the carburetor onto the motorcycle.

NOTE:

The **three most common problems** with this carburetor are (figure 14):

1. Installing the **carburetor top backwards**.
2. The carburetor **slide** indexing **pin falling out**.
3. Either side **vent elbow falling out**.

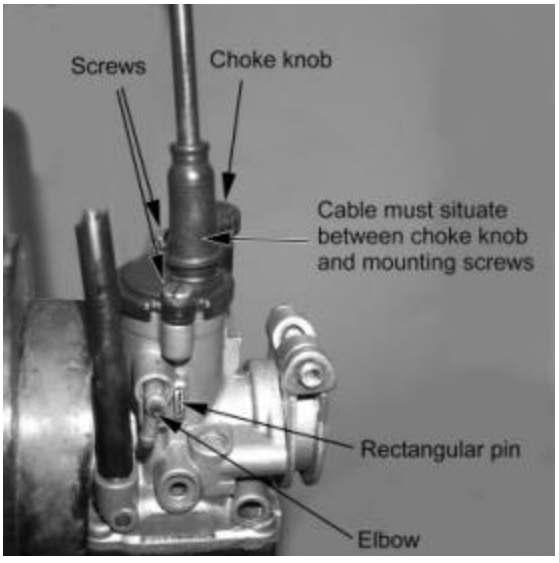


Figure 14 Proper carburetor top installation and location of rectangular slide indexing pin and one of the elbows that has been known to fall out.

ES7: Exhaust

The pipe is a crucial element to a motorcycle. Any kinks, dents, or damage done to the pipe will result in a major performance loss.

NOTE:

Be sure to take the pipe off, and any carbon that may be built up. Carbon build up is created from exhaust. Exhaust has oils in it, and the oils cling to the walls of the inside of the pipe. Over a long period of time, the diameter of the pipe will decrease, due to carbon build up. So it is essential to clear the residue.

CAUTION:

It is important to repack the silencer. Signs of your silencer needing to be repacked are

- The bike is louder than normal.
- A loss of power.

Chassis Service / Parts

CS1: Suspension
Front Forks

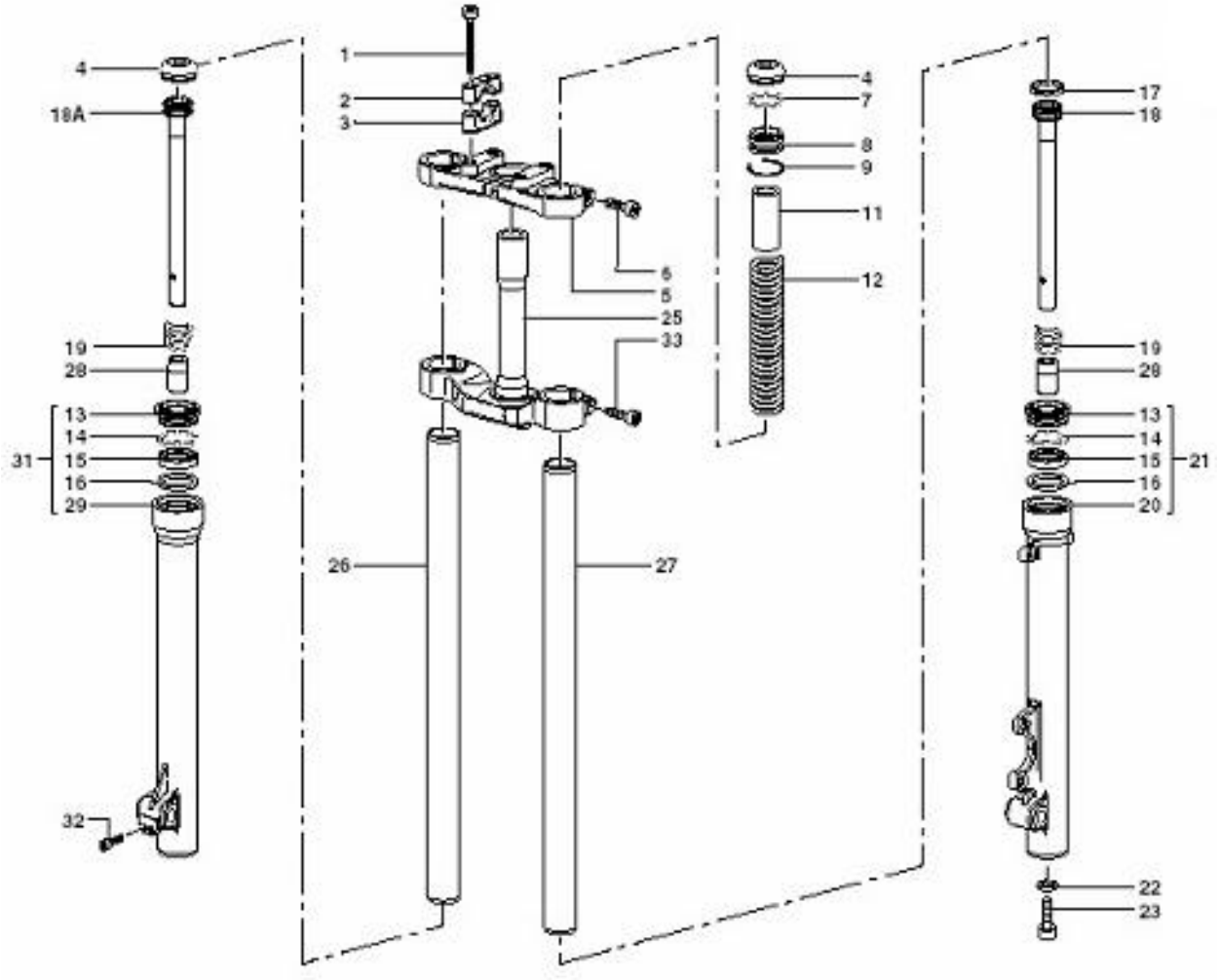


Figure 15

Because of different rider weights, sizes and riding styles, we offer various suspension options:

See *Optional Components* section of this manual for details on these and other optional components for your Cobra Motorcycle.

2003 CH2 FRONT FORK PARTS LIST

REF #	PART #	DESCRIPTION
1	KCMZ0001	8 X 50 CS
2	KCMZ0002	TOP HANDLE BAR CLAMP
3	KCMZ0003	LOWER HANDLE BAR CLAMP
4	KCMZ0004	FORK PLUG – BLACK
5	KCMZ0005	TRIPLE CLAMP UPPER
6	HCBC0806	8 X 30 CS PINCH BOLT FOR TOP TRIPLE CLAMP
7	KCMZ0007	SNAP RING FOR FORK CAP
8	KCMZ0008	INNER FORK CAP - WHITE
9	KCMZ0009	O-RING UNDER FORK CAP
11	KCMZ0011	PRELOAD SLEEVE
12	KCMZ0012	FORK SPRING
13	KCMZ0013	SWIPER
14	KCMZ0014	SNAP RING
15	KCMZ0015	FORK SEAL
16	KCMZ0016	WASHER
17	KCMZ0017	SNAP RING FOR PISTON
18	KCMZ0018	PISTON ROD - REBOUND
18A	KCMZ0018A	PISTON ROD - COMPRESSION
19	KCMZ0019	REBOUND SPRING
20	KCMZ0020	FORK LEG OUTER LEFT
21	KCMZ0021	FORK LEG – 5 PIECE UNIT – LEFT
22	HCWC0000	WASHER
23	HCBC0806	8 X 30 CS
25	KCMZ0025	TRIPLE CLAMP BOTTOM W/STEM
26	KCMZ0026	FORK TUBE – INNER RIGHT
27	KCMZ0027	FORK TUBE – INNER LEFT
28	KCMZ0028	TOP OUT BUMPER
29	KCMZ0029	FORK LEG – OUTER RIGHT
31	KCMZ0031	FORK LEG – 5 PIECE UNIT – RIGHT
32	HCBC0609	6 X 20 CS
33	HCBC0525	6 X 25 CS

Troubleshooting

1) **Engine not behaving properly**
    a) Carburetor top is installed backwards (happens a lot)
    b) The carburetor slide indexing pin is missing
2) **Engine is down on power**
    a) Clutch engagement is not set properly
    b) Jetting is incorrect
    c) Silencer needs repacked
    d) Exhaust pipe
        i) Has excess carbon buildup
        ii) Has large dent in it
    e) Compression is low
        i) Piston
        ii) Rings
    f) Reeds are damaged
    g) Ignition timing is incorrect
3) **Engine is excessively loud**
    a) Silencer needs repacking
4) **Engine 'blubbers' at high RPMs**
    a) Jetting too rich
5) **Engine won't start**
    a) Fuel
        i) None in tank
        ii) Is sour or bad
    b) Carburetor is dirty
    c) Ignition
        i) Spark plug fouled
        ii) Spark plug cap off
        iii) Engine Shut-off 'kill' switch is shorted
        iv) Bad electrical ground
        v) Stator winding damaged
    d) Exhaust is plugged
6) **Engine won't idle**
    a) Idle knob needs adjusted
    b) Carburetor jets are dirty

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