AN INTEGRATED CIRCUIT DESIGN TO MAINTAIN THE BOOST CONVERTER

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Abstract - *A brand new integrated circuit for motor drives with dual mode control for EV/HEV programs is suggested. Therefore, the suggested integrated circuit can considerably lessen the volume and weight from the system. The integrated circuit presented within this paper can behave as an inverter along with a boost ripper tools with respect to the operation mode. For that integrated circuit, it although lessen the volume and weight but additionally boost torque and electricity-link current for motor/ ripper tools modes, correspondingly. In motor mode, the suggested integrated circuit functions being an inverter also it turns into a boost-type boost ripper tools, when using the motor windings because the boost inductors to improve the ripper tools output current. Furthermore, a brand new control way of the suggested integrated circuit under boost ripper tools mode is suggested to improve the efficiency. The suggested integrated circuit enables the magnet synchronous motor to function in motor mode or functions as boost inductors from the boost ripper tools, and therefore boosting the output torque combined towards the same transmission system or electricity-link current from the inverter attached to the creation of the integrated circuit. The suggested control technique is by using interleaved control to considerably lessen the current ripple and therefore lowering the deficits and thermal stress under heavy-load condition. Experimental results produced from digital-controlled 3-kW inverter/ripper tools using digital signal processing show the current boost ratio can move up to 600Wto 3 kW. And also the efficiency is 93.83% under full-load condition and keeps the motor temperature in the atmosphere level. These results fully read the stated merits for that suggested integrated circuit. In comparison, single phase control can be used because of not invoking additional switching and passing deficits under light-load condition.*

***Key Words*: Boost converter, inverter, motor drives.**

1.INTRODUCTION : In parallel hybrid electric vehicle (HEV) and electric vehicle (EV) system, the ripper tools can be used for enhancing battery current to ranked electricity bus to have an inverter they are driving motor [1]. Within the multi motor drive system, the machine uses several motors to improve torque, especially under low speed and-torque region the suggested integrated circuit enables the magnet synchronous motor (PMSM) to function in motor mode or functions as boost inductors from the boost ripper tools, and therefore, boosting the output torque combined towards the same transmission system or electricity-link current of the inverter attached to the creation of the integrated circuit. In motor mode, the suggested integrated circuit functions being an inverter also it turns into a boost-type boost ripper tools, when using the motor windings because the boost inductors to improve the ripper tools output current. Therefore, the suggested integrated circuit can considerably lessen the volume and weight from the system [2]. The integrated circuit presented within this paper can behave as an inverter along with a boost ripper tools with respect to the operation mode. For that integrated circuit, it although lessen the volume and weight but additionally boost torque and electricity-link current for motor/ ripper tools modes, correspondingly. Furthermore, a brand new control way of the suggested integrated circuit

under boost ripper tools mode is suggested to improve the efficiency. Based on the interleaved control idea, a lift-control technique using motor windings as boost inductors for that suggested integrated circuit is going to be suggested. Under light load, the integrated circuit functions like a single-phase boost ripper tools because of not invoking additional switching and passing deficits, and processes because the two-phase interleaved boost ripper tools under heavy load to considerably lessen the current ripple and therefore lowering the deficits and thermal stress [3]. Therefore, the suggested control way of the suggested integrated circuit under boost ripper tools mode can boost the efficiency.

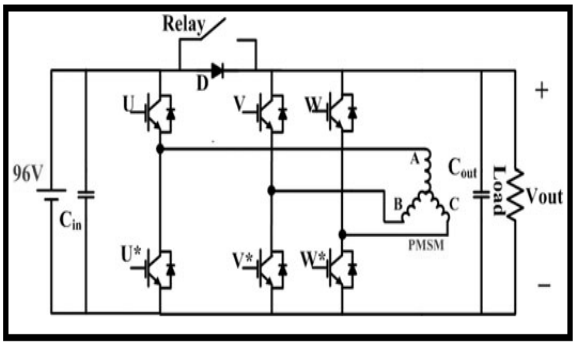


Fig.1.Circuitry diagram of the proposed system

II. IMPLEMENTATION

Diode (D) can be used for stopping output current effect on the input side. Once the integrated circuit is operated in inverter (motor) mode, relay is going to be switched ON and 6 power products are controlled by pulse width modulation (PWM) control signals. Once the suggested integrated circuit is operated within the ripper tools mode, relay is switched OFF. Along with a single-phase or interleaved control method will be relevant to charge of the ability products based upon the burden conditions. will introduce the type of boost ripper tools and derive the transfer purpose of the current controller. Fig. 8 shows the non-ideal equivalent circuit from the boost ripper tools, it views noni deal condition of components: inductor winding resistance RL, collector-emitter saturation current VCE, diode forward current drop VD, and equivalent series resistance of capacitor Rear. Research into the boost ripper tools using the condition-space averaging method, small-signal ac equivalent circuit could be derived [4]. Within this paper, the switching frequency is 20 kHz and current loop bandwidth is going to be under 2 kHz. And also the phase margin ought to be greater than 45? to boost the noise immunity. The measured efficiency from the suggested integrated circuit and switching reason for different current ratios because it functions like a boost ripper tools. the efficiency for interleaved control is elevated as load goes greater than 2.4 kWas in comparison to that particular for single-phase control. Therefore, the boost ripper tools are controlled through the suggested hybrid control method. In comparison, as load is under the switching reason for power ratio for that given current ratio, the ripper tools is controlled through the singlephase control method without invoking additional passing and switching deficits as in comparison to that particular for 2-phase interleaved control. The transition point is dependent upon the burden condition and implemented within the interrupt service routine (ISR) for that flow chart from the suggested control for that suggested integrated circuit under boost ripper tools mode. The suggested integrated circuit which functions as inverter/boost ripper tools and DSP control board to provide PWM control signals of inverter/ripper tools based on the feedback signals and reference [5]. The high temperature of power products to be able to read the decrease in switching deficits led through the two-phase interleaved control method. Once the suggested integrated circuit works in single-phase mode, the inductor current flows with the power device V * and it is temperature will increase to 87.9 ?C. In comparison, once the suggested integrated circuit works in 2-phase interleaved mode, the inductor current flows with the power products V * and W* as well as their temperature is going to be 62 ?C. Similar recent results for other test conditions could be derived and won't be incorporated within the paper because of length limitation.

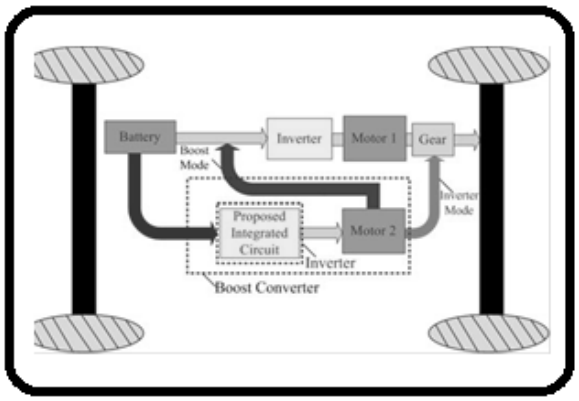
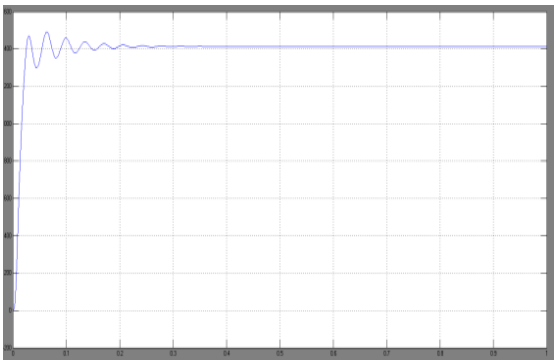


Fig.1.Block diagram of the proposed model

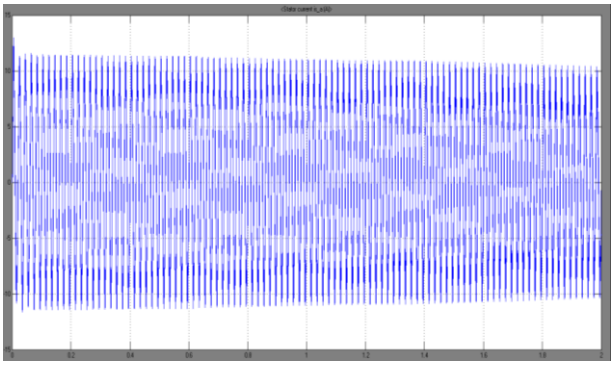
III. CONCLUSION

The contributions of the paper include: proposal of the new integrated inverter/ripper tools circuit of motor drives with dual-mode control for EV/HEV programs to considerably lessen the volume and weight proposal of the new control way of the integrated inverter/ripper tools circuit operating in boost ripper tools mode to improve the efficiency verification from the suggested integrated inverter/ripper tools circuit verification from the suggested control method. Experimental results reveal that the current boost ratio can move up to three.



3.1.Speed of a induction motor.

Under full-load condition, the utmost efficiency is much more than 95% and efficiency could be maintained at greater than 91.7% for current ratios differs from 1.25 to three. These results fully read the stated merits from the suggested integrated circuit and control method. The high temperature of power products to be able to read the decrease in switching deficits led through the two-phase interleaved control method.



3.2.Armature current of induction motor.

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