Magnum 180
Magnum 200
Magnum 220
Magnum 240

Continuously Variable Transmission (CVT) Tractor

PIN ZERH02500 and above

SERVICE MANUAL

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CASE IH AGRICULTURE

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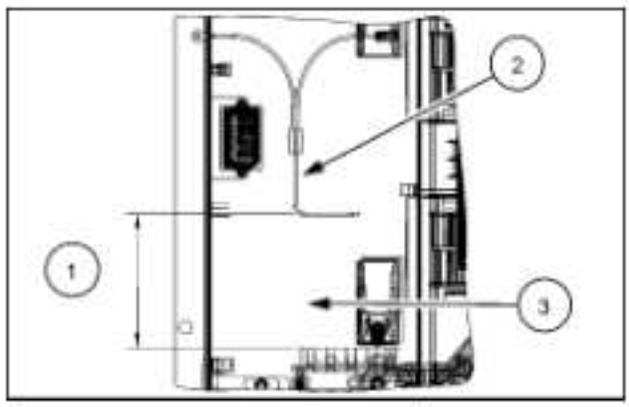
Platform, cab, bodywork, and decals 90

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Temperature sensor Evaporator temperature sensor - Dynamic description

Background

The evaporator temperature sensor **(2)**, sometimes called the "freeze" or "core" sensor, is located in the evaporator/heater assembly **(3)**. The sensor measures the effectiveness of system response to the current demand for heating or cooling.



RCPH12CCH006ABC 1

Freeze control

The evaporator sensor **(2)** also prevents the system from operating in low ambient temperatures where damage to the system might occur. When temperature sensed at the evaporator falls to **0 °C** (**32 °F**), the controller cycles the compressor clutch off. When temperature sensed at the evaporator rises to **3 °C** (**37 °F**), the controller cycles the clutch back on. In Defog mode or in Automatic mode at the maximum cooling setting where the compressor runs continuously, the freeze range controls the cycling of the compressor off or On.

Sensor location

Proper location of the evaporator sensor **(2)** is essential to system performance. The evaporator temperature sensor must be installed **147 mm** (**5.8 in**) from the right end (heater valve end) of the coil **(1)**. The sensor must be installed on the third row up, between the refrigeration tube row, at a **30 °** downward angle. Insert the sensor in the evaporator core up to the angled section, being careful not to kink the sensor.

Electrical test

The sensors should measure **10000 - 25000 Ω** at room temperature for normal operation.

The sensor is a thermistor – thermal resistor. With this thermistor the colder the environment, the greater the electrical resistance; and the warmer the environment, the less electrical resistance.

If fault codes are active, the most likely problem is wiring to the sensor. The out of range values are so high or low – **82 °C** (**180 °F**) and **-19 °C** (**-2 °F**) – that occurrence is unlikely except as noted below in the fault code explanations.

More importantly, this sensor can fail without generating a fault code. Measure the resistance of the sensor and the ambient temperature at the sensor, and compare the readings to the temperature versus resistance table at **Temperature sensor Evaporator temperature sensor - General specification - Temperature versus resistance (55.050)**. If the readings are not within a minus or plus **2.5 %** range, replace the sensor.

NOTE: *For the test to be valid, the thermometer used must be accurate, and the temperature recorded must be the temperature at the sensor.*

Power circuit

Minimal voltage is fed to the sensor: about **0.5 V** at **21 °C** (**70 °F**), and voltage drops as the temperature increases. Current is fed to the evaporator sensor from pin 23 of the 36-pin connector at the ATC control module.

Service Note: Too little cooling/too much heating without symptoms

The sensors should be suspect when the complaint is too little cooling when cooling and too much heating when heating ("the cab is too hot or too cold all the time") and obvious symptoms are absent:

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Clear all fault codes.

A. Fault code re-displays. Submit a concern to ASIST.

B. Fault code does not display. Clear all fault codes, and return unit to field operation.

Wire harnesses - Electrical schematic frame 18 (55.100.DP-C.20.E.18)
Wire harnesses - Electrical schematic frame 35 (55.100.DP-C.20.E.35)

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B. If you do not find damage and the display indicates only normal readings, then erase the fault code and continue operation.

Wire harnesses - Electrical schematic frame 04 (55.100.DP-C.20.E.04)

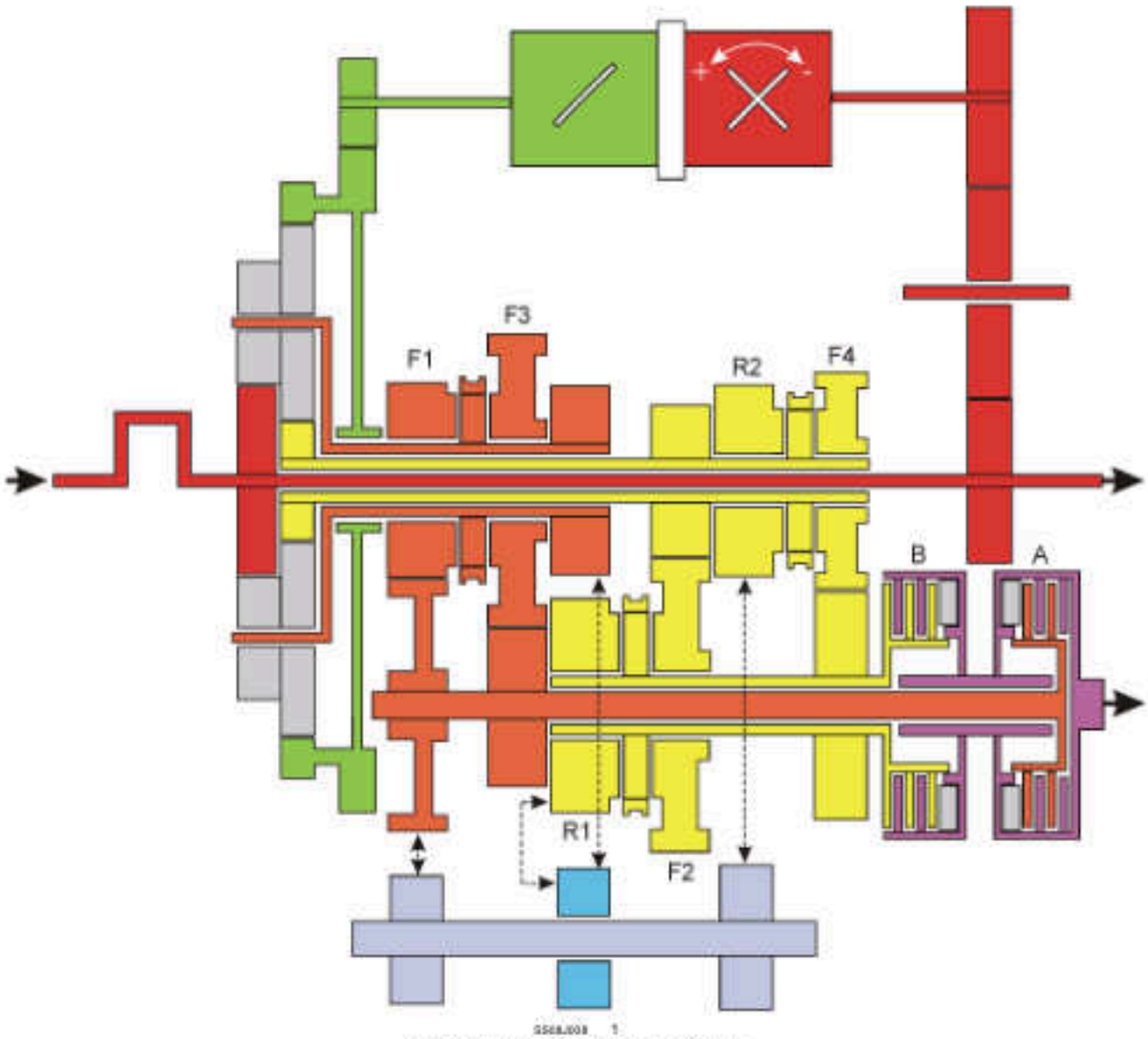
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Continuously Variable Transmission (CVT) - Functional diagram

The following diagrams show the power flow of the transmission in the individual mechanical gears and in the stationary control (powered zero) and neutral position/park position operating modes.

Color coding

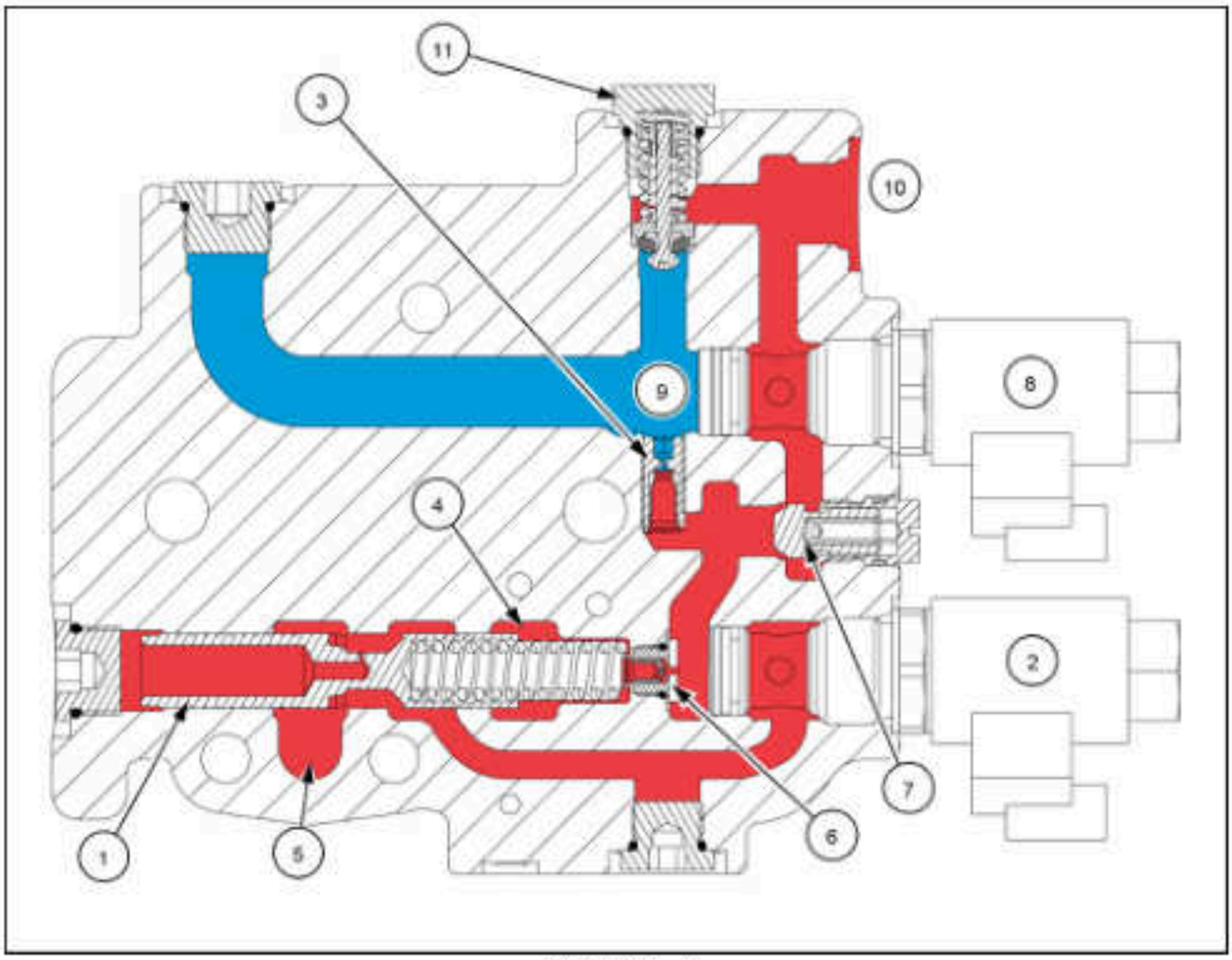
Transmission input and hydrostat drive	Hydrostat output - ring gear summing planetary gears
Power train summing planetary gear/planetary carrier - clutch A	Power train summing planetary gear/sun gear - clutch B
Power flow	



Neutral position/park position

In the neutral position and the park position the transmission is not engaged. No mechanical gear is engaged and the clutches A/B are open. If the tractor rolls off inadvertently in the neutral position, the speed differences arising as a result are equalized by the hydrostat. This means that when shifting out of the neutral position the relevant gear can be engaged again at the synchronous speed.

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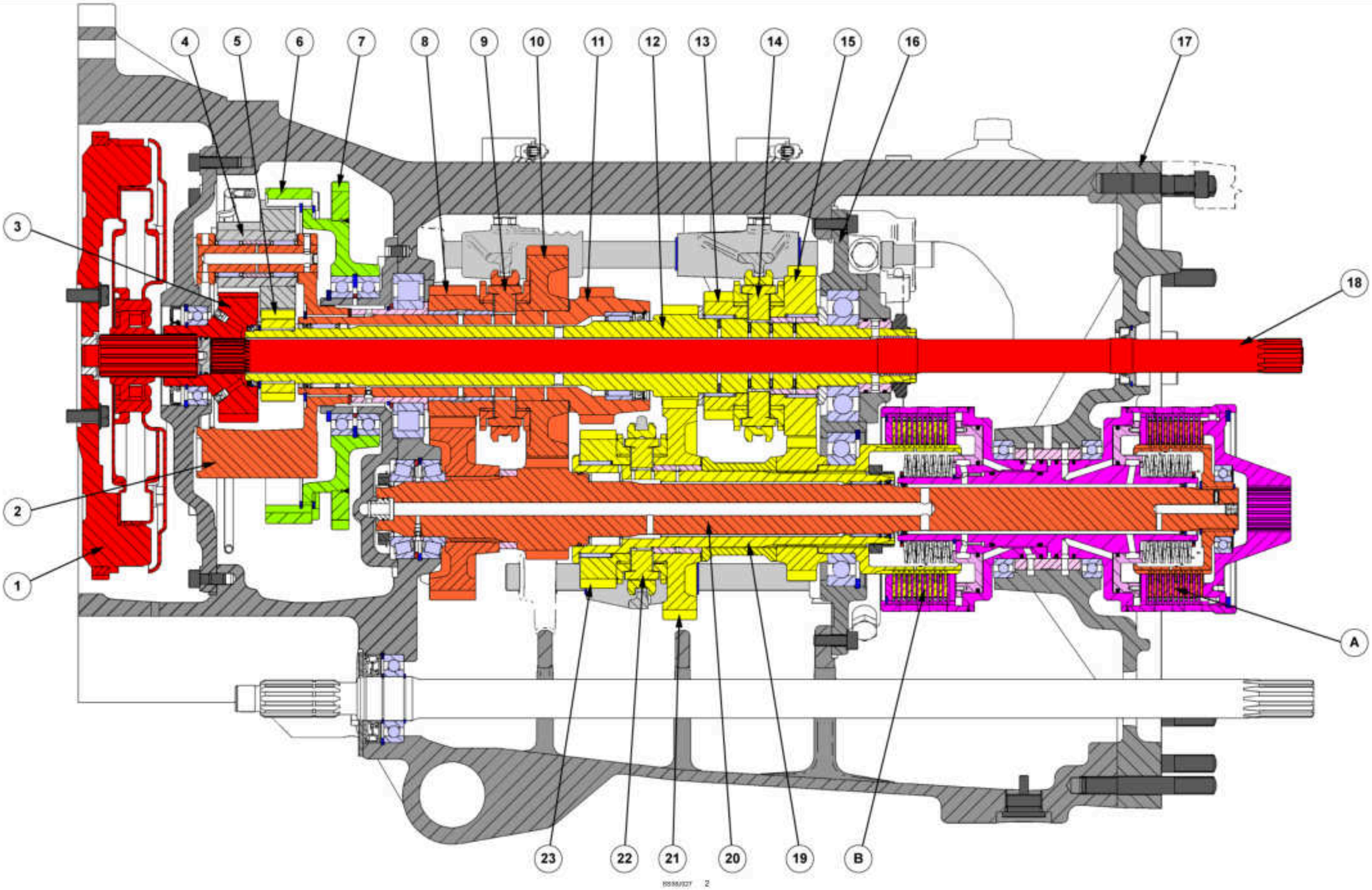
RAISE POSITION

PFC pump pressure	Return to tank pressure
Trapped oil	
1. Flow control spool	7. Load check
2. Raise solenoid	8. Lower solenoid
3. Screened orifice plug	9. Return to tank
4. Pilot signal to compensator	10. Hitch cylinders
5. PFC pump supply	11. Relief valve
6. Check/orifice plug	

Lowering Function

To lower the hitch, the lower proportional solenoid valve must be energized by the central control unit (RM). The amount of spool movement depends on the amount of current supplied by the controller to the proportional solenoid. Once the lower solenoid is energized, the solenoid valve shifts opening a flow path directly back to tank.

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