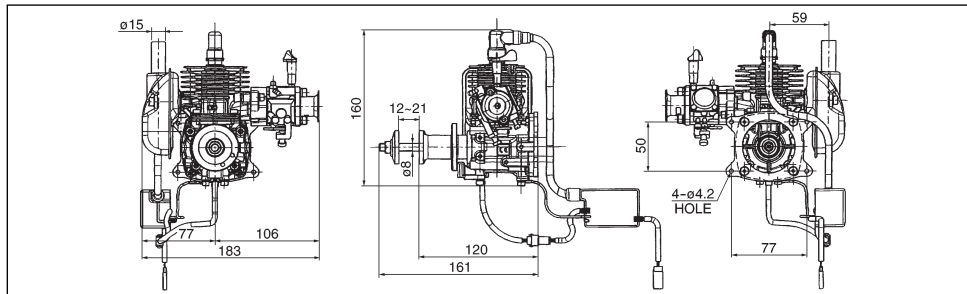


ZENOAH
KOMATSU
OWNER'S MANUAL
Model: G200PU
Model code: X374320000


Thank you for purchasing a KOMATSU ZENOAH engine.

- Please read this Service Manual thoroughly and use the engine correctly. (For safety reasons, please contact your sales dealer prior to using the engine if there is something about it that you do not understand.)
- This engine has been designed for radio control airplanes. Please use it in conjunction with the manuals for the models or radio control equipment you will be using.
- Remodeling or use of the engine for other than its intended purpose is prohibited.
- We ask that the product be used only after it has been understood that the purchaser (user) shall bear all obligations and responsibilities stipulated by law, ordinance and the like and that KOMATSU ZENOAH shall bear no responsibility whatsoever.



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SPECIFICATIONS

NO.	ITEM	SPECIFICATIONS
1.	Engine model	G200PU
2.	Displacement	20.1cm ³
3.	Bore x stroke	ø32mm x 25mm
4.	Weight	990g (not including DC Ignition Unit)
5.	Carburetor type	WT-811
6.	Ignition	Battery ignition; digital control
7.	Sparkplug	Champion Y82
8.	Revolution direction	Counterclockwise (from PTO side)
9.	Starting method	External motor
10.	Sensor spacing	0.8 ~ 1.2mm (1.0mm ± 0.2mm)
11.	Fuel consumption	1.0ℓ / 9000rpm (at full throttle)
12.	Noise (at 2-meter points)	98dBA (APC 15x10)
13.	Battery capacity	4.8V / 1500 ~ 2700mA

⚠ SAFETY PRECAUTIONS ⚠

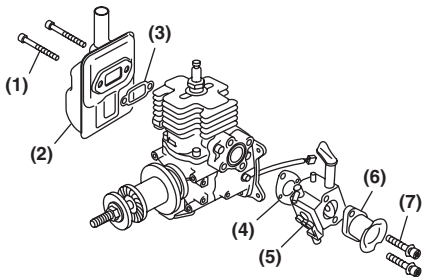
- **These safety precautions are to prevent you and those in the vicinity from incurring harm or damage. Make sure to observe these precautions and to constantly strive to ensure safety.**
- **Safe use of the engine is your personal obligation and responsibility. Constantly take care to act with good judgment as you enjoy your hobbies.**
- **Make sure never to touch the propeller when it is rotating. Also make sure that the propeller does not come in contact with the ground or with anything in its surroundings. Doing so could result in grave injury.**
- **The fuel is toxic. Do not let it get into your eyes or mouth. Store it in a cool place, out of the reach of infants and children. Improperly handled, it is a health hazard.**
- **Use of open flames around the fuel is prohibited, owing to the danger of fire occurring.**
- **To prevent burns, make sure not to touch the engine while it is operating or immediately after it has stopped.**
- **Do not run the motor in poorly ventilated places. When running it outside, do not breathe the exhaust, as it is a health hazard.**

⚠ SAFETY PRECAUTIONS ⚠

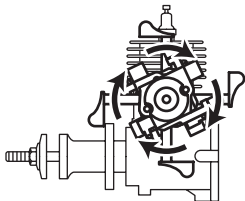
- **Special caution must be taken with all propellers used. Make sure to use them correctly, in keeping with the manufacturers' operating manuals, etc. Failure to do so could result in injury.**
- **Please wear clothing that facilitates your safety. Remove all scarves, overly long sleeves, neckties and the like. Failure to do so could result in injury.**
- **Please check to ensure that the direction in which the engine's throttle linkage operates and the amount it operates are correct. Failure to do so could result in engine damage.**
- **When starting the engine, make sure to be wearing protective eyewear and gloves and to use the starter. Failure to do so could result in injury.**
- **Do not run the motor on sandy soil or where there is a lot of gravel. Doing so could result in injury.**
- **When mounting the engine to a model, make sure to follow the model's operating manual. If necessary, reinforce the engine mounting unit and the peripheral units.**

ENGINE ASSEMBLY

The carburetor, muffler, and air funnel have not been attached. Please assemble them correctly, following the diagram shown below.



No.	Part	Part no.	Quantity	Tightening Torque (N-m)
1.	Bolt	01252-30540	2	8.8
2.	Muffler	848EW015A0	1	
3.	Gasket	1140-13141	1	
4.	Gasket	848H7014C1	1	
5.	Carburetor set	848EW09710	1	
6.	Air funnel	848ES08300	1	
7.	Bolt	8488455000	2	3.4



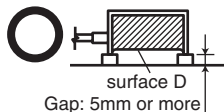
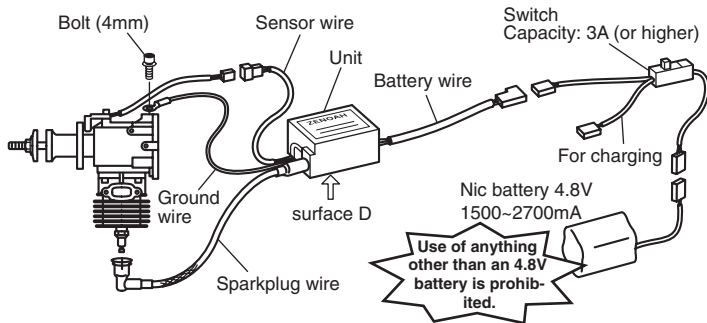
The carburetor can be mounted anywhere 90 degrees apart on the top, bottom, left or right. Mount the linkage at a place where it is easy to do so.

DC IGNITION UNIT MOUNTING

1. Make sure to install the power switch.
2. Push the sparkplug cap all the way over the sparkplug.
3. Fixate the body within the fuselage, as shown in the diagram. Make sure that the sponge, cloth or the like is not enclosed.
4. The temperature of the bottom surface (D) of the unit, in particular, will rise. Thus, when fixating surface (D), make sure to leave sufficient space (a gap).

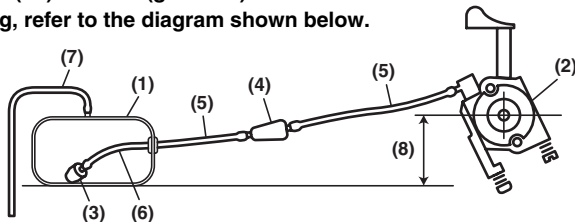


The temperature of the unit may rise to as high as 70~80°C, depending on the operating environment and conditions, but this is not abnormal. However, make sure not to touch this part or you could risk being burned.



FUEL AND PIPING

- For gasoline, please use either regular or high octane, for cars. (The octane number should be 85 or higher.)
- For oil, use a high-performing mixed lubrication type of 2-cycle engine oil and make the fuel volume ratio 1 (oil) to 25-40 (gasoline).
- For fuel piping, refer to the diagram shown below.

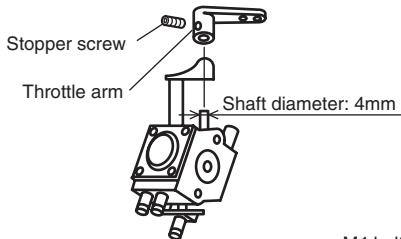


- Do not use a silicon tube.
- Clip the weight so that it does not shift when the engine is running.

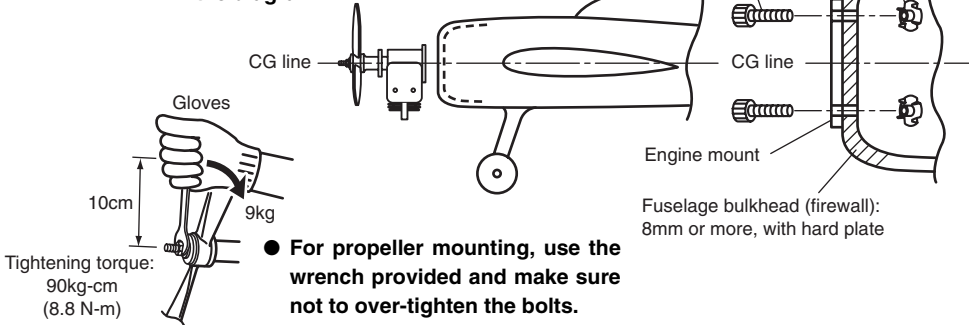
1. Fuel tank	Capacity of 300~400cc
2. Carburetor	
3. Weight	
4. Filter	Mesh, 300 or more
5. Fuel pipe	Gasoline-resistant rubber or plastic type with inner diameter of 2.5~3mm
6. Fuel pipe	Gasoline-resistant rubber type
7. Air vent pipe	
8. Fuel head	100mm or less

THROTTLE LINKAGE AND ENGINE MOUNTING

- Mount the throttle arm to the carburetor's throttle shaft as shown in the diagram.



- Mount the engine as shown in the diagram.

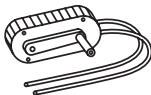


ITEMS TO CONFIRM BEFORE STARTING THE ENGINE **=====**

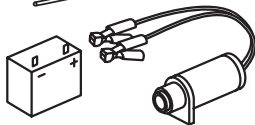
- Please determine the propeller to use in keeping with the airplane's size, gross weight, and flight characteristics. If necessary, consult with someone who has the proper experience.

Guidelines for an APC propeller: about 8.300rpm / 15x10, about 8,900rpm / 15x8

- Fuel pump for gasoline



- Electric starter device



- Make sure that during the lubrication process, the fuel does not come in contact with the battery or that fuel that has overflowed does not come in contact with the muffler.
- Make sure there is no loosening of or abnormalities with the tightening, etc., of each part of the engine and model.
- Are there any problems with the linkage (in terms of its direction and actuation stroke)?
- Has the battery been sufficiently charged?
- Are there any propeller abnormalities (scratches, deformation, etc)?
- Tighten the muffler additionally (for starting an engine from the second try on).
- Make sure that the fuel pipe and the wiring of the DC ignition unit and the like do not pass through the engine's muffler unit and that the wiring and fuel pipe are not interferences.

STARTING THE ENGINE

- Close the choke lever and open the throttle valve 10% to 15%.
- Pressing the tip of the starter to the engine's spinner, press the start switch for 1-2 sec and let the engine rotate.
- If the engine makes an explosive sound, suspend the starting operation and start by opening the choke lever and rotating the engine using the starter. (Opening or closing the choke lever during engine operation is prohibited.)
- If the engine will not start, leave the choke lever in the open position and rotate the engine by pressing the starter for 1-2 sec. --- If the engine will not start, repeat this operation 2 or 3 times.

(A) Points in starting

- During the first startup operation, does the fuel reach the carburetor?
- If the fuel reaches the carburetor, the choke will open.
- Is the ignition switch on?
- If there is absolutely no explosive sound, remove the sparkplug and check it.
- If leakage has occurred from the sparkplug being over choked, dry it out, open the choke, and restart.

(B) Cautions in starting

- One person must restrain the fuselage during the startup operation. (Thus, solo startup is prohibited.)
- With the sparkplug removed when using the starter for rotation or rotating the propeller by hand, make sure the power has been turned off.
- Rotation should be to the left. Confirm the direction of motor rotation in advance.

ADJUSTMENTS FOLLOWING STARTUP

(A) ADJUSTING THE IDLING

- Following startup, set the number of engine rotations for idling at about 2000rpm, rotate the L needle to the right (to reduce fuel), and search for the position for the highest number of rotations. From that position, turn the L needle about 1/4 (90°) to the left (to increase fuel) and set the number of rotations for idling with the idle screw or the transmitter.

(B) ADJUSTING NUMBER OF ROTATIONS AT FULL THROTTLE

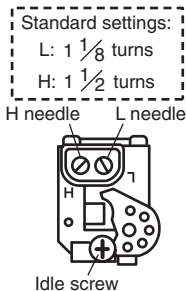
- Achieve full throttle slowly.

When the number of rotations stabilizes, turn the H needle to the left and right to locate the position for the highest number of rotations.

- From the position of the highest number of rotations, open the H needle 1/8 (to increase fuel) to make the setting. As a rule, consider 100rpm to be the difference between the highest number of rotations and the set number of rotations.
- After making the setting, return to idling. Accelerate rapidly and confirm that there are no problems with acceleration. If acceleration is poor, open the L needle an additional 1/8th (45°) and confirm that acceleration is smooth. In this case, the number of rotations for idling will be low, so use the idle screw or transmitter to adjust it.
- This engine has had the carburetor set at the standard position at time of factory manufacture. Thus, no calibration is normally necessary.

In keeping, if poor acceleration or insufficient rotations at full throttle or the like result, make adjustments in conformance with the main points of adjustment following startup.

However, the number of rotations for idling will change depending on the size of the propeller used, which will make adjustment using the idle screw or transmitter necessary.



TRIAL RUN

- Different from a glow engine, this engine does not require any special trial run.
- After 5~10 tanks (2~3 hours), adjust the carburetor's L and H needles if necessary.
- After about 5 hours' running, the highest number of rotations will be slightly above the initial value, owing to the engine having been conditioned.

STOPPING THE ENGINE

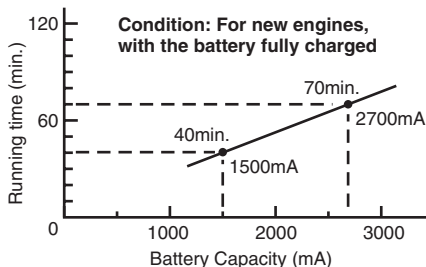
- To stop the engine, either use the transmitter to achieve full throttle or turn the battery switch off.
- When you have stopped the engine and when not operating the engine, make sure to keep the battery switch off.

ENGINE RUNNING TIME

Because this engine uses a battery for power supply, the engine's continuous running time will depend on battery capacity.

Please refer to the table on the right for guidelines.

Recommended battery: 4.8V / 1500~2700mA



INSPECTION

To ensure safe use of the engine, make sure of the items specified in the table below.

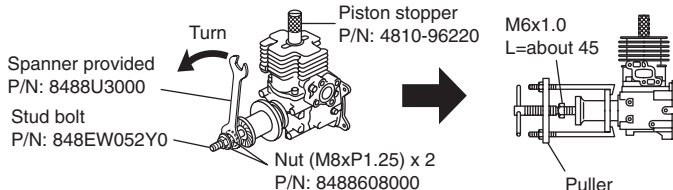
Item	Before using	Every 25h	Every 100h	Inspection
Leakage & breakage	✓	✓	✓	Cylinder, carburetor, muffler, crankcase, Fuel pipe, etc.
Idling stability	✓	✓	✓	Is it stable? Is acceleration okay?
Sparkplug	–	✓	✓	Remove sediment; adjust air gap
Cylinder	–	✓	✓	Check for wear & scratches
Piston/Ring	–	✓	✓	Check for wear & scratches
Muffler tightening bolt	✓	✓	✓	Retighten
Ignition unit	✓	✓	✓	Check for damage
Propeller hub (Stud)	✓	✓	✓	Check for damage to screws & for deformation
Crankshaft	–	–	✓	Check alignment
DC unit wiring	✓	✓	✓	Check for dislocation, cracks, wear, rattling, etc.
Stud/Nut	✓	✓	✓	Is there any slack or screw damage?

TIGHTENING TORQUE CHART

Part	Screw Size	Tightening Torque		Remarks
		N-m	Kg-cm	
Cylinder	M4 (P0.7)	3.9	40	
Sparkplug	M10 (P1.0)	7.8	80	Using the tool provided
Muffler	M5 (P0.8)	8.5	90	
Crankcase	M4 (P0.7)	3.9	40	
Insulator	M4 (P0.7)	3.4	35	
Carburetor	M5 (P0.8)	3.4	35	
Sensor	M4 (P0.7)	1.7	20	
Stud (hub)	M6 (P1.0)	9.8	100	Using a piston stopper & LOCK TIGHT
Nut (propeller)	M8 (P1.25)	9.8	100	Using the tool provided
Engine mount	M4 (P0.7)	2.0	20	

PROPELLER HUB REMOVAL

- Remove the propeller hub as specified below.



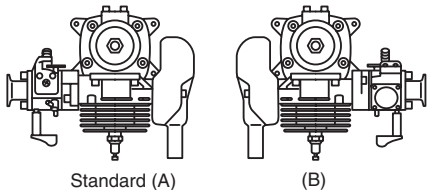
CAUTION:

- Do not remove the sensor.
- Make sure that nuts turned with a lug wrench are nuts on the propeller hub side.
- Use a commercial puller of the appropriate size.
- When reassembling the start bolt, apply (LOCK TIGHT) to the M6 thread part.

OTHER INFORMATION

This information is to enable our customers to enjoy radio control airplanes more, but all customers must take responsibility if they implement it.

- With this engine, the muffler side and the carburetor can be reversed by rearranging the cylinder and piston.

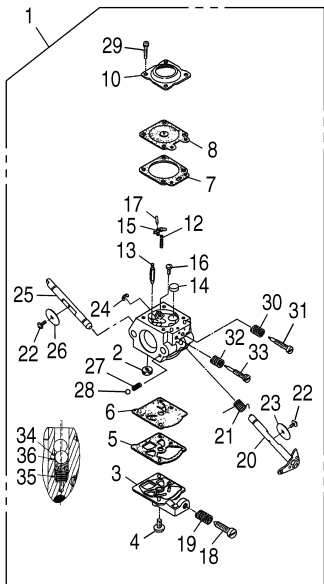


CAUTION:

- When changing to (B), make sure to also rearrange the piston or the cylinder, piston, etc, will be damaged.
 - Please use a new snap ring (1260-41320) to prevent skipping of the piston pin.
- The crankcase is made of magnesium. During processing, allow for sufficient cooling to avoid the risk of chips burning.
 - In the event of even one crash, make sure to contact your service shop or dealer for inspection and repairs.

PARTS LIST

KEY#	PART NUMBER	DESCRIPTION	Q'TY/ UNIT	REMARKS
1	848EW08100	CARBURETOR ASSY	1	
2	3306-81380	• SCREEN	1	
3	3080-81120	• COVER	1	
4	3310-81130	• SCREW	1	
5	3304-81140	• GASKET	1	
6	1172-81150	• DIAPHRAGM	1	
7	2850-81290	• GASKET	1	
8	3310-81260	• DIAPHRAGM	1	
10	3310-81280	• METERING COVER	1	
12	2867-81270	• SPRING	1	
13	3356-81310	• VALVE, inlet	1	
14	1480-81420	• PLUG, welch	1	
15	3310-81230	• LEVER	1	
16	3310-81240	• SCREW	1	
17	3310-81250	• PIN	1	
18	2630-81330	• SCREW	1	
19	3350-81380	• SPRING	1	
20	848EW081T0	• SHAFT, throttle	1	
21	2670-81410	• SPRING	1	
22	2880-81470	• SCREW	2	
23	1282-81340	• VALVE, throttle	1	
24	1148-81390	• RING	1	
25	T2070-81460	• SHAFT, choke	1	
26	2841-81451	• VALVE, choke	1	
27	3350-81350	• SPRING	1	
28	3350-81220	• BALL	1	
29	3310-81351	• SCREW	4	
30	1491-81160	• SPRING	1	
31	1148-81171	• NEEDLE, low speed	1	
32	3080-81320	• SPRING	1	
33	T2070-81330	• NEEDLE, high speed	1	
34	2812-81520	• BALL	1	
35	2810-81530	• SPRING	1	
36	2812-81510	• PISTON	1	



PARTS LIST

KEY#	PART NUMBER	DESCRIPTION	Q'TY/ UNIT	REMARKS	KEY#	PART NUMBER	DESCRIPTION	Q'TY/ UNIT	REMARKS
1	848EW012A1	CYLINDER	1		25	1152-43290	WASHER	1	
2	848EW012B0	GASKET, cylinder	1		26	8488608000	NUT	1	
3	8488441800	BOLT	6		27	848EW071N0	SENSOR	1	
4	848EW014A0	INSULATOR	1		28	8488441400	BOLT	2	
5	848EW014B1	GASKET, insulator	1		29	848EW071T0	SPARK PLUG	1	Y82
6	848EW02110	CRANKCASE COMP.	1		30	848EW053X0	MOUNT PLATE	1	
7	848EW021D0	GASKET, case	1		31	3819-54780	SCREW	4	
8	1155-21240	BEARING	1		32	848EW07120	UNIT ASSY	1	
9	06034-06001	BEARING	1		33	01252-30410	BOLT	1	
10	T1600-21240	BEARING	1		34	1641-20405	WASHER	1	
11	04065-02812	SNAPRING	1		35	848EW08100	CARBRETOR ASSY	1	
12	T1600-21210	SEAL	1		36	T2070-82410	LEVER, choke	1	
13	3310-72150	BOLT	4		37	848H7014C1	GASKET	1	
14	848EW041A1	PISTON	1		38	848ES08300	AIR,funnel	1	
15	T2071-41210	RING	1		39	8488455000	BOLT	2	
16	1101-41310	PISTON PIN	1		40	848EW015A0	MUFFLER	1	
17	1260-41320	SNAP RING	2		41	1140-13141	GASKET, muffler	1	
18	5500-41410	BEARING	1		42	01252-30540	BOLT	1	
19	1101-41340	WASHER	2		43	8488U30000	SPANNER	1	
20	848EW04200	CRANKHAFT COMP.	1		44	848EW093A0	OWNER'S MANUAL	1	
21	1000-43240	KEY	1		45	4810-96220	STOPPER	1	OPTION
22	1140-43250	SHIM	1		46	1101-96220	ROD ASSY	1	OPTION
23	848EW05290	HUB COMP.	1						
24	848EW052Y0	STUD	1						

WARRANTY

● **Applicable Range**

This warranty applies only to the engines and parts manufactured by KOMATSU ZENOAH and sold directly or through distributors.

● **Range of Warranty**

This warranty shall apply only to trouble resulting from material defects and inferior assemblies that KOMATSU ZENOAH acknowledges.

● **Method and Extent of Compensation**

- 1) Repair or replacement through the distributor, etc.
- 2) KOMATSU ZENOAH and its distributors shall not provide compensation for incidental loss to engine purchasers resulting from trouble.

● **Term of Warranty**

The term of warranty shall be three (3) months from the date of purchase, within one year from the date of manufacture.

● **The warranty shall not cover the following, even if occurring during the term of warranty:**

- 1) Trouble resulting from not having read or from having ignored the essentials of engine operation
- 2) Dismantled or remodeled engines and parts
- 3) Expendable parts
- 4) Trouble resulting from submersion in water, from fire or from other natural disasters and calamities
- 5) Engines installed with parts that are not genuine

ZENOAH
KOMATSU

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