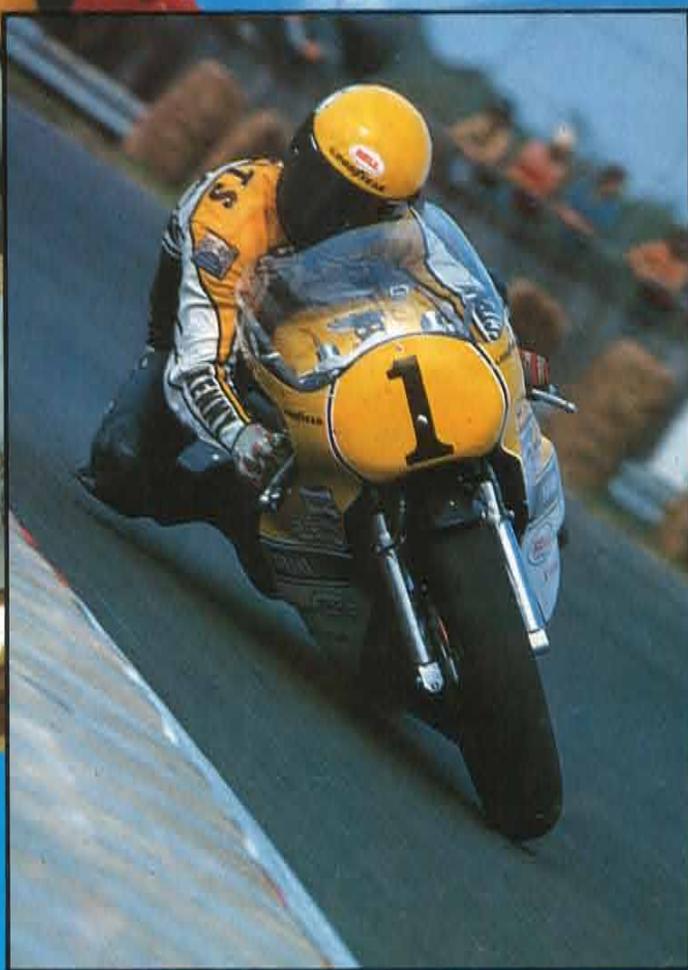


## Congratulations, "King" Kenny!!



### 500cc crown clinched for the second consecutive year

Kenny Roberts (Yamaha YZR500) clinched the 500cc world championship title when he finished 3rd at the French GP, the final round of the series held at Le Mans on Sept. 2. He snatched 5 wins of the 10 races he contested and collected 113 championship points to defend his title.  
(See page 6 for more details)



**New Yamaha Diesel Engines  
ME60, ME120,  
and ME180  
make their debut!**

(See page 4 for more details)



### "Speedy" and "Accurate"

Yamaha's perfect parts  
supply  
system

(See page  
12-13 for  
more details)



## Around the World

# No restriction on motorcycles!



A street in Colombo at dusk. More and more working people will come to switch to motorcycles or scooters from cars.

**From Sri Lanka:** The government of Sri Lanka has recently decided to keep private cars off the road with all petrol sheds closed between 8 a.m. and 2 p.m. on Sunday every week.

The government has also decided to allow motorcycles and public transport to operate without any restriction on Sundays. This move by the government is intended to cope with a recent 30% increase in fuel prices imposed by the OPEC countries.

### No duty on bikes and scooters

Another noteworthy decision taken by the government was the

abolishment of the Customs duty on the import of bicycles, motorcycles and scooters, with immediate effect.

There will be no duty on the import of spare parts for these vehicles, and components for bicycles. Motorcycles and scooters were formerly charged a duty of 50% and

The headline from the "Ceylon Daily News" reporting Sunday restrictions on the use of cars.

### Sundays: cars off road for 6 hours

● Petrol sheds closed all day

By T. Sabaratnam and Kumar Weeratunge  
The government yesterday decided to keep private cars off the road on Sundays between 8 a.m. to 2 p.m. Mr. Cyril Mathew, who would result in the Ceylon Petroleum Corporation paying an additional 3.5 US dollars a barrel, C.P.C. sources said yesterday. This means that Sri Lanka would have to pay a...

## Yamaha Licence School

**From New Zealand:** Moller Yamaha in New Plymouth recently organized a motorcycle licence school in Christchurch in co-operation with their dealers—Jack's Yamaha, Norjo Motors and Tommy's Yamaha. The aim of this school was to introduce new customers to the Yamaha dealers by assisting non motorcyclists to obtain their licence to ride.

Some days earlier, the students had attended an evening lecture to learn how to go about obtaining their licence and mastering basic riding skills.

On the riding day, the students were shown the fundamentals of riding a bike on new Yamaha machines supplied by the above dealers, and those riders passing the test

were given their Provisional Licence by the Ministry of Transport. Weather condition was unfortunately bad but all students tackled the curriculum with ardor. Similar schemes will be run again in summer.



## Iranian market is picking up!

Production and sales are expanding at high pitch

**From Iwata:** According to the latest news from Iran, the demand for bikes is shifting favorably in various parts of Iran even after the recent political turmoil. D.M.I., an assembly plant, continues its 100% operation but still cannot fully satisfy the demand while C.P.C., sales distributor, also holds a considerable backlog of orders. Now

bikes have become an established part of Iranian life in and play an important role as a means of transportation especially for those actively engaged in industrial activities.

President Tale of D.M.I. and President Tavassol of C.P.C. visited Japan in February and April respectively, and each had a meeting with

due the above abolishment the prices of these vehicles are expected to fall and be within the reach of many more people. The majority of working people will prefer to use scooters or motorcycles as low-cost means of daily transport.

"We must back the government on this. We are able to import bikes

into the country because of government policy. As it is the government's wish to conserve fuel and help middle class people to own vehicles, we must do everything possible to help", says Mr. Brian Lourensz, Managing Director of Consolidated Engineering Company, importers of Yamaha motorcycles.

The city of Tehran



The plant is at full capacity for production increase.

will be even greater and the production and sales record of 160,000 in 1977 can easily be renewed.

Against such a market background, both D.M.I. and C.P.C. sent Yamaha a following message; Since bikes are regarded as handy and essential means of transportation due to their low and economical running cost, their market will be sure to expand in future, reflecting various advantages, but, at the same time, we can not forget our important task of giving further deliberation to safety, including service follow-up.

the executives of Yamaha Motor. It is reported that the production and sales figures for last year reached 115,000. If traffic controls in the congested downtown area are strengthened and restrictions are imposed on 4 wheelers entering such areas, dependence on bikes

## Look at a prospective big figure!



**From Finland:** A little rider on a Yamaha works motocrosser is posing for a camera. Who is he? He is too small for the machine but his posture is truly that of a motocross competitor.

This is five-year old Antti Mikkola, the dearest son of Heikki Mikkola. It is no wonder that he has learned his father's top form having watched it in actual competition.

# A big topic

Yamaha  
outboard motors

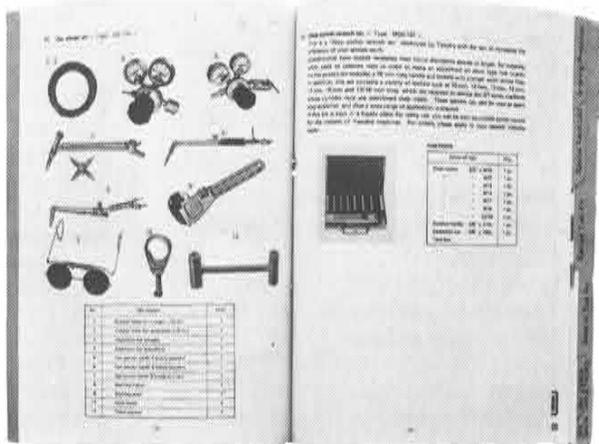


**Costa Rica:** A new range of Yamaha outboard motors which was shown by Motorcentro S.A. provided a big topic for conversation among marine pleasure seekers and commercial users at the Torneo Nacional de Ski Acuático recently held at the Hotel Colonial, San Jose, Costa Rica.

There is notable new tendency that big power models make a good appeal to customers and the Yamaha 85, the largest of the Yamaha range, is becoming one of the best sellers in its own class. Yamaha importer Motorcentro S.A. is seizing every possible chance to launch sales drives in close cooperation with all affiliated dealers.

## Make full use of "Service Shop Equipment"

**From Iwata:** No.1 and No.2 issues of "Service Shop Equipment" have already been distributed for wide use by Yamaha distributors and dealers. No.1 issue shows many different types of special and standard tools together with their individual applications while No.2 issue explains various workshop equipment and facilities. Both issues are now being fully utilized.



No.1 and No.2 issues are very favorably received by worldwide distributors and dealers.

The production of No.3 issue providing a general guide for workshop layout has also got under way. Sale and service are, as it were, the two wheels of a machine. Both are closely connected with each other for the sound growth of business. A great number of orders have been placed with us for the above two issue as the contents of them are very instrumental. You are also cordially requested to make full use of "Service Shop Equipment" for your better service work.



For better after-sale service and higher level of service skill.

► Numerous questions come out of the enthusiastic members, concerning the explanation given by Yamaha on factory scale and production system at the Hamakita factory.

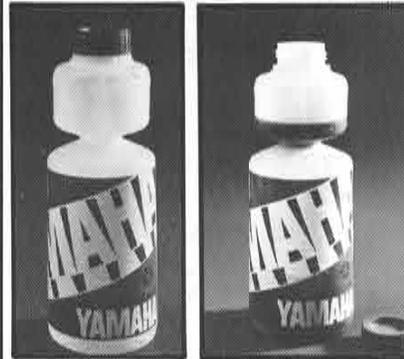
▲ After recognizing Yamaha's capability in the field of marine equipment, the members enjoy a trial cruise at the Yamaha Marina on Lake Hamana.



**President Koike of Yamaha Motor** welcomes the group and exchanges greetings with President Hendra of P.T. Harapan.



## Oil mixing bottle



**From Holland:** Yamaha Motor N.V. in Holland has recently prepared a very handy oil mixing bottle for use by every outboard

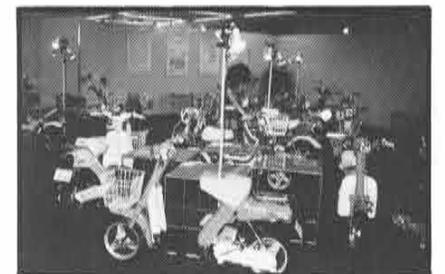
motor owner. The bottle can be used for three different ratios of fuel/oil mixing. The lower part of this gourd-shaped bottle holds one liter of oil while the upper part has three different sorts of fuel graduations, that is, 1 to 5 liters (25:1), 2 to 10 liters (50:1) and 4 to 20 liters (100:1). Oil is sucked through a tube into the upper part in the following manner:

1. One liter of oil is held.
2. Apply finger-pressure to the lower part.
3. Oil has reached the intended level.
4. Oil is poured into fuel.

Please contact the following address:  
**Public Relations Manager  
Yamaha Motor N.V.  
Postbus 7829, PROF. E.M. Meyerslaan 3,  
Amstelveen, Holland**

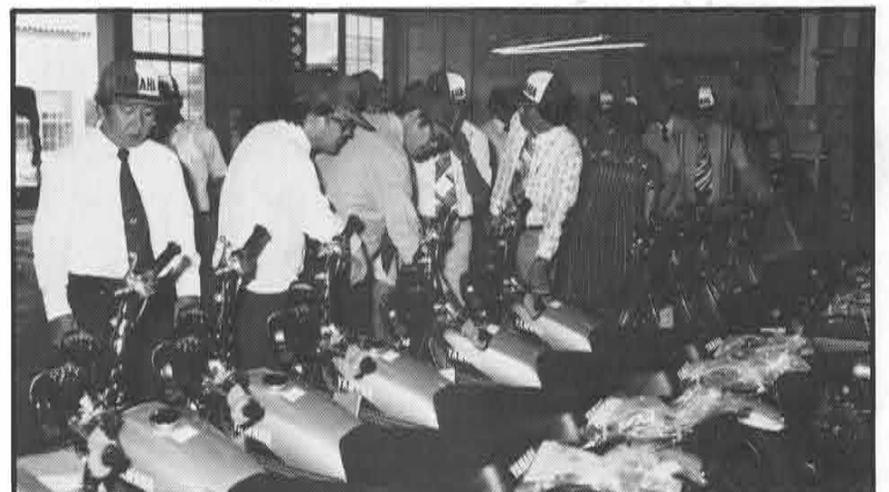
## Family bike show

**From Tokyo:** The Japan Industrial Design Promotion Association sponsored the first family bike show held recently at the Japan Industrial Design Hall in Tokyo. This was part of their design promoting campaign program and emphasized the true pleasure of safe family bike riding. All the family bike models available on the market were exhibited and the G-mark (good design) awarded Yamaha Passol and Passola



especially pleased a number of spectators throughout the session.

## A first-hand view on Yamaha's capability 11 Indonesian dealers visit Yamaha



Lively conversation goes on in front of the new bikes being assembled one after another and waiting for shipment at the main factory.

**From Iwata:** As reported already, using the catch phrase of "KELUARGA BUSAR YAMAHA (Big Family Yamaha)," an extensive sales campaign is under way on a nationwide scale in Indonesia, with steadily increasing sales. It was quite timely, therefore, that, through the good offices of P.T. Harapan, sales distributor and assembler, 11 dealers who had never been to Japan and wanted to know more about Yamaha were chosen and paid their first visit to Yamaha head office. The Yamaha headquarters extended a big welcome to these guests, and showed them around the main factory, the Hamakita factory, Yamaha Marina, etc. Furthermore, the group had a chance to drop in to Yamaha Hamamatsu Company, one of the local dealers, and exchanged a wide range of views on Japanese sales conditions, sales system, and actual after-sale services provided.

At the main factory, they saw the whole process of production from the birth of various bikes rolling off respective assembly lines classified by size and color, to completion in-

spection and finally to the system of packing and shipping. At the Hamakita factory, they observed the processing and assembly of various engine parts close at hand and grasped Yamaha's true capability to produce high quality and high performance products. At the Yamaha Marina, the group witnessed the true picture of Yamaha's popularized marine equipment such as powerboats, sailboats, and outboard motors, and even went on a trial cruise on one of the boats. At Yamaha Hamamatsu Co., being engaged in the same line of business, they were quite enthusiastic in exchanging views especially on the Japanese system of sales and after-sale service, maintenance of users, as well as the future prospect of bike sales including the market trends in Japan. After completing this busy schedule, they left Japan with a good understanding of Yamaha.

# Around the World

## Contributions to the mental and physical growth of children

### Yamaha Mini-cycle Motocross School

As reported already, Yamaha Mini-Cycle Motocross School enjoyed a good response from children and their parents or guardians, and the results of the questionnaire were partly introduced in our No. 6 issue. The full results of it are introduced as follows:

1. At what age did your child ride a mini-cycle for the first time?

No. collected : 221

	No.	%
a. 7 years or younger	47	21.3
b. 8 years	32	14.5
c. 9 years	19	8.6
d. 10 years	31	14.0
e. 11 years	31	14.0
f. 12 years	31	14.0
g. 13 years	17	7.7
h. 14 years	12	5.4
i. 15 years	1	0.4

2. How old is your child?

No. collected : 221

	No.	%
a. 7 years or younger	1	0.4
b. 8 to 10 years	40	18.0
c. 11 to 13 years	96	43.3
d. 14 to 15 years	63	28.5
e. over 16 years	21	9.5

3. How many months ago did you purchase the mini-cycle currently used by your child?

No. collected : 221

	No.	%
a. 3 or less months ago	60	27.1
b. 4 to 6 months ago	48	21.7
c. 7 to 12 months ago	68	30.8
d. 13 or more months ago	45	20.4

4. Had you bought a mini-cycle or mini-cycles for your child before the above currently used one?

No. collected : 209

	No.	%
a. No	38	18.2
b. One	49	23.4
c. Two	71	34.0
d. Three or more	51	22.4

5. Please indicate the reason for purchase.

No. collected : 234

	No.	%
a. Asked by your child	112	47.9
b. Influenced by other children	14	6.0
c. At your own discretion	73	31.2
d. Recommended by a friend	13	5.6
e. Transferred from a friend	2	0.8
f. Recommended by a dealer	4	1.7
g. Other	16	6.8

6. How do you think of your having purchased the mini-cycle for your child?

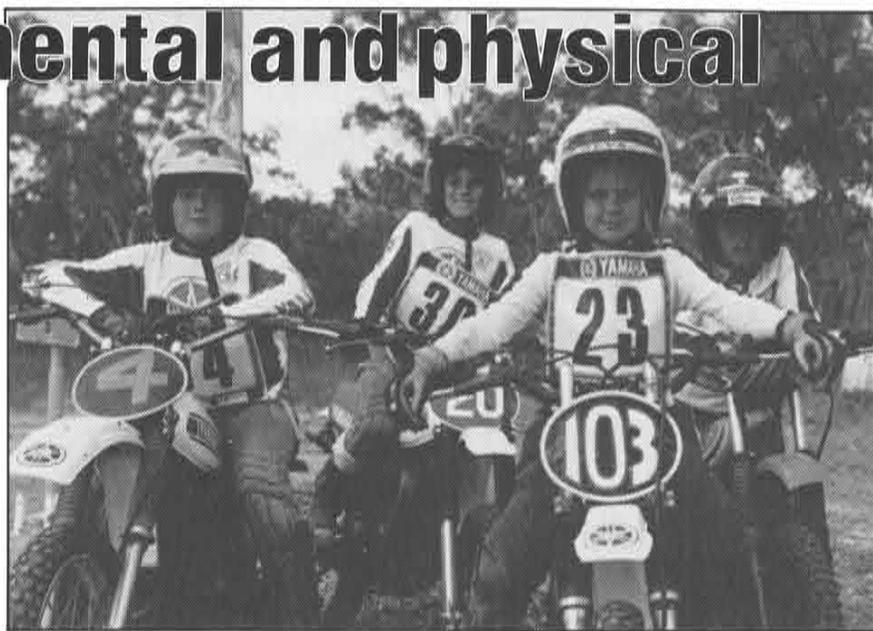
No. collected : 221

	No.	%
a. Definitely good	211	95.0
b. Definitely wrong	0	0
c. Indefinite	10	4.5

7. On what standards did you purchase the present mini-cycle for your child. Please mark all applicable items.

No. collected : 318

	No.	%
a. Child's own choice	134	42.1
b. Some club member's advice	31	9.7
c. Dealer's recommendation	18	5.7
d. Comparative study of catalogs	34	10.7
e. Through advertisements and accounts on newspapers or magazines	10	3.1
f. Most popular among club members	56	17.6



	No.	%
g. Transfer from a child's friend	4	1.2
h. Other	31	9.7

8. Do you (parent) own a bike? If yes, please state the type.

No. collected : 226 (Yes - 88)

	No.	%
a. Trial	5	5.7
b. Trail	30	34.1
c. Motocrosser	16	18.1
d. Street	31	35.2
e. Mini-cycle	6	6.8

9. Please let us know your opinion on correct mini-cycling education for children.

No. collected : 221

	No.	%
a. Necessary	216	97.8
b. Unnecessary	5	2.3
c. Indefinite	0	0

10. In case this education is considered necessary, who do you think is the most suitable teacher(s)?

No. collected : 287

	No.	%
a. Parents or guardians	29	10.1
b. Motorcycle-experienced friend	41	14.3
c. Dealer	6	2.1
d. Manufacturer's instructor	136	47.4
e. Self-governing body	14	4.9

f. Club leader or other responsible person

11. Please tell us your method of pre-riding safety inspection on machine and clothing for your child.

No. collected : 222

	No.	%
a. You do everything for your child	35	15.8
b. Oral instruction to keep him conscious of safety at all times	181	81.5
c. Leaving everything to your child without putting in a word	6	2.2

12. Has your child ever been involved in an accident causing an injury while riding a mini-cycle?

No. collected : 220

	No.	%
a. Yes, seriously injured	21	9.5
b. Yes, slightly injured. Mere bruise or scratch; without hospitalization or surgical operation	142	64.5
c. No	57	25.9

13. Do you think that riding a mini-cycle is something dangerous to your child?

No. collected : 222

	No.	%
a. Yes, definitely dangerous	2	0.9



## A Dynamic New Trio of Diesel Engines

Introduced here is a dynamic new trio of Yamaha diesel engines, ME60, ME120 and ME180, all of which are designed and constructed for small-sized coastal fishing and working boats. With these new models added, Yamaha now offers a complete line of six compact, lightweight, powerful and high-speed diesel engines ranging from 8 HP to 136 HP. The ME60 (single-cylinder), ME120 (twin-cylinder) and ME180 (three-cylinder) are Yamaha's positive answer to the always-growing demand for compact yet powerful engines.

The newly designed vertical 4-stroke engines are available in two different types, standard and special. The standard type features higher power output while the special type is designed with extra durability in mind. They are further grouped into manual starter and electric starter (E) types. In addition, the heavy duty type (W) is also available in each model.

### Technical features

The following technical features are common to all models:

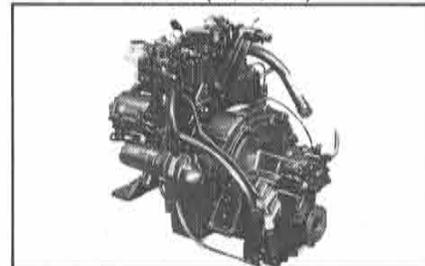
- \* **Lightweight and compact design**  
Full consideration is given to a lightweight and compact design.
- \* **Keystone type piston rings**  
They seal in the compression pressure better and prevent the first ring from getting stuck in the groove.
- \* **Combustion chamber**  
A special profile combustion chamber is designed for better performance.
- \* **Intake system**  
Each cylinder is provided with an independent intake pipe to ensure higher intake efficiency.
- \* **Water-cooled exhaust manifold**  
This lowers exhaust noise and ensures safer engine operation.
- \* **Cooling system**  
The engine is cooled by seawater directly.
- \* **Power-take-off**  
The large crankshaft diameter and bearing capacity yield full strength and versatility in applications of the power-take-off.
- \* **Alternator**  
Being equipped with an IC regulator, the alternator will not interfere with radio equipment.
- \* **Hydraulic type "Reverse and Reduction" gear**  
The gear is a hydraulic wet, multi-disc type.
- \* **Easy operation**  
The throttle lever is equipped with a two-

meter cable for convenience of the operator.

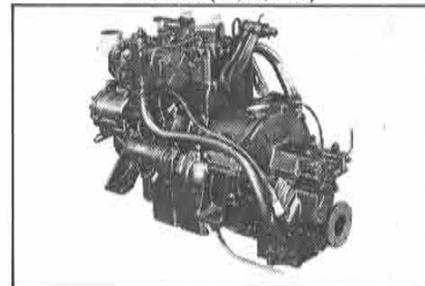
- \* **Instrument panel**  
The meter panel has warning lamps showing the cooling water temperature, oil pressure, state of the battery charge, etc.
- \* **Tachometer with hour-meter**  
This indicates the engine speed and has a built-in hour-meter to show an accumulated time of operation.
- \* **Remote control**  
This is available as an option.
- \* **Clear indication of check-points**  
Routine check-points are clearly indicated by an orange color paint and provide easy accessibility for service.
- \* **Inspection cover**  
This is installed on one side of the cylinder block to afford easy access to the inside of the engine.
- \* **Interchangeable parts**  
The three models use many standardized parts.

Model	Continuous rating output (HP/rpm)	Dry weight (Kg)
ME60	10.5/2,900	162
ME60W	8/2,400	
ME60E	10.5/2,900	172
ME60EW	8/2,400	
ME120	21/2,900	259
ME120W	15/2,400	
ME120E	21/2,900	269
ME120EW	15/2,400	
ME180	30/2,900	311
ME180W	25/2,400	
ME180E	30/2,900	321
ME180EW	25/2,400	

ME60 (W, E, EW)



ME120 (W, E, EW)



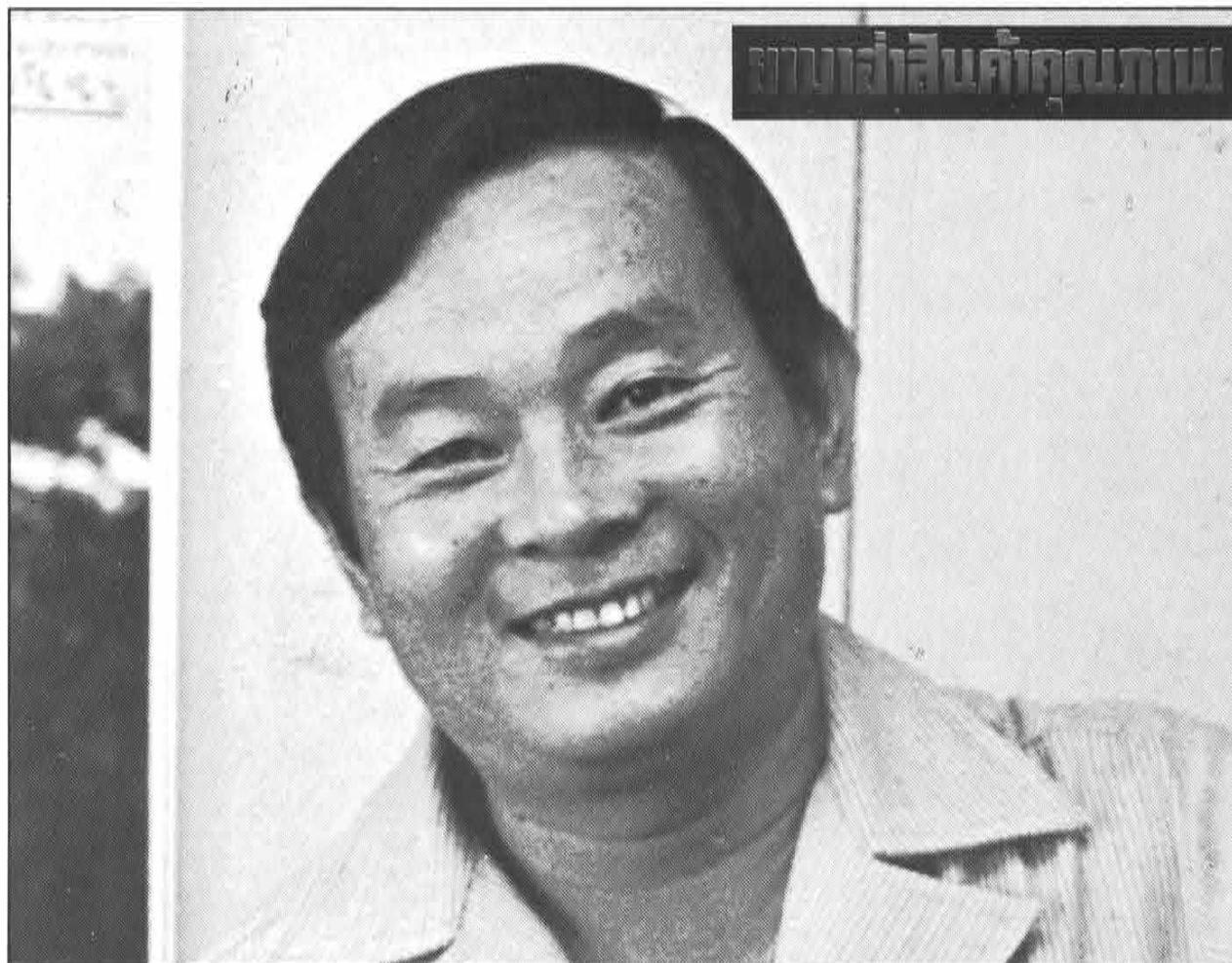
ME180 (W, E, EW)



- rous
- b. Yes, somewhat dangerous. Special care must be taken 198 89.2
- c. No, not all 22 9.9
14. Please let us know your view on possible effect of mini-cycle sport on the mental or physical growth of your child.  
No. collected : 212
- a. Desirable 198 93.3
- b. Undesirable 2 0.9
- c. Indefinite 12 5.7
15. Has your child come to be more interested in science or technology since he owned a mini-cycle?  
No. collected : 214
- a. Yes, indeed 138 64.5
- b. No, not at all 34 15.9
- c. Indefinite 42 19.6
16. If your son gets accustomed to riding a bike in his boyhood, then how do you think it will influence him for social nature or morality when he goes out into the world?  
No. collected : 203
- a. Riding a bike is necessary for him to be a good member of society 96 47.3
- b. Motorcycle sport is not suitable for it 12 5.9
- c. Indefinite 95 46.8
17. What changes have you noticed in your child's behaviour or thinking since he has had a mini-cycle?  
No. collected : 440
- a. He has become more mechanically minded 157 36.9
- b. Increase in activity 79 17.9
- c. Improvement in sense of responsibility and independence 113 25.7
- d. Improvement in physical fitness 79 17.9
- e. No change 9 2.0
- f. Other 3 0.7
18. Please let us know your opinion on the establishment of free zone or facilities where children are allowed to ride their mini-cycle freely.  
No. collected : 220
- a. Public organizations, national or local, should be more positive enough to establish such zones or facilities 206 93.6
- b. Things should be left as they are 11 5.0
- c. Avoid wasting tax 3 1.4
19. As you know already, most of the young men over 16 years of age (licence age) are greatly interested in motorcycles. Then, please let us know your opinion on when children should start riding a bike.  
No. collected : 221
- a. They should start riding a bike at the earliest possible time even before they reach the authorized age of licence acquisition on the condition that riding is limited to off-road area alone. This will benefit their mental or physical growth. 217 98.2
- b. They should wait 3 1.3

## Welcome to Yamaha

### "YAMAHA, IT'S A QUALITY PRODUCT"



**Mr. Suchati Hiranchai**  
Spare Parts and Service Manager, SIAM YAMAHA

**From Iwata:** The above Siamese words mean "Love Thailand". SIAM YAMAHA is now developing a nationwide PR campaign, using these words as their catch phrase. Through this campaign, they are suggesting that Thai people reflect upon and take more pride in the splendor of their national tradition, and eventually, promoting the spread of Yamaha motorcycles as the products to raise the quality of their life. As part of these activities, SIAM YAMAHA established a new service center in Chiang-mai, the main city in northern Thailand, in order to provide thorough services to the users and at the same time, solidify the top position in the market even more firmly.

One of the guests we received at Iwata this month was Mr. Suchati Hiranchai, the newly assigned manager of SIAM YAMAHA North Spare Parts and Service Center, who came to Japan to study the status of Japanese service centers and receive some training. Taking the opportunity of his visit, we conducted the following interview.

*— We hear that agriculture is quite prosperous in Chiang-mai.*

- until they reach the authorized age of licence acquisition.
- c. Indefinite 1 0.4

20. What do you want motorcycle manufacturers to do for the spread of correct motorcycling for boys and girls?

- \* Most of the parents want motorcycle manufacturers to establish many more motorcycle clubs or schools for children who are to be trained under the guidance of expert instructors.

"That's right. Agriculture and fruit plantations as well. There is a big demand for bikes in this area. Limiting to the family bike Y-80, Chiang-mai holds the share as high as 40%, and of these, 80% are used by women.

*— If that is the case, I should say that the establishment of the new spare parts and service center has a great significance.*

"Yes, indeed. We have to sell more Yamahas, and simultaneously, more services. To achieve this, the spare parts and service center has a very important role to play. In Chiang-mai, we have a number of capable dealers, for example, Charoen Motor which sells over 6000 bikes per year. To support these dealers is another big mission assigned to this service center.

*— In other words, you mean a good service system gives a great sense of reliability to the users, and, in turn, creates an environment to make selling easier. By the way, when will it open?*

"This coming October. My responsibility at this service center will be, to

sum up in one word, to support the sales of the dealers. More specifically, to extend sufficient services to the users in northern Thailand will be our main task. In order to realise this, we must maintain ever closer communications with the dealers, combine efforts to raise the level of technology of the service mechanics, and establish a speedy supply system of spare parts. This, I believe, will also diminish the problem of imitation parts. With these works well under way, we wish to support the motor sports activities by sponsoring the popular Yamaha Motocross School.

Mr. Suchati Hiranchai is a Yamaha veteran affiliated with SIAM YAMAHA for 14 years. He has worked through the areas of assembly, completion inspection and quality control, became the Spare Parts and Service manager at SIAM YAMAHA head office in Bangkok, and recently was promoted to the manager of the new center in Chiang-mai. He has an overwhelming confidence in the spirit of "YAMAHA. It's a Quality Product." At home, he has a wife and two children, a 7 year old daughter and a 1 year old son.

## Contributions wanted

We hope that the redesigned make-up of "Yamaha News" has been favorably received and that it will now better serve your purposes. It is emphasized again that we are always

looking forward to your co-operation. Every sort of news or information concerning Yamaha will do a great deal to help us further brushup "Yamaha News".

Address: Editorial Room of Yamaha News  
Yamaha Motor Co., Ltd.  
2500 Shingai, Iwata-shi, Shizuoka-ken (Japan)

\*This issue also contains 16 pages thanks to many more contributions from various parts of the world.

# World-wide sports news

# “KING” KENNY DOES IT AGAIN!

## 500cc Class 78-79 Victory

“King” Kenny after leading V. Ferrari (Suzuki), his nearest 500cc title challenger, rode his high-performance Yamaha YZR500 to the safest third spot in the French GP, the final round of the series organized at Le Mans on Sept. 2, thus clinching the title for the second successive year. Ferrari made a desperate effort to win the race but his faintest title hope was gone when he crashed during lap 13. B. Sheene (Suzuki) was an eventual winner and R. Mamola (Suzuki), runner-up.

### Overcoming an injury handicap

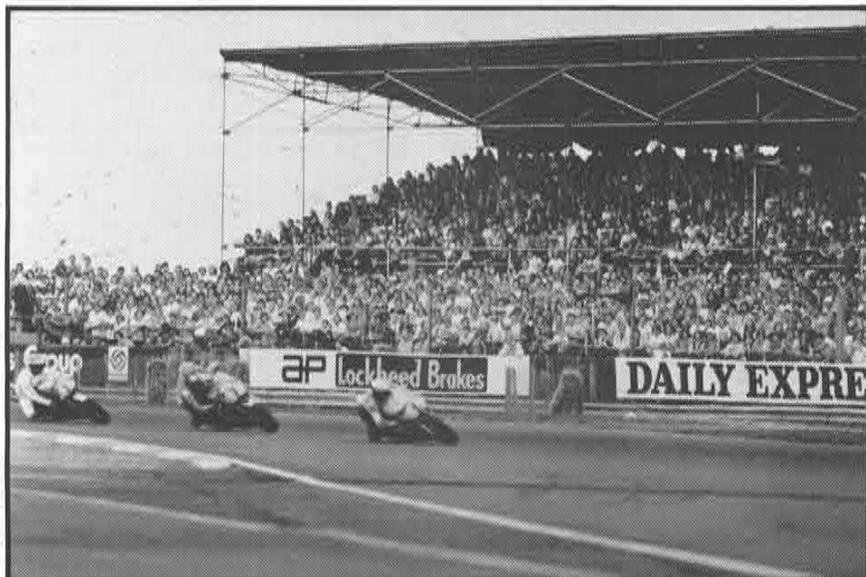
Kenny missed the opening round of the 1979 world championship in Venezuela and quite incredibly it was on his comeback ride in Austria with lingering affects of his broken vertebrae and ruptured spleen that he scored his first win of the series. He followed it up with a second in the West German GP and first in the Italian GP. He continued his triumph march by winning the Spanish and Yugoslavian rounds to lead the Suzuki ace by 3 points. In the Dutch TT he could finish no higher than 8th due to a machine

trouble, and refused to take part in the Belgian GP as the revised Spa-Francorchamps circuit was too dangerous.

He finished 4th and 6th respectively in Sweden and Finland while Ferrari failed to score points in both rounds.

The British GP which was held at Silverstone on August 12, became an exceptionally important race for both aces.

Kenny displayed his real ability to win the race and Ferrari only managed to finish 4th. Kenny widened his lead to a seemingly unsurpassable 14 points.



As mentioned earlier, Kenny finished 3rd in the French GP by keeping the safest pace as he knew that one

point would be quite enough, even if Ferrari could win the race.

## RESULTS

### Race-to-race results

Rider	GP	V	A	G	I	S	Yu	D	B	Sw	F	Br	Fr	Total
1. K. Roberts (Yamaha)		—	15	12	15	15	15	3	—	8	5	15	10	113
2. V. Ferrari (Suzuki)		12	12	10	12	8	12	15	—	—	—	8	—	89
3. B. Sheene (Suzuki)		15	—	—	8	—	—	12	—	15	10	12	15	87

V = Venezuelan, A = Austrian, G = German, I = Italian, S = Spanish, Yu = Yugoslavian, D = Dutch, B = Belgian, Sw = Swedish, F = Finnish, Br = British, Fr = French

### World Championship Road Racing

#### French GP (Final)

500cc	
1. B. Sheene	Suzuki
2. R. Mamola	Suzuki
3. K. Roberts	Yamaha
4. F. Uncini	Suzuki
5. J. Cecotto	Yamaha
6. P. Coulon	Suzuki

350cc	
1. P. Fernandez	Yamaha
2. R. Freymond	Yamaha
3. W. Villa	Yamaha
4. H. Guilleux	Yamaha
5. K. Ballington	Kawasaki
6. M. Rougerie	Bimota

250cc	
1. K. Ballington	Kawasaki
2. G. Hansford	Kawasaki
3. P. Fernandez	Yamaha
4. R. Mamola	Yamaha
5. A. Mang	Kawasaki
6. J-F. Balde	Kawasaki

#### Finnish GP July 29 — Round 10

350cc	
1. G. Hansford	Kawasaki
2. P. Fernandez	Yamaha
3. P. Korhonen	Yamaha
4. A. Mang	Kawasaki
5. R. Freymond	Yamaha
6. C. Estrosi	Kawasaki

250cc	
1. K. Ballington	Kawasaki
2. G. Hansford	Kawasaki
3. P. Fernandez	Yamaha
4. R. Freymond	Yamaha
5. W. Villa	Yamaha
6. P. Korhonen	Yamaha

#### British GP—August 12—Round 11

500cc	
1. K. Roberts	Yamaha
2. B. Sheene	Suzuki
3. W. Hartog	Suzuki
4. V. Ferrari	Yamaha
5. B. V. Dulmen	Suzuki
6. C. Sarron	Yamaha

350cc	
1. K. Ballington	Kawasaki
2. G. Hansford	Kawasaki
3. J. Sayle	Yamaha
4. M. Fruttschi	Yamaha
5. R. Freymond	Yamaha
6. M. Rougerie	Bimota

250cc	
1. K. Ballington	Kawasaki
2. R. Mamola	Yamaha
3. A. Mang	Kawasaki
4. G. McGregor	Yamaha
5. R. Freymond	Yamaha
6. O. Chevallier	Yamaha

#### Czechoslovakian GP—August 18—Round 12

350cc	
1. K. Ballington	Kawasaki
2. A. Mang	Kawasaki
3. P. Fernandez	Yamaha
4. G. Hansford	Kawasaki
5. E. Saul	Yamaha
6. R. Freymond	Yamaha

250cc	
1. K. Ballington	Kawasaki
2. G. Rossi	Morbidelli
3. P. Pileri	Yamaha
4. A. Mang	Kawasaki
5. R. Mamola	Yamaha
6. P. Fernandez	Yamaha

## RESULTS

### World Championship Motocross

500cc  
Belgian GP — August 5 — Round 11

- 1st race
1. R. De Coster ..... Suzuki
  2. A. Malherbe ..... Honda
  3. G. Noyce ..... Honda
  4. H. Schmitz ..... Maico
  5. G. Rond ..... Suzuki
  6. F. Kobele ..... Maico

- 2nd race
1. A. Malherbe ..... Honda
  2. G. Rond ..... Suzuki
  3. I. Van Den Broeck ..... Maico
  4. J. J. Bruno ..... KTM
  5. R. De Coster ..... Suzuki
  6. A. Vromans ..... Suzuki

Luxembourg GP — August 12 — Final Round

- 1st race
1. B. Lackey ..... Kawasaki
  2. A. Malherbe ..... Honda
  3. H. Schmitz ..... Maico
  4. G. Noyce ..... Honda
  5. A. Bromans ..... Maico
  6. I. Van Den Broeck ..... Maico

- 2nd race
1. A. Malherbe ..... Honda
  2. B. Lackey ..... Kawasaki
  3. G. Wolsink ..... Suzuki

## World Championship Motocross

4. H. Mikkola ..... Yamaha
5. H. Andersson ..... Husquvarna
6. J. Weinert ..... Kawasaki

### Final championship positions

1. G. Noyce ..... 225 points  
(Britain, Suzuki)
2. G. Wolsink ..... 177 points  
(Holland, Suzuki)
3. A. Malherbe ..... 176 points  
(Belgium, Honda)
4. B. Lackey ..... 173 points  
(U.S.A. Kawasaki)
5. H. Mikkola ..... 147 points  
(Italy, Yamaha)
6. R. De Coster ..... 125 points  
(Belgium, Suzuki)
7. A. Vromans ..... 86 points  
(Belgium, Maico)
8. J. J. Bruno ..... 85 points  
(France, KTM)
9. I. Van Den Broeck ..... 75 points  
(Belgium, Maico)
10. G. Rond ..... 71 points  
(Holland, Suzuki)



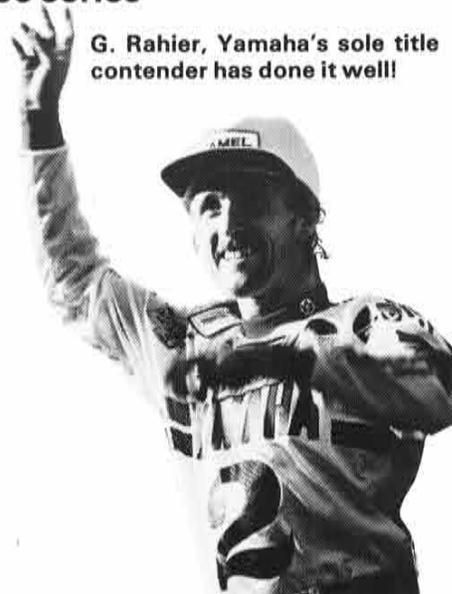
Finnish ironman Mikkola refuses to surrender to his repeated mishap!

## Rahier's safest third

'79 125cc series

Gaston Rahier (Yamaha) secured his 3rd spot in the 125cc championship positions when he finished 3rd in both heats of the Spanish GP, the final round held on August 12.

G. Rahier, Yamaha's sole title contender has done it well!



## RESULTS

Spanish GP — August 12 — Final Round

- 1st race
1. H. Everts ..... Suzuki
  2. A. Watanabe ..... Suzuki
  3. G. Rahier ..... Yamaha
  4. P. Pippola ..... Husquvarna
  5. P. Gruneveld ..... Honda
  6. G. Liljegren ..... Aprilia

- 2nd race
1. H. Everts ..... Suzuki
  2. A. Watanabe ..... Suzuki
  3. G. Rahier ..... Yamaha
  4. P. Pippola ..... Husquvarna
  5. Y. Khudjakov ..... CZ
  6. P. Gruneveld ..... Honda

### Final championship positions

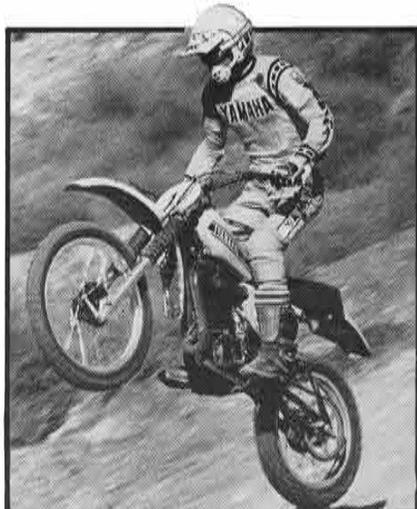
1. H. Everts (Belgium, Suzuki) 314 pts.
2. A. Watanabe (Japan, Suzuki) 235 pts.

3. G. Rahier (Belgium, Yamaha) 183 pts.
4. M. Autio (Finland, Suzuki) 131 pts.
5. C. Maddij (Italy, Aprilia) 66 pts.
6. P. Gruneveld (Holland, Honda) 61 pts.

## AMA Motocross Championships

### B. Glover (Yamaha) captures the title

125cc class



B. Glover is the youngest ever AMA motocross champion.

The final round of the AMA 125cc motocross championship took place at St. Petersburg, Florida on August

26. Young reigning champion B. Glover (Yamaha) finished second in both heats while M. Barnett (Suzuki) monopolized both first places. With these results, Glover boosted his championship tally to 369 against Barnett's 299 and clinched the title for the third consecutive year.

### M. Bell (Yamaha) finishes 2nd overall

500cc class

The final round of the 500cc series was also organized at St. Petersburg on August 26. Yamaha's title contender M. Bell won this round overall by finishing second and first in both heats. Championship battle leader D. LaPorte (Suzuki) finished first and fifth and maintained his 3 points lead from Bell.

## RESULTS

1. M. Barnett Suzuki 1-1
2. B. Glover Yamaha 2-2
3. S. Martin Yamaha 4-4
4. G. Denton Yamaha 5-4
5. R. Coon Yamaha 9-5
6. D. Moroney Suzuki 6-8

### Final championship positions

1. B. Glover Yamaha 369 pts.
2. M. Barnett Suzuki 299 pts.
3. B. B. Meyerscough Suzuki 269 pts.
4. W. Reid Honda 244 pts.
5. D. Cantaloup Yamaha 225 pts.
6. J. Ward Kawasaki 210 pts.

## RESULTS

1. M. Bell Yamaha 2-1
2. D. LaPorte Suzuki 1-5
3. M. Kessler Yamaha 6-2
4. S. Stackable Yamaha 5-3
5. C. Sun Husquvarna 4-6
6. M. Moates Yamaha 7-7

### Final championship positions

1. D. LaPorte Suzuki 399 pts.
2. M. Bell Yamaha 396 pts.
3. G. Semics Honda 233 pts.
4. A. Englund Yamaha 219 pts.
5. R. Staten Yamaha 217 pts.
6. G. Mojeur Kawasaki 213 pts.

## Hannah aims at the crown again!

'79 Trans-AMA Series



Yamaha's double class champion Bob Hannah is aiming at his second successive crown of the Trans-AMA motocross series which has just began.

By doing so, he will complete an incredible record of winning three AMA titles for the second year in succession.

- |          |                |
|----------|----------------|
| Sept. 23 | Lexington, OH  |
| Sept. 30 | Buchanan, MI   |
| Oct. 7   | New Berlin, NY |
| Oct. 14  | TBA            |
| Oct. 21  | St. Peters, MO |
| Oct. 28  | TBA            |
| Nov. 4   | Snoma, CA      |

The development of the series will be reported in the forthcoming issues.



# YAMAHA MA50

\* Reed valve 2-stroke single cylinder \* 2.3ps/5,500rpm  
\* 2.7ft.-lbs. (0.37kg-m)/3,500rpm \* C.D.I. system \* Autolube  
lubrication \* Primary kick starter \* Automatic single-speed  
with shaft drive \* 42kg





# ▶ FOR YOUR BETTER BUSINESS ◀

Introduced here is a special ignition system gaining popularity among both servicemen and customers. It is called the C.D.I. (capacitor discharge ignition) system needing no maintenance except when the engine itself is disassembled.

The performance of this system has already proven excellent on Yamaha's road racing and motocross machines. Many of the street, off-road and family bikes also feature this system, thus enhancing the brand image of Yamaha. You are requested to know more about this wonderful ignition system in order to develop your business possibilities to a maximum.

## Characteristics of the C.D.I. system

As you know, a conventional ignition system uses a contact breaker

to interrupt the flow of current in the primary winding of the ignition coil. When the current flow is cut, a surge of high voltage is produced in the secondary winding, thus causing a spark to jump across the spark gap.

The C.D.I. system has been developed and engineered so that it can reduce time and labor required for maintenance.

In addition, this system can better meet the requirements of modern high-performance engines.

That is, in a conventional ignition system the contact breaker works to interrupt the primary current in the ignition coil. In this case, contact points may be damaged by electric arcs, thus causing a drop in secondary voltage or misfiring.

In order to avoid such troubles, contact points must be periodically inspected for necessary adjustment or replacement.

The contact breaker functions on a bakelite cam. This method sometimes results in an undesirable phenomenon called "chattering" (point jump) to prevent the smooth increase of engine's rpm. This also causes a drastic drop of secondary voltage.

The C.D.I. system is a good solution to these problems. This system uses a capacitor in place of the contact breaker and is virtually maintenance-free.

In this system, the magneto charges the ignition condenser up to a few hundred volts. When the pulse coil incorporated in the magneto gives a signal, almost instantly the semiconductor element (S.C.R.) allows the electric charge to flow from the condenser to the ignition coil, thus inducing a surge of high voltage in the secondary winding. In short, the C.D.I. is an electronic ignition system that produces a spark in the spark plug without using a mechanical contact breaker.

## Construction

The C.D.I. system consists mainly of a magneto, C.D. ignition unit and ignition coil.

The magneto functions as a power source. On an outer rotor type magneto, the rotor rotates along the outer side of the stator. An inner type magneto features the inner rotating rotor. The construction of an outer rotor type magneto gives a greater moment of inertia. This

type is fitted with the lighting and charging coil for easier supply of respective electricity. These coils are also used on the multi pole 3-phase A.C. type.

On the other hand, the inner rotor type features a smaller moment of inertia and is used exclusively for ignition purpose. Road race and motocross machines are fitted with this type magneto.

Did you know that the following Yamaha models feature a C.D.I. system?

**Outer rotor type C.D.I.**  
YZ100C/D/E, YZ125C/D/E, YZ125X, YZ250D, YZ400D/E/F, IT175D/E/F, IT250D/F/E, IT400D/F/E, DT175E/F, DT250E/F, DT400D/F/E, V80, QT50F

**Multi pole 3-phase A.C. type**  
RD250E/F/G, RD400E/F/G, SR500E/F/G

**Inner rotor type**  
YZ250E, MX125C, YZ80F, YZ100F, YZ125F, YZ250F, TA125, TZ250/350

## High performance and maintenance-free

# C.D.I. System is wonderful!

### Characteristics

2 Maintenance-free

1 Positive spark

8 Better acceleration and increased high-speed performance

7 No adjustment of ignition timing

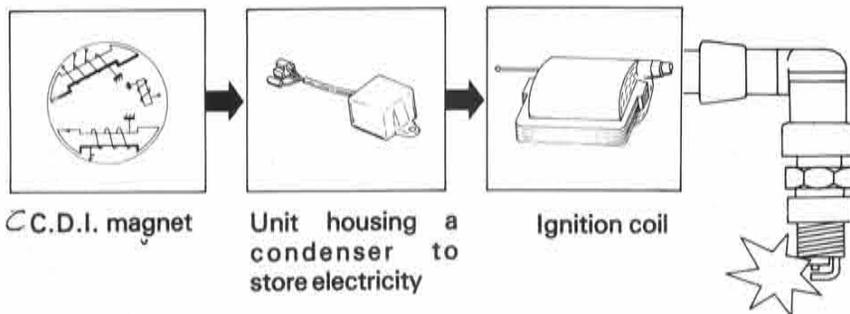
6 No contact points

3 Easier starting

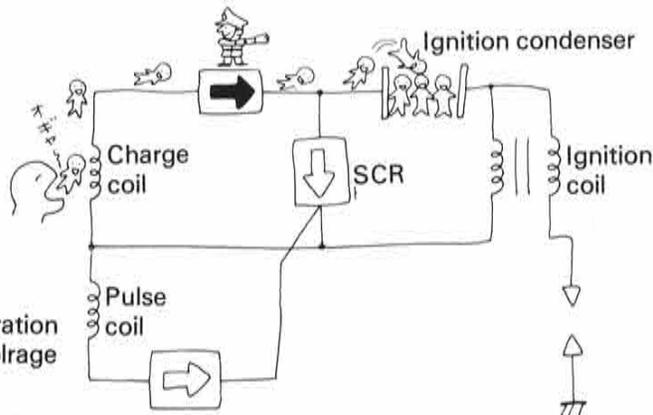
4 Quicker generation of secondary voltage

5 Always smooth

### Construction

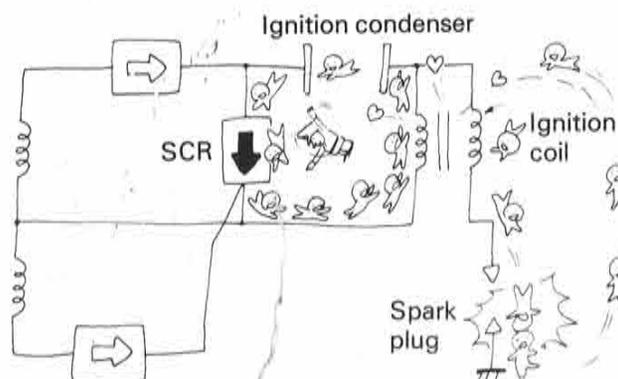
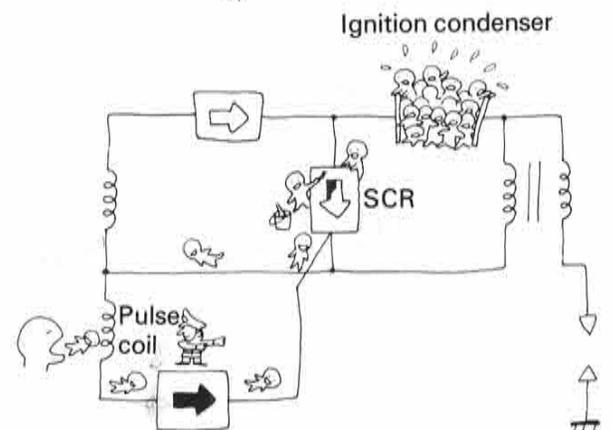


### Function



**Function No. 1**  
The rotor begins to rotate and electricity is produced in the charge coil. This is stored in the ignition condenser.

**Function No. 2**  
The pulse coil gives an electric sign (electricity) for ignition.



**Function No. 3**  
The ignition condenser discharges its stored electricity quickly. This induces high voltage into the secondary winding, thus producing a positive spark.

Yamaha outboard motors

# Win a one-week trip to Japan!

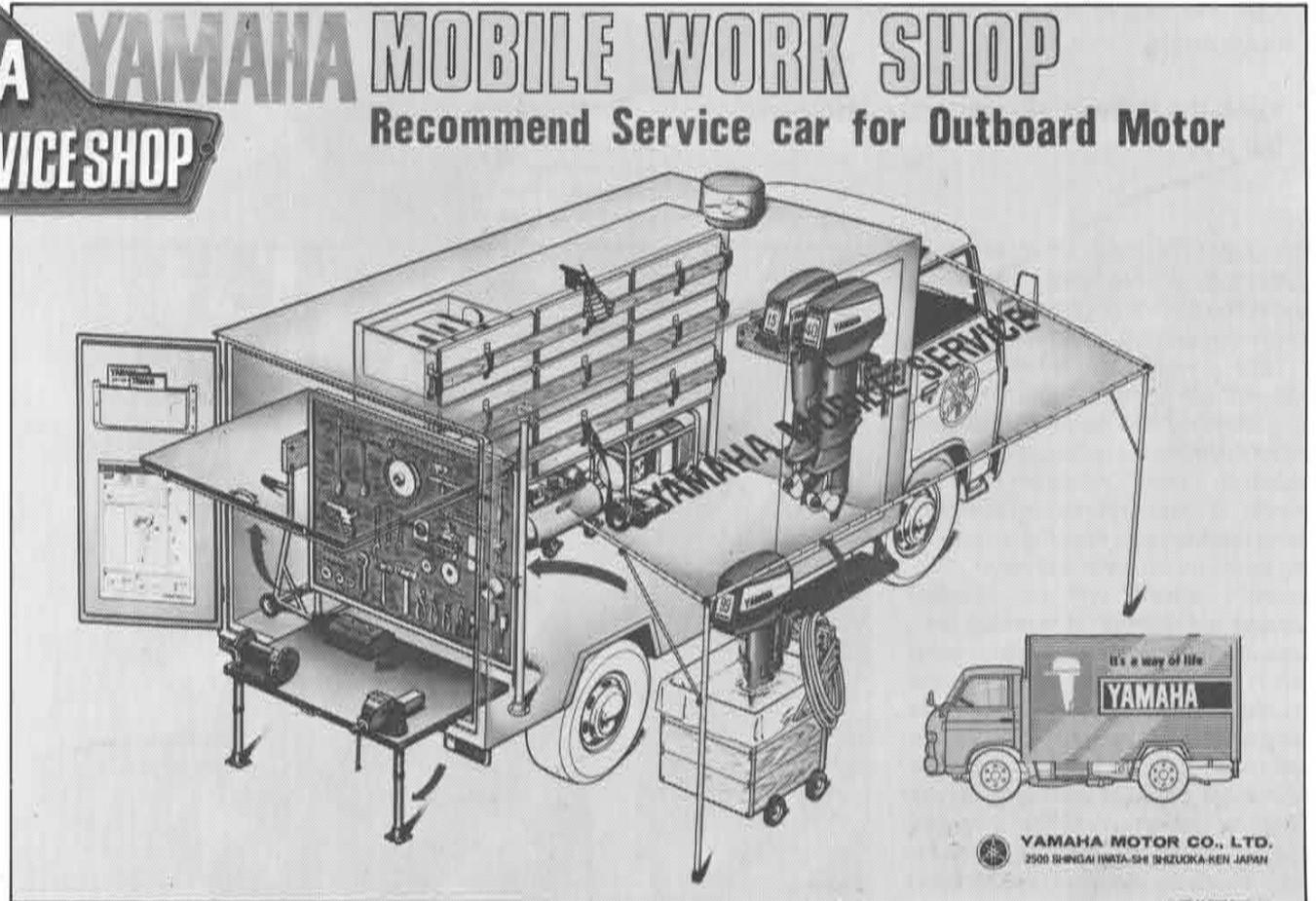
One of the contest prizes



## Service Contest Goes Smoothly June '79 — May '80

The Yamaha Service Contest, which began in June '79 and will last until May '80, is now going smoothly with 72 participating distributors (one per nation).

As reported already, the main aim of this worldwide contest is to improve the quality of Yamaha distributors' after-sale service operation so that every Yamaha user can have his motor in the best working condition.



A recommended "mobile workshop" to move quickly to any place whenever necessary.

### Distributors' interest is keen

80 selected distributors were invited to participate in this contest and 72 of them sent applications to Yamaha. This was a very favorable response and reflects worldwide Yamaha distributors' keen interest in the improvement of their after-sale service operation and parts supply system in order to meet an always-growing demand for Yamaha outboard motors. Four fundamental factors which are to serve as the basis for this contest are: Organization and control of service and spare parts; Set-up of the workshop; Treatment of service and spare parts information; Sales promotion. The above factors are arranged into the following contest items:

- A. Servicemen
- B. Workshop
- C. Servicemobile and/or service boat
- D. Service equipment and facilities
- E. Information
- F. Parts
- G. Sales promotion

That is:

- A-1. How many servicemen are there who are exclusively in charge of outboard motor service?
- A-2. How long has the most experienced serviceman been working on outboard motor service?
- A-3. How long has he been in charge of Yamaha outboard motor service?
- B-1. Do you have a workshop prepared for outboard motor service?

- B-2. Is the workshop exclusively prepared for outboard motor service?

- C-1. Do you have a servicemobile and/or boat for field service?

- C-2. Is the mobile and/or boat painted or displayed with Yamaha name?

- D-1. Do you have the following tools and facilities in your workshop?

- \* Test tank (not drum-can)
- \* Yamaha Outboard Motor Special Tool Kit (Kit A, B and C)
- \* Workstand for outboard motor service
- \* Workbench for outboard motor service
- \* Container for disassembled parts
- \* Outboard motor storage rack (available for more than 5 units)
- \* Air compressor
- \* Measuring instruments (engine tachometer and pocket tester)
- \* Hydraulic press machine

- E-1. How many times have you sent "Market information" to Yamaha in the past one year (from May '78 to April '79)?

- E-2. Are the P.S.I. bulletins (Parts Service Information) kept in file?

- E-3. Is the file of P.S.I. usually kept in the parts shop?

- E-4. Are the T.S.I. bulletins (Technical Service Information) kept in file?

- E-5. Is the file of the T.S.I. usually kept in the workshop?

- E-6. Are the P.S.I. bulletins transcribed to the parts lists concerned?

- E-7. Are all the service manuals for outboard motors kept in complete set?

- E-8. Is the complete set of parts lists usually kept in the workshop?

- E-9. Are the Assembly Charts for outboard motors displayed in the workshop?

- F-1. Is there anyone exclusively in charge of spare parts?

- F-2. Are there any spare racks ex-

clusively for outboard motor parts?

- F-3. What kind of system is employed for spare parts control?

- F-4. Is a periodic parts stock inventory carried out in your parts shop?

- F-5. Do you know the total cost of outboard motor spare parts imported from Yamaha in '78?

- F-6. Do you know the total cost of Yamaha outboard motors imported in '78?

- F-7. Do you know the gross profits of outboard motors and the parts respectively imported from Yamaha in '78?

- F-8. Does the parts section take note of the monthly sales figures for Yamaha outboard motors for each model.

- G-1. How many times have you had the following events in the past year (from May '78 to April '79)?

\* Participation to exhibition (example: outboard motor show)

\* Field service activity (training) for local sub-dealers

\* Demonstration of driving outboard motors

\* Free check service for servicing local users' outboard motors on the spot

Each participant filled in all items and submitted the first report for evaluation by Yamaha.

Scores and suggestions will be forwarded so that participants can improve their parts supply and after-sale service system.

Participants are to fill in the Periodic report 1 and submit it to Yamaha by October 25.

In addition, Yamaha will furnish them with service promotional tools from time to time during the contest session.

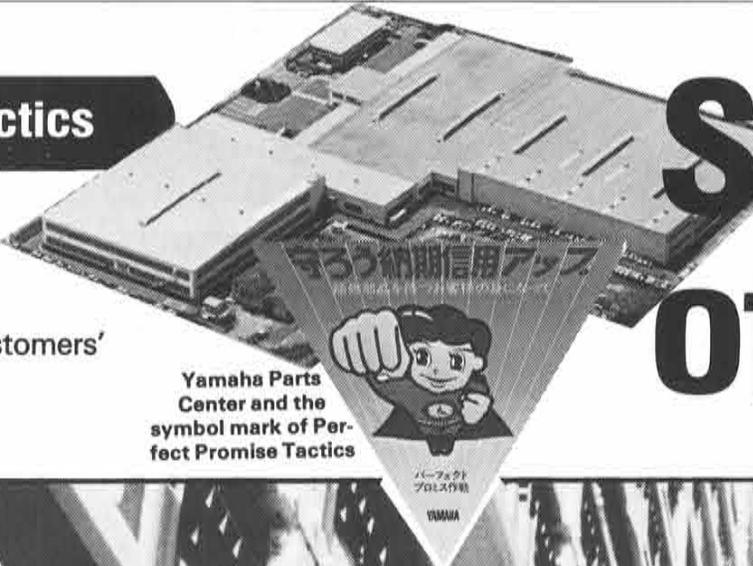
Complimentary gifts to all participants (apron and parts lists binder)



# YAMAHA PARTS DIVISION

## Perfect Promise Tactics

- \* Put yourself in the shoes of your customers
- \* Keep the delivery deadline to customers' full trust



Yamaha Parts Center and the symbol mark of Perfect Promise Tactics

# Smooth, s of replace

The Parts Division of Yamaha is launching a big-scale campaign under the above slogans. The campaign designated "Perfect Promise Tactics", which started on July 1 and will last until October 31, aims at perfecting the parts control and supply system by calling all Yamaha people's closer attention to the trends of international replacement parts markets and keeping strictly to the deadline on parts delivery. Specific efforts will be directed toward the control of working process from reception of parts order down to shipment of parts in close co-operation with all affiliated parts suppliers throughout the above campaign period. Those suppliers who have attained excellent results of parts delivery, will be awarded special prizes so that all Yamaha people will renew their recognition of the importance of parts supply business. Introduced here is the outline of Yamaha's general parts control and supply system working in close linkage with worldwide importers.

### 23 days required for shipment by sea

Fig. 1 shows the general working process from reception of parts order down to shipment of parts, with a time schedule appearing on the right. Yamaha receives 12,000 orders from worldwide distributors a month. These orders are grouped into three different categories, that is, monthly order, emergency order and critical back order. The modern on-line computer system is always working to process all the data and information concerning parts reception, inspection, stock control, shipment, etc. so that every order is processed in the smoothest and quickest manner. The computer system which was first introduced in 1968, was put on-line in 1970 and then the ultra-modern software was induced in the system for the perfection of parts control and supply operation in 1975.

### Yamaha Parts Center

The Yamaha Parts Center, which adjoins the main office building of Yamaha, is the headquarters of Yamaha's worldwide parts supply operation. The Parts Center consists of the No.1 and No.2 buildings and covers 27,799m<sup>2</sup> in total floor area. The Center handles 128,180 different



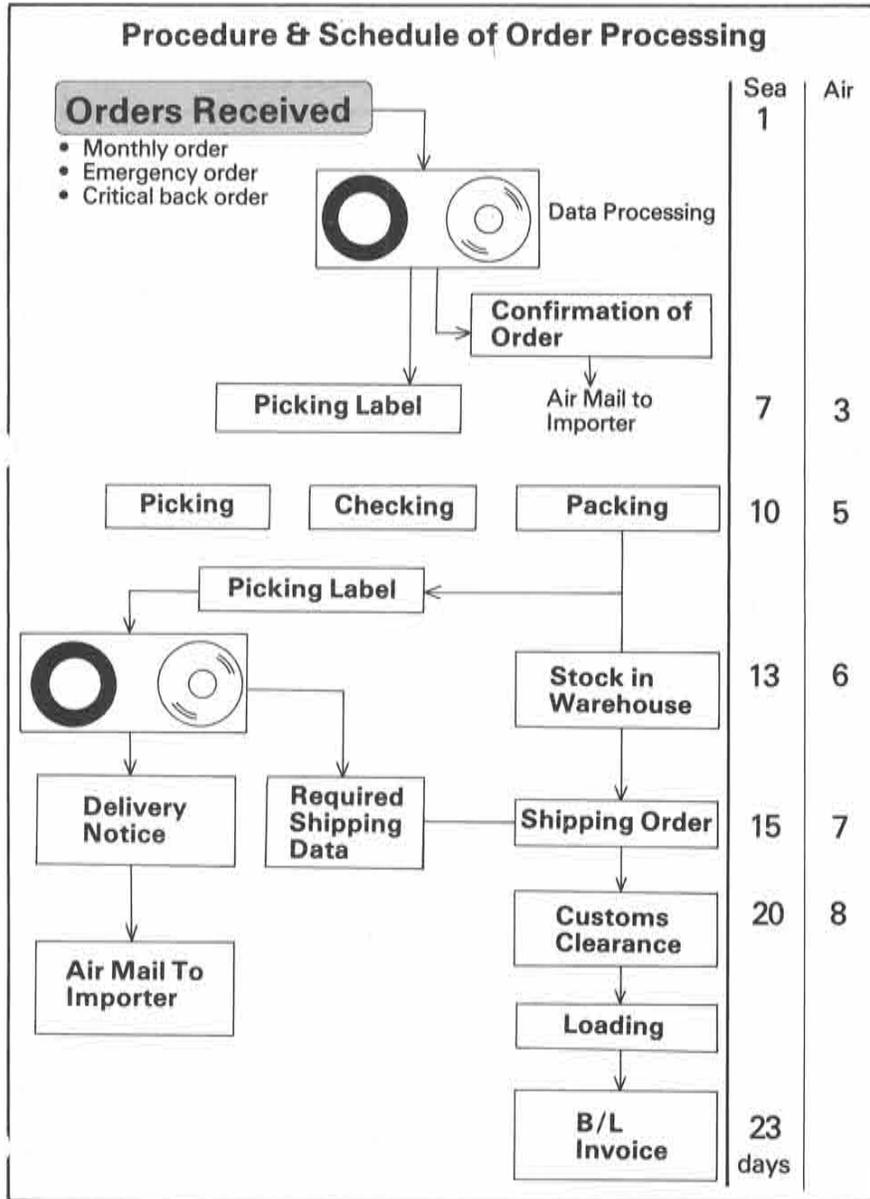
Lofty racks around which 8 stacker cranes are in constant action, are used for storing parts with high turnover rates.

items and supplies more than 90% of total parts demand. As mentioned above, the on-line computer system quickly and smoothly processes all the data and information concerning parts reception, stock control, shipment, etc. with four on-line terminals located inside the Center. Parts with high turnover rates are mostly stored in lofty racks with height of 12 meters, depth of 80 meters, 16 rows of racks, 8 cranes

and 53,760 storage buckets. This method greatly increases handling efficiency. In addition, a well coordinated conveyor system for receiving and shipment of parts is almost completely automated. As shown on fig.1, Yamaha makes it a policy to complete parts shipment by sea within 23 days after an order is received, with the backing of the above highly efficient supply system, in order to expedite the

parts supply and after-sale service operations of 400 Yamaha distributors all over the world. The Parts Sales Overseas Operations of Yamaha is running a system of monthly parts marketing information in order to collect various important data concerning market trends. In this way timely measures can be taken to meet the particular needs of each local market.

# Speedy supply of parts



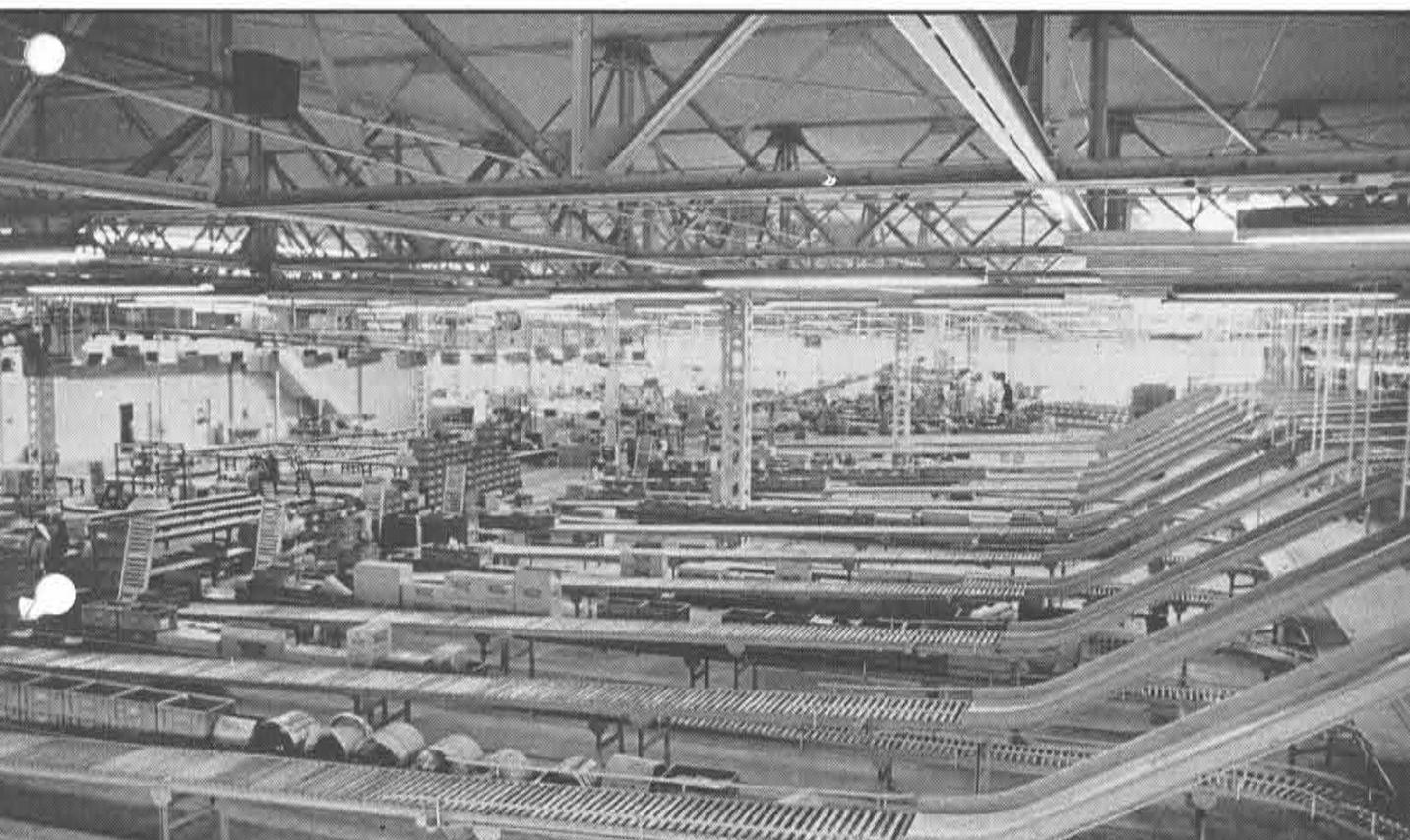
Computer center. The system consists of an inquiry terminal, receiving terminal, inventory register terminal and shipment terminal.



Parts are inspected with special care.



These parts are ready for shipment.

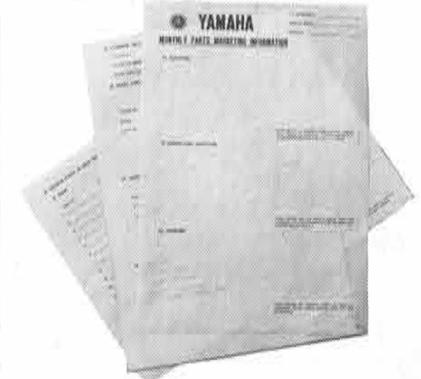


Shipment processing is almost completely automated. All parts are sent to the packing line after they undergo a rigid inspection.

JAF



Monthly reports are expected to tighten cooperative relations between Yamaha and importers.



# Technical series

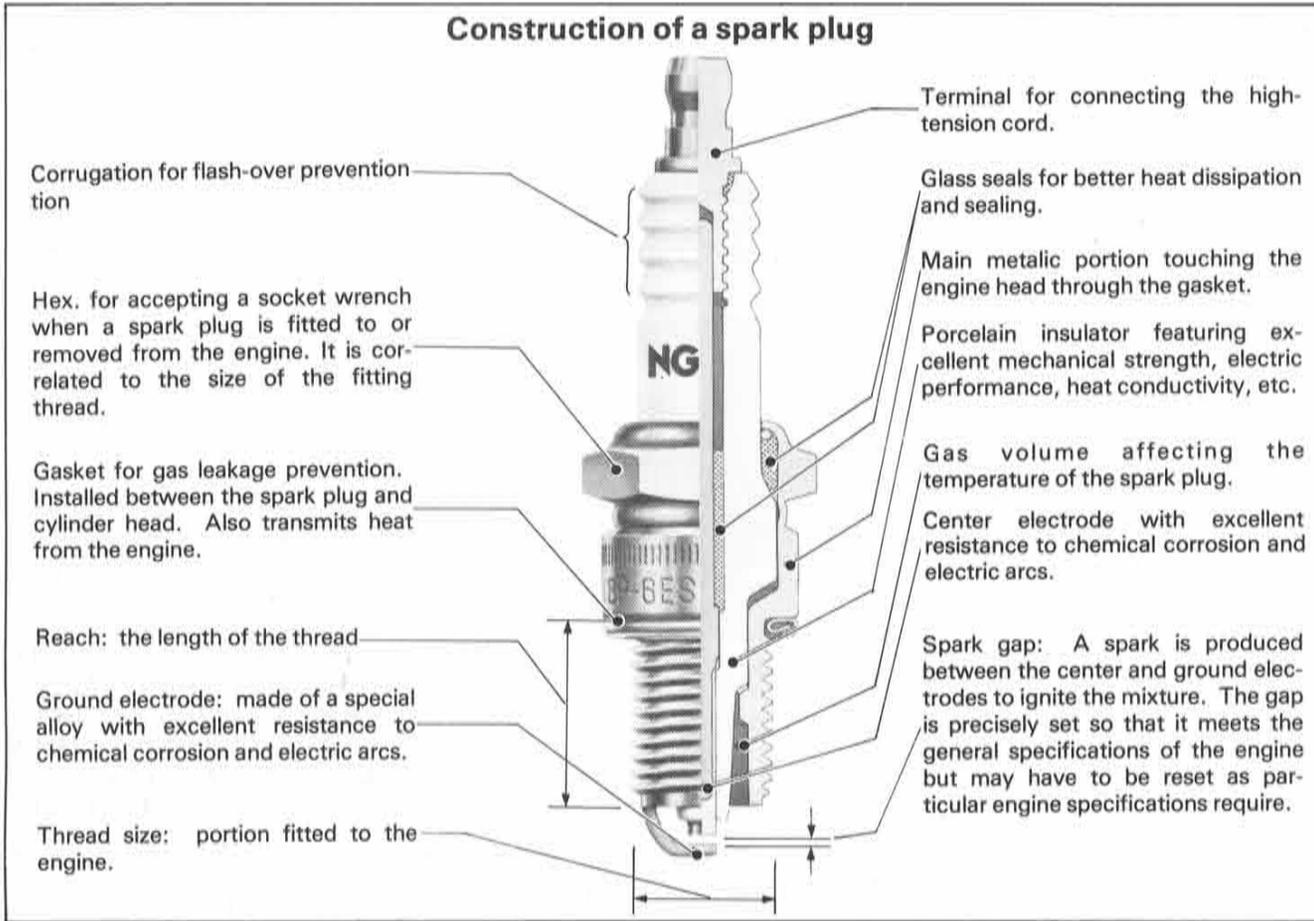
## Service & Maintenance

You should strive to maintain a positive attitude toward improving your level of repair/service techniques and knowledge so that you can see every customer use his or her Yamaha bike in the best operative condition. This technical series has been designed with this in mind and provides proper coverage of the fundamentals required for every Yamaha serviceman. Gain more through elevating the brand image of Yamaha!

*(These pages should be kept long and fully utilized for your better service work.)*

# SPARK PLUG

### Construction of a spark plug



### Heat range is important

Heat range is a means of designating how hot a spark plug will run in operation. All spark plugs may look the same but some are designed for low speed operation (**hot type**) and others for high speed operation (**cold type**). Both types have various heat ranges. Even a spark plug in the same engine will be exposed to varying temperatures according to operating conditions. For this reason, it is impossible to manufacture a spark plug which can meet all the varying heat conditions of an engine. Accordingly, suitable spark plugs are designated for each motorcycle model. For example, Yamaha models use the spark plugs of NGK, Champion, Hitachi or Denso. The designation of heat range differs from one to another as follows:

- \*NGK BP6ES
- \*Champion N-10Y
- \*Hitachi 45PW
- \*Denso W20EP

The method of designating heat ranges is not standardized. That is, larger figures show a colder type in the case of the products of NGK, Denso, Bosch and KLG while they mean a hotter type as for those of Champion, Hitachi and AC. These methods may allow you to set your own standard for choice of suitable spark plugs. As mentioned above, NGK BP6ES corresponds to Champion N-10Y but even in this case the former has not the same range of temperatures as the latter. In addition, heat range has much to do with the temperature of the electrodes. To burn the carbon and oil completely, the temperature of the electrodes must be higher than 400°C. This is called a "self-cleaning" temperature.

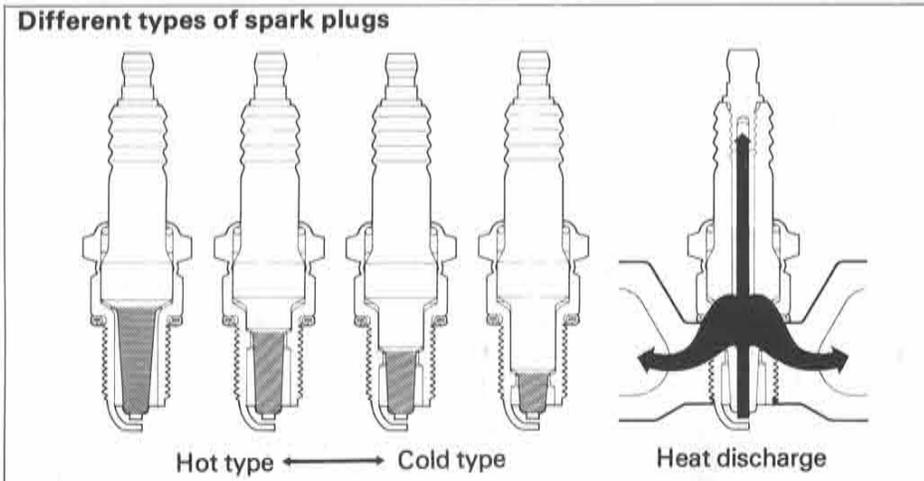
The spark plug is one of the most familiar engine parts. Not only bike users but car drivers will first of all check to see if the function of this part is correct, when the engine does not start or becomes inoperative. You are active in the first line of selling and servicing Yamaha motorcycles and requested to become proficient in the technical diagnosis of spark plugs. That is, you should be able to pass accurate judgement on the condition of the engine or to guess how the bike has been used when you take a look at a spark plug. The spark plug is the only part that is always "peeping" into the engine and the appearance of its electrode tells the condition of the engine.

### Spark ignites the mixture

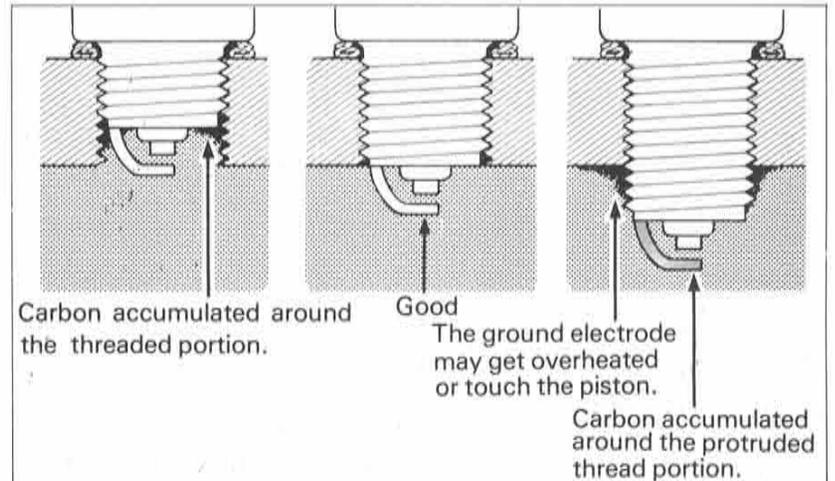
The spark plug produces a spark to ignite the air/fuel mixture in the combustion chamber. To ignite the mixture, a high voltage is needed. The spark plug employs a flywheel magneto or battery as its power source and transforms a low pressure flow of 6V or 12V into a high pressure flow of several thousand volts by making use of the function of an ignition coil so that a spark is produced to ignite the mixture. The mechanism of a spark plug, however, is not so simple as that of a cigarette lighter. The air/fuel mixture which is compress-

ed in the combustion chamber, explodes at a high temperature of 2,000 to 3,000°C. In this case, air pressure also becomes extremely high. This phenomenon takes place several hundred times per second in the combustion chamber. Thus, the tiny spark plug with its simple construction has to work under exceptionally severe conditions. It must be superior in both electrical and mechanical aspects at the same time it must endure the high temperature of the engine and its electrodes must have excellent resistance to electric arcs. Furthermore, it must quickly discharge at high explosion temperature that will burn the carbon and oil completely. Otherwise, the engine could not operate well.

### Different types of spark plugs



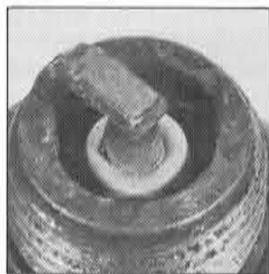
Gas volume enables you to set a standard for suitable heat range.



Both heat range and reach must be correct

## Spark plug tells the condition of an engine

The spark plug does not always function in the prescribed range of temperatures as each rider wants to ride his bike in his own way. In brief, the heat range that is needed varies according to actual operating conditions. Inspect the condition of the electrodes to grasp how the engine has been used. If the electrodes are burnt light grey, tan or white, the engine is in good working condition and the spark plug also performs well. We often see motocross or road race mechanics inspect the condition of the electrodes carefully when they change a spark plug. It tells them how the engine has been used.



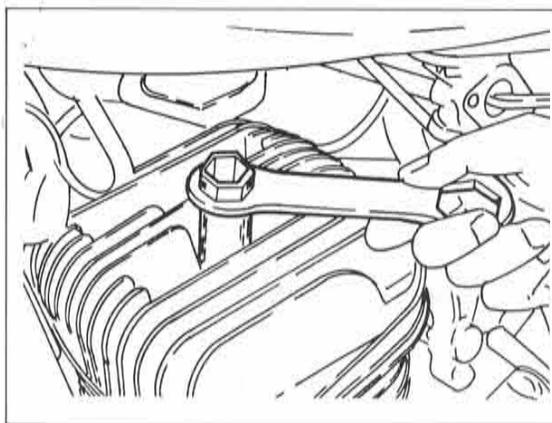
Proper burning: electrode is dry



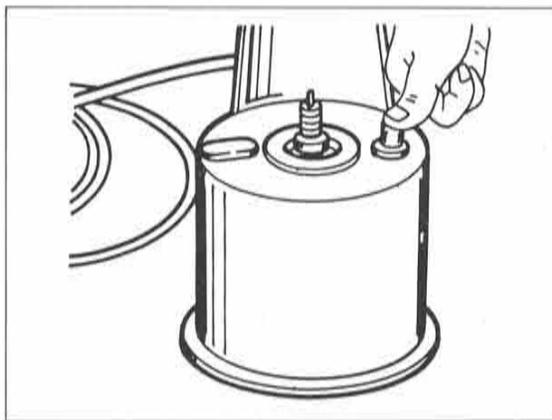
Incorrect burning: electrode is sooty or sometimes wet.



Overheated: center electrode is already damaged. A new one must be used.



Clean the threaded portion and use a suitable wrench for the hex. when installing or removing a spark plug. Otherwise, your hand or the spark plug might get hurt. The spark plug can be easily removed when the engine is cold. When installing it, tighten it by hand until the gasket touches the cylinder head allowing no more hand-tightening. Then, use a wrench for 1/4 - 3/8 more of a turn. On aluminum cylinder heads, tightening torque must be correct.



Clean the spark plug by using a plug cleaner as illustrated.

## Sooty electrodes

### Causes:

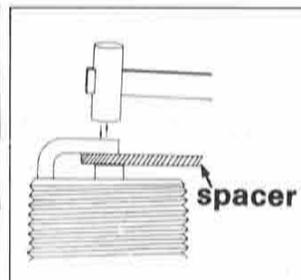
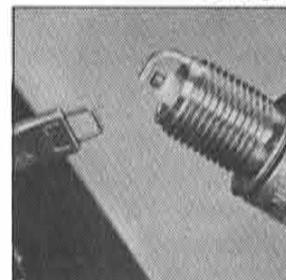
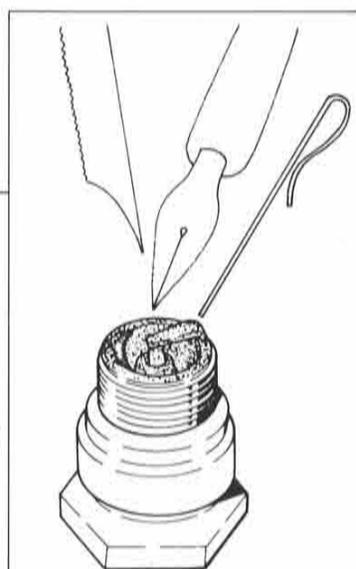
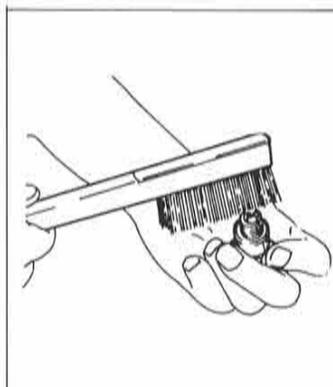
The electrodes are sometimes found to be sooty. This is caused by the following factors:

- \*Long idling or riding at low speed
- \*Misuse or incorrect setting of the carb. starter
- \*Faulty air cleaner or clogged element
- \*Too slow ignition timing or faulty contact points
- \*Faulty condenser or high-tension cord
- \*Incorrect carb. setting or too rich a mixture
- \*Incorrect Autolube setting or excessive oil supply
- \*Worn or oilless cylinder, piston or piston ring
- \*Incorrect spark gap
- \*Too high a heat range

In case the heat range is found to be too high, use the next colder type plug. On the other hand, if the electrodes are burnt bleached white or if the electrodes have worn or the insulator has cracked, the following causes should be considered:

- \*Insufficient engine cooling or carbon accumulation in the combustion chamber
- \*Incorrect carb. setting or too thin a mixture
- \*Too fast an ignition timing
- \*Too low a heat range

In case the heat range is too low, a colder type plug should be used.



Use a wire brush to clean the metallic portion of the spark plug. Clean the gas volume by using a pen. Clean the gas volume by using a sharp-pointed article, such as a pen, hairpin or the like.

Spark gap should be kept correct. In case it is too large, discharge potential will rise too high and badly affect the starting performance of the engine or cause misfire at high-speeds or during acceleration. If the gap is too small, spark energy will be reduced, causing misfire, too. The spark gap should be 0.5 to 0.6mm for a magneto type ignition and 0.7 to 0.8mm as for a battery type ignition. A gauge must be used to adjust the spark gap. Insert the spacer between the center and ground electrodes for correct gap setting.

colder or hotter type. In this case, the condition of the fuel feeding system and general ignition system should also be inspected. The life of a spark plug varies according to actual operating conditions. Roughly speaking, the motorcycle spark plug which is always exposed to high-speed operation, has a life of 5,000km.

## What the signs mean

Signs showing the size, heat range and grade of a spark plug are not standardized but differ from one brand to another. Introduced on table 1 are the signs used by some leading manufacturers:

In addition, individual manufacturers use their own numerical signs to designate the heat ranges of spark plugs. Their correlation is stated on table 2.

As to thread size and reach, individual manufacturers use the signs on table 3.

Each manufacturer designates Model No. of a spark plug by combining the above signs.

Table 1

NGK	B Thread size	P Type	6 Heat range	E Reach	S Type of electrode
Champion	L Thread size/ Reach		81 Heat range	Y Type	
Bosch	W Thread size		8 Heat range	D Reach	

Table 2

Manufacturer	Hot type ←		Standard	→ Cold type	
NGK	4	5	6	7	8
Denso	14	16	20	22	24
Hitachi	7	6	5	4	3
Champion	8,90	6,89	5,86	4,81	3
Bosch	8	7	6	5	4

Table 3

Manufacturer	Thread size		Reach	
	14mm	12mm	12.7mm	19mm
NGK	B	D	H	E
Denso	W	X	F	E
Hitachi	4	2	M	L
Champion	N.L	P.R		R.N
Bosch	W	X	A.B	C.D

## Clean contact points and correct spark gap

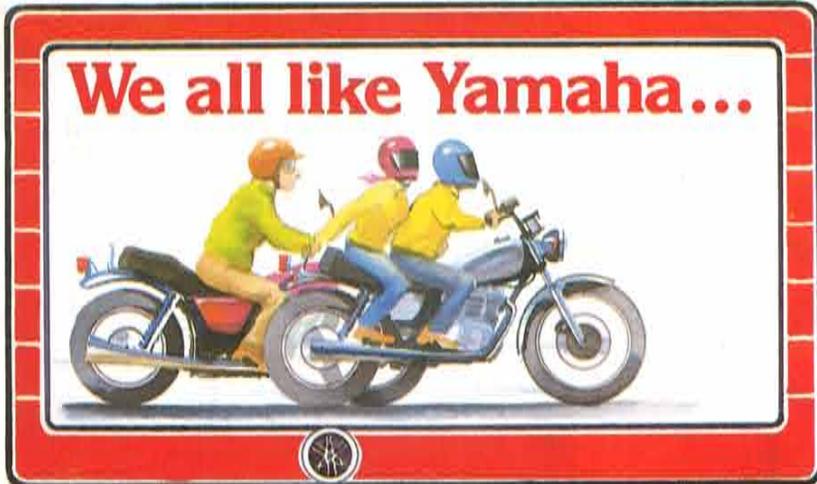
The contact points, high-tension cord and plug cap on the ignition system must be kept clean. Make sure that the spark gap is correct. The spark gap should be periodically inspected. On all motorcycle spark plugs, the gap should be 0.6 to 0.7mm. The spark gap of a battery type spark plug is larger than that of a magneto type one. In case the heat range is found unsuitable, the spark plug should be replaced with a

# Outdoor advertising

## Part 3

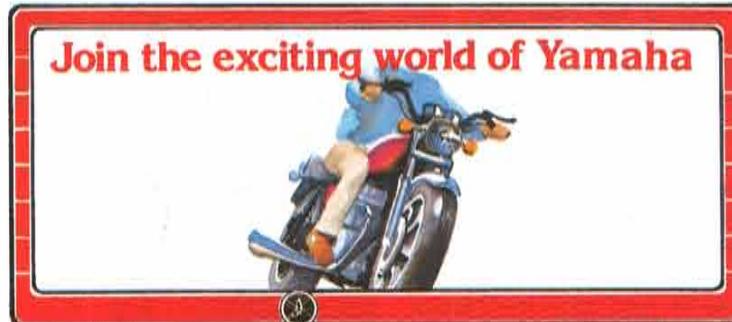
### Entrance to apartment complexes of housing areas

The outdoor billboard with residential areas as the target can be divided into two main types. One is the family bike, and the other is the commuter or sport bike.



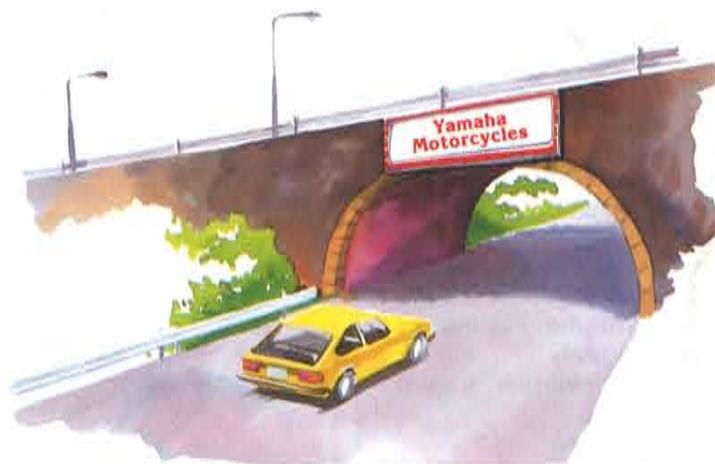
### Near school

The characteristics of the needs in the bike for the student bracket are that they seek a bike that can be used for commuting as well as sports riding. Outdoor billboards located near schools must naturally consider these characteristics. This is an ideal spot for announcing the release of a new sporty product.



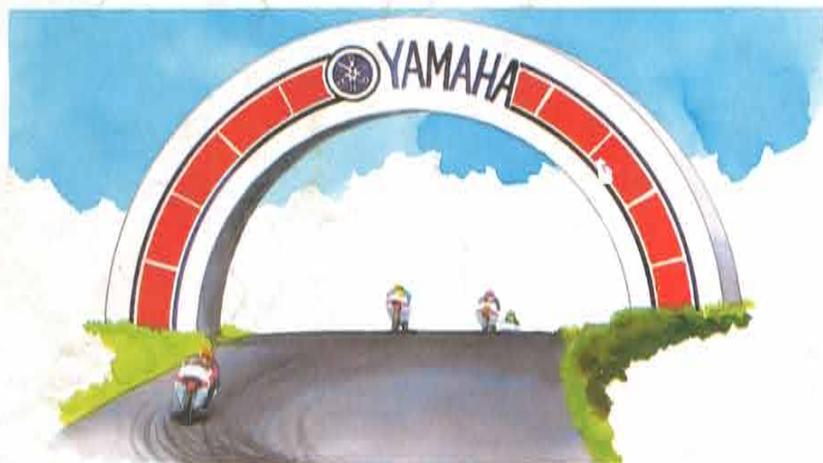
### Along roads in general

The important points regarding outdoor billboards along roads are its expression content, and its location. Here, we introduce representative samples, and recommend that you use them as a reference in selecting locations that suit the circumstances of your territory.



### Near motorcycle race areas

The racetrack where motorcycle fans gather is the ideal place for outdoor billboards. Billboards should be placed along the street approaching the race track, and near the gate, as well as within the racetracks. Within the racetracks, select the spot that will bring about the highlight of the race. Make sure that the Yamaha billboard will be caught by TV, movie, and press coverage. For example, there is a racetrack with a highlight point called the "Yamaha Corner"



### Events

Be sure to make presentations during events such as trade fairs, festivals, and motor shows. To suit the occasion, billboards with a festive atmosphere, or with a race image would be appropriate.

### In the lead...on the track and off

