

Establishment of remote laser welding mass production technology applied to press frames for small scooters for the ASEAN region

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In Asian countries including those of ASEAN, demands are high for motorcycles and scooters having a small displacement engine. Out of approximately 20million units of Honda’s annual worldwide motorcycle production volume, slightly more than 70% are manufactured in the limited number of production lines in Asian countries. When the per-unit production speed is calculated, it is 20+ seconds. It is therefore important to enhance operation rate of the production equipment, which directly affects production man-hours.

In the production line, the frame body is the component that takes the largest man-hours. The main reason is that the frame body is composed of a number of steel pipes. In the conventional steel pipe frame, which has been widely applied, a very large number of parts including the reinforcement gussets, wire harness clamps, are connected by arc welding. To deal with this issue, we have newly developed the pressed-steel frame for scooters applying the remote-laser welding to its side frame.

In the introduction of the remote laser welding, we set the following three requirements to achieve a production equipment operation rate as high as 90%.

- (1) Help prevent blow holes by use of an optimum welding path by control of heat input
- (2) Help prevent contamination of the protector glass on the laser head focus lens
- (3) Remove spatters within the welding cycle time

First of all, we confirmed absence of blow holes in the end of welding and in the center of welding due to expansion of air by setting the welding heat input and the laser beam aiming at an optimum level. Then, the adhesion of contaminant from the welding fume was eliminated by creating a stratified gas flow space right under the protector glass of the focus lens. Lastly the removal of spatters within the welding cycle time without using an additional mechanical device was realized by using the repetitive swinging motions of the clamp arms.

The equipment operation rate higher than 90% in the mass production has been achieved (refer to Fig.1). Thus, a system suitable for mass production has been established.

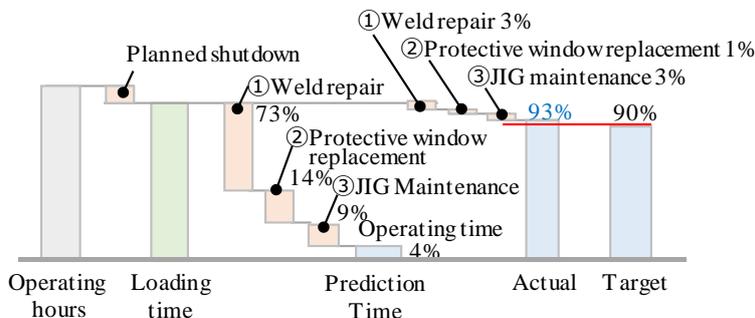


Fig. 1 Facility utilization rate after countermeasures