KAWASAKI 750 MODEL H2-R

SERVICE MANUAL

CONTENTS

1. Specifications

Engine

Type	2-stroke, 3 cylinders, piston valves, air cooled
Displacement	45.63 cu-in (748 cc)
Bore x Stroke	2.80 x 2.48 in. (71 x 63 mm)
Compression Ratio	6.7 : 1
Max. Horsepower	more than 100 bhp @9,000 rpm
Max. Torque	8.3 kg-M @8,500 rpm
Ignition System	Mag. C.D.I.
Ignition Timing	23° BTDC (3.0 mm)
Spark Plugs	NGK B-10.5 EN
Spark Plug Gap	0.018~0.020 in. (0.45~0.50 mm)
Carburetors	MIKUNI VM 35SC
Fuel	Gasoline, high octane above 98
Engine Oil	Castrol R30, Shell Super M(X-100) (Mixing ratio 30:1) (Injection oil and mixing oil should be same one.)
Lubrication	Superlube oil injection and oil-gas mixed

Port Timing			
Inlet	Open	BTDC	78°
"	Close	ATDC	78°
Scavenging	Open	BBDC	63°30'
"	Close	ABDC	63°30'
Exhaust	Open	BBDC	96°30'
"	Close	ABDC	96°30'

Performance

Max. Speed	more than 170 mph (273 km/h)

Transmission

Type	5-speed, constant-mesh, return change
Clutch	Multi-disc, dry plate

Gear Ratio		
Low	1.714 (2.075)	24/14
2nd	1.294 (1.567)	22/17
3rd	1.048 (1.268)	22/21
4th	0.900 (1.090)	18/20
Top	0.826 (1.000)	19/23

Primary Reduction Ratio	1.875	60/32
Final Reduction Ratio	2.733	41/15 (Standard Ratio)

Total Reduction Ratio	Low	8.911
	2nd.	6.728
	3rd	5.449
	4th	4.679
	Top	4.294
Shift Control	Toe shift, Left hand (Right hand is optional system)	
Transmission Oil	SAE 10W-30 automotive oil	
Capacity	1.8 qt. (1.7 liter)	
Starting	Push bump	

Chassis

Type	Tubular, double cradle	
Suspension, Front	Telescopic fork	
Rear	Swinging arm	
Damper, Front	Coil spring, oil damper	
Rear	Coil spring, oil damper	
Front Fork Oil	0.16 qt. (147 cc) for each fork	
	Mobil	#30 oil 80%
	Spindle	#60 oil 20%
Tire, Front	3.00-18 4ply rating	
Rear	3.50-18 4ply rating	
Rim, Front	1.85B-18 racing	
Rear	2.15B-18 racing	
Drive Chain	#530 Racing	

Brakes

Type, Front	Dual disc	
Rear	Internal expansion, leading-trailing	
Size, Front	11.65 in. (296 mm) disc diameter	
Rear	9.1 x 1.9 in. (230 x 48 mm) inside dia. x width	
Disc Brake Fluid	Automotive brake fluid	

Dimensions

Overall Length	78.9 in. (2,005 mm)
Overall Width	21.3 in. (510 mm)
Overall Height	43.3 in. (1,100 mm)
Wheelbase	54.4 in. (1,383 mm)
Road Clearance	5.87 in. (149 mm)

Trail	3.35 in. (85 mm)
Caster	63°30'
Dry Weight	315.3 lbs. (143 kg)
Fuel Tank Capacity	24 liters
Oil Tank Capacity	1 liter

2. Necessary Check before Riding

1) Injection oil quantity and Fuel oil quantity	
2) Mixing Ratio	30 : 1
3) Starter Lever	normal position
4) Throttle Valve Opening	accurately synchronized
5) Wheels	alignment of front and rear wheel
6) Tires	air pressure
7) Tires	wear
8) Spokes	loosening
9) Wheels	balancing
10) Brakes	operation and play
11) Drive Chain	play
12) Rear Shock Absorber	the same position
13) Front and Rear Shock Absorber:	operation
14) Safety Wire and Pin	firmly attached

NOTE: It is recommended to use the hot type plugs for warming up, and replace with the standard ones before racing.

3. Starting Procedure

1) Standard starting procedure is as follows:

a. Stopping of the warmed engine.

(1) First turn the fuel taps off.

(2) Open the throttle grip several times until the fuel in the float chamber decreases by half, and change the gear down to the first, disconnecting the clutch.

(3) Connect the clutch softly and quickly with front and rear brakes on.

b. Just before starting

(1) Replace the spark plugs with the new ones.

(2) Open the fuel taps about 8 to 10 seconds before starting, disconnect the clutch, and open the throttle by 3 to 4 mm (1/8 opening).

2) Caution:

Too much opening of throttle grip leads to the poor starting, especially with 2 strokes. The above procedure b-(1) is pretty important for good result.

4. Breaking In

1) Ride for 20 minutes in 3rd gear or 4th gear at 6,000~7,000 rpm.

2) Ride for 10 minutes or more at 7,000~8,000 rpm.

3) Remove cylinders and check pistons. If any polished surface is found from contact with cylinder wall, smooth that part of piston with #400-#600 sandpaper and wash clean with gasoline.

4) Ride for 5 minutes in top gear at a constant 9,000 rpm.

5) Ride for 2 or 3 minutes in top gear at full throttle.

6) Check the condition of the spark plugs frequently to get a "reading" on engine performance, and change spark plugs or main jets as needed to obtain good engine performance.

7) Check chassis and engine for loose nuts and bolts.

8) Steps 1 through 7 above must be followed for breaking in. Whenever pistonsand or cylinders are replaced with new ones this breaking in procedure must be followed.

NOTE: Piston and cylinder clearance is 0.14~0.15 mm at measuring point 1.0 in. (25.0 mm). (0.05~0.06 mm at piston skirt)

5. Maintenance and Adjustment

Sprockets

1) Engine Sprocket	Standard	15T
	Optional	14T, 16T
2) Rear Sprocket	Standard	41T
	Optional	39T, 43T

NOTE: H2-R is equipped with 15T engine sprocket and 41T rear sprocket. Choose suitable one in accordance with riders skill, racing course and atmospheric circumstance.

Reduction Ratio	3.071	43/14
	2.929	41/14
	2.867	43/15
	2.786	39/14
	2.733	41/15
	2.688	43/16
	2.600	39/15
	2.563	41/16
	2.438	39/16

Carburetors

1) Specifications

a. Type of Carburetors MIKUNI VM 35SC

b. Setting Table

Name	Code	Specification
Main jet	MJ	280
Air jet	AJ	2.0
Jet needle	JN	9FR3-3
Needle jet	NJ	Q-0 (8 m/m)
Throttle valve	CA	5.0
Pilot jet	PJ	60
Pilot outlet	PO	1.8
Air adjusting screw	AS	1/2
Valve Sheet	VS	3.3
Float level (from bore center)		1.44 in. (36.5±1mm)

2) Notes on carburetor setting

a. #280 main jets are available for various riding conditions.

b. When you change the jet needle clip position by one step lower (richer), the main jet number should be also changed by 10 to 20 smaller, in order to keep the same fuel-air mixture ratio at fuel throttle opening.

c. Before adjusting, check dust and fuel flow in the fuel cock.

d. As the grooves of jet needle are often damaged by friction of clip, check the bottom of these grooves before racing.

Spark Plugs

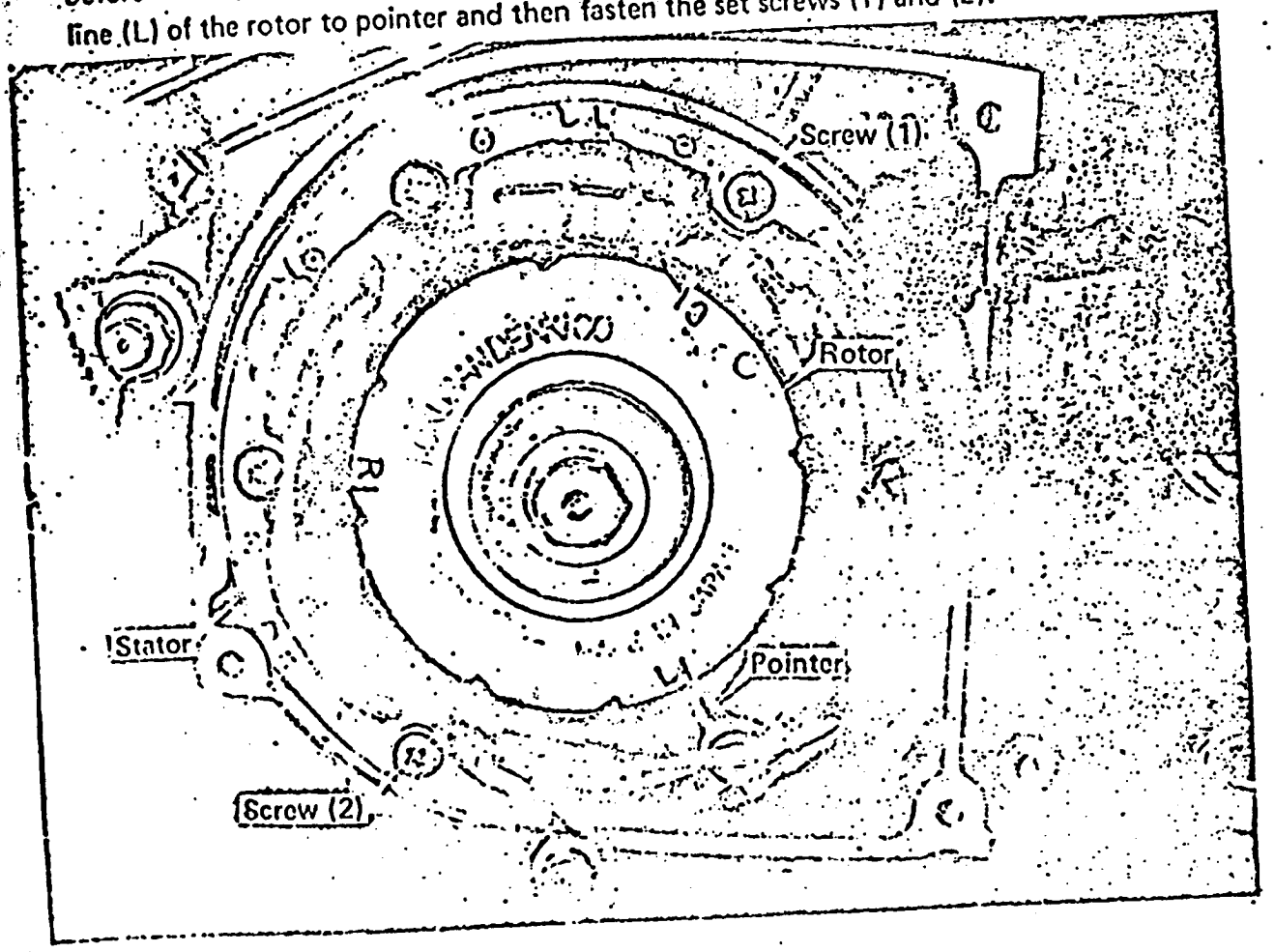
1) Standard spark plug is NGK B-10.5EN. However, they should be chosen according to the racing circuit, atmospheric conditions and rider's skill. This machine has been tested with NGK spark plug. The following conversion charge is furnished as a guide and no more than that.

2) Spark plug conversion chart

NGK	Champion	Auto-Lite	Bosch
B-9EN	E58R	AG603	W290T17
B-9.5EN	E57R		W310T17
B-10EN	E56R	AG403	
B-10.5EN	E54R		W370T17
B-11EN	E53R	AG203	W400T17
B-12EN	E52R	AG103	W440T17

Ignition Timing

Inserting the dial gauge in to the L.H. Cylinder head, set the piston to 3.0 mm (23°) before the top dead center, loosening the set screws (1) and (2), adjust the stamped line (L) of the rotor to pointer and then fasten the set screws (1) and (2).



Oil Pump Setting

Position 1 marked on the oil pump lever is the normal position and pump output at this position is fixed at 50cc/hr per outlet, with the engine at 2,000 r.p.m. At position 2, output per pipe is a fixed 200cc/hr.

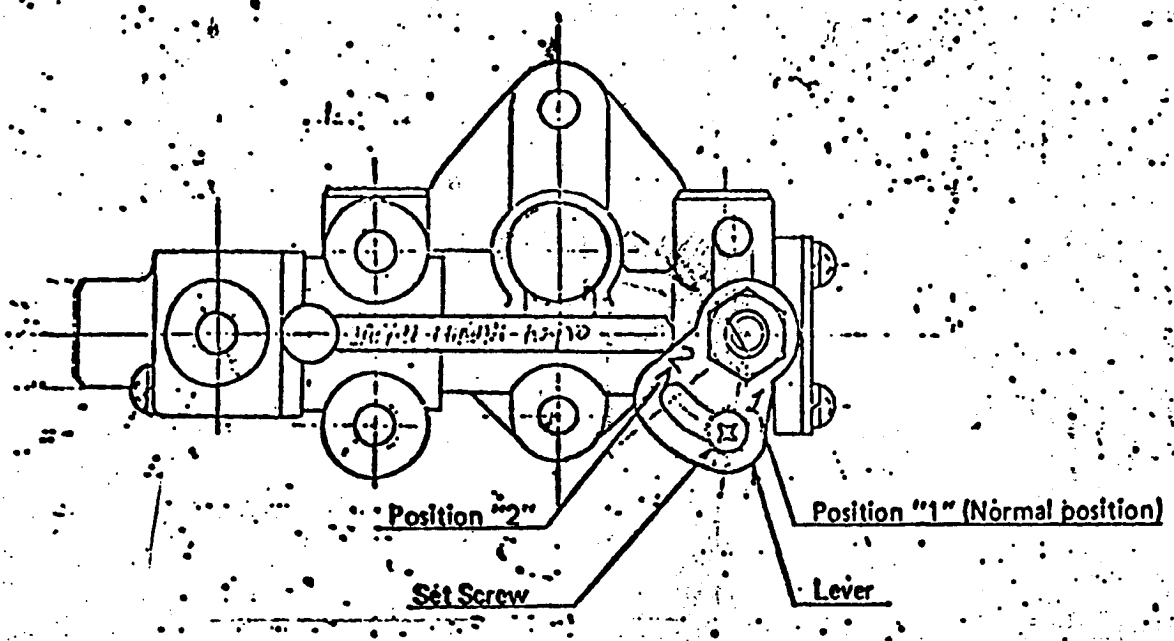
If there is any air or water in the oil lines, bleed them as follows:

(1) Loosen the pump intake fitting until the air or water is drained from the intake pipe.

(2) Tighten all oil pump fittings.

(3) Push the pump lever fully open by hand (to position 2) while running the engine at idle speed until no air bubbles appear in the pump outlet pipes.

(4) After bleeding, return the lever to position 1 and fasten the set screw.



Chassis

1) Front Fork

a. Damping action of the front fork is most important for good steering and the front fork must be kept in good condition to work effectively.

b. When changing front fork oil, refill with clean, new oil only because dust or other foreign matter in the oil will cause rapid wear and insufficient damping. The stiffness of damping action is adjustable by changing either the viscosity or the quantity of oil in accordance with the rider's choice. Normally, stiffness is increased by using a high viscosity oil and decreased by using a low viscosity oil.

c. Standard front fork damper oil is a mixture of 20% spindle oil and 80% #30 mobil oil. Standard quantity is to fill up to 15¾ inches from top of fork inner tube about 0.16 qt. (147 cc) per fork leg.

2) Rear Shock Absorbers

Rear shock absorbers can be adjusted to meet racing circuit conditions by turning to one of the five positions with a special tool.

NOTE: Both shock absorbers must always be set in the same adjustment position.

3) Wheels

a. Front and rear wheels must be aligned precisely to prevent unstable steering at high speed.

b. Check wheels for loose spokes periodically and tighten when necessary.

c. Wheels must be balanced. Always rebalance wheel after removing and remounting the tire.

d. Tire air pressure must be adjusted to match the racing circuit, temperature, etc., in accordance with the rider's experience.

Standard tire pressures are:	Front	28 psi (2.0 kg/cm²)
	Rear	34 psi (2.4 kg/cm²)
Standard tire sizes are:	Front	3.00-18 4PR Ply Rating
	Rear	3.50-18 4PR Ply Rating

e. Check the axle bearings in the wheel hubs frequently. If there is even the slightest play, replace with new ones.

Front wheel bearing	6302Z
Rear wheel bearing	6303Z

4) Brakes

a. Brakes on road racers are subjected to particularly severe usage. It is extremely important to check carefully brake drum and brake lining for wear or seizure before racing. Be particularly careful that dirt or foreign matter are cleaned from brake drums.

b. Play in rear brake wires should be adjusted in accordance with the rider's preferences.

5) Fuel Tank

a. Keep the inside of the fuel tank clean. Use a filter when filling the tank with fuel. Make sure no foreign matter which could clog fuel lines or carburetors gets into the tank.

b. It is very difficult to clean the fuel tank of the H2-R of any foreign matter lodged inside, as the tank has a complicated shape and structure.

6) Cowling

The cowling and screen are made of synthetic resin and can be scratched and damaged easily, and the screen is easily broken. It is best to protect the screen with a cover of soft cloth when not in use.

7) Safety Wire

The following parts should be secured with safety wire to prevent their becoming loose while running:

Axles, swinging arm shaft fender fitting bolts, footrest fitting nuts, other major bolts and nuts.

8) Cables

Check all cables for wear and lubricate before each race.

9) Drive Chain

Check drive chain for wear and lubricate before each race. Adjust drive chain so there is a play of $1^3/_{16}$~$1^3/_8$ inch (30~35 mm) midway between the sprockets, at on the stand.

Torque Value

Size	ft/lbs	in/lbs	kg/m
6 mm	7	90	1.0
8 mm	15	180	2.0
10 mm	26-29	300-350	3.5-4.0
12 mm	29-33	350-400	4.0-4.5
14 mm	33-37	400-450	4.5-5.0

6. Trouble Shooting

1) Hole in Piston

a. Probable cause

(1) Pre-ignition (that is a sort of hot surface ignition) due to inadequate spark timing, main jet number, spark plug, or carbon deposits originated from unsuitable oil.

b. Possible cure

(1) Adjust spark timing exactly to be 23° BTDC i.e. 0.118 in (3.0 mm) with a dial gauge.
Caution: earlier timing leads directly to pre-ignition.

(2) Use larger number of main jet if the mixture is found to be lean.

(3) You may, of course, use colder spark plug like B-11 EN or those equivalent if available. As the most effective method for preventing pre-ignition, however, bear the tendency in mind that the colder spark plug leads to the more frequent plug fouling.

Caution: When you change the jet needle clip position by one step higher (leaner), the main jet number should be also changed by 10 to 20 larger in order to keep the same fuel-air mixture ratio at full throttle opening.

NOTE: Before adjusting, check dust and fuel flow in the fuel taps.

2) Poor starting

a. Probable cause

Inadequate starting procedure for this 2 stroke high-rev. machine.

b. Possible cure

Follow the steps in the same way as mentioned in paragraph 9 on the standard starting procedure.

3) Wobbling

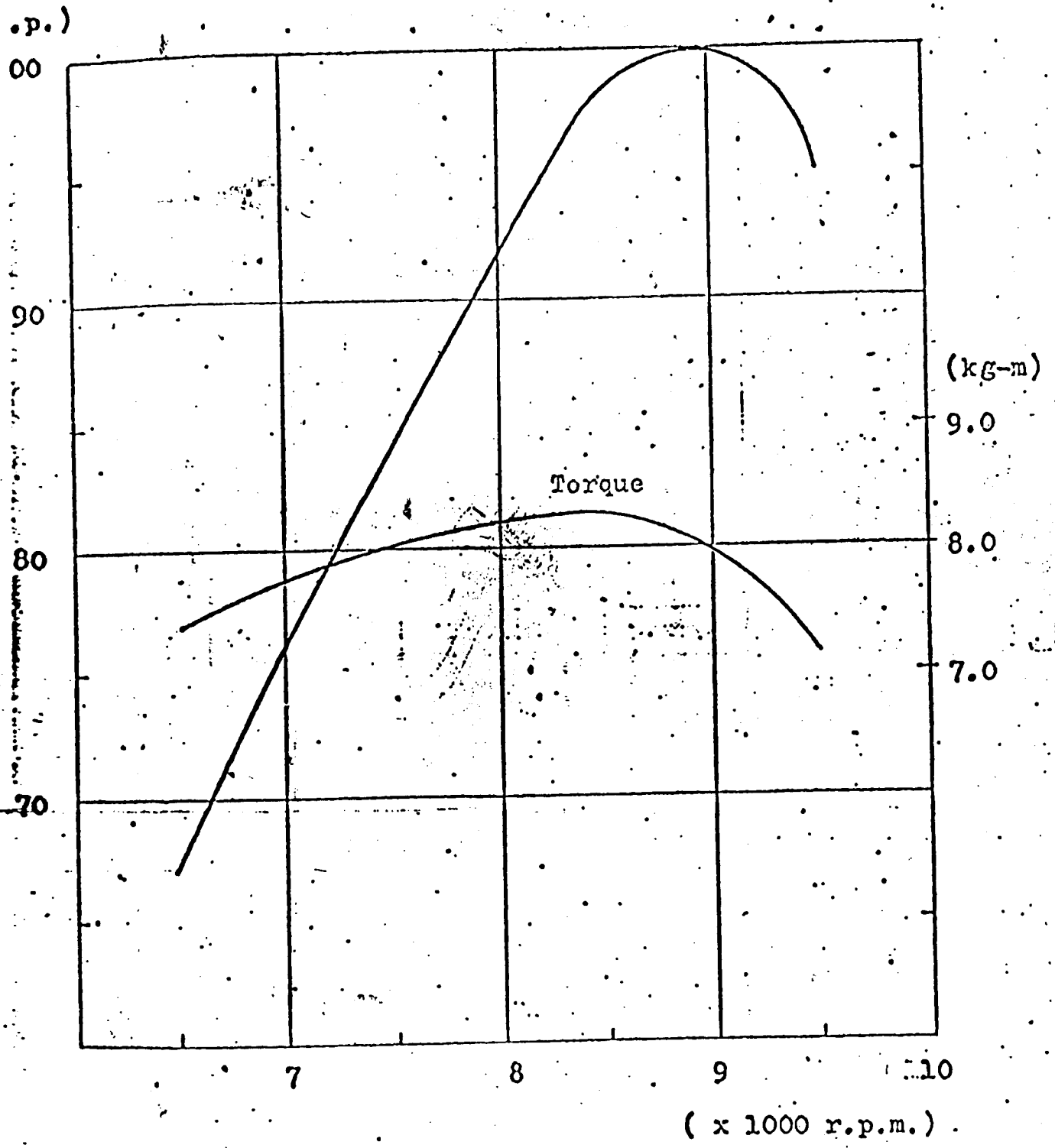
a. Probable cause

It may be due to any bad shape of tires, any wear of tires, unbalance of each wheel, out of order of alignment of two wheels, loose spokes or deformed rims.

b. Possible cure

(1) Replace tires
(2) Adjust with balance weight.
(3) Tighten spokes, repair or replace rims.

7. H2-R Engine Performance Curves



8. H2-R Wiring Diagram