

TZ BOXER

OPERATOR'S MANUAL

Safety Instructions

In order to use the engine, please read through this instruction manual carefully. This is a complex,high-performance engine. If you have any difficulties to understand any part of this instruction manual, please contact the hobby shop from whom you purchased the engine, or contact us directly.

- 1 The propeller double locknut assembly supplied with the engine must be used when mounting the propeller.
- 2 Always use a good quality propeller and follow the manufacturer's instructions.
- 3 Choose a propeller size that will not allow the engine to exceed the maximum practical RPM in flight.
- 4 Always ensure that no people are in front of or beside the propeller while the engine is running.
- 5 To start the engine, set the throttle to the idle position and use an electric starter.
- 6 After starting the engine, always move behind the propeller to adjust the needle settings.
- 7 The engine becomes extremely hot both during and after engine runs. Do not touch the engine, exhaust header, muffler, or any parts attached to the engine while it runs or before it has cooled down.
- 8 If the engine runs incorrectly, DON'T FLY.
- 9 Do not use this engine for anything other than radio controlled airplanes. Do not use it for radio controlled helicopters.
- 10 You have full responsibility while you operate the engine. Please be extra careful for your safety and the safety of others whenever you operate the engine.

Installation

Connect the engine to the tank and CDI system as in "Fig.1". The battery and switch for the CDI unit is not supplied with the engine. A mount plate, mount spacers, mufflers and fuel filter are optional.

- 1 The pressure between the pump and the separate needle is high, so please use tube clips.
- 2 The recommended fuel tank size is 500cc to 700cc (18 to 24 oz). A standard clunk type fuel tank may be used. If this type of tank is used, you must use the special clunk supplied with the engine. Please note that with this clunk, some fuel cannot be drained from the tank. As soon as any part of the clunk becomes exposed, the engine will stop due to air entering the fuel pump.
- 3 Always use a fuel filter. We recommend YS filter (6720). With this filter, you must remove the cloth portion of the filter and leave both the metal filter screens in place.

- 4 Please pay consideration to avoid chafing of the ignition box's wires from vibration. Use the plastic "spiral wrap" supplied with the engine to wrap the shielded plug wire.
- 5 Please place the ignition box about 15cm away from the receiver. Some radio components may need to be over 30cm away from ignition components to avoid interference. Wrap the ignition box in foam rubber or other vibration absorbing material(in the same manner as the receiver is mounted), and fasten (e.g. using Velcro straps).

Fuel

- 1 Use a good quality alcohol based model engine fuel containing 10% to 30% nitro, and oil content 10% to 25%. Do not use gasoline fuel.
- 2 When filling the tank, disconnect Tube A or Tube B (Fig.1) for filling, use a stopper on the Fuel Tube A to avoid flooding the engine.

Propeller

- 1 Due to the high power output of TZ engine, it is supplied with a double locknut system for added safety. Mount the propeller and tighten the rear nut, followed by the front nut. The rear nut has an offset shoulder that the recess of the front nut will secure itself against.
2. Please check and retighten propeller locknut periodically.
- 3 Select a propeller that will allow the engine to run at a maximum of between 6,000 to 7,200 RPM.
- 4 We recommend sizes 21x10.5~23x10. Other propeller sizes may be used as long as the correct RPM range is maintained.

Engine start up

- 1 If you want to start for the first time after purchase, please open the needle about 2.5 turns.
- 2 **Close the throttle completely**, rotate it with an electric starter for about 10 seconds, and draw fuel under negative pressure. Please note that the fuel will not come even if the throttle is fully opened with no fuel in the pump. If the fuel is already coming to the pump, this action is not necessary.
- 3 Turn on the ignition switch and start with the electric starter.

Break-in (break-in operation)

- 1 Open the needle 2.5 turns and start it. Please use about 21x10.5 propeller about 15% nitro 18% oil fuel
- 2 Run for about 5 minutes at 2,000~3,000 rpm.
- 3 As soon as the rpm is raised, it repeats the action of lowering it to 2,000 rpm. Please run 2,000~3,000 rpm a little longer and increase the rpm.
- 4 Turn the needle gradually to the clockwise to get the rpm peak. Please break-in and run for about 30 minutes.
- 5 After the break-in operation, please take about 5 flights and the flight in a rich mixture.

Needle adjustment (full operation)

- 1 After adjustment, the needle will be opened 1~2.5turns, but there are individual differences.
- 2 If you turn it to the clockwise, the mixer become leaner. If you turn it to the counter clockwise, it become richer. Please run in rich mixture.

Idling adjustment

- 1 Please use it as it is at first. It is slightly rich mixture.
- 2 If it is too rich, turn the idling screw to the clockwise to become it leaner.
- 3 When it is completely closed, it will be the leanest.
- 4 The reaction is insensitive, so if it's rich, turn it more.

A battery

A battery of about 6-12V and 1,000mA is required as a power supply. For safety, use a power switch between the battery and the ignition box. When starting the engine, turn it on with a switch.

A plug

Please use the included ignition plug. The plug gap ranges from 0.30 to 0.40mm. If it is more than 0.45mm, it will be easy to misfire, so please adjust it.

Tappets Adjustment (Fig. 2)

- 1 Tappet clearance is pre-set at the factory.
- 2 Clearance adjustment may need after one hour of running time due to initial wear. After adjustment, tappet clearance should be checked during normal maintenance after every 10 hours of running to maintain maximum performance.
- 3 Clearance adjustment should be done when the engine is cool.
- 4 The proper clearance setting is between 0mm (0.000") and 0.1mm (0.004"). The adjustment is achieved by loosening the locknut ("Fig.2") and turning the adjustment screw. The engine must be at top dead center on the compression stroke before any adjustments are made. This engine runs best with the valves set at a tight setting. If the valves are set too loose, power will be affected.

Timing of the cam gear (Fig. 3)

When disassembling, please adjust the timing as follows.

- 1 Fix the crankshaft to the upper dead point.
- 2 The right and left cam gears are different. There is one matching mark of the cam gear on the right bank and there are three matching marks on the left bank.
- 3 Set the right bank matching mark up and the left bank down along the push rod line. It doesn't matter if it's the other way around.

RPM sensor (Fig. 4)

When replacing, please set it as shown in Figure 4. Please tighten RPM sensor screw lightly. Be careful not to tighten it too much.

Engine Mount (option)

Mount Plate A _ T3091 Mount plate B_ T3092

Mount Spacer :

50mm_ T3094 60mm_ T3093 70mm_ T3095

Muffler (option)

Muffler Type A _ WW3030S Type B_ W3031

Cleaning

This engine uses silicon rubber in many parts. Please use methanol or model engine fuel for cleaning. Do not use Kerosene, Gasoline, Machine oil, Automobile parts cleaner or house hold lubricants to clean. It will harm silicon parts.

Engine Cooling

Be sure to secure cooling air for engine cooling. If it is not enough for the engine, it causes the regulator and carburetor heat up and makes vaporized or percolates the fuel. It gets deteriorations of engine performance or stop the engine. Please read carefully below for provision.

- 1 Please open air intakes and outlets as wide as possible.
- 2 Take off cowling when you make engine adjustment for a long time. When air temperature is high, it may heat up the regulator and car-buretor to make vaporized or percolate the fuel even without cowl-ing. If it happens, wait till engine well cooling down before you restart and adjust.

Parts and Repair Service

If you can not find repair parts from hobby shops, you can order parts directly to our factory. We also do repair your engine at our factory. If you need repair service, please make detailed of states and send it together with the engine.

Warranty

Strict quality control is implemented by our factory in all phases, from parts manufacturing to final assembly. If performance deteriorates or a part fails due to a manufacturing error, YS engine will repair or replace the engine at no charge in the period of one year from date of purchase. Warranty does not cover normal maintenance. Incorrectly assembled or abused, under improper usage, any modification will void this warranty and there will be a normal charge for parts and labor.

TZ BOXER

Fig. 1

Bore	32mm
Stroke	24.8 mm
Displacement	39.9 cc
Weight	1,198 g
RPM	1,200~7,500rpm

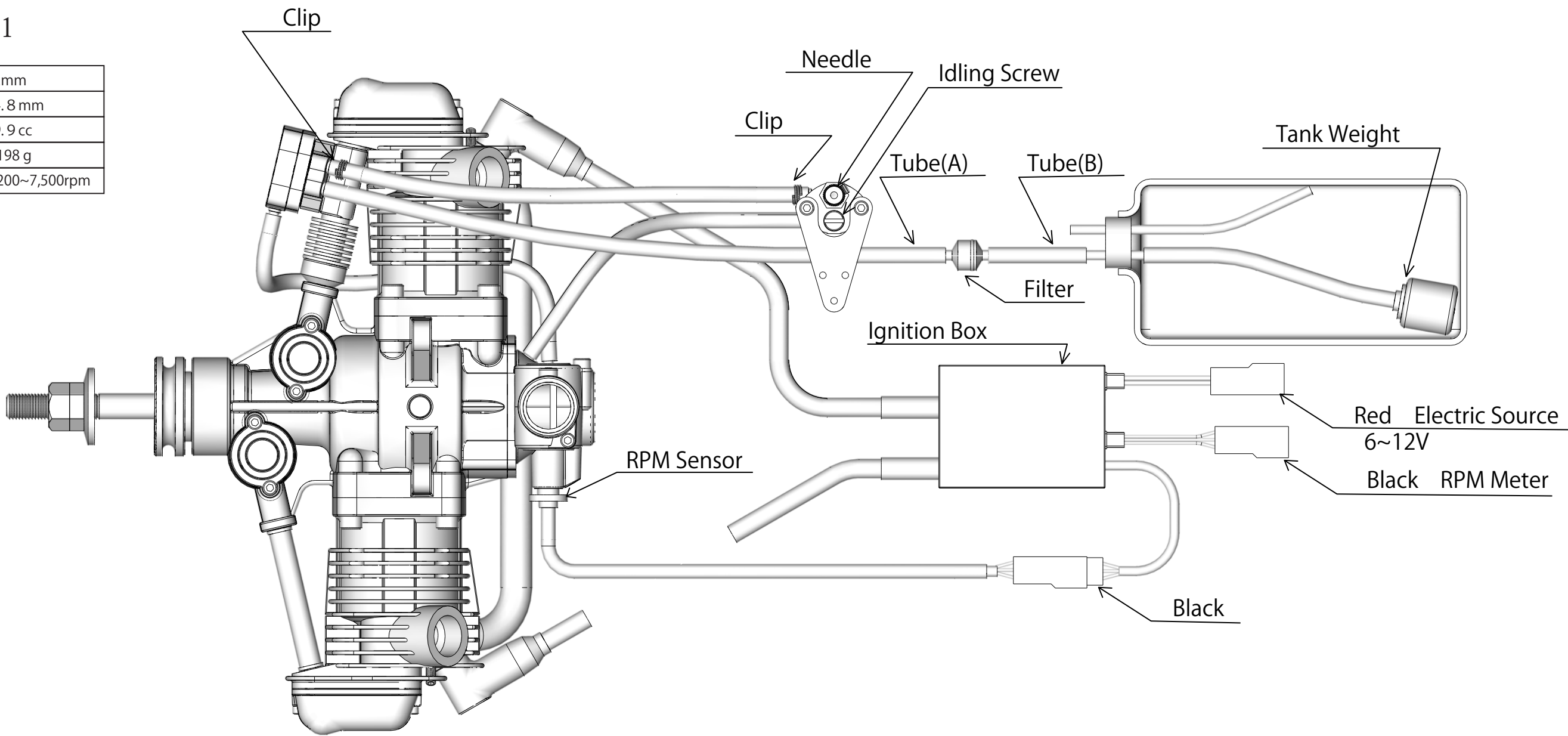


Fig. 3

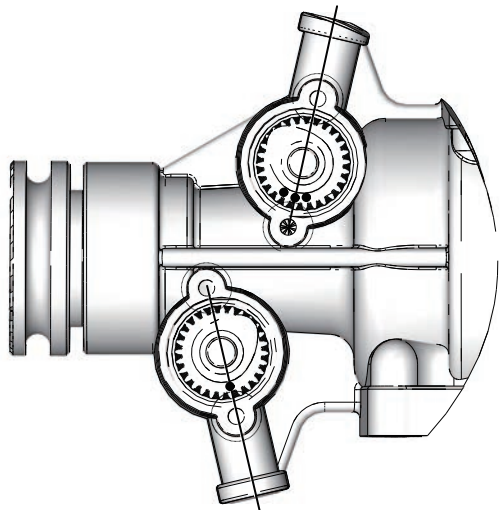


Fig. 4

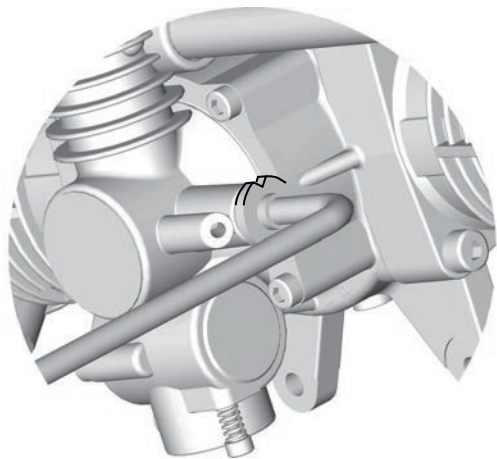
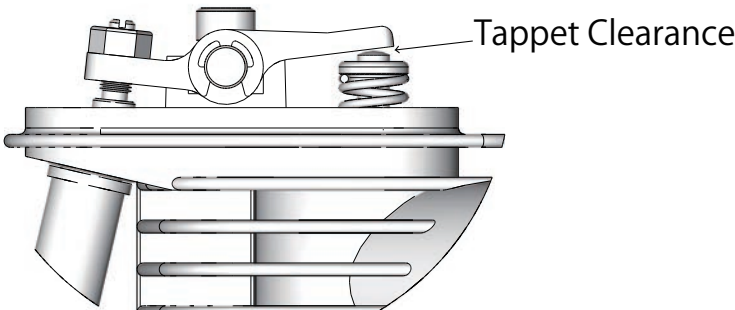
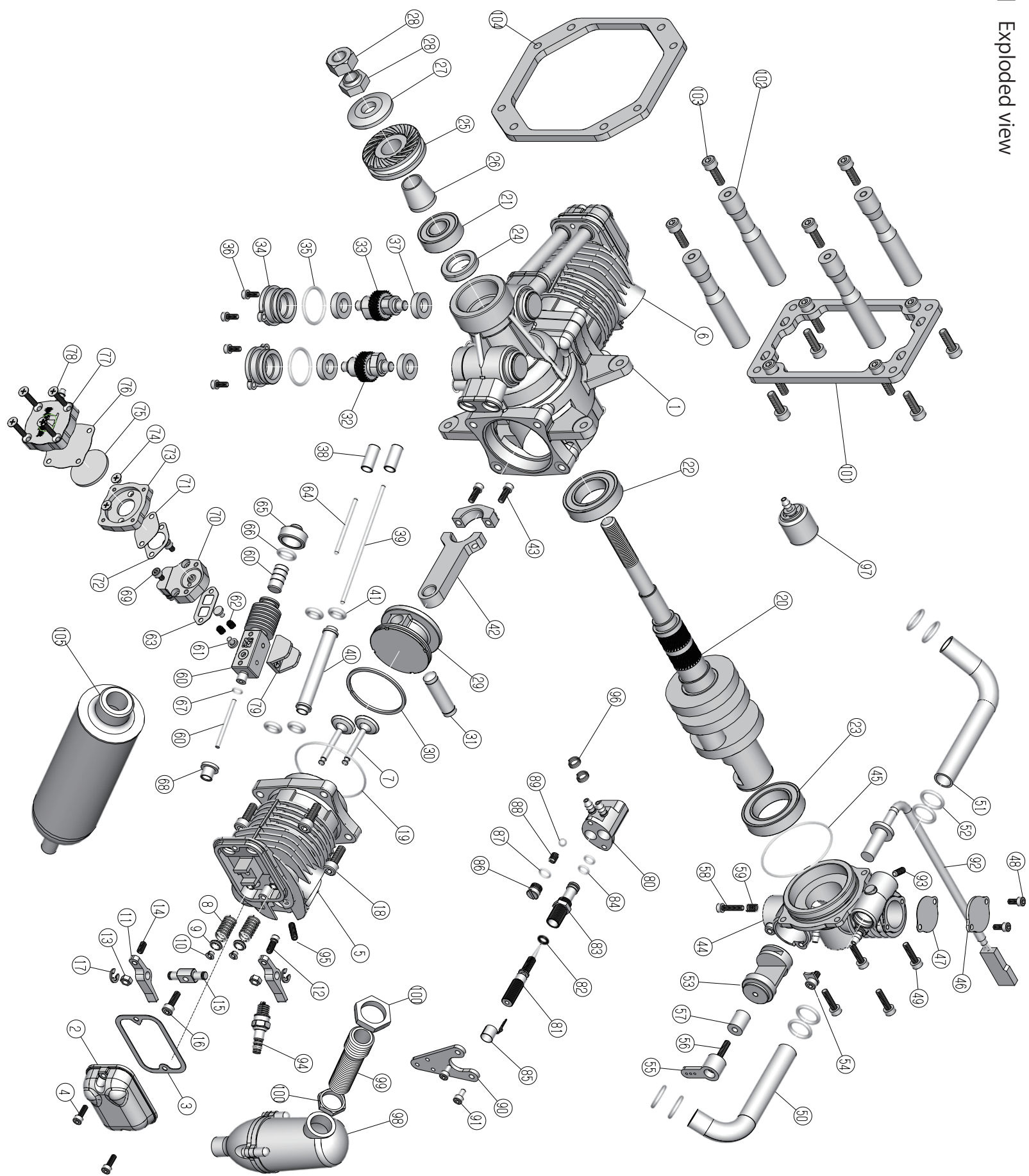


Fig. 2

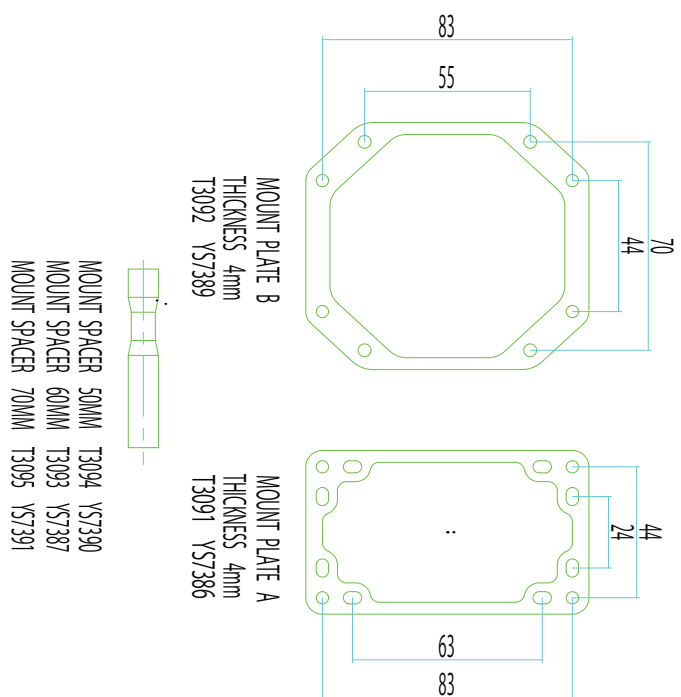


No.	Item No.	Description	QTY	No.	Item No.	Description	QTY
1	T3005	Crankcase	1		T3055A	Pump assy.	
2	T3010	Valve cover	2	60	T3055	Pump body with plunger	1
3	T3015	Valve cover gasket 1 piece	2	61	F2054	Lead valves	2
4	F1204	Valve cover screws 2 piece	4	62	F8056	Lead valve springs	2
	T3030A	Cylinder head L assy.		63	F2058	Pump gasket	1
5	T3030	Cylinder head L	1	64	T3061	Pushrod lower	1
	T3035A	Cylinder head R assy.		65	G5078	Pump insulator	1
6	T3035	Cylinder head R	1	66	F2188	Insulator O ring	1
7	F9104	Head valves 1 piece	4	67	T3066	Pump body O ring	1
8	F1209	Valve springs 2 piece	4	68	T3064	Pump cap	1
9	F9106	Spring retainers 2 piece	4	69	F2057	Pump screws	2
10	F9107	Valve spring clips 4 piece	8	70	F2056	Pump plate	1
11	T3011	Rocker arm 2 pieces	4	71	T3067	Diaphragm A	1
12	T3012	Tappet adjusting screws	3	72	T3068	Regulator gasket	1
13	T3013	Tappet adjusting nuts	4	73	T3069	Regulator plate	1
14	F2013	Tappet adjusting screw	1	74	T3074	Regulator plate screws	2
15	F9134	Rocker arm shaft	2	75	T3075	Regulator plunger	1
16	F9135	Rocker arm screw	2	76	T3076	Diaphragm	1
17	F1217	E rings	4	77	T3077	Regulator cover	1
18	T3018	Cylinder screws	8	78	T3078	Regulator cover screws	4
19	T3019	Cylinder O rings	2	79	F2059	Pump bracket set	1
20	T3050	Crankshaft with conrods	1		T3079A	Needle assy.	
21	E5040	Front bearing	1	80	T3079	Needle body	1
22	T3014	Mid bearing	1	81	F1545	Needle valve	1
23	T3016	Rear Bearing	1	82	F1546	Needle O ring	1
24	F9122	Oil seal	1	83	F1555	Needle socket	1
25	F1564	Drive washer	1	84	F1556	Needle socket O rings	2
26	F1565	Drive washer retainer	1	85	F1557	Needle detent	1
27	F1266	Propeller washer	1	86	T3080	Idling screw	1
28	F2267	Propeller nuts	2	87	T3081	Idling screw O ring	1
29	T3070	Piston	2	88	T3082	Idling spring	1
30	T3071	Piston ring	2	89	T3083	Idling valve	1
31	T3072	Wrist pin	2	90	T3084	Needle plate	1
32	T3031	Cam gear L	1	91	T3085	Needle plate screws	2
33	T3032	Cam gear R	1	92	T3086	RPM sensor	1
34	T3033	Cam gear cover	2	93	T3087	RPM sensor screw	1
35	F1233	Cam gear cover O ring	2	94	E2595	Ignition plug	2
36	F9140	Cam gear screws	4	95	T3088	Plug socket screw	2
37	F1242	Cam gear bearings	4		T3089	Ignition box	1
38	F1236	Cam followers	4	96	F8090	Tube clips	2
39	T3041	Push rods	3	97	F2083	Fuel tank clunk	1
40	T3042	Push rod covers	3	98	W3030S	Muffler type A set	2
41	F1239	Push rod cover O rings	8		F9377	Muffler type A 1 piece	2
42	T3044	Conrod	2	99	F9378	Exhaust pipe	2
43	T3045	Conrod scres	4	100	F9379	Rock nuts	2
	T3020A	Rear cover assy.		101	T3091	Mount plate A	1
44	T3020	Rear cover	1	102	T3093	Mount spacer 60mm	4
45	T3021	Rear cover O ring	1	103	T3090	Mount screws	8
46	T3022	Rear cover cap	1	104	T3092	Mount plate B	1
47	T3023	Rear cover cap gasket	1		T3094	Mount spacer 50mm	4
48	T3024	Rear cover cap screws	2		T3095	Mount spacer 70mm	4
49	T3029	Rear cover screws	4	105	W3031S	Muffler type B set	2
50	T3025	Intake pipe L	1		W3031	Muffler type B 1 piece	2
51	T3026	Intake pipe R	1		T3096S	Gasket set	5
52	T3027	Intake pipe O rings	8		T3097S	O ring set	26
53	T3028	Throttle barrel	1				
54	R6124	Throttle barrel retainer	1				
55	F1260S	Throttle lever	1				
56	T3046	Throttle lever screws	1				
57	T3053	Throttle barrel spacer	1				
58	F1258	Throttle stop screw	1				
59	F1259	Throttle stop spring	1				

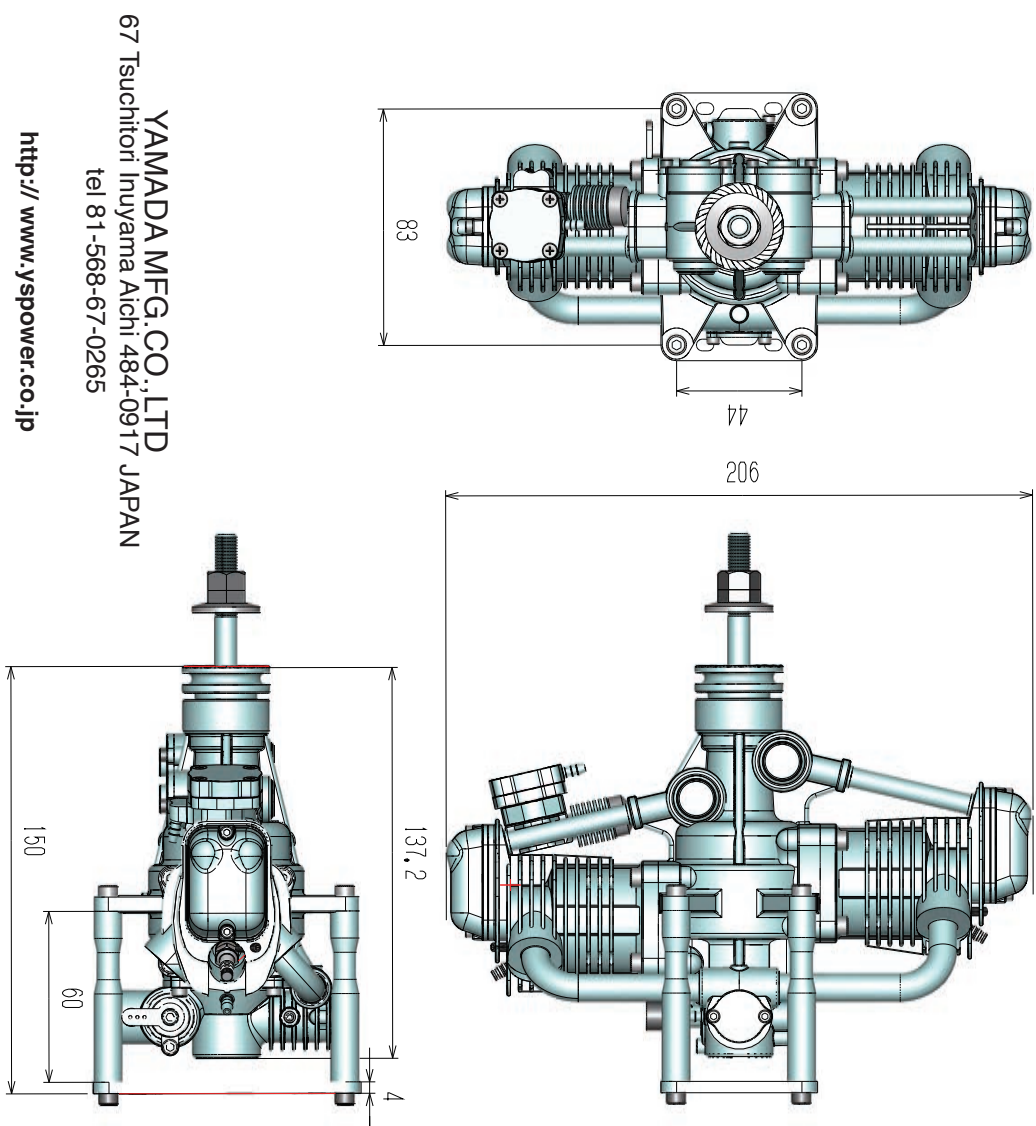
分解図 Exploded view



マウントプレート、スペーサー Mount plate, Spacer



三面図 Three view drawing



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