MAX -CODE NAME-

MAX

Background of P.T.W. MAX Development

We had a specific goal when the development of P.T.W was decided. It was that all new P.T.W. should have functions that exceeded "***SYSTEMA*** **COMPLETE CUSTOM**", which was well received. We have been developing P.T.W. M150 specification for long time and now we can introduce you to "MAX". Then we would like to explain about the development process and the details of the technical features as follows.

1. Revision of engine chamber rigidity and durability

① Planetary gear BOX

"Planetary gear BOX" which was developed as P.T.W. M-16 drive mechanism is credited with its toughness and high transmission efficiency contrary to its compact appearance.

Each gear was adequately quenched and tempered to drive the strongest spring in the series and especially chrome molybdenum steel cutting type was adapted in all planetary gears.

② Sector gear vs. Piston rack gear

③ No matter how much the gear BOX itself excels in the rigidity, there is no point unless it can maintain the rigidity after it really sets up. Regarding P.T.W., mating parts of the gear BOX to the lower receiver is processed by a machining center. Processing dimension of this part is generally specified a little bigger for ease of assembly. However, as for this MAX, it is controlled to realize tight mating all of the time. Building such differences of details dimensions finally becomes the difference of big shooting feeling as a whole.

2. Design of the spring

① Repulsive force and prevention of defect

The inside and outside diameters of the spring used in P.T.W. are manufactured smaller than those of ***SYSTEMA*** parts. As you know, if the spring has the same wire diameter, the one with the smaller outside diameter has stronger repulsive force. Also, this design has a large impact on the durability of the spring and prevents defect accidents. Such basic design itself makes further developing tuning possible.

② Silicon chrome

With regards to the strengthened spring, we take pride in the best performance in the industry. By the spring completed after all of our possible efforts from our experiences, MAX boasts overwhelming high power such as maximum muzzle velocity 158m/sec (0/2g/BB).

3. Cylinder unit set up

①Takedown structure

P.T.W. is possible to recover contingency and select the body power quickly by the same structure as a real gun that can be taken down. Moreover, it is a well-known fact that this replacing work doesn't need any specific tools.

② Prevention of cylinder sliding back

However, P.T.W. structure is possible to slide the cylinder unit from the upper receiver back and remove it. The motor's drive power burdens the sector gear backward strongly and makes air leaked by moving the cylinder unit. Therefore, it also can be said that the structure can't be stabilize muzzle velocity

③ Adjustment of the spring guide click ball

In order to avoid such situation, P.T.W. can prevent the cylinder unit sliding back by placing set bearing by the strong spring inside the spring guide in the cylinder unit.

It is built to allow you to adjust the spring tension supporting the bearing. If you adjust this spring tension too strong, it will impact on "stiffness" of takedown. Therefore, the challenge level of this work is very high. It achieves a balance by torque control for tightening the socket screw this time.

4. Challenge toward energy loss 0 (zero)

① Lower receiver

The most important thing to drive the spring with high tension is to minimize loss of drive power. No matter how much strong motor and high speed reaction ratio of gear structure is adapted, it is no point unless their transmission efficiency is low. It can be reworded P.T.W. structure is the one that "links" each motor and the gear by the lower receiver. As stated previously, the receiver is an outer core as the structure and also requires high accuracy to link engine chamber mutually. We take pride in the quality of only ***SYSTEMA***

② Chamber

Our original technique and know-how are alive in the chamber (chamber base), which is manufactured under various restriction such as high accuracy to realize smooth feed and to protect air leak and need of strength countering striking power by the stronger spring. Final version is adapted after various improvements.

③ Piston head O ring

The degree of adhesion to cylinder inner wall is finally adjusted by manual work. The work called O ring sizing is a typical example of our distinctive process as we think a quality is the most important than anything.

5. PF-480 model 2006 version-MOTOR

① Aiming for the most powerful motor for air gun

It was absolutely necessary to develop the specific motor for realizing the grip with the same dimension and shape of a real gun. We have a track record of initial sales of PR-450 model

motor but the development was depending on only targeted performance. There were piles of problems such as size restriction not to be able to make larger outer diameter and a rotor with a thin diameter that inertia force was hardly generated and development planning to utilize it as the structure.

② Iron and boron magnets

First, resolution for output was realized by adapting iron and boron magnets with unusual magnetic force as a small motor. This magnet over 2300 gauss at a maximum generates strong torque at 30 % increase compared to PF-450 model super torque up motor.

③ Rigidity as the structure

According to our company philosophy, "A gun is a tool operated by a grip and installation strength is the most important than anything", this motor was required a performance as a structure from the beginning of the development. The motor consisted of four parts is built up firmly by swaging. This swaging technique is realized by our original technique that has manufactured gears by swaging various parts for many years.

④ Adjustment of pinion

Mating bevel gear is generally adjusted by shimming.

Because of our higher priority on being adjustable mating after assembly, we generally adjust around pinion gear's set dimension, but there are some technical inconsistencies in this method. This time in accordance with original design base faithfully, mating of the gear was adjusted by shimming and adjustment for the motor was removed.

As the result, noise and vibration dramatically decreased and it offers more smooth rotation.

6. Vibration and heat measures

① Aluminum die casting parts

We think grip rigidity is important and the inter wall of the grip and the motor are almost coherent. Therefore, heat generated from the motor when high current and voltage are connected causes many problems. As countermeasures against these problems, parts surrounding the motor are manufactured with high heat radiation materials. (Motor base, end bell, grip end etc.)

② Installation rigidity of each part

In addition, vibration of shooting by strong spring looses various parts of the gun. As countermeasures, parts are assembled by using strength type adhesive in usable parts but after long time use, we would like ask you to tighten it.

7. Other improvement points

① Takedown pin

Although it was generally required a tool to remove it, it is possible to remove it by finger by changing shape of the stopper pin and revise of spring tension without change of receiver assembly accuracy.

② Each part blast finishing

Putting blast finishing to 11 parts such as the rear side base and the charging handle improves texture of appearance.

That’s we put all current possible improvements and complete P.T.W. “MAX”.

We hope you will pick it up and confirm our technique.

2-8-3 Yahara Nerima-ku Tokyo Japan 177-0032

TEL+81-3-3997-8544 FAX+81-3-3997-8900

SYSTEMA Co.