

# 2004 KING



Owners / Service / Parts



***“CHAMPIONS START HERE”***



For **parts orders** contact your local dealer

To locate your closest Cobra dealer  
log on to

[www.cobramotorcycle.com](http://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

MCKG2004.7

## 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 KING 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.

# Table Of Contents

GENERAL INFORMATION .....	5
SPECIFICATIONS - GENERAL.....	5
OPTIONAL COMPONENTS.....	6
SPECIFICATIONS - TORQUE VALUES .....	7
BREAK-IN PROCEDURE .....	8
STARTING PROCEDURE .....	9
GENERAL TIPS .....	9
MAINTENANCE .....	10
SCHEDULE & TIPS.....	10
REPLACING TRANSMISSION / CLUTCH LUBRICANT .....	11
CHAIN ADJUSTMENT.....	13
REAR BRAKE MAINTENANCE .....	13
AIR FILTER CLEANING.....	14
FORK OIL REPLACEMENT .....	15
PARTS .....	17
PARTS – BARS AND CONTROLS .....	17
PARTS - CARBURETOR .....	18
PARTS – COOLANT SYSTEM.....	19
PARTS – ELECTRICAL SYSTEM.....	20
PARTS – ENGINE – BOTTOM END AND TRANSMISSION.....	21
Parts – Engine – Clutch and Kick Starter .....	22
Parts – Engine – Ignition and Water Pump .....	23
Parts – Engine – Top End .....	24
PARTS – EXHAUST SYSTEM .....	25
PARTS – FORKS & TRIPLE CLAMPS.....	26
Parts – Forks – Leg Assembly .....	27
Parts – Forks – Damper Assembly.....	28
Parts – Forks – Damper – Base Valve Assembly.....	29
Parts – Forks – Damper – Mid Valve Assembly.....	30
PARTS – FRAME – BRAKE MOUNTS, PLASTIC SHIELD & FOOTPEGS.....	31

Parts – Frame - Exhaust, Radiator, & Engine Mounts .....	32
Parts - Frame – Subframe, Shock, & Bodywork Mounts .....	33
PARTS – FRONT BRAKES.....	34
PARTS – FRONT WHEEL.....	35
PARTS – PLASTIC BODYWORK & SEAT.....	36
PARTS – REAR BRAKE.....	37
PARTS – REAR WHEEL.....	38
PARTS – SHOCK .....	39
PARTS – SWINGARM ASSEMBLY .....	40
SERVICE .....	41
ENGINE SERVICE.....	41
Engine Removal .....	42
Complete Engine Disassembly Procedure.....	43
Top End Disassembly Procedure .....	43
Splitting the Cases .....	44
Engine assembly .....	45
CLUTCH .....	50
IGNITION .....	54
COOLING SYSTEM.....	56
FUEL & AIR SYSTEM.....	60
EXHAUST .....	63
WHEELS & TIRES.....	64
BRAKES.....	65
SUSPENSION .....	69
Rear Shock.....	71
Front Forks .....	72
TROUBLESHOOTING .....	73
INDEX .....	75

# General Information

## Specifications - General

Items	KING
<b>Dimensions</b>	
Wheelbase	39" (991mm)
Wheel size	10" (254mm) rear, 12" (305mm) front
Seat height	26" (660mm)
<b>Engine</b>	
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	Electronic, analog advance
Spark plug	Champion 8339-1, 8332-1 hotter, 8904-1 colder
Gap	0.023" – 0.025" (0.58 – 0.64 mm)
Ignition timing	0.045" (1.14 mm) Before To Dead Center (BTDC)
Fuel type	High octane pump gasoline <b>RACE FUELS ARE NOT RECOMMENDED</b>
Oil type	<i>Cobra Venom 2-cycle Race Oil</i>
Fuel / oil mix ratios	Between 32:1 and 40:1 (after engine Break-In is complete)
Carburetion	19 mm Dell'Orto
Main Jet	95
Slow (Pilot) jet	65
Float Height	16mm $\pm$ 0.5mm (0.63" $\pm$ 0.020")
Coolant	<i>Liquid Performance Mini Coolant / Antifreeze</i>
<b>Transmission</b>	
Speed	Single
Final drive ratio	14/39 T
Chain	100 links 420
Transmission / clutch oil type	<i>Cobra Venom 3 Shoe Clutch Milk</i> , or Dexron III
Quantity	235 ml (8.0oz)

<b>Chassis</b>		
Front tire		2.50 - 12
	Pressure	16 psi minimum
Rear tire		2.75 - 10
	Pressure	16 psi min. (20 psi for hard pack or rocky conditions)
Front fork		Cobra 30mm USD
	Fork oil type	SAE 10 weight
	Fork oil amount	105 ml (3.5oz)

## Optional Components

- Carburetor jets
- Sprockets
  - Front
  - Rear
- Suspension Springs

Weight of Rider (lb)	Fork Spring	Shock Spring
Less than 51	9 lb/in, KCKG0109	SCKGOH85 (gray, 185 lb/in)
51 - 60	12 lb/in, KCKG1201	SCKG0H95, (yellow, 195 lb/in)
Greater than 60	15 lb/in, KCKG0015	SCKG0205, (gold, 205 lb/in)

- Suspension Valving

Damping Rate	Fork Valving Compression (base valve)	Fork Valving Rebound (mid valve)	Shock Valving (kit)
Soft (fast)	KAKG0013	KAKG0016	SCKGOH24A
Standard	KAKG0014	KAKG0017	SCKGOH24
Hard (slow)	KAKG0015	KAKG0018	SCKGOH24B

# Specifications - Torque Values

Fastener	Torque Value			Size & Remarks
	ft-lb	in-lb	Nm	
Cylinder head nuts	9.2	110	12	¼"-20
Crankcase bolts	6.6	80	9	6 x 1.0
Spark plug	(SP)	(SP)	(SP)	14 x 1.25
Stator bolts	2.1	25	2.8	#8
Stator cover bolts	1.7	20	2.3	#8
Clutch cover bolts	5.8	70	7.9	6 mm
Clutch	40	480	54	10 x 1.25***
Front axle nut	25	300	34	12 x 1.25
Engine mount bolts	22	265	30	8 mm
Swingarm Pivot	21	250	28	14 mm
Intake manifold bolts	4.6	55	6.2	6 mm
Rear Axle Bolt	25	300	34	12 mm
Rear Sprocket Bolts	18	216	24	7 mm
Fork cartridge rod	12	144	16	
Triple clamp bolts	6	72	8	6 x 1.0
Fork cap	5	60	6.7	1.25" x 18
Ignition rotor nut	40	480	54	10 x 1.25**

\*\* Use green (wicking / bearing retainer) thread locker, with primer, on the flywheel / crankshaft taper but none on the threads.

\*\*\* Use green (wicking / bearing retainer) thread locker, with primer, on the crankshaft / clutch taper but use red (high strength) thread locker, with primer, on the nut.

**(SP)** To apply the proper torque to the spark plug when inserting, one must first screw the spark plug in until the metal gasket ring causes resistance and then turn another 1/8 to ¼ turn.



# Break-In Procedure

Your Cobra KING is a close-tolerance high performance machine and break-in time is very important for maximum life and performance. The KING 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!

Use a fuel / oil mixture of 32:1 for the full 8 hour break-in period. Be sure to use high octane pump gas, with Cobra's specially formulated *Cobra Venom 2-cycle Race Oil*. (Part # MCMUOL02)

## **CAUTION:**

Failure to use proper fuel, oil, or fuel/oil mixture 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 torque 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!

## **NOTE:**

During break-in the bike will likely lose some engine coolant through the radiator overflow hose. Losing up to 4 oz (120 ml, ½ cup) is normal. Proper coolant level will cover the top of the radiator cores. Removing the radiator cap and looking inside is the only way to check the coolant level.

## **⚠ WARNING**

Never open the radiator cap of a machine that has a hot or warm engine or one that has recently been ridden. Burning and scalding could occur.

## **CAUTION:**

It is important that the radiator cap is installed correctly and completely otherwise engine damage could occur.

# Starting Procedure

Before starting the machine inspect the following:

- 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 and sliders do not have improper wear.
- Verify that the handlebars are tight.
- Check the throttle for smooth operation and sound closing.
- Check for loose bolts and nuts, and re-torque as necessary.
- Verify that the air filter is clean and properly saturated with oil.
- Insure that the fuel tank contains an adequate volume of fuel / oil mixture to complete the distance required. (High octane pump gas with Cobra's specially formulated *Cobra Venom 2-cycle Race 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. Pull up the choke knob and turn it to lock it.
3. Kick start the engine.
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. Also, for best clutch performance, warm up the bike before taking off.

# 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. Filling your transmission with more than 8.0 oz (235ml) of lubricant may help to transfer heat from the clutch, but be aware that this extra oil will increase the frictional drag on the engine, thus reducing power, and will often get purged out the crankcase vent during riding.
7. Your Cobra Motorcycle has a 10 digit VIN (Vehicle Identification Number). The first two digits indicate the model and the seventh indicates the model year (MY).
  - a. Example, ACxxxx4xxx is a 2004 MY King.

## **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
  - 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.
  - Inspect the rear sprocket damper plate for bending or warping. Straighten or replace if more than 1/16" (1.6 mm) from flat.
  - Check the rims for signs of stress, like cracks around the rim, spokes and hub.
- 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. Because of the amount of heat generated by the clutch and engine during extended periods of riding, it is advisable to remove the ignition cover afterward to allow the ignition to cool off. The heat transfers through the cases and can damage the stator as it cools off because of lack of airflow around the stator.
2. 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.

3. 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.
4. If your kick-starter lever does not return to the rubber bumper, use WD-40 or light penetrating oil under the plastic cover behind the spring on the shaft. The shaft is a very close fit to the case and also has an O ring in it and is difficult to get lubrication to which may cause binding. If it does not loosen up, remove the kick-starter cover and kicking assembly. Grease the shaft.

## Replacing Transmission / Clutch Lubricant

### Tools needed:

- 235 ml (8.0 oz) *Cobra Venom 3 Shoe Clutch Milk* (Part # MCMUGF01), or Dexron III Automatic Transmission Fluid.
- 13 mm combination wrench

### 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.

- Using a 13 mm wrench, remove the oil drain bolt located on the right side of the engine, on the clutch cover, near the brake lever (Item 2, figure 1).

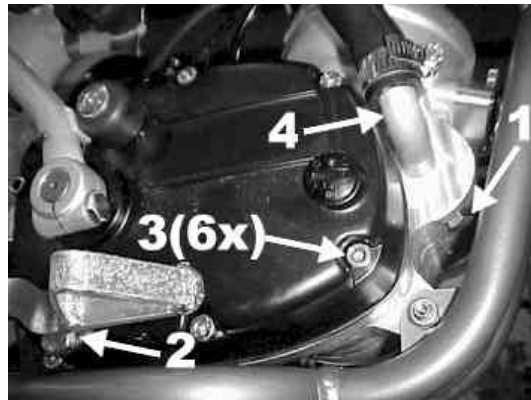


Figure 1

- After it has drained, reinstall the bolt being sure that the copper gasket is in place. Torque to 15 Nm (11 ft-lb).
- Reapply oil from oil fill plug 235 cc (8.0 oz) *Cobra Venom 3 Shoe Clutch Milk*, or Dexron III Automatic Transmission Fluid, thru the oil fill plug.

**NOTE:**

Lean bike over onto it's left hand side so that the clutch cover is up unless you have a squeeze bottle.

- Reapply the oil fill plug, hand tight, being sure the fiber 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's specially developed *Cobra Venom 3 Shoe Clutch Milk* (Part # MCMUGF01) was formulated to provide superior lubrication and cooling capability over extended periods of time and is the recommended lubricant for your Cobra motorcycle.

# Chain adjustment



Figure 2

1. Make sure that the rear wheel is aligned properly.
2. Push down on the seat, compressing the suspension down to where the chain is tightest. At this point, there should be a minimum of 1" of slack.
3. With the rear wheel elevated, there should be a minimum of 2.5" of slack between the swing arm and the chain.

## Rear Brake Maintenance

Brake pedal height can be adjusted with the bolt and nut located under the rear of the brake pedal. The free-play is adjusted with the adjustable plunger on the end of the brake pedal.

**CAUTION:**

Use only DOT 4 brake fluid

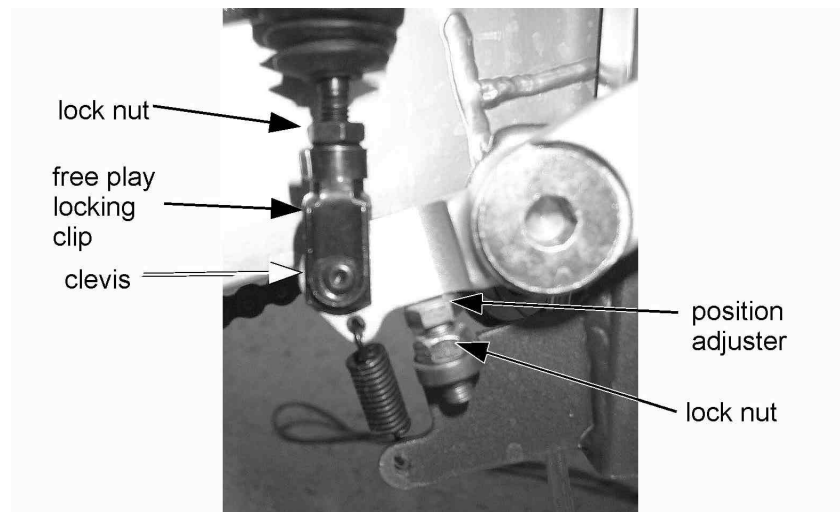
**CAUTION:**

Too little brake pedal free-play will allow the brake pads to drag causing the pads to wear prematurely. Too much free-play will not allow the rider to apply the brakes quickly.

1. Set pedal position first, then
2. Set pedal free play.

Setting rear brake pedal position (see figure 2b):

1. Loosen the lock nut (10mm wrench).
2. Adjust the brake lever stop (10mm wrench) so that the lever is comfortably reachable in both:
  - a. Standing riding position, and
  - b. Sitting riding position.
3. Tighten the lock nut (10 mm wrench).



**Figure 2b**

### Setting rear brake pedal free play

**CAUTION:**

Adequate pedal free play is required so that the brake pads do not wear prematurely.

**WARNING**

Make sure that the free play locking clip is installed such that one must push forward, toward the front of the bike, to remove. Otherwise the clip is apt to come undone while riding.

To adjust (see figure 2b):

1. Loosen the lock nut (10mm).
2. Undo the free play locking clip from around the brake adjuster (plunger), with your hand by pushing it forward.
3. Slide the pin of the locking free play locking clip from the brake lever
4. Adjust as needed by rotating the clevis on the end of the adjuster (plunger).

**NOTE:**

Turning the clevis Clockwise will lengthen the adjuster (plunger), removing free play from the system, and turning the clevis Counter-Clockwise will shorten the adjuster (plunger) adding free play to the system.

## Air Filter Cleaning

**Tools recommended for air filter maintenance:**

- Flat head screwdriver
- Air filter oil
- 5mm hex key
- Foam filter oil

Your Cobra comes with a pre-filter, or filter skin, to prevent the passing of water

to the standard air filter. Remove this pre-filter before cleaning and oiling the standard air filter. The filter skin should be cleaned, with detergent in warm water, but does not require the application of any oil.

**CAUTION:**

It is very important to keep it clean and properly oiled with high quality water-resistant foam filter oil. It is also very important to oil your filter consistently each time because varied amounts of oil will change your carburetor jetting.

Make sure you change your filter after each moto. We recommend carrying three or more filters in your toolbox.

1 for practice

1 for the each moto

In our testing when filters are properly oiled, no water, dirt or mud can penetrate through the yellow or red foam to the carburetor inlet. It is important that the filter does not touch any of the frame components in a rainy, muddy situation. We offer two different filters. One filter, red in color, is for use in sand and extremely dusty conditions (part # RCMU0101), and the regular filter, yellow in color, is for more non extreme conditions (part # RCMU0206).

When washing your bike cover the carburetor/filter with a suitable shield capable of keeping water from entering the engine. Cobra has a rubber clamp-on plug for the carburetor (part # RCMU0104).

## Fork Oil Replacement

### Tools required

- Two 19 mm wrenches or sockets
- 4 & 5 mm hex key (Allen wrench)
- 1" wrench or socket
- 10 wt fork oil

### Disassembly procedure

1. Remove the front wheel (19 mm wrench).
2. Remove the brake caliber from the fork leg (4 mm hex key).
3. Loosen the fork caps (1" socket).
4. Remove the fork legs from the triple clamps (5 mm hex key).
5. One leg at a time
  - a. Remove the fork cap from the leg.
  - b. Separate the fork cap from the damper rod.
  - c. Pull out the fork spring.
  - d. Place upside down over a suitable pan, tray, or container.
  - e. Work the damper rod up and down several times.
  - f. Allow to drain completely.



## Assembly procedure

1. Fill the fork leg with 3.5 oz (105 ml) 10 wt fork oil.
2. Measure the fork oil level to the top of the fork tube with the leg collapsed, and record for tuning purposes.
3. Install the fork spring.
4. Reconnect the damper rod to the fork cap (12 ft-lb, 16 Nm).

### **CAUTION:**

The damper rod is hollow and will break if the nut is over tightened.

5. Reinstall the for cap into the fork leg (5 ft-lb, 6.7 Nm)
6. Reinstall the fork legs into the clamps (6 ft-lb, 8 Nm).
7. Reinstall the brake caliper.
8. Reinstall the front wheel (25 ft-lb, 34 Nm).

# Parts

## Parts – Bars and Controls

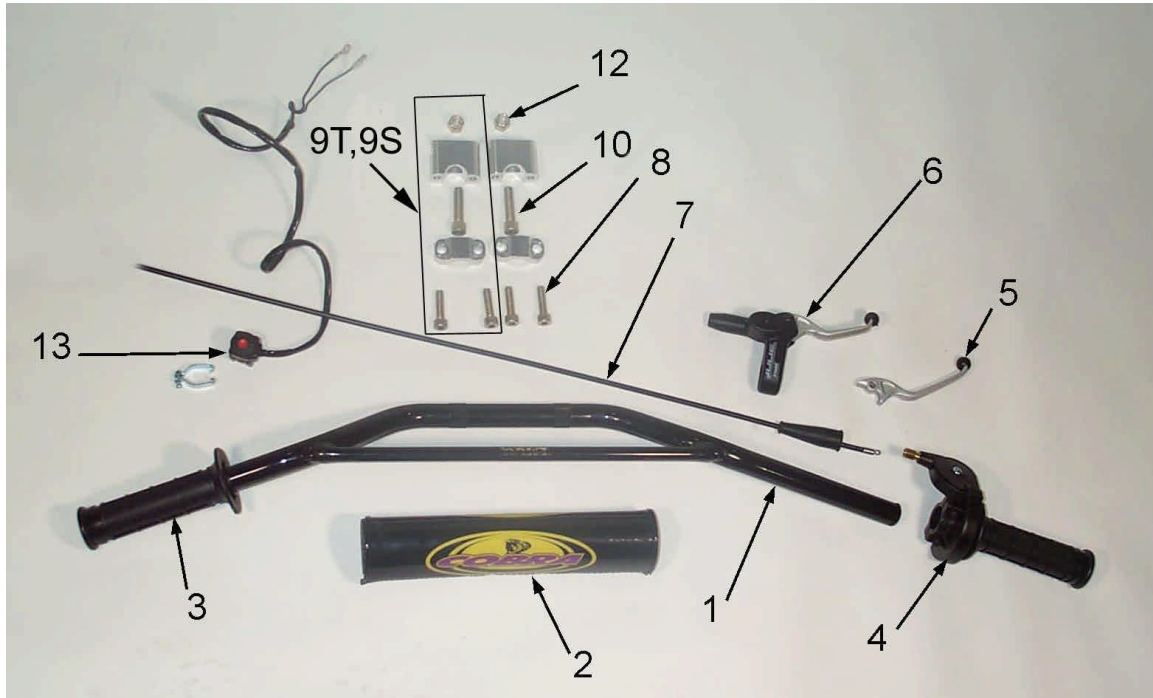


Figure 3

Bars and Controls		
REF #	PART #	DESCRIPTION
1	TCMU0009	HANDLEBAR - STEEL
2	MCMU0001	OPTIONAL CROSS BAR PAD
3	TCMU0008	GRIPS (SET OF TWO)
4	FCMU0066	THROTTLE ASSEMBLY
NOT SHOWN		THROTTLE COVER
5	BCMU0209	ALLOY BRAKE LEVER W/BALL
6	BAMU2002	BRAKE PERCH ASSY W/LEVER & BALL
NOT SHOWN	BAKG0004	SHIELDED BRAKE HOSE ASSEMBLY
7	FCMU0067	THROTTLE CABLE
8	HCBC0806	SOCKET HEAD CAP SCREW M8 X 30 (4 PER)
9S	TKMU0404	BAR MOUNT KIT, SHORT (2 PER)
9T	TKMU0403	BAR MOUNT KIT, TALL (2 PER)
10	HCBC3812	SOCKET HEAD CS 3/8-16 X 1-1/2 (2 PER)
12	HCNL3816	LOCK NUT 3/8 - 16 (2 PER)
13	FCMU0033	KILL SWITCH ASSEMBLY

# Parts - Carburetor

Carburetor		
REF. #	PART #	DESCRIPTION
1	RCMU0305	CARB SLIDE
2	RCMU0601	NEEDLE
3	RCMU0002	ATOMIZER
4	RCMU0095	MAIN JET
5	RCMU0065	PILOT JET
6		CHOKE JET
7	RCMU0301	FLOAT
8	RCMU0102	RUBBER CABLE CAP SEAL
9	RCMU0003	CABLE ADJUSTER
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	RCMU0269	VELOCITY STACK

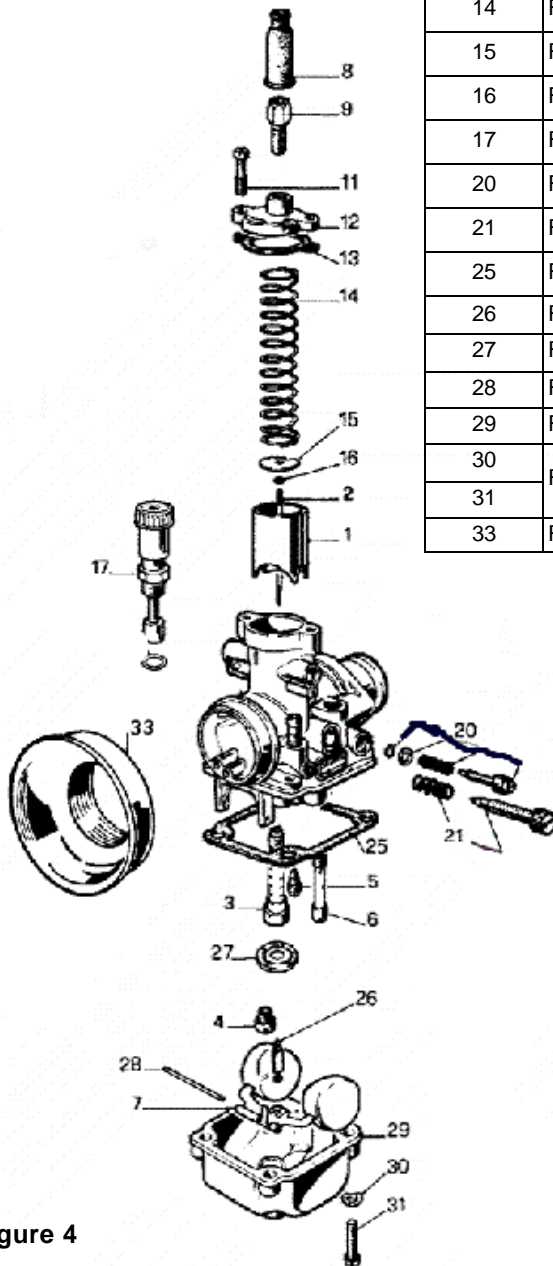


Figure 4

# Parts – Coolant System

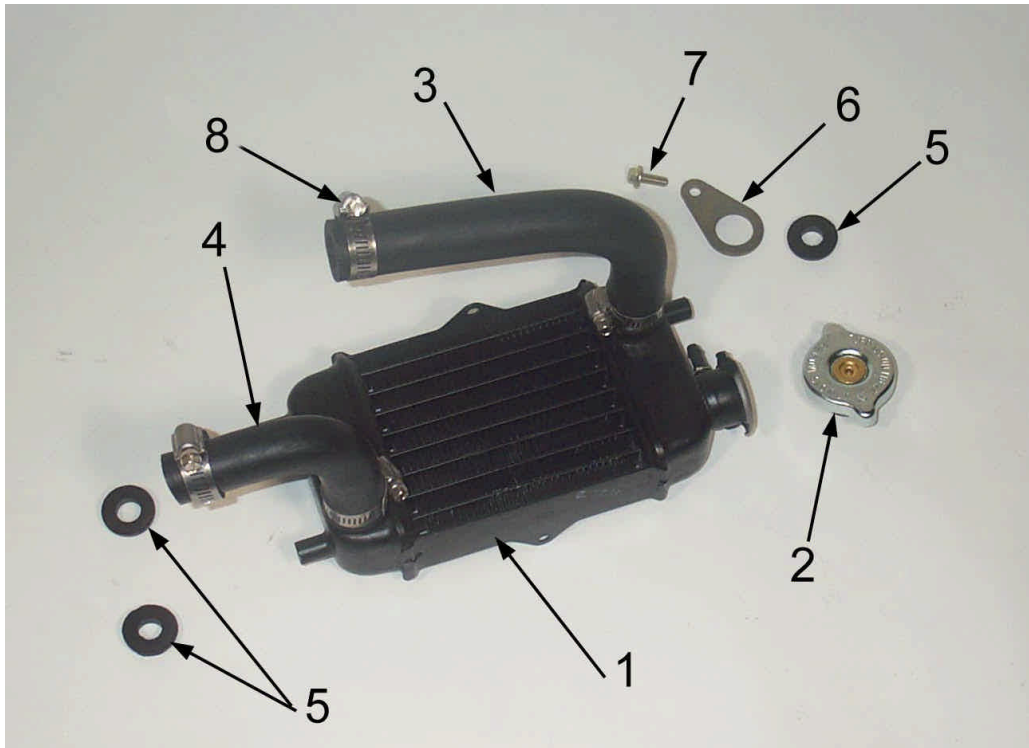


Figure 5

Coolant System		
REF #	PART #	DESCRIPTION
1	FCMU0045	RADIATOR
2	FCMU0047	RADIATOR CAP
3	ECMU0024	RADIATOR HOSE LARGE, TOP, LEFT
4	MCMUHO01	RADIATOR HOSE, SMALL, BOTTOM, RIGHT
5	MCMUGR03	MOUNTING GROMMET (3 PER)
6	FCMU0006	RADIATOR MOUNTING BRACKET (TEARDROP)
7	HCBF0616	FLANGE HEAD BOLT M6X16
8	MCMUCL02	HOSE CLAMP (4 PER)

# Parts – Electrical System

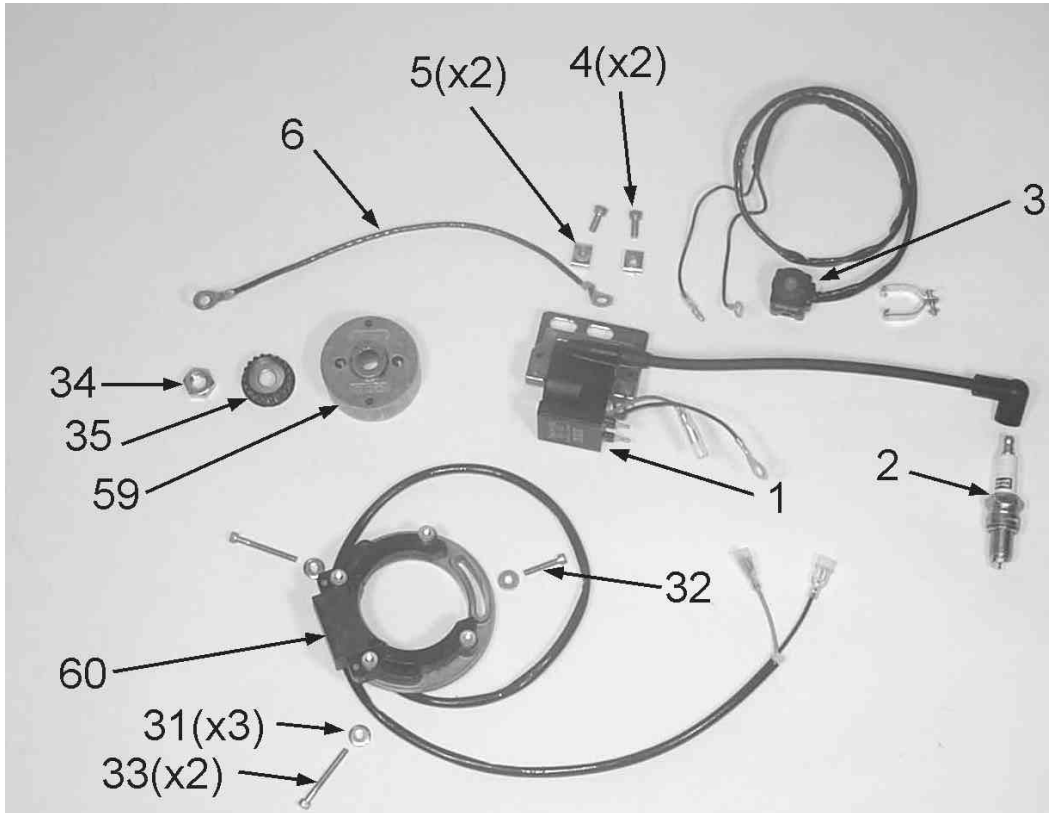


Figure 6

Electrical System		
REF #	PART #	DESCRIPTION
1	IAMU0001	COIL W/SPARK PLUG CAP
2	ECMU0065	SPARK PLUG, CHAMPION (8339-1)
2H	ECMU0067	OPTIONAL HOTTER PLUG (8332-1)
2C	ECMU0066	OPTIONAL COLDER PLUG (8904-1)
3	FCMU0033	KILL SWITCH ASSEMBLY
4	HCBC0516	SCREW, M5 X 16 (2 PER)
5	HCCN0000	5MM CLIP NUT (2 PER)
6	IAMU0002	GROUND WIRE
31	HCWP0001	WASHER FOR STATOR (3 PER)
32	HCBC8312	SOCKET HEAD CS, 8-32X1
33	HCBC0801	SOCKET HEAD CS, 8-32X 1-1/2 (2 PER)
34	HCNS1001	NUT 10MM
35	ECKG0042	PULLEY, WATERPUMP CRANK
59	ICMU0006	ROTOR
60	ICMU0007	STATOR
NOT SHOWN	MCKGGR00	GROMMET - STATOR LEAD
NOT SHOWN	ICMU0012	ROTOR SHAFT KEY

# Parts – Engine – Bottom End and Transmission

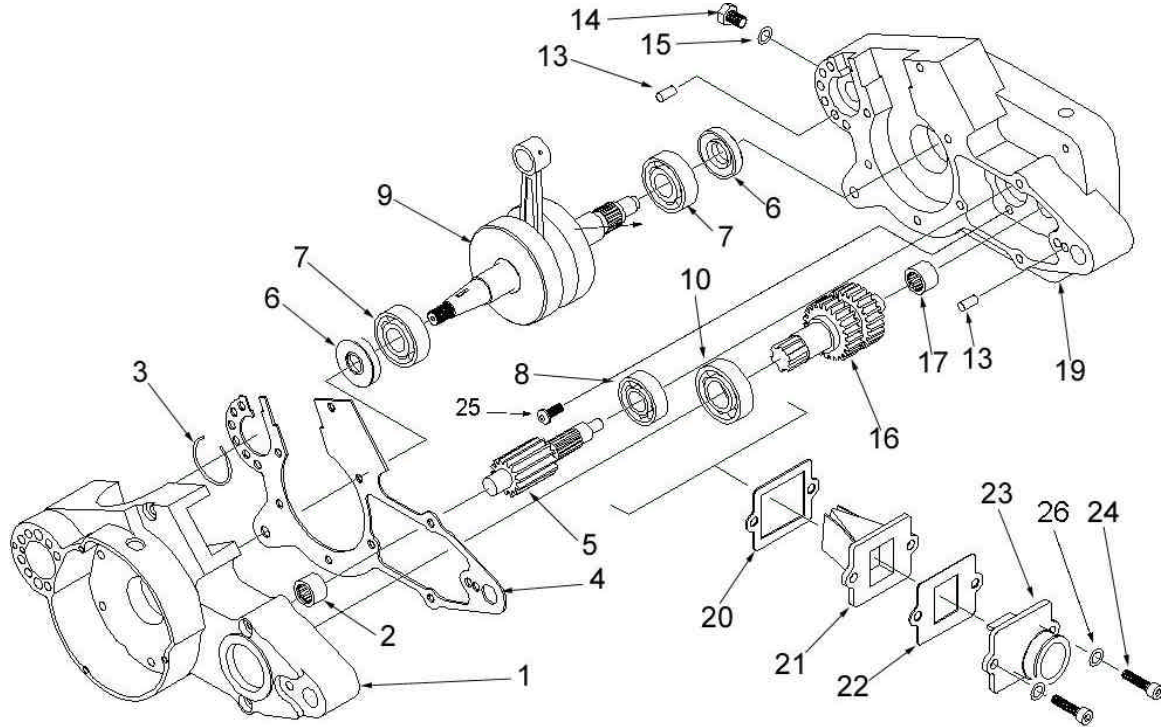


Figure 7A

Engine Bottom End and Transmission		
REF #	PART #	DESCRIPTION
1	ECKG0017	CRANKCASE, IGNITION SIDE
2	ECMU0020L	BEARING, TRANSMISSION PRECISION
3	ECKG0004	SNAP RING, WATER PUMP
4	ZCKG2001	GASKET, CRANKCASE
5	ECMU0106	SECONDARY SHAFT, TRANSMISSION WITH GEAR
6	ECMU0017	SEAL, CRANKSHAFT
7	ECMU0016	BEARING, CRANKSHAFT
8	ECMU0001	BEARING, TRANMISSION SECONDAY SHAFT
9	ECMU0038	CRANKSHAFT
10	ECKGBR01	BEARING, TRANSMISSION OUTPUT SHAFT
13	HCDP1401	DOWEL, ENGINE CASE ALIGNEMENT
14	HCBH0805	M8X12 SCREW
15	HCWC0000	COPPER GASKET
16	ECMU0107	OUTPUT SHAFT, TRANSMISSION WITH GEAR
17	ECMU0020	BEARING, TRANSMISSION PRECISION
19	ECKG0018	CRANKCASE, CLUTCH SIDE
20	ZCMU0032	GASKET, REED TO CASE
21	ECKG0202	REED ASSEMBLY
NOT SHOWN	ECKG0205	REED KIT
22	ZCMU0031	GASKET, INTAKE TO REED
23	ECKG0203	INTAKE MANIFOLD
24	HCBC0602	SCREW M6X20
25	HCBB0612	M6X12 BUTTON HEAD SCREW - BEARING RETAINER
26	HCWF0601	6MM FLAT WASHER

Parts –  
Engine –  
Clutch  
and Kick  
Starter

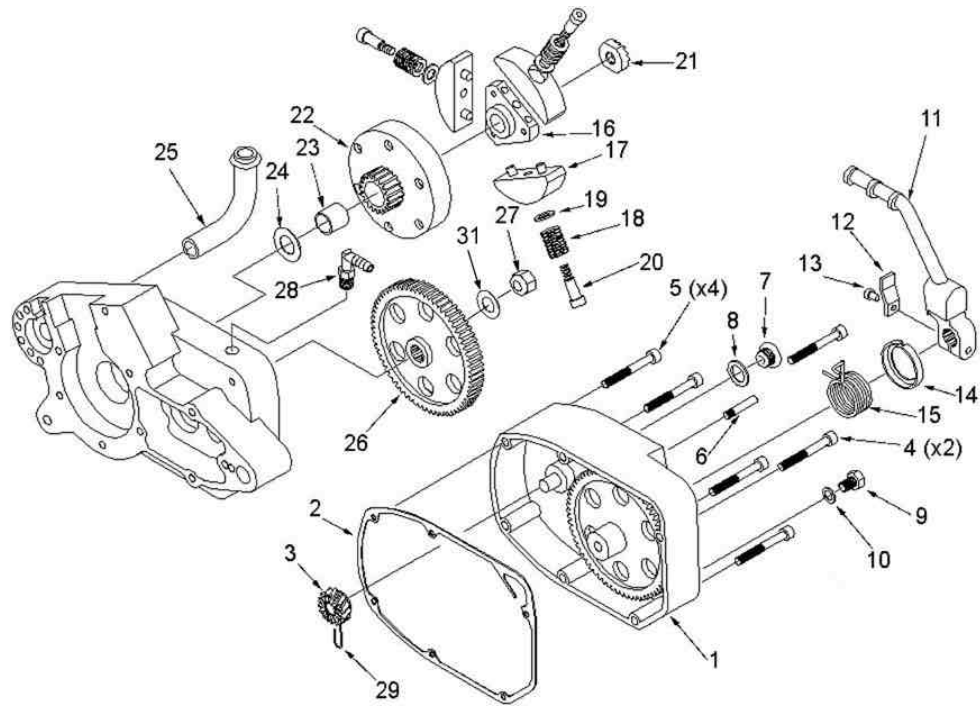


Figure 7B

Engine – Clutch and Kick Starter		
REF #	PART #	DESCRIPTION
1	ECMU0128	CLUTCH COVER WITH KICK SHAFT AND GEAR (NO LEVER)
2	ZCMU0030	CLUTCH COVER GASKET
3	ECMU0207	KICKSTART GEAR SMALL
4	HCBC0608	M6X55 SHCS CLUTCH CVR SCREW LNG (2 REQD) CENTER
5	HCBC606	M6X45 SHCS CLUTCH COVER SCREW SHORT (4 REQD)
6	ECMU0068	KICKSTART STOP BOLT
7	ECMU0037	OIL FILL PLUG
8	ZCMU0001	OIL FILL PLUG GASKET
9	HCBH0805	M8X12 OIL DRAIN SCREW
10	HCWC0000	COPPER GASKET
11	ECDC0046	KICK START LEVER
12	ECMU0164	KICK LEVER STOP BRACKET
13	HCBF0625	M6X25 FLANGE HEAD BOLT
14	ECMU0204	KICK STARTER DUST COVER
15	ECMU0063	KICK RETURN SPRING
16	CCMU0031	CLUTCH ARBOR
17	CAKG0005	CLUTCH SHOE (SET OF 3)
NOT SHOWN	CAKG0004	SET OF 3 CLUTCH SHOES WITH SPRINGS, WASHER & BOLT
NOT SHOWN	CAKG0002	CLUTCH ASSY W/ ARBOR, SHOES, SPRINGS, WSHR & BOLT
18	CCMU0129	SPRING, CLUTCH (SINGLE PIECE)
19	See Clutch	WASHERS, CLUTCH FLAT
NOT SHOWN	CAMU0008	SPRINGS, WASHER, & BOLT (COMPLETE SET FOR 3 SHOES)
20	HCBS5603	BOLT, CLUTCH CENTER (SINGLE PIECE)
21	ECMU0018	NUT, CLUTCH SPECIAL
22	ECMU0133	CLUTCH BASKET, WELDED WITH BUSHING
23	ECMU0003	BUSHING, CLUTCH BASKET
24	ECMU0040	SPACER, CLUTCH BASKET (1 - 3 REQD)
25	ECMU0131	WATER ELBOW
26	ECMU0108	GEAR, PRIMARY TRANSMISSION
27	HCNS1202	NUT, 1/2-20 LEFT HAND THREAD
28	ECDC0105	ELBOW, CASE VENT
29	ECMUSP01	KICK START DOG SPRING (PAPER CLIP)
31	HCWB0042	SPRING WASHER

## Parts – Engine – Ignition and Water Pump

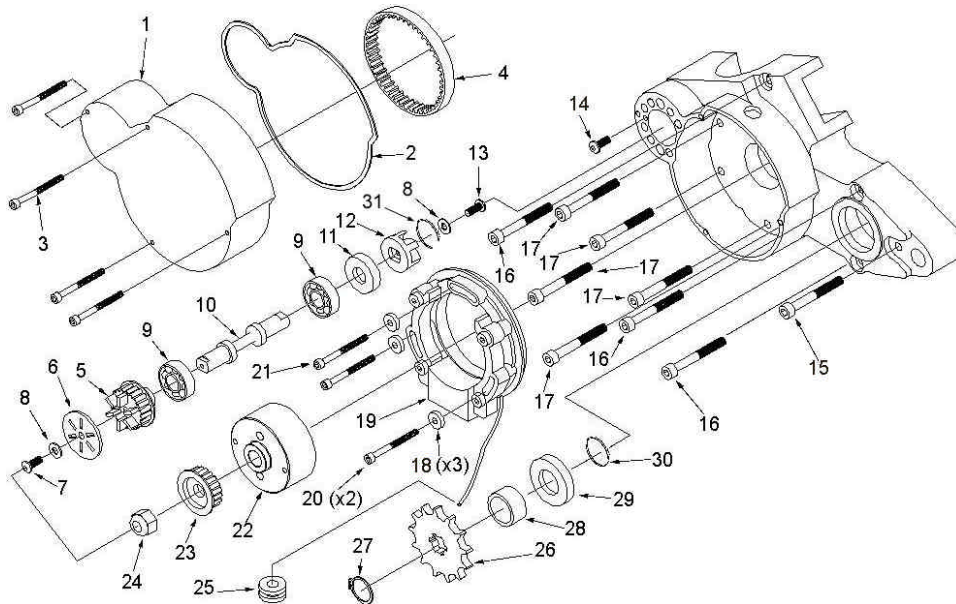


Figure 7C

Engine – Ignition and Water Pump		
REF #	PART #	DESCRIPTION
1	ECKG0001	IGNITION COVER
2	ZCKG0101	IGNITION COVER GASKET
3	HCBC0802	COVER SCREW, SHCS 802X1-3/4
4	ECKG0070	WATER PUMP BELT
5	ECKG0075	WATER PUMP PULLEY, FAN TYPE - DRIVEN
6	ECMU0080	BELT RETAINER
7	HCBC1033	PULLEY SCREW, SHCS 10-32X3/4
8	HCWF0501	FLAT WASHER
9	ECKG0072	BEARING, WATER PUMP
10	ECKG0141	SHAFT, WATER PUMP
11	ECKG0074	SEAL, WATER PUMP SHAFT
12	ECKG0073	IMPELLER, WATER PUMP
13	HCBB0001	IMPELLER SCREW, SHCS 10-32X1/2
14	HCSS8201	RETAINING SCREW, SHCS 8-32X3/8
15	HCBC0603	CASE SCREW, SHCS M6X30
16	HCBC0606	CASE SCREW, SHCS M6X45 (3 REQD)
17	HCBC0604	CASE SCREW, SHCS M6X35 (5 REQD)
18	HCWP0001	WASHER, STATOR (3 REQD)
19	ICMU0007	STATOR
20	HCBC0801	STATOR SCREW, SHCS 8-32X1-1/2 (2 REQD)
21	HCBC8312	STATOR SCREW, SHCS 8-32X1
22	ICMU0006	ROTOR
23	ECKG0042	WATER PUMP PULLEY, CRANK
24	HCNS1001	NUT 10MM
25	MCKGGR00	GROMMET
26	PCKG0014	SPROCKET, 14T COUNTERSHAFT
27	ECKGSR03	SNAP RING, COUNTERSHAFT SPROCKET
28	ECMU0073	SPACER, SPROCKET
29	ECMU0072	SEAL, COUNTERSHAFT
30	ZCDCOR01	O'RING, COUNTERSHAFT SPACER
31	ECKG0004	RETAINER, WATER PUMP ASSEMBLY



Parts –  
Engine – Top  
End

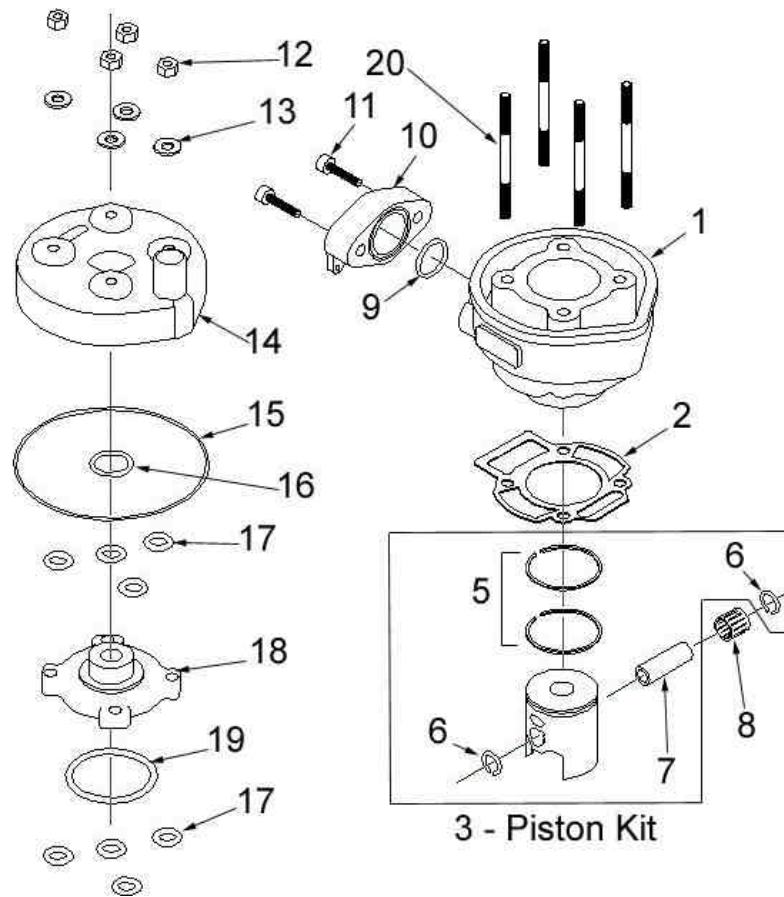
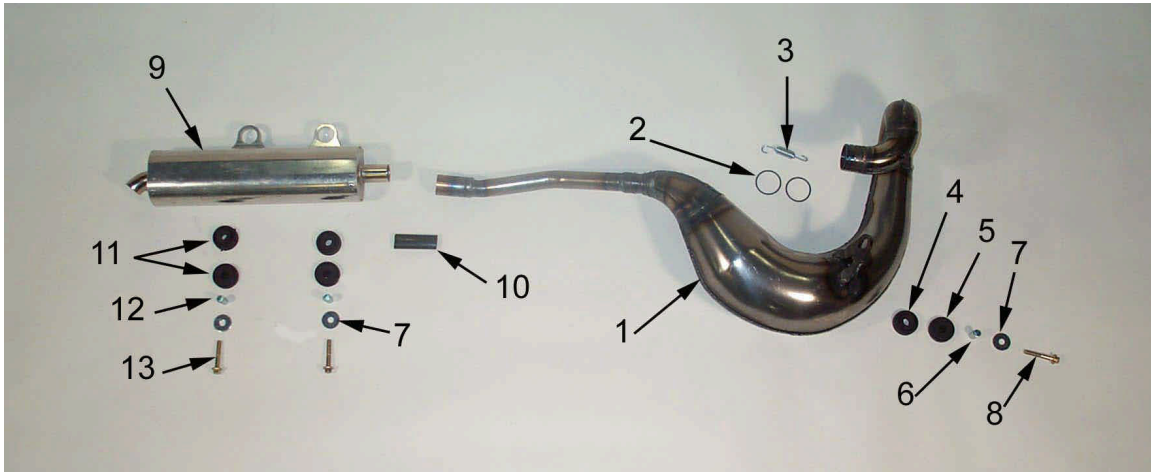


Figure 7D

Engine – Top End		
REF #	PART #	DESCRIPTION
1	ECMU0052	CYLINDER
2	ZCKG0002	BASE GASKET
3	ECMU0060	PISTON KIT
5	ECMU0055	PISTON RINGS (2 PER SET)
6	ECMUSR00	SNAP RING FOR PISTON (2 REQ'D)
7	ECKG0012	WRIST PIN
8	ECMU0077	BEARING, WRIST PIN
9	ZCMUOR07	O'RING, EXHAUST FLANGE
10	ECKG0015	EXHAUST FLANGE
11	HCBC0602	M6X20, EXHAUST FLANGE SCREW (2 REQ'D)
12	HCNS1401	NUT, CYLINDER HEAD 1/4-20 (4 REQ'D)
13	HCWF1401	FLAT WASHER, 1/4" (4 REQ'D)
14	ECKG0025	CYLINDER HEAD OUTER
15	ZCMUOR02	O'RING, CYLINDER HEAD LARGE
16	ZCMUOR08	O'RING CYLINDER HEAD SMALL
17	ZCMUOR03	O'RING CYLINDER STUD (8 REQ'D)
18	ECKG1121	CYLINDER HEAD, INSERT
19	ZCMUOR05	O'RING CYLINDER HEAD MEDIUM
20	ECMU0008	STUD, CYLINDER

# Parts – Exhaust System



**Figure 8**

Exhaust System		
REF #	PART #	DESCRIPTION
1	XCKG2004	2004 KING EXHAUST PIPE
2	ZCMUOR30	HEADER PIPE O-RINGS (2 REQD)
3	XCMU0005	EXHAUST SPRING - SHORT
4	MCMUGR06	PIPE GROMMET MALE
5	MCMUGR07	PIPE GROMMET FEMALE
6	MCMUSP02	PIPE GROMMET SPACER
7	HCWF1478	PIPE GROMMET WASHER (1 ON PIPE, 2 ON SILENCER)
8	HCBF0635	M6X35 FLANGE HEAD BOLT
9	XCDC0003	SILENCER
NOT SHOWN	XCMU0018	SILENCER PACKING
10	XCKG0009	PIPE / SILENCER SEAL
11	MCMUGR03	MOUNTING GROMMET (4 REQD TOTAL, 2 PER BOLT)
12	TCKG0001	SPACER (2 PER)
13	HCNF0601	6MM FLANGE NUT (2 REQD)

# Parts – Forks & Triple Clamps

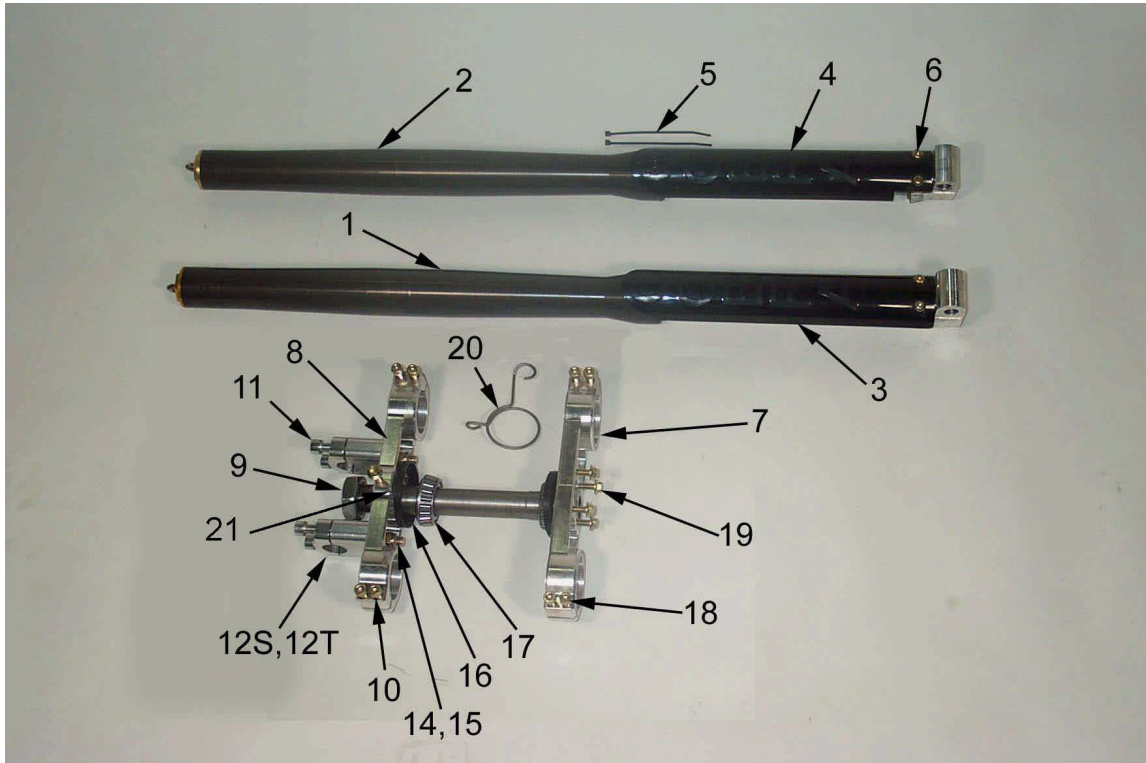


Figure 12

Front Forks and Triple Clamp		
REF #	PART #	DESCRIPTION
1	KAKG0010	FORK COMPLETE, NON-BRAKE SIDE
2	KAKG0009	FORK COMPLETE, BRAKE SIDE
3	KCKG0040	FORK GUARD SET
4	KCKG0040	FORK GUARD SET
5	MCMUZH04	CABLE TIE (2 REQD)
6	HCBB0612	M6X12, BUTTON HEAD SCREW (4 REQD)
7	FAKG0010	TRIPLE CLAMP BOTTOM ASSY, (1 BEARING AND DUST COVER)
8	FCKG0033	TRIPLE CLAMP UPPER
9	HCNJ0101	STEERING HEAD NUT 1X14
10	HCBC0604	SOCKET HEAD CS M6X35 (4 REQD)
11	HCBC0806	CAP SCREW M8X30 (4 REQD)
12S	TKMU0404	BAR MOUNT KIT, SHORT (2 REQD)
12T	TKMU0403	BAR MOUNT KIT, TALL (2 REQD)
14	HCBC3812	SOCKET HEAD CS 3/8-16 X 1-1/2 (2 REQD)
15	HCNL3816	LOCK NUT 3/8 - 16, (2 REQD)
16	FCMU0103	DUST COVER (2 REQD)
17	FCMU0004	STEERING HEAD BEARING (2 REQD)
18	HCBC0604	SOCKET HEAD CS M6X35 (4 REQD)
19	HCBF0616	FENDER BOLT, M6X16 FLANGE HEAD (4 REQD)
20	FCKG0212	BRAKE LINE HOLDER
21	HCBF0620	M6X20 FLANGE HEAD BOLT (NUMBER PLATE FASTNR)

## Parts – Forks – Leg Assembly

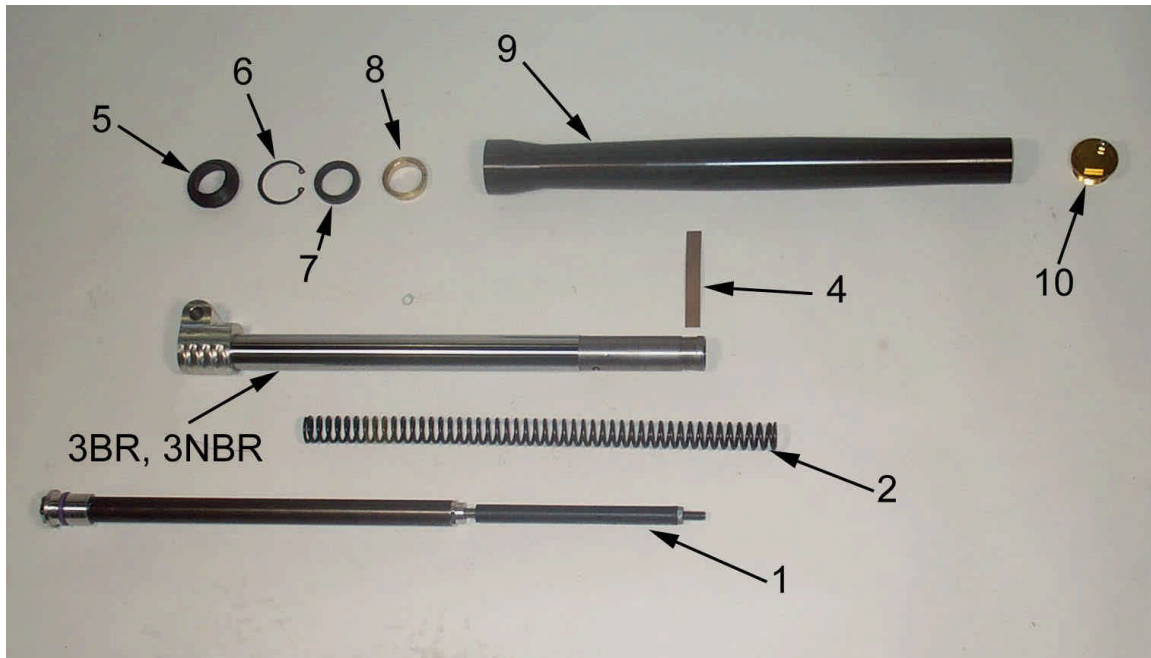


Figure 13

Fork Leg Assembly		
REF #	PART #	FORK DAMPER ASSEMBLY
1		FORK SPRING STANDARD (12 LB/IN)
2	KCKG1201	FORK SPRING OPTIONAL SOFTER (9 LB/IN)
NOT SHOWN	KCKG0009	FORK SPRING OPTIONAL STIFFER (15 LB/IN)
NOT SHOWN	KCKG0015	FORK LEG INNER ASSEMBLY, BRAKE SIDE
3 BR	KAKG0028	FORK LEG INNER ASEMBLY, NON-BRAKE SIDE
3 NBR	KAKG0029	FORK BUSHING, OUTER
5	KCMU0008	SNAP RING
6	KCMUSR23	FORK SEAL (PART NUMBER IS A SINGLE PIECE)
7	KCMU0007	FORK BUSHING, INNER
8	KCKG0020	OUTER FORK TUBE
9	KCKG0121	FORK CAP ASSEMBLY WITH RELIEF
10	KAKG0030	FORK DAMPER ASSEMBLY

## Parts – Forks – Damper Assembly

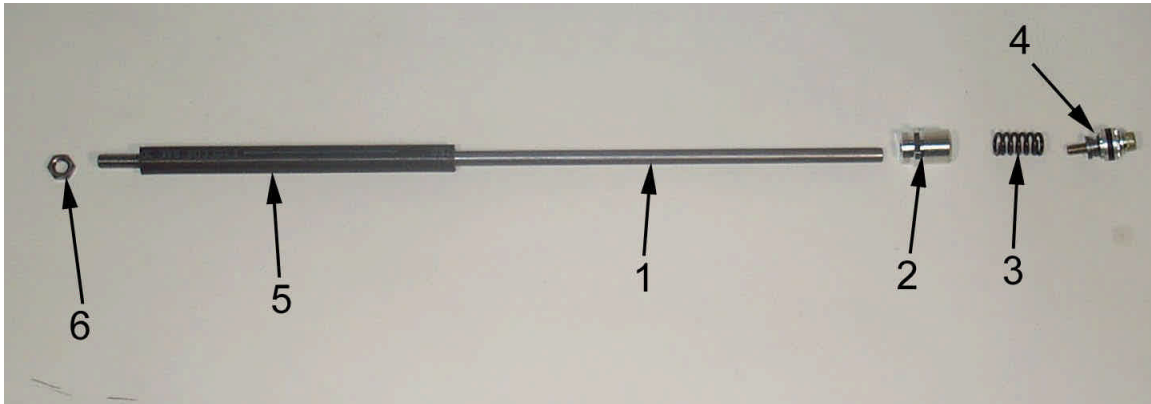


Figure 14

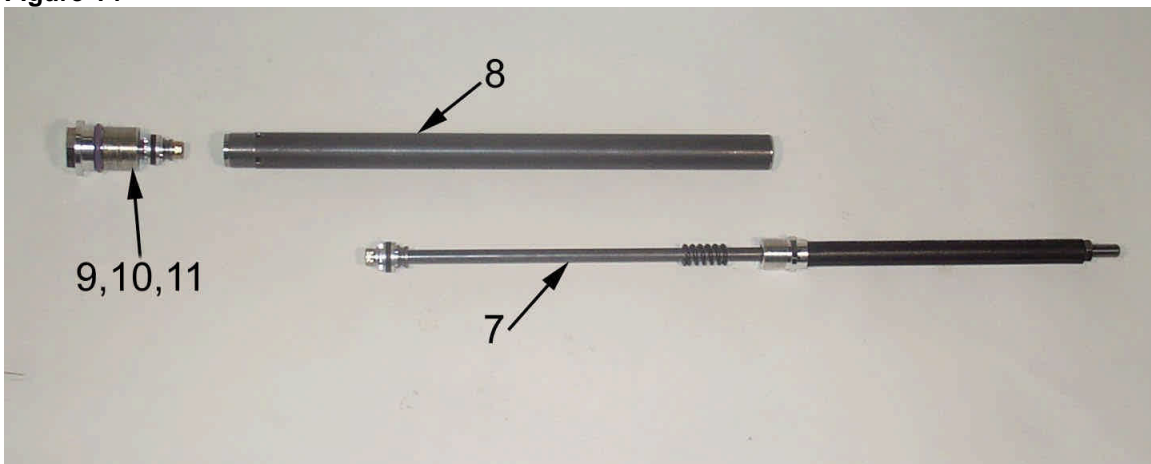


Figure 15

Damper Cartridge Assembly		
REF #	PART #	DESCRIPTION
1	KCKG0027	FORK DAMPER ROD
2	KCKG0025	CARTRIDGE TOP
3	KCKG0031	TOP OUT SPRING
4	KAKG0017	MID VALVE ASSEMBLY (STANDARD)
NOT SHOWN	KAKG0016	MID VALVE ASSEMBLY (SOFT/FAST) OPTIONAL
NOT SHOWN	KAKG0018	MID VALVE ASSEMBLY (HARD/SLOW) OPTIONAL
5	KCKG0032	FORK SPRING GUIDE
6	HCNJ5601	NUT
7		DAMPER ROD ASSEMBLY WITH MID VALVE
8	KCKG0023	CARTRIDGE TUBE
9	KAKG0014	BASE VALVE ASSEMBLY STANDARD
NOT SHOWN	KAKG0013	BASE VALVE ASSEMBLY (SOFT/FAST) OPTIONAL
NOT SHOWN	KAKG0015	BASE VALVE ASSEMBLY (HARD/SLOW) OPTIONAL
10	KCKG0024	BOTTOM PLUG
11	ZCKGOR10	BOTTOM PLUG O'RING

## Parts – Forks – Damper – Base Valve Assembly

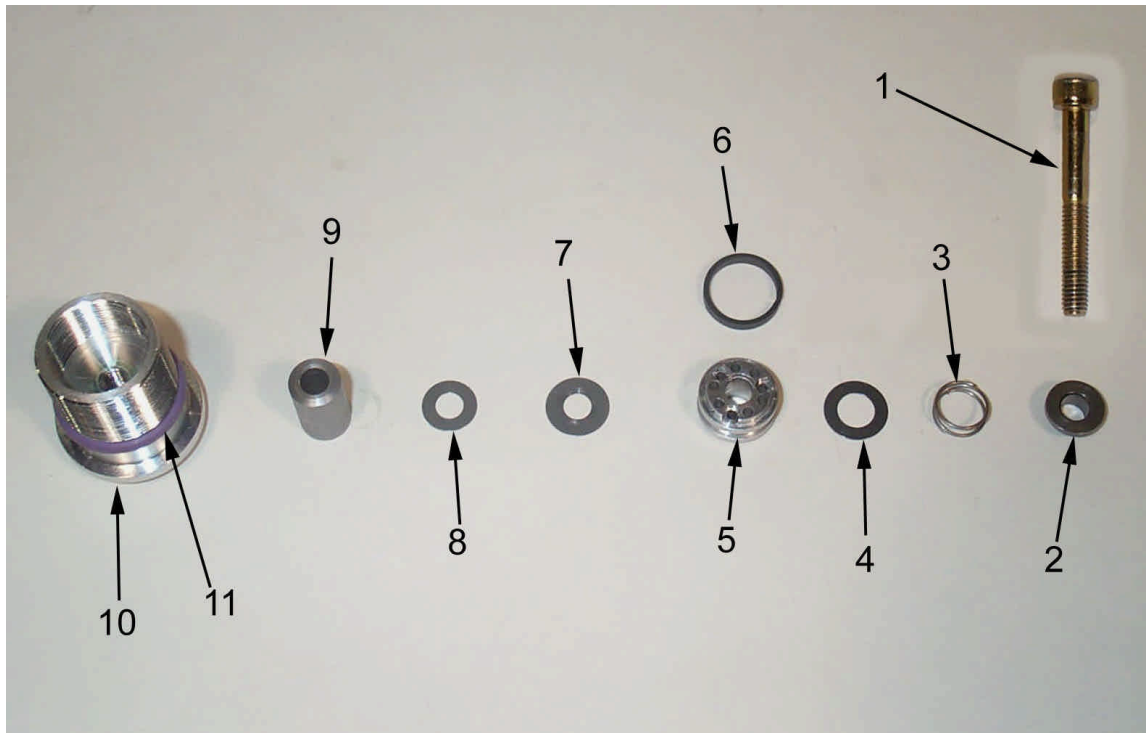


Figure 16

Forks -Valving, Base Valve Assembly – Std.		
REF #	PART #	DESCRIPTION
1	HCBC0606	M6X45 SOCKET HEAD CAP SCREW
2	KCKG0011	CHECKSTOP
3	KCKG0038	SPRING, BASE VALVE
4	KCKGSH01	CHECKPLATE, 14 X .3
5	KCKG0026	PISTON, FORK VALVE
6	KCKG0035	PISTON SEAL RING, BASE VALVE
7	KCKGSH02	SHIM, 14 X .1
8	KCKGSH03	SHIM, 12 X .15
9	KCKG0036	CONICAL SPACER
10	KCKG0024	BOTTOM PLUG
11	ZCKGOR10	O'RING, BOTTOM PLUG

## Parts – Forks – Damper – Mid Valve Assembly

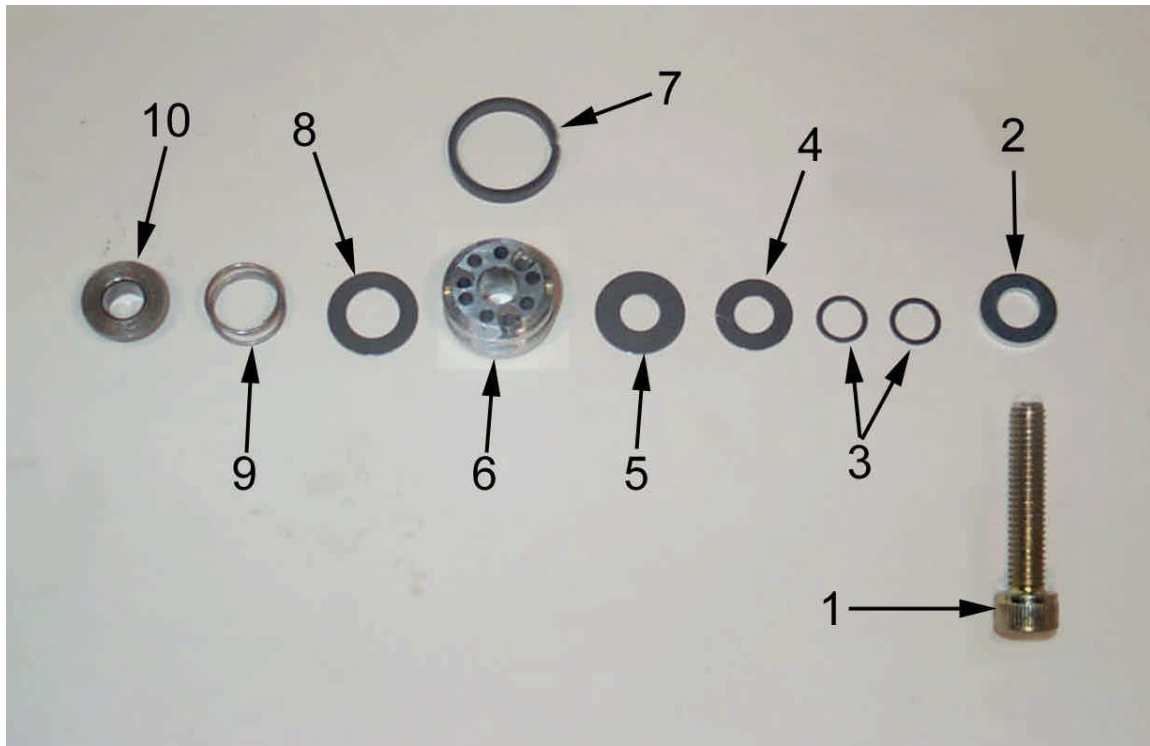
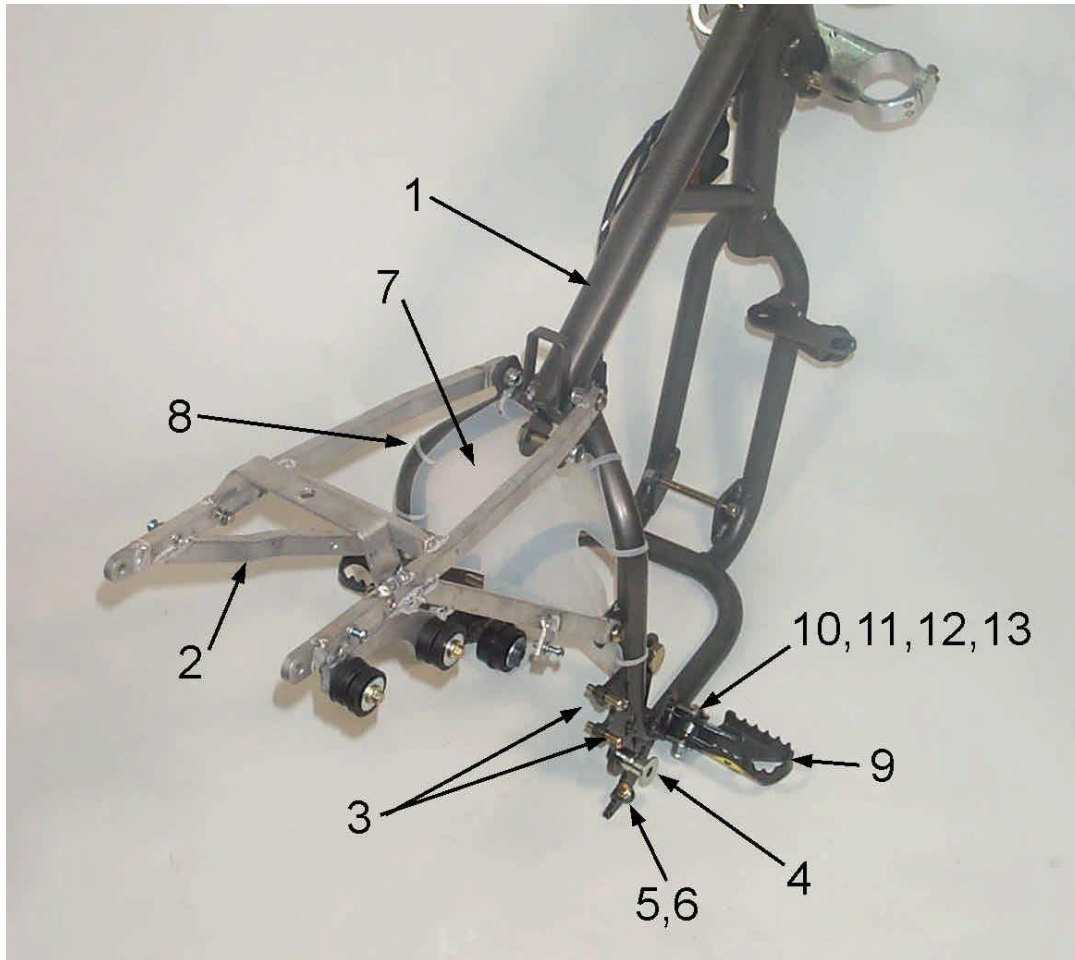


Figure 17

Forks – Valving, Mid Valve Assembly – Std.		
REF #	PART #	DESCRIPTION
1	HCBC0603	M6X30 SOCKET HEAD CAP SCREW
2	HCWF0601	FLAT WASHER
3	KCKGSH05	SHIM, 8 X .15 (2 REQD)
4	KCKGSH04	SHIM, 12 X .1
5	KCKGSH02	SHIM, 14 X .1
6	KCKG0026	PISTON, FORK VALVE
7	KCKG0035	GLIDRING, MIDVALVE PISTON
8	KCKGSH01	CHECKPLATE, 14 X .3
9	KCKG0038	SPRING - MID VALVE
10	KCKG0011	CHECK STOP

# Parts – Frame – Brake Mounts, Plastic Shield & Footpegs



**Figure 9**

Frame – Brake Mounts, Plastic Shield, & Footpegs		
REF #	PART #	DESCRIPTION
1	FAKG0001	FRAME 2004 KING
2	FAKG0009	SUB FRAME 2004 KING
3	HCBF0620	M6x20 FLANGE HEAD CS (2 PER)
4	BCDC0009	BRAKE PIVOT BOLT
5	HCBH0601	M6 X 16 HEX HEAD BOLT
6	HCNS0601	6 MM NUT
7	TCKG0202	MUD GUARD - FRONT OF SHOCK
8	MCMUZT06	6 INCH CABLE TIE (7 PER)
9	TCMU0110	WIDE FOOTPEGS (PAIR)
10	TCMU0106	FOOTPEG SPRING (2 PER)
11	HCBB0803	M8X40 BUTTON HEAD BOLT (2 PER)
12	HCNL0801	8MM LOCK NUT (2 PER)
13	HCWF5601	FLAT WASHER (2 PER)



## Parts – Frame - Exhaust, Radiator, & Engine Mounts

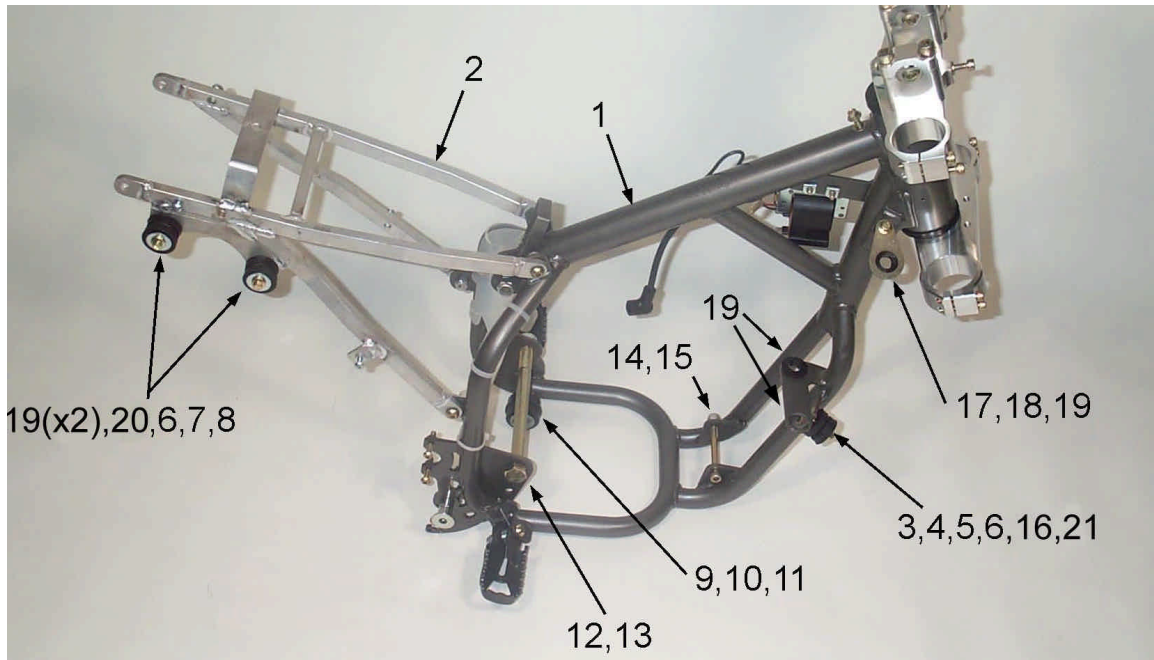


Figure 10

Frame – Pipe, Engine, and Radiator Mounts		
REF #	PART #	DESCRIPTION
1	FAKG0001	FRAME 2004 KING
2	FAKG0009	SUB FRAME 2004 KING
3	MCMUGR06	PIPE GROMMET MALE
4	MCMUGR07	PIPE GROMMET FEMALE
5	MCMUSP02	PIPE GROMMET SPACER
6	HCWF1478	PIPE GROMMET WASHER
7	HCBF0630	FLANGE HEAD BOLT, M6X30
8	HCNF0601	6MM FLANGE NUT
9	FCMU0057	CHAIN ROLLER
10	HCWF1201	WASHER FLAT, CHAIN ROLLER (2 REQ'D)
11	HCCP0002	COTTERPIN 3/32 X 1 (2 REQ'D)
12	HCBH1403	SWINGARM PIVOT BOLT
13	HCNL1402	SWINGARM LOCK NUT (M14 X1)
14	HCBH0880	FRONT ENGINE MOUT BOLT, M8X30 SHCS
15	HCNL0801	8MM LOCKNUT
16	HCHA0003	6MM CLIPNUT
17	FCMU0006	RADIATOR MOUNTING BRACKET (TEARDROP)
18	HCBF0616	FLANGE HEAD BOLT M6X16
19	MCMUGR03	MOUNTING GROMMET (3 FOR RADIATOR, 4 FOR SILENCER)
20	TCKG0001	SPACER
21	HCBF0635	M6X35 FLANGE HEAD BOLT

## Parts - Frame – Subframe, Shock, & Bodywork Mounts

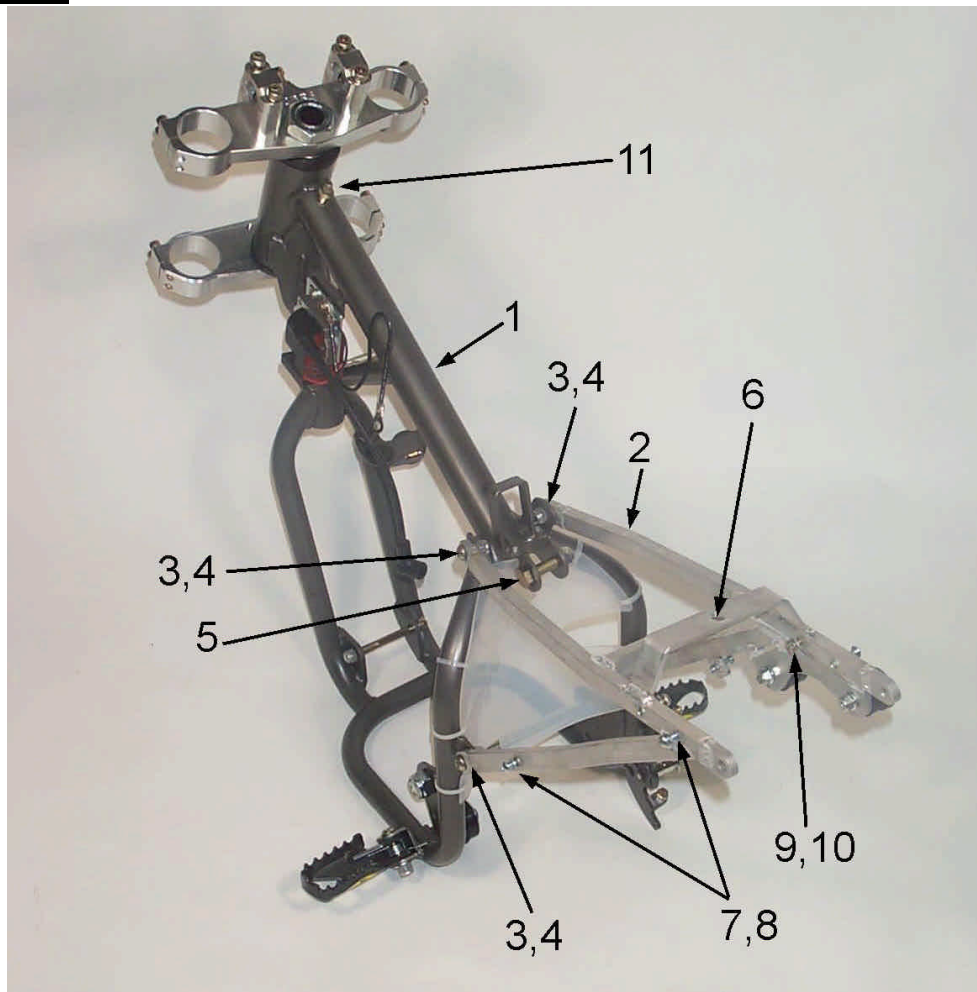


Figure 11

Frame & Subframe – Plastic and Shock Mounts		
REF #	PART #	DESCRIPTION
1	FAKG0001	FRAME 2004 KING
2	FAKG0009	SUB FRAME 2004 KING
3	HCBB0802	8X20 BUTTON HEAD CAP SCREW (4 PER)
4	HCNL0801	8MM LOCKNUT (4 PER)
5	HCBH1001	M10X40 UPPER SHOCK MOUNT BOLT
6	HCNF0601	6 MM FLANGE NUT
7	HCBB0002	M5X20 BUTTON HEAD CAP SCREW (4 PER)
8	HCWF0501	FLAT WASHER ( 2 REQD PER NUMBER PLATE)
9	HCBH0502	M5 X 16 HEX HEAD CAP SCREW (2 PER)
10	HCWF0601	FLAT WASHER (2 REQD)
11	HCBF0620	M6X20 FLANGE HEAD BOLT

# Parts – Front Brakes

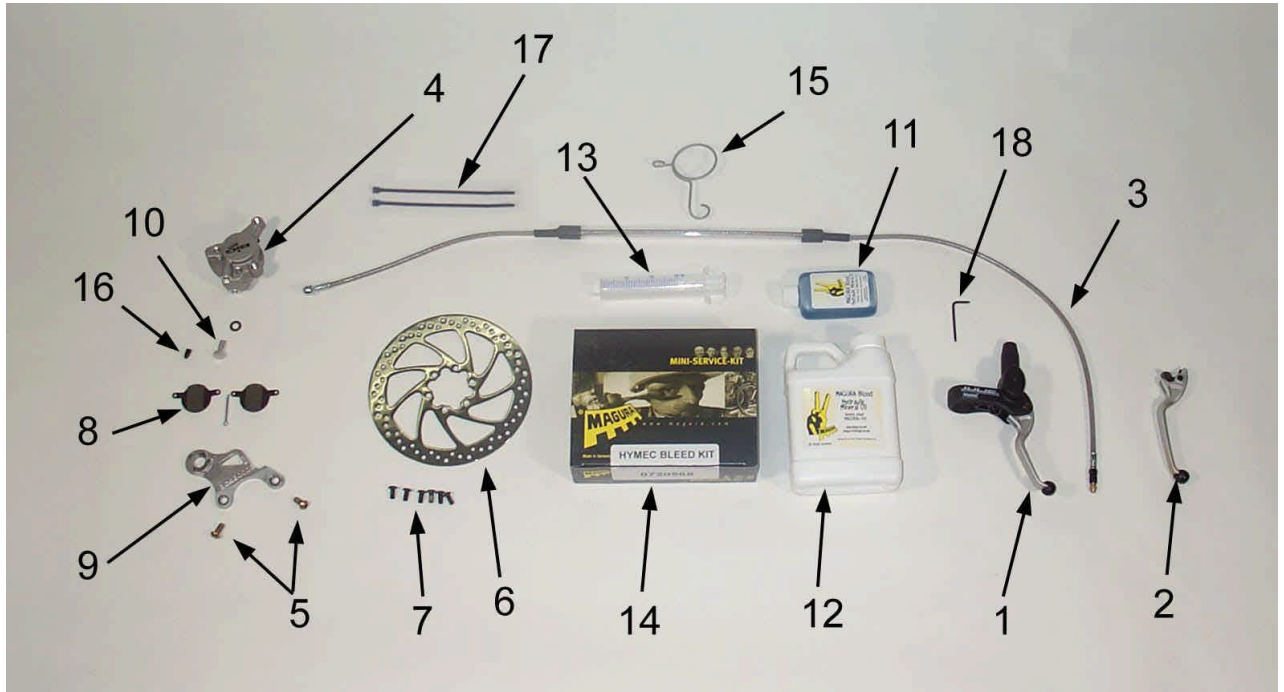


Figure 18

Front Brakes		
REF #	PART #	DESCRIPTION
1	BAMU2002	PERCH ASSEMBLY W/LEVER
2	BCMU0209	ALLOY BRAKE LEVER
3	BAKG0004	BRAKE HOSE WITH SHIELD
4	BCMU0204	BRAKE CALIPER WITH PADS
5	HCBB0612	M6X12 BUTTON HEAD BOLT (2 REQD)
6	BCMU0206	BRAKE ROTOR W/BOLTS
7	BCMU0207	BRAKE ROTOR MOUNTING BOLTS (6 REQD)
8	BCMU0203	BRAKE PADS (SET OF 2)
9	BCKG0008	BRAKE CALIPER MOUNTING BRACKET
10	BCMU0212	BRAKE HOSE MOUNTING SCREW (BANJO BOLT)
11	BCMU0205	BRAKE OIL, 2 OZ BOTTLE
12	BCMU0211	BRAKE OIL, 500 CC BOTTLE
13	BCMU0210	SYSTEM BLEED SYRINGE
14	BKMU0200	BRAKE BLEEDING KIT (2OZ OIL, SYRINGE, FITTINGS, ETC...)
15	FCKG0212	BRAKE LINE HOLDING BRACKET
16	BCMU0213	BLEED HOLE PLUG
17	WCMUZT04	CABLE TIES (2 REQD) TO SECURE BRAKE LINE TO FORK GUARD
18	BCMU0216	MASTER CYLINDER REMOVAL TOOL, TORX WRENCH T08

# Parts – Front Wheel

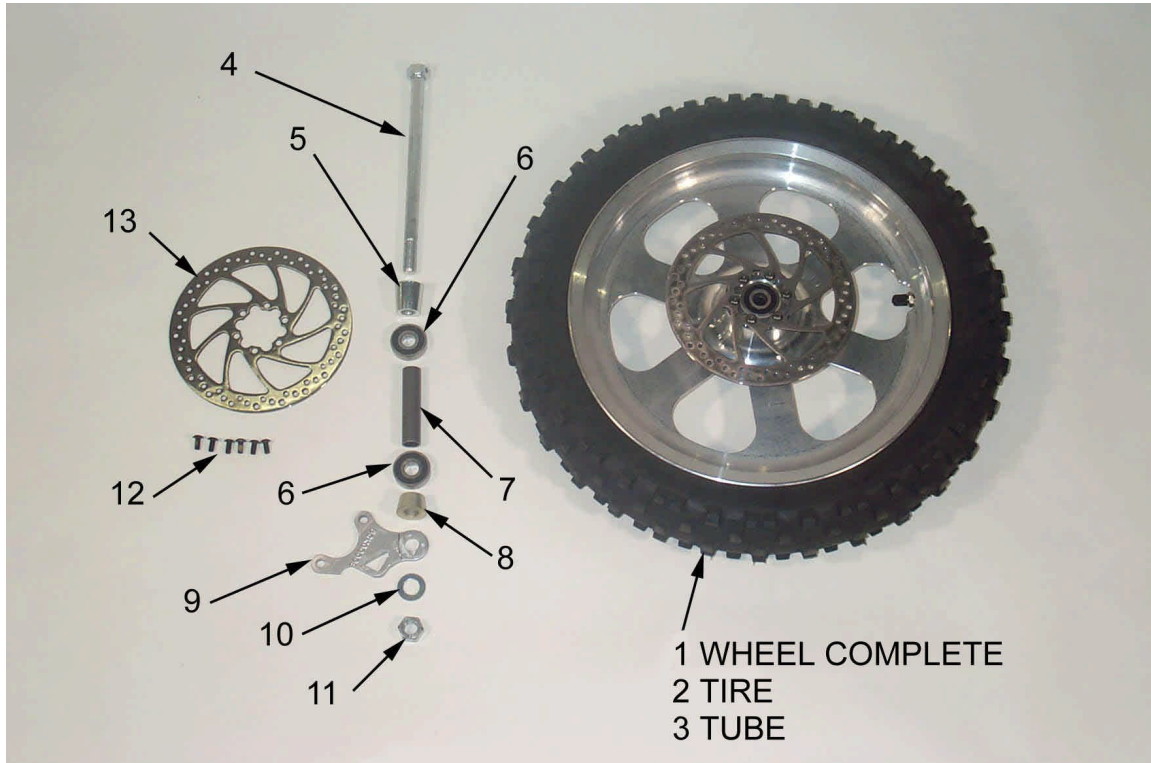


Figure 19

Front Wheel		
REF #	PART #	DESCRIPTION
1	WAKG2003	FRONT WHEEL COMPLETE
2	WCKG1200	12" FRONT TIRE
3	WCKG1201	12" FRONT TUBE
4	WCKG0011	FRONT AXLE
5	WCMU0023	FRONT WHEEL SPACER, X LARGE
6	WCMU0020	WHEEL BEARING (2 REQD)
7	WCKG0010	WHEEL BEARING SPACER
8	WCMU0001	FRONT WHEEL SPACER, LARGE
9	BCKG0008	BRAKE CARRIER BRACKET
10	HCWF1202	FRONT AXLE WASHER
11	HCNS1201	FRONT AXLE NUT (12MM)
12	BCMU0207	BRAKE ROTOR MOUNTING BOLTS (6 REQD)
13	BCMU0206	BRAKE ROTOR WITH MOUNTING BOLTS

# Parts – Plastic Bodywork & Seat

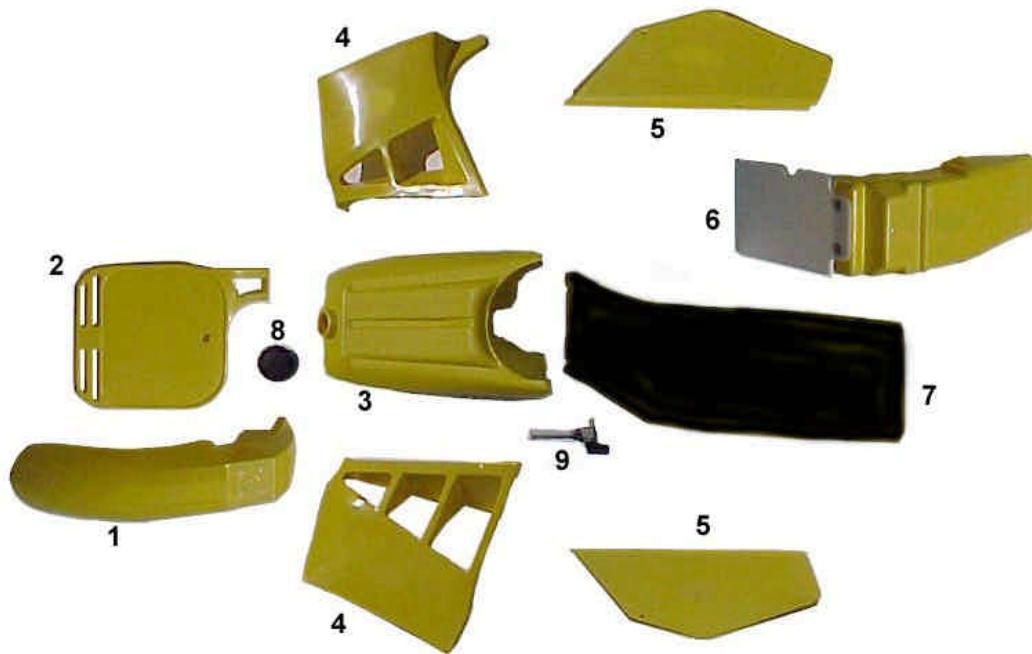


Figure 20

Plastic and Seat		
REF #	PART #	DESCRIPTION
1	TCMU0016	FRONT FENDER
NOT SHOWN	HCBF0616	FRONT FENDER MTG BOLTS (4 REQD)
2	TCMU0005	FRONT NUMBER PLATE
NOT SHOWN	HCBF0620	FRONT NUMBER PLATE MTG BOLT
3	TCMU0006	FUEL TANK (NO PETCOCK OR CAP)
NOT SHOWN	HCBF0620	FUEL TANK MOUNTING BOLT
4	TCMU0203	RADIATOR SHROUDS
NOT SHOWN	HCBB0402	RAD SHROUD MTG BOLT, LONG (1 PER SIDE)
NOT SHOWN	HCBB0403	RAD SHROUD MTG BOLT, SHORT (1 PER SIDE)
5	TCMU0013	SIDE NUMBER PLATE SET
NOT SHOWN	HCBB0002	NUMBER PLATE MTG SCREW (2 PER SIDE)
NOT SHOWN	HCWF0501	NUMBER PLATE WASHER (2 PER SIDE)
6	TAMU0012	REAR FENDER ASSEMBLY
NOT SHOWN	HCBH0502	REAR FENDER MTG BOLT (2 REQD)
NOT SHOWN	HCWF0601	REAR FENDER WASHER (2 REQD)
NOT SHOWN	TCMU0012	REAR FENDER NO MUD GUARD
NOT SHOWN	TCMU0011	MUD GURAD
7	TCMU0505	SEAT
NOT SHOWN	HCFN0601	SEAT MOUNTING NUT
8	TCMU0103	FUEL TANK CAP
9	TCMU0038	FUEL PETCOCK
10	TCMU0108	GRAPHIC KIT

# Parts – Rear Brake

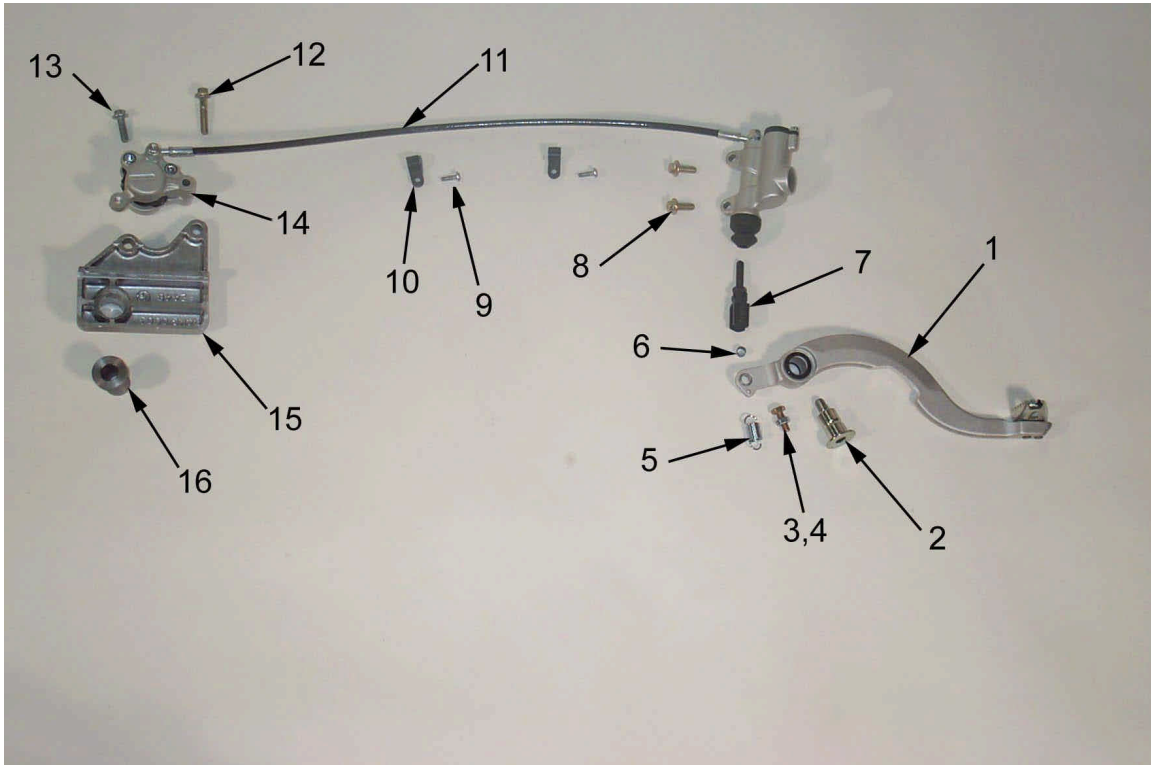


Figure 21

Rear Brake System		
REF #	PART #	DESCRIPTION
NOT SHOWN	BAKG0002	<b>BRAKE KIT, MASTR CYLR, CALIPER, PADS AND HOSE</b>
1	BCKG0001	BRAKE PEDAL
2	BCDC0009	BRAKE PIVOT BOLT
3	HCBH0601	M6X16 HEX HEAD BOLT
4	HCNS0601	6 MM NUT
5	BCMUSP01	BRAKE RETURN SPRING
6	BCDCBU01	BUSHING
7	BCDC0004	PUSH ROD, REAR BRAKE
8	HCBF0620	M6X209 FLANGE HEAD BOLT (2 REQD)
9	HCCC0002	BRAKE HOSE CLAMP (2 REQD)
10	HCPP0832	BRAKE HOSE CLAMP FASTENER (2 REQD)
11	BCKG0010	REPLACEMENT BRAKE HOSE
12	HCBF0635	M6X35 FLANGE HEAD BOLT
13	HCBF0620	M6X20 FLANGE HEAD BOLT
14	BCKG0009	BRAKE PADS
15	BCKG0003	BRAKE CARRIER
16	BCKG0006	WHEEL SPACER - FLOATING CARRIER
NOT SHOWN	BCKG0011	BRAKE ROTOR
NOT SHOWN	HCBB0620	M6X20 BUTTON HEAD CAP SCREWS (5 REQD)

# Parts – Rear Wheel

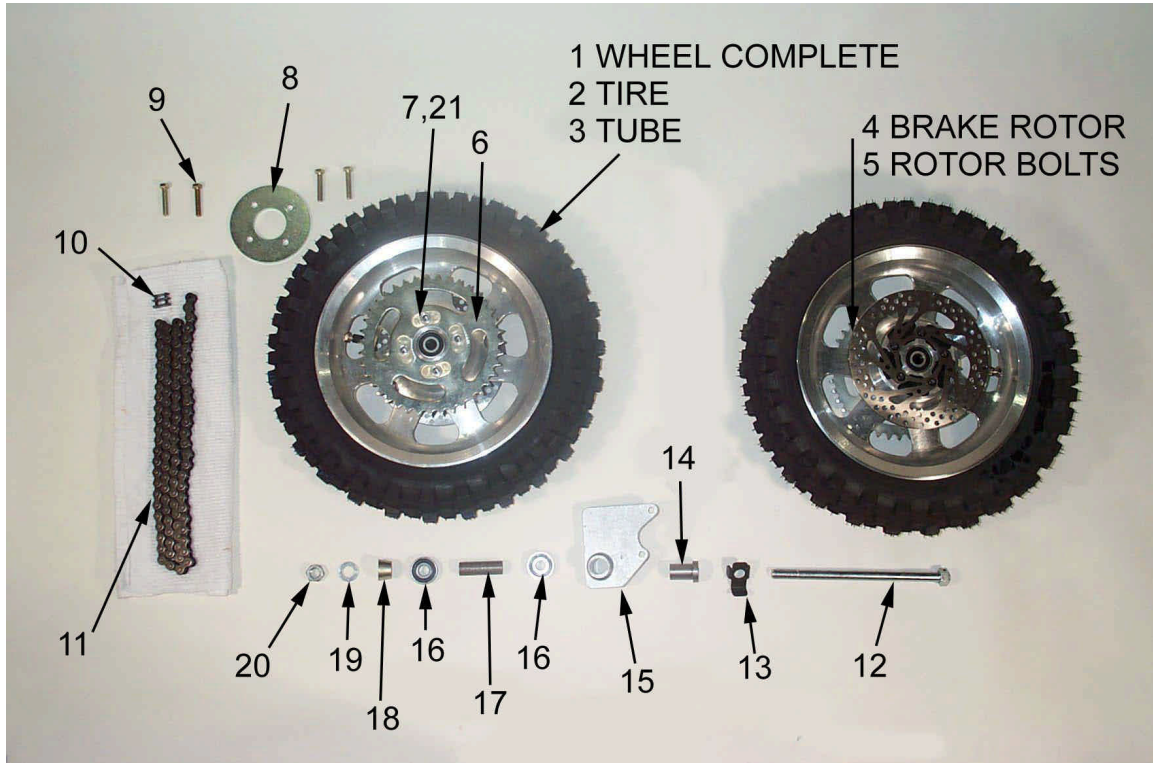


Figure 22

Rear Wheel		
REF #	PART #	DESCRIPTION
1	WAKG0009	REAR WHEEL COMPLETE
2	WCMU0275	REAR TIRE, BRIDGESTONE MT320 2.75X10
3	WCMUTU10	TUBE, BRIDGESTONE 10"
4	BCKG0011	BRAKE ROTOR
5	HCBB0620	M6X20 BUTTON HEAD CAP SCREWS (5 REQD)
6	PCMU0139	39T STEEL REAR SPROCKET
7	PCMU0059	RUBBER DAMPERS
8	WCMU0008	WHEEL DAMPING PLATE
9	HCBH0701	M7X35 HEX HEAD BOLT
10	PCMU0001	MASTER LINK 420
11	PCMU0100	CHAIN 420 X 100
12	WCMU0016	REAR AXLE
13	HCPA0002	AXLE HEAD FIXING PLATE
14	BCKG0006	WHEEL SPACER - FLOATING CARRIER
15	BCKG0003	BRAKE CARRIER
16	WCMU0020	WHEEL BEARING
17	WCMU0009	WHEEL BEARING SPACER
18	WCMU0001	WHEEL SPACER
19	HCWF1202	AXLE WASHER
20	HCNS1201	AXLE NUT 12MM
21	WCMU0006	SPACER, SPROCKET DAMPER (4 REQD)

# Parts – Shock

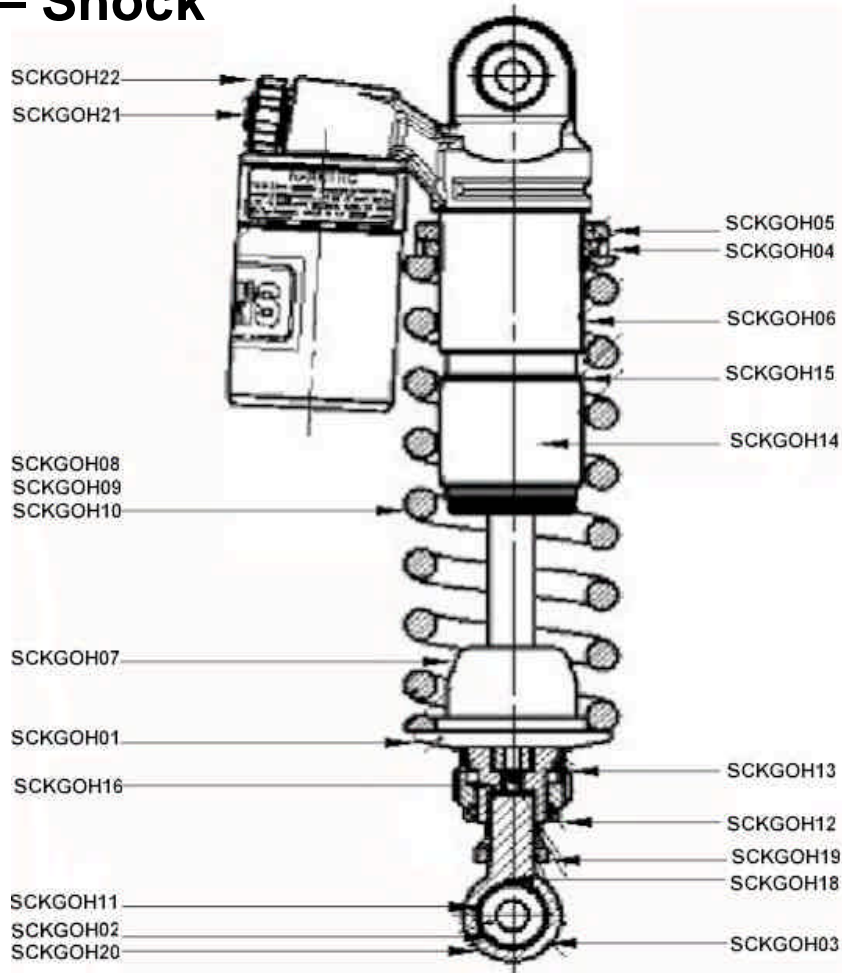


Figure 23

COBRA PART NUMBER	DESCRIPTION
SCKGOH01	SPRING CLIP
SCKGOH02	SPACER
SCKGOH03	BALL JOINT
SCKGOH04	SPRING PLATFORM
SCKGOH05	LOCKNUT
SCKGOH06	SLEEVE
SCKGOH07	BUMPER RUBBER
SCKGOH08	SPRING - LIGHT
SCKGOH09	SPRING-MEDIUM-STOCK
SCKGOH10	SPRING-HEAVY
SCKGOH11	ORING FOR BALL JOINT
SCKGOH12	ORING FOR REBOUND ADJUSTER
SCKGOH13	ORING FOR REBOUND ADJUSTER
SCKGOH14	SUPPORT SLEEVE
SCKGOH15	CIRCLIP
SCKGOH16	PIN FOR REBOUND ADJUST
SCKGOH17	ADJUSTMENT KNOB
SCKGOH18	SHAFT FOR END EYE
SCKGOH19	NUT
SCKGOH20	END EYE
SCKGOH21	SCREW FOR KNOB
SCKGOH22	KNOB FOR ADJUSTMENT



# Parts – Swingarm Assembly

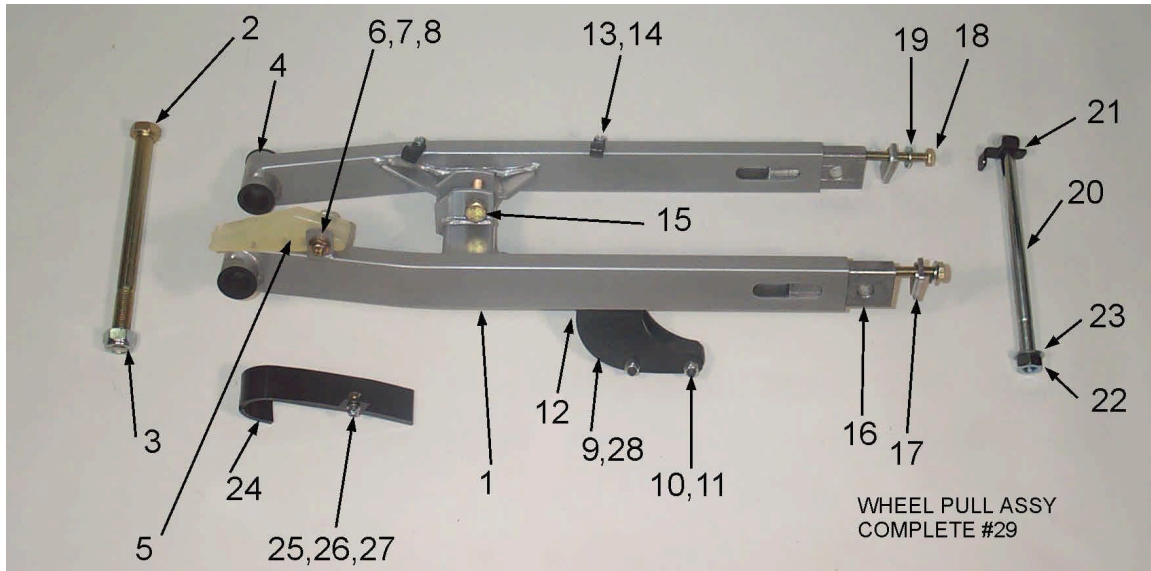


Figure 24

Swingarm		
REF #	PART #	DESCRIPTION
1	GAKG2004	SWINGARM ASSEMBLY COMPLETE
2	HCBH1403	SWINGARM PIVOT BOLT
3	HCNL1402	SWINGARM LOCK NUT (M14 X1)
4	GCMU0001	SWINGARM BUSHING (4 PER)
5	GCMU0005	TOP SWINGARM GUARD (CHAIN SLIDER)
6	HCBF0840	FLANGE HEAD BOLT M8X40
7	HCWF5601	FLAT WASHER
8	HCNL0801	8MM LOCK NUT
9	PAKG0001	CHAIN GUIDE ASSEMBLY COMPLETE
10	HCBF1401	1/4 X 20 X 1-1/2" FLAT HEAD SCREW (2 PER)
11	HCNL1401	1/4" LOCKNUT (2 PER)
12	HCBF0620	M6 X 20 FLANGE HEAD BOLT (2 PER)
13	HCCC0002	BRAKE HOSE CLAMP (2 PER)
14	HCPP0832	BRAKE HOSE CLAMP FASTNER (2 PER)
15	HCBH1001	M10 X 40 LOWER SHOCK MOUNT BOLT
16	FCMU0203	WHEEL PULL
17	FCMU0202	WHEEL PULL CAP
18	HCBH0810	WHEEL PULL BOLT M8X65
19	HCWF5601	WHEEL PULL WASHER
20	WCMU0016	REAR AXLE
21	HCPA0002	AXLE HEAD FIXING PLATE
22	HCNS1201	AXLE NUT, 12 MM
23	HCWF1202	AXLE WASHER
24	GCMU0017	OPTIONAL TO P CHAIN SLIDE
25	HCFH0516	FLAT HEAD SCREW
26	HCWF0501	WASHER
27	HCNL0501	LOCK NUT
28	PCKG0004	BOTTOM CHAIN SLIDER
29	FAMU0005	WHEEL PULL ASSEMBLY COMPLETE
30	GCKG0008	SWINGARM PIVOT TUBE SPACER (2 PER)

# Service

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 has specialized mechanics that 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. Call (330) 549-9603 for details.

## Engine Service

One method for determining whether the top end of your engine needs rebuilt is to perform a WOT (Wide Open Throttle) kicking compression test. Before performing the procedure please read the caution notes below.

### **CAUTION:**

- There appears to be a wide range of variability in reading compression gauges across the country.
- The head volume of this Cobra Motorcycle is very small and so requires many kicks ~20 before you establish the most accurate reading possible.
- Because of the geometry of the spark plug used in this Cobra Motorcycle, the adapter used with your compression tester must have a similar volume protruding into the combustion chamber to establish an accurate value.
- Length of hose on the compression tester will affect the reading. The shorter the hose length the more accurate your reading will be.

Because of these difficulties in measuring an *absolute* compression value, a useful *relative* value can be achieved by testing your bike's compression with your own particular gauge after a new top end or when the bike is new so that you know what your particular gauge reads on a 'fresh' engine. When it has

dropped to 90% of its original value the engine will be down on power and would benefit from a rebuild. When it's dropped to 80% it really needs rebuilt! Using the table below will help you determine monitor the condition of your top end.

	Engine is Fresh Measured Value	Engine Down on Power Measured Value * 0.9	Engine NEEDS Rebuilt Measured Value * 0.8
Example	110 psi	110 psi * 0.9 = 99 psi	110 psi * 0.8 = 88 psi
Your Values			

### Procedure for Compression Testing

1. Shut off the fuel petcock.
2. Install the compression gauge into the spark plug hole.
3. Hold the throttle to wide open, and kick repeatedly (approximately 20 times) or until the gauge reading does not increase in value with each kick.

## Engine Removal

To service the bottom end and transmission, the engine must be removed from the frame.

### Tools required

- 5/16", 10, 14, mm socket
- 10, 13, 22 mm wrench
- 10, 17 & 19 mm sockets
- 9/64", 3,4 & 5 mm hex key (Allen wrench)
- 7 mm nut driver, flat or Phillip, screwdriver for hose clamps
- Spring remover
- Flywheel / clutch puller (#MCMUTL68)
- Clutch nut removal tool (Call local dealer for details).

### Procedure

1. Remove the seat (4mm hex key).
2. Turn of the fuel at the petcock and disconnect the fuel line.
3. Remove the tank (5 mm hex key & 10 mm socket).
4. Remove the carburetor from the inlet (flat head or Phillips head screwdriver, 7 mm nut driver).
5. Remove the right side number plate (3mm hex key).
6. Remove the silencer & pipe (spring remover, 5mm hex, & 10mm wrench).
7. Disconnect the ground wire from the reed cage with a 5 mm hex key (depending on your ultimate repair, you may want to reinstall the fastener in the inlet).
8. Leaving the coolant lines connected to the engine, remove the radiator from the frame (5mm hex with 10 mm wrench).
9. Remove the master link from the chain.
10. Remove front engine mount bolt (13 mm socket, 6 mm hex key).

11. To access the swingarm bolt, remove brake lever (13 mm wrench, 5 mm hex key).
12. Remove the swingarm bolt (22mm socket & wrench).

**NOTE:**

Only drive the swingarm bolt far enough to clear the engine, leave it holding the one side of the swingarm to the frame

13. Remove the engine from the right side of the frame.
14. Locate a suitable container for the engine coolant and remove radiator hoses from engine (coolant will drain).

**NOTE:**

If the coolant looks to be free of contaminants it may be reused.

**NOTE:**

If you are merely performing a top end service skip ahead to *Top End Disassembly Procedure*.

## Complete Engine Disassembly Procedure

1. Remove the magneto cover (9/64" hex key)
2. Remove the bolt from the water pump shaft (4mm) and slide off the belt cover and the water pump belt
3. Using a flywheel holding tool and 14 mm socket remove the nut that secures the flywheel.
4. Using the Cobra flywheel / clutch puller (#MCMUTL68), remove the flywheel from the crankshaft.
5. Remove the stator (9/64" hex key).
6. Remove the nut holding the large gear to the transmission input shaft (19 mm socket).
7. Remove the special nut / starter gear that holds on the clutch (special tool available, contact your local dealer).
8. With the Cobra flywheel / clutch puller (#MCMUTL68), remove the clutch from the crankshaft (details in Clutch Service portion of this manual).

## Top End Disassembly Procedure

1. Remove the cylinder head nuts (5/16").
2. Remove the outer cylinder head.
3. Remove the inner cylinder head.

**INSPECTION NOTE:**

Inspect the cylinder head for deposits and abrasions.

1. If there are deposits they should be removed
  - a. Black oily deposits (indicating a rich mixture or improper oil type/quantity) can be removed with solvent
  - b. Crusty deposits (indicating dirt ingestion) can be removed with solvent and may require some scraping.
2. Abrasions
  - a. Pitting or erosion indicates detonation and may require cylinder head replacement, also
    - i. Retard the ignition timing
    - ii. Use a higher octane fuel
  - b. Missing chunks or indentations indicate broken hardware or ingested items - replace the cylinder head.

4. Remove the cylinder.

**INSPECTION NOTE:**

Inspect the cylinder bore for abrasions, deposits, and missing coating.

1. If abrasions: scrapes, scratches, pitting, etc... are found, replace the cylinder.
2. If deposits are all are found
  - a. Clean with muratic acid.
  - b. Once the deposits are removed, inspect for abrasions and missing surface coating.
    - i. If there are abrasions or missing coating, replace.
    - ii. If all looks well, the cylinder may be saved.

** WARNING**

Muratic acid can be dangerous. Follow the manufacturers instructions closely.

5. Remove the piston clip with a scribe.
6. Remove the piston pin with a piston pin remover.

**INSPECTION NOTE:**

Inspect the piston for abrasions and deposits on the top and sides and clean or replace as necessary.

## Splitting the Cases

1. Remove the fasteners holding the two halves of the crankcase together.
2. Separate the cases with a proper case splitting tool.

**CAUTION:**

Take caution when handling the crankshaft. It is the main power transfer to the rest of the engine. If it is out of alignment, it will cause premature failure of your bearings which can lead to serious damage to the cylinder and the rest of the engine. Do not try to true the crank yourself. Truing the crank should be done professionally.

**CAUTION:**

- If you split the cases, check the gear tooth faces for chapping & signs of fatigue.
- Check the small needle bearings for fatigue. If the bearings are damaged, the engine cases should be checked to make sure the needle-bearing casing didn't oblong the bearing hole in the case.
- Needle bearings should be replaced every racing season.

## Engine assembly

**CAUTION:**

For any seals that are to be installed, apply a light amount of grease to the seals' ID and a small amount of Loctite to the OD.

1. Press the three bearings into the respective holes in each case half.
2. Press in the crank seals such that the concave side faces the crank weights.
3. Press in the counter shaft seal (concave side faces inside of transmission)
4. Install the water pump assembly wire ring retainer
5. Press in the water pump assembly
6. Tap both ways axially then verify easy rotation
7. Press crank into right case half

**CAUTION:**

Insert a 7.05mm (0.278") shim between the crank throws before pressing on the crank.

8. Insert the transmission input shaft and install large drive gear as shown in figures 25 & 26.

**NOTE:**

If the nut was removed from the input shaft, it will be easier to install and tighten later.

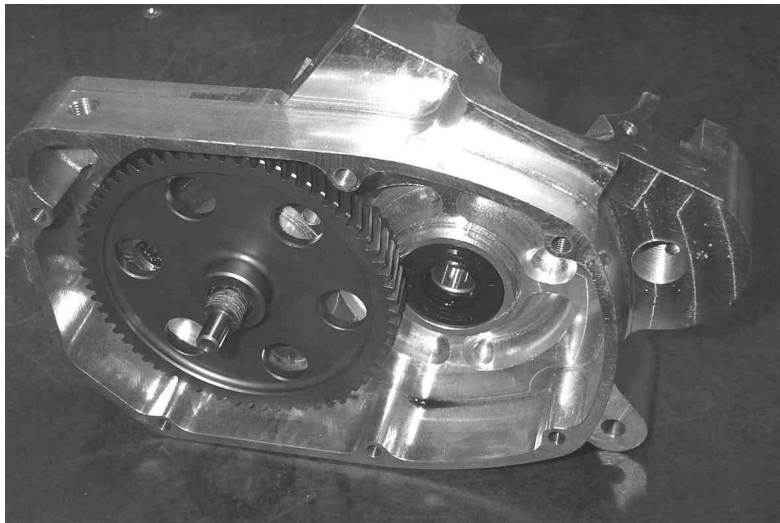


Figure 25

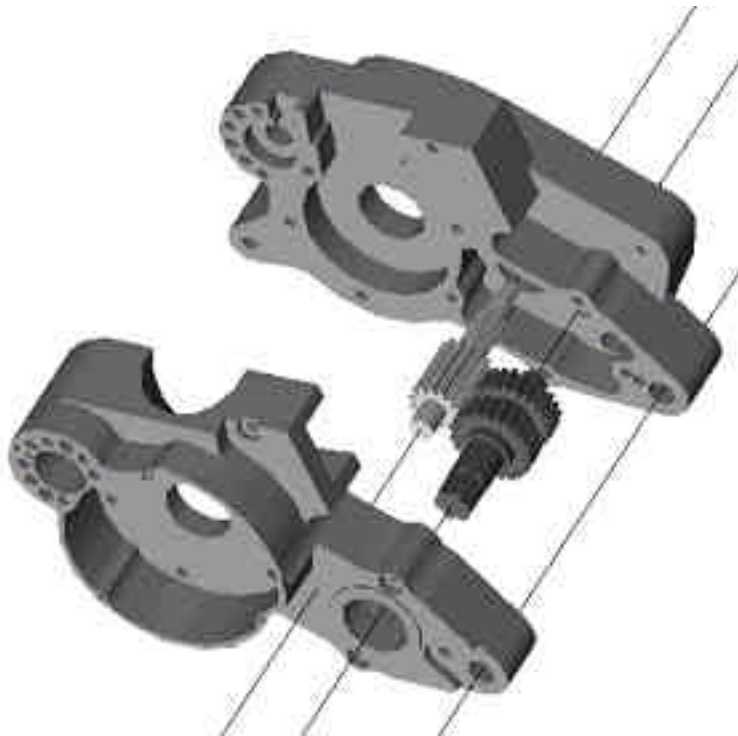


Figure 26

9. Insert dowel pins in the left side case as shown in figure 27.

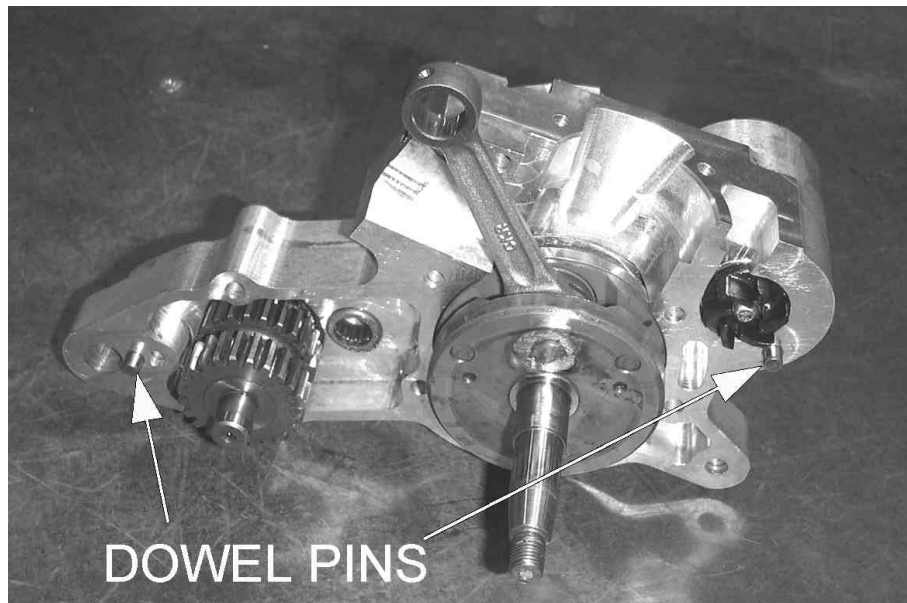


Figure 8

10. Apply gasket sealer (ThreeBond 1104 gasket material or equivalent) to the mating surfaces of both crankcase halves.
11. Apply the crankcase gasket to the left crank case half being sure to install the gasket behind the connecting rod.
12. Assemble the two case halves together with the shim installed between the crank throws. **Be sure to remove the shim after assembly.**
13. Insert the screws with the proper lengths at locations shown.

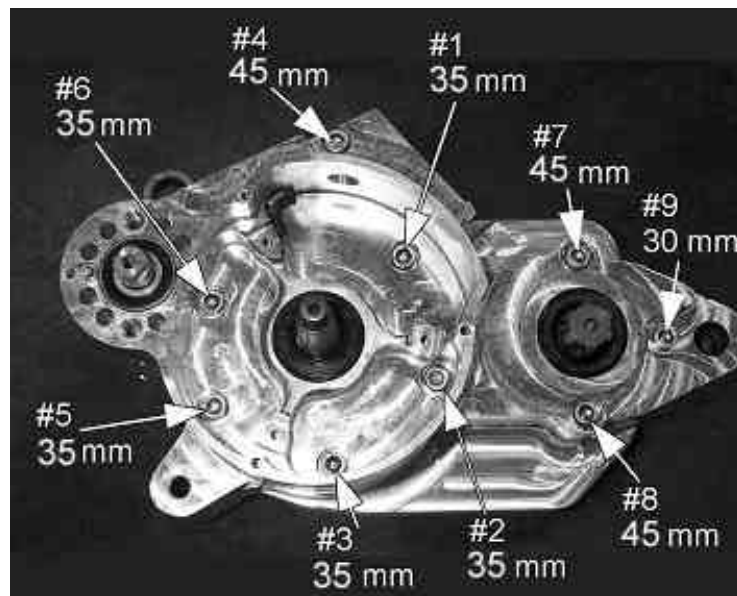


Figure 28

14. Torque to 9 Nm (80 in-lb) in the pattern shown in figure 28.
15. Install the piston with new wrist pin bearing and, pin and clips.

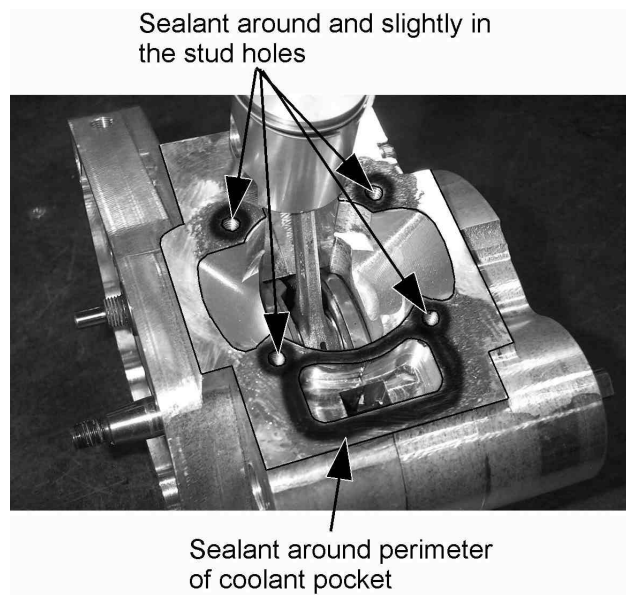


16. Install the piston rings.

**CAUTION:**

Be sure to align the piston such that the arrow on the top piston surface points to the exhaust (front of bike/engine).

17. Apply gasket sealer (ThreeBond #1104, semi-drying liquid gasket material) to the cylinder deck areas around the coolant passage and cylinder studs as shown in figure 29.



**Figure 29**

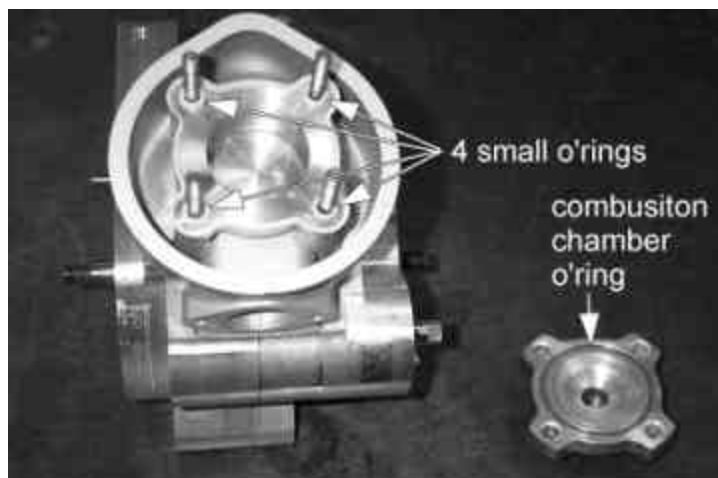
18. Install the base gasket

19. Install the cylinder being sure that the piston rings are properly aligned with the indexing pins.

**CAUTION:**

Never force the cylinder. If resistance is felt, determine the problem and solve it.

20. Install the cylinder studs and o'rings as shown in figure 30.



**Figure 30**

21. Install cylinder head insert.
22. Install O'rings as shown in figure 31.

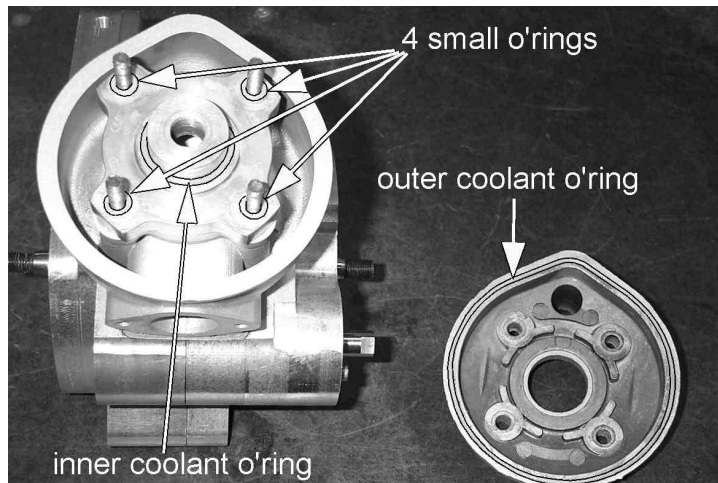
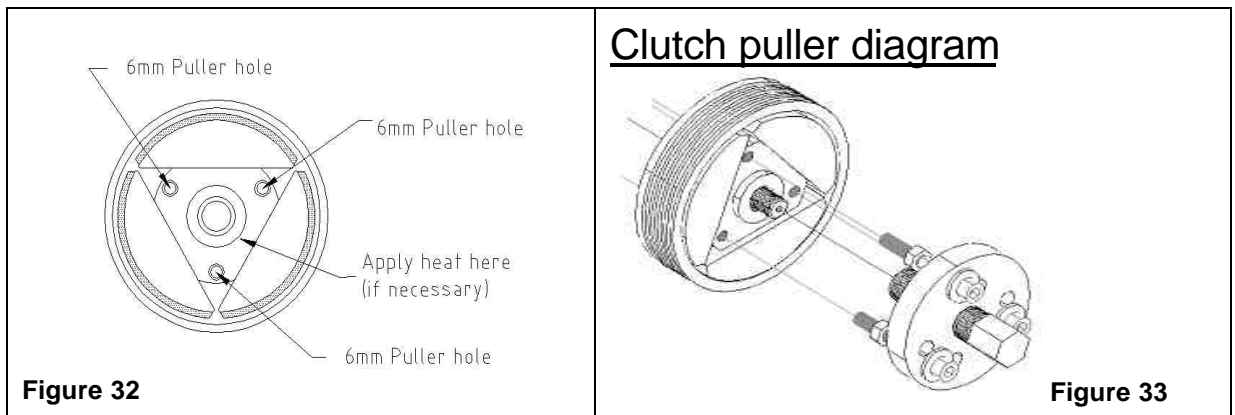


Figure 31

23. Install the cylinder head and torque to 9.2 ft-lb (12 Nm)
24. Install stator reinstalling the grommet and wires (snug the bolts).
25. Install the rotor per *Rotor Installation* section, under the *S3: Ignition* portion of this manual.
26. Install the water pump outlet pipe (apply Ultra black Hi-Temp RTV silicon gasket maker to the threads before assembly) before installing the clutch and rotate to a vertical position with the engine resting on a bench
27. Install the clutch per *Clutch Installation* section in this manual.
28. Install the coolant drain plug with copper washer (11 ft-lb, 15 Nm).
29. Make sure that the exhaust spacer is on the cylinder (53 in-lb, 6 Nm).
30. Install the spark plug with a fresh gasket (to apply the proper torque to the spark plug when inserting, one must first screw the spark plug in until the metal gasket ring causes resistance and then turn another 1/8 to 1/4 turn).
31. Install reed and inlet manifold with new gaskets (58 in-lb, 6.5 Nm).

# Clutch

## Cobra clutch puller assembly:



### Tools recommended for clutch service:

- Universal clutch puller- a universal puller that pulls the clutch, main drive gear and rotor. (Part # MCMUTL70).
- 5mm T-handle
- Clutch nut removal tool (Call local dealer for details)
- *Cobra 3 Shoe Clutch Milk* (Part # MCMUGF01) or Dexron III ATF.

### CLUTCH REMOVAL:

1. Drain the engine transmission oil.
2. Remove the pipe and remove the 6 bolts that hold the kick-starter cover on.
3. Remove the clutch nut (not left hand thread) on the end of the crankshaft with the clutch nut removal tool.
4. Attach the *COBRA CLUTCH PULLER*. There are three 6mm clutch puller holes located on the ends of the center hub. (figures 32 & 33) You must use a *draw type puller* to remove the clutch.

#### CAUTION:

Do not use a jaw type puller or use the 6mm tapped holes as jackscrews or you are likely damage the clutch or drum.

5. If necessary apply heat to the center clutch hub.

#### CAUTION:

Do not heat the crankshaft threads or the aluminum shoes.

6. Keep tension on the puller as you are heating it.

#### **⚠ WARNING**

The clutch will often pop off under tension from the puller and it will be very hot.

**CLUTCH WASHER STACKUPS:**

Once the clutch is removed, and cool to touch, carefully put it into a vice and remove the center shoulder bolt out of each clutch shoe. You will probably have to heat the center hub again to remove the bolts. Once you get a bolt loosened, carefully remove it with the shoe and observe the way the spring washers are stacked.

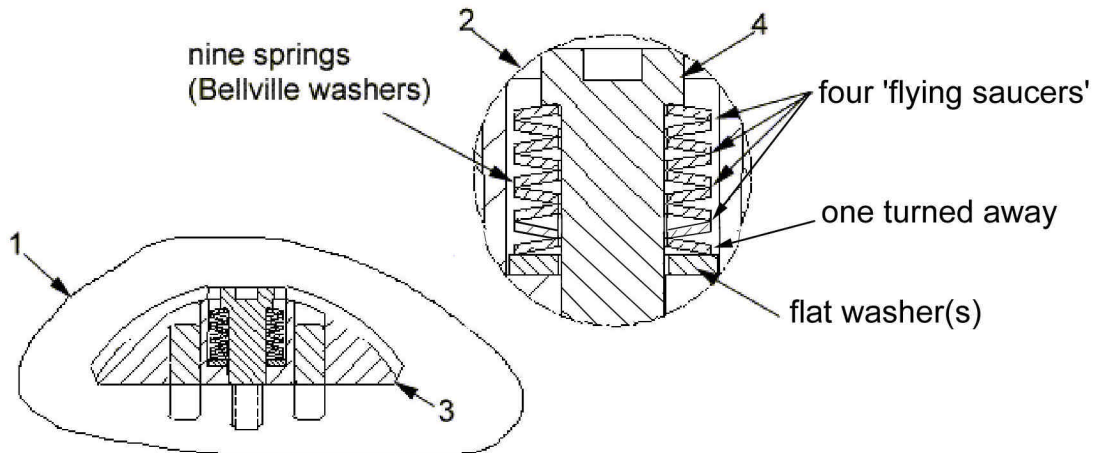
**CAUTION:**

It is very important that the clutch stack be reassembled as it was disassembled unless new shoes are being installed then it is important to reinstall per figure 34.

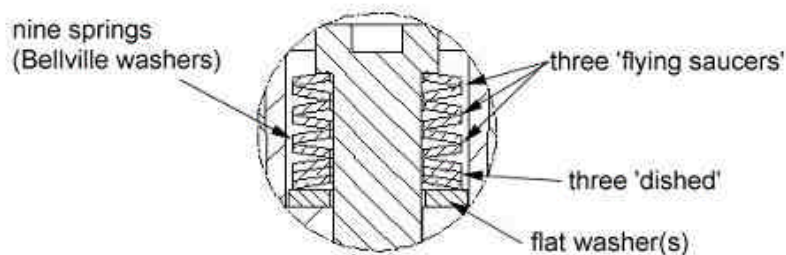
CLUTCH ASSEMBLY REFERENCE DRAWING		
REF #	PART #	DESCRIPTION
1	CAKG0004	Set of three shoes, springs, bolts, flat washers & nuts
2	CAMU0008	Set Of three springs, washers, bolts & nuts
3	CAKG0005	Set of three shoes
4	HCBS5603	Single center shoulder bolt

**CAUTION:**

The '4 stack' clutch spring stack is new for 2004.



**Figure 34 Recommended clutch spring stack.** Each 'spring' stack contains nine springs (Bellville washers) - six arranged into four 'flying saucers', and one turned away against the flat washer(s). An optional 'three stack' will deliver smoother, less aggressive power. For details see Figure 34b.



Optional 'three' stack for smoother, less aggressive power delivery

**Figure 34b**

Clutch shoe wear:

- If the clutch has been slipping and shows signs of glazing, it is best to replace the shoes. We have found that once the shoes are glazed, even if deglazed with emery paper or a file, the performance is reduced.
- The best way to prevent glazing is by not gearing too high, changing the oil as specified and by not blipping the throttle. Every time you blip the throttle, you are working your clutch springs.

**CAUTION:**

The clutch produces a tremendous amount of heat and when a rider is blipping the throttle. This makes the clutch and clutch springs wear out quicker. This also makes your engine tend to run hotter which decreases engine power and degrades ignition stator efficiency. It is important to train your rider **NOT** to be a **throttle 'blipper'**.

**CAUTION:**

**Sludge build-up** between the spring washers also keeps the clutch shoe from engaging fully and this will cause the clutch to start to slip. So you will need to clean the sludge out or just replace the spring washers and bolts with new ones. How quickly this sludge builds up depends on how often you **change your oil** and whether your rider is a throttle 'blipper'.

REF #	PART NO.	DESCRIPTION
1	ECMU0017	Crank seal
2	ECMU0040	Clutch to hub spacer
3	ECMU0003	Brass bushing
4	ECMU0033	Clutch Hub w/ brass bushing
5	CAKG0002	Clutch Complete w/ Arbor
6	ECMU0018	Clutch nut

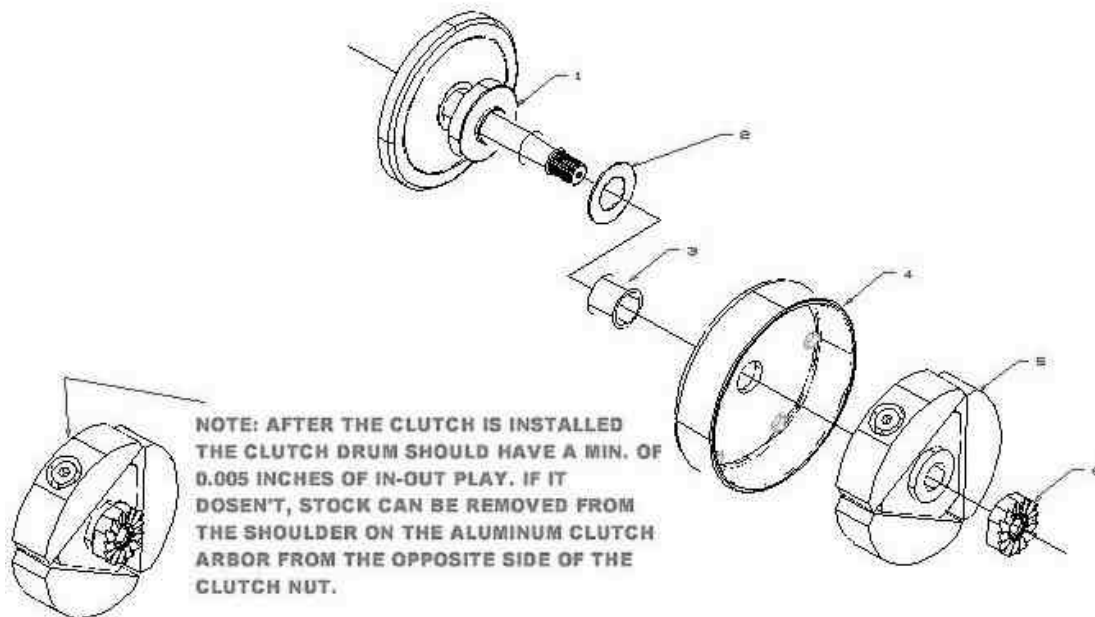


Figure 35, Clutch Assembly Drawing

## **CLUTCH ASSEMBLY:**

1. After cleaning or replacing the spring washers, reassemble the stack up of washers.

### **CAUTION:**

It is important to reassemble the washer stack to that recommended or to your own specialized stack.

### **CAUTION:**

It is also important that all three shoes are stacked the same. (See figure 34)

2. Clean the threads of the stack bolt and the clutch with contact cleaner removing all old thread locking material.
3. Apply high strength (red) thread lock material to the stack bolt and tighten as tight as possible without stripping the Allen head.

### **CAUTION:**

Avoid allowing excess thread lock material to contact the spring washers and the clutch or the clutch is likely to malfunction.

4. Use fine emery paper on the center hole of the clutch and on the tapered section of the crankshaft.
5. Apply a small amount of wicking / bearing retainer (green) thread lock agent to the center tapered section of the crankshaft and taper of clutch arbor.

### **CAUTION:**

Lean the bike / engine such that any excess thread lock agent goes away from the bushing in the clutch drum.

6. Put the clutch back in.
7. Apply high strength (red) thread locking agent to the threads and install the nut and torque to 40 ft-lb (54Nm) with the special socket (see figure 35).

### **CAUTION:**

Use high strength (red) thread locker on the threads of the clutch nut. If you are using an impact socket, just zap it lightly with an air wrench to tighten it because there are only about 4 threads inside the nut and they can be easily stripped. If you are tightening it by hand, you can very carefully use a 3/4" piece of wooden dowel rod inside the exhaust port to block the piston so you can tighten the nut. Do not use something harder than your aluminum piston and do not crush the top of the piston into the ring.

**INSPECTION NOTE:**

- a. There must be in / out play in installed clutch, 1.0 mm (0.04") maximum.
- b. Excess in/out will cause early crank seal failure.
- c. A blue clutch drum is worn out from excessive slippage or improper lubrication.
- d. Should be no looseness in clutch shoes.

8. Install the clutch cover taking care to put the two longer bolts in their proper locations and tightening in the order specified in figure 36. (5mm hex key, 5.8 ft-lb, 7.8 Nm).

**CAUTION:**

Prior to tightening the six clutch cover bolts, press the kick lever down to ensure proper kick gear alignment.

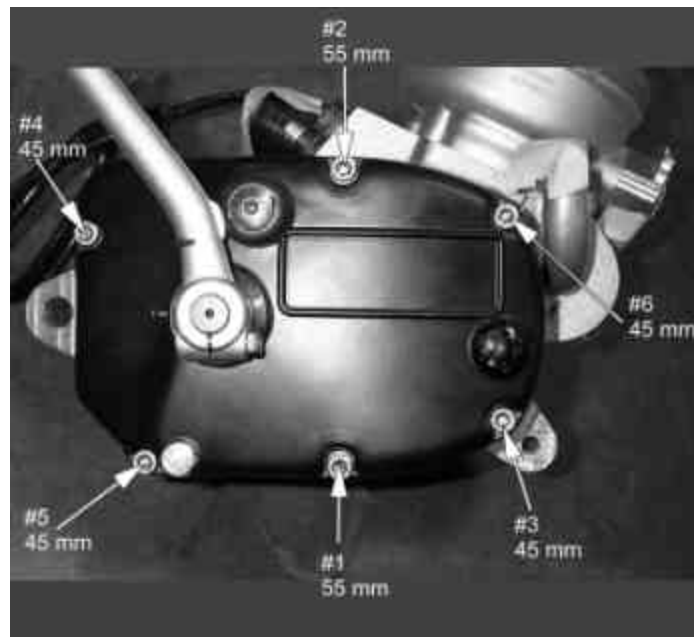


Figure 36

9. Put pipe back on and add oil (235 ml (8.0 oz) *Cobra 3 Shoe Clutch Milk* (Part # MCMUGF01) or Dexron III ATF).

## Ignition

### Stator care

Stator failure will result from running the bike hot. Following is a list of things that will make your engine run hot.

1. The timing should not exceed the maximum specifications listed.
2. Improper carburetor jetting.

3. Improper spark plug heat range. Never run a hotter plug than the specified spark plug.
4. Clutch slippage. See “CLUTCH” section for causes of slippage.

**CAUTION:**

- Because of the amount of heat generated by the clutch and engine during extended periods of riding, it is advisable to remove the ignition cover afterward to allow the ignition to cool off. The heat transfers through the cases and can damage the stator as it cools off because of lack of airflow around the stator. Spray the stator and rotor with CRC 3-36 or WD-40 and let it drip dry or blow it off a little with an air nozzle.
- Ignition will overheat if the gap between the rotor and stator is not large enough. There should be even clearance as the rotor rotates relative to the stator.
- Non-resistor spark plug caps should be used. Resistor caps will result in a weaker spark that will reduce performance.
- Make sure ground wires are secure.
- Make sure connections are free of dirt.

**CAUTION:**

If the engine is hot, it is EXTREMELY important to take the ignition cover off, put a fan on it to let it cool, and spray it with CRC 3-36 or WD-40. Proper stator care is important for the durability of the ignition system. (Stator- Part # ICMU0007)

The proper ignition timing for this model of is at **0.045”** before Top Dead Center (that means 0.045” before the piston reaches the highest point of it’s travel in the cylinder).

**CAUTION:**

Advancing the ignition timing will cause the engine to run hotter, in-turn causing power loss, shortened clutch life, and possibly lead to premature stator failure, and can also cause detonation which can lead to premature piston and ring failure.

**Tools recommended for timing service:**

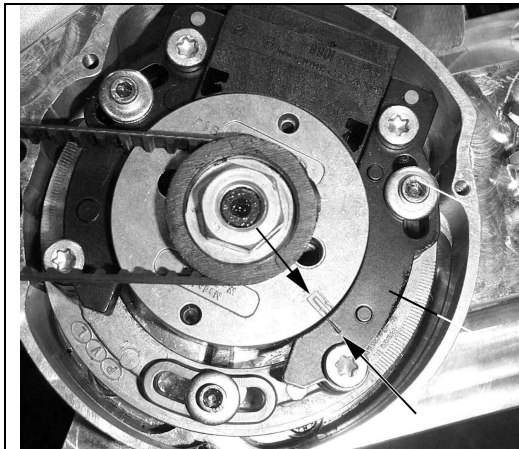
- Compact motorcycle dial indicator
- Universal clutch puller- a universal puller that pulls the clutch, main drive gear and rotor. (Part # MCMUTL70).

**TIMING YOUR IGNITION:**

1. Remove the spark plug cap, and sparkplug.
2. Insert the dial indicator into the spark plug hole.
3. Remove the four 8/32” X 1 3/4” bolts from the ignition cover.
4. Remove the water pump belt from the rotor and water pump shaft.
5. Turn the crankshaft counterclockwise until it reaches top dead center.



6. Set the dial indicator to zero
7. Turn the crankshaft clockwise until the dial indicator reaches 0.045" (1.14mm) from top dead center.
8. Line up the lines on the stator and the rotor (figure 37). Otherwise loosen the three 10X32 bolts to adjust the stator.



**Figure 37**, Lining up the line on the rotor with the line on the stator.



**Figure 38**, Using a dial indicator to measure piston height for setting ignition timing.

### **ROTOR INSTALLATION:**

1. Use wicking / bearing retainer (green) thread locker on the inside of the rotor, and on tapered part of crankshaft.

#### **CAUTION:**

It is recommended that you apply the proper thread locking primer to the components that are to receive thread locking material per the manufacturers instructions.

2. Eyeball the lines on the rotor and stator then press the rotor onto the crankshaft firmly (figure 37).
3. Torque the nut on the rotor to 40 ft-lb (54 Nm).
4. Recheck the timing following the procedure of *timing your ignition*.
5. Install the water pump belt back on.
6. Bolt the ignition cover back on.
7. Put the spark plug back in, and firmly stick the spark plug cap onto the spark plug.

## **Cooling System**



The water pump in the engine keeps the radiator fluid in circulation throughout the motor. The air stream running through the radiator cools the radiator fluid. Therefore dirty radiators additionally reduce the cooling effect.

Cobra has tested numerous brand name automotive and racing coolant / antifreeze solutions and has found *Liquid Performance* Propylene Glycol based Mini Coolant / Antifreeze to have the greatest effect on reducing cylinder head temperatures.

**Radiator fluid removal:**

1. Remove the coolant drain plug (A) on the front of the engine case (figure 39).

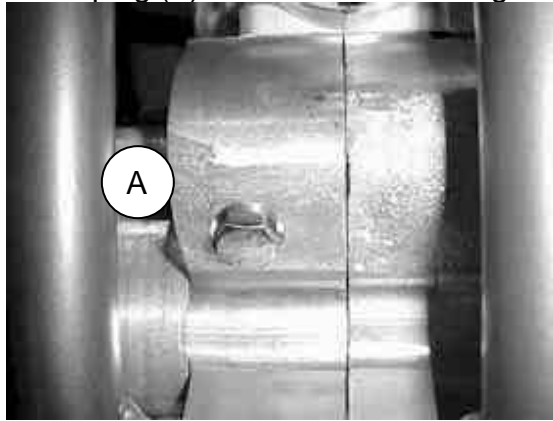


Figure 39

**To remove radiator cap:**

1. Turn the cap counter clockwise to the first stop and wait there for a few seconds.
2. Push the cap down and turn it further in the same direction and remove the cap.

**NOTE:** Inspect the old coolant for visual evidence of corrosion and abnormal smell.

Fill the radiator up to the bottom of the radiator filler neck with coolant. Install the cap, turning it clockwise about ¼ turn.

**Tools recommended for impeller service:**

- Flat head screwdriver
- 5mm hex key
- 13mm- hex wrench
- 1/8" hex key
- 9/64" hex key
- 3/32" hex key
- Propane torch
- 3/8" diameter x 8" long steel rod
- Hammer

**COBRA IMPELLER SERVICE INSTRUCTIONS**

1. Remove exhaust pipe and gas tank (you will be using a propane torch in step 12).
2. Remove radiator cap and drain engine coolant by removing the 13mm- hex head coolant drain plug.
3. If the impeller is damaged or broken completely back flush the coolant system to ensure no solid pieces are in the system.
4. Remove foot brake.
5. Drain engine transmission oil by removing drain screw using a 13mm- hex wrench. (item 2 in the figure below).

6. Remove kick-starter cover using a 5mm hex key. (item 3 six places)
7. Remove clutch and basket.
8. Unscrew water elbow fitting. (Figure 40)

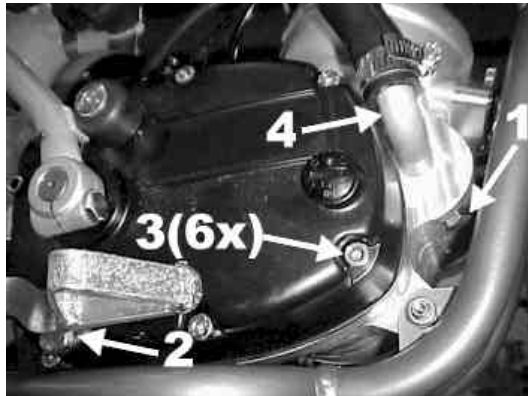


Figure 40

8. Remove ignition cover using a 9/64" hex key (four places)
9. Remove belt retainer screw using a 1/8" hex key. (Figure 41 - item 1)
10. Remove belt retainer, water pump belt and water pump fan pulley.
11. Remove bearing retainer screw using a 3/32" hex key. (Figure 41 – item 2)

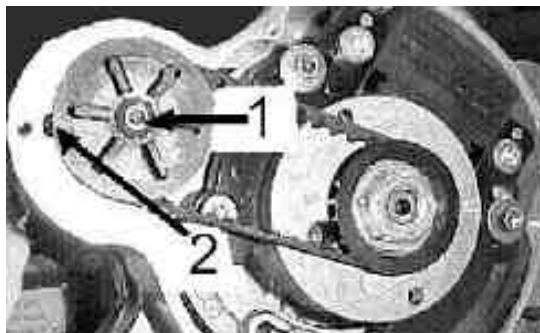


Figure 41

12. Heat engine case around area of impeller lightly with a small Burnsmatic propane torch. Using a 3/8" diameter x 8" long steel rod, tap impeller assembly out of engine as shown in figure 42.



Figure 42

**CAUTION:**

Too much heat can be detrimental to the engine cases.

13. The shaft assembly is serviceable. Use a 1/8" hex key to remove impeller retainer screw. Remove impeller, seal and both bearings. Check shaft for wear in the area of the seal. If there is any sign of wear (like a groove) replace the shaft.

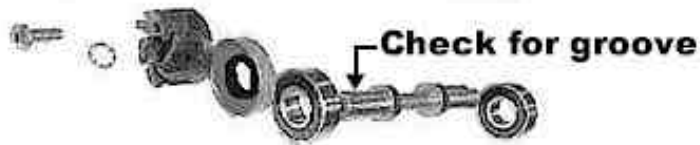


Figure 43

14. Reinstall new bearings, seal and impeller. Clean all threads and use green (wicking / bearing retainer) thread locker.
15. Using a liberal amount of grease on the outside seal, bearings and inside of case, reinstall bearing assembly by using a 0.500" ID by 1.000" OD steel tube 2" long and tap on end of tube per figure 44.



Figure 44

16. Re-assemble in same order of disassembly.

**CAUTION:**

Clean all threads and use green (wicking / bearing retainer) thread locker on the belt retainer screw.

**NOTE:**

Apply Ultra black Hi-Temp RTV silicon gasket maker to the threads of the water pump 90° elbow fitting before assembly.

**NOTE:**

Refill the coolant system with *Liquid Performance* Propylene Glycol based Mini Coolant / Antifreeze.



**CAUTION:**

Do not mix Propylene Glycol based coolant / antifreeze solutions with Ethylene Glycol based coolant / antifreeze solutions.

# Fuel & Air System

## Carburetor:

### Tools recommended for carburetor service:

- Small flat head screwdriver
- WD-40
- 8mm socket

KING Carburetor Ref. Drawing		
REF. #	PART #	DESCRIPTION
1	RCMU0305	CARB SLIDE
2	RCMU0601	NEEDLE
3	RCMU0002	ATOMIZER
4		MAIN JET
5		PILOT JET
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

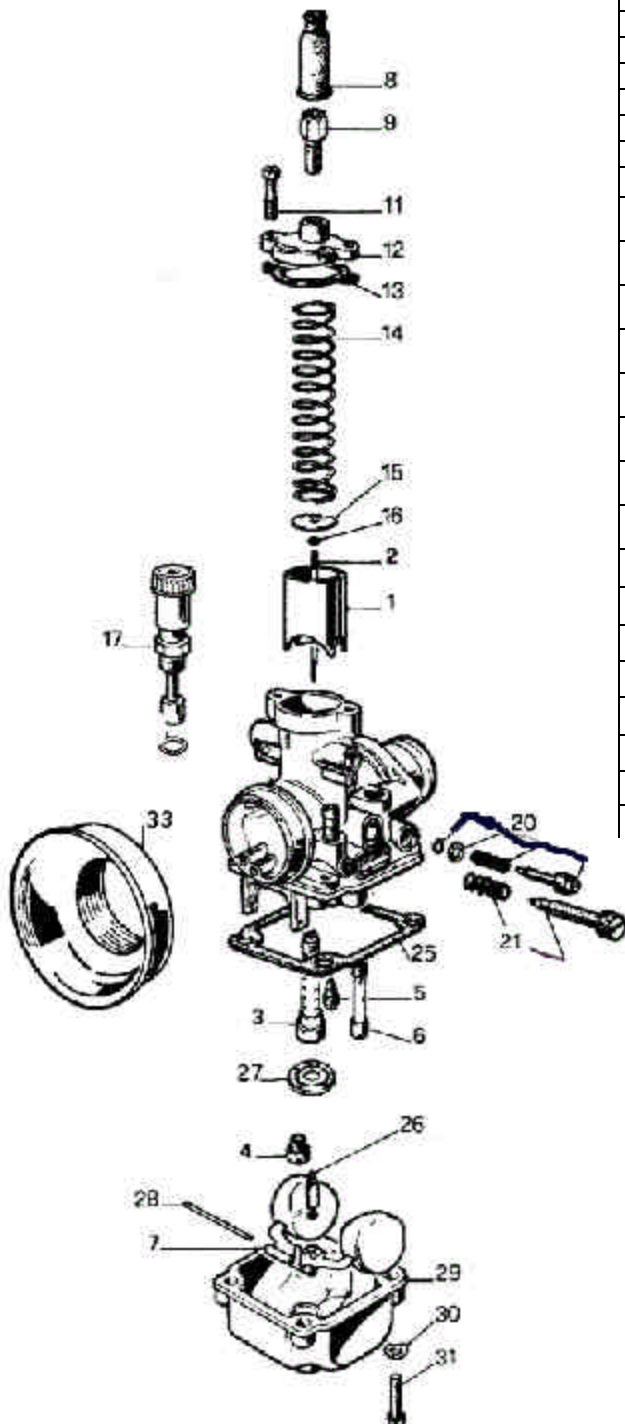


Figure 45

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 two 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.

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 KING stock carburetor settings from the factory are:

- 65 pilot jet
- 95 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:**

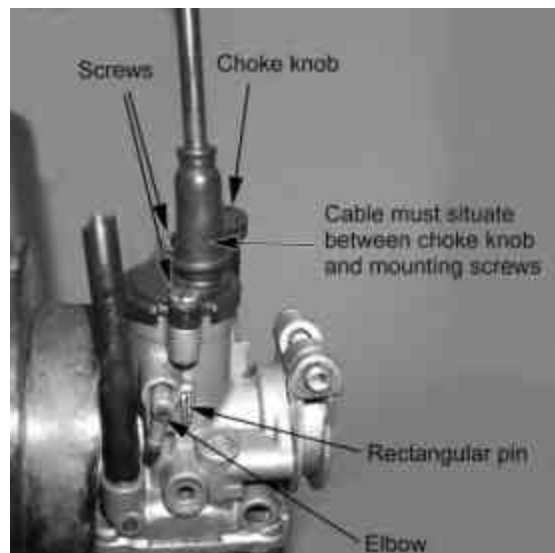
Do *not* use compressed air on an assembled carburetor. Or the pressure may deform the float. Do not use a strong carburetor cleaning solution, which could attack the parts of the carburetor; instead, use a mild high cleaning solution safe for plastic parts.

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.

#### **CAUTION:**

1. The motorcycle will only operate properly if the carburetor top is installed properly with the mounting screws, cable and choke knob oriented as shown in figure 46.

**Figure 46** Proper carburetor top installation and location of rectangular slide indexing pin and vent elbows.



## 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 47)

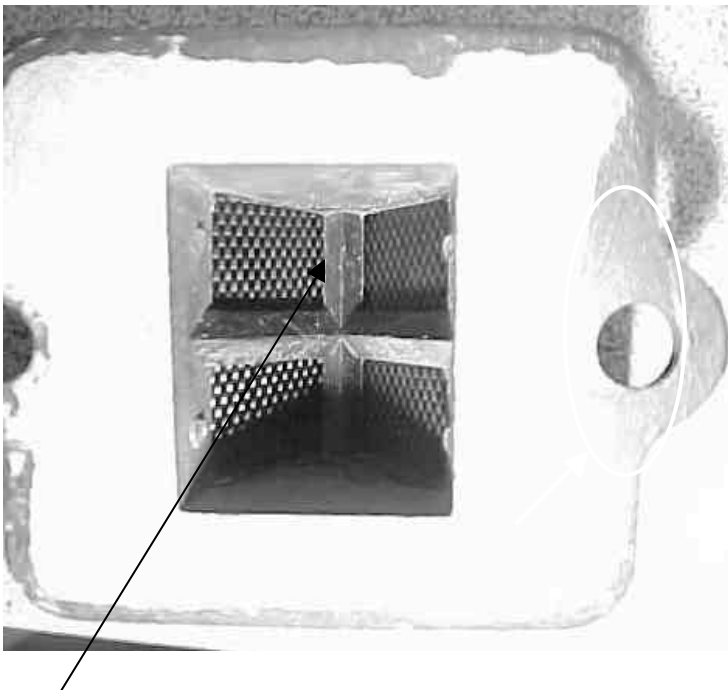


Figure 47

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

## 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.



# Wheels & Tires

## Rear wheel

---

### Rear wheel dampening

#### Tools recommended for wheel service:

- 13mm socket
- Flathead screwdriver
- 11mm wrench or socket
- 19mm wrench

The Cobra is the only 50cc to have the rear wheel damping system. This feature prevents engine impact shock caused by hard landings. This design allows the cushioned sprocket to move forward and backwards separately from the wheel. After each moto, check the 4 rubber dampers, spacers and bolts for fatigue. You should keep extra rubber dampers in your toolbox (part # PCMU0059). Different sized sprockets are also available.

Watch for bending and warping of the outside rear damper plate. If it is bent or warped, the rubber dampers in the sprockets do not last as long as when using a straight unit. Usually you can straighten the plate with a hammer or just flip it over.

#### Changing the rubber dampers:

1. Remove the four bolts with the 11mm wrench
2. Take the backing plate off
3. Observe the four rubber dampers, and pull the sprocket upward to remove it.



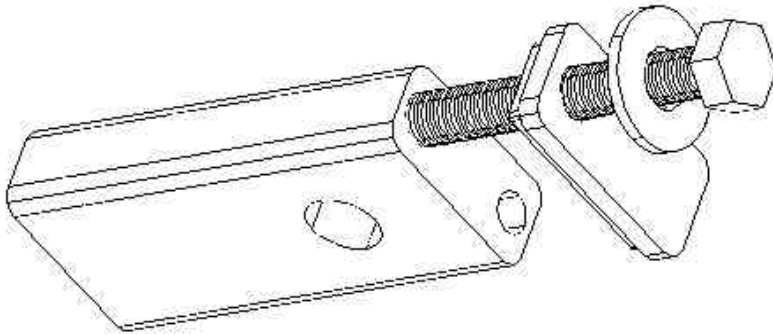
Figure 48

1. Pop the four rubber dampers out of the sprocket.
2. Push the rubber dampers into the sprocket.
3. Place the sprocket with rubber dampers, onto the aluminum studs.
4. Place backing plate over the dampers and sprocket.
5. Insert the 11mm bolts into the holes and tighten to 18 ft-lb (24 Nm).

## Rear wheel pullers

---

### Disassembly:



1. Remove axle, and back wheel assembly.
2. Pull the rear wheel pullers out of the back of the swing arm.

Figure 49

### Rear wheel alignment:

By eye, ensure that the rear sprocket is running true (in-line, planar) with the front sprocket. When the sprockets are running true, the wheel is properly straightened, and the chain will run straight.

## Brakes

### Front Brakes

---

**WARNING!** Your front brake needs a break-in period to achieve maximum brake power. 30-40 stops will bring the brake to peak performance.

Check before each ride:

- Make sure the brake does not have any leaks by holding the lever in while checking hose connections.
- Make sure the brake lever pressure is OK by pulling in on the lever and ensuring full braking performance is achieved before the lever touches the handlebar. If this is not the case, pump the lever several times until the lever feels firm.
- Always make sure the rotor and brake pads are free from oil and grease. Clean the rotor with mild dish soap or alcohol. Contaminated pads must be replaced.
- Do not remove the brake lever unless you want to bleed the brake!!! The piston will come out along with the oil behind it unless you keep it held in the master cylinder.

### **CAUTION:**

This brake uses low viscosity mineral oil available from a Cobra Dealer. **DO NOT USE DOT BRAKE FLUID!!!**

### Brake Pad removal procedure:

- 1) Remove brake caliper using 4mm Allen wrench as shown



Figure 50

- 2) Remove cotter key from caliper as shown and pull pads out.

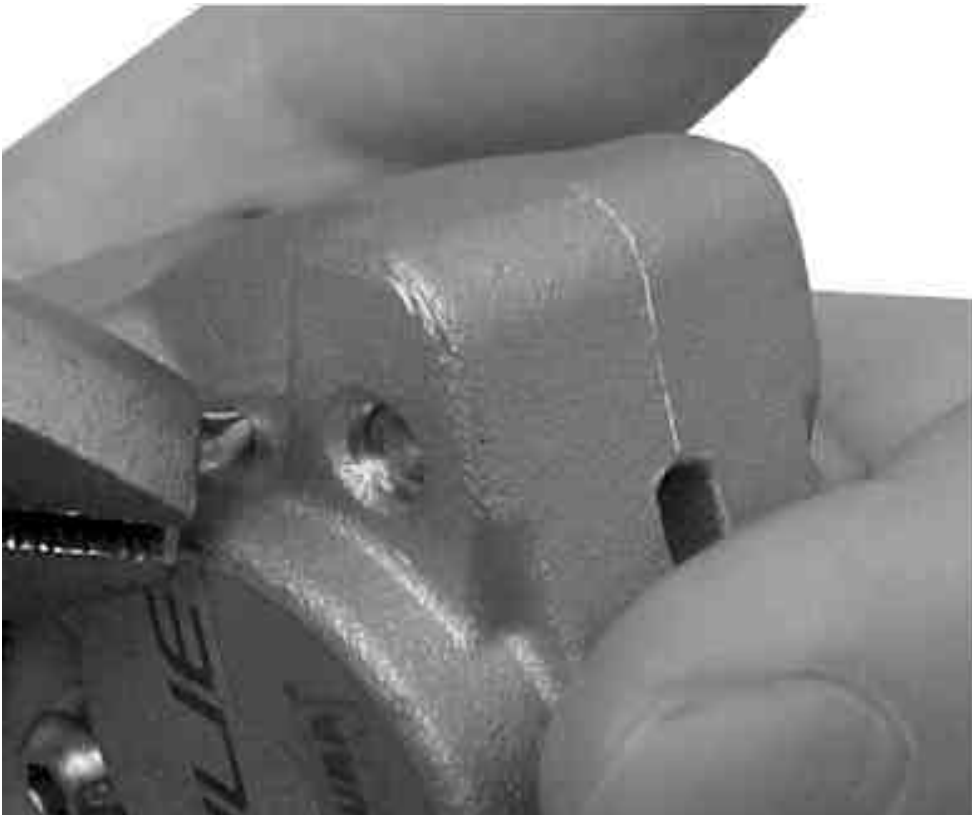


Figure 51

- 3) Brake pads must be checked periodically for wear. They are also available from a Cobra dealer. The brake pad must be a minimum thickness of 2.5mm. This is measuring the pad + the holder as shown below.



Figure 52

**Brake bleeding procedure:**

- 1) Remove brake caliper using 4mm Allen wrench as shown in pad removal procedure. Pry pads outward to fully retracted position.
- 2) Remove reservoir cap using a Torx T25 wrench as shown. Keep reservoir level.

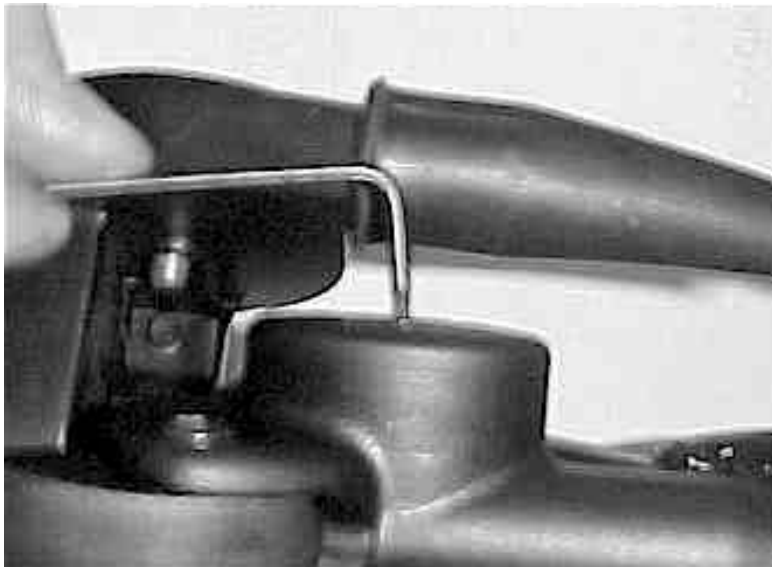


Figure 53

3. Remove bleed screw on caliper using a 3mm Allen wrench as shown.

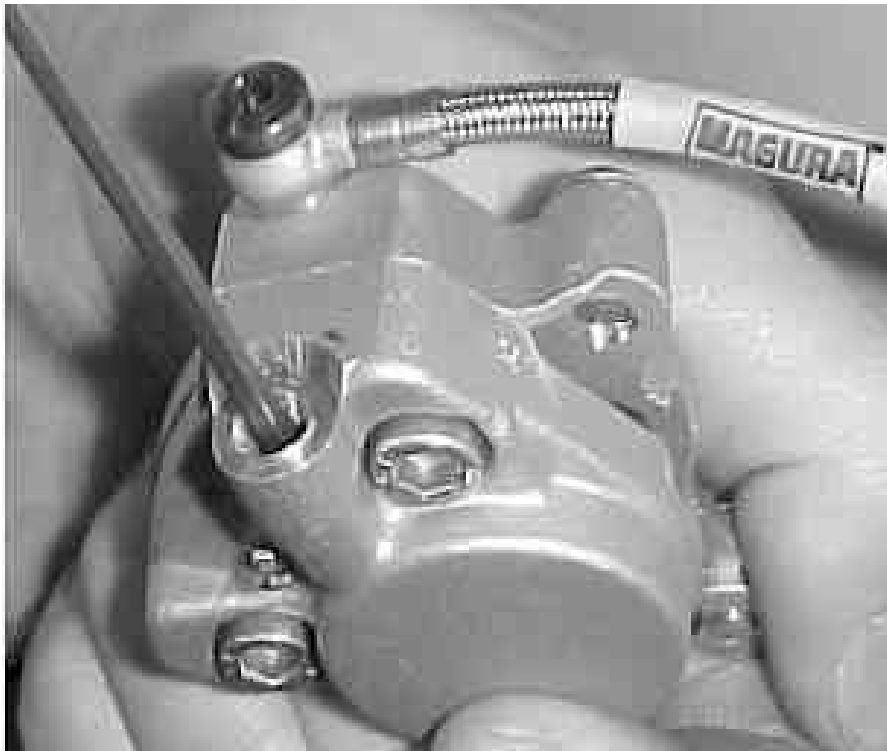


Figure 54

- 4) Attach Bleeding syringe as shown. Pump all air out of system until only clean oil runs out of reservoir.



Figure 55

- 5) Reinstall reservoir cap. Oil will overflow in the process. This is necessary to ensure no air is in the system. Remove bleeding syringe and quickly reinstall bleed screw.

# Suspension

## Adjustment:

1. Front forks
  - 1.1. Fork oil
    - 1.1.1. Oil type
      - 1.1.1.1. Heavier weight oil – more damping – slower responding
      - 1.1.1.2. Lighter weight oil – less damping – quicker responding
    - 1.1.2. Oil quantity / level
      - 1.1.2.1. Greater quantity / higher level – greater bottoming resistance, stiffer near the end of the travel.
      - 1.1.2.2. Smaller quantity / lower level – less bottoming resistance, less stiff near the end of the travel.
  - 1.2. Fork spring
    - 1.2.1. Stiffer spring (higher spring rate) – stiffer throughout the travel.
    - 1.2.2. Less stiff spring (lower spring rate) – less stiff throughout the travel.
  - 1.3. Gas pressure – always bleed off any pressure.
  - 1.4. Fork height
    - 1.4.1. Rise in clamps for quicker turning.
    - 1.4.2. Lower in clamps for improved straight line stability.
2. Rear shock
  - 2.1. Shock length (eye to eye)
    - 2.1.1. Shorter shock length – lower ride height for shorter riders.
    - 2.1.2. Longer shock length – higher ride height for taller riders.
  - 2.2. Preload adjustment
    - 2.2.1. More preload (greater distance) – less race sag.
    - 2.2.2. Less preload (smaller distance) – more race sag.
  - 2.3. Shock spring
    - 2.3.1. Stiffer spring – stiffer throughout the travel.
    - 2.3.2. Less stiff spring – less stiff throughout the travel.
  - 2.4. Compression damping
    - 2.4.1. Harder (more damping, slower) – adds resistance to the suspension motion when the suspension is compressing.
    - 2.4.2. Softer (less damping, quicker) – reduces resistance to the suspension motion when the suspension is compressing.
  - 2.5. Rebound damping
    - 2.5.1. Harder (more damping, slower) – adds resistance to the suspension motion when the suspension is returning to full length.
    - 2.5.2. Softer (less damping, quicker) - reduces resistance to the suspension motion when the suspension is returning to full length

## Front Forks Bottoming Too Frequently

## Fork oil level

If the front forks bottom harshly more than a couple of times per lap and the fork springs are proper for the weight of rider (as detailed above), try raising the fork oil level in increments of 10mm. Raising the fork oil level, reduces the air volume, and increases the stiffness of the forks late in the travel, thus adding a 'progressive' feel.

## Front forks feel too stiff over small bumps.

## Fork oil weight

If the forks feel too stiff over small bumps try decreasing the weight (increasing the viscosity) of the fork oil.

## Rear suspension troubleshooting.

## Damping

Always start with standard settings and make damping changes in no more than two click increments and only make one change at a time.

Symptom	Action
Rear end feels stiff on small bumps	Softer compression damping
Rear end 'sways' on straights	Harder compression damping
Bike tends to jump 'rear end high'	Harder rebound damping
Bike tends to jump 'rear end low'	Softer rebound damping
Frequent rear end bottoming	Harder compression damping
Bottoms after end of continuous bumps	Softer rebound damping
Rear end 'kicks' over square edge bumps	1) Harder rebound, 2) Softer Compression

## Proactive Suspension Adjustments

Once you have the suspension adjusted for decent overall feel, you can make proactive adjustments when faced with different racing conditions.

Situation	Actions
Sand track	Lower the rear end (increase race sag).
Sand track	Stiffer compression and rebound damping.
Long fast track	Lower the forks in the clamps by 3 mm.
Tight slow track	Raise the forks in the clamps by 3 mm.
Mud track	Lower the bike if the rider has difficulties touching the ground.

# Rear Shock

The rear shock is fully serviceable. Only trained professionals should service your shock. Contact Cobra or PR2 for questions and service of your King shock.

## Shock preload

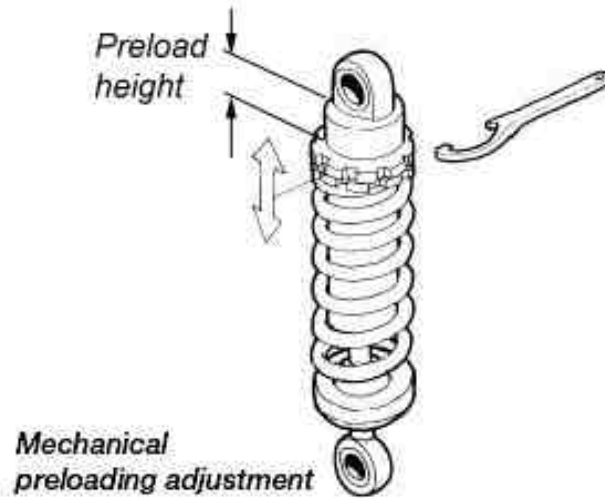


Figure 15

## Shock Damping

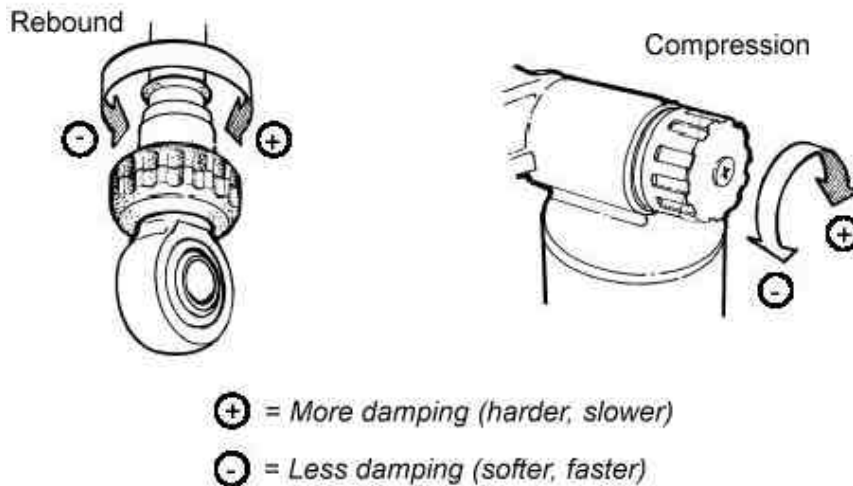


Figure 16

## Shock Length

**⚠ WARNING**

The shock on your Cobra Motorcycle has an adjustable (eye to eye) length. It is not to be extended any longer than when one groove is visible below the locknut after tightening.

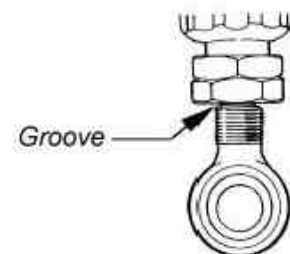


Figure 17



# Front Forks

## Tools recommended for front fork service:

- Flat head screwdriver
- Hammer
- Snap ring pliers
- Seal drivers
- 13mm wrench
- 1" wrench or socket
- 10 wt fork oil

## FORK DISASSEMBLY PROCEDURES:

1. Using the 1" wrench, remove the fork cap.
2. Drain the fork oil into a suitable container.
3. Disconnect the fork cap from the damper rod (13mm wrench & 1" wrench).
4. Disconnect the damper assembly from the fork leg by removing the large aluminum bolt from the bottom of the fork leg (22mm wrench).
5. Pry the dust seal (swiper) from its position with a small screw driver.
6. Using snap ring pliers, remove the snap ring holding the fork seals into place.
7. 'Pop' the fork seal out by forcibly pulling on both ends of the fork tube assembly, thus separating the inner from the outer tube.
8. Remove the bushings
9. Clean all components to be reused.

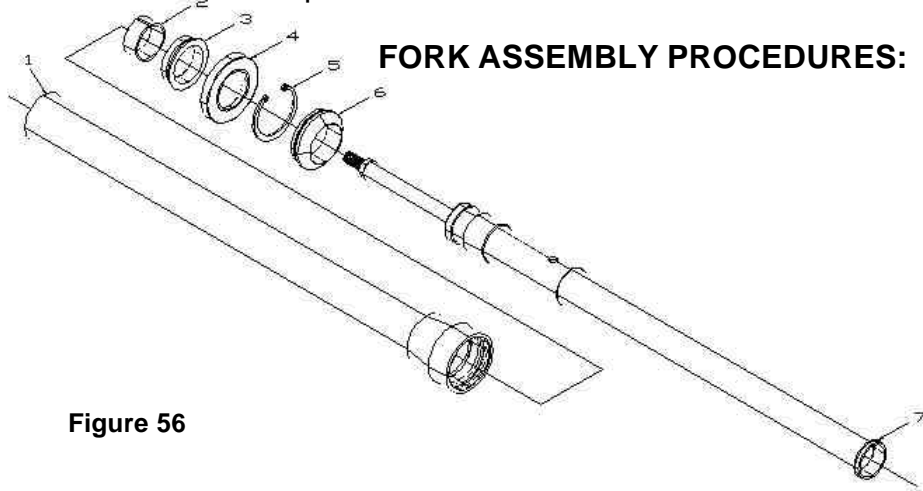


Figure 56

### CAUTION:

Make sure all components are clean before assembly.

### CAUTION:

Be sure to apply oil to the new fork seal and other components before installing.

1. Slide dust seal (swiper) (#6) onto lower fork leg.
2. Slide snap ring (#5) onto lower fork leg.
3. CAREFULLY slide seal (#4) onto lower fork leg with spring facing away from snap ring.

### CAUTION:

It is helpful to cover the sharp corners of the fork leg with tape or thin plastic before sliding on the new seal. Also take care that the inner lip is not folded over when installing.

4. Slide bronze bushing (#3) onto lower fork leg.
5. Install Teflon bushing into groove on lower fork leg.
6. Slide the bronze bushing over the Teflon bushing about 1/4" to hold the Teflon in the groove.
7. Insert the lower leg assembly into the upper fork tube about 5-6".
8. Use a seal driver to drive the seal into the upper tube.
9. Install the snap ring. Make sure it is properly seated in the groove.
10. Snap the dust seal (swiper) into the groove in the upper tube.
11. Reinstall the damper cartridge assembly to the fork leg. Secure the large bolt with 22 mm wrench to 35 ft-lb with green thread locking agent.
12. Fill with 3.5 oz (105 ml) 10 wt fork oil (should measure 6 mm (0.25") above the damper cartridge tube with spring removed).
13. Install the fork spring
14. Connect the cartridge rod to the cap and tighten to 12 ft-lb (9 Nm).

**CAUTION:**

The damper rod is hollow and will break if the nut is over tightened (proper torque is 12 ft-lb, 16 Nm).

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.

## **Troubleshooting**

### **1) Engine operates erratically**

- a) Carburetor top is installed backwards
- b) The carburetor slide indexing pin is missing
- c) A carburetor vent elbow is plugged or has fallen out
- d) Faulty stator
- e) An air leak
  - i) Base gasket
  - ii) Intake / reed gaskets
  - iii) Crank seals
  - iv) Crank case gasket

### **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
- h) Stator needs replaced

**3) Engine is excessively loud**

- a) Silencer needs repacking

**4) Engine 'blubbers' at high RPMs**

- a) Jetting too rich
- b) Stator needs replaced

**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 with object or flooded fuel
- e) Engine is flooded
- f) Cracked, broken, or jammed reed pedal
- g) Excessive piston or cylinder wear
- h) Clutch bolt or shoe dragging on basket (drum).

## 6) Engine won't idle

- a) Idle knob needs adjusted
- b) Carburetor jets are dirty

# Index

Air Filter .....	14	Front Brakes	
Bars and Controls .....	17	Service .....	65
Break-In.....	8	Front Wheel Parts .....	35
Carburetor		Fuel System	
Service .....	60	Parts list .....	60
Specifications .....	5	Service .....	60
Carbutetor		General Tips.....	9
Parts .....	18	Hardware	
Chain		Frame .....	31
Adjustment.....	13	Plastic.....	36
Chassis		Ignition	
Specification.....	5	Parts .....	23
Clutch		Service .....	54
Parts .....	22	Timing.....	55
Service .....	50	Jetting	
Clutch Lubricant		How To .....	61
Replacing .....	11	Stock.....	5
Compression test .....	42	Lubrication	
Cooling System.....	56	Recommended .....	5
Cylinder head		Maintenance	
torque .....	7	Schedule .....	10
Damper .....	64	Tips.....	10
Electrical		Oil	
Parts .....	20	Recommended .....	5
Engine		Optional components .....	6
Parts List.....	17	Parts	
Specifications .....	5	Bars and Controls .....	17
Exhaust .....	63	Bottom End & Transmission .....	21
Parts .....	25	Carbutetor.....	18
Fork oil replacement .....	15	Clutch & Kick Starter.....	22
Forks		Coolant System .....	19
Parts .....	26	Electrical .....	20
Service .....	72	Engine .....	21
Frame Parts.....	31	Exhaust .....	25
Front Brake			
Parts .....	34		

Forks.....	26	Service .....	70
Frame .....	31	Spark Plug	
Front Brake.....	34	Recommended .....	5
Front Wheel.....	35	Specifications .....	5
Ignition & Water Pump.....	23	Torque Values.....	7
Plastic & Seat.....	36	Starting .....	9
Rear Brake .....	37	Stator	
Rear Wheel .....	38	torque .....	7
Shock.....	39	Suspension.....	70
Swingarm .....	40	Swingarm Parts .....	40
Top End .....	24	Tips .....	9
Triple Clamps .....	26	Top End	
Parts List		Parts .....	24
Engine .....	17	Service .....	41
Plastic & Seat Parts .....	36	Torque Values.....	7
Pullers .....	65	Transmission Lubricant	
Rear Brake		Replacing .....	11
Adjustment.....	13	Troubleshooting .....	73
Parts .....	37	VIN reading .....	9
Rear Wheel		WARNING .....	2
Damper .....	64	Water Pump	
Parts .....	38	Parts .....	23
Pullers .....	65	Wheels	
Reeds .....	63	Service .....	64
Shock			
Parts .....	39		