PUMA 170 / 170 CVT
PUMA 185 / 185 CVT
PUMA 200 / 200 CVT
PUMA 215 / 215 CVT
PUMA 230 CVT

Tractor

SERVICE MANUAL

Part number 47524345
English
June 2013
Replaces part number 84476208A

CASE IH AGRICULTURE

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Publication 47524345

Order the manual at mid-west-tech.com >

Contents

INTRODUCTION

Engine 10

[10.001] Engine and crankcase 10.1

[10.102] Pan and covers 10.2

[10.216] Fuel tanks 10.3

[10.210] Lift pump and lines 10.4

[10.218] Fuel injection system 10.5

[10.250] Turbocharger and lines 10.6

[10.254] Intake and exhaust manifolds and muffler 10.7

[10.500] Selective Catalytic Reduction (SCR) exhaust treatment 10.8

[10.400] Engine cooling system 10.9

[10.414] Fan and drive 10.10

[10.408] Oil cooler and lines 10.11

Transmission 21

[21.113] Powershift transmission 21.1

[21.155] Powershift transmission internal components 21.2

[21.160] Creeper 21.3

[21.166] Overdrive 21.4

[21.504] Continuously Variable Transmission (CVT) 21.5

[21.505] Continuously Variable Transmission (CVT) external controls 21.6

[21.506] Continuously Variable Transmission (CVT) lubrication system 21.7

[21.507] Continuously Variable Transmission (CVT) internal components 21.8

[21.109] Transmission cooler and lines 21.9

Four-Wheel Drive (4WD) system 23

[23.202] Electro-hydraulic control 23.1

[23.314] Drive shaft 23.2

Front axle system 25

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >

[25.100] Powered front axle 25.1
[25.102] Front bevel gear set and differential 25.2
[25.108] Final drive hub, steering knuckles, and shafts 25.3
[25.122] Axle suspension control 25.4
Rear axle system 27
[27.100] Powered rear axle 27.1
[27.106] Rear bevel gear set and differential 27.2
[27.120] Planetary and final drives 27.3
Power Take-Off (PTO) 31
[31.101] Rear mechanical control 31.1
[31.104] Rear electro-hydraulic control 31.2
[31.114] Two-speed rear Power Take-Off (PTO) 31.3
[31.116] Three-speed rear Power Take-Off (PTO) 31.4
[31.119] Four-speed rear Power Take-Off (PTO) 31.5
[31.146] Front Power Take-Off (PTO) 31.6
Brakes and controls 33
[33.202] Hydraulic service brakes 33.1
[33.110] Parking brake or parking lock 33.2
[33.220] Trailer brake hydraulic control 33.3
[33.224] Trailer brake pneumatic control 33.4
[33.350] Anti-lock Brake System (ABS) 33.5
Hydraulic systems 35
[35.000] Hydraulic systems 35.1
[35.300] Reservoir, cooler, and filters 35.2
[35.106] Variable displacement pump 35.3
[35.102] Pump control valves 35.4
[35.105] Charge pump 35.5
[35.322] Regulated/Low pressure system 35.6

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >

[35.204] Remote control valves 35.7
[35.220] Auxiliary hydraulic pump and lines 35.8
[35.114] Three-point hitch control valve 35.9
[35.162] Front hitch cylinders and lines 35.10
Pneumatic system 36
[36.100] Pneumatic system 36.1
Hitches, drawbars, and implement couplings 37
[37.120] Rear three-point hitch linkage 37.1
[37.162] Front hitch 37.2
[37.110] Rear three-point hitch 37.3
[37.106] Automatic pickup hitch 37.4
Frames and ballasting 39
[39.100] Frame 39.1
Steering 41
[41.101] Steering control 41.1
[41.106] Tie rods 41.2
[41.200] Hydraulic control components 41.3
[41.216] Cylinders 41.4
[41.432] Autoguidance steering 41.5
Wheels 44
[44.511] Front wheels 44.1
[44.520] Rear wheels 44.2
Cab climate control 50
[50.100] Heating 50.1
[50.104] Ventilation 50.2
[50.200] Air conditioning 50.3
Electrical systems 55
[55.610] Ground speed control 55.1

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >

Remote control valves - Dynamic description - Anti-Saturation

NOTE: *This information is only applicable to vehicles with electronic remote control valves.*

Anti-Saturation installed

When anti saturation is set to installed (on), the valve spool is electronically regulated in relation to the engine rpm. This regulates the valves so the pump never reaches full flow (saturation). Even when the flow setting is at **100 %** the spool will only move to allow maximum flow from the valve when the engine is at maximum rpm.

The table below shows flow provided from a vehicle with a standard **56 cm³** pump.

Engine Speed	850 RPM	1100 RPM	1700 RPM	2200 RPM
Flow	30 l/min	40 l/min	70 l/min	95 l/min

Anti-Saturation not installed

When anti saturation is set to not installed (off), the pump will be allowed to reach the saturation point (full flow). The remote valve spool position is only regulated according to the flow setting set by the operator. When the flow setting is set to **100 %** then the spool is moved to maximum flow when the valve is activated. This means that the pump is giving full flow (saturation) as long as the pressure difference between P (Pressure) and LS (Load Sense) pressure is less than the spring force in the flow compensator.

The table below shows flow provided from a vehicle with a standard **56 cm³** pump.

Engine Speed	850 RPM	1100 RPM	1700 RPM	2200 RPM
Flow	50 l/min	70 l/min	95 l/min	95 l/min

Saturation / Anti-Saturation

This graph shows the flow in relation to engine rpm. The red square is with anti-saturation set to not installed and the blue square is with anti-saturation set to installed.

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >

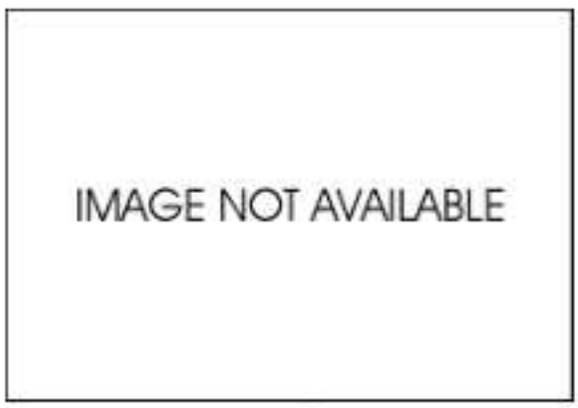
Wire connectors - Component diagram 65

X653 Mid Range Speed Sensor

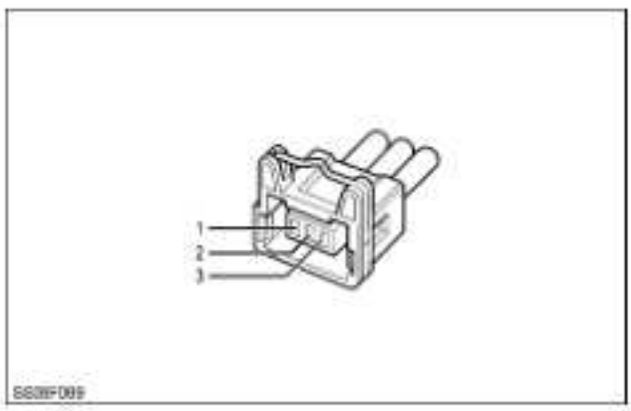
POS.	COLOR	WIRE NUMBER	CIRCUIT REFERENCE
1	**BL**	7000	TRANS CONTROL SUPPLY
2	**YE**	7400	TRANS RPM SPEED SENSOR TO TCM INPUT
3	**BK/WH**	60	SENSOR GROUND

NOTE: For the wiring color code refer to, **Wire harnesses - Identification (55.100)**.

PUMA 170, PUMA 185, PUMA 200, PUMA 215



PAA 1



SS08F089 2

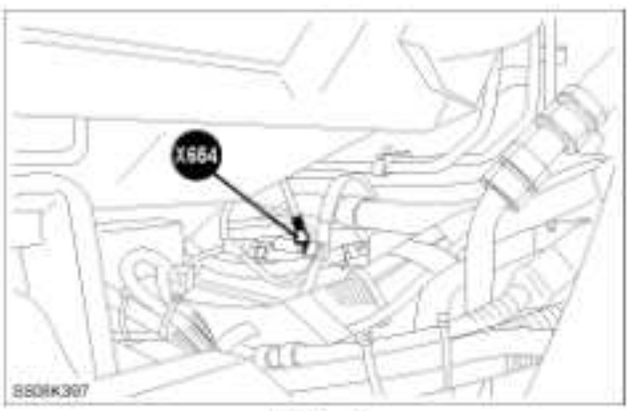
FRONT RIGHT SIDE OF TRANSMISSION

X654 Brake Lubrication Control Solenoid

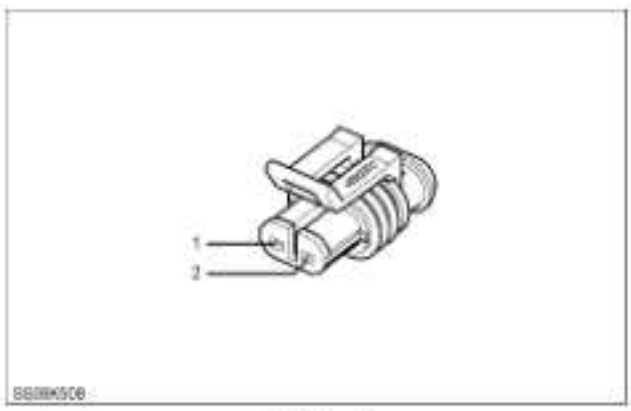
POS.	COLOR	WIRE NUMBER	CIRCUIT REFERENCE
1	**BL**	7586	BRAKE LUBRICATON SOLENOD
2	**BK**	57	EARTH (ALL)

NOTE: For the wiring color code refer to, **Wire harnesses - Identification (55.100)**.

PUMA 170 CVT, PUMA 185 CVT, PUMA 200 CVT, PUMA 215 CVT, PUMA 230 CVT



SS08K397 3



SS08K508 4

REAR RIGHT HAND AXLE

X657 ISO BUS Implement Socket (Rear)

POS.	COLOR	WIRE NUMBER	CIRCUIT REFERENCE
1	**RD**	5920	ISO BUS CAN SUPPLY POSITIVE
2	**YE**	5910	ISO BUS CAN SIGNAL HIGH

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >

4504-Front Remote No.1 Under Voltage

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:

Possible failure modes:

1. Other EHR error code(s) detected.
2. Faulty EHR valve

Solution:

1. Check for other EHR error code(s).

   A. Make a note of the error code(s), clear the error code(s) and test the system for normal operation. If any other error codes are still displayed, continue to these tests.

   B. If only error code 4503 is still displayed, download the correct level of software and configure the EHR valve. For further information refer to **Electronic module Universal controller - H3 - Configurations and options (55.640)** and **Electronic module Universal controller - HJ - Electronic hydraulic remote control valve number programming (55.640)**. If the fault re-occurs, remove, replace, and configure the EHR valve.

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >

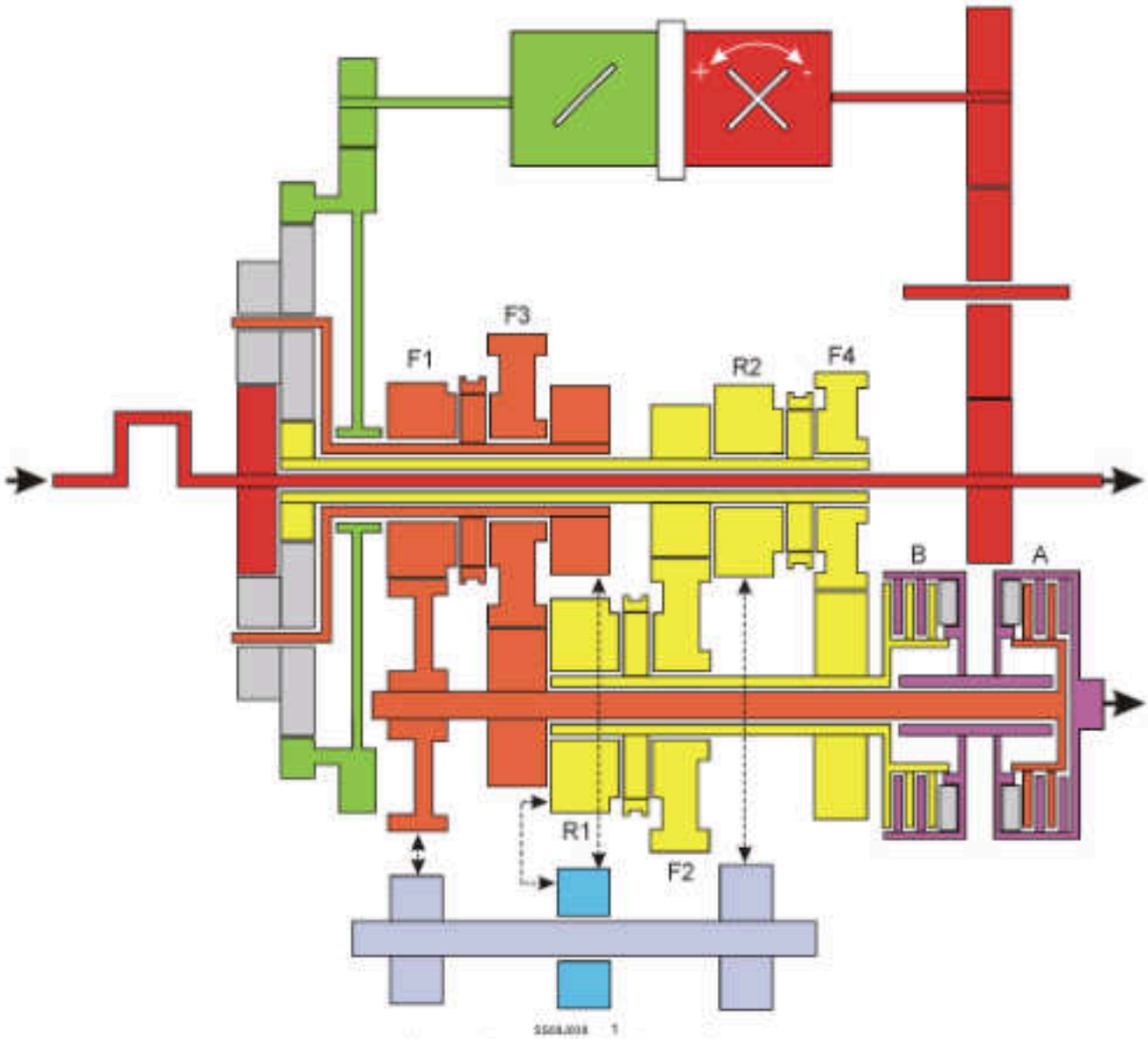
Continuously Variable Transmission (CVT) - Functional diagram

PUMA 170 CVT 50 km/h gearbox, PUMA 170 CVT 40 km/h ECO gearbox, PUMA 185 CVT 50 km/h gearbox, PUMA 185 CVT 40 km/h ECO gearbox, PUMA 200 CVT 50 km/h gearbox, PUMA 200 CVT 40 km/h ECO gearbox, PUMA 215 CVT 50 km/h gearbox, PUMA 215 CVT 40 km/h ECO gearbox, PUMA 230 CVT 50 km/h gearbox, PUMA 230 CVT 40 km/h ECO gearbox

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.

Colour coding

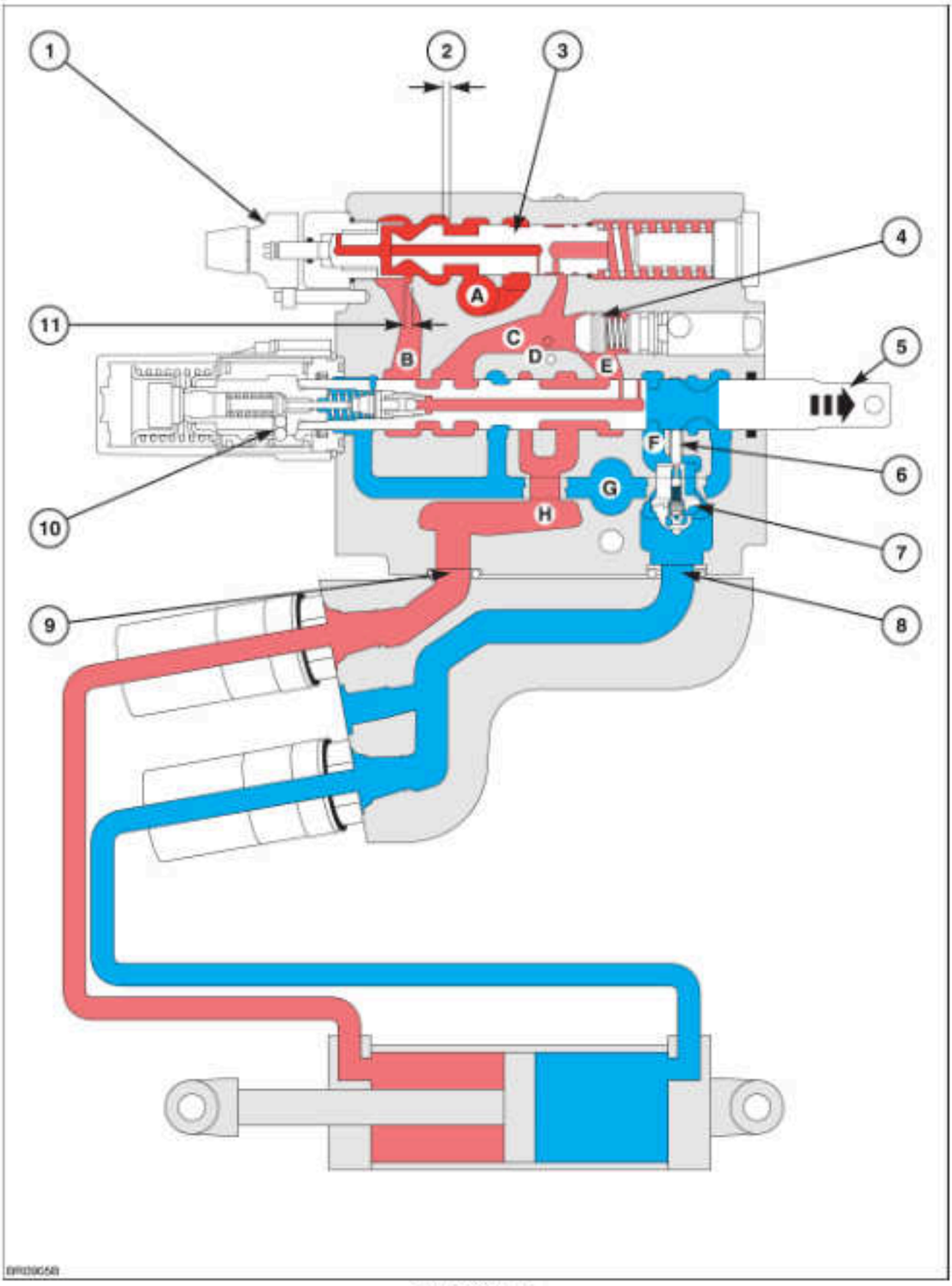
Transmission input and hydrostat drive	Hydrostat output - ring gear summing planetary gears
Power train summing planetary gear / planetary carrier - clutch A	Power train summing planetary gear / sun gear - clutch B
Power flow	



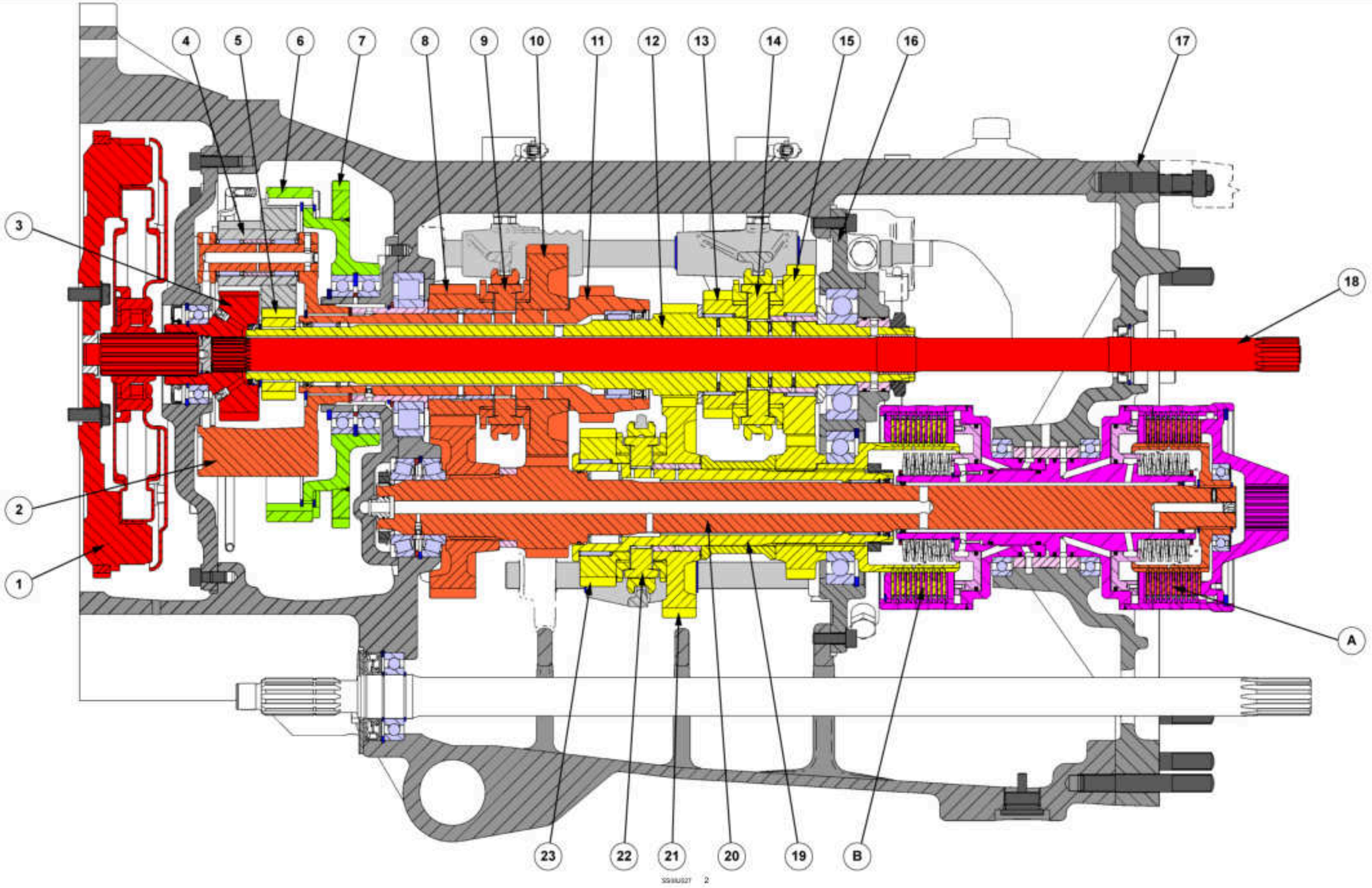
Neutral position / park position

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.

MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >



MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Pu... Order the manual at mid-west-tech.com >



MidWestTech | Case Puma 170, 185, 200, 215, 230 CVT Tractor Service Manual | Publication 47524345
Order the manual at mid-west-tech.com >