

50cc Scooter YAMAHA Why/MBK Flipper

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1 INTRODUCTION

In Europe, 50cc scooter's market has been increasing year after year. In 1997, the size of total market was more than 1 million units. One character of this market is that more than half of total units has been sold in Italy, since there is a complete segmentation of the market in Italy.

Especially in the last few years, the large wheels scooter category was expanding strongly in Italy (150,000unit in 1997). Following this market situation, YMENV Product Planning Division decided to introduce one Yamaha Motor's product in this category and officially requested to MBK R&D to develop one large wheels scooter at the end of 1996.



Fig. 1 Flipper / Why

2 DEVELOPMENT TARGET

The concepts of the scooter are as follows.

- (1) Fashionable and high quality 16 inches scooter
- (2) Very easy, clean and uncomplicated to use in "Rome" conditions
- (3) Stable on bad road
- (4) Safety feeling from slenderness and lightness of the vehicle

Following these concepts, MBK R&D performed QFD in order to define clearly the development direction and target. It was the first QFD in MBK. Achievement of the QFD target has been validated by the test in the market with the first prototype machines.

Result of QFD showed the following customer target.

- (1) Adult, 25 to 40 years old
- (2) Educated and middle to high income
- (3) Business clothes and briefcase
- (4) Wants to move around easily, so called "active life"

Following QFD result, target was to be the best large wheels scooter for the following items.

- (1) Good starting acceleration
- (2) Good comfort on bad paved road
- (3) Comfortable seat
- (4) Natural and comfortable riding position
- (5) Light weight
- (6) Enough fuel tank capacity
- (7) Light weight feeling
- (8) High quality image
- (9) Easy to adapt wind screen

3 STYLING OF FLIPPER / WHY

The stylist of ELM Design based in Europe has studied the styling of Flipper/Why. Actual work, sketches and clay model has been done in the styling room of MBK.

Target for the styling of Flipper/Why was to give to the rider some elegance and pride feeling while riding its scooter. It was important to work on the general lines of the body to give a lightweight feeling but also to work on each detail in order to have a high quality product finishing. Therefore, we can find more painted parts (12parts) and chrome plating parts (10parts) on this scooter (Fig.2 & Fig.3).



Fig.2 Flipper Styling

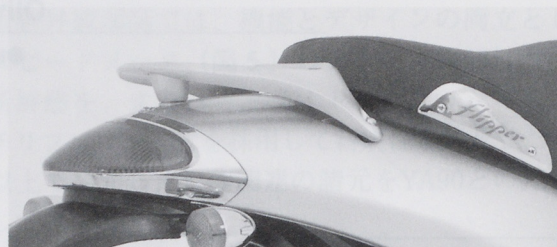


Fig. 3 Chrome Plating Parts

4 SPECIFICATIONS

Specifications of Flipper/Why have been defined in order to satisfy the QFD result shown in Fig.4.

4.1 Engine specifications

Flipper /Why is equipped with a 50cc air-cooled engine developed and produced by Motori Minarelli (MY E/G) (Fig.5). In order to have the best performance engine, Minarelli developed a new head cylinder and MBK, which was supported by Yamaha Motor Co., Ltd. (YMC), developed a new air cleaner. For this purpose one MBK R&D draftsman spent two weeks in YMC.

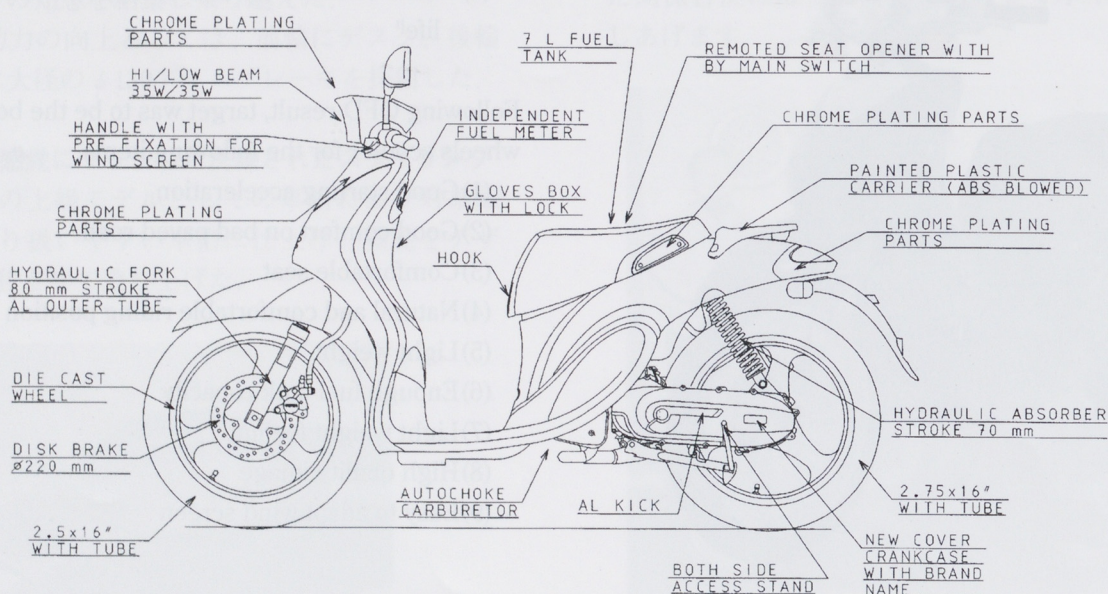


fig.4 Flipper/ Why specifications

Thanks to these jobs, Flipper/Why's performances after tune up are as follows.

- (1) Acceleration 0 to 50m : less than 5.8 seconds
- (2) Maximum speed : 68km/h
- (3) Engine output : 3.9kW (5.3ps)

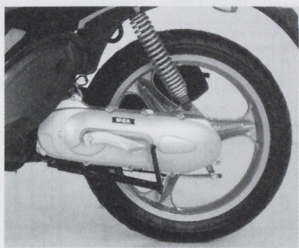


Fig.5 Engine

4.2 Riding position

Target was to define a riding position which is suitable for little or tall person. Then it has been decided as follows.

- (1) Seat height: 770mm, suitable for an easy ground access for all person
- (2) Roomy riding position has been considered by round leg shield shape. Even tall person has enough space for its legs.

Handle height has been decided in order to provide good protection to the rider's body but also to have grips above the rear view mirrors of the cars in traffic jam.

4.3 Suspensions

Flipper has been equipped with hydraulic suspensions in order to provide to the rider the best comfort even on the bad paved road of the big Italian cities.

The setting of the suspensions have been defined by using telemetric data during test of the first prototype in collaboration with the supplier.

4.4 Light weight

During all the development weight has been taken in consideration. From the styling point of view in order to give an extremely light image to the scooter but also for the parts design. Finally, with a

wheelbase of 1295mm, we succeeded to reach a dry weight of 71kg. Then, Flipper/Why is the lightest scooter of its category.

5 FIRST PROTOTYPE EVALUATION

In order to confirm achievement of the QFD target, it has been decided to perform a real evaluation in the market with the first prototype machines. This test took place in Italy, in the city of Bologna. Following this test MBK R&D could check target achievement for QFD items and define countermeasure for some of them.

6 CONCLUSION

Finally, mass production of Flipper/Why started in May 1998, on schedule and with a good level of quality. This has been possible by a total involvement of MBK divisions but also of the different entities of the Yamaha group in Europe, YMENV, YMCE, ELM Design and Motori Minarelli. Following Flipper/Why development experiences, I can say that Yamaha group has a real power for the development of new models of scooters in Europe. Our job is to take advantage of it against all our competitors.



Development team