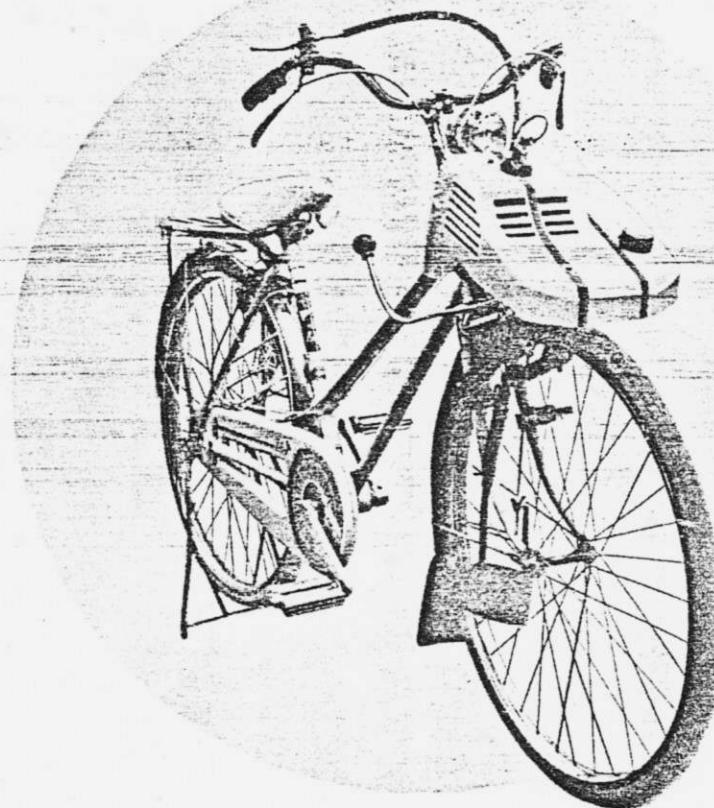


TAS BICYCLE ENGINE

SPITZ Deluxe

MODEL **QBM-23N**

OWNER'S MANUAL



INTRODUCTION

We thank you for your purchase of the TAS BICYCLE ENGINE, MODEL QBM-23N and we are certain that you will receive many years of satisfactory service from this unit.

This manual is designed to help the operator the best performance from the unit, and to serve as a guide for routine servicing.

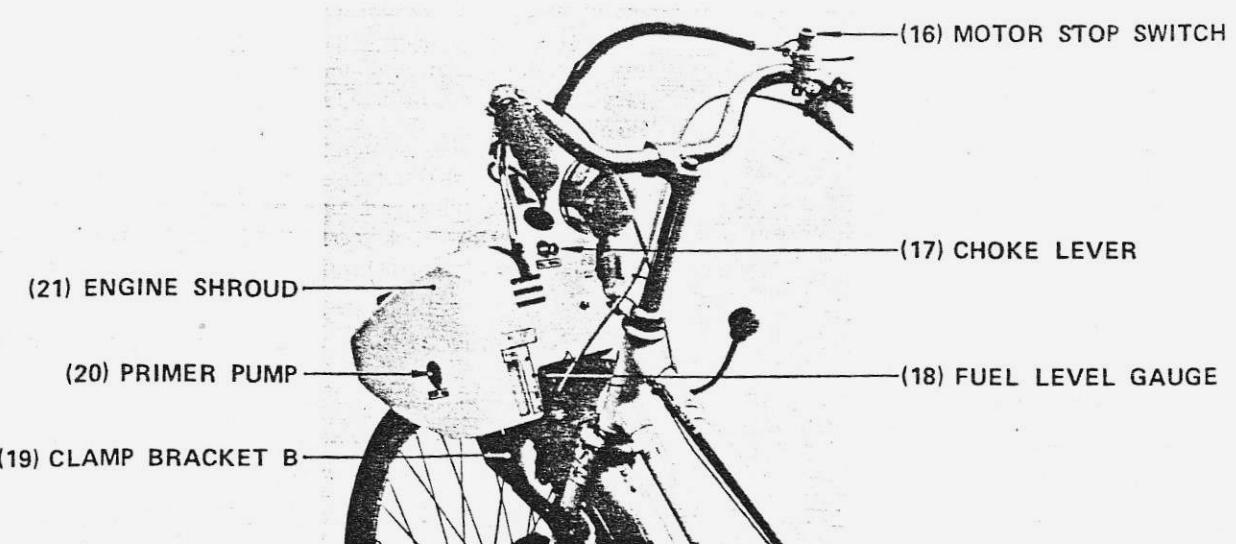
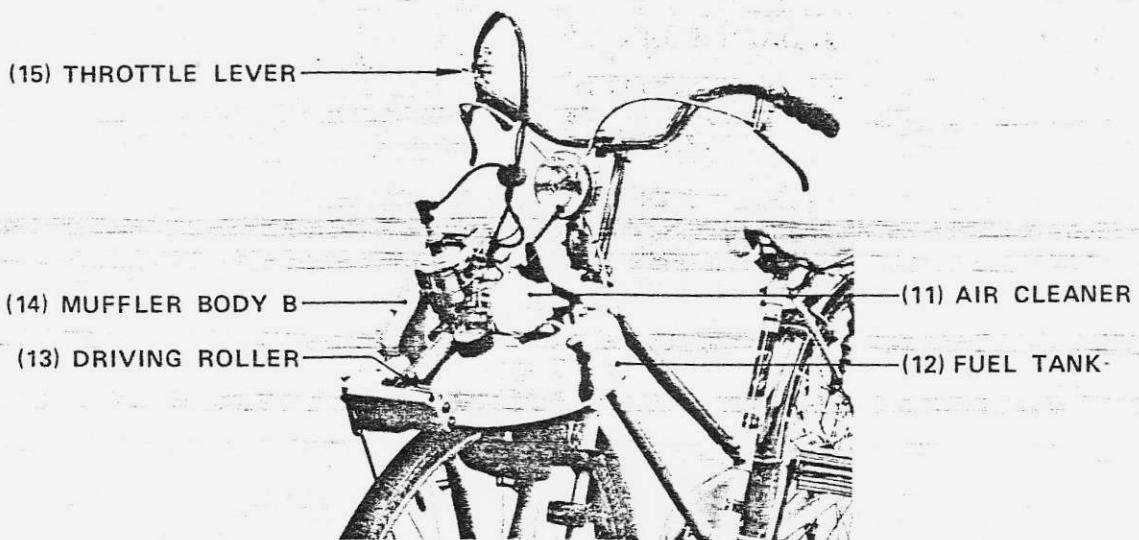
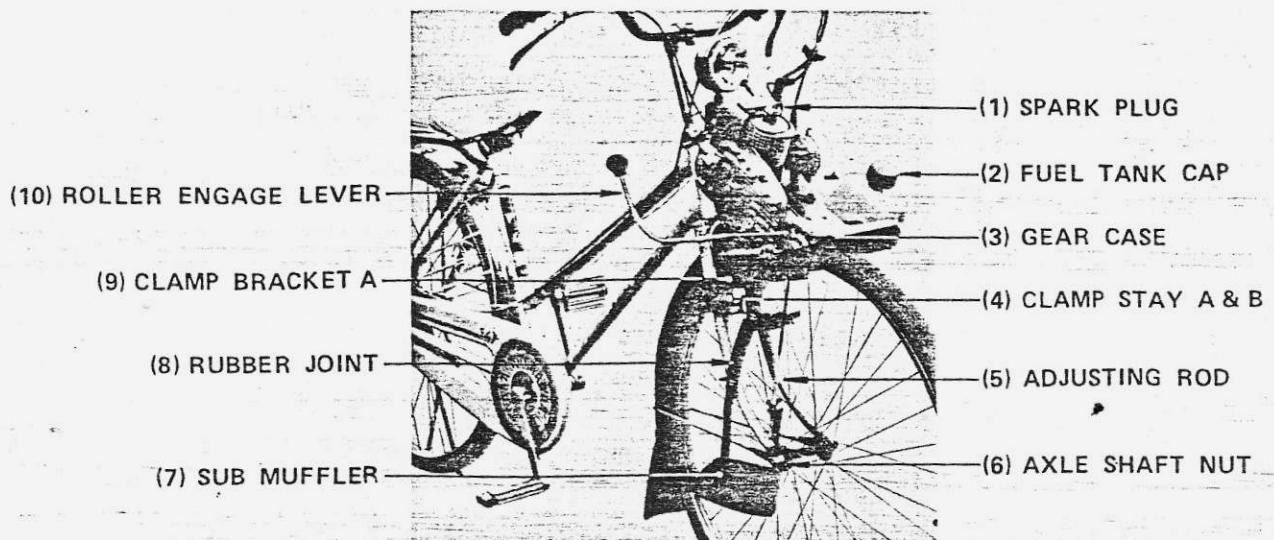
Thank you for your patronage.

TANAKA KOGYO CO., LTD.

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MAJOR PARTS



SPECIFICATIONS

MODEL NO.	TAS BICYCLE ENGINE, MODEL QBM-23N
TYPE	Two-Cycle, Forced Air Cooled, Single Vertical Cylinder
PISTON DISPLACEMENT	22cc. (1.39 cu. in.)
BORE x STROKE	30 x 30mm
COMPRESSION RATIO	7.2 : 1
OUTPUT (MAXIMUM)	1.0HP/6500RPM
MAXIMUM TORQUE	0.10kg-m/5500RPM
DRYWEIGHT	5.5kgs (12.0 Lbs) (Motor only)
CARBURETOR	Patented Rotary Type (Automatic choke)
STARTING SYSTEM	Rubber Roller Drive
FUEL CONSUMPTION	68 km per liter gas (160 Miles/US Gal.)
FUEL TANK CAPACITY	1.0L. (0.26 US Gal.)
FUEL MIXTURE RATIO	25 parts regular gasoline to 1 part two-cycle oil
MAXIMUM SPEED	32km/H (20MPH)

ALL DATA SUBJECT TO CHANGE WITHOUT NOTICE.

FEATURES

The TAS BICYCLE ENGINE MODEL QBM-23N can be installed on any standard bike in minutes. The motor mounts on the front fork of the bike, and transmits power from the driving roller to the front wheel. The motor speed is finger-controlled by the throttle lever (15). Raising the roller engage lever (10) will lift the roller off the tire, giving you the choice of operating as a bicycle, or as a motor bike, without ever dismounting to do either.

DEPENDABLE MOTOR

The utter reliability and extreme light weight of this motor are the result of years of engineering experience, and guarantee dependable service under all circumstances.

HANDLING

Because of the ease of installation, and simplified controls, the motor can be used on every type of bike, from a ten-speed racer to a three-wheeled adult tricycle.

ECONOMICAL

The motor runs up to 160 miles per gallon (MPG) at an average cruising speed.

GREAT PERFORMANCE... PEDAL OR POWER

Since the motor mounts on your own bike, a bike suited to your needs, you have the best of two worlds. Motor off, your bike performs as well as it always did. Motor on, you've added a wonderful new dimension to cycling, without sacrifice.

UNIQUE CARBURETOR... AUTOMATIC CHOKE!

With the throttle lever closed, the carburetor choke is automatically activated, with nothing to fiddle with, assuring you of quick and easy starts. As you move the throttle lever to higher speeds, the choke turns itself off at the proper time, without your having to even think about it. Patented, of course. There is another choke lever (I-1), but this is for use only when the temperature is extremely cold.

FUEL LEVEL GAUGE

From the slit on rear side of the engine shroud and through the half transparent fuel tank wall, the fuel level can easily be observed (18).

NOTE: To pour the fuel, keep front tire and engine straight ahead and fill fuel only up to the maximum level in the filler hole with this position. After pouring, close Tank Cap tightly.

INSTALLATION

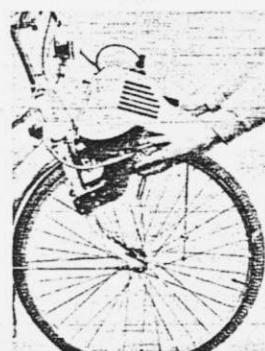
- a. First, remove the clamp stay (A&B KEY NOs 31 and 33, FIG. 3 on Page 10) from the clamp bracket (A&B KEY NOs 2 and 32, FIG. 3 on page 10), (I-2)
- b. Hold the clamp brackets with both hands and place the motor unit on the front tire and clamp the front fork loosely by the clamp stay (A&B).
- c. Push the roller engage lever down all the way. (I-4)
- d. Unscrew the front axle shaft nut (6), put the sub muffler stay (KEY No. 2-23) on the axle and replace the axle shaft nut loosely. (I-5) Then, connect rubber joint (8).
- e. When size of the bicycle wheel is less than 23 inches, longer side of sub muffler pipe should be shortened to fit. This can be accomplished by cutting with a steel saw.
- f. Apply recommended air pressure to tire.
- g. Keep the clearance between the driving roller and tire approximately 4mm (1/6 in.) by adjusting wing nut on adjusting rod (5). Or you may use thickness of the enclosed spanner (KEY No. 1-61) to get rough idea of the clearance. (I-6) For riding on wet surface, smaller clearance than 4mm will help avoiding slipping of the driving roller.



I-1



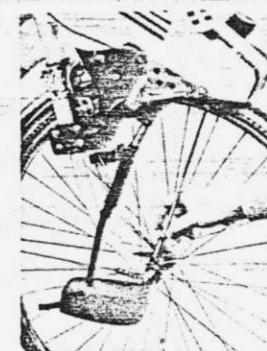
I-2



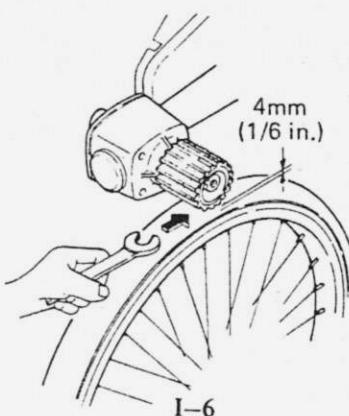
I-3



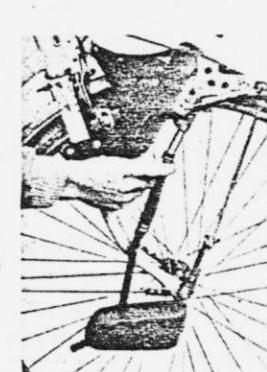
I-4



I-5



I-6



I-7

- h. Make sure no part of the motor touches the fender or tire. Tighten screws on the clamp brackets A & B.
- i. Tighten axle shaft nut (6). Connect sub muffler (7) with rubber joint (8) and attache spring clips. (I-7)
- j. Install throttle lever in convenient position on bicycle handle bar. (I-8)

STARTING INSTRUCTIONS

1. BEFORE STARTING

The motor uses a fuel mix of 25 parts regular gasoline to 1 part two-cycle oil. The fuel should be premixed prior to pouring into the fuel tank (12). It is recommended that a quality two-cycle oil be used in the fuel mix. Failure to mix oil with gasoline will result in seizure and severe damage to the motor.

2. STARTING OPERATION

- a. Before starting, push knobbed area (A) of Primer Pump (20) several times by finger, until Fuel gets to Carburetor.
- b. Push down the roller engage lever. (I-9)
- c. Push the throttle lever away from you (closed position).
- d. Pedal the bicycle at proper speed.
- e. Pull the roller engage lever up to start the motor. When the motor is cold, the throttle lever must be placed at fully closed position for the carburetor's pump-up action.
- f. Keep pedaling until the motor starts.

NOTE: For the first run, a little longer pedaling would be required in order to pump gas into the carburetor.

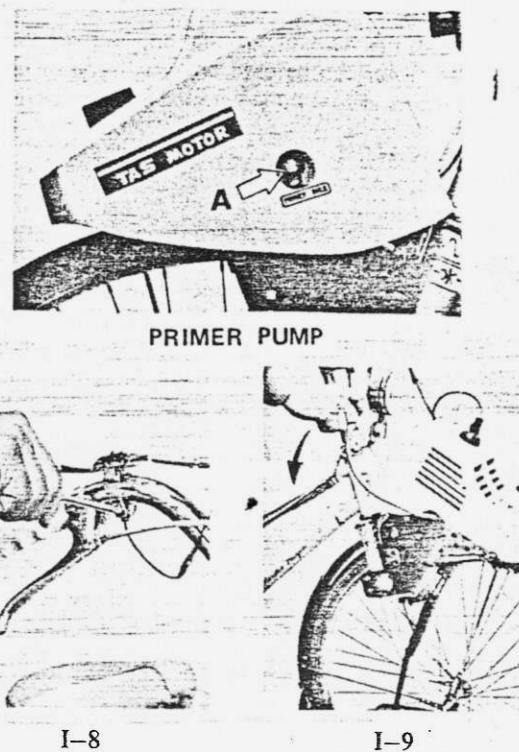
- g. After the motor starts, gradually open the throttle.

NOTE: As the motor has been equipped with the choke-less carburetor, the motor will start if the throttle lever is positioned at idle.

NOTE: For starting in cold weather, a little longer pedaling is required. When extremely cold use special choke lever (17).

3. DRIVING INSTRUCTIONS

- a. The bike speed is controlled by the throttle lever. On the throttle lever there is also a "red" motor stop switch (16) which will turn the motor off in any position.
- b. When climbing a steep hill, some pedal-assistance from you may be necessary. Use your bike's lower gears if necessary. Remember, mopeds also need assistance on steep hills, but they don't have the gears you probably have on your own bike.
- c. When slowing down, reduce speed with the throttle or disengage the driving roller off the wheel. In an emergency stop, just use your brakes hard, and the motor will stall itself. Drive carefully at all times.
- d. To re-start after a sudden stop, just follow regular starting procedures.
- e. When going down a long slope, do not use engine brake. Disengage the driving roller.
- f. On bad roads, or going cross-country, operate the motor at moderate speeds, for your own safety, and the protection of the motor.



I-8

I-9

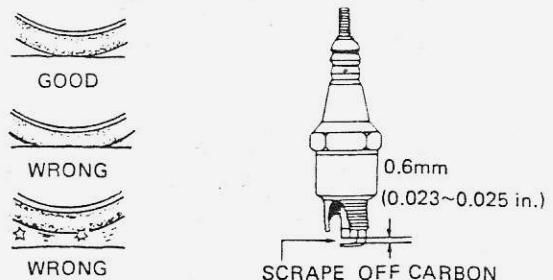
4. MOTOR SHUTDOWN

Return throttle lever to idle and depress "red" motor stop switch.

MAINTENANCE AND ADJUSTMENT

SPARK PLUG

Always use the recommended spark plug (NGK BM-6A or the equivalent) and occasionally check the plug gap which should be 0.6mm (0.023 ~ 0.025 in.). Under normal circumstances the electrodes should be perfectly dry and light brown in color. If the electrodes are covered with carbon or oil, the plug should be cleaned; either in solvent or by sand blasting. Be sure to remove all solvent or grit before reinstalling the spark plug. (I-10)



TIRE INFLATION

I-10

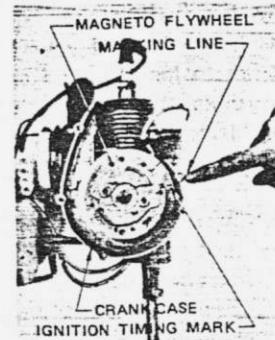
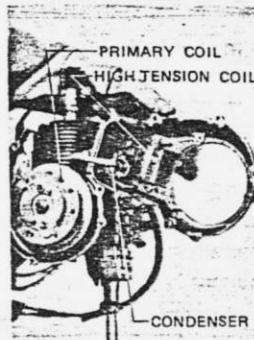
DECARBONIZING

When the exhaust port of the cylinder and exhaust opening of the muffler or piston are found carbonized and narrowed after long use, the motor tends to give insufficient power. It is very important that the exhaust port of the cylinder and exhaust port of the muffler are cleaned with utmost care. This should be done at least after every 50 hour's operation.

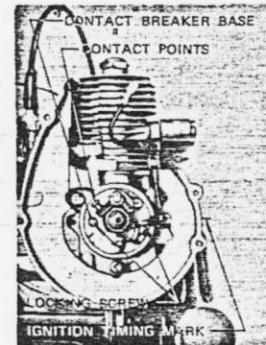
IGNITION TIMING

Dismantle the engine shroud, then remove the bracket cover and the fan case from the motor, and observe the mark "M" on the circumference of the magneto flywheel. The letter "M" denotes "IGNITION TIMING". When the letter "M" lines up with mating line stamped on the crankcase, the contact points should be opening. The ignition timing should be adjusted by turning the contact breaker base plate. If the two locking screws on the contact breaker base plate are loosened, it can be moved easily to the right or the left.

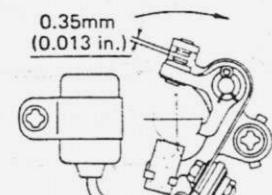
- When advancing the ignition timing, turn the base plate towards the right.
- When retarding the timing, turn the base plate towards the left. (I-11 & 12)



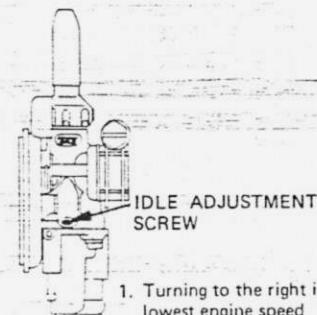
I-11



I-12

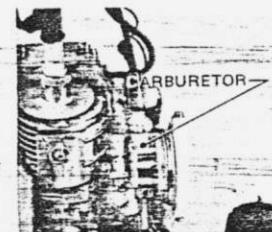


I-13

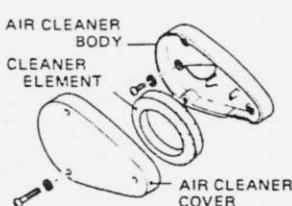


1. Turning to the right increases lowest engine speed
2. Turning to the left decreases lowest engine speed

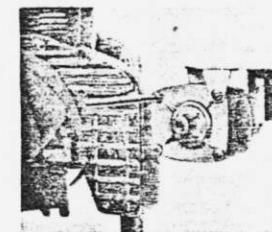
I-14



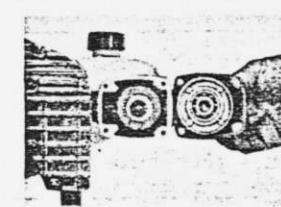
I-15



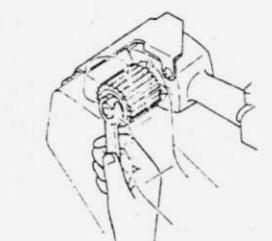
I-16



I-17



I-18



I-19

CONTACT BREAKER POINTS

It is necessary to remove the engine shroud, the fan case and the magneto rotor prior to adjusting the contact points. The point gap should be set to 0.35mm (0.013in.) at maximum opening. If the contact points are burnt or pitted, they should be lightly filed with a point file or fine sandpaper. If an oil film is noted on the point surface, they should be wiped with a clean rag.

NOTE: Always reset the contact points after filing or dressing to the recommended gap (0.35mm or 0.013 in.). If a deviation of more than 5 degree is noted when lining the "M" mark with the mating line, the contact points must be replaced. (I-13)

CARBURETOR

This type of carburetor is used on equipment which may occasionally be operated at various angles and with the fuel tank position below the level of carburetor to prevent gas leaking or carburetor flooding. This is one of the most advanced, yet simply constructed and most reliable carburetors on the market today. The carburetor is used in conjunction with a diaphragm type fuel pump to assure a constant flow of fuel and steady motor performance. This carburetor also features "SERVICE FREE" operation with servicing generally being limited to cleaning of the fuel passages only. (I-14 & 15)

AIR CLEANER

The carburetor is supplied with a high efficiency type reusable sponge air filter. When the filter element becomes clogged, the motor may fail to start or run in an overrich fuel condition which greatly reduces the power. The filter element should occasionally be cleaned by washing in warm soapy water; completely drying and reinstalling in the case. (I-16)

NEVER RUN MOTOR WITHOUT AIR CLEANER.

GEAR CASE LUBRICATION

After every 100 hours of operation, it is important that a good quality grease be added to the gear case. (I-17 & 18)

DRIVING ROLLER

To remove roller, first dismantle the engine shroud, then unscrew the roller fixing nut clockwise with the wrench. (I-19)

No. 48859 Roller should normally be replaced approximately every 500 miles.

DAILY CHECKING

A daily check of your bicycle motor will pay big dividends in long life and satisfactory service. Take care of anything that needs attention at once. Don't let little problems develop into big ones.

KEEP YOUR UNIT CLEAN, BE ON THE LOOKOUT FOR LOOSEN NUTS AND DAMAGED PARTS.

- a. Check if the front and rear brakes are correctly adjusted. It is recommended to maintain effectiveness of the front brake in 70 ~ 80% of the rear brake.
- b. Check if the tire air pressure agrees with that recommended on tire.
- c. Check tires for worn out tread.
- d. Check for loose parts especially around the front fork area.

TROUBLE SHOOTING

When fuel is reaching the carburetor, and the motor still does not run, note the following:

- ★ Excess choking may cause an over rich (flooded) situation in the motor. Remove and clean the spark plug, and crank the motor briskly 5-6 times, to "BLOW" the excess fuel from the motor. Replace the spark plug and repeat the starting steps.

IN THE EVENT OF A LOSS OF POWER OR MOTOR STALL:

FUEL SYSTEM

When the motor stalls, or loss of power is noted, the fuel system should be checked as in above. If water is mixed in the fuel, the entire fuel system must be drained, and refilled with fresh fuel.

IGNITION SYSTEM

Check the ignition system as outlined previously and correct if necessary.

MOTOR STOP SWITCH

Ascertain that the motor stop switch and lead wire are not broken. Also, be certain that the switch is not wet or it may cause short circuit.

OVERHEATING

Check the following and correct if necessary.

- ★ The fuel mixture should be 25 parts regular gasoline to 1 part two-cycle engine oil. Too much oil in the mixture will result in severe carbonization of the combustion and exhaust areas and cause overheating.
- ★ When ignition timing is off from the factory-set standard it will result in over heating and cause poor performance.
- ★ When a high carbon buildup is noted in the combustion or exhaust areas, the carbon should carefully be removed.

- e. The filter element of the air cleaner should occasionally be cleaned by washing it in warm soapy water.

STORAGE

- a. Dismount the motor from the bicycle and drain all fuel from the carburetor, fuel tank and fuel line.
- b. Remove the spark plug, and place a few drops of motor oil through the spark plug hole, crank the motor over several times and replace the spark plug.
- c. Take special care in cleaning the unit, and coat all bare metal or plated parts with proper anti-corrosion oil.
- d. Store the unit in a dry, dust-free place.

THE CARBURETOR AND FUEL PUMP ARE PRE-SET AT THE FACTORY. THEREFORE READJUSTMENT OF THESE INTEGRAL COMPONENTS BY CUSTOMERS IS NOT RECOMMENDED. FOR SERVICE OTHER THAN THE PERIODICAL INSPECTIONS CONTAINED IN THIS MANUAL, ALWAYS TAKE THE MOTOR TO YOUR NEAREST DEALER OR SERVICE CENTER.

TROUBLE SHOOTING CHECK LIST

Motor Does Not Start	Starts But Does Not Run	Motor Misses	Does Not Idle	Does Not Develop Full Power	* Take your Bicycle Engine to your nearest dealer or service center.	
X	X				Push Primer Pump to Pump up Fuel	
X	X				Fuel Tank Empty	
X	X	X	X		Fuel Line Kinked or Pinched	
	X	X	X		Fuel Filter Dirty or Clogged	
X	X	X	X		Carburetor Passages Clogged or Dirty	*
X	X	X	X	X	Wrong Fuel-Oil Mixture	
X	X	X	X	X	Carburetor Out of Adjustment	
X	X				Fuel Flooded	
X	X	X	X	X	Wrong Type Spark Plug	
X	X	X	X	X	Defective or Fouled Spark Plug	
X	X	X	X	X	Breaker Contact Points Out of Adjustment	*
X		X			Defective Magneto	*
X					Spark Does Not Jump Spark Plug Gap	*
			X		Out of Timing	*
X	X	X	X	X	Breaker Contact points Burned or Pitted	*
X	X	X	X	X	Weak Ignition Coil	*
X	X	X	X	X	Weak or Defective Condenser	*
X		X			Spark Plug Lead Wire Not Secured	
X		X			Frayed or Cracked Lead Wire Insulation	*
X		X			Disconnected, Grounded or Loose Wiring in Electrical System	*
X				X	Roller Slips (Needs adequate pressure against tire)	

The parts list and drawings in the following contain all the spare parts available for the TAS BICYCLE ENGINE, MODEL QBM-23N should always be mentioned when ordering genuine spare parts and also include the correct part number and the description.

INSTRUCTIONS FOR THE PROPER USE OF THIS OWNERS MANUAL

1. ABBREVIATION

The following abbreviations are used in this manual.
 COMP. (COMPLETE) This refers to a part made of two or more pieces, fixed together permanently, which cannot be broken down.
 ASS'Y (ASSEMBLY) This refers to a part made of two or more pieces, which can be broken down to components.

HEX. HEXAGONAL
 CONN. CONNECTING
 MAG. MAGNETO
 SCREW ROUND HEAD SCREW
 F. H. SCREW COUNTER SUNK SCREW
 WASHER FLAT WASHER
 S. WASHER SPRING (LOCK) WASHER
 S. NUT SPECIAL NUT
 * The component parts of an assembly.

2. DIMENSIONS

All dimensions are in millimetres except for special fasteners, pulleys, steel balls, and wheels.

PART NAME	EXAMPLE	INTERPRETATION
PIN or DOWELL	5x13	5mm diameter, 13mm length
WASHER	6	for 6mm fastener
TUBE	6x150	6mm inside diameter, 150mm length
PIN	6x12	6mm diameter, 12mm length
OIL SEAL	12225	12mm inside diameter, 22mm outside diameter 5mm thick
GASKET or O-RING	8	8mm inside diameter

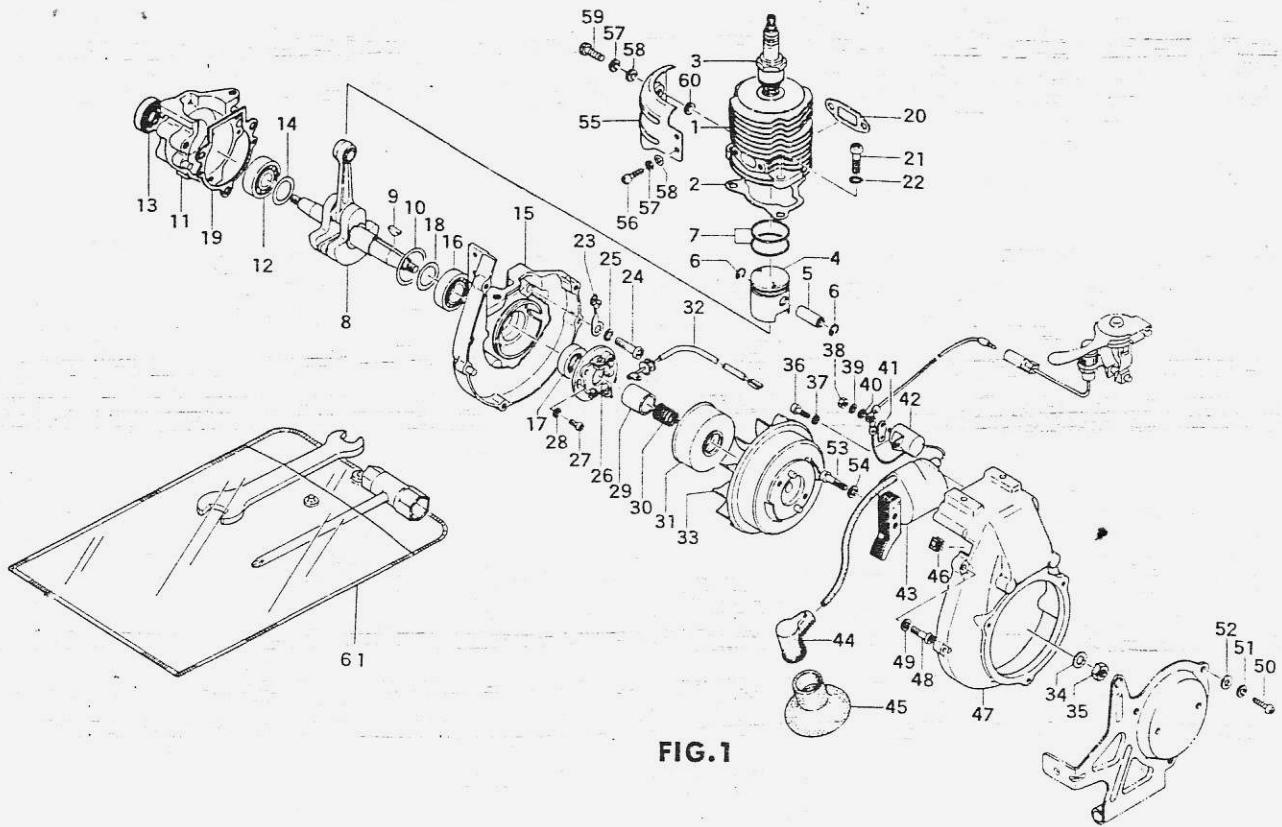


FIG.1

KEY.No.	PARTS. No.	PARTS NAME	Q'ty
FIG.1 ENGINE			
1- 1	002-00500-804	CYLINDER COMP	1
1- 2	017-00501-202	CYLINDER GASKET	1
1- 3	018-11107-200	SPARK PLUG (NGK BM-6A)	1
1- 4	031-00500-200	PISTON COMP	1
1- 5	037-00000-200	PISTON PIN	1
1- 6	039-00000-201	PISTON PIN CLIP	2
1- 7	041-00000-200	PARKER RING	2
1- 8	046-00501-803	CRANK SHAFT COMP	1
1- 9	068-02000-200	WOOD-RUFF KEY 3 x 13 x 5	1
1-10	070-02401-201	CRANK SHAFT WASHER	1
1-11	077-00502-204	CRANK CASE DRIVE SIDE COMP	1
1-12	990-61620-100	BALL BEARING #6201	1
1-13	999-66122-821	OIL SEAL #12287	1
1-14	07J-00601-201	CRANK SHAFT WASHER	1
1-15	076-00501-203	CRANK CASE STARTER SIDE COMP	1
1-16	999-61600-200	BALL BEARING #6002	1
1-17	999-66152-500	OIL SEAL #15257	1
1-18	071-02007-200	CRANK SHAFT SHIM	0 ~ 3
1-19	090-00501-202	CRANK CASE GASKET	1
1-20	737-00531-201	MUFFLER GASKET	1
1-21	990-11060-201	SCREW 6 x 20	3
1-22	992-10060-012	S. WASHER 6	3
1-23	198-00501-200	CORD CLAMP	1
1-24	990-11060-221	SCREW 6 x 22	3
1-25	992-10060-012	S. WASHER 6	3
1-26	159-20702-900	CONTACT BREAKER ASS'Y	1
1-27	990-11040-081	SCREW 4 x 8	2
1-28	992-01040-011	WASHER 4	2
1-29	246-20701-201	MAGNETO CAM	1
1-30	247-01000-201	CAM SUPPORT SPRING	1

KEY.No.	PARTS. No.	PARTS NAME	Q'ty
1-31	191-00501-201	CONTACT BREAKER COVER	1
1-32	173-20702-804	PRIMARY CORD COMP	1
1-33	155-20702-812	MAGNETO ROTOR COMP	1
1-34	065-00000-200	FLYWHEEL WASHER	1
1-35	066-00000-200	FLYWHEEL NUT	1
1-36	990-11040-081	SCREW 4 x 8	1
1-37	992-10040-012	S. WASHER 4	1
1-38	991-01030-011	NUT 3	1
1-39	992-10030-012	S. WASHER 3	1
1-40	992-01030-011	WASHER 3	1
1-41	205-00501-200	TERMINAL TAB	1
1-42	177-20701-801	CONDENSER COMP	1
1-43	167-20748-800	IGNITION COIL COMP	1
1-44	157-04000-800	SPARK PLUG CAP COMP	1
1-45	255-0062A-200	RUBBER CAP	1
1-46	202-10200-201	SECONDARY CORD GROMMET	1
1-47	112-00564-200	FAN CASE COMP	1
1-48	990-11050-201	SCREW 5 x 20	3
1-49	992-10050-012	S. WASHER 5	3
1-50	990-11040-121	SCREW 4 x 12	3
1-51	992-10040-012	S. WASHER 4	3
1-52	992-01040-011	WASHER 4	3
1-53	990-11050-201	SCREW 5 x 20	2
1-54	992-10050-012	S. WASHER 5	2
1-55	132-00539-201	FLASH PAN	1
1-56	990-11040-081	SCREW 4 x 6	2
1-57	992-10040-012	S. WASHER 4	3
1-58	992-01040-011	WASHER 4	3
1-59	990-11040-101	SCREW 4 x 10	1
1-60	751-0062W-200	SPECIAL PACKING, MUFFLER	1
1-61	985-36150-900	TOOL KIT	1
	970-36152-202	OWNER'S MANUAL (NOT ILLUSTRATED)	1

P. W. J. WOOD
9 MAXWELL AVE,
PAPATOETOE

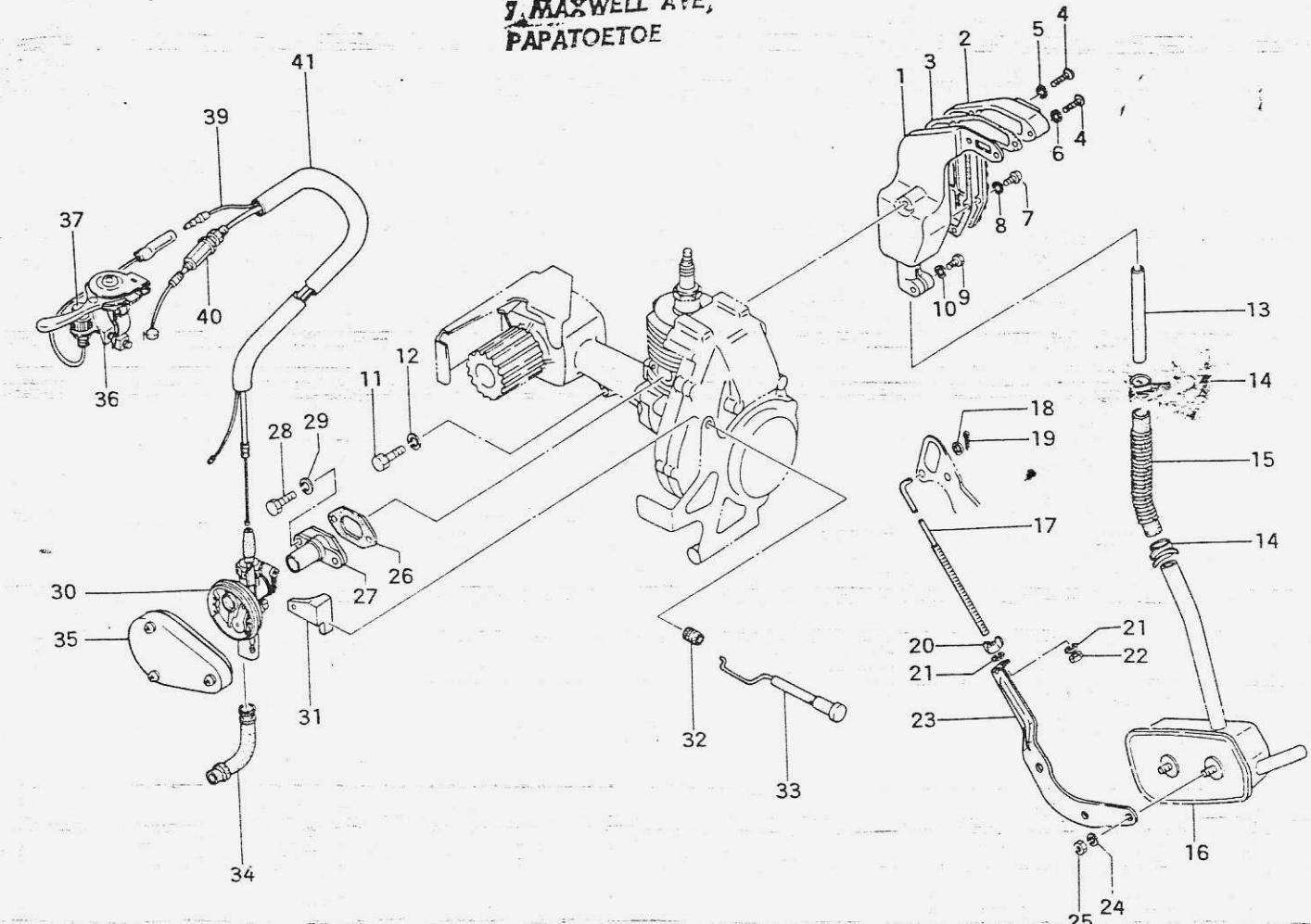


FIG. 2

KEY.No.	PARTS. No.	PARTS	NAME	O'ty
FIG.2 MUFFLER & CARBURETOR				
2- 1	716-00539-210		MUFFLER BODY A	1
2- 2	717-00539-200		MUFFLER BODY B	1
2- 3	737-00539-200		MUFFLER GASKET	1
2- 4	990-11050-381		SCREW 5 x 38	2
2- 5	751-00601-200		MUFFLER S. GASKET	1
2- 6	992-10050-012		S. WASHER 5	1
2- 7	990-11040-141		SCREW 4 x 14	6
2- 8	992-10040-012		S. WASHER 4	6
2- 9	990-21060-201		BOLT 6 x 20	1
2-10	992-10060-012		S. WASHER 6	1
2-11	990-21060-181		BOLT 6 x 18	1
2-12	992-10060-012		S. WASHER 6	1
2-13	220-36100-210		MUFFLER PIPE	1
2-14	680-36100-200		CLIP	2
2-15	222-36100-210		MUFFLER JOINT RUBBER	1
2-16	531-36150-800		SUB MUFFLER COMP	1
2-17	330-36100-202		ADJUSTER ROD	1
2-18	992-00050-011		SMALL WASHER 5	1
2-19	992-90200-150		SPLIT PIN	1
2-20	991-61060-012		WING NUT 6	1

KEY.No.	PARTS. No.	PARTS	NAME	Q'ty
2-21	992-10060-012	S. WASHER 6		2
2-22	991-01060-011	NUT 6		1
2-23	530-36100-201	SUB MUFFLER STAY		1
2-24	992-10060-012	S. WASHER 6		2
2-25	991-01060-011	NUT 6		2
2-26	403-00001-200	INLET MANIFOLD GASKET		1
2-27	393-00005-202	INLET MANIFOLD		1
2-28	990-11050-161	SCREW 5 x 16		2
2-29	992-10050-012	S. WASHER 5		2
2-30	455-22012-920	CARBURETOR ASS'Y		1
2-31	532-22012-200	CHOKE LEVER CAP		1
2-32	202-01225-200	GROMMET		1
2-33	704-36150-801	CHOKE BOTTON COMP		1
2-34	530-00564-200	RETURN PIPE		1
2-35	NIL	AIR CLEANER ASS'Y (Refer to FIG. 6)		1
2-36	870-00005-930	THROTTLE LEVER ASS'Y		1
2-37	170-01004-801	STOP SWITCH COMP		1
2-39	178-00539-810	STOP CORD COMP		1
2-40	885-00566-800	THROTTLE WIRE COMP		1
2-41	264-00564-200	CABLE PROTECTOR		1

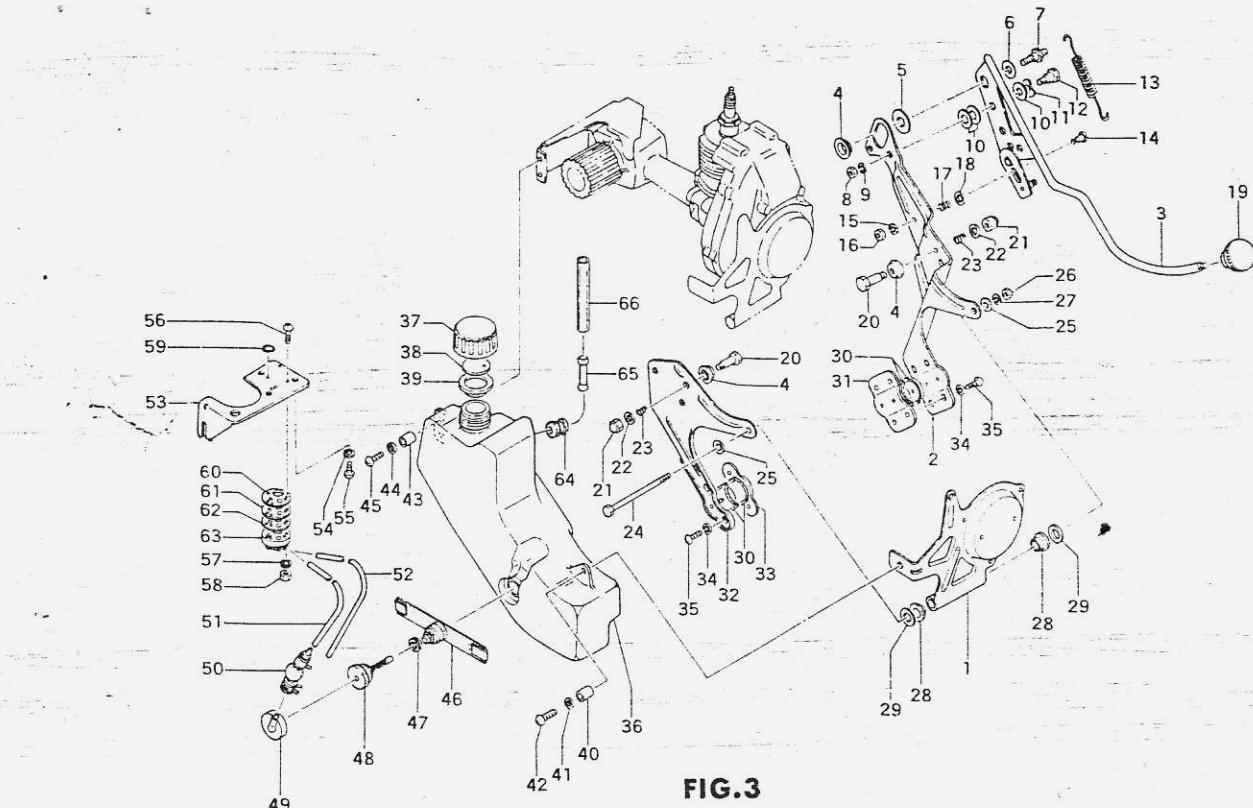


FIG.3

KEY.No	PARTS. No	PARTS NAME	Q'ty
FIG.3 BRACKET, TANK & PUMP			
3- 1	115-36150-800	BRACKET	1
3- 2	106-36100-201	CLAMP BRACKET A	1
3- 3	161-36150-801	ROLLER ENGAGE LEVER COMP	1
3- 4	109-36100-200	CLAMP BRACKET A GUIDE	3
3- 5	307-36100-200	ENGAGE LEVER WASHER	1
3- 6	992-01100-011	WASHER 10	1
3- 7	301-36100-201	ENGAGE LEVER SET BOLT	1
3- 8	991-01060-011	NUT 6	1
3- 9	992-10060-012	S. WASHER 6	1
3-10	992-01100-011	WASHER 10	3
3-11	992-04100-030	WAVE WASHER 10	1
3-12	300-36100-200	ENGAGE LEVER BOLT	1
3-13	306-36100-202	LEVER SPRING	1
3-14	304-36100-200	LINK GUIDE BOLT	1
3-15	992-10050-012	S. WASHER 5	1
3-16	991-01050-011	NUT 5	1
3-17	308-36100-201	ADJUSTER SPRING A	1
3-18	992-00060-011	SMALL WASHER 6	1
3-19	305-36100-200	KNOB	1
3-20	299-36100-201	STEP BOLT	2
3-21	991-42050-012	BLIND NUT 5	2
3-22	992-00050-011	SMALL WASHER 5	2
3-23	309-36100-200	ADJUSTER SPRING B	2
3-24	990-21061-001	BOLT 6 x 100	1
3-25	992-01060-011	WASHER 6	2
3-26	991-01060-011	NUT 6	1
3-27	992-10060-012	S. WASHER 6	1
3-28	102-36100-202	BRACKET GUIDE PLATE	2
3-29	108-35500-200	CLAMP BRACKET BUSHING	2
3-30	117-36100-200	CLAMP RUBBER	6
3-31	112-36100-201	CLAMP STAY A	1
3-32	107-36100-202	CLAMP BRACKET B	1

KEY.No	PARTS. No	PARTS	NAME	Q'ty
3-33	113-36100-201	CLAMP STAY B		1
3-34	992-10060-012	S. WASHER 6		6
3-35	990-11060-251	SCREW 6 x 25		6
3-36	401-36150-201	FUEL TANK		1
3-37	628-00539-200	TANK CAP		1
3-38	646-0062C-200	AIR VENT VALVE		1
3-39	629-0062A-200	TANK INNER CAP		1
3-40	426-36151-200	COLLAR		1
3-41	820-32500-200	WASHER		1
3-42	990-11060-181	SCREW 6 x 18		1
3-43	659-00601-200	COLLAR		2
3-44	992-01050-011	WASHER 5		2
3-45	990-11050-151	SCREW 5 x 15		2
3-46	675-04001-900	PUMP FILTER BODY ASS'Y		1
3-47	680-04019-210	CLIP 7		1
3-48	678-00601-201	RUBBER PIPE		1
3-49	500-33202-205	RUBBER CAP		1
3-50	593-01550-200	PRIMER PUMP ASS'Y		1
3-51	700-03005-200	FUEL PIPE 3 x 5 x 200		1
3-52	700-03005-230	FUEL PIPE 3 x 5 x 230		1
3-53	200-00539-210	PUMP FIXING PLATE		1
3-54	992-10060-012	S. WASHER 6		3
3-55	990-10060-101	SCREW 6 x 10		3
3-56	990-11040-161	SCREW 4 x 16		3
3-57	992-10040-012	S. WASHER 4		3
3-58	991-01040-011	NUT 4		3
3-59	999-67004-000	O-RING P-4		1
3-60	671-04001-213	PUMP GASKET		1
3-61	670-04001-211	PUMP DIAPHRAGM		1
3-62	674-04001-211	FREE VALVE		1
3-63	667-00539-801	PUMP SUCTION SIDE		1
3-64	203-10302-201	GROMMET		1
3-65	669-00539-200	FUEL PIPE JOINT		1
3-66	700-03005-045	FUEL PIPE 3 x 5 x 45		1

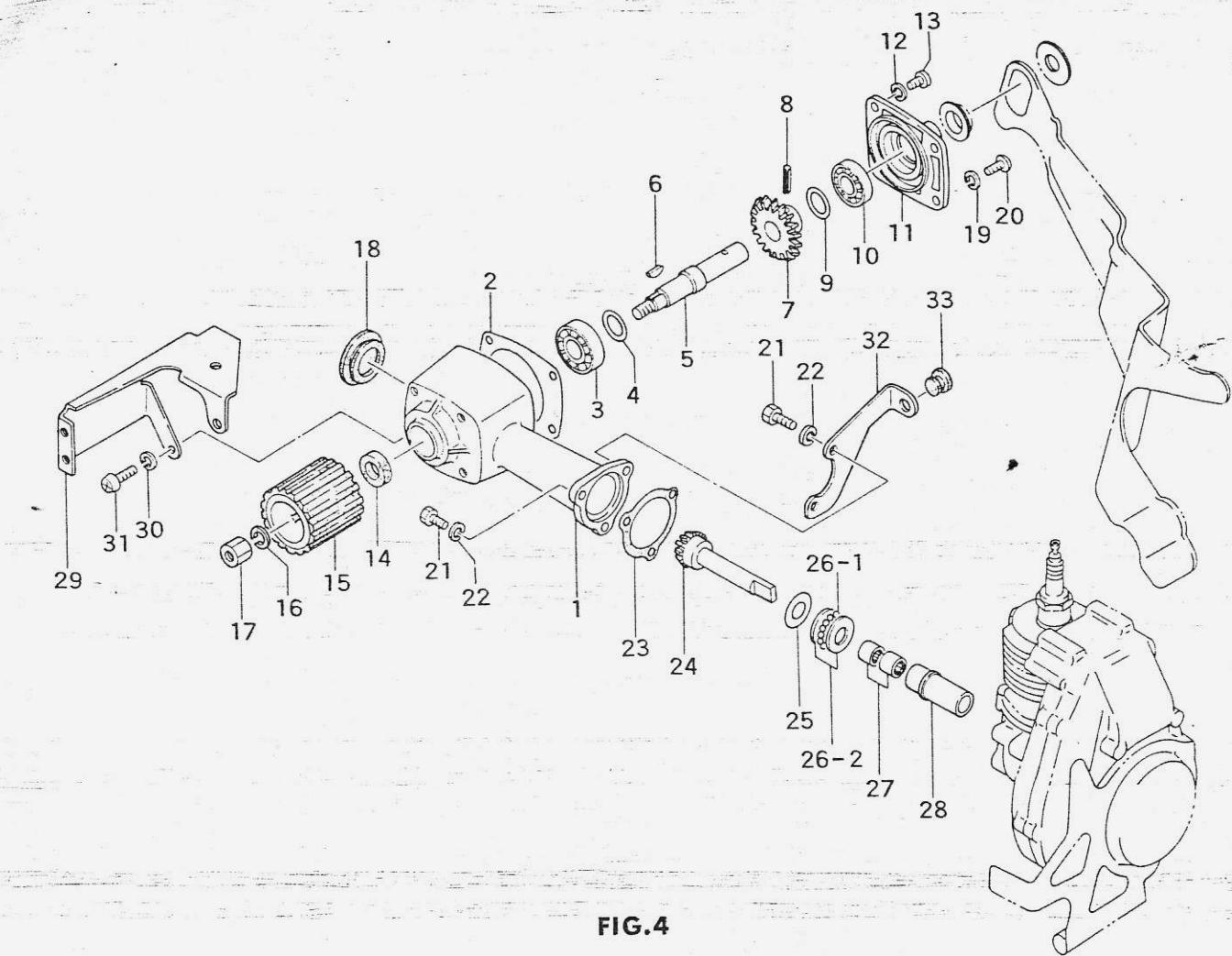


FIG.4

KEY.No.	PARTS. No.	PARTS	NAME	Q'ty
FIG.4 GEAR CASE				
4- 1.	131-36100-201	GEAR CASE		1
4- 2.	049-38100-200	GEAR CASE COVER GASKET		1
4- 3.	999-61620-100	BALL BEARING #6201		1
4- 4.	015-35500-200	PROPELLER SHAFT SHIM 0.1	1~3	
	016-35500-200	PROPELLER SHAFT SHIM 0.2	1~3	
	022-35500-200	PROPELLER SHAFT SHIM 0.3	1~3	
	014-35500-200	PROPELLER SHAFT SHIM 1.0	1~3	
4- 5.	005-36100-204	GEAR SHAFT		1
4- 6.	068-00300-200	WOOD-RUFF KEY 3 x 10 x 3.7		1
4- 7.	017-36100-210	GEAR		1
4- 8.	993-24050-241	SPRING PIN A		1
4- 9.	015-35500-200	PROPELLER SHAFT SHIM 0.1	1~3	
	016-35500-200	PROPELLER SHAFT SHIM 0.2	1~3	
	022-35500-200	PROPELLER SHAFT SHIM 0.3	1~3	
	014-35500-200	PROPELLER SHAFT SHIM 1.0	1~3	
4-10.	999-61600-100	BALL BEARING #6001		1
4-11.	045-36100-200	GEAR CASE COVER		1
4-12.	992-10050-012	S. WASHER 5		1
4-13.	990-11050-161	SCREW 5 x 16		1
4-14.	999-66122-266	OIL SEAL 12227		1

KEY.No.	PARTS. No.	PARTS	NAME	Q'ty
4-15.	231-36100-800	ROLLER COMP (No.48859)		1
4-16.	992-12080-012	S. WASHER 6		1
4-17.	991-85080-321	LONG NUT 8 x 32/L.H. SCREW		1
4-18.	046-36100-200	GEAR CASE GROMMET		1
4-19.	992-10050-012	S. WASHER 5		3
4-20.	990-11050-141	SCREW 5 x 14		3
4-21.	990-21060-161	BOLT 6 x 16		3
4-22.	992-10060-012	S. WASHER 6		3
4-23.	303-00200-200	GEAR CASE GASKET A		1
4-24.	060-36100-210	PINION		1
4-25.	064-35500-200	PROPELLER SHAFT SHIM 0.1	1~3	
	063-35500-200	PROPELLER SHAFT SHIM 0.5	1~3	
4-26-1.	999-62102-463	THRUST BEARING #1024		1
4-26-2.	999-62102-464	THRUST WASHER #1024		2
4-27.	999-62101-010	NEEDLE BEARING TLA 1010		2
4-28.	079-36100-802	ADAPTER COMP		1
4-29.	420-36150-800	TANK BRACKET		1
4-30.	992-10050-012	S. WASHER 5		2
4-31.	990-11050-121	SCREW 5 x 12		2
4-32.	390-36150-200	BRACKET		1
4-33.	599-00601-200	GROMMET		1

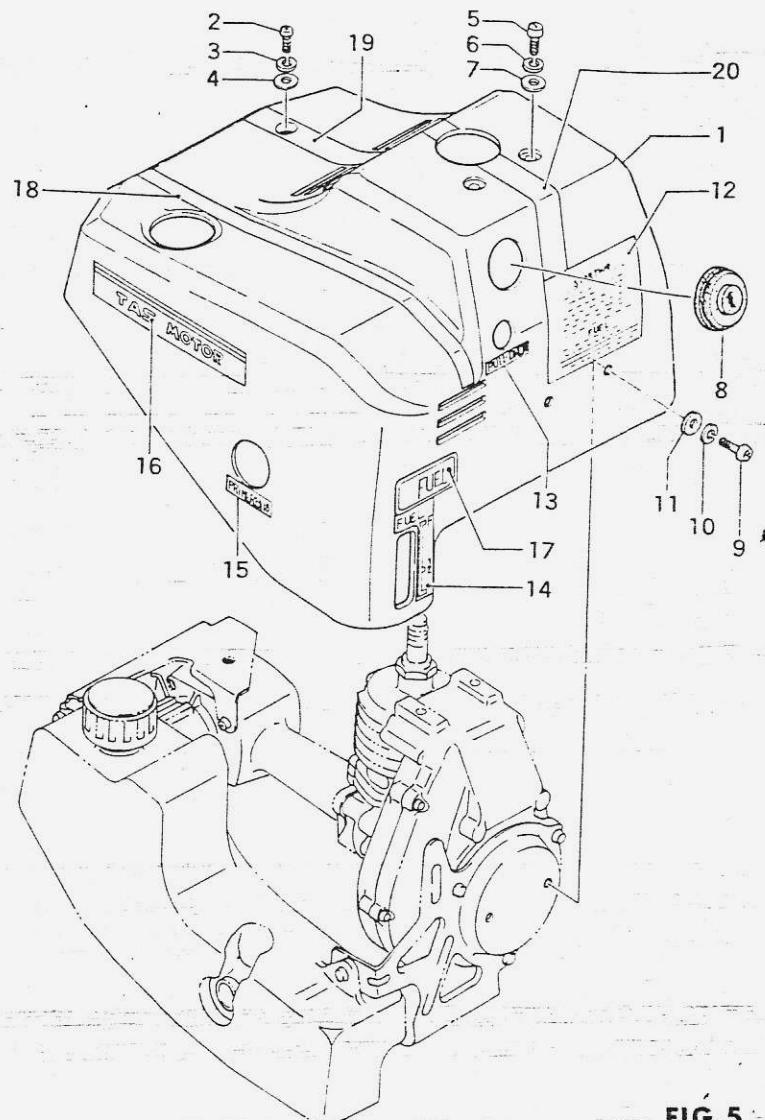


FIG.5

KEY.No.	PARTS. No.	PARTS NAME	O'ty
FIG.5 ENGINE SHROUD & MARK			
5- 1	380-36150-200	ENGINE SHROUD	1
5- 2	990-11050-141	SCREW 5 x 14	1
5- 3	992-10050-012	S. WASHER 5	1
5- 4	992-01050-011	WASHER 5	1
5- 5	990-11050-141	SCREW 5 x 14	2
5- 6	992-10050-012	S. WASHER 5	2
5- 7	992-01050-011	WASHER 5	2
5- 8	202-01003-201	GROMMET	1
5- 9	990-11050-141	SCREW 5 x 14	2
5-10	992-10050-012	S. WASHER 5	2
5-11	992-01050-011	WASHER 5	2
5-12	580-36152-200	CAUTION MARK, TAS	1
5-13	908-36150-200	CHOKE MARK	1
5-14	923-36150-200	FUEL LEVEL MARK	1
5-15	927-36150-200	PRIMER MARK	1
5-16	920-36152-200	SIDE MARK	2
5-17	909-11108-201	TANK MARK	1
5-18	930-36152-200	SHROUD MARK A	1
5-19	933-36152-200	SHROUD MARK B	1
5-20	934-36152-200	SHROUD MARK C	1

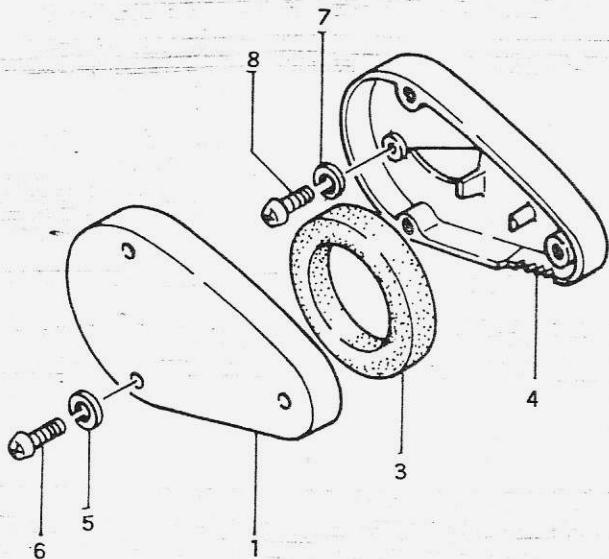


FIG.6

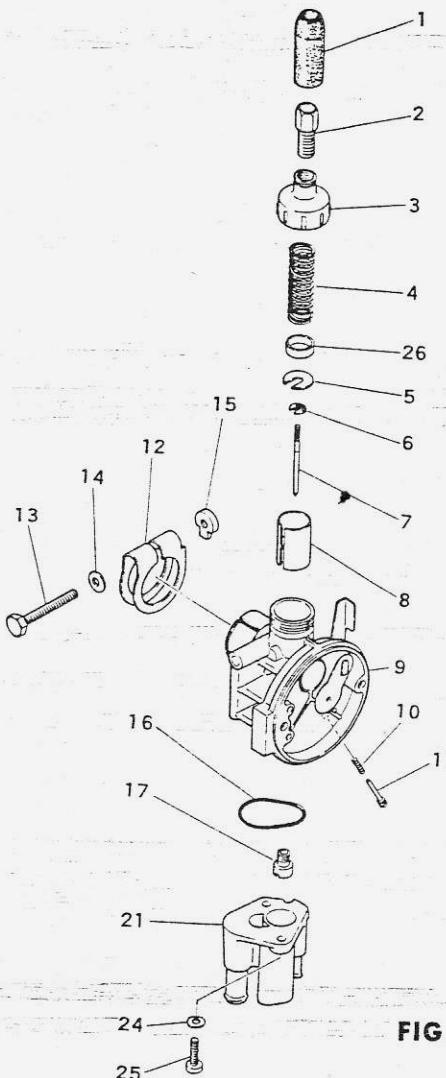


FIG.7

KEY.No.	PARTS. No.	PARTS	NAME	Q'ty
FIG.6 AIR CLEANER				
6- 1	424-00539-200	AIR CLEANER COVER		1
6- 3	445-00601-200	CLEANER ELEMENT		1
6- 4	423-00539-202	AIR CLEANER BODY		1
6- 5	992-00040-011	WASHER 4		3
6- 6	990-11040-101	SCREW 4 x 10		3
6- 7	992-10040-012	S. WASHER 4		2
6- 8	990-11040-101	SCREW 4 x 10		2

KEY.No.	PARTS. No.	PARTS	NAME	Q'ty
FIG.7 CARBURETOR				
7-0-1	455-22012-920	CARBURETOR ASS'Y		1
7- 1	560-22602-200	* RUBBER CAP		1
7- 2	597-22602-200	* CABLE ADJUSTER		1
7- 3	595-22602-200	* BODY CAP		1
7- 4	594-22000-200	* THROTTLE VALVE SPRING		1
7- 5	619-22602-200	* THROTTLE SPRING RECEIVE		1
7- 6	593-22000-200	* JET NEEDLE CLIP		1
7- 7	592-22012-210	* JET NEEDLE		1
7- 8	591-22009-200	* THROTTLE VALVE		1
7- 9	530-22009-800	* CARBURETOR BODY COMP		1
7-10	623-22000-200	* ADJUST SPRING		1
7-11	622-22000-200	* ADJUST SCREW		1
7-12	591-22602-200	* BAND		1
7-13	617-22602-200	* BAND BOLT		1
7-14	992-01050-001	* WASHER 5		1
7-15	618-22602-200	* BODY BAND NUT		1
7-16	607-22000-200	* CHAMBER GASKET		1
7-17	599-22000-252	* MAIN JET		1
7-21	580-22009-800	* FLOAT CHAMBER COMP		1
7-24	992-10040-012	* S. WASHER 4		2
7-25	990-11040-101	* SCREW 4 x 10		2
7-26	526-22012-202	* COLLAR		1

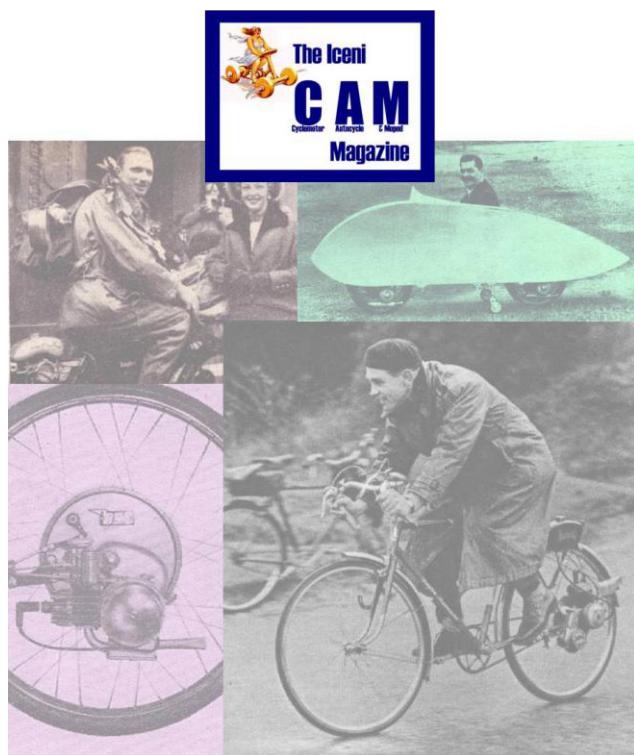
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