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SMART TECHNOLOGIES OF TECHNICAL CONTROL OF MACHINE USE OF SELF-PROPELLED BEET HARVESTERS

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First control unit for self-propelled harvesters: Smart Turn combines for the first time on a sugar beet harvester the mechanical steering system [1] and the Terra Control turn control system with GNSS turn control [2], as is already known from tractor technology [3]. At the same time, for the first time, automatic turning on the headland is possible – including lifting and automatic re-dipping of the lifter [4], as well as the necessary turning maneuver [5].

The Reich Hardt co-development complements the Terra Dos T4 with state-of-the-art automatic control and smart farming functions to optimize beet harvesting and soil protection [6]. This system has been awarded the silver medal of the German Agricultural Society.

1. Acoustic signal indicates the optimal time to start the turn (Fig. 1). The driver activates Smart Turn. Terra Dos T4 automatically completes lifting at the planting boundary and raises the lifter at the ideal time.

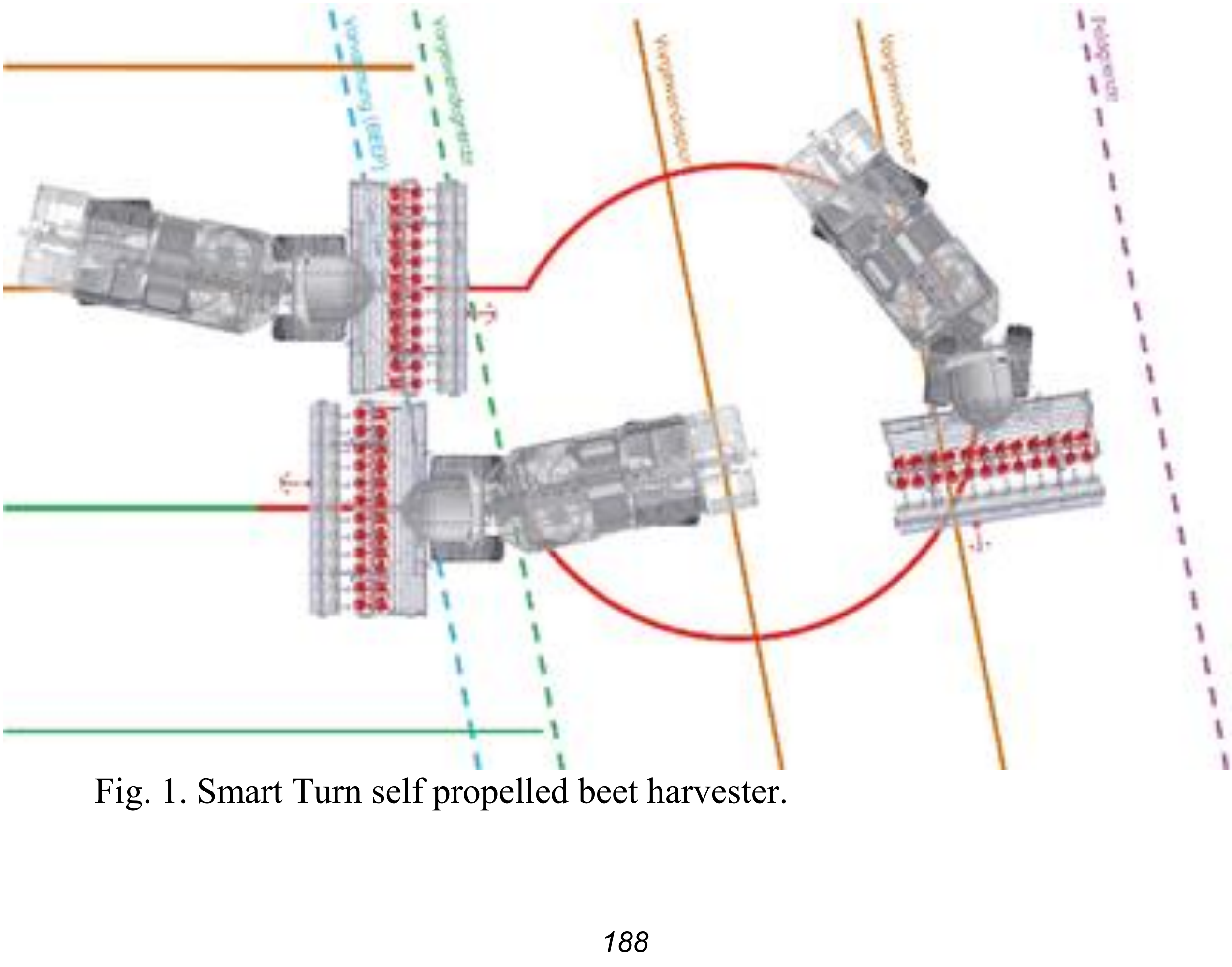

Fig. 1. Smart Turn self propelled beet harvester.

2. At the same time, the GNSS system takes over the control of the turn process, while choosing the best track. After turning around, the system automatically selects the next track.

3. There, the Smart Turn automatically lowers the stump back into the soil at the ideal time point. The well-proven automatic system then takes over the control of the machine in the track. Reich Hardt Smart Control records all reversal information; the stored data is available for documentation and subsequent evaluation.

Reversal in a tricky way:

- automatic vehicle control system using GNSS and probes allows the driver to fully concentrate on quality control of uprooting;
- always the best and shortest headland paths without unnecessary maneuvers – the most careful use of the soil;
- automatic lifting and immersion of the puller at the right time – to reduce wear and reduce fuel consumption;
- quick turn on the headland – the minimum time for preparing the machine;
- automatic immersion in the desired row – to facilitate the work of the driver and to avoid losses during harvesting.

The EcoPower system is unique in the field of self-propelled sugar beet harvesters (Fig. 2). Depending on the actual driving mode (harvesting or moving), as well as depending on the load on the undercarriage drive, the EcoPower system selects the optimal range of operation of the diesel engine and the undercarriage drive. This ensures optimum performance and power with low fuel consumption.

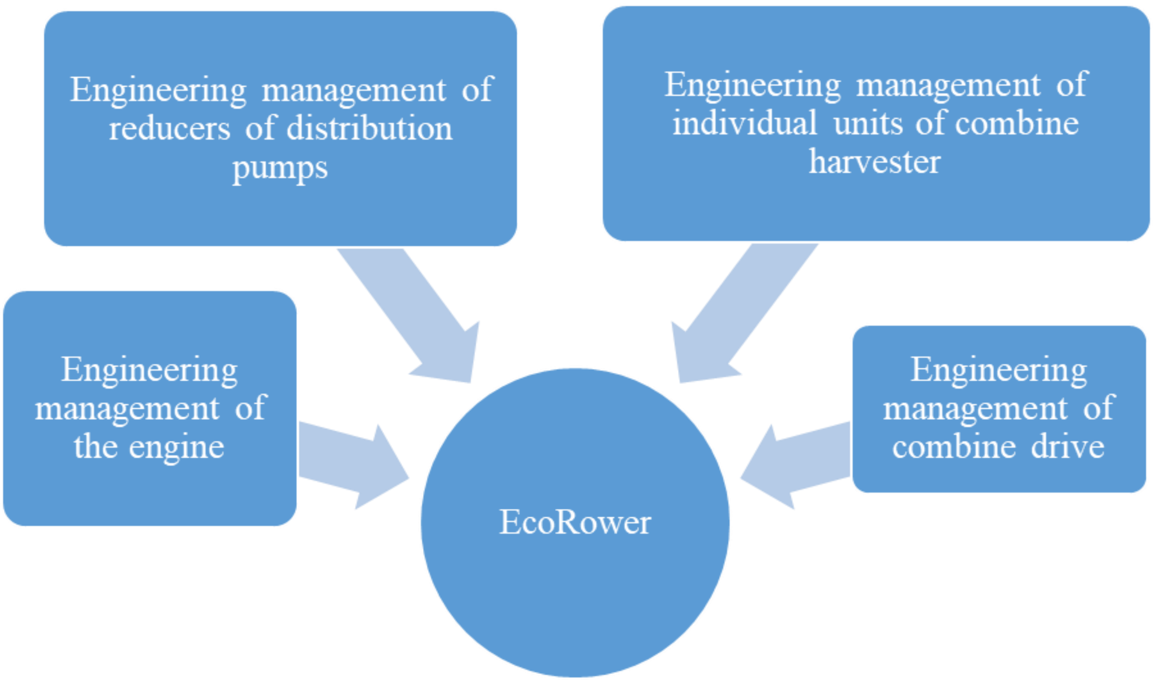

Fig. 2. Engineering management of shutdown of hydraulic circuits.

Optimal operation of the diesel engine, a significant increase in the efficiency of all drives of structural units, as well as the drive of the running gear, regardless of the technological process:

- increased efficiency due to an increase in the number of pumps and an optimal coordination of the functioning of pumps and components;
- comprehensive optimization of the entire energy management system;
- disabling unused mechanisms to reduce fuel consumption.

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