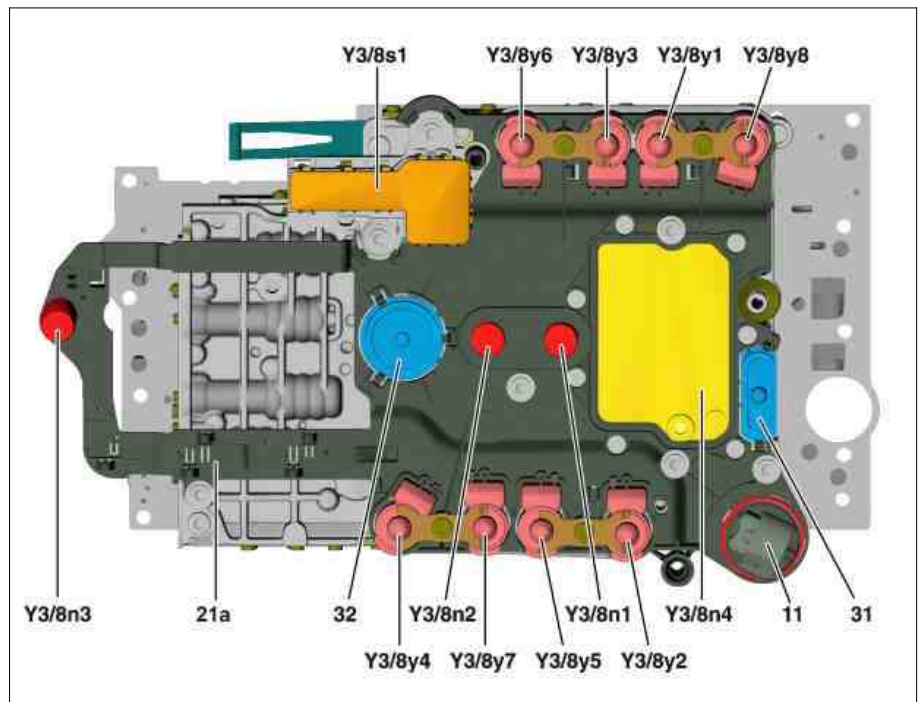


- 11 Plug connector
- 31 Float 1
- 32 Float 2

- Y3/8 Electric controller unit (VGS)
- Y3/8n1 Turbine speed sensor (VGS)
- Y3/8n2 Internal speed sensor (VGS)
- Y3/8n3 Output speed sensor (VGS)
- Y3/8n4 Fully integrated transmission control (VGS) control unit
- Y3/8s1 Selection range sensor (VGS)**
- Y3/8y1 Working pressure control solenoid valve (VGS)
- Y3/8y2 K1 clutch control solenoid valve (VGS)
- Y3/8y3 K2 clutch control solenoid valve (VGS)



P27.19-2198-76

- Y3/8y4 K3 Clutch control solenoid valve (VGS)
- Y3/8y5 B1 brake control solenoid valve (VGS)
- Y3/8y6 B2 brake control solenoid valve (VGS)

- Y3/8y7 B3 brake control solenoid valve (VGS)
- Y3/8y8 Torque converter lockup clutch control solenoid valve (VGS)

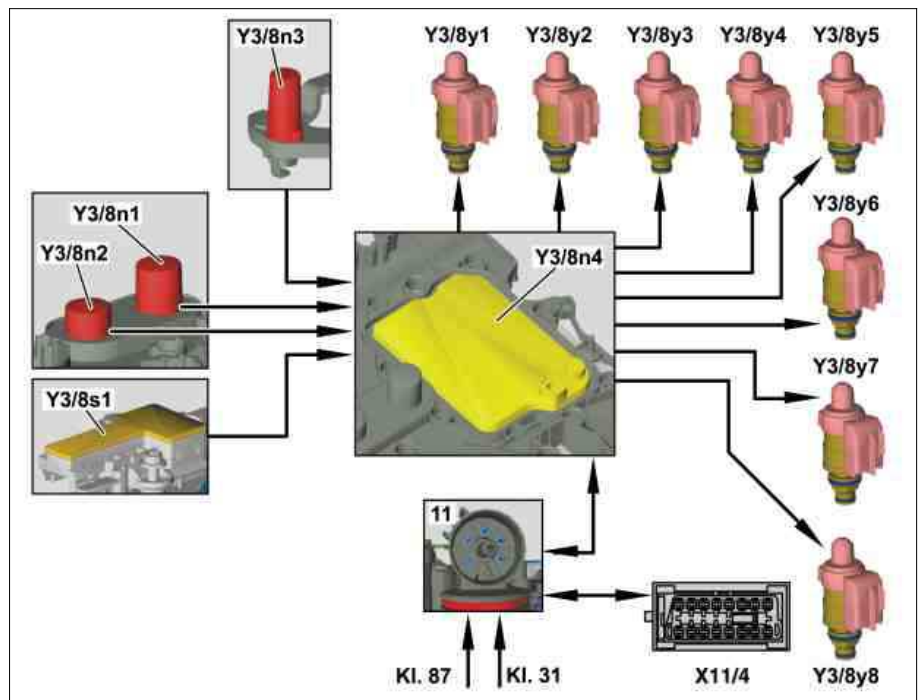
Location

The fully integrated transmission control (VGS) control unit is integrated into the electric controller unit (VGS).

Input and output signals

- 11 Connector

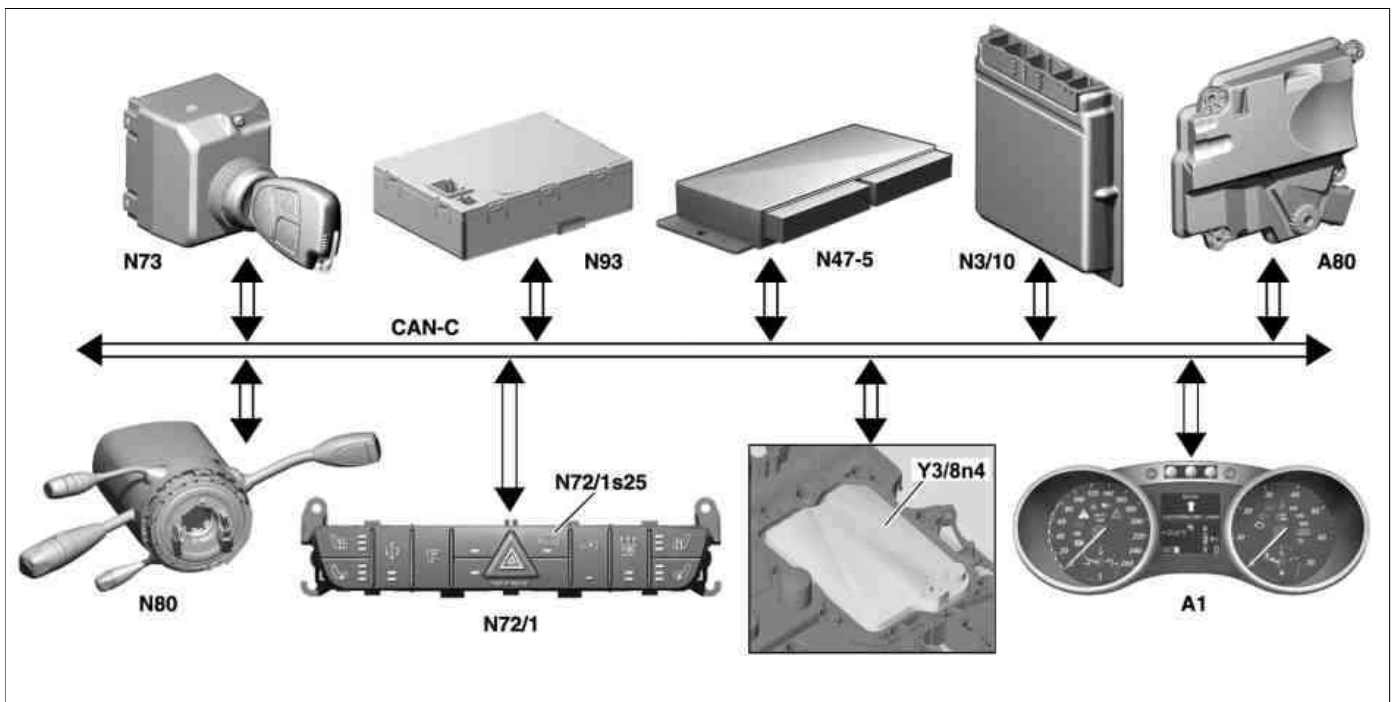
- X11/4 Data link connector
- Y3/8n1 Turbine speed sensor (VGS)
- Y3/8n2 Internal speed sensor (VGS)
- Y3/8n3 Output speed sensor (VGS)
- Y3/8n4 Fully integrated transmission control (VGS) control unit
- Y3/8s1 Selection range sensor (VGS)
- Y3/8y1 Working pressure control solenoid valve (VGS)
- Y3/8y2 K1 clutch control solenoid valve (VGS)
- Y3/8y3 K2 clutch control solenoid valve (VGS)



P27.19-2211-76

- Y3/8y4 K3 Clutch control solenoid valve (VGS)
- Y3/8y5 B1 Brake control solenoid valve (VGS)
- Y3/8y6 B2 brake control solenoid valve (VGS)

- Y3/8y7 B3 brake control solenoid valve (VGS)
- Y3/8y8 Torque converter lockup clutch control solenoid valve (VGS)



P27.19-2280-09

Networking of components, shown with engine 113, except code (430) Offroad package

A1	Instrument cluster	N47-5	ESP control unit	N80	Steering column module
A80	Intelligent servo module for DIRECT SELECT	N72/1	Upper control panel control unit	N93	Central gateway control unit
N3/10	ME control unit	N72/1s25	Offroad program switch	Y3/8n4	Fully integrated transmission control (VGS) control unit
		N73	EIS [EZS] control unit		

Task

The fully integrated transmission control (VGS) control unit determines the instantaneous operating condition of the vehicle and actuates all gear change sequences taking ease of shifting and driving situation into consideration.

It receives operating data as internal transmission input signals from the:

- Selection range sensor (VGS)
- Transmission oil temperature sensor (VGS) (Y3/8s2), which is integrated into the fully integrated transmission control (VGS) control unit
- Turbine speed sensor (VGS)
- Internal speed sensor (VGS)
- Output speed sensor (VGS)

In addition via the Controller Area Network bus class C (engine compartment) (CAN-C) there is a connection to the:

- Instrument cluster
- Intelligent servo module for DIRECT SELECT
- CDI control unit (N3/9)
- ME control unit

- ESP control unit
- Upper control panel control unit
- EIS [EZS] control unit
- Steering column module
- Central gateway control unit

The fully integrated transmission control (VGS) control unit actuates the following control solenoid valves depending on the processed input signals:

- Working pressure control solenoid valve (VGS), for load-dependent and gear-specific operating-pressure control
- K1 clutch control solenoid valve (VGS)
- K2 clutch control solenoid valve (VGS)
- K3 clutch control solenoid valve (VGS)
- B1 brake control solenoid valve (VGS)
- Brake control solenoid valve B2 (VGS), which also actuates the BR multi-disk brake for reverse gear
- B3 brake control solenoid valve (VGS)
- Torque converter lockup clutch control solenoid valve (VGS)

This involves the processing of the following data from other systems:

Intelligent servo module for DIRECT SELECT

- Actual position of selection range lever

CDI control unit (with engine 629, with engine 642)

- Start-off in 1st gear, aids engine warm-up
- Shift line displacement, aids engine warm-up
- Shift line displacement, dependent on load condition of diesel particulate filter (DPF), a heavily loaded DPF results in slightly lower upshift speed for full-load and kick-down upshifts
- Kickdown
- Specified gear, lower and upper limit, aids engine warm-up

- Cruise control regulates, a special shift strategy for cruise control mode is stored in the fully integrated transmission control (VGS) control unit (up to 31.5.05)
- Engine coolant temperature, used as substitute value in event of malfunction in transmission oil temperature sensor (VGS)
- Engine oil temperature, shift limitation is canceled
- Requirement torque for Electronic Stability Program (Electronic-Stability-Program) (ESP), torque reduction or torque increase taking into account directional stability and road adhesion
- Request "Torque converter lockup clutch OPEN", in the warm-up phase of the engine, increase in engine speed
- Engine-speed limitation function active, adaptations are

- Emergency operation of the common rail diesel injection, the pedal value is limited to approx. 20 %, the driveability of the vehicle is assured

deactivated in the fully integrated transmission control (VGS) control unit

- Engine speed, for slip calculation of torque converter lockup clutch and for start of pressure calculation by fully integrated transmission control (VGS) control unit

- Engine idle specified speed for the actuation of the torque converter lockup clutch
- Pedal value

ME-SFI [ME] control unit (except engine 629, except engine 642)

- Active downshift for heating up the catalytic converter (TWC)
- Starting off in 1st gear to heat up the catalytic converter
- Shift curve offset for heating up the catalytic converter
- Specified gear, and lower/upper limit for heating up the catalytic converter
- Emergency operation of the ME fuel injection and ignition system (motor electronics) (ME), the pedal value is limited to approx. 20 %, the driveability of the vehicle is assured
- Cruise control regulates, a special shift strategy for cruise control mode is stored in the fully integrated transmission control (VGS) control unit (up to 31.5.05)
- Engine coolant temperature, used as substitute value in event of malfunction in transmission oil temperature sensor (VGS)

- Engine oil temperature, shift limitation is canceled
- Selected torque ESP, torque reduction or increase taking directional stability and road adhesion into account
- Kickdown
- Pedal value
- Request "Torque converter lockup clutch Open", in the heating up phase of the catalytic converter, to increase engine speed
- Engine idle specified speed for the actuation of the torque converter lockup clutch
- Engine speed, for slip calculation of torque converter lockup clutch and for start of pressure calculation by fully integrated transmission control (VGS) control unit
- Engine-speed limitation function active, adaptations are deactivated in the fully integrated transmission control (VGS) control unit
- Engine torque

ESP control unit

- Signal from BAS release switch (A7/7s1), change of shift strategy, brake the vehicle, the fully integrated transmission control (VGS) shifts down earlier
- Set brake torque, change of shift strategy, brake the vehicle, the fully integrated transmission control (VGS) shifts down earlier
- Wheel speeds and direction of rotation, substitute values in event of malfunction of output speed sensor (VGS)
- ESP request shift into "N" (neutral), power flow interruption, transmission/rear axle
- Vehicle lateral acceleration at center of gravity, adaptation of shift strategy, detection of dynamic driving style
- Cruise control controls, a special shifting strategy for cruise control mode is filed in the fully integrated transmission control (VGS control unit () as of 1.6.05)

Upper control panel control unit

- Offroad program switch, Offroad program activated or deactivated, Shift lines are displaced, on model 164.120/122/128/175/186 except code (430) Offroad package
- Transmission mode switch (N72/1s32), on model 164.120/122/128/175/186 with code (430) Offroad package, except code (494) USA version, on model 164.8 except code (494) USA version, on model 164.177

i On model 164.120/122/128/175/186 with code (430) Offroad package and with code (494) USA version and on model 164.8 with code (494) USA version only the Sport-program "S" is available.

EIS [EZS] control unit

- Refrigerant compressor (A9) ON
- Circuit 50, influencing fault memory
- Torque requirement of refrigerant compressor, torque correction

Steering column module

- Signal from steering wheel gear shifter MINUS (S110/1), on model 164.177
- Signal from steering wheel gear shifter PLUS (S111/1), on model 164.177
- Signal from left steering wheel gear shifter (S110/2), except model 164.177
- Signal from right steering wheel gear shifter (S111/2), except model 164.177
- Signal from DIRECT SELECT gear selector switch (S16/13)

Central gateway control unit

- Diagnosis

The following information is passed to other systems:

Instrument cluster

- Gear selector switch position and selected shift range for multifunction display (A1p13)
- Transmission mode selection for multifunction display

Intelligent servo module for DIRECT SELECT

- Specified position of selection range lever

CDI control unit (with engine 629, with engine 642)

- Starter lockout release in selector lever position "P", "N"
- Transmission variant, recognition of basic variants, difference in gear ratios
- Actual gear and target gear, gear engaged, gear to be shifted, can be shown using STAR DIAGNOSIS
- Status of torque converter lockup clutch
- Engine torque requests, engine intervention when shifting
- Limp-home of fully integrated transmission control (VGS)
- Transmission oil temperature, actuation of transmission oil cooler circulation pump (M13/7) and actuation of engine and air conditioning electric suction fan with integrated control (M4/7), in combination with engine 642

ME-SFI [ME] control unit (except engine 629, except engine 642)

EIS [EZS] control unit

- Engine torque requests, engine intervention when shifting
- Limp-home of fully integrated transmission control (VGS)
- Starter lockout release in gear selector switch position "P", "N"
- Transmission variant, recognition of basic variants, difference in gear ratios
- Actual gear and target gear, gear engaged, gear to be shifted, can be shown using STAR DIAGNOSIS
- Status of torque converter lockup clutch

ESP control unit

- Wheel torque factor, overall gear ratio
- Transmission variant, recognition of basic variants, difference in gear ratios
- Actual gear, target gear, gear engaged, gear to be shifted, can be shown using STAR DIAGNOSIS

- Position of selector range lever for the actuation of the reversing lamp function

Central gateway control unit

- Position of selector range lever for the actuation of the reversing lamp function
- Diagnosis