www.StarFireBikeEngines.com.au

WELCOMES YOU TO

StarFire QUALITY PRECISION ENGINE KITS

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION

GT50 & GT80 Kit Contents

GT50 - 48cc & GT80 - 70cc 2.85hp - 2 Stroke or Cycle petrol needle bearing Engines include - Mounting Clamps - Exhaust Muffler - Tear Drop 2.5L Fuel Tank with Cap and mounting brackets - Heavy Duty 415 Drive Chain - Chain guard - 44 Tooth Wheel Sprocket - 9 hole Sprocket Installation Hardware (9 hole mounting for 36 spoke wheel) - Ball Bearing Chain Idler - Push button clutch handle - GT50 Kit supplied with Gen II Carburetor and GT80 supplied with NT Premium model Carburetor with bowl drain and shut off valve - CDI Electronic Ignition Module - Right hand throttle & cable with Colored push button integral Kill Switch.
Extra spares included in the tool kit - *Head Gasket - Spark Plug - 10T Sprocket Removal Tool - Spark Plug Removal Tool - 2 Extra long mounting Screw Studs - Extension Engine Mounting Bracket.*

Note: With some mechanical ability and basic tools required to perform this installation, many DIY backyard mechanics will find this project rewarding. A love of bicycles and small engines is the only required catalyst for this project. However, installation is sometimes best done by a professional auto or motorcycle mechanic. The bike frame tube should be 28mm to 30mm dia. with 70 degree included V angle. For sufficient engine clearance, select a bike with a seat tube length of at least 315mm, measured between the inside top tube, to the top of the pedal sprocket tube. If buying a new bike for your StarFire Engine Kit, make sure your V frame is sufficient to accept the

engine motor. The joy of assembling your engine and kit components to your bike, will give you total satisfaction when you fire that StarFire motor into life for the first time, to motorize your push bike. A rewarding joy and challenge is found, in designing a custom installation of your own. Remember, a quality installation is paramount to safe usage and long term rider satisfaction. Have fun and good luck on your motorized bike project and enjoy many hours of happy motoring.

STEP - 1 Mounting the Engine:

1. The engine mounts in a "Vee" frame. It is best to make sure all 4 engine studs are securely bottomed out in the engine before mounting. Use a Jam nut procedure to tighten.
2. Consider using Masking or Duct Tape on the front down-tube & seat tube of your bicycle to protect the paint finish while test fitting the engine to your donor bike. If the distance between the two frame tubes exceeds the engine mounting span then additional spacers or welded brackets may be required. Mount the engine to the seat tube first and then fit to the front tube. If frame tube fit is smaller than engine clamp dia. use strip shims to fit. See figure one for example of installation on a wide frame bike..

Figure 1.

Bike with wide frame or big down tube: Use ¼" thick 1-1/8" x 2-1/2" steel plate with one hole in the center for a bolt to go through a drilled hole in tube frame and two holes for cap screws to go into engine block. Additional spacers maybe required depending on the donor bike.

Figure - 1

3. If the rear frame tube from the seat down to the pedal sprocket is too small to fit the rear engine mount, a rubber shim can be made from an old bicycle rubber inner tube. This also helps reduce engine vibration.
   Engines require to have the carburetor set in a level position. **Too much engine tilt can cause chain to hit the drive cover and engine to not run correctly. It is best to have the drive chain to rear wheel sprocket be as horizontal as possible with no more than 15 degrees max engine tilt.** After the desired engine location is determined mount the engine to

frame. Appling LocTite thread lock is recommended to avoid loosening due to vibration. **Note: All threads are metric**.

Chain Wheel Sprocket Installation:

The Drive Chain Sprocket has a 36.9 mm dia. center hole and mounts on axel hub on the left side of the rear wheel against the spokes dish side in. The sprocket must fit over the hub in a perpendicular plane with the axle. This insures that your rear chain sprocket spins true with the rear bike wheel. ***NOTE:** On some older bike axle hubs like on coaster brake models it may be required to slightly enlarge the sprocket center hole to obtain a flush, and concentric fit next to the spokes. This is best done on a engine lathe by a professional machinist.. . It is also recommended that the rear wheel be re-spoked to 12 ga. spoke wires to insure long life. Most Bike shops can do this operation for you. Applying thread adhesive and equal tightening of the sprocket bolts. This keeps the chain sprocket true with axle and free from wobble while spinning. With your bike upside down, spin the wheel and check the sprocket for wobble. The chain can jump off the sprocket if the sprocket installation is done incorrectly

1. For kit sprocket installation, locate the Wheel sprocket on the axel hub with the convex/curved side next to the spokes or shinny side in.
   If not pre sliced, cut the rubber isolator ring between holes in order to fit INSIDE the spokes and around the axle. Install the split steel retainer plates next to the rubber isolator and insert 9 bolts
2. Secure with 9 bolts compressing the chain sprocket to the spokes. Note: Rubber isolators may be needed on both sides of sprocket for chain alignment on some non-coaster brake bikes.
3. The **Chain Sprocket on the Wheel** must align within 1/2 cm to the **Chain Sprocket on the Engine**.
4. The wheel chain sprocket is mounted with teeth-out and dish-in next to spokes. **SEE FIG. - 2**

Note - Mount Sprocket bight chrome dished out side next to spokes:

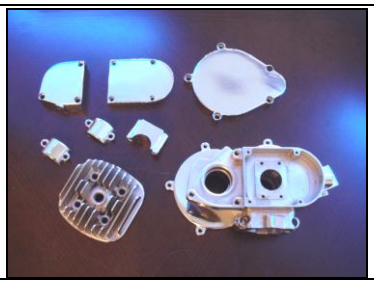
Figure -2

9 slot - Chain Wheel Sprocket Installation mounted dish side inward

Options available from your dealer:

HD axle kit:

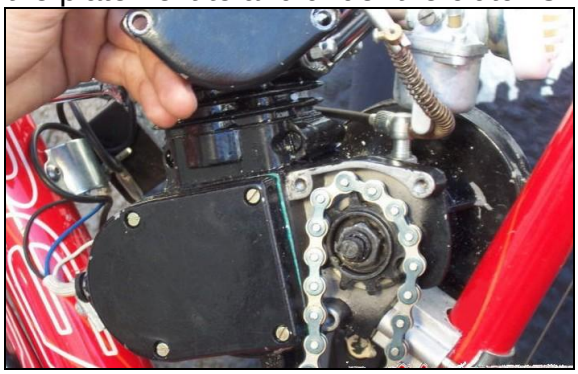
Chrome Tank



Chrome engine parts available:

The drive chain can be easily shortened to the correct length. Special tools are required to remove and replace the master link when shortening the chain by removing links. Ideally, both your **pedal drive chain** and your **engine drive chain** should have the same tension.

A. Remove left rear cover plate from engine.
This is the plate next to and under the clutch swing arm.



MASTER LINK

B All StarFire GT50 and GT80 Bike Engine Kits supplied by StarFire Bike engines include the Heavy Duty 415 drive chain as standard to all kits.
The 415 Heavy Duty Drive Chain uses a wide drive sprocket by comparison to the standard bike chain that uses narrow gauge sprocket . A 415 chain will work with a narrow sprocket but a standard bike chain will not fit over a wide drive sprocket.
Note: Install chain with master link clip on outboard side of the primary drive sprocket teeth.

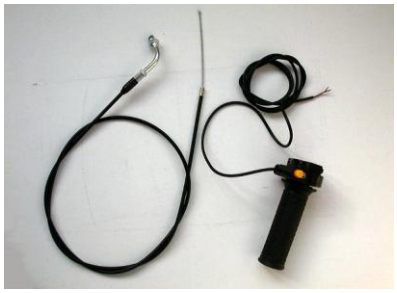
Note: Wide tires larger than 2.125, may rub on a wide 415HD chain

A. Use supplied spark-plug wrench to turn engine crankshaft sprocket to feed chain around it. Do not pry sprocket with a screwdriver or similar object.
B. Fit chain, measure and remove excess links to assure proper length. Be sure master link connection rides on the inboard side of the primary drive sprocket or interference of link and sprocket can occur. Proper chain length is when top chain has ¼ inch to ½" deflection with the bottom side of the chain loop tight.
C. Chain tension adjustments can be made by pulling rear wheel back if frame has straight slot wheel drop out. If both chains can be adjusted equally then installing chain idler on the wheel strut may not be necessary. At installer's discretion the chain idler can be installed on either the pedal chain or engine drive chain.
D. Install supplied chain safety guard by attaching to engine and wheel axle struts.

CDI Electronic Ignition Coil and Engine Kill Switch installation

A) Mount CD ignition coil on bike frame, close enough to attach coil wire to spark plug. Mount as far away from exhaust pipe as possible to avoid heat damage to semiconductors in CDI module.
B) Attach CD ignition coil wires to same identical color coded wires coming from engine.
C) Install Engine Kill Switch Wire on throttle to white wire coming from engine. Install the other wire with eyelet to a good frame ground not on paint. This will ground ignition and stop the engine when the kill button switch is activated.
D) Route all wires away from engine exhaust heat. Secure wires with a plastic tie straps.

***!WARNING!** Operation of engine without stop or kill switch installed could result in personal injury if an emergency stop is required! The only alternate non recommended way of killing the engine is by releasing the clutch lever with bike brakes on and engine at slowest idle.



Throttle with kill switch - CDI Electronic Ignition coil - Extra spark plug included

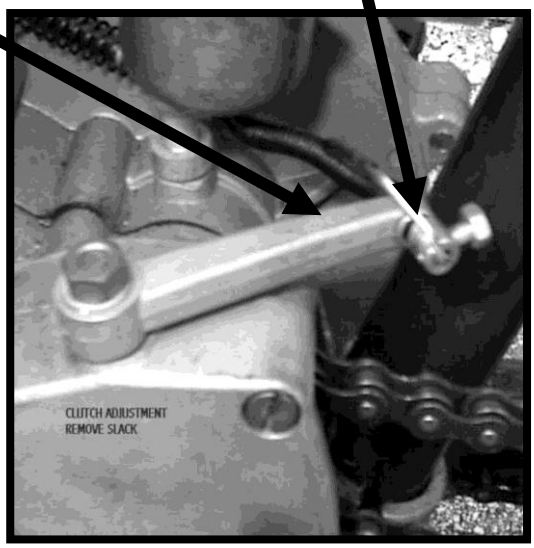

Push button Clutch lever - Dual lever Clutch & Brake Clutch cable end barrel locks in lever handle.

GT series Clutch cable installation and adjustment: Not required for GGG series:

A) Install clutch lever to left side of handlebar and attach cable end barrel into lever slot hole.
B) Squirt oil down the cable sleeve: Route clutch cable through the ball-mount on motor with the big spring around the cable jacket and ahead of the ball mount. The big spring serves as a cable heat shield.
C) Insert cable wire through small spring and route through clutch arm and attach brass cable-end and screw. Adjust cable tension to allow very slight play in arm. Handlebar clutch lever must be in the released or outward position to complete this operation.
D) Activate lever a few times, and check clutch arm for slight free play: **About 1/16" engine clutch arm free play is required with the handle bar lever in the released in what is called clutch engaged position or the engine will fail to start if cable is too loose or if too tight. Re-adjust as required.**

E) Basics of clutch operation: The handlebar lever pulls the cable that moves the engine clutch arm. In turn the clutch arm pushes a rod through the motor that pushes the clutch plate out. (similar to a car clutch.) Releasing the handle bar lever engages the clutch and provides engine torque to the drive chain or to start the engine. The clutch friction allows engine to start, and also transmits engine torque to the drive chain. When the bike is in the pedal mode the handle bar clutch lever is locked inward in the catch notch. The bike then operates in default as it would without any engine. Periodic clutch adjustment is necessary to maintain efficient operation ***NOTE:** Cut off excess cable from clutch arm, before operation, to avoid possible interference with pedals, chain, your legs, etc. **See Figure - 4.**

Clutch arm;
1/16" free play;



Clutch cable Note brass screw lock at the end;

Figure - 4
made at mid cable
If Clutch cable is
will not start.
free play with

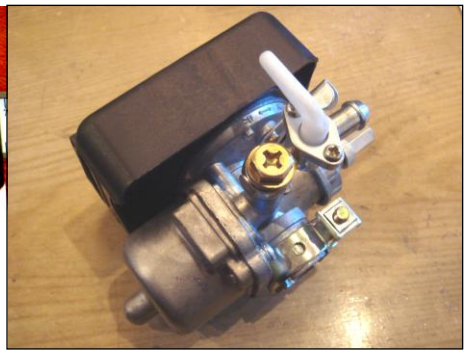
Additional cable adjustment can be joint.
not adjusted correctly the engine
Check for 1/16 " clutch cable arm
handle bar lever released.

Carburetor and Throttle Installation

u

NEW STYLE THROTTLE with kill switch:
Kill switch; one wire goes to white wire from engine and the other to frame grd.

Drill small hole in handle bar for pin lock.

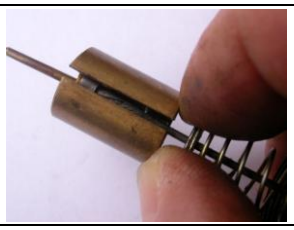
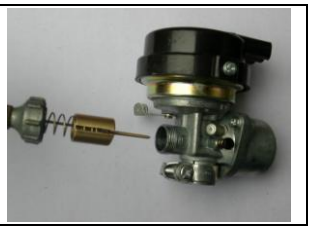


Note: Special 70cc Carburetor has fuel shut off valve and bowl drain petcock, it also has a larger throttle slide and outlet opening than found in the GT50-48cc carburetor. Square AC is interchangeable with smaller versions.

Be sure to check carburetor air cleaner attachment screws for tightness before installing engine - Air cleaner screw coming loose and entering engine is not covered by warranty!!

Procedure for attaching throttle cable to carburetor throttle slide: The small stop on the cable wire slides through the long groove of the carburetor brass cylinder slide. It held in a slot at the end of the cylinder.



(Note component positions in pictures:)

The spring is placed inside the cylinder slide and is compressed when the throttle is twisted. Be sure it is seated all the way inside the cylinder. The spring then forces the throttle to return. For this to work properly the throttle must twist freely on the handle bar in both directions prior to the cable being installed.

A) Install twist grip throttle on right side of handlebar end. On some bike handle bars it may be necessary to ream out the handle ID to fit the bar so that the throttle will twist freely.
B) After installing cable inside the carburetor mount it on engine intake tube and tighten clamp screw. Mount carburetor as level as possible.
C) **Note:** The air/fuel mixture screw should be preset at 3.5 turns counter clockwise from the totally closed position. **Do not** back-off screw more than 4.5 turns or vibration may loosen the screw and cause it to fall out. If this situation occurs, stop engine immediately and replace mixture screw.

If a more rich gas mixture is required you can move the jet pin “pac man” clip to the next lower position notch.

Fuel Tank installation

A) Attach fuel petcock to tank. Use Teflon pipe tape to seal threads. Careful not to strip threads.
B) Mount tank on bike top crossover frame with two supplied brackets and nuts.
C) Attach fuel line from tank to carburetor. Best to use fuel line like GoodYear SAE 30-7 4.8mm or similar obtained from local automotive stores like Repco or Coventrys. Factory supplied clear plastic line gets hard over a period of time. ***NOTE:** Filters are contained in the petcock and in the carburetor inlet. If engine runs poorly clean the valve filter as residue from the tank may have clogged it. It is highly recommend that a tank liner coating be applied inside the tank before installation. This product is available from motorcycle dealers.

D) **TIP! - use a rubber strip ie. Tyre inner tube - to cushion the tank on the top tube.**

IMPORTANT: > Petrol /Quality Two Stroke Oil Mixture for Fuel ratio <

StarFire Bike Engines are a 2 stroke design, therefore, a gasoline to quality two stroke oil mixture is necessary. During the run-in period for the first three tank fills - mix the fuel ratio: 18 parts petrol to 1 part quality two stroke oil. After the run-in period, the ratio can increased to 25 parts gasoline to 1 part quality two stroke oil. ***NOTE: Synthetic 2 Stroke Oil** can also be used to insure proper engine lubrication. If in doubt, consult your dealer for his recommendations.

!WARNING! Remember safety first: Wipe up any spilled fuel. NEVER fuel a hot engine or smoke while fueling. This could result in sudden fire, personal injury. Always move your motorized bike at least 10 feet from any fueling area before attempting to start it. Never leave the tank fuel cap off after fueling as rain water will contaminate the fuel and cause engine failure. Never use a lit match or lighter to view tank fuel level.

MAINTENANCE SECTION

1. How to Adjust Clutch if signs of slipping or squealing are encountered :

A) Disengage clutch by pulling handle bar clutch lever inward and lock into catch lock.
B) Remove right side engine clutch cover and remove small locking screw on center *Clutch Adjust Nut.
C) Pull clutch arm on left rear engine inward. Back off *Clutch Adjust Nut ¼ turn counterclockwise.
D) Release clutch lever and check for slight clutch arm 1/16" free-play on opposite side of engine. Readjust *Clutch Adjust Nut as required to get required 1/6" clutch arm free play.
E) Tighten *Clutch Adjust Nut on clutch plate clockwise until just snug.
F) Then re-install small locking screw in outer edge of *Clutch Adjust Nut .
G) Good idea to place a small gob of grease at gear mesh area. Use grease sparingly! Then replace cover.
H) Squirt light grade oil down clutch cable sheathing to reduce friction and make for easy lever pull.

*Clutch Adjust Nut

2. Carburetor

After every 5 hours of operation check the adjustment of the mixture screw by rotating screw clockwise until seated and then rotate screw 4½ turns back counterclockwise. Depending on dusty riding conditions, clean air filter every 5 hours of operation by removing the filter cover to access the screen and element. Wash element with a degreasing fluid which can be sourced in your local hardware store. Be sure the element is completely dry before re-assembly. IMPORTANT: If engine runs poorly clean tank shut off value filter.

MAINTENANCE SECTION Continued:

3. Spark Plug

Remove spark plug and inspect for excess carbon build up. Clean, re-gap to .0.036" of an inch if necessary. Check plug after every 20 hours of operation. New spark plugs are available from your selling dealer. Be careful using aftermarket spark plugs as heat range and threads differ greatly. For your convenience an Extra spark plug is included in your kit

4. Exhaust system

After 20 hours of operation check exhaust pipe for excessive oil and carbon build-up. Make sure attaching nuts are tight and no exhaust leaks are occurring. Be sure to use supplied support strap to secure exhaust muffler to a solid anchor point on bike frame or engine.

USA application only…

A) To remove inside catalytic exhaust insert loosen the retaining screw on end cap.
B) Pull cap and baffle out of pipe. Note: Some catalytic inserts are welded in and cannot be removed. If you need a replacement muffler contact your dealer.
C) Clean with degreaser, rinse and dry.
D) Re-assemble

***NOTE:** Excessive periods of low speed operation, idling or leaving fuel petcock in the "on" position during shut down periods may cause the muffler to become clogged with unburned fuel.

5. Chain

Every time bike is ridden check the tension of the drive chain by:

A) Rolling to bicycle forward to remove slack from the bottom of the chain.
B) Find the center and push downward on the top of chain while measuring the deflection.
C) Tighten chain if deflection is more than ½ inch.

6. Head Bolts Tighten all fasteners after each five hours of operation. Most important to check Cylinder head bolts : Tighten in a X pattern to 10 ft/lb using a torque wrench. A two piece cylinder and head design engine requires head bolts be kept tight. **Important:** Check head bolts before each and every long ride, vibration can cause them to loosen and blow a head gasket. **Caution:** Do not over torque or head bolts may break off. (Twisted or broken head bolts due to over tightening is not covered by warranty.)

7. Right side gears: Remove cover plate and keep small amount of heavy grease on gear train. Do not over grease as leaks will occur and also may adversely affect clutch operation. Regular greasing if required will help reduce gear wear and keep gear train quiet.

8. Left side drive: Routinely pack grease in the shaft hole behind 10T sprocket and also in cover bushing hole. This will also help deduce noise.

Tools and extra service parts are supplied with your StarFire Bike Engine Kit – Head Gasket – Spark Plug – 10T Sprocket Removal Tool – Spark Plug Removal Tool – 2 Extra long Mounting Studs – Engine Mount Extension Bracket.

General Information

Obey all traffic regulations. Always wear a helmet while riding. Remember that you are riding a motorized bicycle and other traffic may not be able to see you. Never operate your motorized

bicycle on a pedestrian through way or sidewalk while the engine is operating. Never operate your motorized bicycle in an unsafe manner. Check local and state laws before riding on streets. WARNING! ALWAYS wear a helmet while riding.

STAR-FIRE ENGINE WARRANTY POLICY:

Proper use and maintenance is important for the continued enjoyment of your StarFire Bike Engine.

This product has been manufactured to strict quality control standards. **For customer assurance there is a 90 day Engine Warranty starting from the date of original purchase from an authorized dealer:**. Warranty approval is subject to factory inspection and only the defective part or parts will be replaced, not the complete kit. Only the defective part or parts should be returned to the selling dealer for warranty replacement consideration. Send via email or include description and picture of the part failure with as many details as possible. Note: Seized pistons due to improper fuel / oil mix or shipping damage due to carrier neglect is not warranty.

ENGINE STARTING & OPERATION PROCEDURE

1. IMPORTANT: PLEASE READ THIS: Petrol and Oil Mixture for Fuel ratio

The engine is a 2 stroke design, therefore, a petrol and oil mixture is necessary. During the run-in period for the first three tank fills, the ratio is 18 parts petrol to 1 part quality two stroke oil. After the run-in period, the ratio is increased to 25 parts petrol to 1 part quality two stroke oil. The engine crankshaft bearings are lubricated by the oil in the fuel mix. The use of a quality two stroke oil available from chain saw dealers, with a rich ratio mixture ensures bearings will not cease.

!WARNING! Remember safety first: Wipe up any spilled fuel. NEVER fuel a hot engine or light a cigarette while fueling. This could result in sudden fire, personal injury. Always move your motorized bike at least 10 feet from any fueling area before attempting to start it. Never leave the tank fuel cap off after fueling as rain water will contaminate the fuel and cause engine failure.

2. Open the fuel valve. Small lever pointed down with fuel line is in the open position.
3 Depress the small round cap plunger, (Tickle button), to prime carburetor. Located on left side of the carburetor next to the idle adjust screw. One or two times is enough.
4. **Lift choke lever to the upward position**. This is the small lever on the right side of the carburetor. **All the way Up the choke is on. All the way Down the choke is off.** Move progressively downward to off position during engine warm up period.

Starting procedure for Lever Clutch Models:

5. Pull the handlebar clutch lever inward, to disengage the engine from the rear wheel.
6. Pedal; (down hill if possible for first start)
7. A mid frame or rear wheel bike stand is helpful to start the engine in place.
7. Let out the clutch lever all the way out and continuing to pedal. The result is a direct engine hook up via the friction clutch with the rear wheel via chain and sprocket. The engine will now start spinning, Pedal until motor starts. Accelerate slowly at first..
8. Twist throttle to increase speed, reverse twist throttle to decrease speed. To stop, disengage clutch and apply brakes. To accelerate, pedal and release clutch while opening throttle.
9. Adjust choke to the smoothest engine running position.
10. **After warm up push choke lever all the way down.** If engine races too fast, or too slow, pull clutch lever and lock in the notched catch, stop and adjust engine rpm.
11. If the rpm needs adjusting, turn the idle adjust screw (left side of carburetor) in or out slowly to obtain the proper idle speed of about 1400 rpm +/- 100 rpm
To correctly break the engine in, Do not exceed 15/20 kph or 30 minutes of continues running

for the first 3 tank fills of fuel during engine brake in. **Engine will develop more power after the run-in period and a better fuel economy.**

12. To stop the engine, push the Kill switch (coloured button) on the accelerator handle and turn off fuel valve at tank. Turning off the petrol will prevent fuel from being siphoned from tank into the engine
13. **Warning Note:** Never leave the tank petrol valve in 'open position' when the engine is not running or the bike is in storage.
14. After or before each ride check all mounting fasteners, including head bolts, axle and brakes.

15. **Warning Note:** Engine lock up or piston seizure due to improper petrol / oil mixture will not be covered by factory warranty. This the responsibility of the owner or operator to make sure the petrol and oil is mixed correctly.

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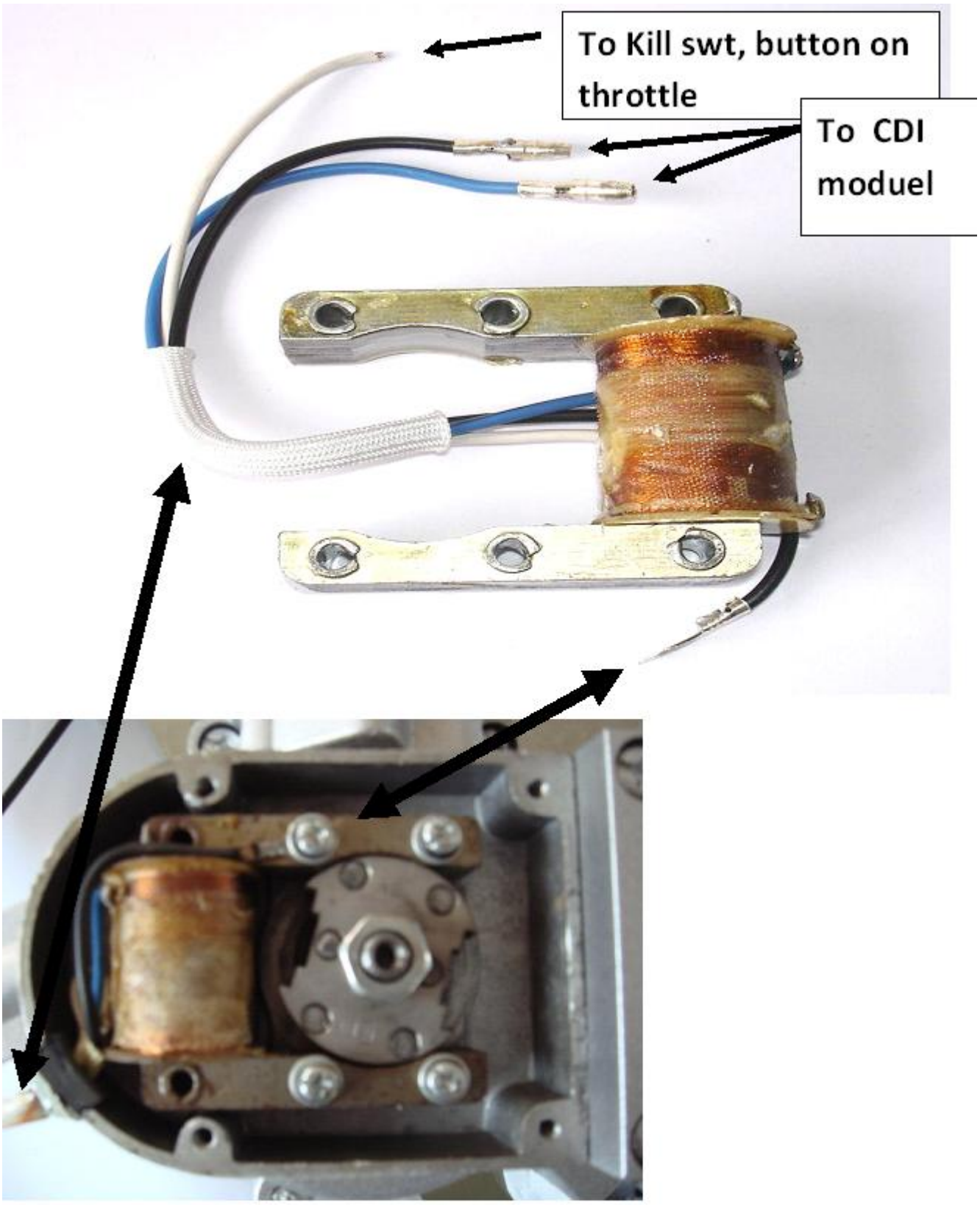
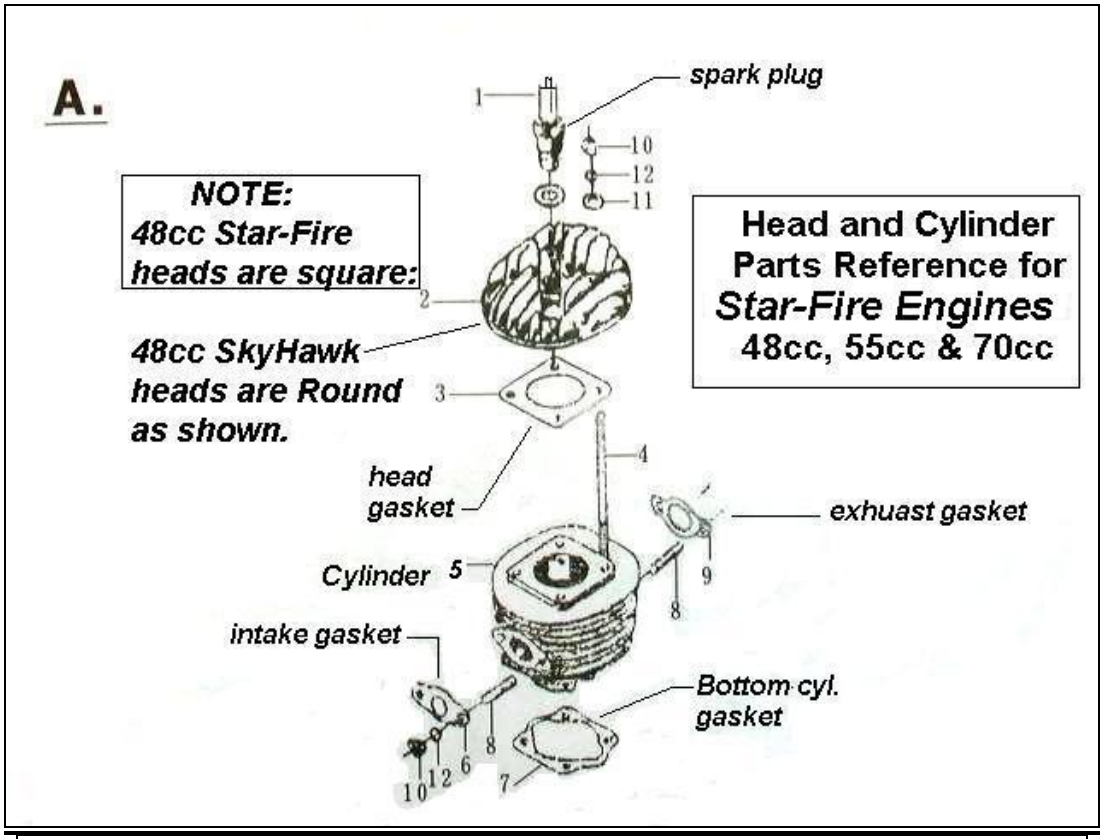
For all your quality precision Bike Engine Kits and Service Parts –
Contact our Customer Care Service….. manager@StarFireBikeEngines.com.au

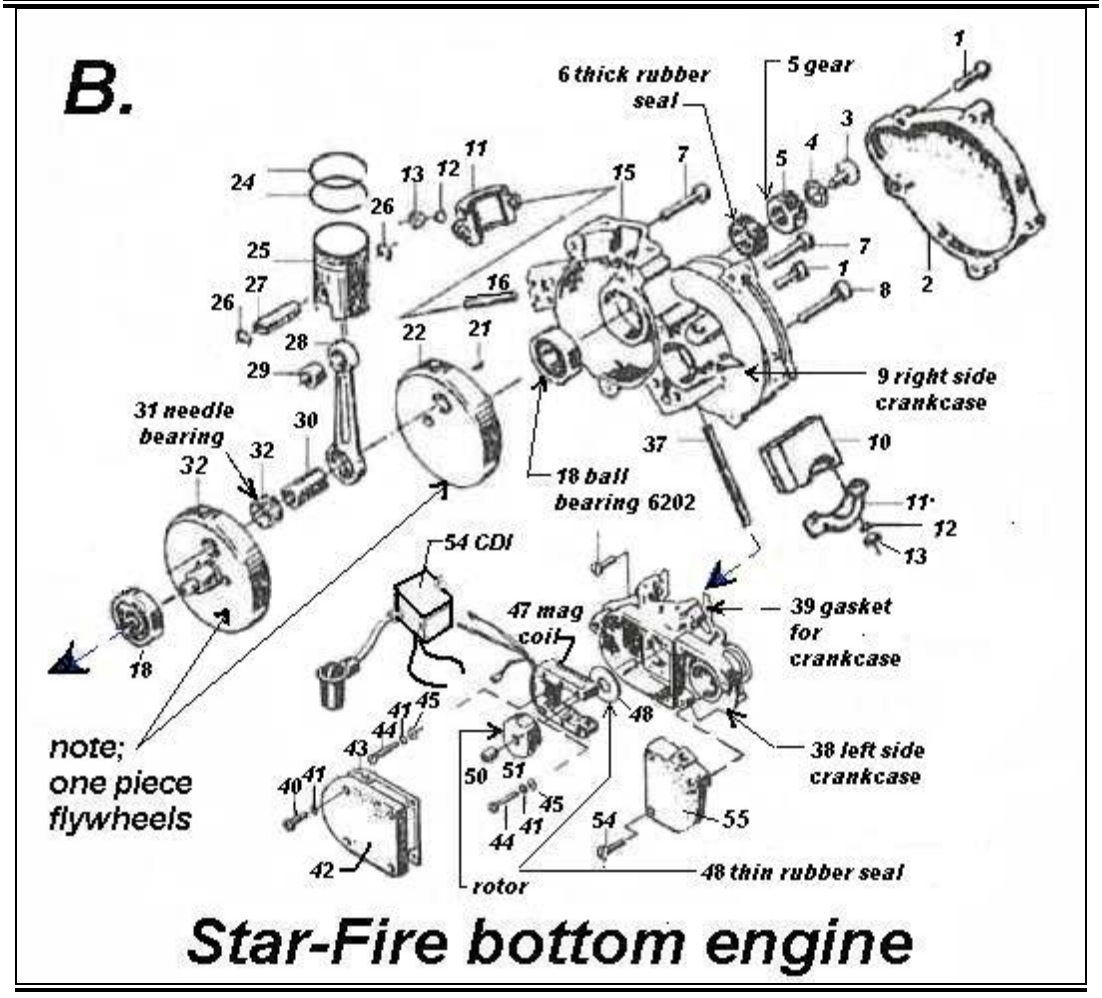
www.StarFireBikeEngines.com.au

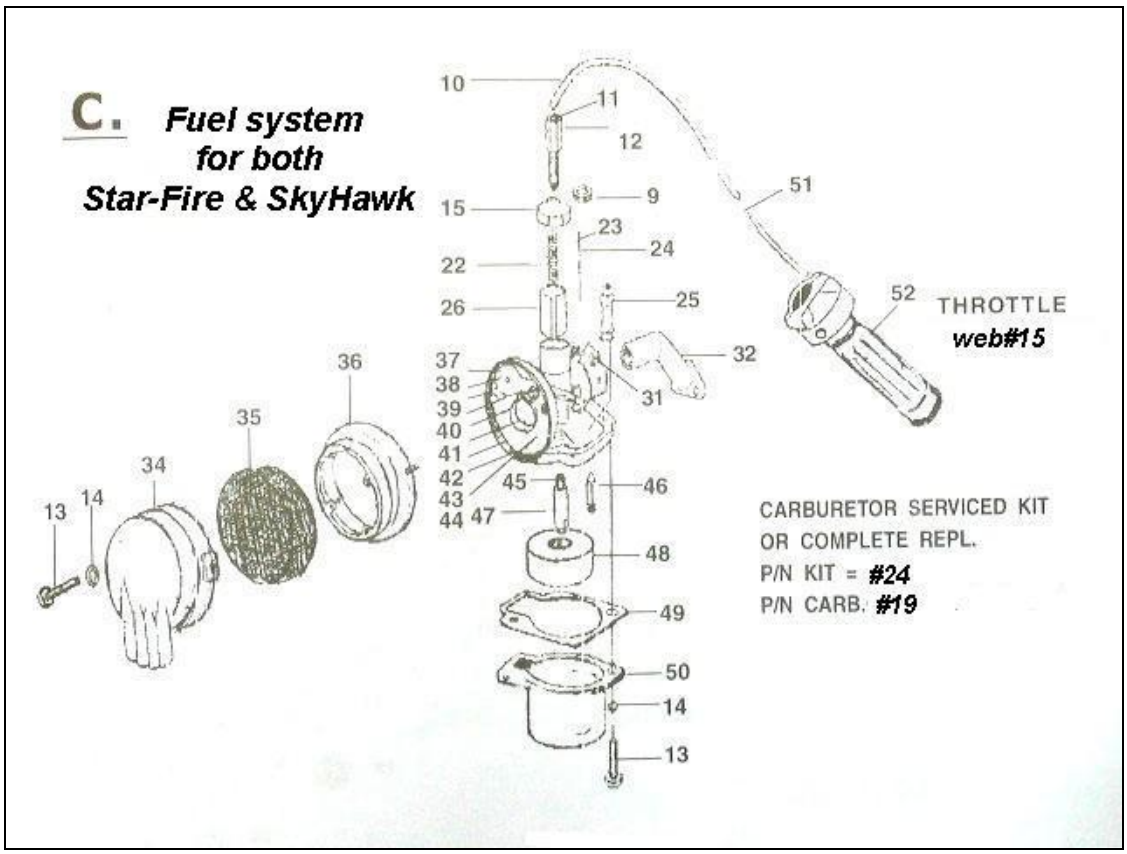


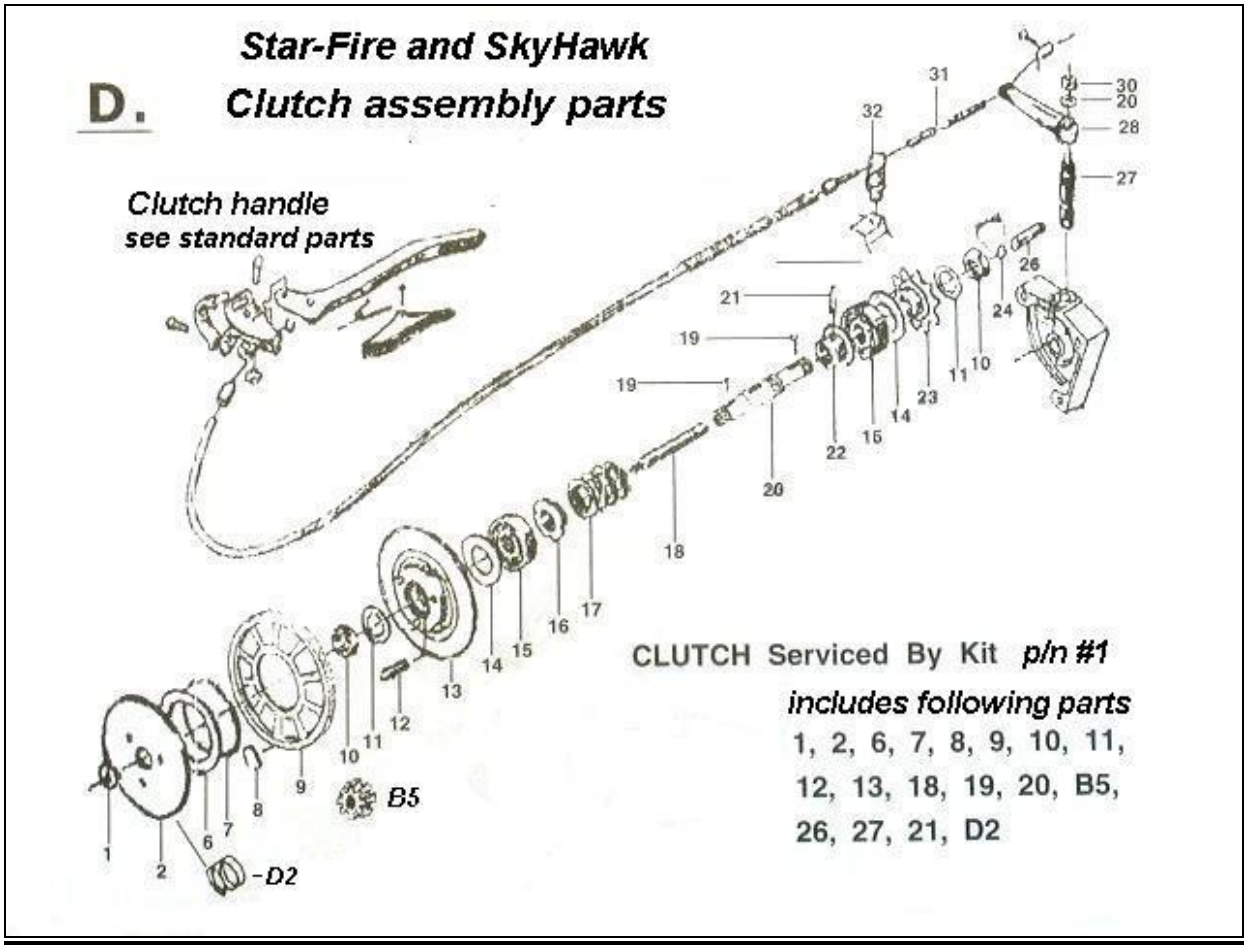
StarFire magneto wiring

Parts Reference:






C. Fuel system for both Star-Fire & SkyHawk
THROTTLE web#15
CARBURETOR SERVICED KIT OR COMPLETE REPL.
P/N KIT = #24
P/N CARB. #19

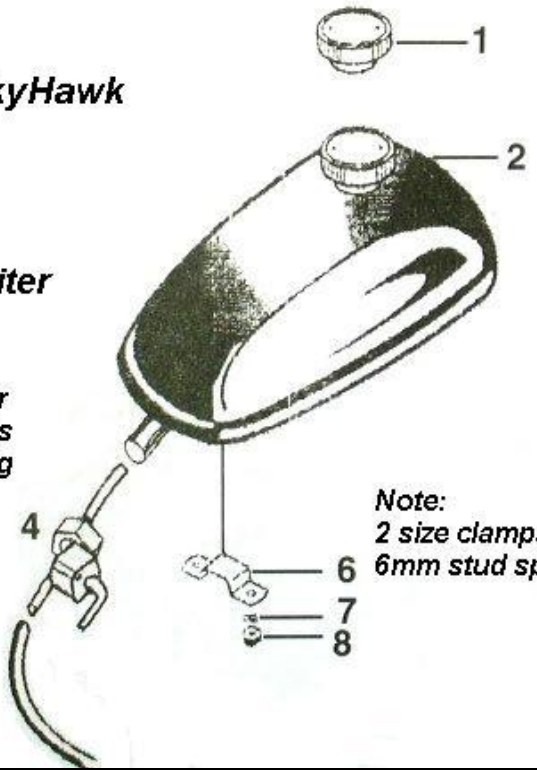

Star-Fire and SkyHawk
D. Clutch assembly parts
Clutch handle see standard parts
B5
D2
CLUTCH Serviced By Kit p/n #1
includes following parts
1, 2, 6, 7, 8, 9, 10, 11, 12, 13, 18, 19, 20, B5, 26, 27, 21, D2

E.

Star-Fire and SkyHawk

tank available in two sizes; 2 liter and 4 liter

As of Aug 2004 all tanks come with plating inside for rust prevention; New tanks have 6 mm stud mt. spacing for large top bars. New tanks are also made of heavier gage metal.



Note:
2 size clamps 5mm & 6mm stud spacing

F.

Rear Wheel sprocket installation

Star-Fire