2003 DCx65

Owners / Service Manual

“CHAMPIONS START HERE”

For **parts orders** contact your local dealer

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

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

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

MCDC2003.1

DISCLAIMER OF WARRANTY

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

"WARNING"

THE COBRA DC65 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

Specifications – Suspension 8

Optional Components 9

Break-In Procedure 10

Starting Procedure 11

General Tips 12

Maintenance 13

Schedule & Tips 13

M1: Replacing Transmission Lubricant 14

M2: Chain adjustment 15

M3: Front brake adjustment 16

M4: Clutch lever adjustment 16

M5: Rear brake adjustment 17

M6: Air Filter Cleaning 18

M7: Fork Oil Replacement 19

Engine Parts / Service 20

ES1: Top End Parts 20

ES2: Bottom end & transmission 20

ES3: Clutch and Shifter components 21

ES4: Ignition 24

ES5: Cooling System 25

ES6: Fuel & Air System 25

ES7: Exhaust 26

Tuning 27

Tuning 1: Carburetor 27

Jetting Decisions 27

Jetting Changes 30

Tuning 2: Suspension 34

1 Suspension Guidelines 35

2 Proper Suspension Adjustments for Your Rider 36

3 Symptoms of Incorrect Suspension Adjustment 40

4 Proactive Suspension Adjustments 41

5 How to Adjust the Suspension 42

6 Suspension Reference 43

Troubleshooting 44

Index 45

General Information

Specifications - General

Items	DC65
Dimensions	
Wheelbase	44.75” (1136 mm)
Wheel size	14” (356 mm) front, 12” (305 mm) rear
Seat height	
Engine	
Type	2-stroke, single cylinder, reed valve
Cooling system	Liquid-cooled
Displacement	64.8 cc (3.95 Cubic inches)
Bore and stroke	43 mm x 44.6 mm
Ignition system	Electronic
Spark plug	Splitfire SF406B
Gap	0.023” – 0.025” (0.58 – 0.64 mm)
Fuel type	*Sunoco MO2$_X$* or 93 octane pump gasoline **OTHER RACE FUELS ARE NOT RECOMMENDED**
Oil type	*Cobra Venom 2-cycle Race Oil*
Fuel / oil mix ratios	32:1 to 40:1
Ignition timing	0.050”
Carburetion	28 mm PWK style
Main jet	128
Slow (Pilot) jet	38
Jet needle	JJH 3rd position from the top
Float height	19 mm $\pm$ 0.5mm (0.75” $\pm$ 0.020”)
Transmission	
Speed	Six speed
Clutch	Manual hydraulic
Final drive ratio	13/46 T
Transmission / clutch oil type	85W 90 Gear Lubricant
Quantity	530 ml (18 oz)

Chassis	
Front tire	60/100 x 14
Pressure	10 - 15 psi.
Rear tire	80/100 x 12
Pressure	10 - 15 psi.
Front fork	Cobra USD 35 mm
Fork oil type	SAE 5 weight
Fork oil amount	4 oz (118 ml)
Fork oil level	

Specifications - Torque Values

ENGINE Fastener	Torque Value			Size & Remarks
	ft-lb	in-lb	Nm	
Cylinder head nuts	9.2	110	12	¼" x 20
Engine oil drain	3	36	4	8 x 1.25
Engine oil fill	2	24	2.7	14 x 1.0
Spark Plug	(SP)	(SP)	(SP)	14 x 1.25
Crank case half	5	60	6.8	6 x 1.0
Crank case cover	5	60	6.8	6 x 1.0
Flywheel rotor nut	40	480	54	10 x 1.25 (G)
Clutch hub	40	480	54	10 x 1.25 (G)

Units of mm unless otherwise specified

(G) denotes the use of wicking / bearing retainer (green) thread locking agent to applied to the mating surfaces of the two components but not the threads.

(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.

CHASSIS Fastener	Torque Value			Size & Remarks
	ft-lb	in-lb	Nm	
Front axle nut	25	300	34	12 x 1.25
Front brake caliber	22	264	30	8 x 1.25
Front brake rotor	6	72	8	6 x 1.0 (B)
Triple clamp bolts	6	72	8	6 x 1.0
Fork cap	5	60	6.7	1.25” x 18
Steering head	30	350	40	1.0” x 12 (R)
Handle bar mounts	15	177	20	8 x 1.25
Handle bar clamps	15	177	20	8 x 1.25
Front engine mount	22	265	30	8 x 1.25
Rear brake lever pivot	10	120	13.6	8 x 1.25
Subframe fasteners	22	265	30	8 x 1.25
Upper shock mount	40	480	54	10 x 1.5
Lower shock mount	40	480	54	10 x 1.5
Swingarm pivot	21	250	28	14 x 2.0
Rear axle nut	25	300	34	12 x 1.25
Rear sprocket bolts	13	160	18	8 x 1.25 (B)
Rear brake caliper bolts	22	264	30	8 x 1.25
Rear brake rotor bolts	6	72	8	6 x 1.0 (B)

Units of mm unless otherwise specified

(R) designates that the application requires the use of high strength (red) thread locking agent applied to the threads.

(B) designates that the application requires the use of medium strength (blue) thread locking agent applied to the threads.

Specifications – Suspension

	Factory setting	Track 1	Track 2	Track 3	Track 4
Fork Oil Viscosity	5 wt				
Oil Height (amount)	4 oz (118 ml)				
Fork Spring	STD.				
Shock Spring	STD.				
Preload height					
Rebound Damping (clicks from full damp)					
Compression Damping (clicks from full damp)					

Optional Components

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

Weight of Rider (lb)	Fork Spring	Shock Spring
Less than 51	-	SCDC0285 (285 lb/in)
51 - 60	KCDCSP01 (blue, 14 lb/in)	SCDC0300 (300 lb/in)
Greater than 60	KCDCSP02 (red, lb/in)	SCDC0325 (325 lb/in)
		SCDC0350 (350 lb/in)

- Suspension Valving

Damping Rate	Fork Valving Compression (base valve)	Fork Valving Rebound (mid valve)	Shock Valving (kit)
Soft (fast)	KCDCBV01	KCDCMV01	SCDCOH01A
Standard	KCDCBV02	KCDCMV02	SCDCOH01
Hard (slow)	KCDCBV03	KCDCMV03	SCDCOH01B

- Flywheel weights
  - Middle weight #ECDC0200
  - Heavy weight #ECDC0201

Break-In Procedure

Your Cobra Motorcycle is a close-tolerance high performance machine and break-in time is very important for maximum life and performance. The DC65 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 93 octane pump gas, or *Sunoco MO2X* , with Cobra's specially formulated *Cobra Venom 2-cycle Race Oil*. (Part # MCMUOL02)

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

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

- First ½ hour of operation
  - Follow the starting procedure listed in this manual.
  - Avoid prolonged operation at Wide Open Throttle.
- After 1 hour of operation
  - Check for loose bolts and nuts on the bike and retighten as necessary (proper toque values are listed under Specifications).
  - Clean the carburetor bowl.
  - Change the transmission / clutch lubricant.
  - Replace the fuel filter.
- 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:

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

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

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

1. Reaching down to the carburetor, on the left side of the bike, pull up the black choke knob and rotate it so that it locks in this 'up' position.
2. Kick start the engine.
3. Rev the engine in short spurts, turning the throttle no more than 1/4 open until the engine will run without the choke.
4. Verify a functional engine shut-off switch by shutting off the engine.
5. Restart the engine and proceed with riding when the engine is sufficiently warm (i.e. the side of the cylinder is warm to touch).

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

General Tips

1. Always wear a **helmet** and other **protective riding gear**.
2. Cobra recommends that you tell your child to take it easy the first couple of minutes in practice until the engine comes up to full **operating temperature**.
3. Make sure your riders' foot is not resting on the **rear brake** pedal while they are riding.
4. Evaluate the bikes **jetting** only after it has been warmed up to race temperatures.
5. A **properly maintained** machine is safer, faster, and more fun to ride.
6. When **washing the bike**, be careful to not directly aim the hose at the bottom edge of the seat, or water is apt to enter the airbox.
7. Some people have found cable ties (zip ties) more favorable for securing the **rear brake line** to the swingarm.
8. Also, some people are **moving the rear brake line** (hose between the master cylinder and the reservoir) from it's stock position, to a position slightly more forward and securing it with a cable tie (zip tie). This moves it further from the heat of the exhaust pipe.
9. Mare sure that there is adequate free play in both the **front lever and rear brake pedal**.
10. Your Cobra Motorcycle has a 12 digit VIN (Vehicle Identification Number). The first four digits indicate the model and the nineth indicates the model year (MY).
    a. The exception is that '03 MY DC65 which came out late so the model year is off by one.
    b. Example, DC65-xxx-x2xxx is a 2003 MY DC65.

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
  - Inspect the fuel filter for contaminates.
  - 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.
- Every 2 hours of operation
  - Replace the transmission oil.
- Every 10 hours of operation
  - Replace the fork oil.
  - Have the shock oil replaced by a Certified Cobra Mechanic.

CAUTION:

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

⚠ WARNING

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

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

M1: Replacing Transmission Lubricant

Tools needed:

- 530 ml (18 oz) 85W 90 gear lubricant
- large flat blade screwdriver
- 13 mm wrench or socket

Procedure:

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

⚠ WARNING

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

2. Lean bike against something or set on stand with oil drain hole.
3. Using the 13 mm wrench, remove the oil drain bolt located on the right side of the engine (figure 1).

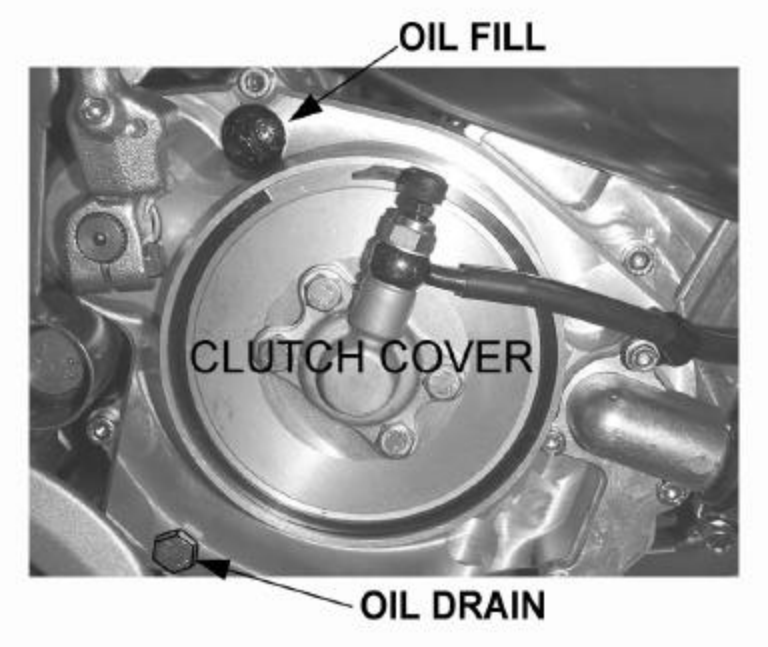


Figure 1

4. After it has drained, reinstall the drain screw with gasket.
5. Remove the oil fill plug and pour in 530 ml (18 oz) 85W 90 gear lubricant.

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.

M2: Chain adjustment

Tools needed:

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

Procedure:

1. Loosen the rear axel nut (two 19 mm wrenches).
2. Adjust the chain adjusters in the end of the swingarm (clockwise for tighter chain) until proper chain tension, 37 – 42mm (1.50" – 1.63") is achieved (13 mm wrench). See figure 2 for proper measurement location.

NOTE:
This **measurement is to be made** with the **motorcycle setting on a stand** and the rear wheel suspended in the air while **lifting on the chain**.

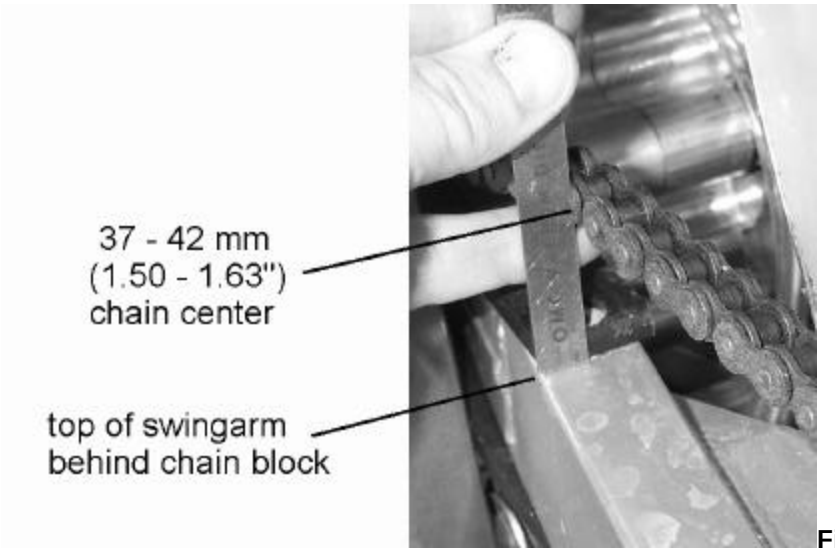


Figure 2

3. From the back, sight down the length of the chain to confirm that the rear wheel is running true (rear sprocket is not forcing the chain to turn).
4. Verify that the wheel is all the way forward against the adjusters.
5. One way to do this is to place a shop rag between the chain and sprocket while rotating the wheel backwards (figure 3) thus pulling the wheel forward.

Figure 3

6. Tighten the rear axel nut to 25 ft-lb (34 Nm) (two 19 mm wrenches). Rotate the wheel forward and remove the shop rag.

M3: Front brake adjustment

Tools recommended for front brake maintenance:

- 10mm open end wrench
- 3 mm hex key

CAUTION:
Adequate lever free play is required so that the brake pads do not wear prematurely.

1. Loosen the lock nut (10mm wrench).
2. Screw the adjuster in (Clockwise) to remove free play, or out (Counter Clockwise) to add free play (3mm hex key).

M4: Clutch lever adjustment

The clutch lever adjuster requires no tools. Rotate the red adjusting knob in (Clockwise) to remove free play, or out Counter Clockwise) to add free play

M5: Rear brake adjustment

Tools required

- 10 mm wrench

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

Setting rear brake pedal position (see figure 4):

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).

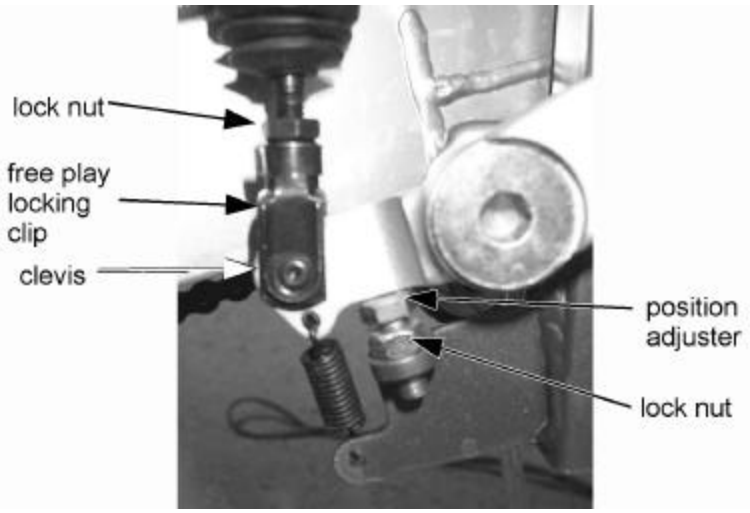


Figure 4

Setting rear brake pedal free play

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

To adjust (see figure 4):

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.

M6: Air Filter Cleaning

This Cobra Motorcycle comes with a unique air filter / air boot unit designed to facilitate motorcycle service.

Tools recommended for air filter maintenance:

-
- Foam filter oil

Procedure

1. Removed the front fastener from the left side number plate (?? Hex key).

NOTE:
This fastener holds a spacer between number plate and the frame, which will drop into the airbox when the fastener is pulled from the number plate. Merely grab the spacer with one hand while removing the spacer from the number plate with the other.

2. Rotate the number plate counter clockwise (downward) exposing the aluminum air box side plate.
3. Remove the two fasteners holding the air box side plate (Hex key)
4. Separate the air filter from the carburetor a
5. Clean the filter with cleaning solvent and then again with hot soapy water.
6. Allow it to dry thoroughly.
7. Saturate with foam filter oil and remove excess.

⚠ WARNING
Do not clean the air filter with gasoline or other highly volatile petroleum product. Cleaning solvent, diesel fuel, or kerosene would be preferred but caution should still be taken.

NOTE:
The biodegradable air filter oils, greases, and cleansers work acceptably with this Cobra Motorcycle.

CAUTION:
Cobra does not recommend using the spray on air filter oils due to their limited saturation.

NOTE:
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.

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

- 1 for practice
- 1 for each moto

CAUTION:
It is recommended to apply medium strength (blue) thread locking agent to the threads of the air box side fasteners as well as the number plate fastener.

M7: Fork Oil Replacement

Tools required

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

NOTE:
It is strongly recommended that you **leave the front brake caliper attached to the fork leg** for this procedure. The mounting bolts are all that hold the two halves of the caliper together, and disassembly would require bleeding the brake system.

Disassembly
1. Remove the front wheel (19 mm wrenches).
2. Remove the front brake lever perch from the handlebars (4 mm hex
3. Remove the fork legs from the triple clamps (5mm hex key).
4. Perform the following on one leg at a time.

Assembly
1. Remove the fork cap (1" wrench)
2. Turn upside down over a suitable pan and allow to drain.
3. Work the fork in and out several times.
4. Allow to drain at least 15 minutes.
5. Fill the leg with 118 ml (4 Oz) 5 wt fork oil.
    1. Measure the fork oil level to the top of the fork tube with the leg collapsed, and record for tuning purposes.
    2. Install the fork spring.
    3. 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.

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

Engine Parts / Service

At this time, the service instructions for are not yet available your Cobra Motorcycle.

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 being returned, the engines performance will be measured on a dynamometer to ensure that your engine is operating at its highest potential. All this for one low nominal fee, plus cost of parts. Call (330) 549-9603 for details.

ES1: Top End Parts

(Parts list coming soon.)

ES2: Bottom end & transmission

(Parts list coming soon.)

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.

Cobra trues every crank before it leaves the factory, and also welds the pin to keep it true. If there are any problems send the engine in, or call tech support (330) 549-9603 to determine what the problem is.

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.

ES3: Clutch and Shifter components

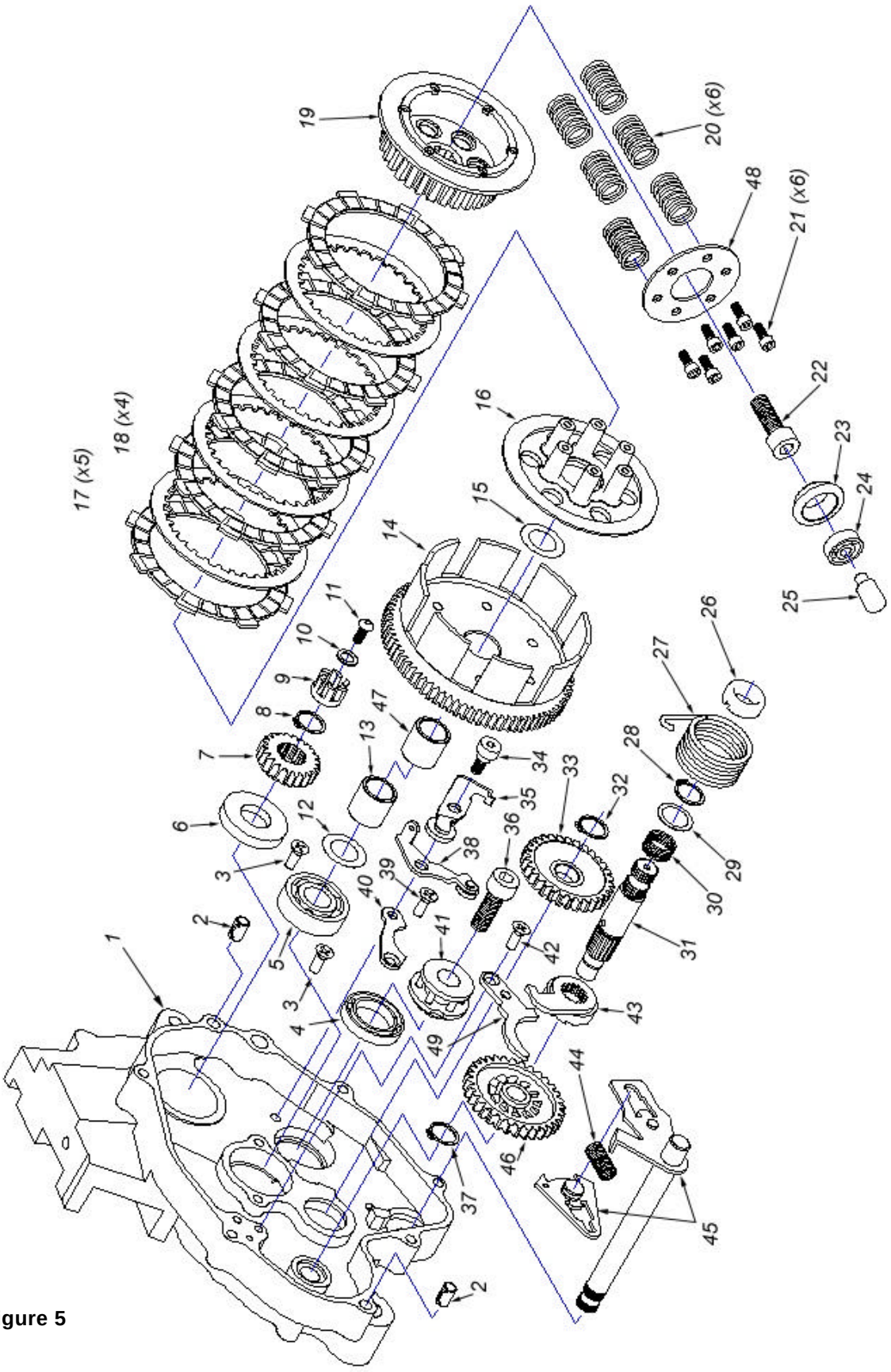


Figure 5

REF. #	PART #	CLUTCH / SHIFTER COMP. DESCRIPTION
1	ECDC0129	CASE,RIGHT,DC65-MACHINED
2	ECDC0031	DOWEL,HOLLOW,CENTERING 6X13
3	HCBB0612	6X12 MET SOC BUT BOLT-ZINC YEL
4	ECDC0022	BEARING,SHIFT DRUM 65CC
5	ECMU0016	BEARING-50 CRANK
6	ECDC0024	SEAL, CRANKSHAFT DC65
7	ECDC0073	CRANK DRIVE GEAR - DC65
8	ECDC0036	SNAP RING,EXT.16MM-SPRING RET.
9	ECDC0075	IMPELLER,65CC WATERPUMP
10	HCWF0501	WASHER FLAT 5MM
11	HCBB0001	10-32X1/2 STAINLESS SCREW
12	ECDC0063	CLUTCH WASHER-DC65
13	ECDC0064	CLUTCH BUSHING DC65 - INNER
14	ECDC0165	CLUTCH BASKET BILLET DC65
15	ECDC0063	CLUTCH WASHER-DC65
16	ECDC0066	CLUTCH PRESSURE PLATE-DC65
17	ECDC0068	CLUTCH DISC-FRICTION-DC65
18	ECDC0067	CLUTCH DISC-STEEL-DC65
19	ECDC0069	CLUTCH HUB - DC65
20	ECDC0070	SPRING, CLUTCH - DC65
21	ECDC0100	5X25 SOCKET HEAD CAP SCREW
22	ECDC0072	1.12X30CS M10
23	ECDC0019	CLUTCH BEARING SEAT
24	ECDC0018	BEARING,CLUTCH THROW OUT-DC65
25	ECDC0020	CLUTCH PUSH ROD
26	ECDC0111	SPACER,KICKSTARTER-DC65
27	ECDC0040	SPRING,KICKSTARTER RETURN-DC65
28	ECDC0036	SNAP RING,EXT.16MM-SPRING RET.
29	ECDC0043	WASHER,KICKSTART BACKUP-DC65
30	ECDC0042	SPRING,KICK STARTER RAMP-DC65
31	ECDC0034	SHAFT,KICK STARTER - DC65
32	ECDC0037	SNAP RING,EXT.15MM-IDLER RET.
33	ECDC0032	GEAR,KICK STARTER IDLER-DC65
34	ECDC0059	BOLT,SHOULDER,M6X11,8X5SB
35	ECDC0057	LEVER,NEUTRAL POSITIONING
36	HCBC0803	SCREW M8X35 SOCKET HEAD CAP
37	ECDC0035	SNAP RING,EXT.12MM-GEAR RET.
38	ECDC0058	LEVER, DRIVE GEAR POSITIONING
39	ECDC0060	SCREW,M6X16PF
40	ECDC0056	BEARING RETAINER PLATE
41	ECDC0052	CASETTE
42	ECDC0060	SCREW,M6X16PF
43	ECDC0038	RAMP GEAR - DC65
44	ECDC0055	SHIFTER SPRING
45	ECDC0054	SHIFTER SHAFT
46	ECDC0033	GEAR,KICKSTARTER - DC65
47	ECDC0167	CLUTCH BASKET BUSHING-OUTER
48	ECDC0071	PLATE, CLUTCH SPRING - DC65
49	ECDC0039	RAMP - DC65

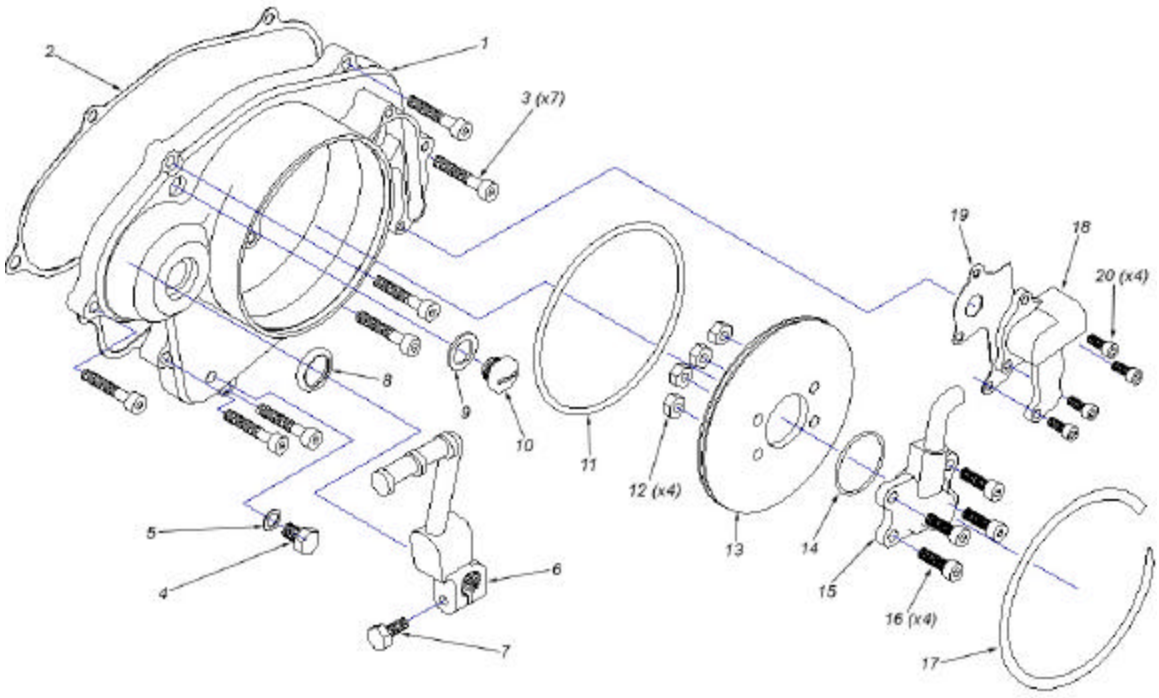


Figure 6

Clutch cover components

REF. #	PART #	DESCRIPTION
1	ECDC0176	CLUTCH COVER-DC65-MACHINED
2	ZCDC0002	GASKET-CLUTCHCOVER-DC65
3	HCBC0625	6X25 SOCKET HEAD CAP SCREW
4	HCBH0805	M8X12 OIL DRAIN SCREW
5	HCWC0000	GASKET 10MM COPPER WASHER
6	ECDC0046	KICKSTARTER LEVER-DC65
7	HCBH0602	SCREW M6X25 HEX HEAD
8	ECDC0078	SEAL,KICKSTARTER DC65
9	ZCMU0001	GASKET-OIL FILL PLUG-ALL 50'S
10	ECMU0037	OIL FILL PLUG
11	ZCDCOR03	ORING-CLUTCH CAP-DC65
12	HCNL0602	M6 CONICAL TOP LOCKNUT
13	ECDC0074	CLUTCH CAP, DC65, FINISHED
14	ZCDCOR04	ORING,CLUTCH SLAVE CYLINDER
15	CCDC0002	SLAVE CYLINDER-DC65
16	HCBC0601	6X16 SOCKET HEAD CAP SCREW
17	ECDC0082	SNAP RING-CLUTCH CAP
18	ECDC0180	IMPELLER COVER-DRILLED-DC65
19	ZCDC0003	GASKET-IMPELLER COVER
20	HCBC0516	5x16CS-IMPELLER COVER-DC65

ES4: Ignition

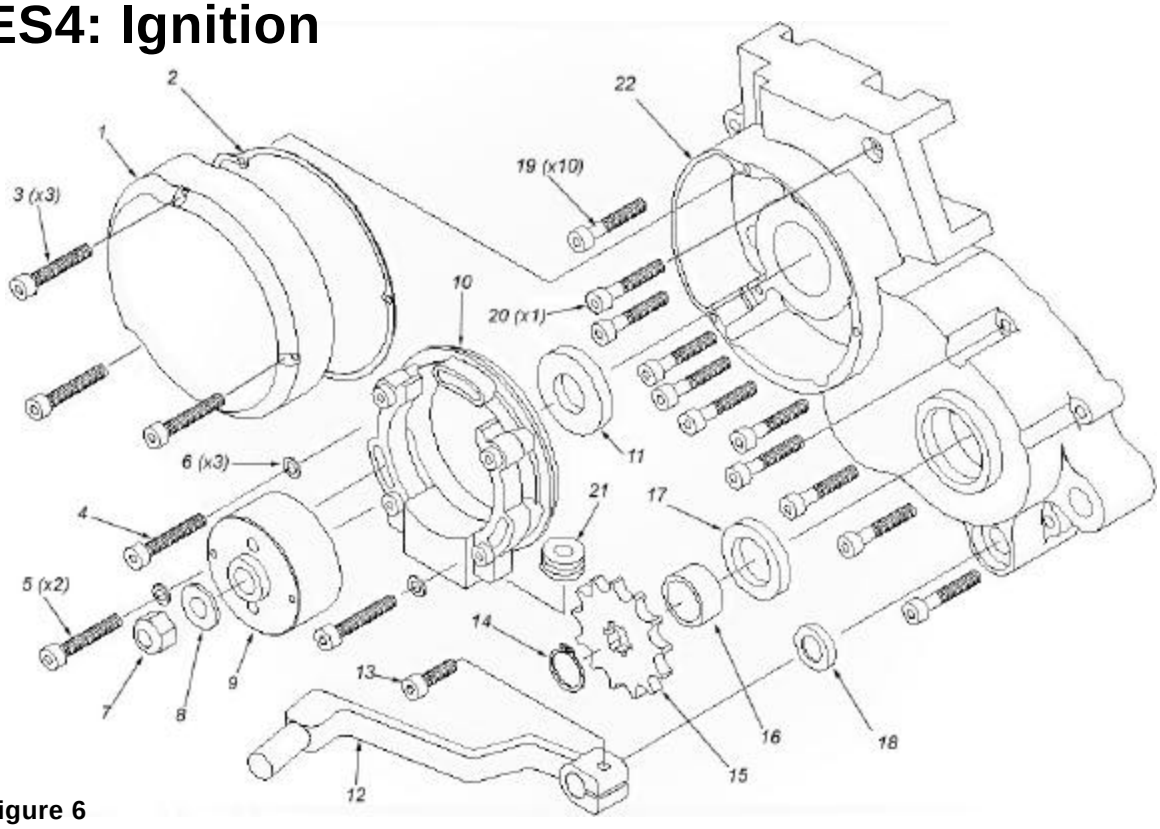


Figure 6

Ignition components

REF. #	PART #	DESCRIPTION
1	ECDC0085	IGNITION COVER-DC65
2	ZCDC0004	GASKET-IGNITION COVER
3	HCBC0402	4X35 SOCKET HEAD CAP SCREW
4	ECDC0100	5X25 SOCKET HEAD CAP SCREW
5	ECDC0084	5X35 SOCKET HEAD CAP SCREW
6	HCWF0501	WASHER FLAT 5MM
7	HCNS1001	NUT M10
8	HCWF0038	3/8 FLAT WASHER
9	ICMU0006	ROTOR
10	ICMU0007	STATOR
11	ECDC0024	SEAL, CRANKSHAFT DC65
12	ECDC0087	SHIFTER LEVER - DC65
13	INCLUDED WITH SHIFTER LEVER	
14	ECKGSR03	SNAP RING-OUTPUT-COBRA
15	PCKG0013	SPROCKET 13T COBRA
16	ECDC0009	SPACER,SPROCKET
17	ECDC0025	SEAL,OUTPUT DC65
18	ECDC0026	SEAL,SHIFTER DC65
19	HCBC0604	SCREW M6X35, SOCKET HEAD CAP
20	HCBC0606	SCREW M6X45, SOCKET HEAD CAP
21	MCKGGR00	GROMMET-ENGINE CASE-COBRA-STAT
22	ECDC0128	CASE,LEFT,DC65-MACHINED

CAUTION:

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

ES5: Cooling System

(Parts list coming soon.)

ES6: Fuel & Air System

(Parts list coming soon.)

Reeds

CAUTION:

- 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 7)

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

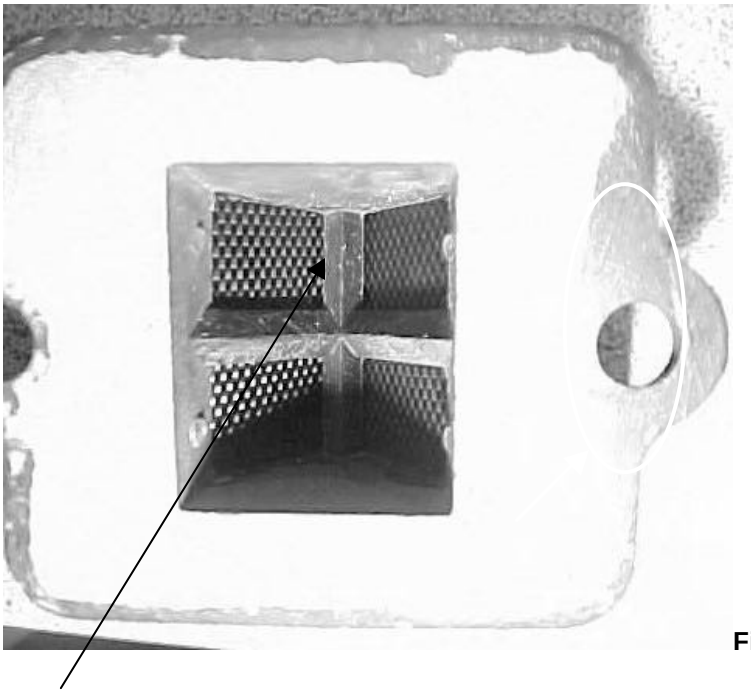


Figure 7

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

Carburetor Cleaning

⚠ 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.

ES7: Exhaust

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

NOTE:

Be sure to take the pipe off, and remove 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:

For optimum performance 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.

Tuning

Tuning 1: Carburetor

Topics included are:
1. Jetting Decisions
2. Jetting Changes

C1: Jetting Decisions

Although your Cobra is sent from the factory with the carburetor jetted for optimal performance, you may find it necessary to adjustment 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:
  - o You are using the proper fuel and oil
  - o The fuel is fresh and uncontaminated
  - o The oil and fuel have been mixed in the proper ratio
  - o The carburetor is clean (no plugged jets)
  - o The air filter is properly clean and oiled
  - o 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 8 shows its range of adjustment and in particular what adjustable component affects what range of operation (specifically throttle position).

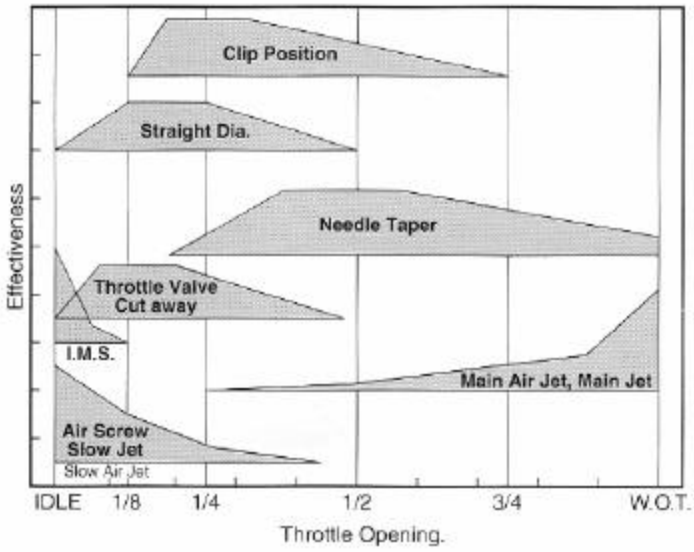


Figure 8

AIR SCREW ADJUSTMENT: **Adjust for maximum idle speed**

The air 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 air screw requires more than 3 turns out, replace the pilot jet for one that is one size leaner (smaller number) then readjust the air screw.

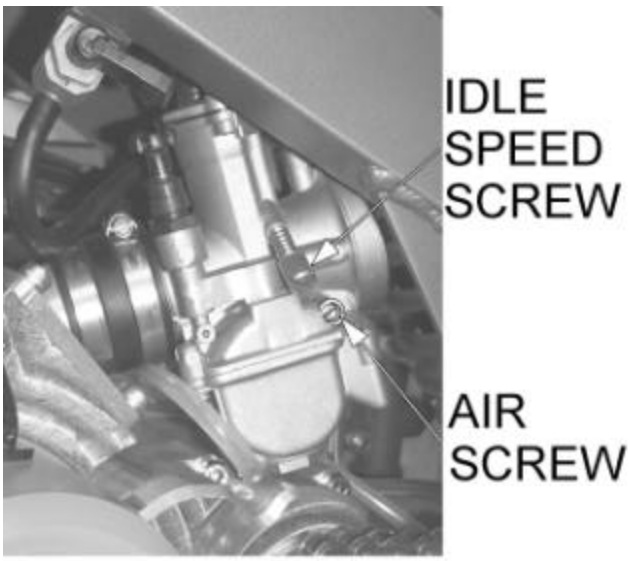


Figure 9

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.

C2: Jetting Changes

STOCK CARBURETOR SETTINGS

- 19 mm ± 0.5mm (0.75" ± 0.020") float height
- Air screw ½ turn out
- 38 pilot jet
- JJH – 3 (3rd position from top) jet needle
- 128 main jet

To check and/or adjust float height:

REQUIRED TOOLS

- Flat blade screwdriver
- #1 (small) Phillips screw driver
- Accurate measuring device

1. Insure that the fuel petcock is turned to off.
2. Using a flat blade screwdriver loosen the hose clamps to the front and rear of the carburetor.
3. Work the carburetor from the inlet and airbox.
4. Detach the fuel line from the top of the carburetor.
5. Detach the carburetor from the cable and slide by unscrewing the cap off the top of the carburetor

   CAUTION:
   The jet needle is attached to the end of the slide. Take care not to bend or abuse it.

6. Remove the float bowl by removing the two Phillips head screws.

CAUTION:
Perform step six in a well ventilated area and over a small pan as some flammable fuel is likely to drain from the bowl as it is removed from the carburetor.

7. Hold the carburetor (with the float bowl removed) as shown in figure 10, measuring from the bottom of the float to the carburetor body gasket surface.

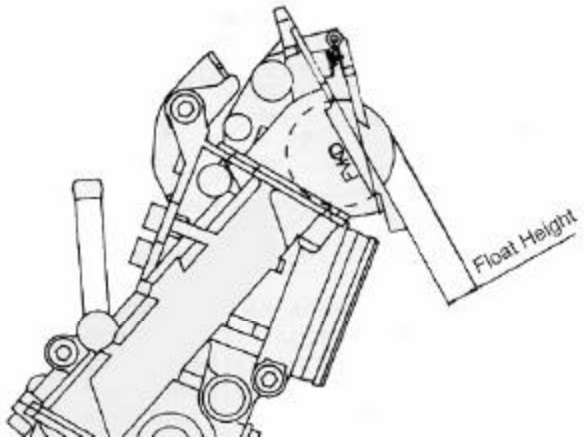


Figure 10

NOTE:
When measuring the float height, the float should be resting, but not depressing, the spring loaded float valve pin (his can be done by tilting the carburetor until the float tab just makes contact with the valve pin). If adjustment is needed, bend the metal tab on the float arm until correct height is obtained (19 mm $\pm$ 0.5mm (0.75" $\pm$ 0.020")).

To replace the main jet:

REQUIRED TOOLS

- Flat blade screwdriver
- 17 mm wrench
- 6 mm socket or Keihin jet wrench

Removal

1. Insure that the fuel petcock is turned to off.
2. Loosen the hose clamps at the front and rear of the carburetor (screwdriver).
3. Rotate the carburetor so that the float bowl is exposed (may need to dislocate from the air boots)
4. Remove the jet access plug from the bottom of the float bowl (17 mm wrench).
5. Remove the jet (6mm socket or jet wrench).
6. The jet size is stamped in the side.

CAUTION:
When making main jet changes, make changes in single step sizes and always take the conservative approach if you are unsure (experiment rich before experimenting lean).

Installation

1. Lightly seat the new jet (6 mm socket or jet wrench).
2. Reinstall the jet access plug in the bottom of the float bowl (17 mm wrench).
3. Reinstall the carburetor properly in the inlet and air boot.

CAUTION:
Make certain that the carburetor completely inserted into the inlet and that the air

boot is pulled at least 8mm over the inlet of the carburetor body.

To replace the pilot jet:

REQUIRED TOOLS

- Flat blade screwdriver
- 17 mm wrench

Removal

1. Insure that the fuel petcock is turned to off.
2. Loosen the hose clamps at the front and rear of the carburetor (screwdriver).
3. Rotate the carburetor so that the float bowl is exposed (may need to dislocate from the air boots)
4. Remove the jet access plug from the bottom of the float bowl (17 mm wrench).
5. Remove the jet (flat screw driver).
6. The jet size is stamped in the side.

CAUTION:

When making main jet changes, make changes in single step sizes and always take the conservative approach if you are unsure (experiment rich before experimenting lean).

Installation

4. Lightly seat the new jet (flat screw driver).
5. Reinstall the jet access plug in the bottom of the float bowl (17 mm wrench).
6. Reinstall the carburetor properly in the inlet and air boot.

CAUTION:

Make certain that the carburetor completely inserted into the inlet and that the air boot is pulled at least 8mm over the inlet of the carburetor body.

To adjust the jet needle clip position:

REQUIRED TOOLS

- Flat blade screw driver

1. Insure that the fuel petcock is turned to off.
2. Using a flat blade screwdriver loosen the hose clamps to the front and rear of the carburetor.
3. Work the carburetor from the inlet and airbox.
4. Detach the fuel line from the top of the carburetor.
5. Detach the carburetor from the cable and slide by unscrewing the cap off the top of the carburetor.

CAUTION:

The jet needle is attached to the end of the slide. Take care not to abuse it.

CAUTION:

The carburetor will likely still hold some flammable fuel, which is likely to drain out when laid in a horizontal position, so place it in a well ventilated area where it

may drain.

6. To remove the slide from the cable, hold the slide in one hand and compress the spring into the cap with the other.
7. While compressing the spring, hold the slide upside down such that the retaining plate drops free.
8. Snake the cable through the proper grooves to remove the cable from the slide.
9. With the slide free from the cable, lightly push on the pointed end of the jet needle to remove it from the slide.
10. Make note of what groove the clip is in on the end of the needle (groove one is at the top and groove 5 is furthest away from the top).
11. To adjust richer, move the clip further from the top (to a higher number) and conversely to adjust the bike leaner, move the clip closer to the top.

NOTE:
Make adjustment by one step at a time.

NOTE:
The clip can be easily removed and reinstalled by pressing the needle (with the clip in position) against the top of a table.

Tuning 2: Suspension

Topics included are:

1. Suspension Guidelines
2. Proper Suspension Adjustments for Your Rider
3. Symptoms of Incorrect Suspension Adjustment
4. Proactive Suspension Adjustments
5. How to Adjust the Suspension
6. Suspension Reference

	Factory setting	Track 1	Track 2	Track 3	Track 4
Fork Oil Viscosity	5 wt				
Oil Height (amount)	4 oz (118 ml)				
Fork Spring	STD.				
Shock Spring	STD.				
Preload height					
Rebound Damping (clicks from full damp)					
Compression Damping (clicks from full damp)					

S1: Suspension Guidelines

Proper suspension adjustment is a crucial component for a winning combination of rider and machine. As important as the rider's abilities, health, and fitness, or the performance of the engine, the suspension controls what the rider feels and how the engine's power is delivered to the ground. A good rider will struggle on a poorly suspended machine and a lesser rider will shine on a machine that is properly adjusted for his or her abilities, physical stature, and the terrain. Properly adjusted suspension instills confidence in the rider.

While tuning the suspension keep the following important points in mind:

- If the machine is new, the suspension will require a couple of hours of **'break-in'** time. Adjustments made during this time may need to be redone after 'break-in'.
- Before making adjustments be sure that the machine is **properly maintained**, lubricated, and in fine working order.
- The most important factors to consider when adjusting the suspension are; 1) **rider weight**, 2) **rider ability**, and 3) **track conditions**. Also consider your particular **rider's style** and personal **riding position**.
- Before making drastic changes to suspension settings, consult a riding expert to ensure that an **improper riding style, or body position**, is not the cause of the problem.
- The front forks are designed to operate without any gas pressure. Continually **bleed off any pressure** that builds up during riding or this will effect the feel of the front forks.
- A properly adjusted machine is a **balance** of front and rear suspension adjustments. Adjustments to one end may require compensating adjustments to the other end.
- Adjustments to improve the feel of one portion of the race track may adversely effect the feel in another portion of the track. Make **small adjustments** to improve the feel at a problem area, but **continually evaluate the effects** of those adjustments on all other areas.
- A **tired rider** will behave differently than an energetic rider.
- **Make notes**. Write down what works, and what doesn't work for a particular track.
- The suspension on this Cobra Motorcycle has many degrees of adjustment. This is to provide a machine, which can be set up most precisely to the rider and tracks requirements. Unfortunately, this also means that there many ways to do it wrong. You will achieve the best results if you:
    1. **Read and understand** this whole suspension tuning portion of **the manual** and,
    2. Precisely **follow the steps** spelled out in the following section called "Proper Suspension Adjustments for Your Rider" and,
    3. If you get confused, overwhelmed, or feel that you have just made things worse, take a **step backward** in adjustment **to what DID work** best. Perhaps even requiring you to return to stock settings.
    4. If all else fails, **call the Cobra Technical support hotline (330) 549-9603**.

S2: Proper Suspension Adjustments for Your Rider

Free length – measurement of available suspension travel with bike on stand (wheels suspended).
No load sag – amount that the free length measurement is reduced by taking the machine off the stand (fluids filled to race quantities).
Race sag – amount that the free length is reduced with a rider onboard in riding position (fluids filled to race quantities).
Ride height – The height of the bike while the rider is onboard.
Fork height – The amount of fork tube extending above the top triple clamp (figure 11).

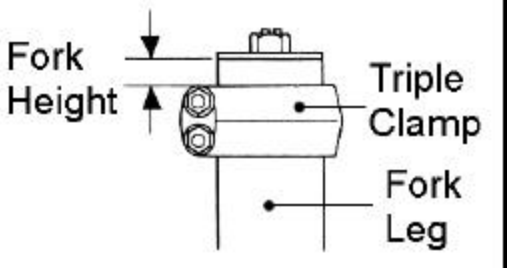


Figure 11

STEP 1: Fork Spring Selection

The standard fork spring should be fine for the typical Cobra rider. Although, depending on your racers weight, and alternative spring may suit him/her better.

If your child weights more than 85 lb (39 kg) then the optional stiffer spring is recommended.

If you child weights less than 60 lb (27 kg) then the optional softer spring is recommended.

STEP 2: Proper Ride Height

Taller riders will want the ride height set as high as possible. Conversely shorter riders will want to set ride height as low as possible. Keep in mind that you need a front to rear balance. The bike is balanced when the rear frame spars are vertical.

A proper ride height is established by first adjusting the rear of the bike to the desired height, and then readjusting the fork height to rebalance the bike. The height of the rear of the bike is adjusted with the shock (eye to eye) length. Adjust the ride height such that the rider feels most comfortable touching the ground when not moving.

⚠ 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.

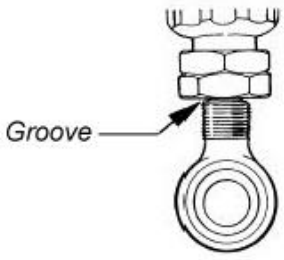


Figure 12

Adjustment Procedure

1. Adjust the height of the rear of the bike.
   1.1. Remove the shock as covered in the service portion of this manual.
   1.2. Using a vice and a thin 17 mm wrench, adjust the length of the shock.
   1.3. Reinstall the shock.
2. Rebalance the bike by readjusting the front fork height.
   2.1. Loosen the fork triple clamps.
   2.2. Slide the forks up or down until the rear frame spars are vertical (see figure13 and notes below).
   2.3. Tighten the front fork clamps 6 ft-lb (8 Nm).

NOTE:

Measuring how vertical the frame spar is can be most accurately done by placing the motorcycle on a level surface and attaching a magnetic protractor to the frame spars. Make the measurement while the bike is off the stand and with no rider onboard.

NOTE:

This measurement only needs to be approximately close to vertical at this point as some suspension setting to be made later will effect the precise value of this measurement.

Figure 13

STEP 3: Proper Race Sag

Tools required
Measuring tape
Shock preload spanner
Calculator or the ability to subtract without one

NOTE:
Always be consistent with measuring units. Stick with inches (“) or millimeters (mm).

Adjustment Procedure

1. Place the bike on a suitable stand to suspend the rear wheel off the ground.
2. Measure the distance between the centers of the rear fender bolt and the rear axel bolt (see figure 14).
3. Write this number in table 1 as the **Free Length**.
4. Remove the bike from the stand and with your rider sitting aboard the bike, record this measurement again and record it in Table 1 as the **Race Length**.

NOTE:
Have the rider bounce on the seat a couple of times to overcome any static friction (stiction) forces.

5. Calculate the **Race Sag** by subtracting the **Race Length** from the **Free Length** and record it in the table.
6. The desired number is 75 mm (3.0”)

Figure 14

Free Length	Race Length	Race Sag Target 75 mm (3.0”)	No Load Length	No Load Sag Target 19 mm (3/4”)
Measure	Measure	Calculate as Free Length – Race Length	Measure	Calculate as Free Length – No Load Length

Table 1 Sag calculations

7. If your race sag number does not equal 75 mm (3.0”) adjust the preload on the shock to achieve this value.
   7.1. If your race sag is greater than 75 mm (3.0”) increase the shock preload by one turn.
      7.1.1. Loosen the shock preload lock nut.
      7.1.2. Turn the preload adjuster in towards the spring one more turn.
      7.1.3. Resecure the lock nut.
   7.2. If your race sag is less than 75 mm (3.0”) reduce the shock preload by one turn.
      7.2.1. Loosen the shock preload lock nut.
      7.2.2. Turn the preload adjuster back from the spring by one turn (**NOTE:** If you unload the spring while performing this task, you must purchase a softer spring).
      7.2.3. Resecure the lock nut.
   7.3. Remeasure the race length as described above.
   7.4. Repeat this procedure until you are sufficiently close to the target value.

STEP 4: Proper No Load Sag

Tools required

Measuring tape
Shock preload spanner
Calculator or the ability to subtract without one

NOTE:
Always be consistent with measuring units. Stick with inches (“) or millimeters (mm).

Adjustment Procedure

1. Again measure the distance between the centers of the rear fender bolt and the rear axel bolt with the bike off the stand, but this time without a rider.

NOTE:
Bounce the seat a couple of times by hand to overcome any static friction (stiction) forces.

2. Record the measurement in table 1 as the **No Load Length**.
3. Calculate the **No Load Sag** by subtracting the **No Load Length** from the **Free Length** and record it in the table.
4. The target 19 mm ± 6mm (3/4" ± ¼").
5. If your calculated **No Load Length** is not within this value you need to replace the spring and start at **Step 2**.
   5.1. If your value is greater than 25 mm (1.0 ") then you need a softer spring.
   NOTE: This may be counter intuitive. It is because your current spring *rate* is sufficiently stiff that very little preload distance is required to get the proper Race Sag that is not enough distance for the spring to return it to full stroke.
   5.2. If your value is less than 13 mm (1/2 ") then you need a stronger spring.
   NOTE: This may be counter intuitive. It is because your current spring *rate* is sufficiently soft that it requires so much preload to get the proper Race Sag that there is not enough loading of the bike itself to cause enough sag in the suspension.
6. If your No Load Sag is acceptable then verify the following:
   6.1. Ride height is still acceptable – if not readjust.
   6.2. Front to back balance is still acceptable (**Step 1** vertical frame spar) – if not readjust.

Other parameters such as Fork oil type and level as well as compression and rebound damping you should adjust based on symptoms of incorrect suspension discussed in the next section.

S3: Symptoms of Incorrect Suspension Adjustment

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

S4: 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.

S5: How to Adjust the Suspension

Shock preload

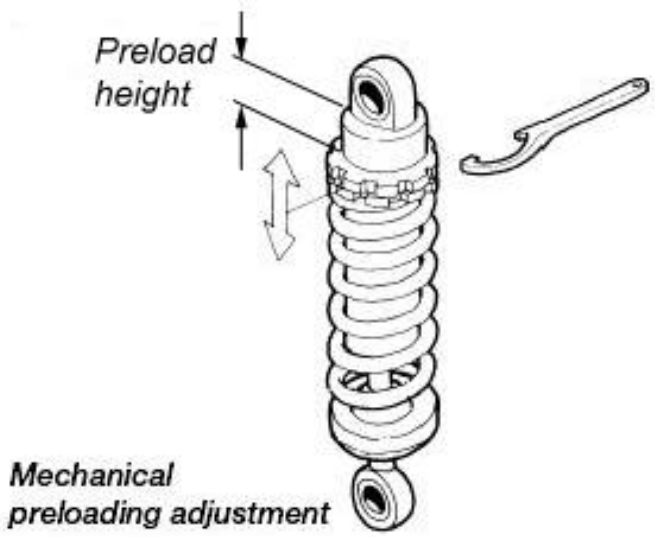
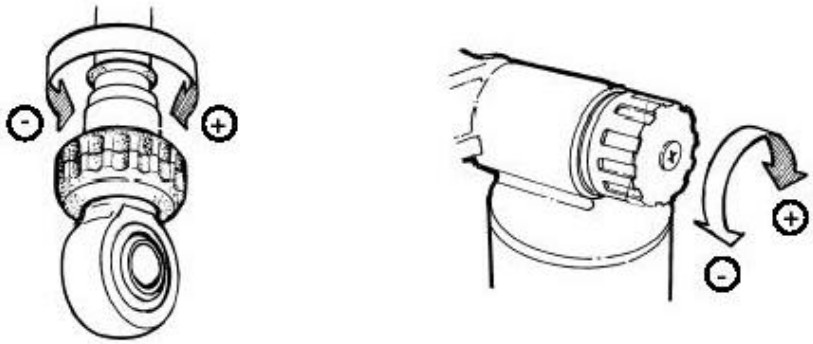


Figure 15

Shock Damping



⊕ = More damping (harder, slower)

⊖ = Less damping (softer, faster)

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.

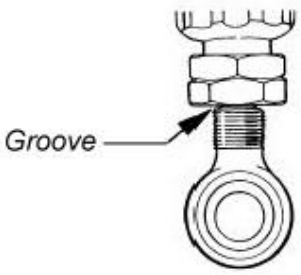


Figure 17

S6: Suspension Reference

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 (see figure ??)
        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.

Troubleshooting

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

Index

Air Filter
  Maintenance....18
Bottom End
  Service....20
Break-In....10
Carburetion
  Specifications....5
Carburetor
  Tuning....27
Chain
  Adjustment....15
Chassis
  Specification....5
  Torque....7
Clutch
  Parts....21
  Service....21
Clutch Lubricant
  Replacing....14
Engine
  Parts List....20
  Specifications....5
  Torque....6
Exhaust....26
Fork Oil
  Replacement....19
Front Brake
  Adjustment....16
Fuel
  Petcock....11
Fuel System
  Parts list....25
  Service....25
General Tips....12
Ignition
  Parts....24
  Service....24
Jetting
  Stock....5
  Troubleshooting....27
Lubrication
  Recommended....5
Maintenance
  Schedule....13
  Tips....13
Oil
  Recommended....5
Optional Components....9
Parts
  Bottom end....20
  Clutch....21
  Ignition....24
  Inlet....25
  Reeds....25
  Top end....20
  Water pump....25
Petcock....11
Rear Brake
  Adjustment....17
Reeds....25
Spark Plug
  Recommended....5
Specifications....5
  Torque Values....6
Starting....11
Suspension
  Troubleshooting....34
  Tuning....34
Tips....12
Top End
  Service....20
Torque
  Chassis....7
  Engine....6
Transmission
  Service....20
  Specifications....5
Transmission Lubricant
  Replacing....14
Troubleshooting
  General....44
  Jetting....27
  Suspension....34
Tuning
  Carburetor....27
  Suspension....34
VIN reading....12
WARNING....2
Water pump....25