

# SkyHawk

# 4G

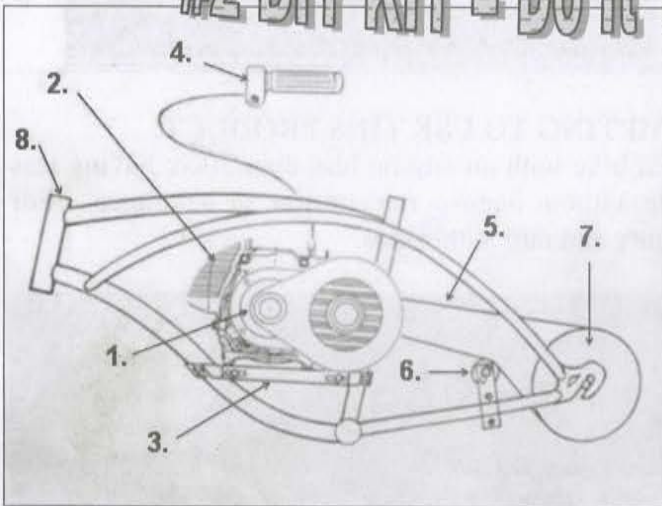
# CHINA GAS

## 4G T Belt Transmission DIY Parts Kit— Model #2 Mid Frame mount

for use with Honda GXH50-Q &/or HuaSheng 142FG engines.

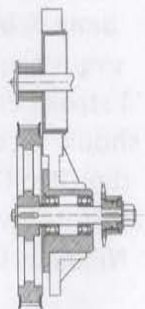
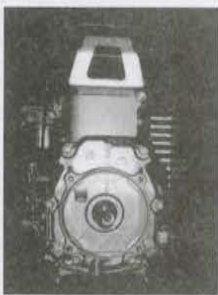
USA patent pending: 11428539-4173 [www.chinabestexporter.com](http://www.chinabestexporter.com) / [www.grubeeinc.com](http://www.grubeeinc.com)

### #2 DIY KIT = Do It Yourself

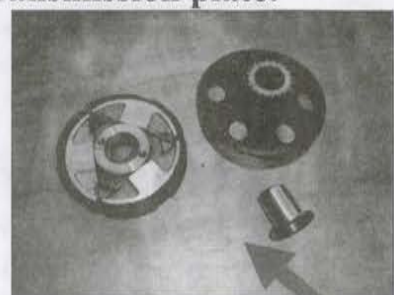


1. #2 SkyHawk 4G transmission
2. Customer supplied engine
3. Adjustable engine bracket
4. Hand throttle
5. 415 drive chain
6. Chain idler
7. Rear wheel chain sprocket
8. Customer supplied frame

*Use with a 5/8"x 32mm Straight Output Shaft Engine*



T-belt adjustment is done on the outboard side of transmission plate.



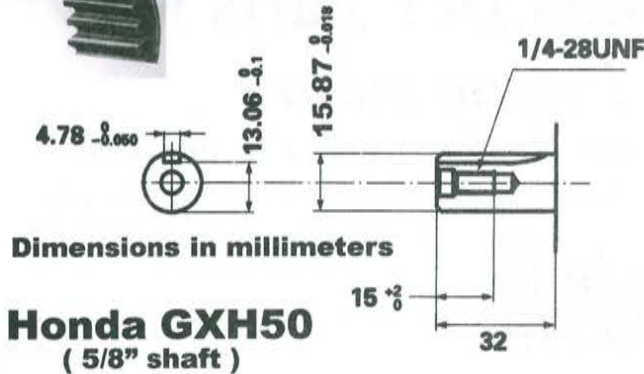
This special made Centrifugal Clutch is included in the 4G #2 kit.

**Mechanical Aptitude is Required:** Please do not attempt this project if you do not have a good understanding of gasoline engine maintenance, hand tool usage and mechanical mechanism operation.

# Kit #2. > Honda & HuaSheng Engines using 5/8" dia. Straight Shaft PTO



T-Belt Drive



**READ THIS MANUAL THOROUGHLY BEFORE ATTEMPTING TO USE THIS PRODUCT:**

**Legal Issues:** Most USA State laws stipulate that a motorized bike with an engine less than 50cc; having less than 2 hp and going no faster than 30 mph is legal to operate without license, registration, or insurance. For complete legal details you should contact your local state, county and city authorities.

FYI:

If you want to be pragmatic, the suck-squeeze-bang & blow sequence of a 4 stroke engine should be called the Otto Cycle, after its inventor Nikolaus Otto.

**HuaSheng**  
**142FG**  
**49cc**  
**4 stroke**  
**15.87 Ø**  
**straight**  
**shaft PTO**

For 142F-G 49cc engine  
Carb. p/n: 142F.2  
Carb. mark: H12AC  
For use with tip tank  
Black AC

Standard front exhaust muffler

Dimensions in millimeters

**Honda GXH50**  
( 5/8" shaft )

(4) M6 mt. bolts

106 dia.

Crankcase cover for 15.87 dia straight shaft engine. Note: 53 mm radius for 4 M6 mounting bolts.

EPA certified for shipment to the USA: 142F-G 49cc 4 cycle engine with Output Shaft same size as Honda GXH50 engine - Carb. 142F.2 with Black Air cleaner - Standard exhaust muffler; No gas tank:

**Disclaimer:** This is a Do it Yourself Parts kit; End user or the installer becomes the vehicle designer, and manufacture thus assuming all laws of the land including product liability. Do not use or buy this DIY product if you expect otherwise. This SkyHawk 4G transmission kit has US patent pending # 11428539-4173. These instructions are copyrighted, therefore DO NOT copy for commercial use without our written permission.

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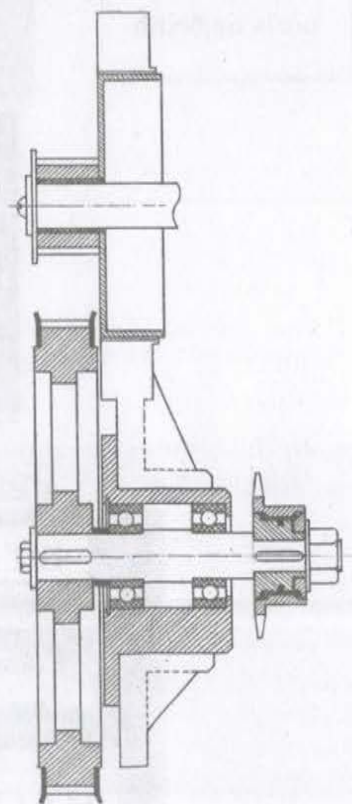
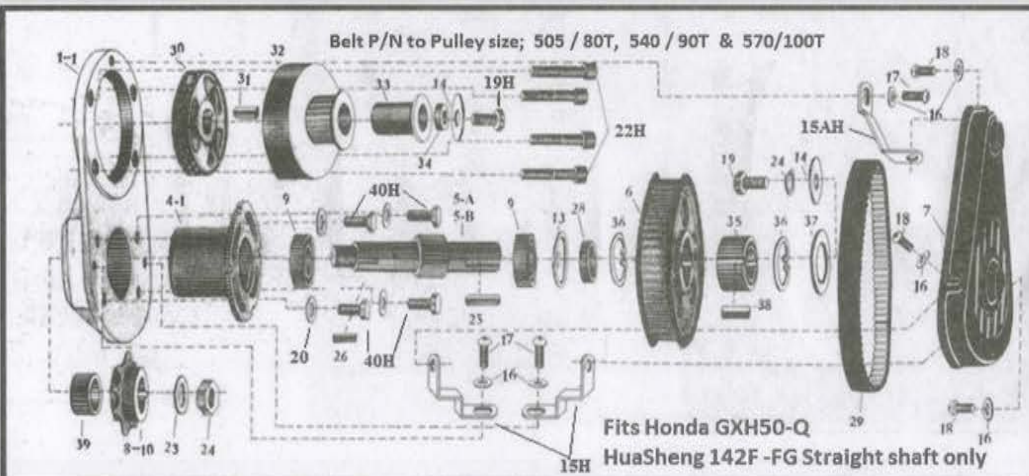
- #1. Honda 4G T Belt Trans.
- #1C. Centrifugal Clutch for Honda
- #2. Honda Eng. shown at right
- #3. Engine Mt. Bracket
- #4 Throttle & eng. kill swt.
- #5. 415 Drive Chain
- #6. Ball Bearing Chain Idler
- #7. 44T clamp to spokes sprocket
- #8. 2.5L Tear Drop Gas Tank
- #9. 3 pcs. Wide Pedal Crank
- #10. 3 to 1 conversion kit.



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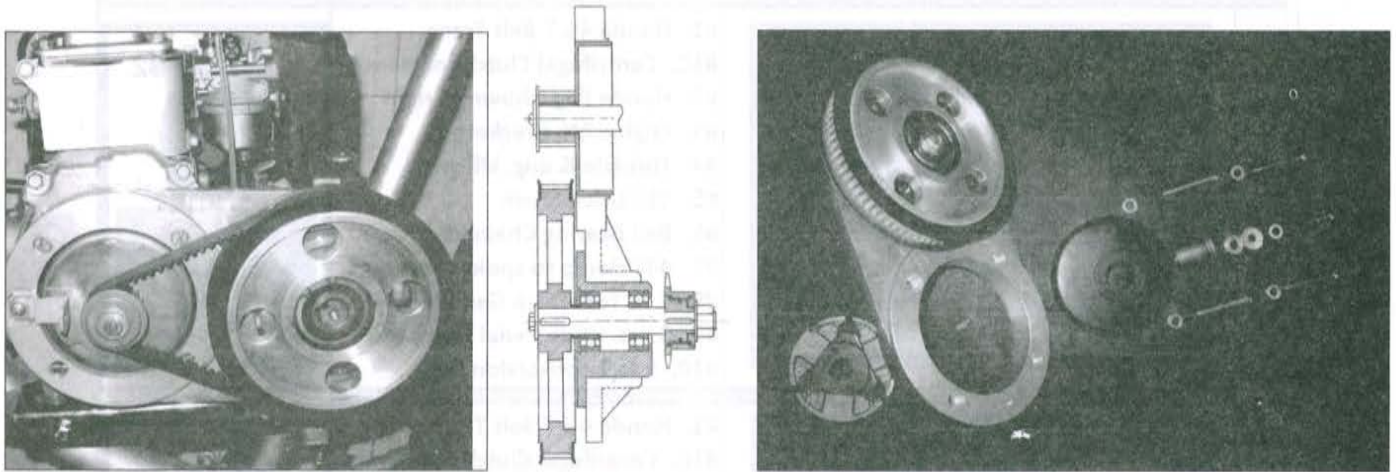


- #1. Honda 4G T Belt Trans.
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- #4 Throttle & eng. kill swt.
- #5. 415 Drive Chain
- #6. Ball Bearing Chain Idler
- #7A. 44T HD axle kit
- #8. 2.5L Tear Drop Gas Tank
- #9. 3 pcs. Wide Pedal Crank
- #10. 3 to 1 conversion kit.



**4G T Belt Drive Transmission for 5/8 x 1-1/4 Straight Shaft Eng.**

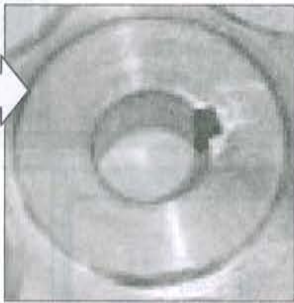
P/n	Description	P/n	Description	P/n	Description
1-1	Housing Bracket / Honda	13	Snap Ring ( 35mm dia. )	26	Key, 11T /12T dr. sprocket
4-1	Pulley Cam Hsg. > Honda	14	Large flat washer	28	Spacer collar, 9mm long
7	Plastic Cover	15H	Bracket (2)	29	Belt 3 sizes: 505, 540 & 670
5-A	Honda JackShaft - 11&12T	15AH	Bracket	30	Centrifugal Clutch > Honda
5-B	Honda JackShaft - 10T	16	M5 Washer, cover att. (6)	31	CC Key
6-a	100-T Pulley 15mm $\phi$ hole	17	M5x10 Screw, bkt. att. (3)	32	CC Bell Rotor w/ 21T pulley
6-b	90-T Pulley 15mm $\phi$ hole	18	M5x8 Screw, cover att. (3)	33	CC Bronze Oil Lite Bushing
6-c	80-T Pulley 15 mm $\phi$ hole	19	Bolt, M6 x 15	34	CC Bushing spacer
6-d	80-T Pulley w/Freewheel	19H	Bolt, 1/4-28 x 5/8 Hex hd.	35	One-Way Bearing discontinued
7	Plastic cover guard 100T	20	Flat Washer, M6 (4)	35A	Special FreeWheel new 2012
7A	Plastic cover guard 80T	21	Lock Washer, M6 (10)	36	Snap ring for 1-way brg. (2)
8-10	10T Solid Sprocket	22-H	1/4-28 x 1 Allen Bolt, (4)	38	Key
8-11	11T Freewheel Sprocket	23	Washer, 11/12T sprocket	39-a	Spacer for 12T spr. 19mm long
8-12	12T Freewheel Sprocket	24	Nut, FW sprocket	39-b	Spacer for 10T spr. 12mm long
9	Ball Brg, 6202-2RS (2)	25	Key, large pulley	40H	M6 x 12 Allen hd. Bolt, (4)



**GHX50 & 142FG- Engines with 5/8" PTO shaft with key slot and 1/4 - 28 end screw.**

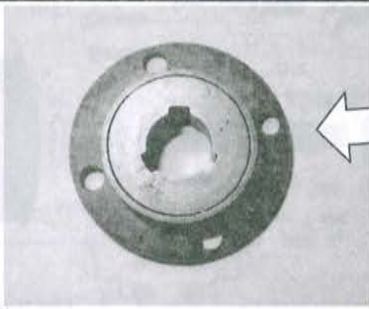
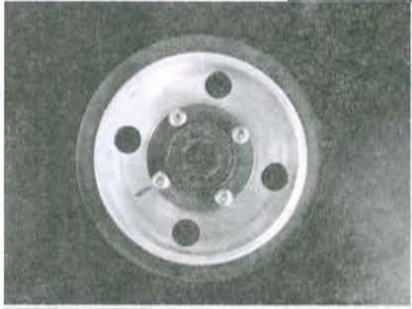
#6 Big Pulley > Has 4 variations > p/n's 6a. / 6b. / 6c. / 6d

100T,90T,80T  
15mm dia. hole  
**SOLID**  
Center HUB  
p/n's 6a,6c,6b



**Solid No Brg. Pulleys**

<b>100T</b>	<b>90T</b>	<b>80T</b>
<b>15mm</b>	<b>15mm</b>	<b>15mm</b>

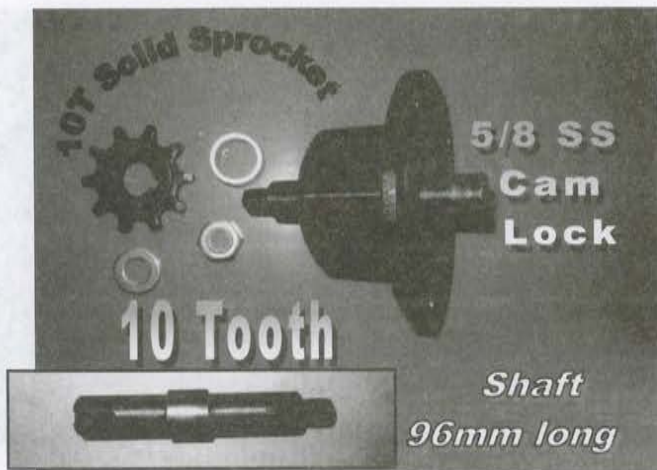


**80T**  
**FREEWHEEL**  
15mm dia. hole  
Center HUB  
p/n 6d.

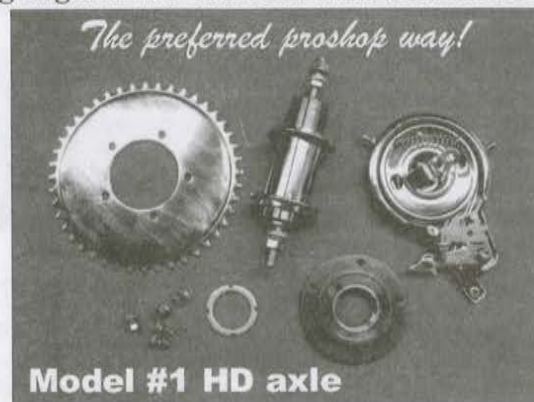
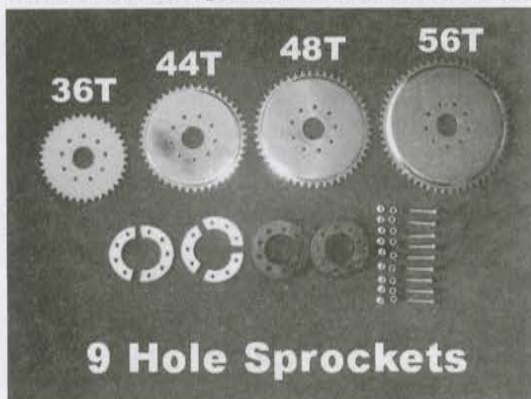
**Jackshaft and Output Chain Drive Sprocket options:**

<p><b>10T shaft 96mm</b></p>	<p><b>10T sprocket</b></p>	<p><b>12T sprocket</b></p>
<p><b>11T / 12T shaft 108mm</b></p>		

11T & 12T Freewheel drive sprockets should only be used with a 100T belt pulley:  
 10T solid sprocket can be used with any belt pulley if using Model #1 Freewheel HD rear axle.  
 10T solid sprocket is especially well suited for the new 6-d.) 80T Freewheel Hub belt pulley.



5/8" dia. PTO Straight Shaft Honda & HuaSheng engines use cam lock with outboard flange;



### Rear Wheel Chain Sprocket Options;

- a.) 9 H Standard > 44 Tooth sprocket 9 hole clamp to spokes:
  - b.) 9H Standard > 48 Tooth sprocket 9 hole clamp to spokes:
  - c.) 9H Standard > 56 Tooth sprocket 9 hole clamp to spokes:
  - d.) HD-Axle Optional: 44 Tooth sprocket 5 hole for HD axle model #1 with freewheel hub:
  - e.) HD-Axle Optional: 48 Tooth sprocket 5 hole for HD axle model #1 with freewheel hub:
  - f.) HD-Axle Optional: 56 Tooth sprocket 5 hole for HD axle model #1 with freewheel hub:
- Pulleys with one-way bearings have been discontinued until a better bearing can be found,
  - 10T solid drive sprocket is more durable than the 11T or 12T freewheel sprockets.
  - To use a 10T drive sprocket use a 80T belt driven pulley with Freewheel hub or use Model #1 HD axle kit with freewheel to use any belt driven pulley;
  - To get away from clamping a chain sprocket to the wheel spokes use the Model #1 HD axle with freewheel hub and any of the chain drive sprockets, 10T, 11T or 12T and any driven pulley.
  - If you use a Model #2 HD solid hub axle be sure to use a 12T freewheel drive sprocket or use a driven pulley with a Freewheel hub.
  - Choose bike rear wheel chain sprockets from 56T to 44T depending on the speed ratio desired.
- Mechanical aptitude and basic tools are required to install and use this kit.*
- All fasteners are metric except for transmission plate 4 attach bolts 1/4x28 and CC bell attach screw.
  - Use Loctite blue 242 on all fasteners.
  - In all 4G applications, a freewheel is used somewhere in the drive system to allow bike pedaling engine on or off thus enhancing safe engine performance.

# 6 Big Driven Pulley. 2 designs

**Solid No Brg. Pulleys**

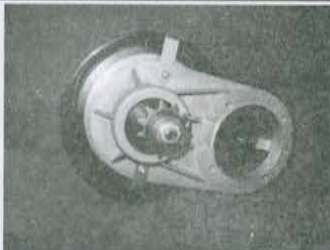


**100T 15mm**      **90T 15mm**      **80T 15mm**

**80T Freewheel Hub Pulley**



New Freewheel hub 80T pulley replaces One-Way bearing used in 2010 and 2011 models:



**#2 4G transmission with FREEWHEEL 80T Pulley on jackshaft to 10T sprocket**



**#2 4G transmission with solid 100T Pulley on jackshaft to HD 12T freewheel sprocket.**



**#2 4G trans. > with solid 80 or 100T pulley with 10T drive sprocket going to a #1 HD axle.**

To calculate final drive ratio you have one constant, the 20T belt drive; Divide 20 into the driven pulley's number of teeth. ie:  $80/20 = 4$  Divide the output chain drive teeth number into the rear wheel sprocket teeth number. ie:  $48/10 = 4.8$  Now multiply both quotients together, ie:  $4 \times 4.8 = 19.20$

4G 4 cycle T-Belt Transmission Drive Ratio and Speed Info.								63360 inches / MILE & 0.62137 mile / KM			
Transmission	Max. HS eng. rpm at load	1st. Driver	1st. Driven and ratio	2nd. Driver	2nd. Driven and ratio	Engine rpm to bike wheel rpm	Max. Bike Wheel RPM	26" wheel Circumference	Max MPH for 26" bike	Max KMPH for 26" bike	Comments
4G 4 cycle	6800 rpm	20T	100T / 1-5	10T	56T / 1-5.6	28 to 1	242 rpm	81.7 inches	18.0 mph	29 KM	Mt. country
4G 4 cycle	6800 rpm	20T	100T / 1-5	10T	50T / 1-5	25 to 1	272 rpm	81.7 inches	21.0 mph	34 KM	Hill country
4G 4 cycle	6800 rpm	20T	100T / 1-5	11T	50T / 1-4.45	22.25 to 1	305 rpm	81.7 inches	23.6 mph	38 KM	Hill country
4G 4 cycle	6800 rpm	20T	100T / 1-5	10T	44T / 1-4.4	22 to 1	309 rpm	81.7 inches	23.9 mph	38.7 KM	Hill country
4G 4 cycle	6800 rpm	20T	80T / 1-4	10T	50T / 1-5	20 to 1	340 rpm	81.7 inches	26.0 mph	42 KM	Flat land hills
4G 4 cycle	6800 rpm	20T	80T / 1-4	10T	48T / 1-4.8	19.2 to 1	354 rpm	81.7 inches	27.0 mph	44 KM	Flat land hills
4G 4 cycle	6800 rpm	20T	80T / 1-4	10T	44T / 1-4.4	17.6 to 1	386 rpm	81.7 inches	30.0 mph	48 KM	Flat land hills
4G 4 cycle	6800 rpm	20T	80T / 1-4	11T	44T / 1-4	16 to 1	425 rpm	81.7 inches	32.0 mph	53 KM	Racing



**Peek-a-Boo cover for 80T Pulley is available on a limited special order basis.**



**Step #1. Fill engine with oil before installing the 4G transmission.**

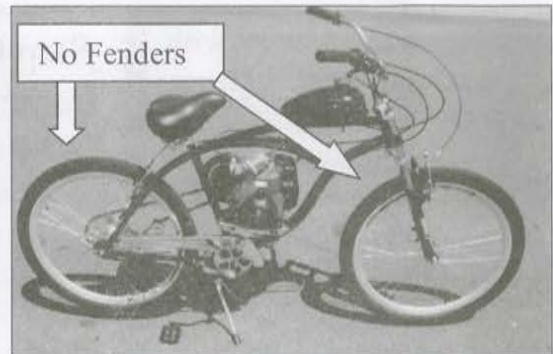


**Basic hand tools needed:**

- Large and small slot head screw drivers.
- Small size Phillips screw driver.
- # 6 thru #10 metric sockets and ratchet wrench.
- Hard rubber mallet hammer;
- Needle nose pliers Metric Allen wrench set.
- Kit supplied spanner wrench.
- Use 1042 Loc-tite thread lock on all fasteners:

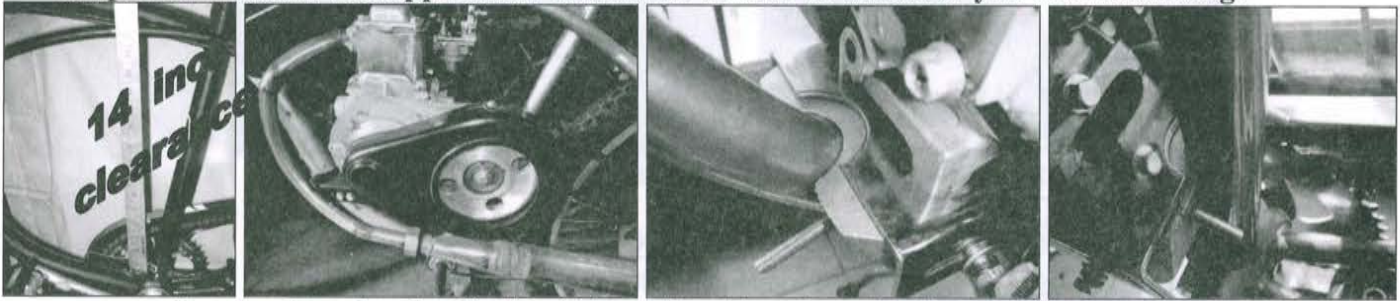
**Model #2 4G TRANSMISSION OPERATION**

When the engine PTO is turning approximately 3000 rpm the centrifugal clutch shoes on the crank shaft will **engage** or latch with the drum bell. A 20T drive belt pulley on the drum bell transmits torque to a large driven pulley and jackshaft. The driven pulley being affixed to a jackshaft then transmits engine torque to an output drive sprocket which can be 10T, 11T or 12T depending on how the kit was ordered. A heavy duty 415 size chain drives a 56T / 48T or 44T sprocket on the bike rear wheel. When bike is people pedaled a Freewheel hub in the driven pulley or a Freewheel in the drive sprocket or a Freewheel in the HD axle will allow unrestricted pedaling with engine off.



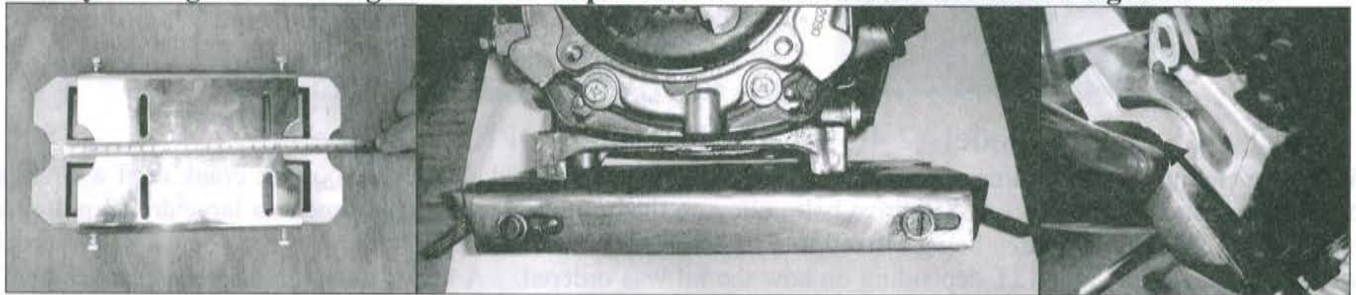
## Donor Bike Requirements for this "DIY", ( Do It Yourself ), Parts kit;

Donor bike with a 28 to 38mm dia. front down tube and a 28mm dia. seat tube works best. Old style 26" Crusier type bikes with heavy steel frames work good. **Do not use a bike with wheel fenders as attach struts can come loose and get jammed in the spokes while riding causing rider injury.** Your 4G Kit includes a Wide Pedal Crank with 3 in 1 conversion that allows installation into 52mm dia. large bottom holes made for a one piece crank or can also fit small bottom holes made for a 3 pices pedal crank. It is essential that your donor bike have both front and rear brakes for safe operation but a disc brake on the rear wheel cannot be used. **Using a bike with a coaster brake is not recommended because if the pedal chain breaks you have no brake unless you install V caliper brakes in addition to front and back wheels. Do not ride with inadequate brakes!** The doner bike needs at least 14" clearance between bottom hole and top tube. Do not use bikes with cheap made axles and front forks. Do not use wheel fenders as they can cause danger if they come loose and the stays get intangled with spokes causing rider to have a flying leap over the handle bars. Speeds in excess of 25mph is not recommended due to a bicycle's lightweight inherent design.. The smaller the rear sprocket; the faster you go. Going faster than a bicycle was designed to go is foolish. #1 HD or #2 HD axle kit is recommended for longer lasting results. **When riding always wear a helmet and abide with local and state laws. You are the designer and manufacture of your own motorized bike so use good engineering practice and use common sense when making your componet selections and application to a donor bike or to whatever you are motorizing.**



Front and rear bracket fit should look like this. Length adjustment is from 17cm to 25cm.

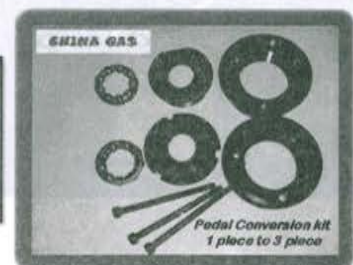
**Note: Engine mounting bolts (4) for this bracket are not included in this kit; IMPORTANT: Measure your engine mounting hole thread depth and determine if it's Metric or English thread.**



Engine mounting bracket has 8cm of slide adjustment. If needed, grind or file bracket to fit. ( After bracket is installed and aligned on the bike frame it can then be tack welded in place if desired. )



**Step One: Install the 3 piece pedal crank in the frame Bottom hole. To install in a one piece large bottom hole use the 3 into 1 conversion kit included with all 4G kits.**





How to install a 3 piece pedal crank in a one pc. pedal crank big bottom hole.



Remove old crank & chain; Insert hubs in both sides and hammer tap in place while lining up 3 bolt holes.



Insert crankshaft; Install Bearing cage on right side and tighten; Install bearing cage on left side and adjust.



Install lock ring left side: Adjust shaft rotation & lock in place: Install sprocket on R side: Note letter on arms:



Install pedal arm with L on left side and R on right side viewing as if setting on the bike seat. After final adjusting shaft rotation secure lock ring in place: Install 2 pedals knowing that the Left side is CCW left hand thread and Right side is CW right hand thread. Re-install pedal chain in reverse procedure to that of removal.

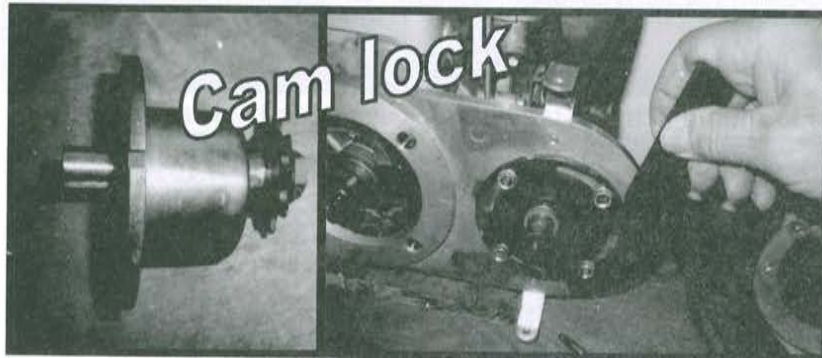
**If you already have a bike with a 3 piece pedal crank no need for the 3 into 1 conversion kit.**



Note: 4 Engine mounting bolts for this bracket are not normally included with 4G kit; Measure your engine hole thread depth and determine if Metric or English bolts are needed.



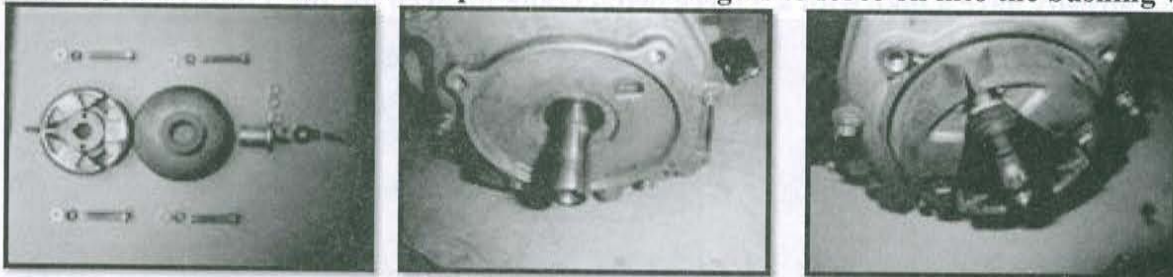
Standard is HS Eng. Box Muffler with right side exhaust exit. The HS muffler also fits the Honda engine. You may want to add an extension pipe and curve exhaust more downward and out of the way. Note the curved neck has a internal screen wire to keep insects like mud dobbers out of the muffler.



**Note:**  
The Cam Lock design eliminates having to use an idler pulley to keep the belt tight. Turning spanner wrench up loosens the belt and turning down tightens belt.



**Fill Bushing with 5 or 10 WT oil and press hard with fingers to force oil into the bushing wall.**



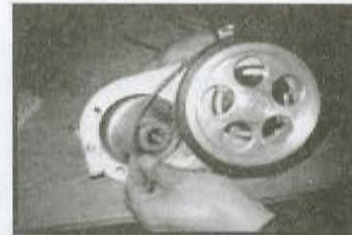
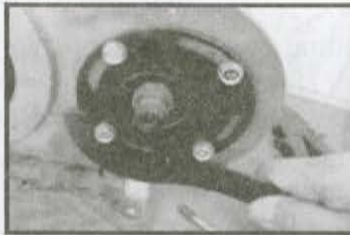
**Inspect CC parts. Install clutch rotor w/ 2 holes outboard seated as far back as possible.**



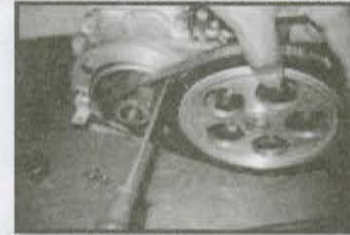
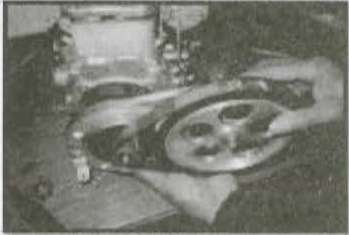
**Insert key in CC keyway seated all the way in flush; Fill slot with grease**



**Check for burrs:**



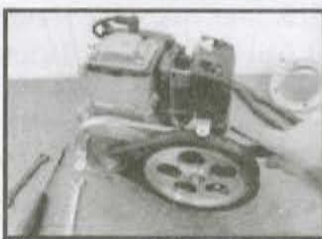
Set cam lock to inboard position. Insert CC bell in trans. plate and install on engine.



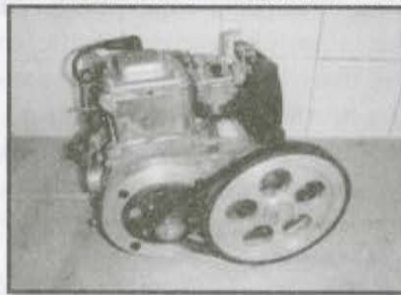
Soak bushing in 10W oil over night.

Install 4 of 1/4 -28x1 attach screws with Loctite:

Install pre-soaked oil lite bushing:

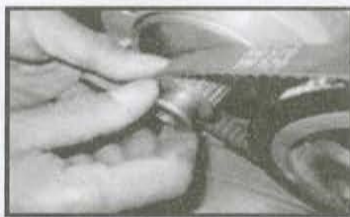


Use spanner to turn Cam lock and tighten belt; Tighten 4 metric M6 bolts as shown;



DO NOT OVERTIGHTEN BELT; 1/4" belt deflection is OK.

WARNING: If belt is over tightened ( too tight ), engine may not run due to tight friction.



Use Loctite on 1/4-28 x 3/8 bolt

Wobble bushing so it slips onto the shaft; Install washers on spacer to not lock bushing:



Unwanted gap

Flush fit

Side movement of pulley bell and bushing rotation is desired; Before going any further check back side of transmission plate to make sure it is pulled up flush and has no gaps showing. If not flush try taping transmission with a wood mallet to get properly seated on the engine flange opening. An improper transmission fit will caused problems later. Make sure fit is proper and tightly secured with liquid thread lock. Time spent here with final fitting is the secret to obtaining long life service results.

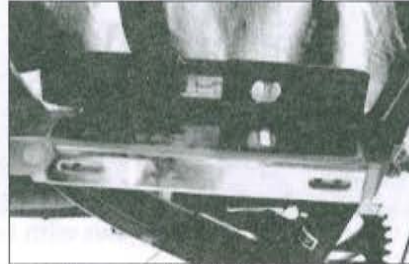
### **Engine Mounting:**

Remove 8 side bolts from the engine mounting bracket and separate the plate from the 2 end slide mounts. Attach the end slide mounts to the bike frame; (Figure 14). If the frame down tube is too big for the slide mount opening, grind out the curvature and you may need to remove, drill and tap to reposition the studs out ward. You may have to cut the bolts to the right length. A Dremel with cut-off wheel works well for this. Make sure that the engine mounting plate sits level position on the tube mounts, ( Figure 15 ) and lines up with the side holes. Lift the plate off the mounts and install the engine on it.

**NOTE: Engine must set level for best carburetor operation.**



**Figure 14.** Attach the slide mounts.

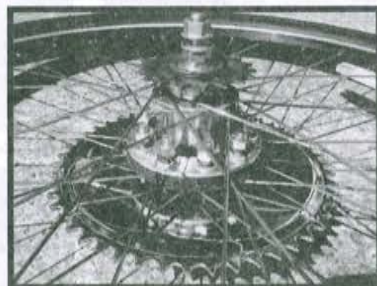
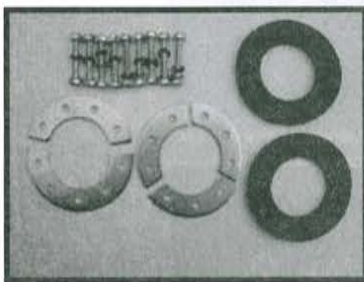


**Figure 15.** Make sure the plate is level.

**Attach engine to bracket plate using grade 8 bolts obtained from a local hardware store.**

Measure depth of threaded holes in the engine first so you won't buy bolts too long and snap them off if they bottom out. Determine if Metric or English threads. Tighten bolts finger-tight only, for right now. Place the engine with 4G transmission pre-attached on the 2 castings. Remove the master link from the engine drive chain with the needle-nose pliers. Put the master link in a bag or other container immediately, before it gets lost! Drape the chain over the rear sprocket and transmission output sprocket. Pull the chain taut. Check the alignment of the chain from the rear of the bike. The chain should be in alignment with both sprockets. You can adjust the alignment by sliding the engine left or right on the engine plate. If you cannot get the chain aligned properly, you may have to remove the wheel drive sprocket and change its orientation (from concave-in to concave-out). Once you are satisfied with the engine drive chain alignment apply LocTite to the side bolts and tighten. You should be able to tighten these bolts from the underside without removing the engine. If holes don't line up, you can clamp the engine plate to the slide mounts with vise-grips while you install the side bolts. Be very cautious when tightening the side bolts. They will strip the threads in the castings if you over tighten them (over tightening is not covered under warranty). At this time, you can install any special muffler you intend to use. HS engines can be ordered with a std. box muffler and side pipe that works ok in a V frame mount, however, the optional extra cost Skyhawk Fancy Poo Poo Pipe mufflers add cosmetic and motorcycle appearance.

### **How to install a Clamp To Spokes 9 Hole 56T, 50T, 48T or 44T Sprocket**



**Economical way:** Install the clamp to spokes sprocket on rear wheel hub with dish convex side inward, teeth outward. Affix with 9 bolts through 2 half moon bearing plates on top of 3 banana plates bearing on rubber gaskets next to wheel spokes much like a ham sandwich. Use LocTite 242 on the threads and torque evenly to produce a sprocket

installation that does not wobble. If the center hole needs enlarging to fit the axle hub use an engine lathe to gain best cutting accuracy. If hand grinding with a Dremel tool mark a circle out line using a round pattern such as a piece of PVC pipe and a black marker so your cutting is evenly round. Use of the Model #1. HD axle kit avoids all these problems but is an extra cost option available only from your

**Shyhawk dealer:**

### How to install a standard clamp to spokes sprocket on a caliper brake wheel.

First step will be to disassemble the sprocket mounting assembly included with the kit. Apply a light coat of grease or anti-seize compound on fasteners. This will keep water and salt out of the threads and allow for easier removal of the sprocket mounting assembly in the future. Hold the engine drive sprocket with the concave side facing you and push the bolts through the holes. On the convex side, fit the set of three bannana mounting plates on the bolts. Then, fit a rubber gasket on the bolts (Figure 8). Place the sprocket assembly on the wheel. In order for the inside rubber gasket to go around the axle cut one side between the holes. Reach inside the spokes and fit the gasket on the bolts. Install the 3 banana plates first and then 2 half moon plates on top. Install lockwashers and nuts with a cross or star pattern tighthening process. You will find a ratchet and long extension helpful to do this. (Figure 9).

**Fig. 8.** Install the bolts through the sprocket, mounting plates, and gasket.

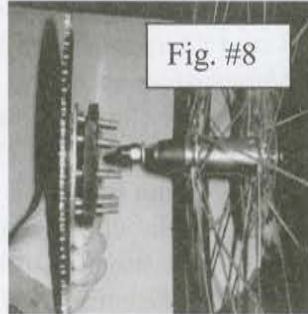


Fig. #8

**Fig. 9.** Install the other gasket, washers, and nuts on the inside of the spokes.

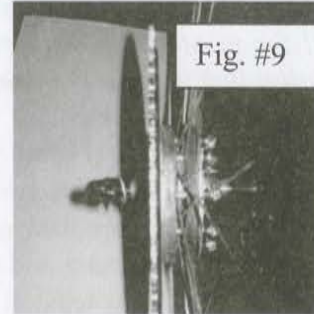


Fig. #9

Make sure the sprocket is centered on the axle. Once the sprocket is centered, tighten all bolts in a "star" pattern. Tighten the 9 bolts until the gap between the rubber gaskets closes completely. Spin the wheel while looking at the edge of the sprocket. If there is little or no wobble, the sprocket is aligned with the wheel. It is important that the sprocket be installed correctly, or the chain will jump off. Install the rear wheel on the bike. Prop up the bike so the rear wheel is free to spin. Place a ruler or straight edged on the chain stay bar and push it towards the sprocket until it almost touches (Figure 11). Spin the bike wheel and check for any sprocket wobble; Loosen and re-tighten sprocket bolts in X pattern sequence to eliminate wobble.

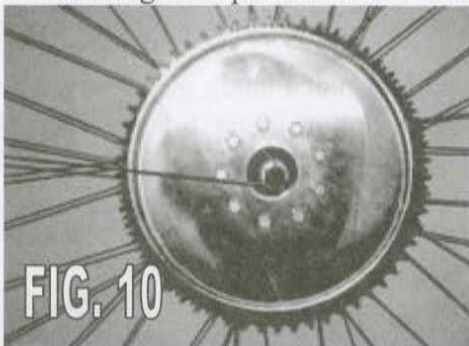


FIG. 10



FIG. 11

**Figure 10.** Make sure the sprocket is centered by measuring concentricity from teeth to axel hub.

**Figure 11.** To detect wobble use a ruler to help true your sprocket. Loosen and retighten bolts till true.

#### **Chain Length and Installation** *Install Chain after first test starting engine and setting idle speed;*

The chain you receive is longer than necessary in order to accommodate most bikes. You may need to remove the appropriate number of links to fit. To estimate length required place the chain around both drive sprocket and wheel sprocket griping in one hand while pulling chain taut with your other hand. Mark chain location to make the master link splice.

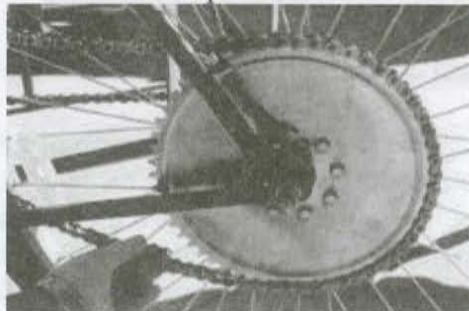


FIG. 17 chain breaker tool



**Figure 16.** After splicing the chain together it should be just loose enough to slip off the sprocket. You will need to estimate the proper length for the chain. The chain will need to be loose enough to slip off the rear sprocket, (Figure 16). You will want to be able to remove the chain later without having to remove the rear wheel. When the chain tensioner is installed, the chain will not slip off on its own, assuming everything is aligned properly. Keep in mind that the chain will be one link longer when the master link is re-installed. Once you have decided on a chain length, mark the link to be removed. You can use a "chain breaker" tool suitable for 415 chain to remove the link. (see Figure 17 ).

*Note: If you don't have a chain breaker, you can use a blunt nail and hammer (carefully) to punch out the link pins. Do this operation on a block of wood. Drill a hole in a block of wood and place the link on the wood with the link pin over the hole. Tap one link pin until it is halfway out. Then work out the other pin from the same link. Install the master link on the chain and check to see if the tension is correct. If it is too tight, you will have to install a link using a hammer and block of wood.*

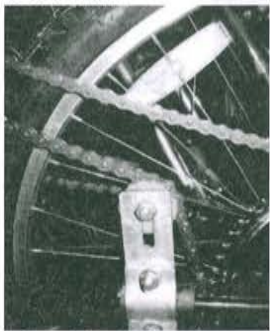
Install the master link on the chain. Push the master link (with pins) into the chain from the left side of the bike. Install the chain tensioner (Figure 18). Make sure that the chain tensioner wheel rides on the outside of the chain as shown in the photo. If you install the chain tensioner wheel on the inside of the chain loop, the chain will pull away from the sprocket, and slip off. The chain should move about 1/2" up and down from a point midway between the seat tube and rear wheel. It should not bind excessively when the rear wheel is turned. If it binds, check the chain tension and sprocket alignment. *Do not start the engine until you can rotate the wheel by hand without the chain binding or slipping off. A binding chain under full load can break sprocket teeth or cause other damage!*



Figure 25; Chain idler with ball bearing pulley wheel:

Adjust chain tension with chain idler mounted on bike wheel strut or chain stay. At middle span adjust to 1/2" chain deflection. Install idler bracket with pulley on inboard side as shown; ( See Fig. 25 & Fig 26 )

The end user can fabricate a sheet metal chain guard as required for his own form, fit and function. One option is use a 2 cycle engine chain guard available from your WD or selling dealer. Install the chain guard as shown (Figures 26 and 27). The chain guard has a front strap built into it. For the rear strap, use the strap that comes with the guard. Make sure that when you are riding, you don't have any long clothing or other belongings or body parts that could get caught in the chain.



**Fig. 25 Idler installed:**

**Fig. 26. Chain guard—left side.**

**Fig. 27. Chain guard—right side.**

The 11T or 12T primary drive sprockets have an over running freewheel clutch built in. This allows freewheel operation in one direction and lockup in the opposite direction.



Install tank on top tube and hook up gas line to carburetor. Use strip of rubber from an old tire tube to cushion tank on top tube. Even though the tank in our installation kit has zinc plating inside to help prevent rust it is a **good idea to have your tank KREEMED before installation to prevent possible rusting during times of long term non-useage such as winter time storage.** This

product is available from motorcycle dealers by the trade name of "KREEM" and is made in Somis, CA. USA.

- A) Factory supplied clear plastic line gets hard over a period of time. \*NOTE: A Gas Filter is in the tank petcock valve. If engine runs poorly clean the valve filter as residue from the tank may have clogged it.
- B) Unlike 2 cycle engines don't forget this is a 4 cycle engine and requires frequent crankcase oil changes to ensure long engine life. 2 cycle engines have a gas / oil mix system and have no crankcase oil reservoir;

C) ( Refer to the engine owners manual for oil change and maintenance recomendations. )



Install throttle on right side handle bar. Drill 15/64" hole in the handle bar to accommodate throttle housing lock pin. Measure depth of handle and pin location to locate the spot to drill handlebar. Use center punch to make a dent to start the drill. Make sure handle does not bottom out on the handlebar.

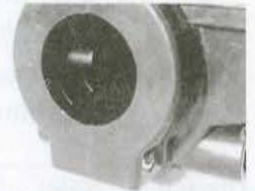
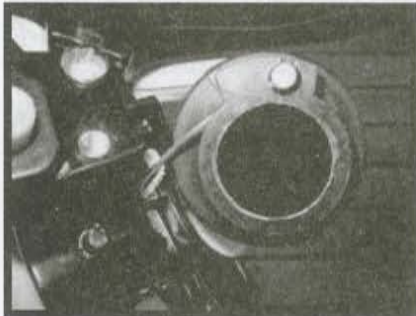


Figure: 22. Throttle cable installation:



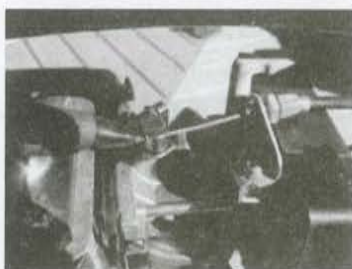
Remove top plate on throttle housing: Pull cable outward and insert thru open threaded hole in throttle housing. Connect cable metal barrel into twist grip slot as shown. Insert twist grip in grooved slot on the throttle housing. Slide the throttle assembly on to right side handlebar and match up peg with the 13/64" drilled hole. Tighten goose neck cable connection. Install the top plate on the throttle body and put a small amount of loctite on the screw and tighten securely. Pull slack out of cable and attach to carburetor. Use plastic ties to hold cable out of the way making sure enough loop slack is given to turn handlebar both directions.



Throttle kill switch has 2 wires that plug into the engine switch wires. Unplug and insert the 2 throttle wires in series. Leave red engine switch knob in the "OFF" position or engine will not stop when using the throttle kill button. It makes no difference which wire goes where as throttle button switch is a normally open switch. If engine swt. knob is in the ON position the

engine will start OK but will not die if the throttle handle kill switch button is pushed. Check engine oil level in crankcase; **New engines have no oil! Be sure to read the owner's manual.** Use 20 or 30wt. oil to full line. Use of an oil drain hose is recommended: Change oil every 200 to 300 miles; Remember: This is not a car engine that can go 5000 miles between oil changes:

**Install drive chain and connect master link; Before restarting engine elevate the rear wheel and check chain and wheel alignment;** Check chain idler and chain for smooth operation;



Carb. Cable and Choke Hook Up: Hook up the throttle cable to the throttle arm on the carburetor as shown. Ensure that the throttle arm returns to the idle position after you let go of the throttle grip. The idle position is when the throttle arm touches the black plastic idle screw. Some engines differ in this area so field modification may be required on the part of the installing mechanic. Test Start engine without chain installed and tune rpm to optimum idle condition to ensure centrifugal clutch is not engaging at idle speed; To start: set choke; and open air cleaner baffle lever and pull on rope: After starting progressively remove choke

and let warm up. After test starting, kill the engine and proceed to complete the installation process. If engine fails to start check fuel line; ignition spark and kill switch;

- Practice starting and running operation in a vacant parking lot or a safe place until you are thoroughly familiarized with your moped before going on public streets.
- Ensure that the fuel valve lever is in the "on" position (parallel with the fuel line ). Check the fuel line to make sure gas is getting to the carburetor.
- Before you start the engine, test the brakes. Set choke to ON position, Rope pull start the engine; Allow warm up time and release choke lever.
- **It is best to pedal your bike until moving and then give the engine progressive throttle advance.**
- Twist throttle handle progresively; As engine rpm increases the centricugal clutch will engage.
- If it feels like the engine is "over revving", you have reached the maximum speed allowed by the sprocket gearing. Coasting will allow you to travel smoothly down a hill.
- To stop, shut off throttle and apply brakes. To kill engine; push kill switch button on throttle handle.

**Disclaimer Note:** Please remember this is a DIY Parts Kit made for adults for use with a HuaSheng 142FG engine as hobby or for personal pleasure: Failure to understand or carry out installation instructions is not the responsibility of the manufacture or the selling distributor. **Engine knowledge, and mechanical aptitude is required.** Modifications to install may be necessary on the part of the end user due to unknown donor bike variables. The end user or assembler must take self-responsibility of his own recognizance to design and make his own product. Operating a motorized bicycle involves risk of bodily injury. Buyer accepts full responsibility for any and all vehicle operations that may lead to personal injury, economic loss, social distress, other losses, costs and damages. Neither China GAS,/ GruBee inc. nor the selling WD Distributors can be held responsible for injuries and / or damages resulting from operating a motorized bicycle with this engine installation kit. This kit is not recommended for use by persons under 16 years of age. 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 running. Never operate your motorized bicycle in an unsafe manner. Check local and state laws before riding on state highways or city streets. A rewarding and joyful challenge can be found in designing a custom installation of your own. Remember, a quality installation is paramount to safe usage and your long term satisfaction. You may find many uses for this Parts kit from stationary machinery to off road go-carts. Have fun and good luck:

### List of Tools and Materials:

SAE & Metric open end wrench set,  
Ratchet & metric socket set;

Needle-nose pliers

Vise-Grip pliers

Metric Allen wrenches

Phillips head and slot head Screwdrivers

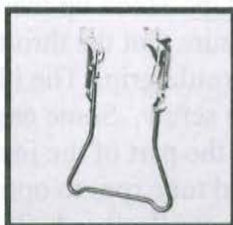
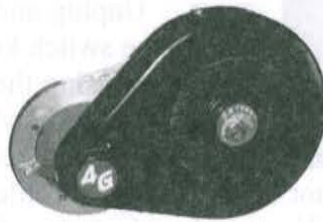
Ruler or tape measure.

Permanent marker ("Sharpie" or equivalent)

Drill with 3/32" and 15/64" (or 1/4") bits

Cable Ties ("Zip" ties) Medium strength thread locking compound

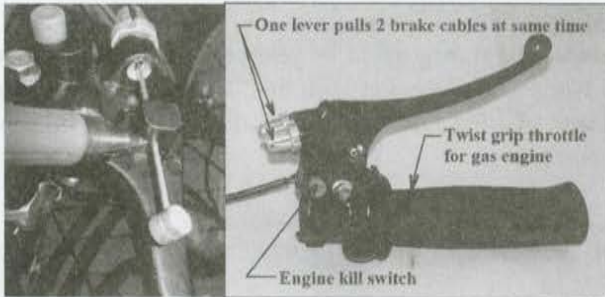
"Blue Loctite" #242 or equivalent.



If your bike has a mid frame bracket hole you can use a mid frame wish-bone type kick stand or you can use a rear wheel kick stand available from your local distributor or bicycle shop. **This allows for easy engine starting with rear wheel up.**



- Drive Chain should be checked for stretching after riding for several days;
- Gas tank should be Kreemed; Be sure to remove any rust or foreign partials .
- *If any dirt gets into the carburetor, it may cause the float valve to stick open. If this happens, the fuel will run out through the overflow tube until the fuel tank is empty. To remove debris, remove the float bowl and blow compressed air into the brass inlet tube.*
- To remove handle bar grips off doner bike use compressed air nozzele under grip and twist off.
- Throttle cables can stretch over time. Adjust as needed.
- Good brakes are a must: HD axle model #1 is recommended: Coaster brakes are not recommended.



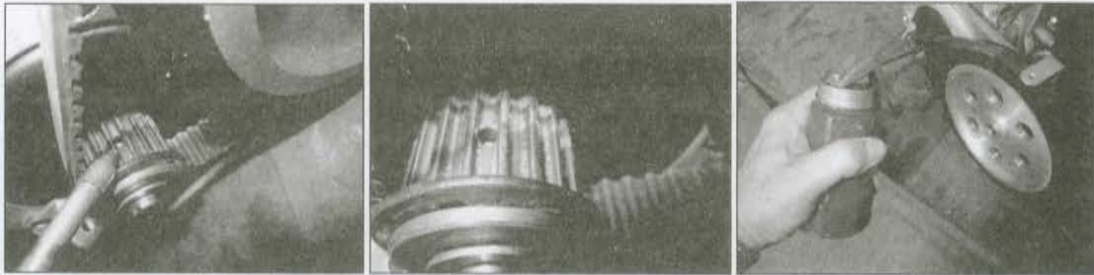
### Installing a 2 Brake Cable Throttle:

Loosen clamps and pull the brake cables out of sheathings: Feed brake cables through the holes in the throttle grip lever. ( Fig. 23 ) and then back through the nipple housings into the cable sheathing.

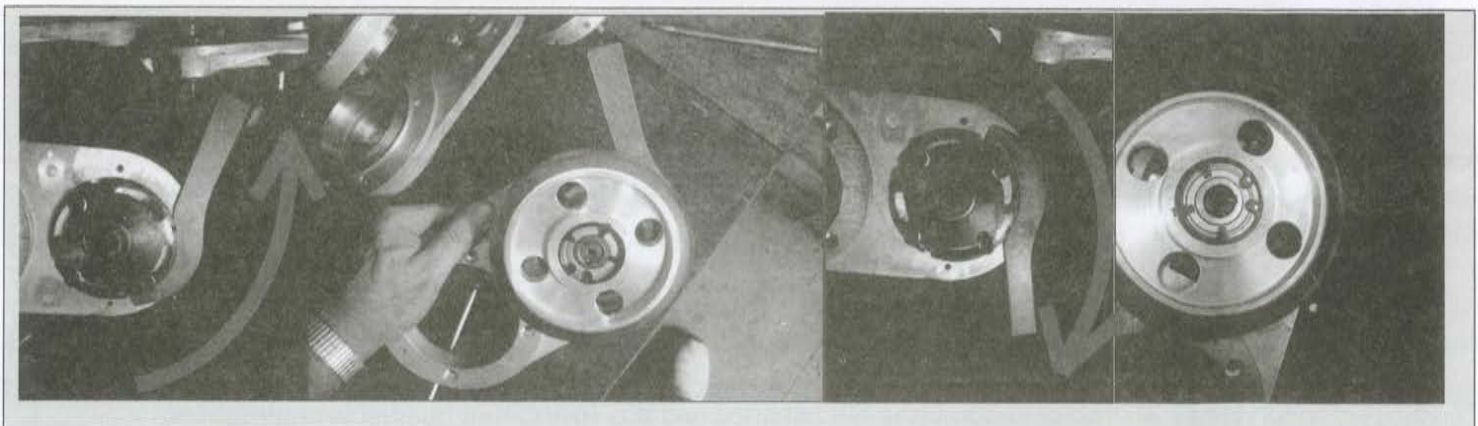
Lever boss holes are drilled for standard diameter brake cable. If you have oversize brake cable, you will have to enlarge the holes slightly with a drill. If more lever stroke is

needed you can file off some of the leading front edge of the lever where it seats.

HTD 505-5M HTD 505-5M HTD 505-5M	HTD 540-5M HTD 540-5M HTD 540-5M	HTD 570-5M HTD 570-5M HTD 570-5M
<b>Belt P/n for 80T Pulley</b>	<b>Belt P/n for 90T pulley</b>	<b>Belt P/n for 100T pulley</b>



**Oil bushing in drive pulley once a week with light machine oil;**



**Turn Cam Lock CCW to Loosen Belt and CW to tighten:**

## Special Order Optional accessories:

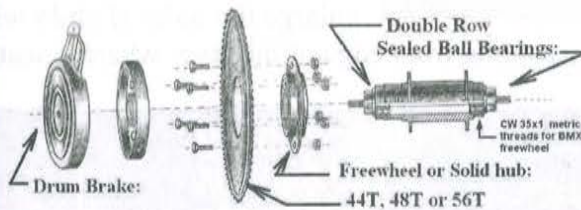


Optional Gru-Bee HD Rear Axle Kit Model #1 with freewheel flange made for attaching 44T, 48T or 56T sprockets. **HD axle #1 allows bolting chain wheel sprocket directly to a freewheel hub flange that screws on the axle threads. Sprocket to Spoke clamp installation is eliminated and allowing pedaling engine off without any chain restriction.** Prevents broken spokes and gives true alignment for a pro-shop set up: The accompanying drum brake helps ensure safe stops for a 3 brake system; HD Axle has sealed ball bearings with double row balls to ensure long life. **NOTE:** Using the optional *dual brake cable throttle* and the *integral clutch brake lever* allows for a 3 brake system control on the bike handlebar.

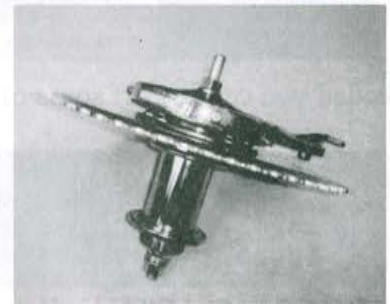
The new 2012 model 80T pulley with freewheel hub replaces the old one-way brg. used in years past and allows using either HD Axle Model #1 or HD axle Model #2. For hill climbing use a 10T Sprocket with 56T sprocket; For highest flat land speed use the 10T drive sprocket and select 44T rear sprocket. Going fast is not a good idea if your bike has poor brakes, worn tires or if you are an inexperienced rider. Be Safe; Not Sorry!



### Heavy Duty Axle Kit: > for bicycle motorizing



Model #1, with freewheel hub sprocket attach for rope pull start engine  
Model #2, with solid hub sprocket attach for pedal start engine



Optional: #1. HD Axle Kit with freewheel sprocket hub and drum brake;

### Thank you and Congratulations:

You have just purchased an outstanding DIY parts kit; DIY means “do it yourself” and enjoy what you end up with. If you’re wondering why we have so many options it is because all markets are different and personal opinions differ. Some folks require the cheapest way and some require the premium way. The end user or installer must decide to suit his own needs. Mechanical aptitude and hand tools are required. Be sure to apply LocTite 242 thread lock to all fasteners and final torque to ensure all are tight and secure. It is best to have a qualified automotive or motorcycle mechanic do the installation if you lack the necessary experience and talent. Use caution when operating a motorized piece of equipment and follow all federal, state and local laws:

For more information click [www.chinabestexporter.com](http://www.chinabestexporter.com)

[Ref, info. www.grubeeinc.com](http://www.grubeeinc.com)

**CHINA GAS**

### Examples of other applications for GruBee SkyHawk 4G DIY parts kit:

- Motorized Paddle Boats / Lawn Mowers / Brush cutters Motorized go-cart; Motorized wagons;
- Motorized rickshaws Stationary work station in remote areas without electricity: Power gen. set; Table saw; Belt Conveyor; Brush cutter; Wood chipper; Garden tiller; Push-Me-Tractor

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