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Attention

In order to make the diesel engine work normally and reliably, the regulations below should be followed.

1.Equip the machine with the rated output specified in the name plate, avoid overloading, over speeding or long – term operation under low load and low speed.

2.Use the fuel and lubrication specified in this manual, the fuel and oil should be purified (filtered and precipitated) before being used and the lube – oil should be changed regularly.

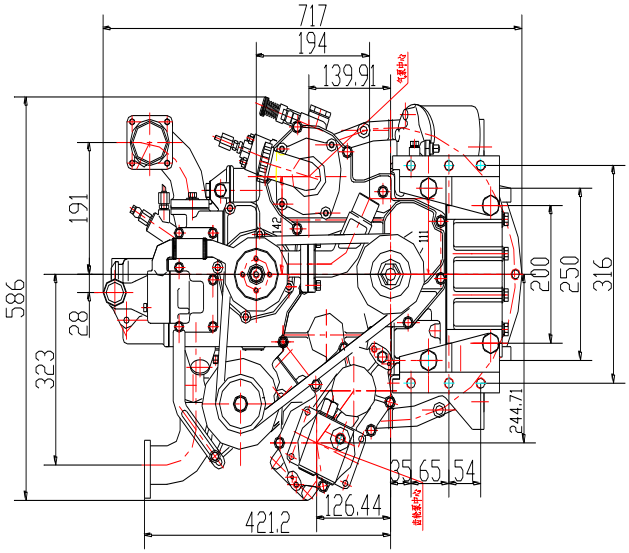
3.Check the installing and connecting bolts and the fastening bolts of the engine itself regularly, strengthen them when loosen.

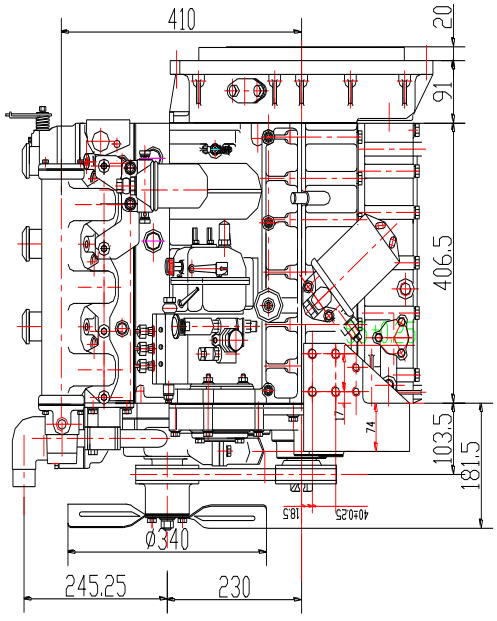
4.Clean the air filter, fuel filter, oil filter periodically according to regulations.

5.The cooling water must be clean and soft water, operating without water is forbidden.

6.The operators must get familiar with the working principles and structures of the engine, and stick to maintain regularly. The defects should be dismissed as soon as it is discovered, avoid operating defective engine.

7. Don't touch high-temperature parts (such as exhaust muffler ,EGR pipe etc.)and running parts (such as flying wheel etc.) in case of being hurt. Fuel tank should prevent fires.





Overall Dimensions

PART I SERVICE INSTRUCTION

Chapter 1 The Main points of Usage & application Range

Compared with the same type of diesel engines,its has the advantage of high power, small dimensions, low fuel and oil consumption, easy to start, high reliability, etc. It is the perfect engine of agricultural irrigation, generating sets and small type marine sets if it get proper transformation.

In order to make the diesel engine work normally and reliably, the regulations below should be followed.

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6、The operators must get familiar with the working principles and structures of the engine, and stick to maintain regularly. The defects should be dismissed as soon as it is discovered, avoid operating defective engine.

7、The location screws of fuel injection pump have been adjusted, fastened and sealed with plumbum , do not dismantle or adjust them an one will.

Chapter 2　Principal Technical Specifications

MODEL	TY395I	TY3100I
TYPE	VERTICAL WATER – COOLED FOUR – STROKE	
NUMBER OF CYLINDER	3	
PISTION STROKE	105mm	
TOTAL PISTON DISPLACEMENT(L)	2.23	2.47
COMPRESSION RATIO	18:1	
RATED OUTPUT (kW/r/min)	22.06/2300	25.7/2300
MAXIMUM TORQUE/RPM (N.m/rpm)	123/1725	140/1725
TYPE OF COOLING	FORCED WATER	
TYPE OF LUBRICATION	PRESSED OIL	
TYPE OF STARTING	ELECTRIC STARTING MOTOR	
NET WEIGHT	300+10kg	
OVERALL DIMENSIONS	666×500×678 (L×W×H)	

TYPE OF COMBUSTION	DIRECT INJECTION
CLEARNCE OF VALVE (COLD)	INTAKE VALVE 0.35mm
	EXHAUST VALVE 0.40mm
VALVE TIMING	
INTAKE VALVE OPEN	8° CA BEFORE T.D.C
EXHAUST VALVE OPEN	52° CA BEFORE B.D.C
INTAKE VALVE CLOSE	52° CA AFTER B.D.C
EXHAUST VALVE OPEN	8° CA BEFORE B.D.C
FUEL INJECTION PRESURE	1.95×10^{3} kPa
FUEL SUPPLE ADVANCED ANGLE	20±1° CA
TYPE OF FUEL PUMP	I PUMP/BQ PUMP
PLNGER DIAMETER	8.5mm
STROKE	8mm
TYPE OF FUEL INJECTOR	LONG–SHAPE MULTI–HOLE VALVE
	TYPE PF98S19
TYPE OF NOZZLE	ZCK 154S432A
TYPE OF STARTING MOTOR	QD1247A (12V, 1.5kW)
	QD1315A(12V,2.5kW)
TYPE OF RECHARGE GENERATOR	2JF200(14V) , JF11(14V , 350W)
OIL FILTER	J0810A OR JX 0811
OIL CAPACITY	4.5 LITERS
FUEL FILTER	C0708
TIGHTENING TORQUE FOR PRINCIPAL BOLTS	
CONNECTING ROD BOLT	90~110N.m
CONNECTING ROD BOLT	120~135N.m
MAIN BEARING BOLT	150~160N.m
FLYWHEEL BOLT	90~110N.m

Chapter 3 Engine installation

Power output of TY395Iand TY3100Iis effected through bolts of flywheel side connecting the flywheel with equipped machine. Diesel engine should be located properly and installed firmly with its equipped machine. The corresponding base or assembling surface frame foe diesel engine connecting part must be flat smoothly . The specific disposition of installation holes of TY395I andTY3100I type is diagramed below.

TY395I and TY3100I diesel engine can be matched with clutch assembly or clutch box according to users' requirements.

Chapter 4 Service Instruction and Engine Adjustment

1. Fuel ,oil ,and cooling water

1) Fuel

Fuel should be kept in clean and sealed container , the fuel must be precipitated and filtered for 24 hours before pouring into the fuel tank. Clean fuel can avoid faults in the fuel supply system and prolong the life of fuel injection pump and nozzle.

Summer : NO.0 light diesel fuel

Winter :NO.-10 light diesel fuel

2) oil

Viscosity is different for different brand of oil . If high viscous oil is adopted under low temperature , this would cause difficulties in output as well as in diesel engine staring and operating . On the other hand , if low viscous oil is used under high temperature , the lubricant function would be weakened and the life of diesel engine would be shorted . As usual , the lubricating-oil should be selected as the following suggestion :

a) oil HC-14 is suitable for temperature above 25℃

b) oil HC-11 is for temperature between 0℃ and 25℃

c) Oil HC-8 is for temperature below 0℃

3)Cooling Water

The coolant should be soft water , such as rain water or river water . If hard water , such as well – water or mineral water , is used, the engine should be treated once per 500 hours by weakened acid.

1) Preparation before Starting

a. Check the fixation of engine and the connection of attachments , which should be firmed well

b. Turn the flywheel , the moving –components should run smoothly and the compressing condition should be in normal condition.

c. Turn on fuel-tank cock , if there is air in the fuel pipe ,exhaust it .

d. Check the oil lever with oil stick which should line between the two marked lines.

e. Make sure the radiator has been filled with coolant and check water pipe joints in which

there should not be leaky.

f. Check battery and circuits , the former should be adequately charged and the later should be in order.

2) staring the Engine

After finishing preparation above mentioned ,check again till to be sure ready for staring and then do as follows.

Set the throttle handle at the middle speed position , turn on the power switch of starting motor

to “start” , but the time must not be more than 30 seconds , or the starting motor would be destroyed . The engine started , turn the power switch to “O” .

2. Engine stopping

1) Normal stopping

a. Before stopping engine , the load and the speed should be decreased gradually and the engine should be let run at idle speed for 2 to 5 minutes . At last , stop it .

b. In winter , when the ambient temperature is below 0 ℃ , the water in the cylinder must be drained off completely in order to avoid the engine being destroyed be freezing , which should be done after the cylinder temperature has decreased below 40℃ .

2) Emergency Stopping in case of Rain-way

When the engine speed increased out of control , in another words , running away takes place , the stopping handle must be pulled directly . If fail to stop the engine , the following emergency measures should be taken at once :

a. Loose the connecting nuts of the high-pressure fuel injection pipe to cut off the fuel supply .

b. Block the intake pipe .

c. Pull out the fuel pipe .

3. points for attention

1) Newly-produced or over-hauled diesel engine must do running for 60 hours at lower speed (below 2000rpm) and lower(below 20kW) and then it can be put into normal practice .

2) After being started , the engine must run for 2 to 5 minutes at no load , then run as normal .

3) Check the oil pressure whether in normal condition , if no pressure , stop the engine immediately and check lubricating system completely .

4) Overload should be controlled when the engine is in operation .long-time of overload is prohibited.

5) Observed the color of exhaust smoke and the sound of running , normal emission smoke should be very light or no color . If the smoke and sound of the engine get abnormal , the engine should be stopped and checked .

4. Adjustment of Engine

1) Adjustment of value clearance

Take the cylinder head-cover down and turn flywheel to make the first cylinder be at T.D.C of the compression stroke . Loosing the adjustment nut and slip a feeler gauge between the rocker arm and the value to adjust value to adjust value clearance (0.35mm thick for the inlet value and 0.40mm for the exhaust value) . Do as the same for adjusting the value clearance of the rest cylinders .

2) Adjusting of Fuel Supply Advance Angle

Dismantle the high pressure fuel injection pipe of the first cylinder , then turn the flywheel slowly and pay attention to the level of the fuel . Stop turning right way as soon as the level of the

fuel begins to rise .

And then measure arc-length between the T.D.C line in the flywheel's surface and the line in the box of flywheel . It will get the fuel supply advance angle to let the arc-length be divided be 3.07.

If the angle is bigger than 21 degrees (crankshaft angle) or less than 19 degrees , it should be adjusted . Turn the fuel pump towards cylinder block will make the angle bigger and against cylinder block will make it smaller .

Chapter 5 Fitting Wear limits of the Main Moive Parts

Chapter 6 Maintenance of the Engine

1. Diesel Engine

1) Operating – maintenance

a) Check the oil level in the oil sump to keep the level between the marked lines, approaching the upper one.

b) Check oil level in injection pump, and fill more if necessary.

c) Check cooling water in the radiator whether it is sufficient, refill it if necessary.

d) Check thoroughly and the leakage of oil or water or air should be forbidden.

e) Check all connectors and joints and keep them in normal condition.

f) Clean the dirt on the surface of the engine.

2) Maintenance after 100 Hours Operating

When the engine is operating for 100 hours, maintenance as following should be done, besides the "operating maintenance".

a) Clean the main parts of the oil filter. Replace the paper oil filter cartridge if it is worn out.

b) Clean fuel filter cartridge and replace it if necessary.

c) Check the tension cylinder head cover bolts and tighten it to regulated position.

d) Check value clearance and adjust it if necessary.

e) Check the tension of the driving belt.

f) Clean the accumulated carbon in the exhaust pipe.

g) All units including parts, assemblies which were dismantle from the engine for the maintenance should be reset carefully. After ensuring correct positions and specified clearances, start the engine and get rid of any trouble which appears. The engine should be proved perfect in performance before it is put into normal operation.

3) Maintenance after 500 Hours Operating

After the engine has been operating for 500 hours, not only the "maintenance after 100 hours operation", but also the following procedures should be done.

a) Check the injection pressure of the fuel injectors and the spray characteristics. Dismantle the fuel injectors and make needle values clean if necessary.

b) Check the fuel supply advance angle and adjust it if it is required.

c) Check the sealing condition of inlet and exhaust values. If it's necessary, the sealing lip of the values should be remedies or polished.

d) Retighten the connector bolts, the main bearing – cover bolts and the flywheel bolts.

e) Retighten cylinder head bolts and adjust value clearance as regulation.

f) Replace the lube. Oil in the fuel injection pump.

g) Clean cooling system. (fill 10% solution of HCI into the water jacket, after remaining it for 20 minutes or so, drain it off, and wash the water jacket with water repeatedly)

h) Check crankshaft seal and replace it if it is worn out.

Clean oil passage.

i) Make a whole check for the engine and do some adjustment if necessary.

2. Fuel Injection Pump

Combustion system is the heart of diesel engine. In order to prolong the life of the engine and assure good performance, it is necessary to perform perfect maintenance work for the fuel injection pump.

1) Maintenance Principle

a) Operating Maintenance

Fuel injection pump and its connecting units should be kept clean and firm to assure normal working performance. Check the fuel pipes to prevent them from blocking. Refill fuel into the tank and oil into the injection pump in time.

b) Maintenance after 500 Hours Operating

Replace the oil in the injection pump completely when the engine is running for 500 hours.

c) Maintenance after 2000 Hours Operating or in Case of abnormal Working Performance.

Make a whole – check for the fuel injection pump and clean all the units and parts. Replace the worn – out parts if necessary.

2) Cautions

a) Keep the fuel supplying system clean and fuel filter in good performance.

b) Use the regulated fuel.

c) The fuel must be precipitated and filtered completely before pouring into the fuel tank.

d) Do not dismantle the fuel injection pump if not necessary.

e) After the engine being worn by the users, oil in the injection pump and governor must be drained off completely and refill fresh oil before it is put into normal operation.

f) Keep proper amount and viscosity of oil in the governor when diesel engine is in normal operation.

3) Supplements

For accessories, starting motor and generating sets, etc. maintenance work should be performed according to their operation manual.

Chapter 7 Troubles and their Elimination

A. Engine starting in difficulty or engine fails to start

Probable Causes	Solving
1. ambient temperature too low	replace as regulated or preheat the oil
2. Faults of fuel system	
1) water in the fuel	Drain and replace fuel, clean fuel pipe and fuel filter
2) excessive viscosity of fuel	Replace with regulated brand of fuel
3) air in fuel supply system	Exhaust air and check the fuel pipe connecting nut for leakage
4) fuel pipe destroyed or leak in the connecting joints	Repair or replace them
5) fuel spray abnormal	Clean injector nozzle and adjust fuel injecting pressure
6) destroying of injecting nozzle spring	Replace it
3. incorrect valve clearance	Check and adjust it
4. incorrect brand oil	Replace it with regulated oil
5. fuel supply advance angle incorrect	Adjust it
6. low compression pressure	
1) leakage of gas through cylinder head gasket	Check the tightening torque of nut on the cylinder head, replace it if the gasket in bad

	condition
2) piston rings worn out	Replace them
3) the gaps of the rings lined on the same direction	Separate the gaps spacing 120° one another
4) piston rings being stuck or broken	Clean with diesel fuel or replace it them
5) leak in valves	Check the sealing condition of valves and seats, repair them if necessary
7. problems of electric system	
1) voltage of battery too low	Charge the batteries
2) starting motor worn out	Repair or replace it

B. Low Output

Probable causes	Solving
1. problems of fuel supply system	
1) fuel pump precise coupler worn out	Replace them
2) speed governing spring deformed	Replace it
3) uneven distribution of fuel	Adjust injecting pump
4) fuel supplying insufficient because of choking of fuel passages or fuel filter cartage	Check and make the fuel cook open, clean or replace fuel filter, adjust quantity of fuel supplying
2. speed insufficient	Adjust the governor handle to make the speed rise
3. fuel supply advance angle incorrect	Adjust it as regulated
4. cooling system out of order	Check the problem out and get rid of it

C. Self – stopping

Probable causes	Solving
1. problems of fuel supply system	
1) fuel tank empty	Fill fuel into tank
2) fuel pipe lines blocked and fuel filter choked	Check and make them clean
3) air standing in fuel supply system	Exhaust air
4) the injector needle valve clogged	Clean injector needle valve coupler, or replace it if necessary
5) governor spring broken	Replace it
2. insufficient lube. – oil supply or some components being destroyed because of faults in lubrication system	Check the quantity of oil, oil pump, oil passage, find out the faults and get rid of them
3. piston clogged in the cylinder	Repair or replace it
4. valve stuck	Clean it
5. engine over load suddenly	Relieve the load

D. Abnormal exhaust

Probable causes	Solving

1. Black smoke	
1) load too heavy	Relieve the load, if the equipment unit is in suitable, replace it
2) spraying abnormal	Repair or replace the nozzle coupler
3) air charge insufficient	Check and make the intake passage clean
4) the timing of valves' shutting or opening incorrect	Correct it
5) the timing of fuel delivery incorrect	Adjust it
2. Blue Smoke	
1) lube. – oil excessive	Drain the needless oil off
2) the piston rings stuck, worn out, insufficient elasticity or the gaps of rings in the same direction	Check and replace piston rings, or make the gaps of rings apart from one another
3) the clearance between piston and cylinder too big	Replace the piston or the cylinder
3. White Smoke	
1) water in fuel	Clean the fuel tank and fuel filter, replace the fuel with normal fuel
2) Water in cylinder	Check the cylinder – sleeve, gasket, cylinder – head cover, and replace any of them if necessary
3) the needle valve clogged or the injection pressure very low	Clean or replace the nozzle or adjust the injection pressure
4) the engine temperature too low	When the engine temperature rises, this phenomenon will disappear

E. Running Away

Probable causes	Solving
1. the governor out of order	Check the fuel controller system, get rid of the problems
2. lube. – oil excessive	Decrease the lube. – oil to normal condition

F. Supplements

If any of following condition takes place, the engine should be stopped at once

Probable causes	Solving
1. running speeding unsteady	
1) the sliding resistance of fuel pump's moving parts too big	Make the moving part's slip in good condition
2) the stiffness of governor spring in sufficient	Replace the spring
3) axel clearance of pump camshaft too big	Adjust it
2. Coolant disappearing	Check the water pipes, water passage and water pump, get rid of the faults which are found
3. oil pressure disappears suddenly	Check the lubrication system

Chapter 8　Seal and Preservation of the Engine

I. Diesel Engine

If engine is out of operation for long time, the following preservation methods should be followed to avoid corrosion or erosion.

1. Drain the fuel and lube – oil away.
2. Remove the dust and oil stain on the surface.
3. Drain the oil filter and clean it.
4. Dismantle the oil filter and clean it.
5. Dismantle the fuel filter and clean it.
6. Clean the crank case.
7. Heat 2kg brand HC – 8 oil to around 120° C until no foam is seen (waterless oil). Fill 1Kg waterless oil into crank case, rotate the engine so that the oil would be sprayed upon mobile parts, then drain the oil.
8. Fill a little amount of waterless oil into intake passage, rotate the engine so as to make the oil cover piston tops, cylinder liners and valve sealing surfaces, set the exhaust valve at close state to separate the liners from outside.
9. Add 0.2Kg industrial Vaseline into the remainder waterless oil, heat and mix them till melt completely, that is the mixed oil.
10. Dismantle the cylinder head cover, stain a brush with the mixed oil to brush rocker arms and other parts.
11. Install all the parts and make the cover of the engine clean and dry.
12. Pack the parts of the intake and exhaust pipe well with oiled paper to avoid pollutants entering.

Finally, paint the rest mixed oil evenly on the unpainted exposed parts (eg. Flywheel) of the

13. engine.
14. Oil – brushing is forbidden on rubber and plastic parts.
15. The engine should be put in a well – ventilated clean and dry place, placement of chemicals (eg. Fertilizer, pesticide) is forbidden there.

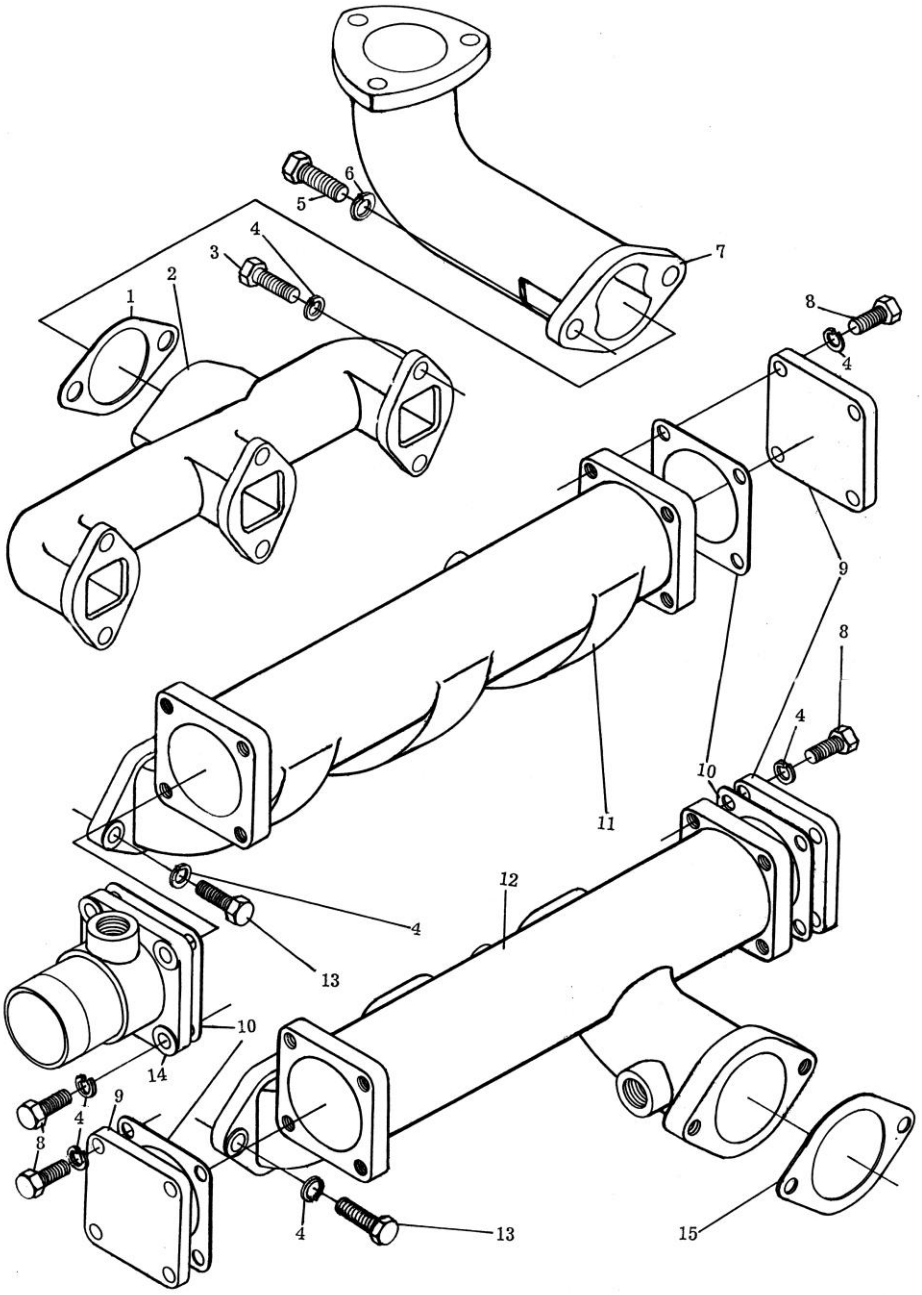
Caution: Maintenance as above can keep 3 months, repeat it if over 3 months.

II. Fuel Injection Pump

In order to prevent the fuel pump from eroding during long – term preservation, the pump should be sealed.

Drain the remainder fuel, filling in antirust oil, fix the pump on a testing platform, connecting the pipes and let antirust oil in it, run the pump with the speed 500rpm to made the antirust oil follow over the surface of all parts, then drain the oil in the camshaft case and place protection caps upon the fuel intake and exhaust pipe joints.

PARTII PARTS WITH ILLUSTRATIONS

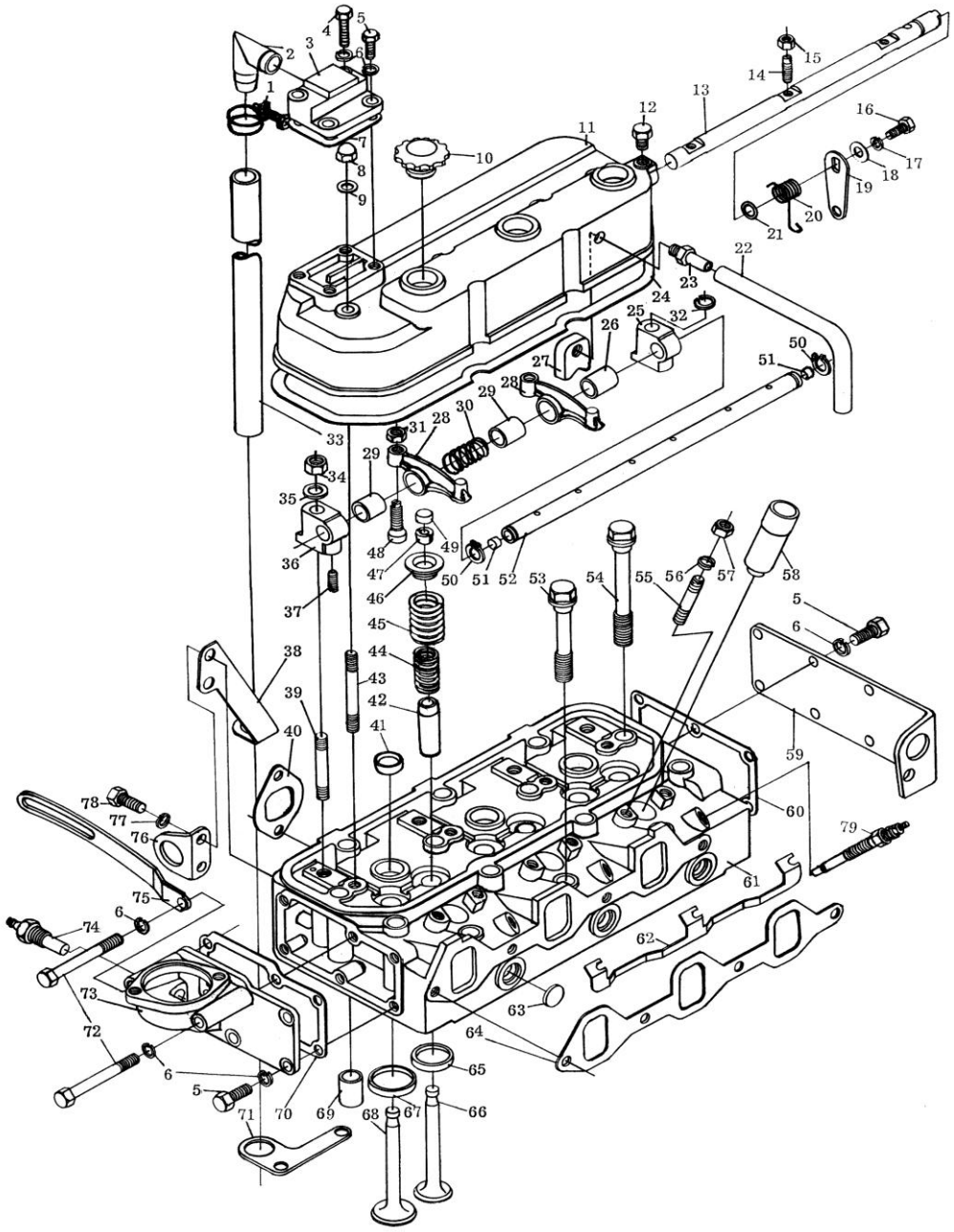


图一　进排气岐管总成

Fig1　Exhaust Pipe Assembly

Intake and Exhaust Assembly(Fig.1)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	TY295I.10.2-3	排气弯管垫片 Exhaust pipe gasket	1
2	TY395I.10-2	排气支管 Exhaust connecting pipe	1
3	GB5783-86	螺栓 M8×25 Stud bolt M8×25	6
4	GB93-87	垫圈 8 Washer 8	12
5	GB5783-86	螺栓 M10×22 Stud bolt M10×22	2
6	GB93-87	垫圈 10 Washer10	2
7	TY395I.10-2-4	排气弯管 Exhaust pipe	1
8	GB5783-86	螺栓 M8×20 Stud bolt M8×20	4
9	TY395I.10-4	进气管法兰 Intake pipe flange	2
10	TY395I.10-5	进气管法兰垫片 Intake pipe flange gasket	2
11	TY395IT.10.1-1NBa	进气管 Intake pipe(30Ps)	1
12	TY395IT.10-1NBa	进气管 Intake pipe(35Ps)	1
13	GB5783-86	螺栓 M8×22 Stud bolt M8×22	6
14	TY395I.10.1-2NBa	进气接管 Intake connecting pipe	1
15		进气管弯头垫片 Intake pipe elbow gasket	1



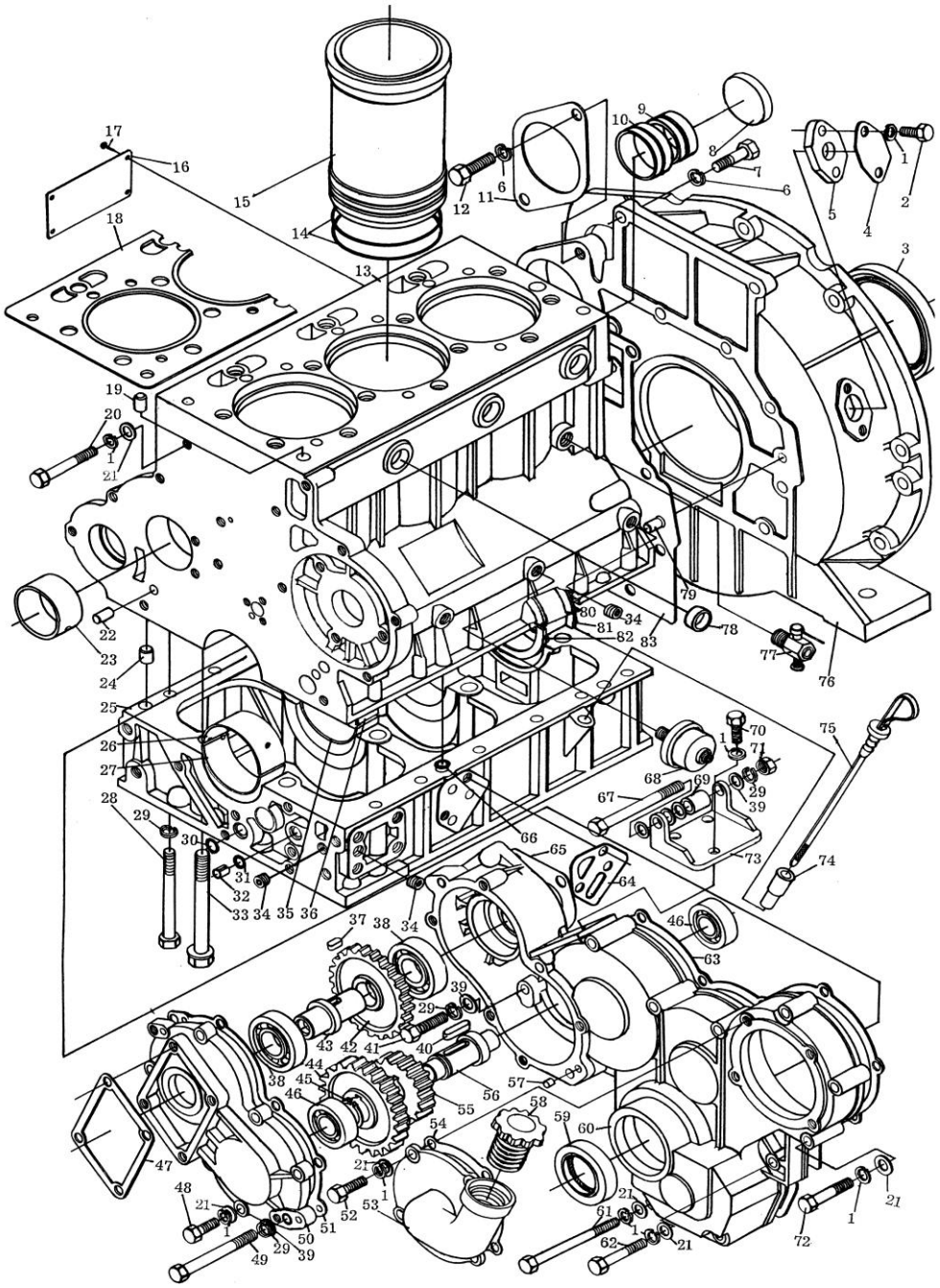
图二　气缸盖总成

Fig2　Cylinder Head Assembly Intake

Cylinder head Assembly(Fig.2)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1		卡箍 Hoop assembly	1
2	TY395IT.1.2-10NB	通气管接头 Ventilate pipe fittings	1
3	TY395IT.1.2-12NB	通气室盖板 Ventilate room blind fiangs	1
4	GB5783-86	螺栓 M8×40 Bolt M8×40	2
5	GB5783-86	螺栓 M8×20 Bolt M8×20	2
6	GB859-87	垫圈 8 Washer8	24
7	TY395IT.1.2-11NB	通气塞盖板垫片 Ventilate the board gasket of plug livl	1
8	GB923-88	盖形螺母 M8 Nut M8	4
9	GB848-85	垫圈 8 Washer8	4
10	TY395.1.2-4	调整口盖 Adjusting hole cover	3
11	TY395.1.2-1	气缸盖罩 Cylinder head bonnet	1
12	TY395.1.2-6	定位螺钉 Locating screw	1
13	TY395.1.2-2	减压轴 Decompression shaft	1
14	TY395.1.2-3	减压螺钉 Reduce pressure screw	3
15	GB6170-86	螺母 M6 Nut M6	3
16	GB5783-86	螺栓 M6×16 Bolt M6×16	1
17	GB859-87	垫圈 6 Washer6	1
18	TY395.1.2-8	垫圈 Washer	1
19	TY395.1.2-2	减压手柄 Decompression handle	1
20	TY295I.1.3-4	扭力弹簧 The spring of twisting force	1
21	GB3452.1-2	O 型圈 11.8×2.65 Type O rubber seal ring 11.8×2.65	1
22	SG79-84	通气管 8×0.6×190	1
23	TY295I.1-25	导气管 Wind pipe	1
24	TY395.1-1	气缸盖罩垫片 Cylinder head bonnet gasket	1
25	TY295.1-10	摇臂轴支座 I Rockshaft carrier II	3
26	TY295.1-13	摇臂轴套 I Rockershaft bush I	2
27	TY295I.1.4a	呼吸器总成 Respirator becomes always	1
28	TY295.1-23	气门摇臂 Valve rocker arm	6
29	S195-03005	摇臂衬套 Rocker arm bush	6
30	TY295.1-14	摇臂轴弹簧 Rockshaft spring	3
31	GB6170-86	螺母 M8 Nut M8	4
32	TY495.1-24	摇臂轴支座垫圈 Rockshaft carrier washer	3
33	TY395IT.1.2-13NB	胶管 Stick pipe	1
34	GB6170-86	螺母 M12 Nut M12	4
35	GB859-87	垫圈 12 Washer 12	3
36	TY295.1-11	摇臂轴支座 II Rockshaft carrier II	1
37	TY295.1-22	锥端紧定螺钉 Screw	1
38	TY395IT.1.2-14NB	胶管定位板 Stick pipe location board	1
39	TY495.1-12	摇臂轴支座固定螺钉 The carrier of rockshaft fires screw	4
40	TY295.1-20	排气管垫片 Exhaust pipe gasket	3

41	TY295.1.1-5	水堵φ28 Water plug φ28	3
42	S195-03011	气门导管 Valve guide stem	6
43	GB899-88	螺栓 AM8×80 Bolt AM8×80	4
44	TY295.1-3	气门小弹簧 Valve spring(inner)	6
45	TY295.1-4	气门大弹簧 Valve spring(outer)	6
46	S195-03008	气门弹簧上座 Spring seat cover	6
47	S195-03007	气门锁夹 Valve collects	12
48	S195-03006-1	气门间隙调整螺钉 Valve clearance adjusting screw	6
49	TY495.1-23	气门杆护帽 Valve cap	6
50	GB894.1-86	轴用挡圈φ16 Check ring φ16	2
51	TY295.1.2-2	摇臂轴堵塞 Rockshaft plug	2
52	TY395.1.3.2-1	摇臂轴 Rockshaft	1
53	TY395I.1-5	气缸盖螺栓 I Cylinder head bolt I	3
54	TY295.1-6	气缸盖螺栓 II Cylinder head bolt II	11
55	GB899-88	螺栓 AM8×50 Bolt AM8×50	6
56	GB859-87	垫圈 8 Washer8	6
57	GB6170-86	螺母 M8 Nut M8	6
58	TY395I.1.1-6	喷油器镶套 Injection bush	3
59	TY295.1-8	后盖板 Rear cover plate	1
60	TY295.1-7	后盖板垫片 Rear cover plate gasket	1
61	TY395I.1.1-1	气缸盖 Cylinder head	1
62	TY395I.1-3	电热塞接线板 The wring board	1
63	TY295.1.1-4	堵塞 Stopper	3
64	TY295.1-9	进气管垫片 Intake pipe gasket	1
65	TY295.1.1-3	排气门座 Exhaust valve seat	3
66	TY295.1-2	排气门 Exhaust valve	3
67	TY295.1.1-2	进气门座 Intake valve seat	3
68	TY295.1-1	进气门 Intake valve	3
69	TY495.2.1-8	弹性套 Spring bush	3
70	TY295.1-19	前盖板垫片 Front cover plate gasket	1
71	TY395IT.1.2-15NB	下定位板 Lower orientation board	1
72	GB5782-86	螺栓 M8×80 Bolt M8×80	2
73	TY395I.2-6	前盖板 Front cover plate	1
74	NJ-12 型	水温感应塞 Water temperature induction plug	1
75	TY295.2-20a	发电机调节支架 Belt tightening pulley bracket	1
76	TY295.1-21	吊耳 Hoisting ring	1
77	GB859-87	垫圈 10 Washer 10	2
78	GB5783-86	螺栓 M10×20 Bolt M10×20	2
79	PF68S19	喷油器总成 Injection	3



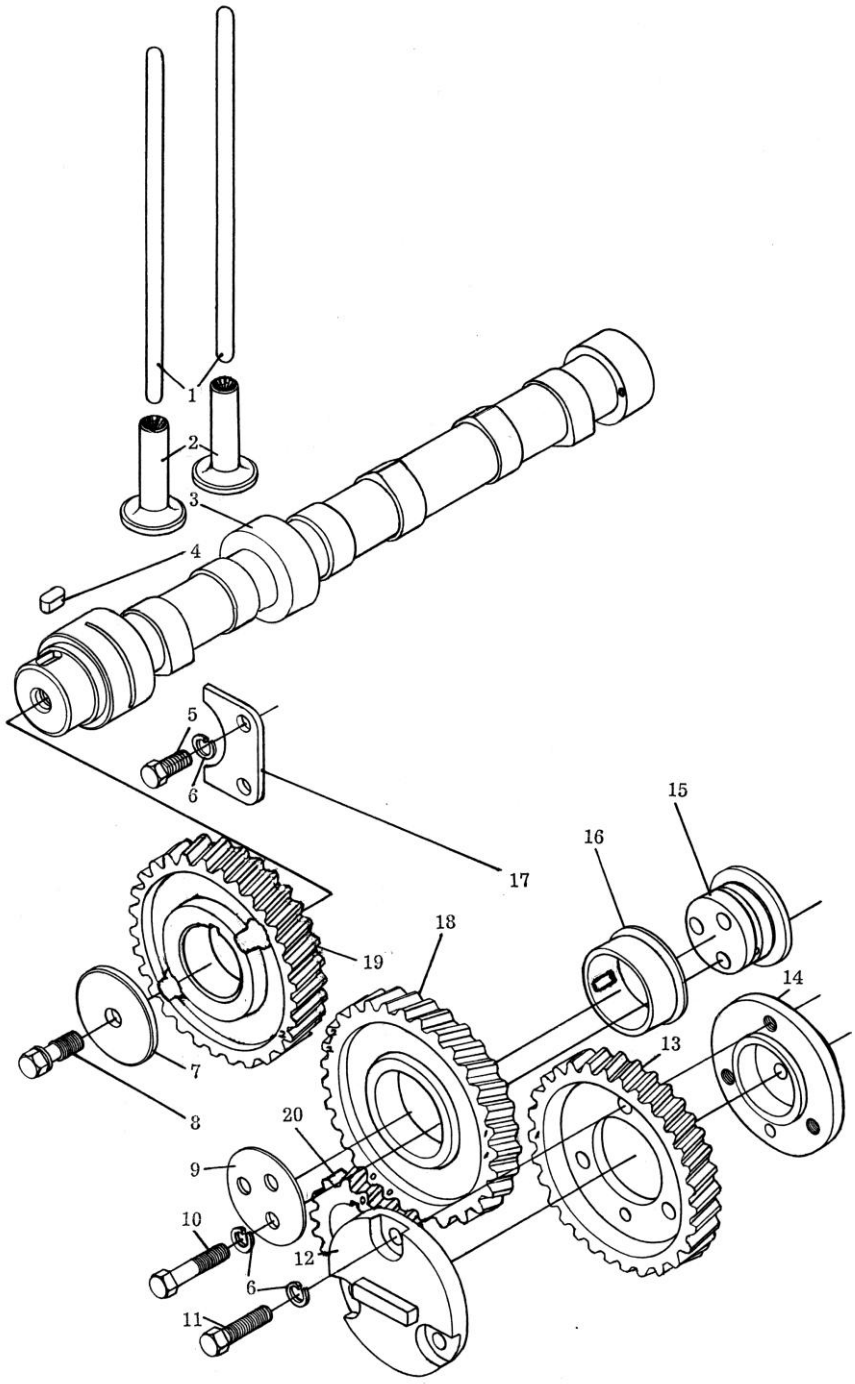
图三　气缸体总成

Fig3　Cylinder Block Assembly

Cylinder block Assembly(Fig.3)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	GB859-87	垫圈 8 Washer8	32
2	GB5783-86	螺栓 M8×16 Bolt M8×16	2
3	GB2600-80	骨架油封 PG100×130×12 Oil seal PG100×130×12	1
4	TY395I.2-17	观察窗口盖板 Cover of observation hole	1
5	TY395I.2-18	观察窗口盖板垫片 Gasket of observation hole	1
6	GB859-87	垫圈 12 Washer12	12
7	GB5783-86	螺栓 M12×35 Molt M12×35	10
8	TY295.2.1-11	堵片 Plug	1
9	TY295.2.1-3	凸轮轴后衬套 Rear camshaft bush	1
10	TY295.2.1-2	凸轮轴中间衬套 Inside camshaft bush	1
11	TY295.2-23	起动电机垫片 Start generator gasket	1
12	GB5783-86	螺栓 M12×35 Molt M12×35	2
13	TY395.2.1-1	气缸体 Cylinder block	1
14	TY295.2-8	水封圈 Water seeling ring	6
15	TY395I.2-7	气缸套 Cylinder sleeve	3
16	TY395I.2-29	铭牌 Date plate	1
17	GB867-86	铆钉 2×6	4
18	TY395.2-6	气缸垫 Cylinder head gasket	1
19	TY295.2.1-10	定位销 Pin	2
20	GB5782-86	螺栓 M10×110 Bolt M10×110	
21	GB859-87	垫圈 8 Washer8	
22	TY295.2.1-5	定位销 Pin	2
23	TY295.2.1-2	凸轮轴前衬套 Front camshaft bush	1
24	TY395IT.2.1-10NB	定位销 Pin	1
25	TY395.2.1-3	整体主轴承座 Main bearing cap	1
26	TY295.2-4	前后上主轴瓦 Front and rear main bearing halfshelf(upper)	2
27	TY295.2-5	前后下主轴瓦 Front and rear main bearing halfshelf(lower)	2
28	GB5782-86	螺栓 M10×110 Bolt M10×110	8
29	GB859-87	垫圈 10 Washer10	
30	GB3452.1-82	"O"型密封圈 11.8×1.8"O"Seal ring11.8×1.8	1
31	GB3452.1-82	"O"型密封圈 15×1.8"O"Seal ring15×1.8	1
32	TY495.2.1-8	弹性套 Elastic sleeve	3
33	TY295.2.1-8	主轴承螺钉 Main bearing cap	8
34	TY495.2.1-7	油道螺塞 Oil gallery plug	6
35	TY295.2-6	中间上主轴瓦 Middle main bearing halfshaft(upper)	4
36	TY295.2-7	中间下主轴瓦 Middle main bearing halfshaft(lower)	4
37	GB1096-79	键 10×16	1
38	GB276-82	滚动轴承 203 Ball bearing 203	1
39	GB93-87	垫圈 10 Washer10	
40	GB1096-79	键 10×34	1
41	GB5782-86	螺栓 M10×110 Bolt M10×110	

42	TY295IT.16-4a	液压泵传动齿轮 II Hydraulic pumpp gear II	1
43	TY295.2-11	液压泵传动轴 Transmission shaft of lift pump	1
44	TY295IT.2-37b	液压泵传动齿轮 I Hydraulic pumpp gear I	1
45	GB894.1-86	挡圈 30 Circlip30	1
46	GB276-82	滚动轴承 106 Ball bearing 106	1
47	TY295.2-13	液压泵盖板垫 Gasket of lift pump	1
48	GB5782-86	螺栓 M8×30 Bolt M8×30	12
49	GB5782-86	螺栓 M10×95 Bolt M10×95	2
50	TY295.2-12	液压泵盖板 Cover of lift pump	1
51	TY295.2-13	液压泵盖板垫片 Gasket of lift pump	1
52	GB5782-86	螺栓 M8×30 Bolt M10×30	2
53	TY395.2-5	气泵孔盖板 Cover of air pump's hole	1
54	TY395.2-4	气泵孔盖板垫片 Gasket of air pump's hole	1
55	TY295IT.16-2a	传动轴齿轮 Transfer axle gear	1
56	TY295IT.2-32a	传动轴 Transfer axle	1
57	GB119-86	定位销 5×10 Pin5×10	2
58	TY295IT.2.3	加油口盖组合件 Oil filler assembly	1
59	JB2600-80	骨架油封 PG45×65×12 Oil seal PG45×65×12	1
60	TY395.2-3	齿轮室盖 Gear case cover	1
61	GB5782-86	螺栓 M8×75 Bolt M8×75	2
62	GB5783-86	螺栓 M8×30 Bolt M8×30	2
63	TY295.2-9	齿轮室盖垫片 Gear case gasket	1
64	TY295.2-22	机油滤清器垫片 Oil clarifier gasket	1
65	TY295IT.16-12a	液压泵垫片 hydraulic pressure pump gasket	1
66	GB3452.1-2	O 型圈 13.2×2.65 Type O rubber seal ring 13.2×2.65	1
67	TY295IT.2-35b	发电机支架螺栓 Alternator support body	1
68	CY-412	机油压力感应塞 Oil pressure sensor	1
69	TY295I.2-27	发电机用衬管 Eiectrical generator's pise	1
70	GB5782-86	螺栓 M10×60 Bolt M10×60	3
71	GB859-87	垫圈 10 Washer10	3
72	GB5782-86	螺栓 M8×55 Bolt M8×55	6
73	TY295.2-19	发电机支架 Alternator support body	1
74	TY295I.2.2.2	机油标尺套管结合部 Oil pressure sensor	1
75	TY295I.2.2.1	机油标尺结合件 Oil level dipstick	1
76	TY295.2-1	飞轮壳 Flywheel box	1
77	S195-01300A	放水开关总成 Water-draining cock	1
78	TY295.2.1-4	油堵 Oil stopper	7
79	TY295.2.1-10	定位销 Pin10	2
80	TY295.2-3	上止推片 Upper thrust piece of crankshaft	2
81	TY495.2-26	下止推片(外)Lower thrust piece of crankshaft(outer)	1
82	TY495.2-25	下止推片(内)Lower thrust piece of crankshaft(inner)	1
83	TY395.2-2	飞轮壳垫片 Flywheel box gasket	1

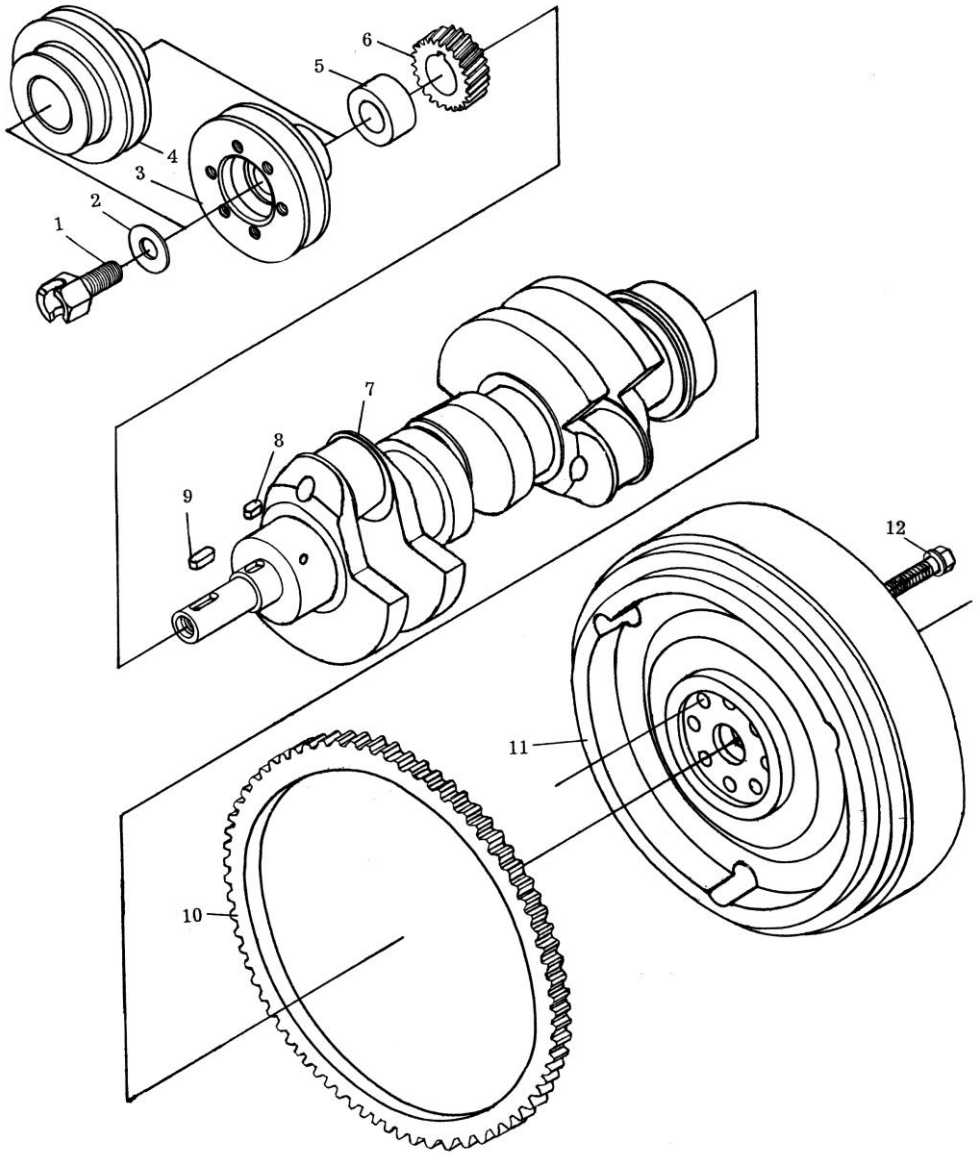


图四　配气机构总成

Fig4　Cainshaft Assembly

Cainshaft Assembly(Fig.4)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	TY295.3-3	气门推杆 Valve push rod	6
2	TY295.3-2	气门挺柱 Valve tappet	6
3	TY395I.3-1	凸轮轴 Camshaft	1
4	S195-02003	平键 Flat key	1
5	GB5783-86	螺栓 M8×16 Bolt M8×16	2
6	GB859-87	垫圈 8 Washer 8	8
7	TY295.3-13	凸轮轴齿轮压板 Camshaft gear holddown	1
8	TY295.3-14	凸轮轴齿轮紧定螺钉 Screw	3
9	TY295.3-9	中间齿轮压板 Idle gear holddown	1
10	GB5782-86	螺栓 M8×40 Bolt M8×40	3
11	GB5783-86	螺栓 M8×25 Bolt M8×25	3
12	TY2100II.3-10	驱动盘 drive tray	1
13	TY295.3-10	喷油泵齿轮 Fuel injection pump gear	1
14	TY295.3-11	喷油泵传动法兰 Flange joint of fuel pump	1
15	TY295.3-7	中间齿轮轴 Idle gear shaft	1
16	TY295.3-8	中间齿轮轴衬套 Idle gear bush	1
17	TY295.3-5	凸轮轴止推片 Thrust piece	1
18	TY295.3-6	中间齿轮 Idle gear	1
19	TY295.3-4	凸轮轴齿轮 Camshaft gear	1

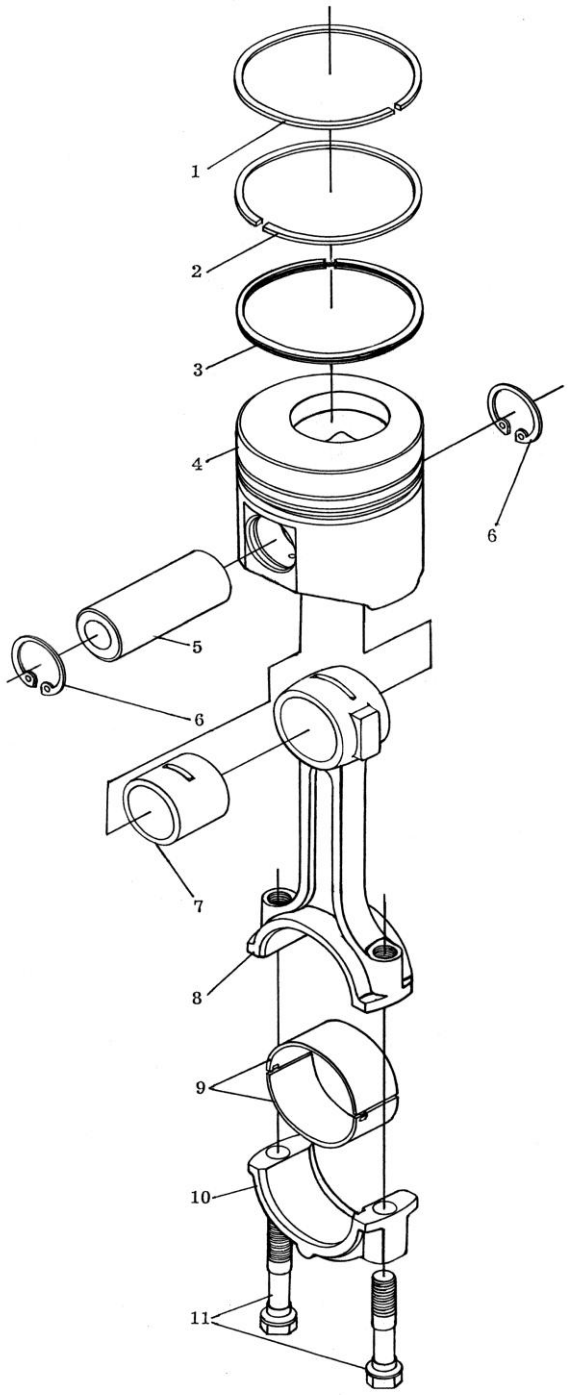


图五　曲轴飞轮总成

Fig5　Crankshaft Flywheel Assembly

Grandshaft-flywheel Assembly(Fig.5)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	TY295.4.2-7	起动爪 Stating claw	1
2	TY295.4.2-8	起动爪垫圈 Starting claw washer	1
3	TY395I.4.2-9	皮带轮 Belt pulley	1
4	TY295IT.4.2-9a	皮带轮 Belt pulley	1
5	TY295.4.2-6	止动套 Bush	1
6	TY295.4.2-5	曲轴齿轮 Crankshaft	1
7	TY395I.4.2-4	曲轴 Crankshaft	1
8	S195-05008	曲轴平键 Key	1
9	GB1567-79	键 A8×5×28 Key A8×5×28	1
10	TY295.4.2-2	齿圈 Flywheel gear ring	1
11	TY395I.4.2-1	飞轮 Flywheel	1
12	TY295.4.2-3	飞轮螺栓 Flywheel bolt	6

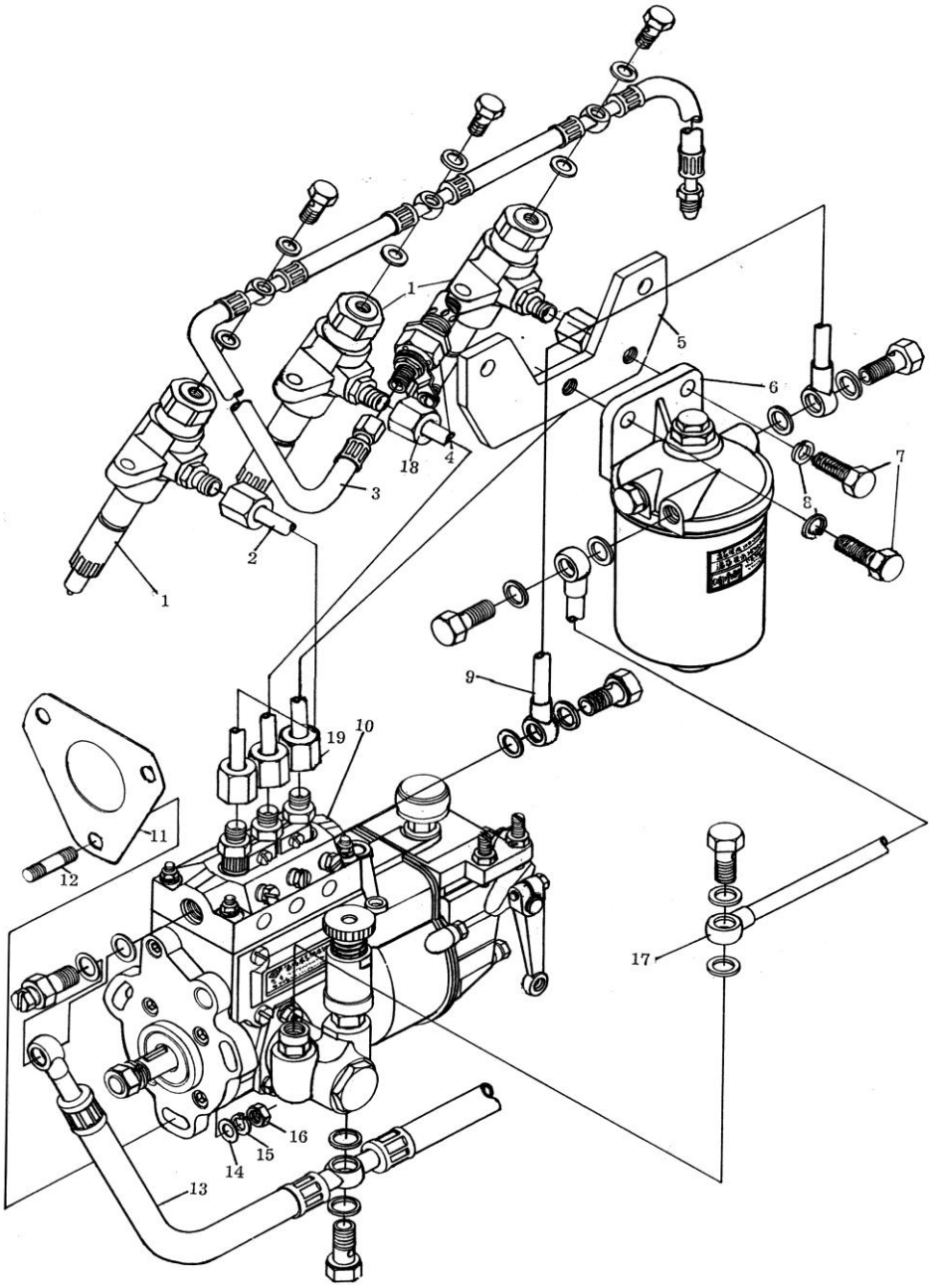


图六　活塞连杆总成

Fig6　Piston Connecting Rod Assembly

Piston connecting Rod Assembly(Fig.6)

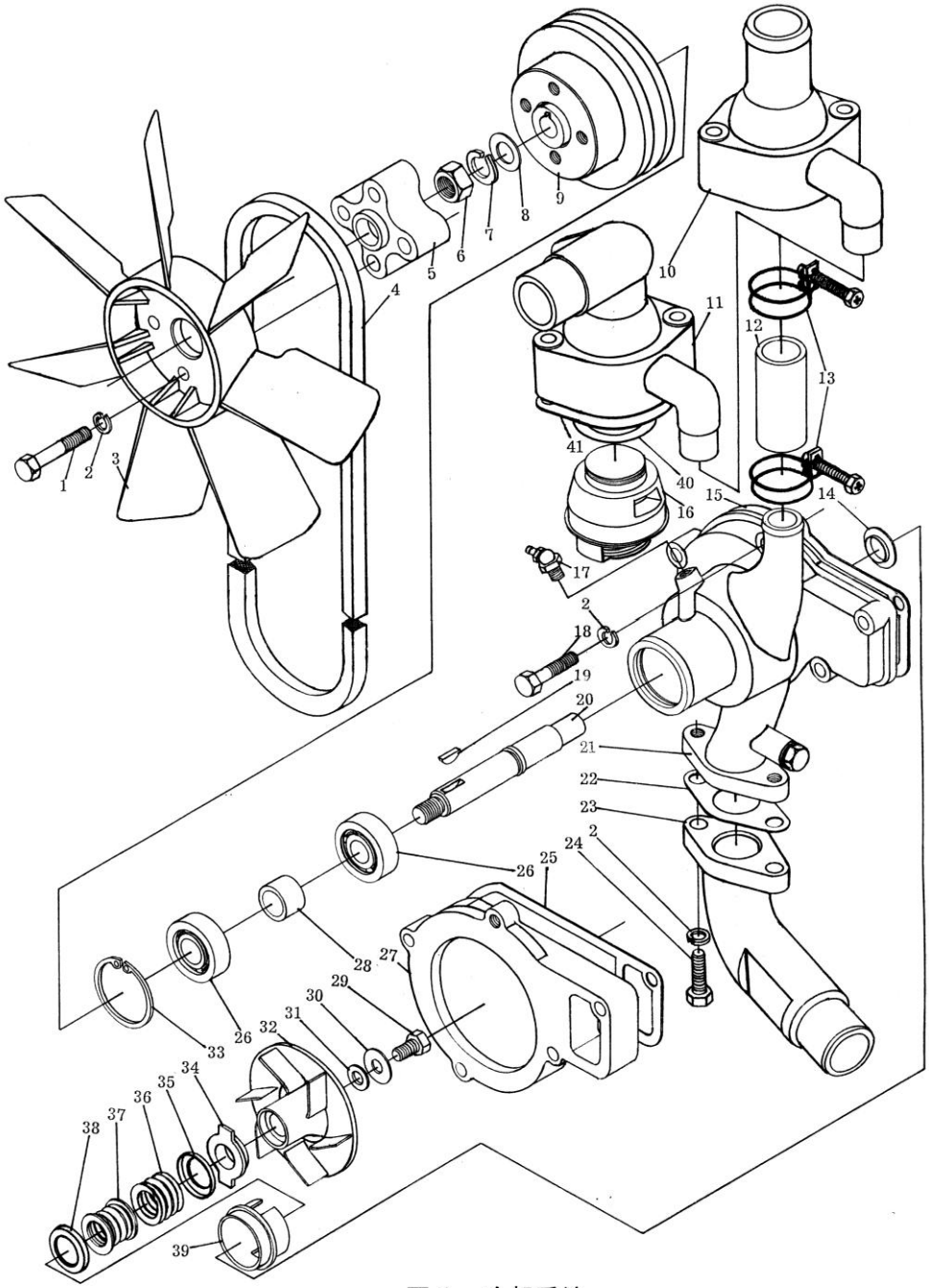
序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	TY395I.4.1-1	第一道气环 Compression ring（1）	3
2	TY395I.4.1-2	第二道气环 Compression ring（2）	3
3	TY395I.4.1.1	螺旋撑簧油环 Oil scraper ring	3
4	TY395I.4.1-4	活塞 Piston	3
5	TY295.4.1-3	活塞销 Piston pin	3
6	GB893-76	挡圈 37 circlip 37	6
7	TY295.4.1.2-2	连杆小头衬套 Connecting small rocl bushing	3
8	TY295.4.1.2-1	连杆体 Connecting rod assembly	3
9	TY295.4.1-6	连杆轴瓦 Connecting rod bearing shell	3
10	TY295.4.1.2-3	连杆盖 Connecting rod cap	3
11	TY295.4.1.2-4	连杆螺栓 Connecting rod bolt	6



图七　燃油系统
Fig7　Fuel Supply System

Fuel System Assembly(Fig.7)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	PF68S19	喷油器总成 Injection assy	3
2	TY395.15.1	一缸高压油管总成 High pressure ipe of cylinder I	1
3	TY395.15.7	喷油器回油管总成 Injecter fuel return pipe	1
4		预热塞 Hest plug	1
5	TY395I.10-3NB	柴滤支架 Cleamer clamp	1
6	C0708A	柴油滤清器 Frel filter assy	1
7	GB5782-86	螺栓 M10×25 Bolt M10×25	1
8	GB859-87	垫圈 10 Washer 10	1
9	TY395.15.6	滤清器喷油泵回油管总成	1
10		喷油泵总成 Fuel injection pump	1
11	TY395.2-7	喷油泵垫片 Fuel injection pump gasket	1
12	GB899-88	双头螺栓 AM8×25 Stud Bolt AM8×25	3
13	TY395.14.4	Fuel pipe assy between fuel-tank transfer-pump and injection-pump	1
14	GB848-87	垫圈 8 Washer8	3
15	GB859-87	垫圈 8 Washer8	3
16	GB6170-86	螺母 M8 Nut M8	3
17	TY395.15.5	输油泵滤清器回油管总成	1
18	TY395.15.3	二缸高压油管总成 High pressure ipe of cylinder II	1
19	TY395.15.4	三缸高压油管总成 High pressure ipe of cylinder III	1
20	TY395I.15.1-1	高压油管 High pressure ipe of cylinder	3
21	TY395I.15.6-3	回油胶管 150Return oil gule cannulation	2
22	TY395I.15.6-5	回油胶管 320Return oil gule cannulation	1
23	TY395I.15.6-6	回油胶管 180Return oil gule cannulation	1

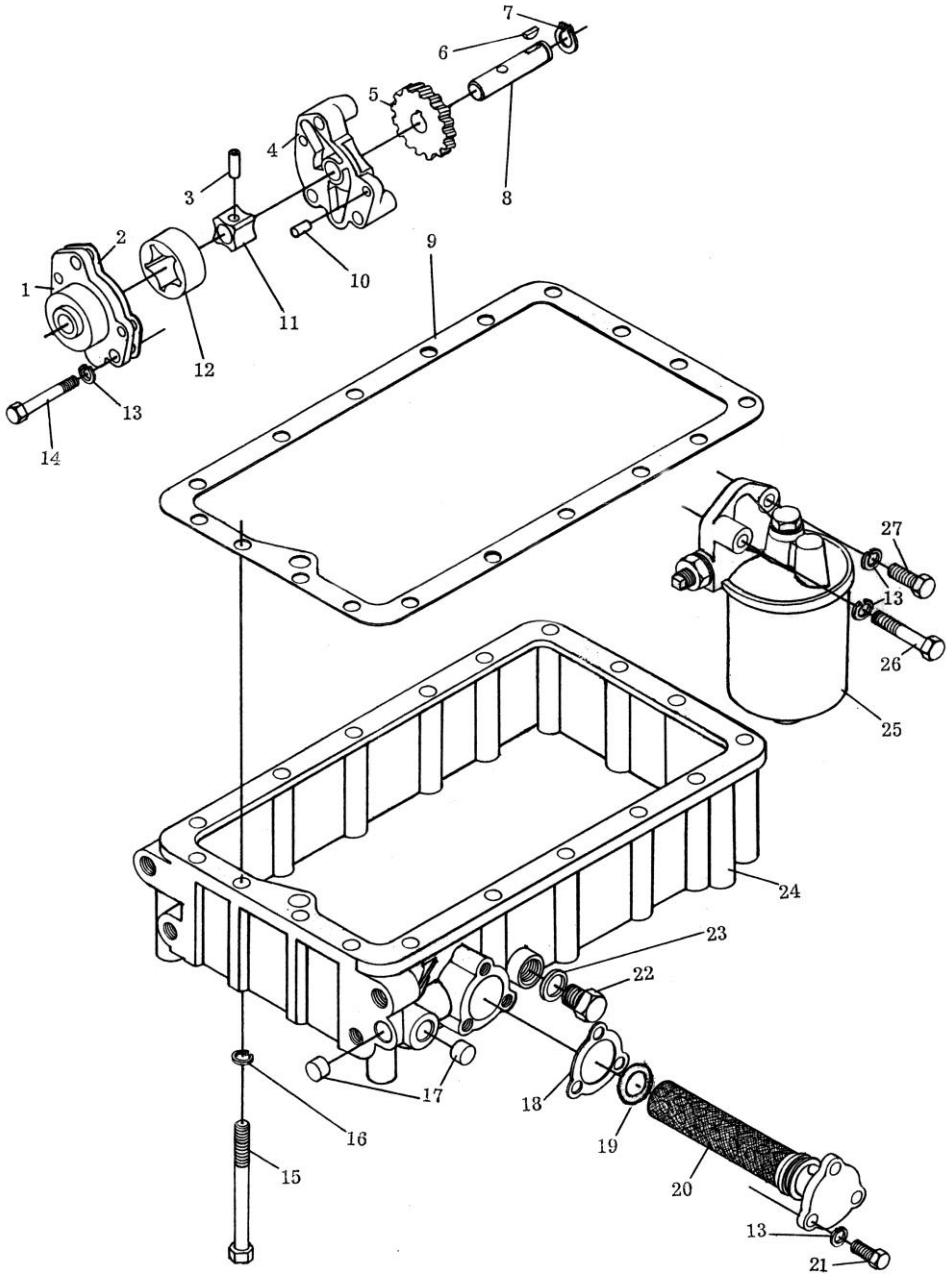


图八　冷却系统

Fig8 Cooling System

Cooling System Assembly(Fig.8)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	GB5782-86	螺栓 M8×45 Bolt M8×45	4
2	GB859-87	平垫圈 8 Flat Washer8	7
3	TY395I.12-15	风扇 Radiater Fan	1
4	HG4-401-74	风扇带 13×8×1000 Fan Beet 13×8×1000	1
5	TY395I.12-18	风扇垫块 Radiater Fan	1
6	GB6173-86	螺母 M12 Nut M12	1
7	GB859-87	弹簧垫圈 12 Spring Washer	1
8	GB97.1-85	平垫圈 12 Flat Washer	1
9	TY295.12-5	皮带轮 Pulley	1
10	TY295.13-1	节温器上盖 Upper cap	1
11	TY295IT.13-1	节温器上盖 Upper cap	1
12	TY295.13-7	小水胶管 Small water tabe	1
13	TY295.13.3	卡箍总成φ33 Hoop assemblyφ33	2
14	295-14006	甩水圈 Water thrower	1
15	TY295.12-13	水泵垫片 Water pump washer	1
16	TY295I.13.5	节温器总成 Assembly	1
17	GB1152-76	油杯 Oil cup	1
18	GB5782-86	螺栓 M8×35 Bolt M8×35	1
19	GB1099-79	键 5×16 Key 5×16	1
20	TY295.12-4	水泵轴 Water pump shaft	1
21	TY295.12-1	水泵体 Water pump assembly	1
22	TY495.12-7	下水管垫片 Lower water tabe gasket	1
23	TY295.13-4	下水管 Lower water tabe	1
24	GB5783-86	螺栓 M8×25 Bolt M8×25	2
25	TY295.12-14	水泵座垫片 Water pump seat washer	1
26	GB278-76	滚动轴承 60203 Rolling bearing 60203	2
27	TY295.12-21	水泵座 Water pump seat	1
28	TY295.12-12	轴承隔套 Bearing sleeve	1
29	GB5783-86	螺栓 M8×14 Bolt M8×14	1
30	295-14005	锁片 Locking ring	1
31	GB97.1-85	垫片 8 Washer 8	1
32	TY295.12-3	水泵叶轮 Washer pump wheel	1
33	GB893.1-86	挡圈 40 Circlip40	1
34	295-14100b	水封部件 IIWater seal assembly II	1
35	TY295.12-9	水封弹簧座 Water seal spring seat	2
36	TY295.12-8	水封弹簧 Water seal spring	1
37	TY295.12-7	橡胶水封 Rubber water seal	1
38	TY295.12-9	水封弹簧座 Water seal spring seat	2
39	295-14100a	水封部件 I Water seal assembly I	1
40	TY295.13-3	节温器垫片 Temperature regulator gasket	1
41	TY295.13-2	节温器上盖垫片 Temperature regulator over cap gasket	1



图九　润滑系统
Fig9　Lubricantion System

Lubricantion System Assembly(Fig.9)

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	TY395.5-1	机油泵上体 Upper oil pump body	1
2	TY395.5-5	机油泵上体垫片 Upper oil pump body gasket	1
3	TY395.5.1-3	销 Pin	1
4	TY395.5-4	机油泵下体 Lower oil pump body	1
5	TY395.5-3	机油泵齿轮 Oil pump gear	1
6	GB1098-79	键 4×65×16 Key 4×65×16	1
7	GB894.1-86	挡圈 14 Check ring 14	1
8	TY395.5.1-2	机油泵轴 Oil pump shaft	1
9	TY395.7-2	油底壳垫片 Oil sump gasket	1
10	GB119-86	销 A5×14 PinA5×14	2
11	TY395.5.1-1	内转子 Inner rotor	1
12	TY395.5-2	外转子 Outer rotor	1
13	GB859-87	垫圈 8 Washer 8	8
14	GB70-85	螺钉 M8×55 Screw M8×55	3
15	GB5782-86	螺栓 M10×65 Bolt M10×65	18
16	GB59-87	垫圈 10 Washer 10	18
17	TY295I.7-7	油堵 Stopper	2
18	TY295.7.1-2	吸滤器垫片 Oil sucking and staining gasket	1
19	TY295I.7.1-3	密封圈 sealing ring	1
20	TY395.7.1.1	吸滤器焊合件 Oil Sucking and Straining Meldment	1
21	GB5782-86	螺栓 M8×22 Bolt M8×22	3
22	TY295I.7-2	放油螺塞 Oil drain plug	1
23	TY295.7-3	放油螺塞垫圈 Oil drain plug washer	1
24	TY395.7-1	油底壳 Oil sump	1
25	J0810A	机油滤清器 Oil filter	1
26	GB5782-86	螺栓 M8×50 Bolt M8×50	1
27	GB5783-86	螺栓 M8×25 Bolt M8×25	1

JD390 appropriative

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	JD490.4.1.2	连杆机械合件 Connecting rod assembled	3
2	JD490.4.1-1	第一道气环 Compression ring(1)	3
3	JD490.4.1-2	第二道气环 Compression ring(2)	3
4	JD3100Q.4.1-3	活塞销 Piston pin	3
5	JD490.4.1-4	活塞 Piston	3
6	JD490.4.1-6	连杆轴瓦 Connecting rod bearing shell	6

7	JD490.2-7	缸套 Cylinder sleeve	3
8	TY295.2-8	水封圈 Water seeling ring	3
9	JD490.4.1.1	油环部件 Oil ring	3
10	JD490.1-3	进气门 Intake valve	3
11	JD490.1-9	排气门 Exhaust valve	3
12	JD490.1.1-2	进气门座 Intake valve seat	3
13	JD490.1.1-3	排气门座 8 Exhaust valve seat	3

TY3100I appropriative

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	TY3100I.2.1	气缸体 Cylinder block	1
2	TY3100I.10.1-1	进气支管 Intake connection pipe	1
3	TY3100I.2-6	气缸垫 Cylinder gasket	1
4	TY3100I.4.1	活塞连杆总成 Connecting rod assembled	3
5	TY3100I.1.1-1	气缸盖 Cylinder head	1
6	TY3100I.10.1-2	进气管垫片 Intake pipe gasket	1
7	TY3100I.10.2-1	排气管 Exhaust pipe	1
8	TY2100I.2-7	气缸套 Cylinder sleeve	3

JD3102 appropriative

序号 Ser NO.	图号 Parts NO.	名称 Name of parts	数量 Qty
1	JD3100Q.4.1.2	连杆机械合件 Connecting rod assembled	3
2	JD3100I.2-16	气缸垫 Cylinder gasket	1
3	JD2101Q.2-7a	气缸套 Cylinder sleeve	3
4	JD3102.1.1	气缸盖机械加工合件 Cylinder head	1
5	JD2102Q.1.1-4	活塞 Piston	3
6	JD2102Q.1.1-1	第一道气环 Compression ring(1)	3
7	JD2102Q.1.1-2	第二道气环 Compression ring(2)	3
8	JD2101Q.1.1-3	活塞销 Piston pin	3
9	JD2102Q.1.1	油环部件 Oil ring	3
10	TY3100I.10.1-2	进气支管 Intake connection pipe	1