重庆高金实业有限公司
Chongqing Gaokin Industry Co,.Ltd

E02（GK194MS）

Maintenance Manual

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Catalog

1 Overview

1.1 Engine characteristic

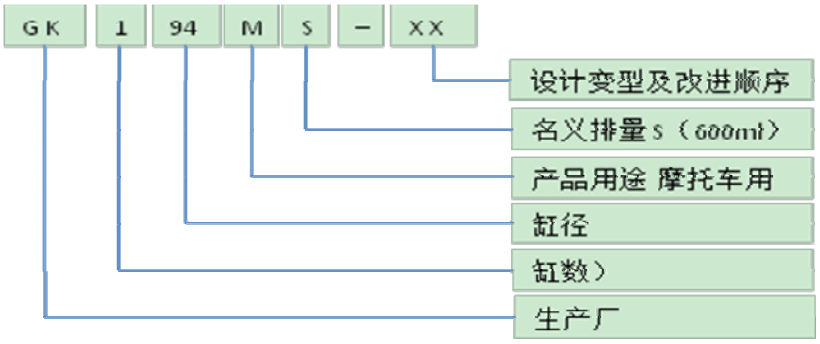
GK194MS engine works stable, with high torque, long life, low consumption, can be used in wide range.

1.2 Types、application、Specification

GK194MS engines including two series E02、E03 and 8 models，E02 is the engine with gears. It is applied to two wheels motorcycles、sports ATV、applicability ATV、UTV。Details please refer to the following table:

S/N	Product code	Model	Feature	Remark
1	E02C	194MS	Carb.、manual clutch、pedal shifting (5forward shifts)	Used on two wheels vehicle
2	E02C-2	194MS-A	EFI、manual clutch、pedal shifting (5forward shifts)	Used on two wheels vehicle
3	E02F	194MS-2	Carb.、manual clutch、pedal shifting (4forward shifts+1 reverse)	Used one ATV
4	E02F-2	194MS-2A	EFI、manual clutch、pedal shifting(4forward shifts+1 reverse)	Used one ATV

1.3 Model meaning



1.4 Operating environment and working condition

Working environment temperature，engine with carburetor -10～40° C；engine with

EFI（with battery above 45A.h）-30～40° C。

Apply to sea level elevation，engine with carburetor in 4000m；engine with EFI in 5000m。

Engine must be installed and fixed on vehicle or testing-bed, assembled all accessories and filled in enough correct lubricating oil and coolant.

1.5 Effect to environment and energy

Polluted air like COx、CxHy、NOx will be emitted when engine works and consumes fuel.

1.6 Safety

The temperature of working engine is high, people are not allowed to touch engine to avoid scald.

Engine output shaft is a high speed spinning part, please install protecting plate or cover to avoid hurt.

2 Product technical characters

2.1Main performance parameters

S/N	Items	Parameter/Description	Remark
1.	Working temperature range ° C	Engine with carb.-10～40	
		Engine with EFI（matched with batter above 45A.h y）-30～40	
2.	Height applied to m	Engine with carb. in 4000m	
		Engine with EFI in 5000m	
3.	Max. net power kW@r/min	27.5@5750 (10h running-in with high shift)	
4.	Calibrating power	——	
5.	Max. net torque N.m@r/min	51.5@4250 (10h running-in with high shift)	
6.	Min. fuel consumption g/kW.h	≤300	WOT
7.	Max. RPM r/min	6500	

S/N	Items	Parameter/Description	Remark
8.	idling r/min	1500±150	
9.	Exhaust limited	Carb. Euro II, EFI Euro.III	Vehicle calibrating
10.	Noise limited Db(A)	≤80	Vehicle calibrating

2.2Main structure parameter

S/N	Items	Parameter/Description		Remark
1	Type	Vertical、1 cylinder、SOHC、4 Stroke 、4 valves、water cooling		
2	Outline size(L x b x h)mm	E02C	E02F	
		380x420x500		
3	Net weight kg	49	50	
4	Bore diameter mm	94		
5	Piston stroke mm	85		
6	displacement ml	589.9		
7	compression	9.7：1		
8	Ignition mode	Storage power supply、ignition coil ignites		
9	Fuel supply	Carburetor or EFI		
10	Air inlet mode	Naturally aspirated		
11	Crankshaft rotating direction	Rotate to right		
12	Valve transmission type	Roller crossed rocker		
13	Valve clearance mm	Inlet valve 0.09～0.14 Outlet valve 0.17～0.22		Cool state
14	Lubrication mode	pressure、splash		
15	Starting mode	electric		

S/N	Items	Parameter/Description	Remark
16	Water pump flow L/min	≥90 (runoff type 5000r/min)	
17	Water coolant volume ml	200	Water jacket
18	Thermostat ℃	open/full open 71/85	
19	Fuel pump flow L/min	4.39 (1000r/min)	
20	Fuel pressure	-	
21	Fuel filter	Pater-type	
22	Fuel volume L	2.3	
23	Generator output	14V 330W (5000r/min)	
24	Starting generator power	12V 650W	
25	Spark plug mm	model: NGK CR7E, clearance: 0.7～0.8	

2.3 transmission system parameter

The follow table shows E02 engine transmission parameter

<table>
<tr><th rowspan="2">S/N</th><th rowspan="2">Items</th><th colspan="4">Parameter/Description</th><th rowspan="2">Remark</th></tr>
<tr><th colspan="2">E02C</th><th colspan="2">E02F</th></tr>
<tr><td>1.</td><td>Clutch type</td><td colspan="4">Manual wet-type oil bath multiple chips type</td><td></td></tr>
<tr><td>2.</td><td>Power output mode</td><td colspan="4">Chain wheel、chain link</td><td></td></tr>
<tr><td>3.</td><td>Chain parameter</td><td colspan="4">530type 15teeth</td><td></td></tr>
<tr><td>4.</td><td>Transmission type</td><td colspan="4">Mechanical、5shifts</td><td></td></tr>
<tr><td>5.</td><td>Gear shift order</td><td colspan="2">1-N-2-3-4-5</td><td colspan="2">R-N-1-2-3-4</td><td>Reverse limited</td></tr>
<tr><td rowspan="5">6.</td><td rowspan="5">Each shift transmission ratio</td><td>1shift</td><td>6.029</td><td>reverse</td><td>4.854</td><td rowspan="5">Primary transmission ratio 2. 345</td></tr>
<tr><td>2shift</td><td>3.846</td><td>1 shift</td><td>4.983</td></tr>
<tr><td>3shift</td><td>2.814</td><td>2 shift</td><td>3.4</td></tr>
<tr><td>4shift</td><td>2.244</td><td>3shift</td><td>2.558</td></tr>
<tr><td>5shift</td><td>1.876</td><td>4shift</td><td>1.97</td></tr>
</table>

2.4 Fuel and lubricating oil parameter

S/N	Items	Parameter/Description	Remark
1.	Fuel grade	93#	
2.	Lubricating oil grade	-10～40° C, API 10W/40-SG or SH	Recommend to Use mineral oil
		-20～40° C, API 5W/40-SG or SH	
3.	Lubrication oil consumption	≤5g/(kW.h)	
4.	Lubricating oil total volume	2. 30 L	
5.	Lubricating oil max. temperature	120° C	

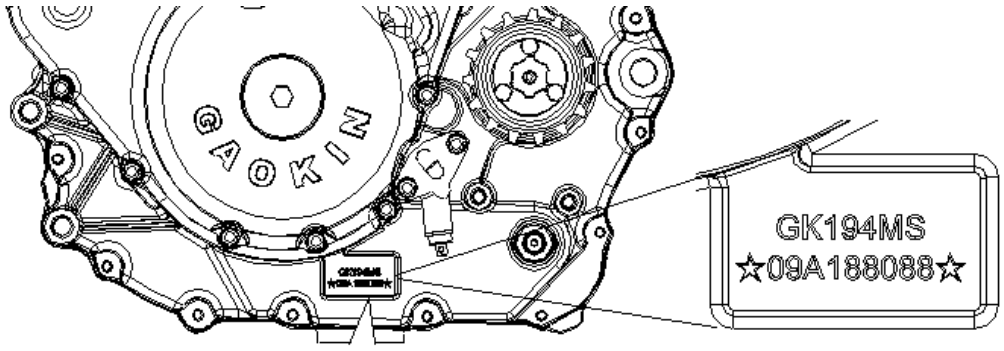
2.5 water coolant parameter

S/N	Items	Parameter/Description	Remark
1.	Coolant specification	Antifreeze -30℃	
2.	Coolant volume ml	200	Water jacket
3.	Coolant inlet temperature ° C	≤90	
4.	Coolant outlet temperature ° C	≤105	
5.	Thermostat	Open /full open 71/85℃, lift 3.5mm	

3. Engine outline

3.1Engine model and countermark location

E02engine,please look at engine left side



3.2 E02 engine outline drawing

See attached file 1 E02outline drawing (EFI)

4. Engine assembly requirement and accessory

Choose and install proper accessory on engine to ensure the engine get best performance. The followings are engine accessory, we can match for customer, or customer can choose from the table by themselves.

4.1Engine assembly

S/N	Items		Parameter/Description	Remark
1)	Assembly dip angle allowed		15（±0.5）°	Bore center line and vertical axis
2)	Suspension fixed mode		Three-point fixed, hard connect	
3)	E02	Front suspension hole diameter、coordinate	Φ11(374.5,-23.5) Φ11(355,-92.5)	To main fixed hole
4)		Rear suspension hole diameter、coordinate	Φ11(35.5,116.5) Φ16(0,0)、 Φ11(30.5,-132.5)	To main fixed hole
5)		Top suspension hole diameter、coordinate	Φ9（211.3,248.8）	To main fixed hole

4.2 Inlet and exhaust system

S/N	Items		Parameter/Description	Remark
1)	Air filter A	Structure	Box type with exhaust gas connector	
2)		Model	17100-E02-0000	
3)		original resistance Pa	1685	
4)		Air inlet rate m^3/h	300	
5)		volume L	4.5	
6)		Filter element	Foam type	
7)	Air filter B	Structure	Box type with exhaust gas connector、scavenge port	
8)		Model	17100-E02-00A0	
9)		original resistance Pa	1685	

S/N	Items		Parameter/Description	Remark
10)		Air inlet rate m^3/h	300	
11)		Connecting tube	Small end internal diameter (throttle valve) ≥ Φ 40mm , length about 140mm	
12)		volume L	4	
13)		filter element	Paper and foam	
14)	muffler	Model	18000-E02B-00C0	
15)		Exhaust backpressure	-	Exit 100mm
16)		original resistance Pa	-	
17)		Pipe diameter mm	Inner diameter ≥ Φ34	
18)		Pipe length mm	625（or 1225）	
19)		Volume L	4.5	
20)		accelerant	No	

4.3 fuel supply system

S/N	Items		Parameter/Description	Remark
1)	Carburetor A (with air filter A)	structure	Equal vacuum membrane type	
2)		Model	KINZO PD42J	
3)		Stroke mm	30	
4)		Oil supply L	-	
5)		Mouth diameter mm	Φ42	
6)		Oil pipe inner diameter mm	Φ7	
7)		Accelerating pump	No	
8)	Carburetor B (with air	Structure	plunger type	
9)		Model	Dellorto PZ40	

S/N	Items		Parameter/Description	Remark
10)	filter B)	Stroke mm	35	
11)		Oil supply L	-	
12)		Mouth diameter mm	Φ40	
13)		Oil pipe inner diameter mm	Φ7	
14)		Accelerating bump	yes	
15)	Electric injector supply oil		See 4.5	

4.4 Coolant system

S/N	Items		Parameter/Description	Remark
1)	radiator	Structure	Integration thermo switch、liquid adding hole、pressure regulating valve	
2)		Model	19600-E02B-00A0	
3)		Radiating area	-	
4)		Thermo switch ℃	starting temperature 65	
5)		Pressure control bar	Starting pressure 0.9	
6)		Water tank volume	≥20% total volume	
7)		Inlet/outlet water pressure difference Pa	-	
8)		Water pipe inner diameter	Φ19	
9)	Fan	Model	19100-E02B-00A0	
10)		Power W	≥80	
11)		Air volume m^3/h	-	

4.5 Electric appliance system

S/N	Items	Parameter/Description	Remark

S/N	Items		Parameter/Description	Remark
1)	Wire connection (electric) schematic diagram		See annex 2 (carburetor)、annex 3 (EFI)	
2)	igniter (carburetor)	structure	Digital control electric ignition	
3)		Install requirement	fixed、far away exhaust pipe、ventilate good	Can be shielded external
4)		Model	33200-E02B-0001	
5)	Ignition coil	Structure	Open magnetic circuit , inductance	
6)		Model	Delphi 28140972	
7)		Ignition energy mJ	≥15	
8)		High voltage wire mm	450, with shielding line	
9)		Spark plug KΩ	Damping electric resistance 5	
10)	rectifier	Structure	Three phase full wave rectifier	
11)		Model	32100-E02B-0000	
12)		Install requiremnet	fixed、far away exhaust pipe、ventilate good	Can be shielded external
13)		Regulate voltage V	14.5±0.5	
14)		Max. current A	25	
15)	storage battery		≥12V14A.h	
16)	Motor connecting line		Line dia. ≥10mm^2	
17)	Wires and plugs model		Annex 4 (carburetor) Annex 5 (EFI)	

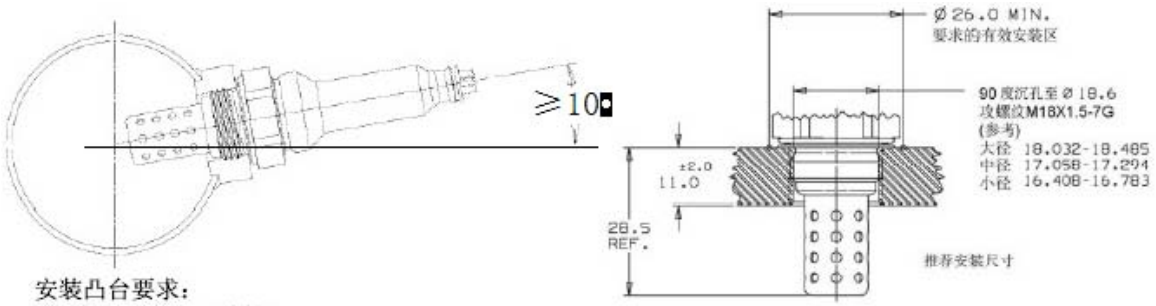
4.6 EFI System

S/N	Items	Parameter/Description	Remark
1)	Wire connecting schematic dragram	See annex 3	
2)	System detail	Delphi MT05 EFI system , small volume, reliability。	

S/N	Items		Parameter/Description	Remark
3)	ECU	Structure	36 needle pin, pin definition see wire connection schematic diagram	
4)		Install requirement	Shock proof: fixed on vehicle frame Water proof: dry, difficult to get wet, connector adown; Anti high temperature: surroundings max. temperature lower than 85℃; Anti electromagnetic interference: 150mm away from spark plug	
5)	Throttle valve (with air filter B)	Structure	Integration valve block、location sensor、idling actuator	
6)		Max. corner °	84 (tie piece stroke about 27.4mm)	
7)		Valve diameter mm	Φ40	
8)	Intake pipe	Structure	Integration fuel injector、intake air temperature /pressure sensor	
9)	Fuel injector	Install requirement	Follow intake tube assembly angle(wire connector face to engine side)	
10)	Fuel pump	Structure	Integration rough strainer (particle diameter ≤ 40 μm)、pressure regulating valve(pressure 250kPa)	
11)		Flow L/h	≥33	
12)		Install	Oil tank low if possible, be aware of leakage	
13)		pipeline	Inner diameter Φ 6high voltage multiple tube (withstand voltage≥ 7bar)	
14)	Fuel fine filter		Particle diameter ≤10μm (no more than ≤20μm) Connector diameterΦ 8, flow more than 40L	
15)	Oil level sensor		No	
16)	Relay		Two pieces 30A、to control oil pump and actuator separately	

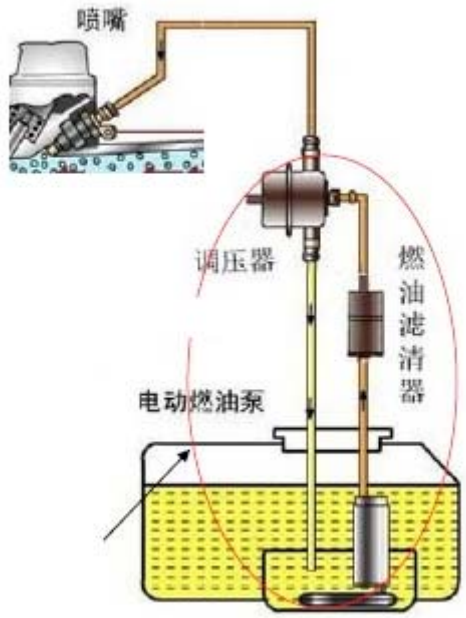
S/N	Items	Parameter/Description	Remark
17)	Engine RPM signal output	Connect to vehicle instrument, 12Vsquare wave, rotate each 1(duty ratio about 50%, high level about 12V, low level about 0V; current less than 30mA)。	
18)	Water temperature alarm output	Without	
19)	O2 sensor per requirement	Distance to engine exhaust port 200-500mm、straight reach、upward （water level included angle≥15°）	Refer to 4.6-01
20)	Fault indicating lamp	Wire K output 12V to driving indicator light, current less than 1A	
21)	Diagnostic apparatus connector	6p connector, can connect with diagnostic apparatus and status monitoring	
Fuel circuit connecting instruction(refer to 4.6-2): Three direct links (A connector) +fuel fine filter + fuel pump oil-let, Three direct links (B connector) +oil pump return opening +250kPa air-vent valve (oil pump integration),			

. Picture 4.6-1



安装凸台要求：
装配凸台材料：不锈钢
凸台最小外直径：不小于26 毫米
凸台推荐最大厚度：不大于13毫米（9~13毫米之间为佳）
螺纹孔尺寸： M18 x 1.5 - 7G
螺纹质量：表面应无毛刺，砂眼，或其他任何可能影响安装和拆卸的缺陷
安装表面平面度为0.2，表面光洁度为Ra3.2，表面对安装孔心的垂直度为0.2

. Picture 4.6-2



5. Engine usage、maintenance and fault solution

5.1Engine usage and cautions

5.1.1 Engine Running-in

Check oil level with oil level window lines. If the oil level lower than the underline, add fuel to the upper line.

It is not allowed to increase load at cold engine state, preheating engine for 1-3 minutes first.

Engine running-in is very important, new vehicle should drive at 75% speed of each shift and shift gear often, if running-in not good, more faults will be increased. Maintain the engine after driving 300km and 1000km, improve the engine working condition to ensure good engine performance. Maintain the engine after every driving 3000km.

Running-in of engine is very important. 1000 km is stipulated as running-in mileages. Running maintenance please refer to 5.2

Mote During the running-in, shift gear often and RPM should be no more than 70% of max. RPM, accelerator should be no more than 70% of accelerator full opening.

Prohibit It is not allowed to make engine running at big accelerator with idling

high speed。

5.1.2 Engine starting

Prohibit The engine can be only started with electricity. It is not allowed to press the electric start button for a long time.

Start engine in N-shift. If it is not in N-shift, ensure the clutch is off before starting engine.

Starting time should be no more than 5s each time, continuous starting should not over 5 times and interval should be no less than 10s.Engine starting failed in 5 continuous times, it would be regarded as engine starting fault.

1）Engine with carburetor, Starting when engine at cold state, close choke valve and open the throttle properly, after the engine started, reopen the choke valve.

2）Engine with EFI system，it takes about 10s to do self-checking before starting

Warn It is not allowed to start engine before EMS self-checking finished

After engine started, preheating for 1-2 minutes at idling speed, avoiding to work in high RPM with high load.

Note The electric control system of the engine must work with engine against reverse ignition function. Or it might cause starting system damaged(such as starting gear、shaft、one-way clutch, motor etc.)

5.1.3 Idling working and adjustment

Idling speed has been adjusted when left factor. If adjust idling speed again, ensure the engine is hot and locate at N shift, spin carburetor idling adjustment screw, make the idling stabilized at 1500±150r/min. If adjusting the screw can't reach the requirement, you can adjust carburetor mixed ratio.

Engine with EFI, adjusting throttle valve idling screw is not suggested. It should be performed with the guidance of expert.

5.1.4 Accelerating working

Avoiding to increasing accelerator rapidly when engine accelerates, it is suggested to increase stable. Engine RPM、shift and speed should match well during driving.

warn A. Engine Working at high shift low RPM should be avoided

B. Engine Working at low shift high RPM for a long time should be avoided

5.1.5 Clutch operation

E02 engine clutch operation structure is chain rack mechanism, when rack strokeis1.5mm the clutch separated. It is not allowed to over pull clutch control arm, or rack will come out of chain or clutch movable locked, which will lead to clutch failure.

The engine clutch working stability is not very good at low RPM, when RPM less than 3500r/min,Or When refuel or oil return, it is normal if clutch makes “dada” noise. when RPM stable, the noise will disappear.

Note It is not allowed to use clutch when it is in a half clutch state

Forbid It is forbidden clutch works in a half clutch state, it will lead to clutch abraded or damaged in a short time

5.1.6 Gear shift operation

E02 engine with 5 gearshifts, shift way is international, catch or step by left foot, the order is: 1-N-2-3-4-5, neutral position Nis between shift 1 and shift 2, it only takes half shift。If reverse shift is set, reverse shift R will occupy shift 1, 2 to 5 will be changed as shift 1 to shift 4, the order will be changed to be R-N-1-2-3-4。

Note Engine gearshift operation should work with coordination of accelerator, clutch and shifting structure.

Warn A. It is not allowed gear shift when the clutch is on and without reducing throttle!

Or it might cause transmission parts damaged.

B. Stopping vehicle, disconnected reverse limited stopper and change into reverse shift. Reverse limited stopper must be locked when vehicle at other shifts

5.1.7 Engine stops

Note engine should keep idling for 1-2 minutes before stopping. After stopping engine, don’t turn off power immediately, let radiator fan keep working until the coolant temperature dropping to 80℃,fan stops working and turn off power.

5.1.8 Engine load

Max. load of engine：no more than 500kg。

5.2 Maintenance

5.2.1 Engine lubrication system maintenance

1)Check before using Check the oil level before starting, ensure the oil is at normal level, look at oil view window, oil level should be between under and above carved lines, it is better to be at the middle. If oil level is lower than the under line, oil should be filled in to above line. Lubricating oil choosing, please see annex 5

2) Lubrication maintenance and replace circle

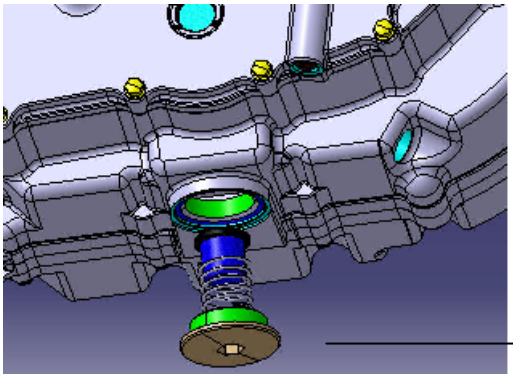
Replace circle km	300	800	2000	5000	Every 5000	Every 10000
Lubricating oil	G.	G.	G.	G.	G.	
Oil filter element	G.		G.	G.		G.
thick filter screen	Q.	Q.	Q.	Q.	Q.	
Magnet ring	Q.	Q.	Q.	Q.	Q.	

Note: G. replace Q.Clean

Remark : replace oil filter element can't be used again

3) Replacement operation

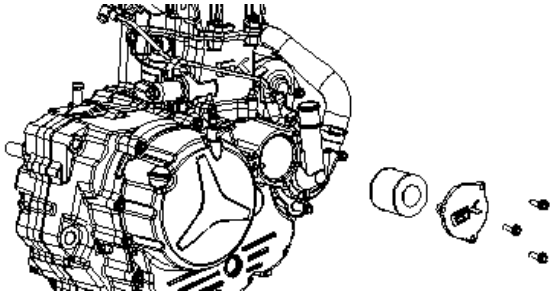
a) Dismantle oil pan nut:



Use 12mmhexagonal head wrench to dismantle

b) filter element replacement picture:

E02 series:



Use10#Thexagonal socket wrench to dismount filter cover, replace oil filter element, use fastening torque10-14N.m to assemble

5.2.2 Engine cooling system check and maintenance

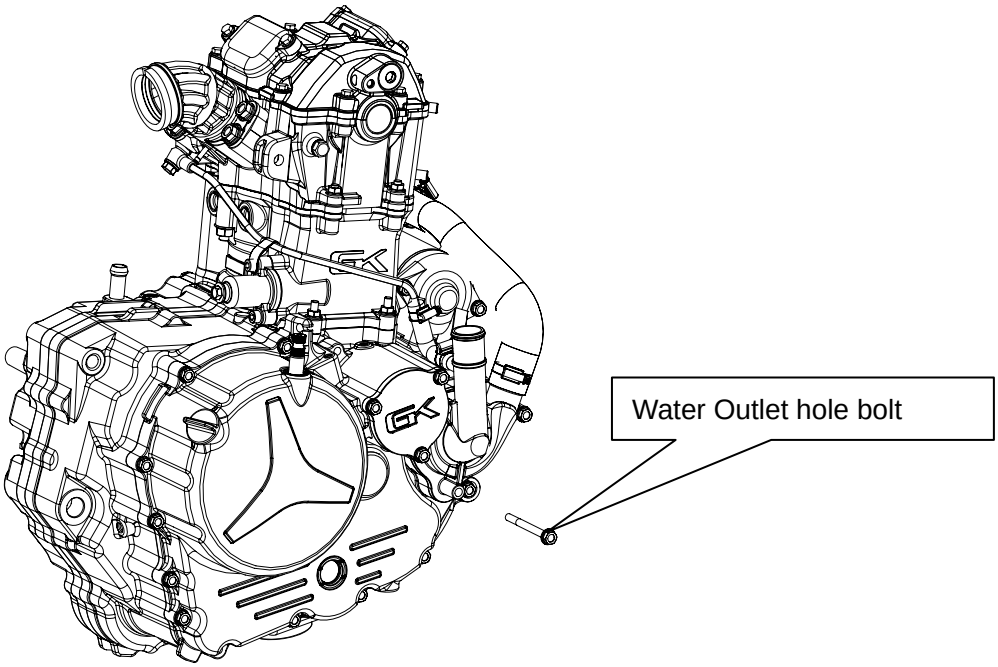
forbid Cooling water (antifreeze solution) is poisonous and corrosive, it is not allowed

to drink

Note A. This operation must be done at cold or low temperature.

B. if it is stick to painting surface careless, please wash and clean it with water

1) Cooling water check, put vehicle on the ground, check if the water level is between above and under carved lines, it is better to be at the middle. If not, please add water. Unscrew plug-hole bolt, normally there should be water overflow. Refer to picture :



2) Cooling water mix ratio table

Lowest temperature	Antifreeze agent V%	Distilled water V%
-9℃	20	80
-16℃	30	70
-25℃	40	60
-37℃	50	50
-44.5℃	55	45

Cooling water should mix according to local temperature, details see table

5.2.3 Valve adjustment

Engine valve clearance has been adjusted when left factory. Adjust the valve clearance to specified value when it is abnormal (cylinder overheat or abnormal sound)

5.2.4 Air filter

If use filter paper type air filter element, replace filter element every driving 8000km. if

other type of air filter element, please refer to supplier's maintenance manual. In dusty condition, shorten driving distance to replace. In a word, air intake must keep unobstructed and clean

5.2.5 carburetor/throttle valve

Check and wash carburetor every driving 5000km

5.2.6 Fastener maintenance

1) Main fastener torque

S/N	Designation	Name	Spec	Torque (N·m)	Assembly position	thread agent
1	Q/QD921.4	Plate bolt grade 8.8	M6	10±2	All	
2	Q/QD920	Plate bolt grade 10.9	M6	12±2	All	
3	Q/QD920	Plate bolt grade 10.9	M8	25±3	All	
4	GB/T819.1-2000	Cross-shaped plate screw	M5	6±1	All	○
5	GB/T6177.1-2000	Hexagon flange nut	M6	10±2	All	
6	GB/T6177.1-2000	Hexagon flange nut	M8	20±3	All	
7	GB/T70.1-2000	Hexagon socket head cap screws M6 x25	M6	10±2	Tightener	
8	90302-E02-0000	Valve clearance adjusting nut	M5	7±1	Inlet/outlet rocker	
9	11001-E02-0000	View hole cover	M39	18±3	Oil pan cover Left front cover	
10	11002-E02-0000	Top View hole cover	M14	8±1	Left front cover	
11	14402-E02-0000	Rocker shaft cover bolt	M14	25±3	Cylinder head cover	
12	3330-E02-0000	Spark plug	M10	12±1	Cylinder head	
13	36540-E02-0000	Water temperature sensor	M12	20±3	Cylinder head	
14	90108-E02-000	Step bolt M6x12	M6	12±2	Driving chain	○

2) **Fastening parts torque as following:**

S/N	Name & specification	Torque value referenced
1	5mm bolt and nut	4.5～6
2	6mm bolt and nut	8～12
3	8mm bolt and nut	18～25
4	10mm bolt and nut	30～40
5	12mm bolt and nut	50～60

6	5mm screw	3.5～5
7	6mm screw	7～11
8	6mm plate bolt and nut	10～14
9	8mm plate bolt and nut	20～30
10	10mm plate bolt and nut	30～40

5.3common fault solution

1)、 5.3.1 Starting difficult or unable starting

Item	Cause		Solution
Operate	Improper operation		Operate per instruction
Fuel supply	No fuel	No fuel in tank	Add fuel
		Fuel tank switch closed	Open fuel tank switch
		Fuel circuit blocked	Wash、clean fuel circuit
			Replace fuel filter
		Carburetor blocked	Clean carburetor
		Fuel pump not working	Check electric system
		Fuel pump fault(EFI)	Replace fuel pump
		Fuel injector blocked(EFI)	Wash or replace
	Fuel pressure low (EFI)		Check fuel pipe connection
			Check pressure, replace fuel pump
	Fuel quality、contain moisture		Use new fuel
	Fuel deposited for too lone		Use new fuel
	Too much fuel in combustor		Close oil tank, let engine idle for 20～30s, to remove deposited fuel
	Gas mixture too strong or too rare		Adjust carburetor mixing ratio
Starting system	storage batter energy not enough	Storage battery volume not enough	Choose battery per recommendation
		Battery self discharge、loss, low pressure	Replace battery or charging again
		Charging not enough in use or not charging	Check charging、replace rectifier
	Starting motor electric supply not enough (low RPM)		Choose connecting wire per recommendation

Item	Cause		Solution
	Starting transmission gear damaged (with abnormal sound)		Check and replace
	Starting one way clutch failure (motor idling)		Check and replace
	Starting motor failure		Replace
	Starting relay failure		Replace
	Insurance off		Replace
Ignition system	Trigger signal connection wires not good		Check connection
	High voltage connecting wire unreliable		Ensure high voltage connect wires reliable
	Spark plug fault	Spark plug carbon deposition	Remove sparkplug carbon deposition
		Spark plug damaged	Replace new sparkplug
		Spark plug clearance too big or too small	Adjust sparkplug clearance
	Ignition coil damaged		Replace ignition coil
	Igniter damaged(carburetor)		Replace igniter
	Crankshaft sensor failure (trigger)		Clean scrap iron or replace
	EMS EFI system fault		Diagnostic with EMS
Intake/exhaust system	Air filter blocked		Clean air filter
	Air intake system pipe air leakage		Ensure intake pipe、air filter not damaged, each connection fixed、no air leakage
	Exhaust clog	Muffler blocked	Dredge
		Vent or muffler carbon deposited	Remove carbon
Valve timing	Bore pressure too high 、 starting resistance too much		Adjust valve clearance
			Check pressure regulator and replace camshaft
	Valve not timing		Check and adjust valve timing
Engine	Cylinder pressure not enough	Cylinder head and body connect face leakage	Replace sealing gasket, tight cylinder bolt
		Spark plug leakage	Tight spark plug

Item	Cause		Solution
		Piston ring or cylinder wall abraded seriously	Replace piston ring or cylinder

5.3.2 Engine working unstable

Item	Cause		Solution
Fuel	Fuel contains moisture		Use new fuel
	Fuel deposited for a long time		Use new fuel
Fuel supply	Fuel supply circuit half blocked		Dredge and clean fuel supply circuit
Electric	Wire connection not good		check and reconnect
	High voltage wire connection not good, electric leakage		Replace high voltage connecting wire
	Ignition coil electric leakage、ignition energy not enough		Replace ignition coil
	Too much carbon deposition in spark plug electrode		Remove carbon deposition
Intake/exhaust system	Air filter blocked		Clean or replace filter element
	Exhaust clog	Muffler blocked	dredge
		Vent or muffler carbon deposited	Remove carbon deposition

5.3.3 Idling fault

Item	Cause	Solution
No idling or idling unstable	Idling screw loosen	Adjust idling screw
	Fuel pipe、intake/exhaust pipe blocked	Clean 、dredge
	Floater room level too low (carburetor)	Adjust floater room liquid to be specified level
	Ignition timing incorrect	Adjust ignition time or replace new igniter EMS
	High voltage wire connection not good, electric leakage	Replace high voltage connecting wire
	Spark plug ageing、inflow、insulation not good	Replace spark plug
	Mixed gas too thick or too rare	Adjust carburetor or ECU data

	Sparkplug carbon deposited or failure	Remove carbon, adjust clearance to specified value or replace spark plug
	Throttle valve sensor failure (EFI)	Check and replace
	Intake pressure sensor failure and tube fault(EFI)	Check and replace
	Water temperature sensor fault (EFI)	Check and replace
	O2 sensor fault	Check and replace
	Idling actuator fault(EFI)	Check and replace
	Wire connection not good or ground wire connection not good (EFI)	Check and connect wires
	ECU fault(EFI)	Check and replace ECU
	Fuel grade incorrect、goes bad or contains moisture	Use qualified fuel
Idling too high	Accelerator clamping /no reset	Check /adjust oil line、reset spring
	Throttle valve(carburetor) clamping /no reset	Check and replace
	Carburetor adjustment improper	Readjust idling adjusting screw
	Pump pressure regulator fault (EFI)	Replace oil pump pressure regulator
	air intake temperature sensor fault (EFI)	Replace intake temperature sensor
	Idling actuator fault (EFI)	Replace idling actuator
	Throttle valve (Carburetor) spring force too weak	Replace spring
	Carburetor idling measuring hole too big	Replace carburetor

5.3.4 Engine overheat

Item	Cause	Solution
Cooling radiating system	Radiator sheltered/windward side area not enough	Adjust radiator location, add air flue
	Radiating performance not good (low speed、overload working)	Select radiator model to improve radiating performance
combustor	Sealing gasket	Check and replace
	Al. alloy loosen、hole shrink through	Check and replace
Engine	Use low shift or road not good, overload driving for a long time	Improve operation or stop for a while

Item	Cause	Solution
overload	Clutch slipping	Adjust or replace
	Muffler blocked	Dredge and remove carbon deposition
Fuel system	Mixed gas too thick or too rare	Adjust carburetor or ECU data
Lubrication system	Lubricating oil too less	Add to upper line
	Lubricating oil grade incorrect or quality not good	Replace correct grade lubricating oil

5.3.5 Engine stalling

Items	Cause		Solution
Fuel system	Fuel used up		Fill in fuel
	Fuel supply not enough	Fuel circuit blocked	Dredge\clean fuel circuit
		Carburetor blocked	Clean carburetor
		Fuel circuit leakage	Check and repair
Idling control	Carburetor adjustment improper		Adjust carburetor
	EFI idling control relative parts failure/connect failure		Check connection 、 fault diagnosis
Exhaust system	Muffler blocked		Dredge\clean carbon
Electric system	Ignition coil、spark plug、high voltage connecting wire failure		Check and replace
crank 、 gearbox	Piston fracture		Repair and replace
	Piston locking		Repair and replace
	Crank connecting rod locking		replace
	Other mechanical failure /locking		Check, repair or replace

5.3.6 Clutch fault

Item	Cause	Solution
Slip	Clutch system adjustment improper or damaged	adjust、repair or replace
	Friction plate abraded or damaged	Replace
	Clutch spring failure	Replace
	Operating distance too long, clutch platen coming off guide rail	Repair
Out of	Improper stroke to be out of gear	Adjust, repair or replace

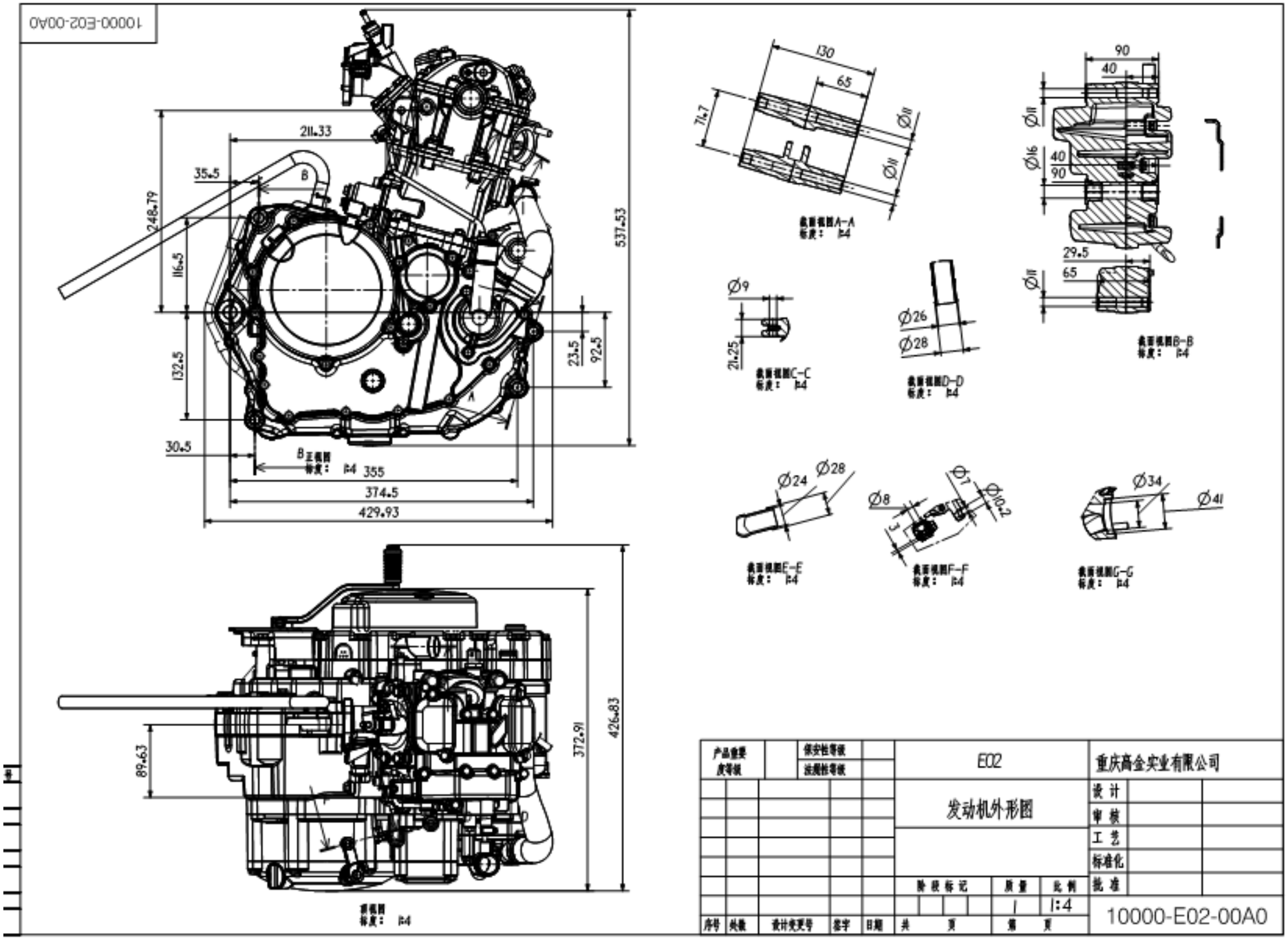
gear	Friction plate thickness improper	Replace

5.3.7 Gear shift fault

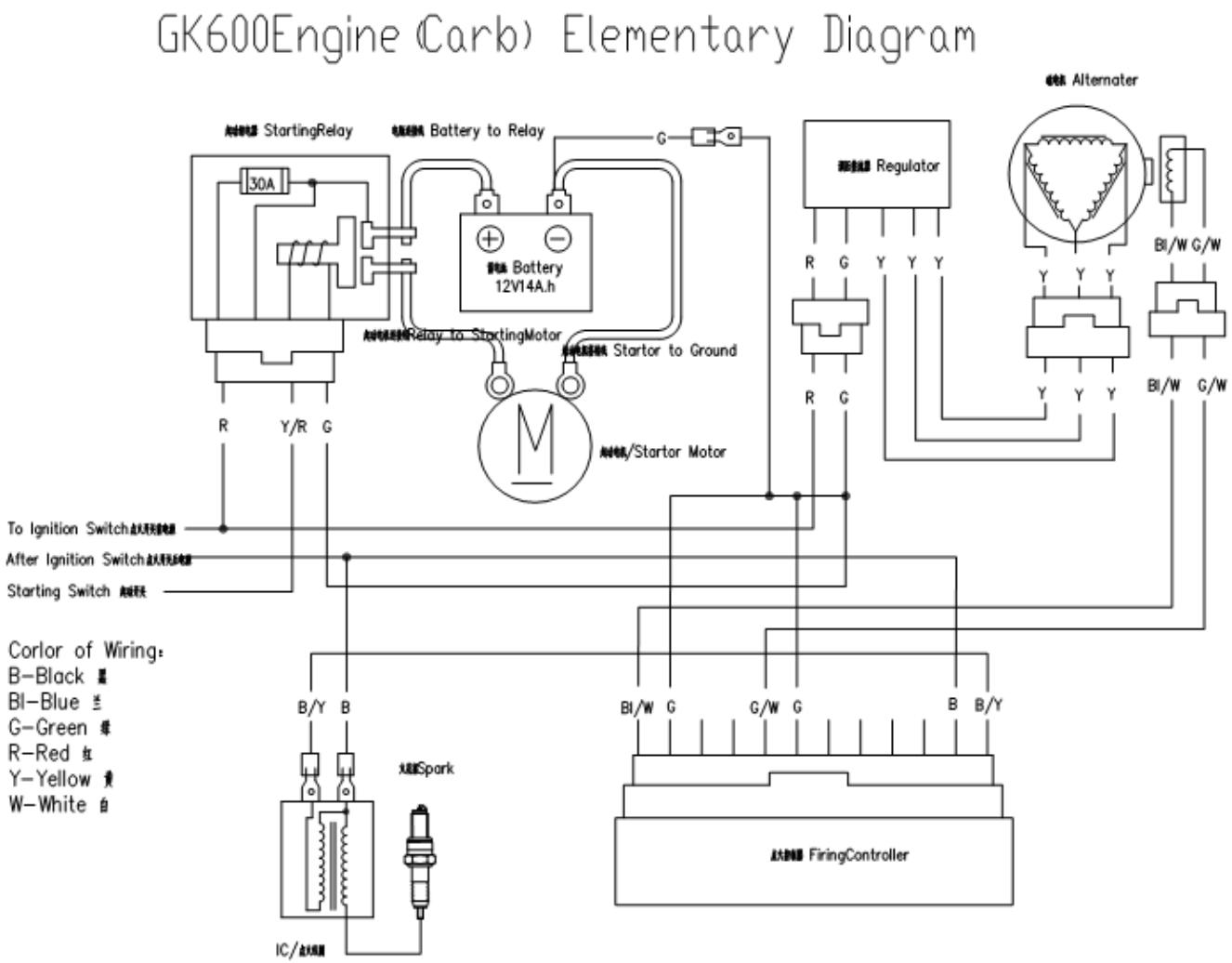
Item	Cause	Solution
Gearshift failure	Shifting fork deformed or broke off	Check and replace
	Variable shaft active plate reset spring dropped /cracked	Check and replace
	Variable shaft reset spring slip off	Check and replace
Gearshift difficulty	Clutch separated not completely	Solve per clutch trouble removal
	Operation improper	Improve operation
	Variable shaft deformation	Check and replace
	Main/sub-shaft shifting	Engine repair
spontaneous out of gear	Gear connecting pawl or hole abrasion	Replace gear
	Variable speed drum guide way abrasion seriously	Replace Variable speed drum
	location-plate spring failure	Replace location-plate spring

Annex files

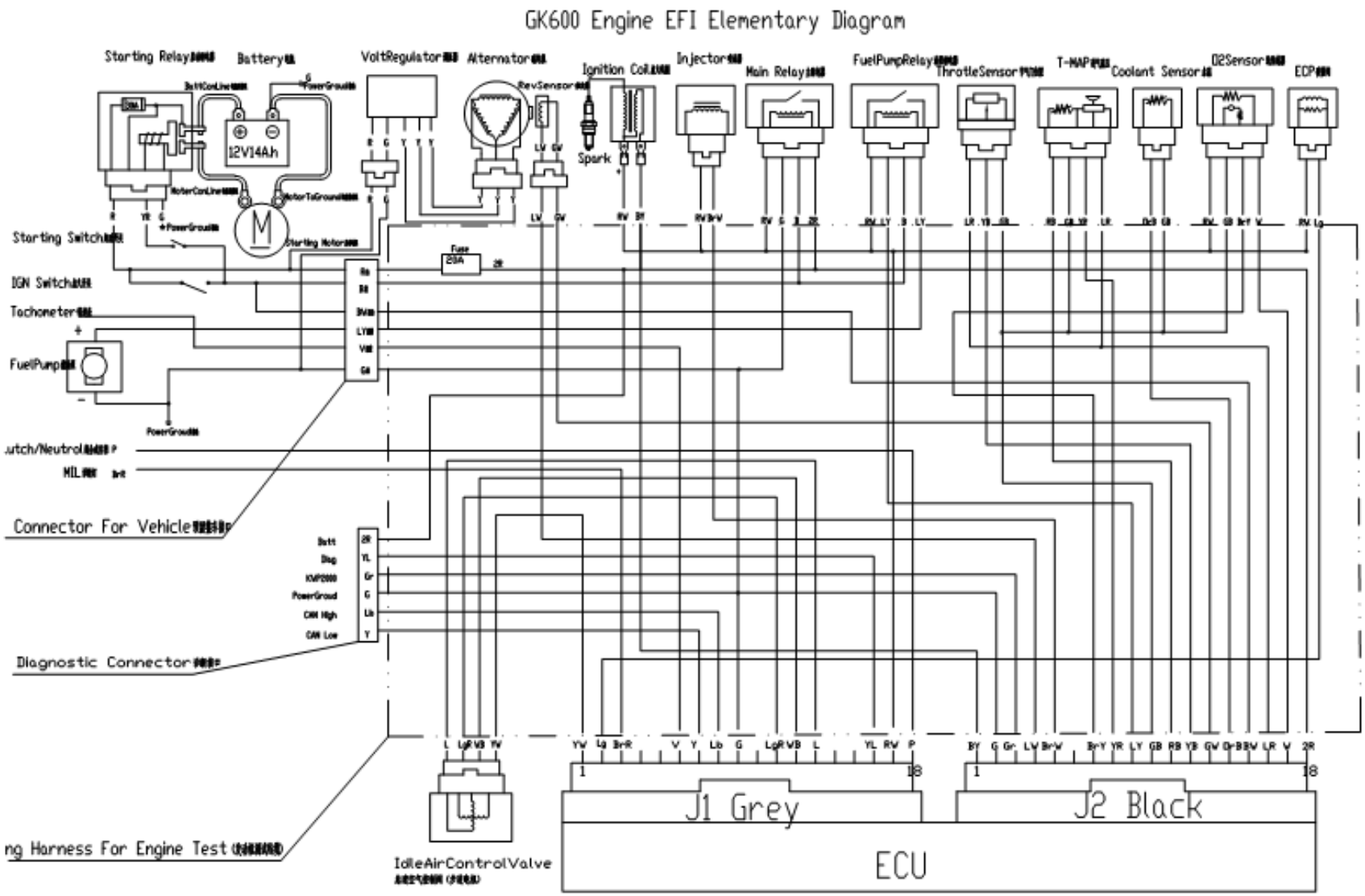
Annex 1　　E02 Outline drawing 外形接口图



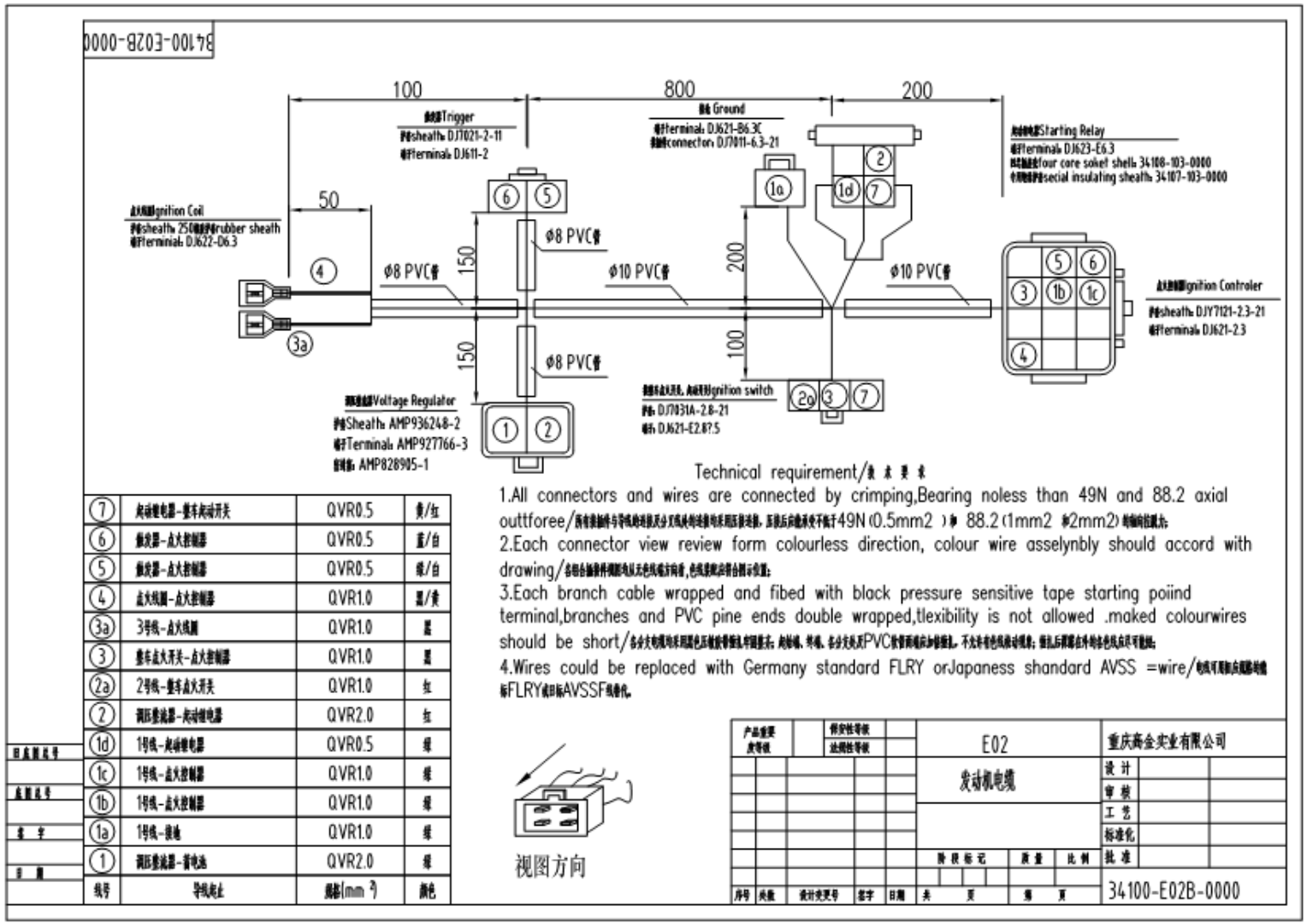
Annex 2 Carburetor wires connection schematic Diagram 化油器接线原理图



Annex 3 EFI wires connection schematic Diagram 电喷接线原理图

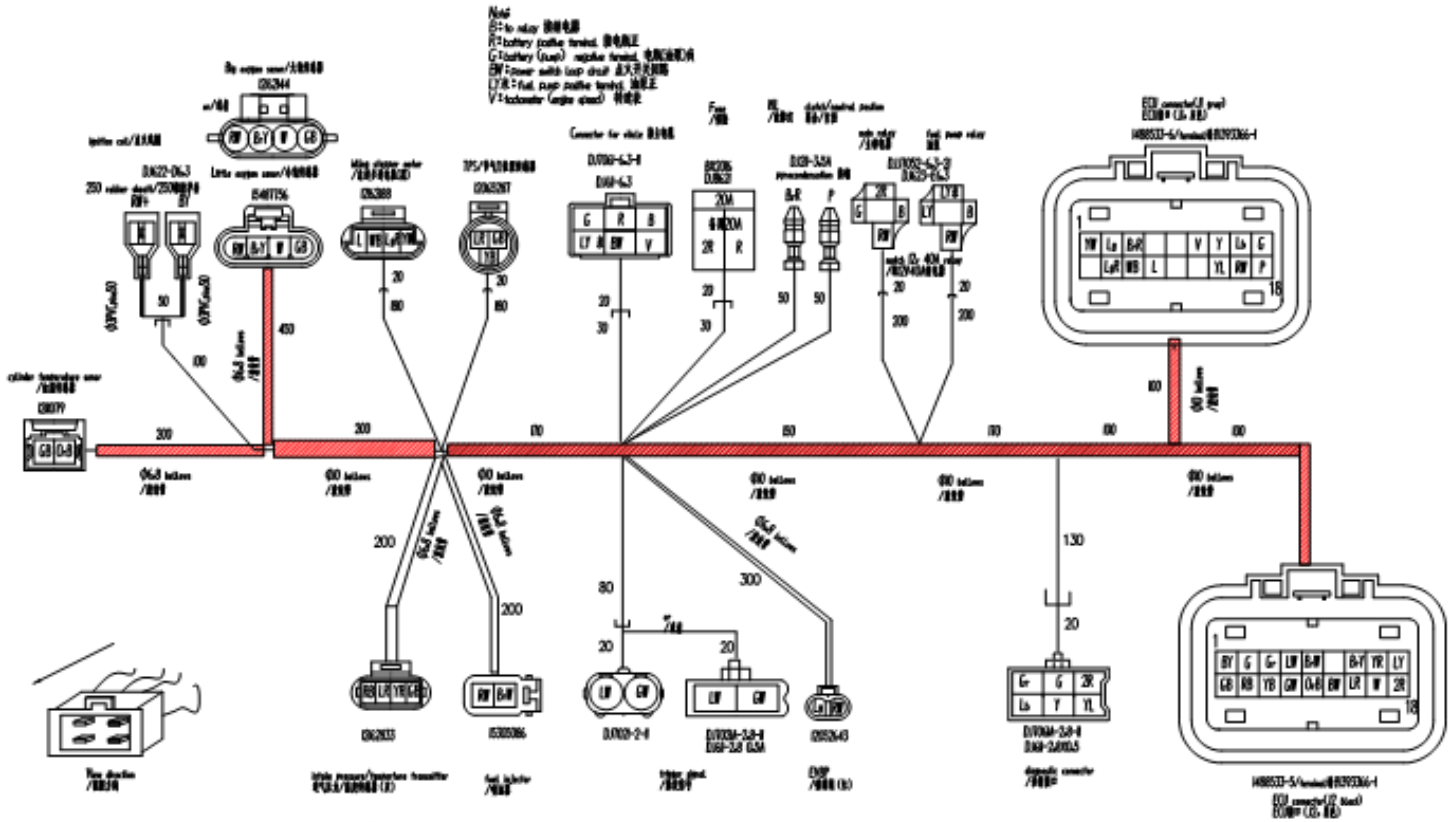


Annex 4 Carburetor wires and connectors model 化油器线束及接插件型号



⑦	起动继电器-整车起动开关	0.VR0.5	黄/红
⑥	脉发器-点火控制器	0.VR0.5	蓝/白
⑤	脉发器-点火控制器	0.VR0.5	绿/白
④	点火线圈-点火控制器	0.VR1.0	黑/黄
③a	3号线-点火线圈	0.VR1.0	黑
③	整车点火开关-点火控制器	0.VR1.0	黑
②a	2号线-整车点火开关	0.VR1.0	红
②	调压整流器-起动继电器	0.VR2.0	红
⑴d	1号线-起动继电器	0.VR0.5	绿
⑴c	1号线-点火控制器	0.VR1.0	绿
⑴b	1号线-点火控制器	0.VR1.0	绿
⑴a	1号线-接地	0.VR1.0	绿
①	调压整流器-蓄电池	0.VR2.0	绿
线号	导线名称	截面(mm²)	颜色

Annex 5 EFI wires and connectors model 电喷线束及接插件型号



technical requirements/技术要求：

1.Each connector positionis back-viewwill connector' material is PA66.
各接插件位置为后视，所有接插件材质为PA66。

2.All terminals are tinned brass.
所有端子为黄铜镀锡。

3.Tape wrapped position is marked with shadow.
带阴影标示处带电位置。

4.1/2winding tape overLap bending 90 degrees.
胶带缠绕1/2重叠，弯曲90度不得露出导电。

5.Dimension measuring baseline starts form sheath bottom.
尺寸测量基准以护套底部为准。

6.Middle connectors cross around over 3 circles .
中接头交叉缠绕3圈以上。

					客户	高金公司	编制规范	AD企业技术标准
					品名	电喷发动机线束 600P	比例	第 1	共 1
更改标记	内容	修订人	修订日期					
制图	金台军	批准	李光伦		图号	3410-E02B-00A2	重庆高金实业有限公司	
审核		制定日期	2011.11.29					
制造	张世群	生效日期	2011.11.30		编号	40-(-42-300		