

PRILOG O REŠAVANJU SAOBRAZNOSTI PROIZVODNJE MOTORA U POGLEDU EMISIJE IZDUVNIH GASOVA

Potpuna kontrola kvaliteta proizvodnje motora obuhvata sve etape počev od prijema gotovih delova i odlivaka preko izrade delova, montaže do završnih ispitivanja. Proizvodno garantovanje izlaznog kvaliteta zahteva primenu standarda (ISO 9000) koji to omogućavaju. Međutim, složenost procesa proizvodnje motora iziskuje određeni period prilagođavanja do potpunog funkcionisanja.

Do uspostavljanja potpunog sistema kvaliteta neophodna su rešenja u izlaznoj kontroli saobraznosti proizvodnje motora u pogledu emisije izduvnih gasova.

Završna kontrola montiranog motora obavlja se radi provera raznih procesa proizvodnje kao i utvrđivanje njegovih izlaznih karakteristika.

Mada je ovom prilikom istraživana emisija izduvnih gasova bitno je napomenuti neophodnost njenog razmatranja u sklopu svih ispitivanja. Razlog za ovo su troškovi kontrole koji utiču na proizvodnu cenu motora.

Postoji dva osnovna proizvodna ispitivanja motora. Prvi, u okviru proizvodnog ciklusa i drugi u okviru kontrole kvaliteta. Svi motori se podvrgavaju ispitivanju. Ovo ispitivanje traje do 1 časa i zavisi od uhodanosti proizvodnje i nivoa kvaliteta motora.

Razumna je težnja za što kraćim ispitivanjem u cilju smanjenja proizvodne cene. Ispitivanja kontrole kvaliteta su znatno detaljnija i traju do 3,5 časa. Važi takode isto pravilo da se vreme smanjuje kod proverenih motora ako se održava kvalitet. Ovom ispitivanju podvrgava se od 2-20% motora zavisno od veličine serije i od stanja kvaliteta motora.

Bitno je, kako sa što manje kontrolnih parametara u proizvodnom ispitivanju obezbediti pouzdanu saobraznost emisije izduvnih gasova.

Osnova za izbor parametara kontrole u serijskoj proizvodnji kojim se prati saobraznost zavisi od zahteva propisa o emisiji izduvnih gasova i od mogućnosti ispitivanja u proizvodnim uslovima.

Sprovedena, dalja istraživanja su bazirana na optimalnim zahtevima proizvodnog procesa u pogledu merne jedinice i uslova merenja.

Optimalni uslovi proizvodnje diktiraju merenja pri punom opterećenju na jednom broju obrtaja motora.

Istraživanja su obuhvatila uslove merenja pri punom opterećenju i pri 80% opterećenja. Rezultati statističke obrade upoređeni su sa maksimalnim vrednostima pojedinih uzoraka. To je neophodno jer konformnost proizvodnje mora biti takva da svi motori budu ispod propisanih granica.

Ključne reči: izduvni gasovi, proizvodnja dizel motora, testiranje.

A CONTRIBUTION TO SOLVING THE ENGINE PRODUCTION CONFORMATION IN RESPECT OF EXHAUST GAS EMISSIONS

A full quality control of engine production covers variety of starting from the acceptance of finished parts and assembling, right up to the final testing. Production guarantee of outgoing quality requires the application of an adequate standard (ISO 9000).

The complexity of engine production process, however, needs a certain period of adjustment to reach full functioning.

To establish full quality system solutions in outgoing control of engine production conformity in respect of exhaust gas emissions are essential.

The final control of an assembled engine is performed to check various production processes as well as to determine its outgoing characteristics.

Although on this occasion we investigated exhaust gas emissions it is essential to underline the necessity of considering such emissions with full test procedure. The reason for this being expenses that affect engine production cost.

There are two basic engine production tests. The first one being within the production cycle and the second within the quality control. Any engine must undergo production test. Such test lasts up to one hour and depends on the smoothness of production and engine quality level. It is reasonable to aim to the shortest test time possible to reduce the production cost.

Quality control tests are more detailed and last up to 3,5 hours. The same rule applies in this case, i.e. that this time is shorter with proved engines providing, of course, that the quality is maintained. Some 2-20% of engines undergo this test depending on the volume of series and on the engine quality.

It is essential to provide reliable conformity in exhaust gas emissions with the smallest number of control parameters in the production test.

The basis for selecting control parameters in the series production to monitor the conformity depends on the requirements of exhaust gas emission regulations and on the testing facilities in the production conditions.

Further investigations that have been made were based on optimum requirements relative to the production process in respect of measuring unit and measuring conditions.

The optimum production conditions request measurements to be made at full load at a certain speed.

Investigation covered measuring conditions at full load and at 80% load. Results of statistic processing are compared with maximum values of certain samples. This is essential because the conformity of engine production must be such to require any engine emission to be below the specified limits.

Key words: exhaust gas, diesel engine production, testing.