

2006 P3-50

Obra

Owners Manual



For **parts orders** contact your local dealer

To locate your closest Cobra dealer
log on to

www.cobramotorcycle.com

or call

(330) 549-9600

If you need **technical assistance**
contact your local dealer or call
the Cobra Technical Support Hotline at
(330) 549-9600

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

MCPW2006.2

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 P3 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 |
| Specifications - Torque Values | 6 |
| Optional Components | 7 |
| Break-In Procedure | 8 |
| Starting Procedure | 9 |
| General Tips | 9 |
| Maintenance | 11 |
| Schedule & Tips | 11 |
| Replacing Transmission / Clutch Lubricant..... | 12 |
| Chain adjustment | 13 |
| Front brake adjustment | 14 |
| Rear brake adjustment | 15 |
| Air Filter Cleaning | 15 |
| Fork Oil Replacement..... | 16 |
| Exhaust Power Regulator | 17 |
| Service | 18 |
| Engine | 18 |
| Clutch | 18 |
| Reeds | 19 |
| Carburetor | 22 |
| Exhaust | 23 |
| Rear wheel pullers | 23 |
| Tuning | 24 |
| Suspension..... | 24 |
| Gearing | 27 |
| Carburetion..... | 28 |
| Troubleshooting | 31 |

General Information

Specifications - General

| Items | P3 |
|--------------------------------|--|
| Dimensions | |
| Wheelbase | 35.75" (908mm) |
| Wheel size | 10" (254mm) |
| Seat height | 22" (559 mm) |
| Engine | |
| Type | 2-stroke, single cylinder, reed valve |
| Cooling system | Liquid-cooled |
| Displacement | 49.8 cc |
| Bore and stroke | 39 mm x 41.7 mm |
| Ignition system | Digital Electronic |
| Spark plug | Champion 8339-1, 8332-1 hotter, 8904-1 colder |
| Gap | 0.023" – 0.025" (0.58 – 0.64 mm) |
| Fuel type | high octane pump gasoline RACE FUELS ARE NOT RECOMMENDED |
| Injector oil type | <i>Cobra Venom 2-cycle Race Oil</i> |
| Fuel / oil mix ratios | Fill oil reservoir as required |
| Ignition timing | Fixed |
| Carburetion | 12 mm Dell'Orto PHVA – PS |
| Main jet | 82 |
| Slow (Pilot) jet | 42 |
| Float height | Non adjustable |
| Coolant | <i>Liquid Performance Mini Coolant / Antifreeze</i> |
| Transmission | |
| Speed | Single |
| Clutch | 3 shoe centrifugal |
| Final drive ratio | 10/44 T |
| Transmission / clutch oil type | <i>Cobra Venom 3 Shoe Clutch Milk</i> |
| Quantity | 250 ml (8.5oz) |

| | | |
|----------------|-----------------|--|
| Chassis | | |
| Front tire | | 2.50 – 10 |
| | Pressure | 20 psi minimum |
| Rear tire | | 2.50 – 10 |
| | Pressure | 20 psi minimum |
| Front fork | | Marzocchi 32mm |
| | Fork oil type | SAE 20 weight |
| | Fork oil amount | 200 ml (6.8 oz) oil change, 220 ml (7.4 oz) rebuild |
| | Fork oil height | 70 mm (2.75") collapsed from top with spring (no spacer) |

Specifications - Torque Values

| Fastener | Torque Value | | | Size & Remarks |
|---------------------------|--------------|-------|----|----------------|
| | ft-lb | in-lb | Nm | |
| Cylinder head nuts | 8.8 | 105 | 12 | M6 X 1.0 |
| Front engine mount bolts | 22 | 264 | 30 | M8 x 1.25 |
| Rear engine mount bolts | 22 | 264 | 30 | M8 x 1.25 |
| Swingarm pivot bolt | 21 | 250 | 28 | M14 x 2 |
| Rear sprocket bolts | 18 | 216 | 24 | M7 x 1 |
| Rear axle bolts | 25 | 300 | 34 | M12 x 1.25 |
| Rear shock mounts | 40 | 480 | 54 | M10 x 1.5 |
| Clutch adjust access plug | 10 | 120 | 14 | M12 x 1.25 |
| Clutch nut | 30 | 360 | 42 | |

Units of mm unless otherwise specified

Optional Components

Call your dealer, or the factory, for details

- Carburetor jets
 - Main jets #'s 74, 76, 78, 80, 84, 86, 88, 90, 92, 94
 - Slow jets #'s 38, 40, 42, 45,
- Exhaust Power Regulator, ECPW0001
- Pre-filter for Airbox
- Sprockets
 - Front sprocket, 11T
 - Rear sprocket, 39 T – 45 T
- Suspension Springs

| Weight of Rider (lb) | Fork Spring | Shock Spring |
|----------------------|------------------------------------|--------------------------------|
| Less than 38 (light) | KCMZ0012A (12 lb/in, 2.10 N/mm) | SCMUOH04 (red) 275 lb/in |
| 38 – 45 (std) | KCMZ0012 (14 lb/in, 2.45 N/mm) | SCMUOH05 (yellow) 285 lb/in |
| 46 to 55 (stiff) | KCMZ0012B (16 lb/in, 2.80 N/mm) | SCMUOH06 (white) 295 lb/in |

- Suspension Valving

| Damping Rate | Fork Valving Compression (right) | Fork Valving Rebound (left) | Shock Valving (kit) |
|--------------|--|-----------------------------------|------------------------|
| Soft (fast) | KCMZ0033A | KCMZ0032A | SCMU0318A |
| Standard | KCMZ0033 | KCMZ0032 | SCMU0318 |
| Hard (slow) | KCMZ0033B | KCMZ0032B | SCMU0318B |

- Tires
- Tubes or 'Tire Balls'

Break-In Procedure

Your Cobra P3 is a close-tolerance high performance machine and break-in time is very important for maximum life and performance. The P3 can be ridden hard after the first ½ hour break-in time but it is recommended that no adjustments are made to the carburetion or suspension until the full 8 hours of bike break-in has elapsed. Also, after the engine, transmission, and drive train have been broken-in for the full 8 hours, the bike will be faster!

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

CAUTION:

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

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

- Start bike on stand
- First 5 minute period, operate the bike on the stand with a combination of idle and high RPM operation. (avoid prolonged high RPM but spin the rear wheel good at least once or twice per minute)
- Allow bike to cool
- Ride for 15 minutes maximum (avoid prolonged high RPM operation and avoid abusing the clutch with throttle blipping.
- Cool and inspect bike for loose fasteners.
- Next ½ hour of operation, 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!

Starting Procedure

Before starting the machine inspect the following:

- Make sure vehicle is properly maintained (see **Schedule & Tips** in the **Maintenance** section)
- Fill the 2-stroke injector oil reservoir with Cobra's specially formulated *Cobra Venom 2-cycle Race Oil*.
- Insure that the fuel tank contains an adequate volume of fuel to complete the distance required. (high octane pump gas).
- Check the throttle for smooth operation and sound closing.
- Turn the fuel on by rotating the fuel petcock knob to the vertically downward position (reserve position is horizontally forward).

CAUTION:

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

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

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

CAUTION:

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

WARNING

This is a high performance race motorcycle. Too much application of throttle will likely land your little racer on his or her arse. Fenders can be replaced but bruised egos and other body parts take longer.

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. Cobra offers a carburetor inlet cover RCMU0109 to keep water and dirt from getting into the carburetor when the bike is being washed.
7. It is acceptable and common to run 40:1, or leaner, premix in the fuel tank.
8. New chains will stretch on first use. Never install a new chain prior to a race. Always 'break' them in during practice.
9. If your young rider is initially uncomfortable with the abrupt power delivery of the P3, install the **Exhaust Power Regulator** to make the bike more easy to control while your rider gains confidence with his or her abilities and the feel of the new machine.
10. 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, Oixxxx6xxx is a 2006 Model Year Oil Injected P3.

Maintenance

Schedule & Tips

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

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

CAUTION:

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

⚠ WARNING

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

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

Replacing Transmission / Clutch Lubricant

Tools needed:

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

Procedure:

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

⚠ WARNING

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

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

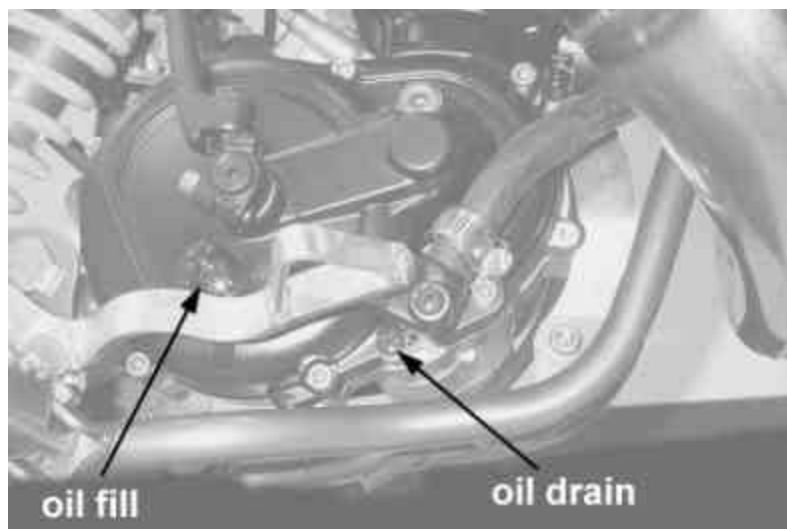


Figure 1

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

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

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

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

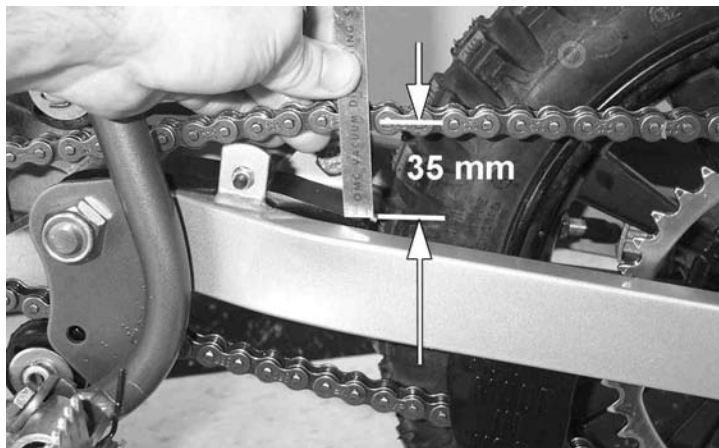
CAUTION:

Cobra has spent considerable time and money developing the proper lubrication to handle the harsh environment of the automatic clutch and transmission of this motorcycle. Cobra was forced to put forth this effort because the other available options and not adequate. Cobra's specially developed *Cobra Venom 3 Shoe Clutch Milk* (Part # MCMUGF01) is the recommended lubricant for your P3 motorcycle.

Chain adjustment

Tools required for chain adjustment

- 19 mm wrench or socket
- 13 mm wrench or socket



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

Figure 2

CAUTION:

Sit on the bike and verify that the chain has a minimum of 12mm (1/2") free movement when the chain is at it's tightest point.



Figure 3

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

CAUTION:

Always check rear brake adjustment and free-play after adjusting the chain.

NOTE:

Lubricate the chain with a light weight oil like Liquid Performance Chain Lube, or WD40 to reduce frictional drag.

Front brake adjustment

Tools recommended for front brake maintenance:

- 10mm open end wrench

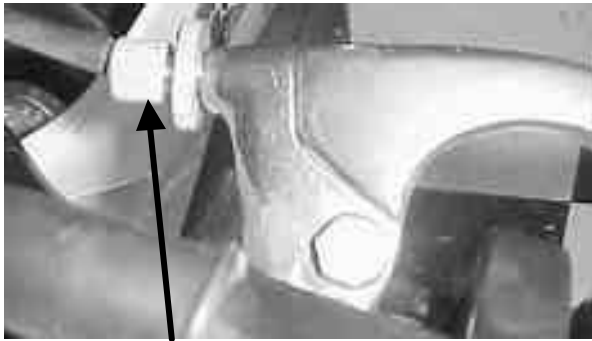


Figure 4, from the brake lever

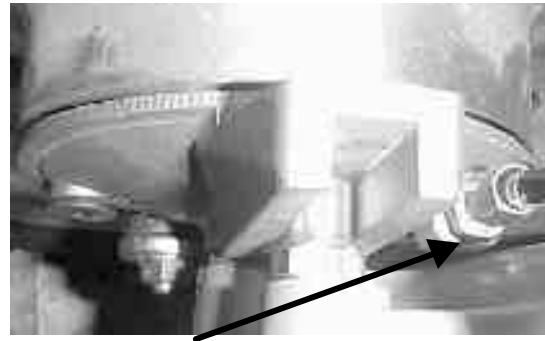


Figure 5, from the brake hub

From the brake lever:

1. Slide the cover out of the way
2. Loosen the locking nut on the brake lever.
3. Adjust the bolt to desirable position.
4. Tighten the locking nut.
5. Slide the protective cover back over the lever pivot and adjustor

From the brake hub:

1. Loosen the 10mm nut on the hub.
2. Adjust the brake cable to desirable position
3. Tighten the 10mm nut.

CAUTION:

If you tighten the front brake up too much, the brakes may hang up causing the brake pads to wear incorrectly and prematurely.

Rear brake adjustment

Tools recommended for rear brake maintenance:

- 10mm open end wrench

There are 2 adjustments on the brake.

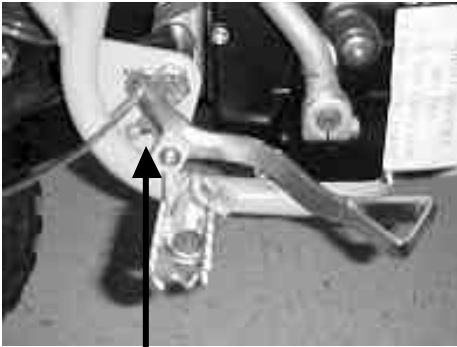


Figure 6, adjust brake lever free height



Figure 7, adjust lever 'free play'

From the brake lever:

6. Loosen the 10mm nut on the back of the brake pedal.
7. Adjust the bolt to desirable position
8. Tighten the 10mm nut.

From the brake hub:

1. Adjust the wing nut to the desirable position.

CAUTION:

If you tighten the wing nut too much, the brakes may remain engaged. If so, the brake pads will burn up, and need replaced.

Air Filter Cleaning

Tools recommended for air filter maintenance:

- #2 Phillips head screwdriver
- 4 mm hex key (Allen)
- Foam filter oil

Procedure

1. Removed the seat with the 4 mm hex key
2. Remove the filter/air inlet boot from the back of the carburetor with a flat screwdriver
3. Pull the filter / boot assembly back, up, and out the top of the airbox.

4. Clean the filter in a nonflammable solvent to remove the filter oil.

⚠ WARNING

Do not clean the air filter with gasoline or other highly volatile petroleum product. Diesel fuel or kerosene would be preferred but caution should still be taken. Hot soapy water works well.

5. Clean the filter in hot soapy water to remove all dirt particles.
6. Allow it to dry thoroughly.
7. Saturate with filter oil and remove excess.

NOTE:

The Cobra is equipped with a special designed Air box. It is very important to keep the air filter clean and properly oiled with high quality water-resistant foam filter oil. It's very important to oil your filter consistently each time because varied amounts of oil will change your carburetor jetting.

8. **Reinstall** the filter / boot assembly by pushing it down and forward into the airbox making sure the letters "PW" are visible between the carburetor and airbox (figure 8).

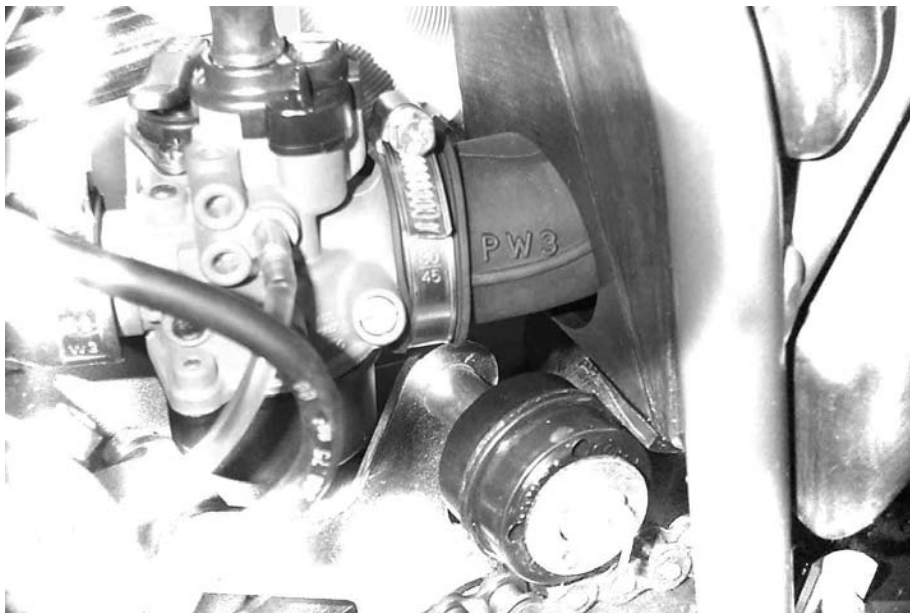


Figure 8

NOTE:

Make sure you change or clean your filter after each moto. We recommend carrying multiple filters in your toolbox, one for each practice session and moto.

Fork Oil Replacement

Tools required

- 5 & 6 mm Allen wrench

- 19 mm wrench or socket (two required)
- Spring clip remover

Disassembly

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

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

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

Assembly

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

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

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

Exhaust Power Regulator

As an entry level race machine, the Cobra P3 comes with an optional Exhaust Power Regulator (EPR) (figure 9b) that when installed, between the exhaust pipe and cylinder flange, will cut the peak rear wheel power by ½. As your rider's skills progress, the EPR can be opened up to the etched line (18mm diameter drill) to deliver ¾ power or removed it completely for full race power.

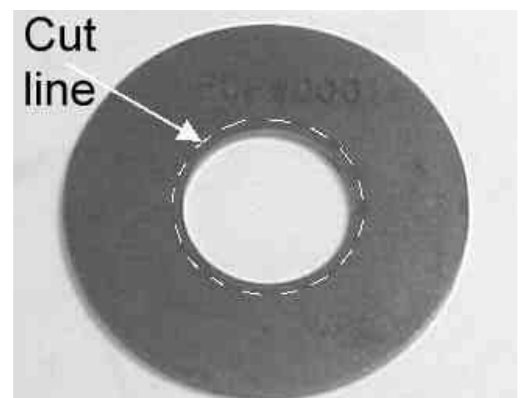


Figure 9b

Service

Engine

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

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

Cobra Precision Engines
11511 Springfield Road
North Lima, Ohio 44452

Cobra's technicians will go through the entire engine, replacing gaskets, bolts, any old part that is worn. The engine will be rebuilt using the same precision gauging and assembly fixtures as when it was assembled new. Before leaving, the engines performance will be measured on a dynamometer to ensure that your engine is operating at its highest potential. All this for one low nominal fee, plus cost of parts. Call (330) 549-9600 for details.

Clutch

Tools recommended for clutch service:

- 5mm T-handle
- Philips screwdriver
- Clutch nut removal tool (ECMU0071)
- *Cobra 3 Shoe Clutch Milk* (MCMUGF01).

CLUTCH REMOVAL:

1. Drain the engine transmission oil and coolant.
2. Remove the clutch nut (LEFT hand thread) on the end of the crankshaft with the clutch nut removal tool.

CAUTION:

The clutch nut has LEFT hand threads. Rotate it clockwise to loosen otherwise damage will occur to the crankshaft or nut.

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.

The spring stacks in your P3 clutch will contain 11 individual springs and a several washers.

CAUTION:

Generally reassemble the springs as you removed them from the engine or as you received them from Cobra.

CAUTION:

It is easy to prematurely damage the clutch and other engine components with improper clutch adjustment. If you are unsure of how to adjust the clutch, by even the slightest, contact the Cobra Technical Support Group before making adjustments.

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'**.

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 35)

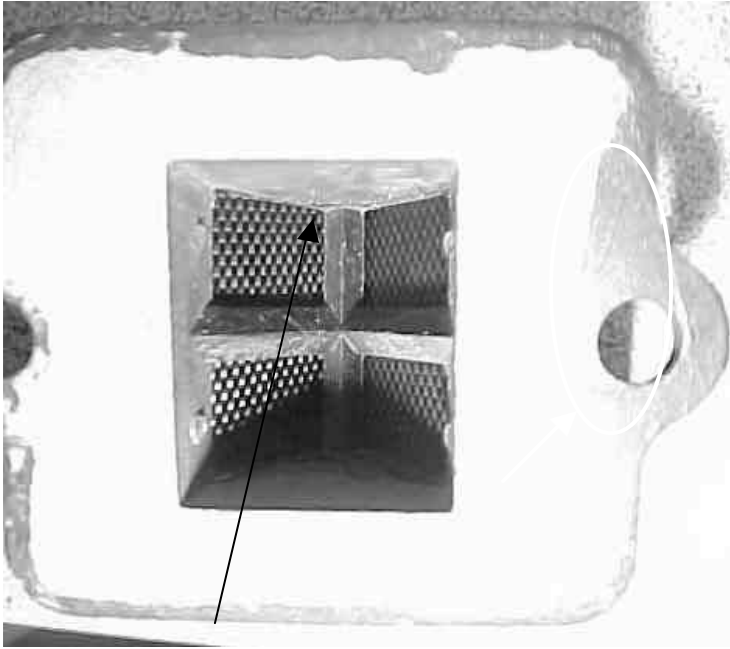


Figure 35

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

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

IDLE ADJUSTMENT:

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

TOP END JETTING:

Indications that the engine is running too rich (too much fuel for the air) are:

- Engine not revving out or blubbering at high RPMs.
- Engine will not 'clean out'
- Wet or black spark plug

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

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

If the engine is running rich on the top end it should be leaned out. Leaning it out can be done by:

1. Changing the main jet to a smaller number.
2. Raising the needle clip (this lowers the jet needle) one notch at a time on the slide.

Indications that the engine is running too lean are:

- Engine cutting out on top end.
- Engine overheating and ultimately seizure.
- White spark plug

CAUTION:

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

To richen the carburetor:

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

FUEL MIXTURE SCREW

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

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

STOCK CARBURETOR SETTINGS

The 2004 P3 stock carburetor settings from the factory are:

- 42 pilot jet
- 82 main jet
- Air screw ½ to 3 turns out

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.
5. Immerse all the metal parts in a carburetor cleaning solution.
6. After the parts are cleaned, dry them with compressed air.
7. Blow out the fuel passages with compressed air.
8. Assemble the carburetor
9. 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 37.

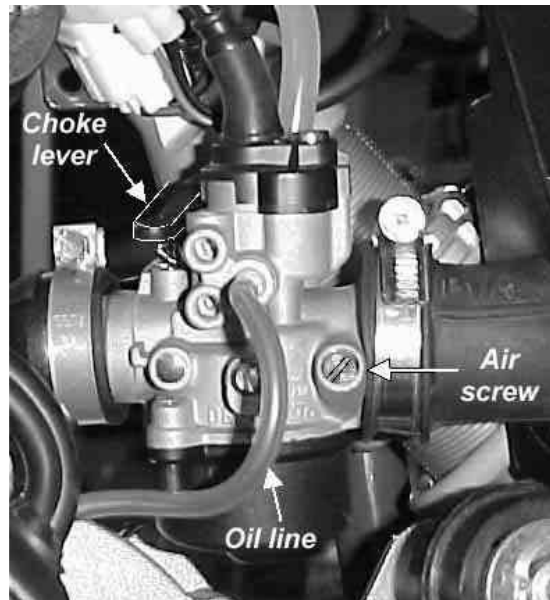


Figure 37 Proper carburetor installation.

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.

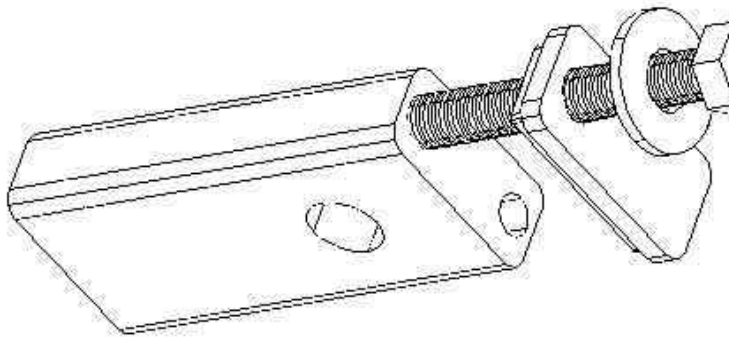
CAUTION:

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.

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 38

Rear wheel alignment:

Either

- ? Accurately measure the distance from the swingarm pivot to the axle center on each side or
- ? From the rear of the bike, sight up through both sprockets to ensure that the chain is running in a straight line (no bend in between or jog at either sprocket).

Tuning

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 (optional 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. Fork height
 - 1.3.1. Rise in clamps for quicker turning.
 - 1.3.2. Lower in clamps for improved straight line stability.
2. Rear shock
 - 2.1. Shock spring (optional spring)
 - 2.1.1. Stiffer spring – stiffer throughout the travel.
 - 2.1.2. Less stiff spring – less stiff throughout the travel.
 - 2.2. Compression damping (optional valve)
 - 2.2.1. Harder (more damping, slower) – adds resistance to the suspension motion when the suspension is compressing.
 - 2.2.2. Softer (less damping, quicker) – reduces resistance to the suspension motion when the suspension is compressing.
 - 2.3. Rebound damping (optional valve)
 - 2.3.1. Harder (more damping, slower) – adds resistance to the suspension motion when the suspension is returning to full length.
 - 2.3.2. 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 on your Cobra is adjustable to your riders weight and riding style by changing the spring rate (stiffness) of the spring and / or by changing the damping valves.

Due to the complexities of the shock absorber internals, Cobra recommends that you either send the shock back to us for damping valve changes or send the shock to a competent suspension specialist such as PR2.

Cobra offers stiffer and softer shock springs depending on the weight of your rider. See the Parts Shock section or the Optional component section at the beginning of the manual for these other components.

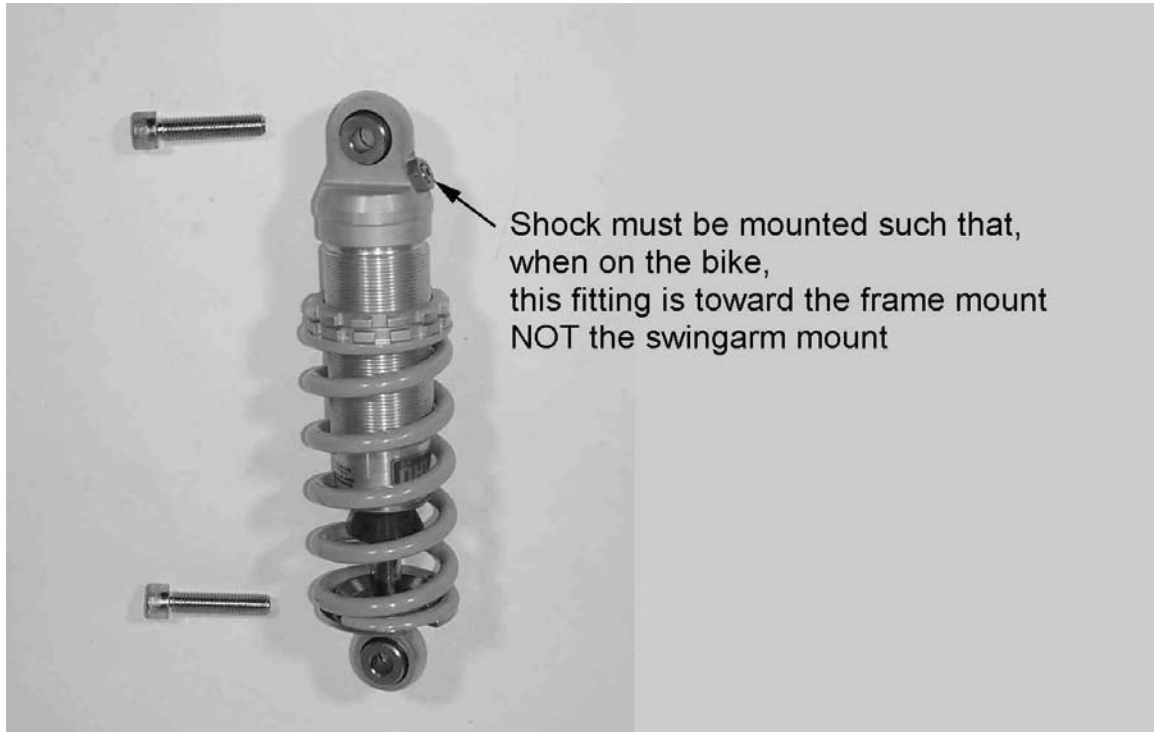


Figure 40

Front Forks

Cobra offers stiffer and softer fork springs depending on the weight of your rider. See the Parts Shock section or the Optional component section at the beginning of the manual for these other components.

The front forks are designed with the damping components in separate fork legs. The **compression damping** duties are performed in the **right fork leg** and the **rebound damping** duties are performed in the **left fork leg**. This allows easy adjustment of the damping characteristics by appropriately changing the viscosity of the fork oil in the fork leg controlling the damping characteristic that needs changed.

Example: if stiffer compression damping is required, switch from 20 (standard) weight fork oil to 25 or 30 weight oil in the right leg. If softer rebound damping is desired, switch from 20 (standard) to 15 or 10 weight fork oil in the left leg.

NOTE:

Fork oil level affects bottoming harshness, and oil viscosity affects valving speed.

Gearing

For a bike with a centrifugal clutch, it's better to be geared too low than too high.

What happens with improper gearing?

- Poor performance
- Not enough top end speed
- No snap
- Over heat clutch
- Premature failure of engine seals, bearings, & electronics
- High clutch wear

| Condition | Gear Taller | Gear Lower |
|---------------------------|-------------|------------|
| Mud | | ↓ ↓ |
| Sand | | ↓ |
| Hills | | ↓ |
| ↑ Hard Pack | | |
| Throt ↑ Blipper (novice)* | | |

*It may be helpful to set up the clutch to hit early for smooth power delivery

| Front Sprocket | Rear Sprocket | Gear Ratio |
|----------------|---------------|------------|
| 10 | 37 | 3.70 |
| | 11 | 41 |
| | 38 | 3.73 |
| 10 | 42 | 3.80 |
| | 11 | 43 |
| | 39 | 3.82 |
| 10 | 44 | 3.90 |
| | 11 | 45 |
| | 40 | 3.91 |
| 10 | 44 | 4.00 |
| | 11 | 45 |
| | 41 | 4.00 |
| 10 | 45 | 4.09 |
| | 11 | 41 |
| | 42 | 4.10 |
| 10 | 46 | 4.18 |
| | 11 | 42 |
| | 43 | 4.20 |
| 10 | 43 | 4.30 |
| | 11 | 44 |
| | 44 | 4.40 |
| 10 | 45 | 4.50 |
| | 11 | 46 |
| | 45 | 4.60 |

Ratio Write © Cobra
R&D 2004

Carburetion

Although your Cobra is sent from the factory with the carburetor jetted for optimal performance, you may find it necessary to adjust your particular jetting due to current weather conditions, altitude, fuel variations, and/or engine modifications.

CAUTION:

Proper jetting is very important for engine performance and engine life. Symptoms of improper jetting are listed below.

- Symptoms of incorrect oil or oil / fuel ratio
 - Poor acceleration
 - Misfire at low engine speeds
 - Excessive smoke
 - Spark plug fouling
 - Excessive black oil dripping from exhaust system
- Symptoms of too rich a fuel mixture
 - Poor acceleration
 - Engine will not 'rev' out, blubbers on top
 - Misfire at low engine speeds

- Excessive smoke
- Spark plug fouling
- Wet, black, or overly dark spark plug (when removed for inspection)
- Symptoms of too lean a fuel mixture
 - Pinging or rattling
 - Erratic acceleration
 - Same actions as running out of fuel
 - High engine temperature
 - White spark plug (when removed for inspection)

NOTE:

When inspecting the spark plug to evaluate jetting, a properly jetted machine will produce a spark plug that is dry and light tan in color.

| Environmental and altitude related mixture adjustments | | |
|---|------------------------|----------------------------|
| Condition | Mixture will be | Required adjustment |
| Cold air | Leaner | Richer |
| Warm air | Richer | Leaner |
| Dry air | Leaner | Richer |
| Very humid air | Richer | Leaner |
| Low altitude | Standard | None |
| High altitude | Richer | Leaner |
| Low barometric pressure | Richer | Leaner |
| High barometric pressure | Leaner | Richer |

NOTE:

- Before making any carburetor jetting changes verify that:
 - You are using the proper fuel and oil
 - The fuel is fresh and uncontaminated
 - The oil and fuel have been mixed in the proper ratio
 - The carburetor is clean (no plugged jets)
 - The air filter is properly clean and oiled
 - The float height is within proper specification (proper measuring technique is described later in this section)

NOTE:

Perform all jetting changes on a motorcycle that has been warmed up to proper operating temperature.

The carburetor on your Cobra motorcycle is quite adjustable. Figure 59 shows its range of adjustment and in particular what adjustable component affects what range of operation (specifically throttle position).

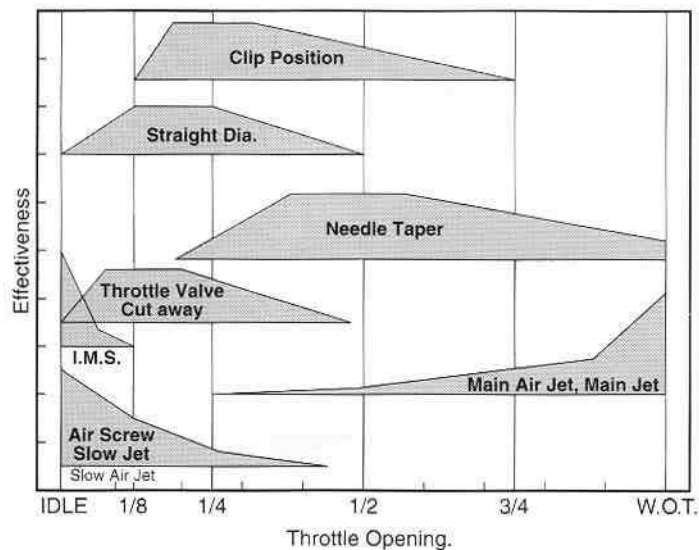


Figure 59

FUEL SCREW ADJUSTMENT: Adjust for maximum idle speed

The fuel adjustment screw is located on the left side of the carburetor. It is the smaller of the two adjustment screws and requires the use of a small flat blade screw driver for adjustment. After adjusting for maximum idle speed, use the idle screw to adjust the desired idle speed.

NOTE:

If the fuel screw requires more than 3 turns out, replace the pilot jet for one that is one size richer (larger number) then readjust the fuel screw.

IDLE ADJUSTMENT: Adjust for desired idle speed

The idle speed screw is located on the left side of the carburetor. It is the larger of the two screws on the side of the carburetor and is unique with its knurled head for easy fingertip adjustment. 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: Adjust for clean full throttle acceleration

Jet your top end (main jet) based on the acceleration of your Cobra Motorcycle on the longest straight at the track. Observe any of the lean or rich symptoms (spark plug appearance and bike performance) listed above and change your jetting accordingly.

PART THROTTLE Adjust for desired acceleration

Using an area of the track that allows the rider to operate and mid throttle and transition (accelerate, or 'roll on') from closed, or mostly closed throttle, to a larger throttle opening. Observe the rich and lean symptoms listed above. Adjust the jet needle position by moving the clip from its current position (move the clip higher on the needle to make the bike run leaner, or move the clip lower on the needle to make the bike run richer) to one higher or lower.

Troubleshooting

1) Engine not behaving properly

- a) Carburetor top is installed backwards (happens a lot)
- b) The carburetor slide indexing pin is missing
- c) Wrong spark plug installed (8339 Champion to be used on '04 or later & no mods)
- d) Needle clip is on top of plastic not below
- e) Air leak – find where with WD40 or the like
- f) Ground wire or ignition leads have fault

2) Engine is down on power

- a) Clutch engagement is not set properly
- b) Jetting is incorrect
- c) Silencer needs repacked
- d)
- e) Exhaust pipe
 - i) Has excess carbon buildup
 - ii) Has large dent in it
- f) Compression is low
 - i) Piston
 - ii) Rings
- g) Reeds are damaged
- h) Ignition timing is incorrect

3) Engine is excessively loud

- a) Silencer needs to be repacked

4) Engine cuts out at high RPMs

- a) Stator bad
- b) Carburetor diffuser plate upside down (install like a skirt)
- c) Plugged fuel petcock
- d) Silencer core tube broken

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) Wrong spark plug installed (8339 Champion to be used on '04 or later & no mods)
- iii) Spark plug cap off
- iv) Engine Shut-off 'kill' switch is shorted
- v) Bad electrical ground
- vi) Stator winding damaged
- d) Exhaust is plugged

6) Overheating

- a) Bad stator
- b) Water pump pulleys or belt broken
- c) Water pump impeller broken or bolt out
- d) Jetting too lean
- e) Too much throttle blipping
- f) Too high gearing
- g) Kinked radiator hose
- h) Rear brake dragging
- i) Chain too tight
- j) Air leak

7) Engine won't idle

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