

# G30 Powertrain

## 3. Gasoline Engines



8th generation hot film air mass meter in the G30

TA16-0539

# G30 Powertrain

## 3. Gasoline Engines

Index	Explanation
1	Voltage supply (5 V)
2	Ground connection
3	Sensor signal (SENT protocol)
4	Not assigned
5	Connector encoding

The 8th generation hot film air mass meter has a specific electric connector, this is so it cannot be swapped between the various engine versions.

The following table provides an overview of the various sensor generations in the gasoline engine.

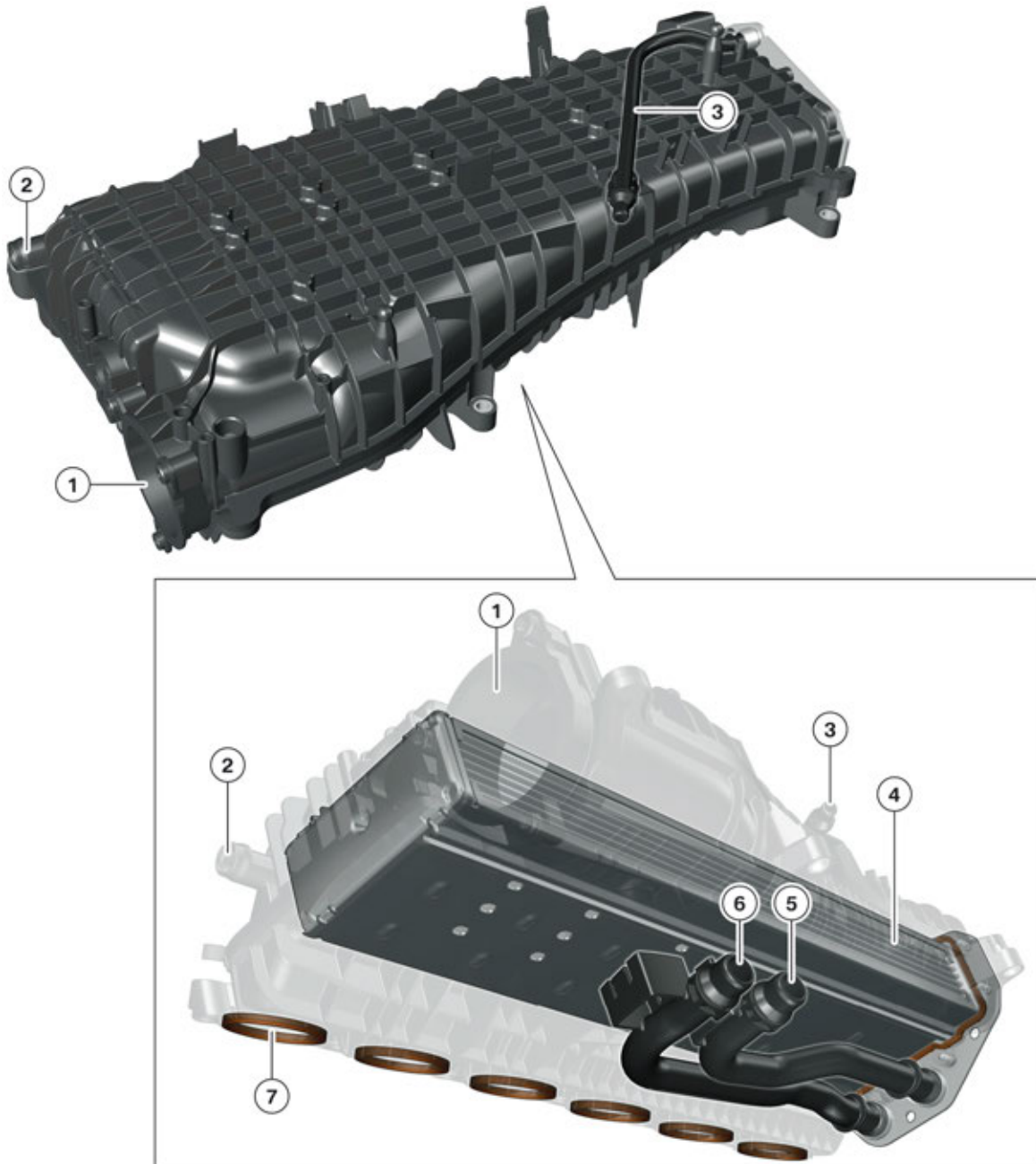
	Hot film air mass meter 7	Hot film air mass meter 8
Manufacturer	Bosch	Bosch
Sensor type	Hot film	Hot film
Voltage supply	12 V	5 V
Signal shape	Pulse-width modulated signal	SENT data protocol
Insert	B46, N63TU	B46, B58, N63TU2 In combination with DME 8.x.x
Connections	4 - 12 V - Ground - Intake air temperature - PWM signal (air mass)	3 - 5 V - Ground - SENT data protocol (air mass/intake air temperature)

# G30 Powertrain

## 3. Gasoline Engines

### 3.6.3. Charge air cooling

All gasoline engines are equipped with indirect charge air cooling.



TO15-0012

Intake system with integrated, indirect charge air cooler using the example of the B58 engine

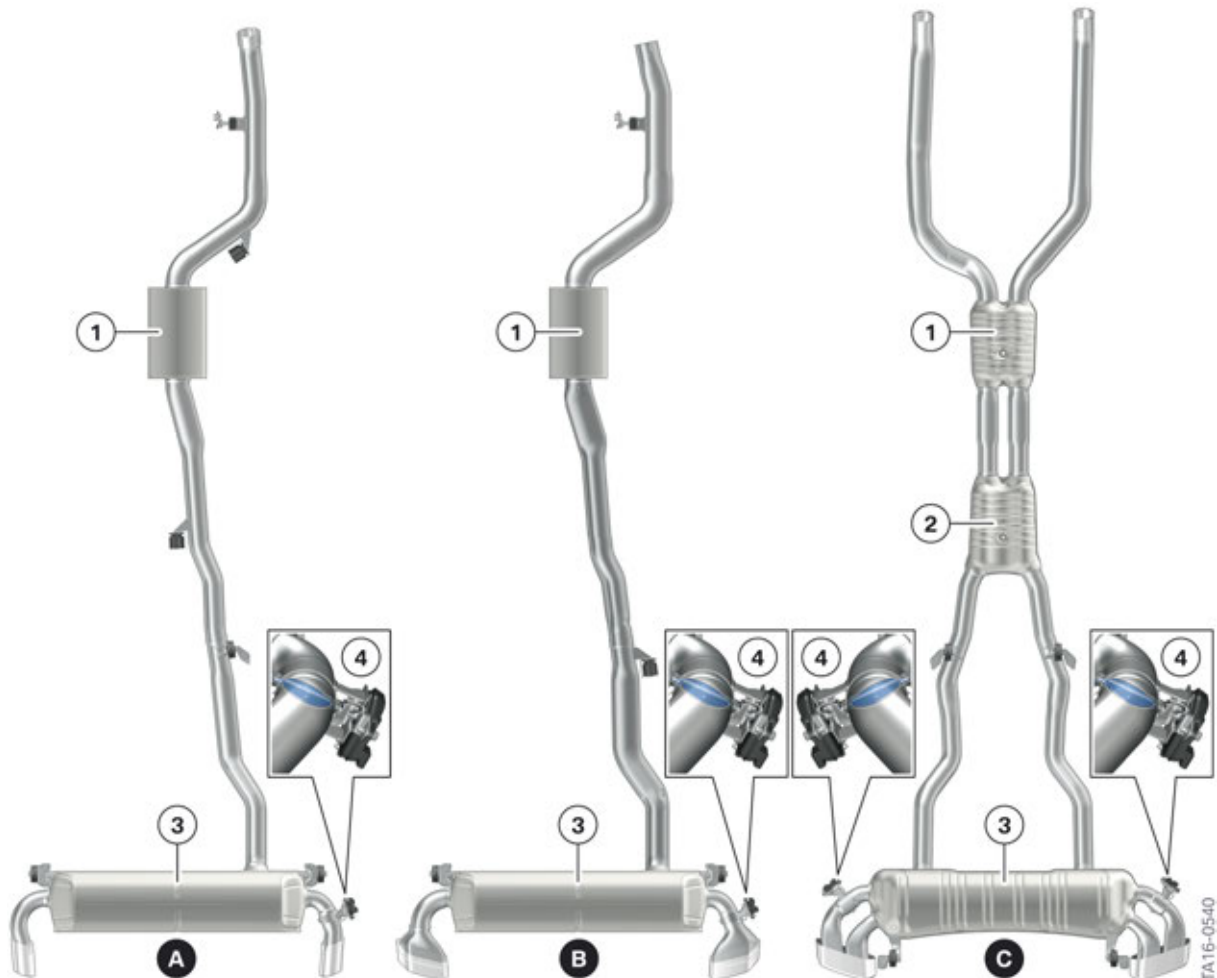
# G30 Powertrain

## 3. Gasoline Engines

Index	Explanation
1	Throttle valve fixture
2	Tank ventilation
3	Ventilation line to the expansion tank
4	Charge air cooler
5	Coolant return
6	Coolant supply
7	Cylinder head connection

### 3.6.4. Exhaust emission system

The 4- and 6-cylinder gasoline engines have an electrical exhaust flap on the right side. The 8-cylinder gasoline engines are equipped with two electrical exhaust flaps.



Overview of exhaust gas variants in the G30

# G30 Powertrain

## 3. Gasoline Engines

Index	Explanation
A	BMW 530i
B	BMW 540i
C	BMW M550i
1	Front silencer
2	Center silencer
3	Rear silencer
4	Electrical exhaust flap actuator

### Tailpipe versions



Gasoline engine exhaust tailpipe variants in the G30

Index	Explanation
A	BMW 530i
B	BMW 540i
C	BMW M550i

BMW 530i models with optional equipment M sport package (OE 337) use the exhaust tailpipe version from figure B.

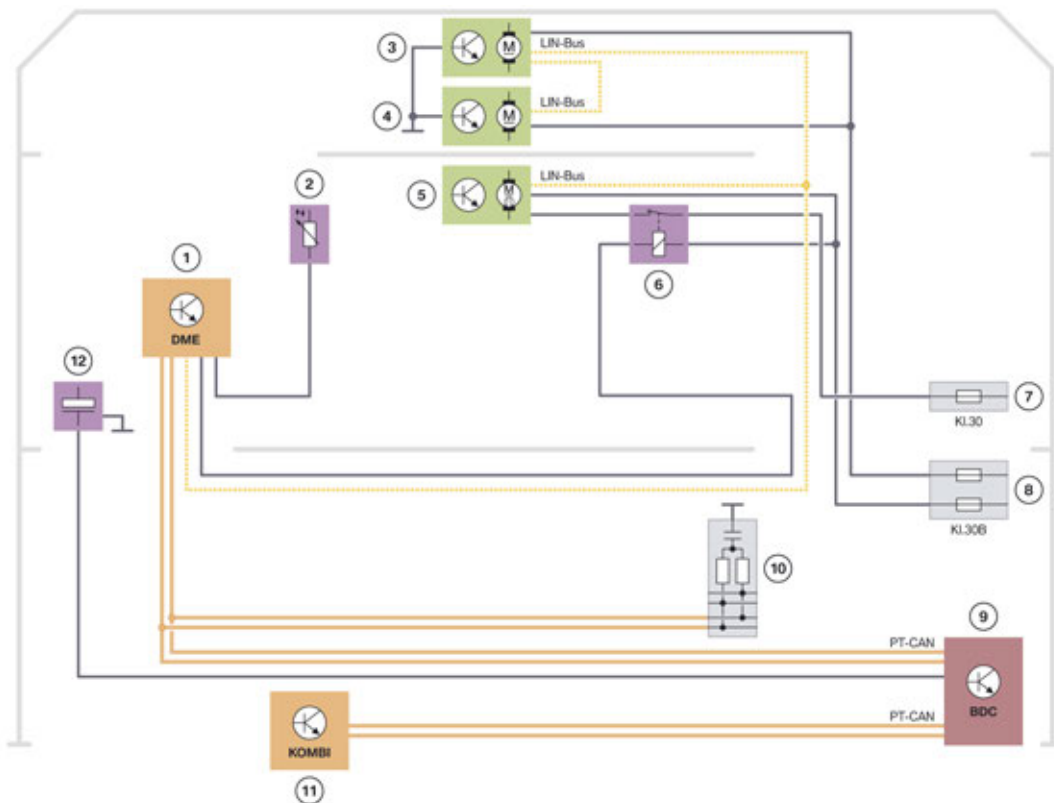
# G30 Powertrain

## 4. Cooling

### 4.1. Active air flap control

It was possible to carry over the active air-flap control from the G12. The cooling surfaces at the front of the vehicle can be closed by means of two separate air flaps. This reduces the drag coefficient and thus saves fuel. A further advantage is faster heating up of the engine after a cold start.

#### 4.1.1. System wiring diagram



TA15-0063

Air flap control system wiring diagram in the G30

Index	Explanation
1	Engine control unit (DME)
2	Coolant temperature sensor
3	Active air-flap control, top
4	Active air-flap control, bottom
5	Electric fan
6	Relay for electric fan
7	Power distribution box, engine compartment
8	Power distribution box, front right

# G30 Powertrain

## 4. Cooling

Index	Explanation
9	Body Domain Controller (BDC)
10	CAN terminator 4
11	KOMBI
12	Coolant level sensor

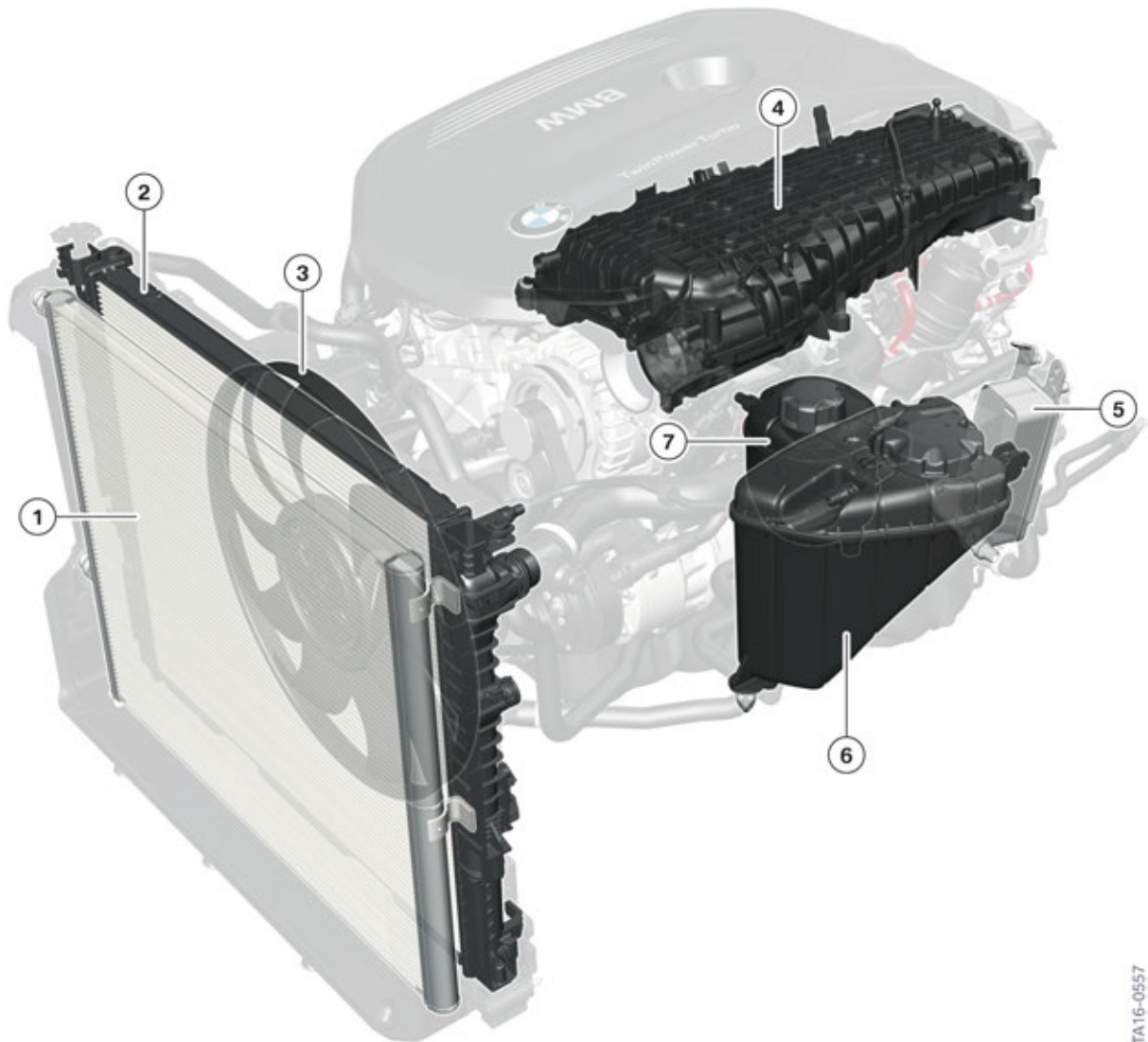
### 4.2. Gasoline engines

#### 4.2.1. B468/B58 Engine

The B46/B58 engines have two separate coolant circuits. The coolant in the low-temperature coolant circuit to cool the charge air. The coolant in the high-temperature coolant circuit to cool the engine. The two coolant circuits each have their own expansion tank.

# G30 Powertrain

## 4. Cooling



Overview of the components of the cooling system B46/B58 engine in the G30

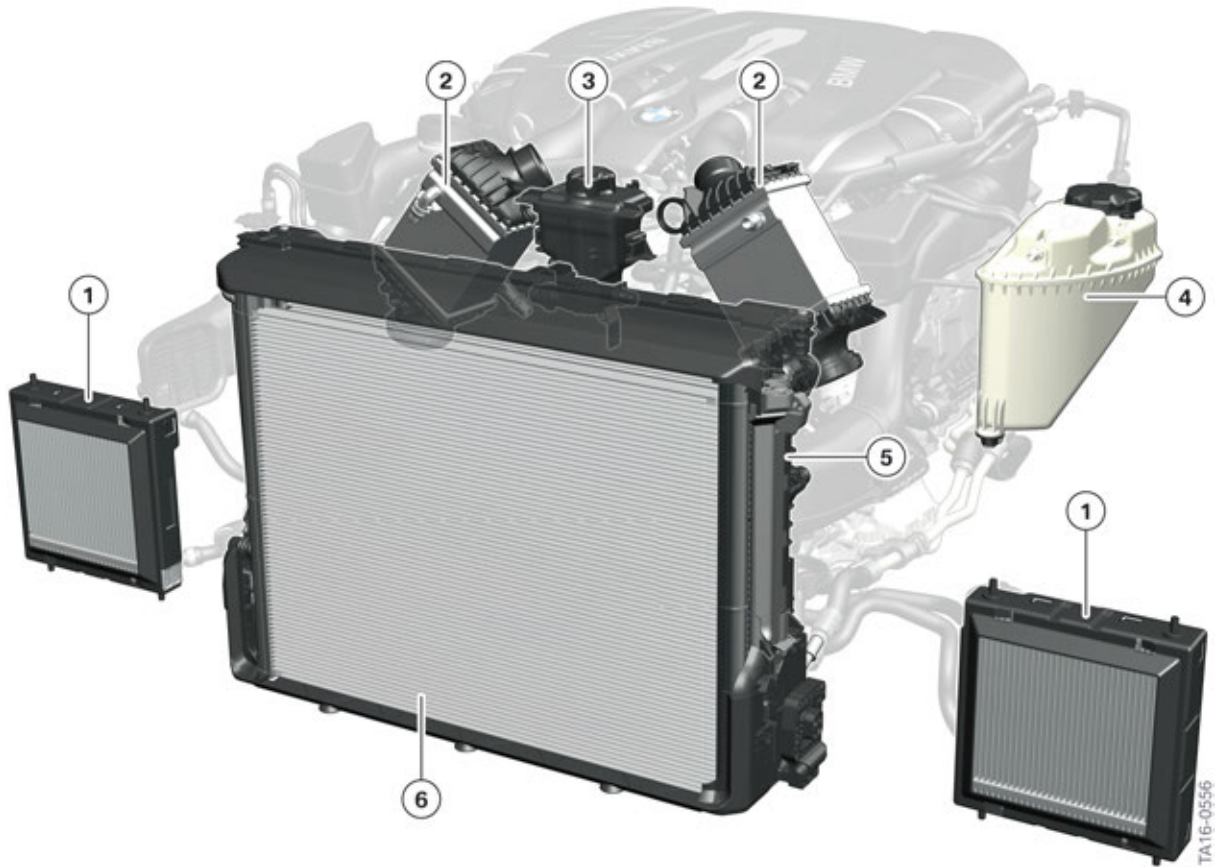
Index	Explanation
1	Low-temperature radiator
2	High-temperature radiator
3	Fan
4	Charge air cooler (integrated in the intake pipe)
5	Transmission oil-to-coolant heat exchanger
6	Expansion tank, low-temperature circuit
7	Expansion tank, high-temperature circuit



# G30 Powertrain

## 4. Cooling

### 4.2.2. N63TU2 Engine



Overview of the components of the cooling system N63TU2 engine in the G30

Index	Explanation
1	External radiator (high-temperature coolant circuit)
2	Charge air cooler (indirect charge air cooler)
3	Expansion tank, low-temperature circuit
4	Expansion tank, high-temperature circuit
5	Radiator high-temperature coolant circuit
6	Radiator low-temperature coolant circuit



# G30 Powertrain

## 5. Fuel Supply

Index	Explanation
7	Rear right power distribution box
8	Carbon canister
9	Fuel Pump Control (FPC)
10	Fuel tank
11	Digital Motor Electronics (DME)
12	Emergency release
13	Fresh air filter
14	Tank leak diagnosis (NVLD)
15	Ventilation line, carbon canister
16	Tank ventilation line

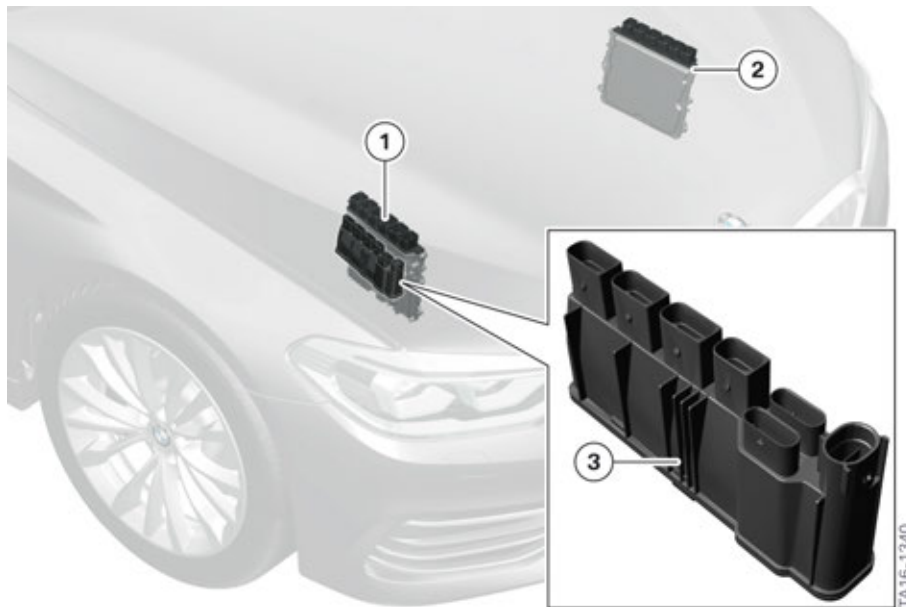
# G30 Powertrain

## 6. Engine Electrical System

### 6.1. Engine control unit

The new 8th generation of Bosch engine control units already used in the G12 is used in the G30. Its appearance is characterized by a uniform housing and a uniform connector strip. However, the hardware inside has been adapted to the various applications.

Two engine control units are used for the N63TU2 engine. All other drive variants are equipped with one engine control unit. The integrated supply module is also on the engine control unit. It supplies the engine control units and various sensors and actuators with the required voltage supply.



Integrated supply module in the G30

Index	Explanation
1	Digital Motor Electronics 1
2	Digital Motor Electronics 2 (only for N63TU2 engine)
3	Integrated supply module

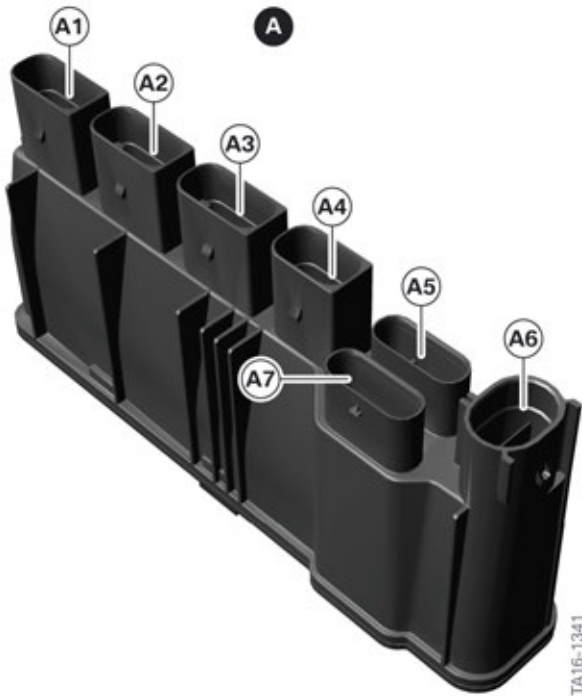
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## 6. Engine Electrical System

### 6.2. Integrated supply module

The integrated supply module supplies the engine control unit and some sensors and actuators with voltage.

Various integrated supply modules are used depending on the engine type and the series or V-engine design.



Integrated supply module in the G30

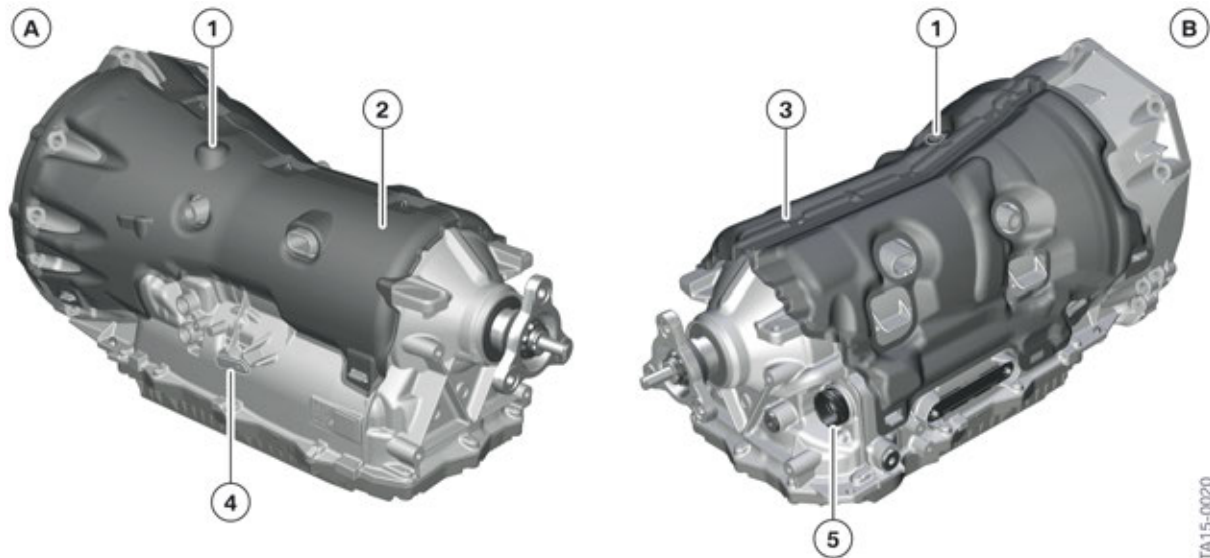
Index	Explanation
A	Gasoline engine
A1	Voltage supply of the actuators and sensors
A2	Voltage supply for actuators and sensors
A3	Actuation of relay for integrated supply module
A4	Voltage supply for oxygen sensors bank 2 (only for the N63)
A5	Voltage supply DME 1
A6	Voltage supply from engine compartment power distribution box
A7	Voltage supply DME 2

# G30 Powertrain

## 7. Automatic Transmission

The revised 8HPTU automatic transmission, which is already known from the F23 (2 Series BMW convertible) and F85/F86 (BMW X5 M, BMW X6 M) and G12 is used in the G30.

The special features of the automatic transmission in the G30 are described in this document.



8HPTU automatic transmission with acoustics encapsulation in the G30

Index	Explanation
A	8HPTU for 6-cylinder engines
B	8HPTU for 8-cylinder engines
1	Transmission breather
2	Acoustic encapsulation (three-part)
3	Acoustic encapsulation (two-part)
4	Mechanism for emergency release
5	Electrical connection (mechatronics to vehicle electrical system)

### 7.1. Transmission variants

Different transmission variants are used depending on the engine installed.

Model	Engine	GA8HP50Z	GA8HP75Z
530i	4-cylinder engine (B46)	●	
540i	6-cylinder engine (B58)	●	
M550i	8-cylinder engine (N63TU2)		●

# G30 Powertrain

## 7. Automatic Transmission

### 7.2. Highlights

The following further developments made it possible to increase the comfort, dynamics and efficiency of the revamped 8-speed automatic gearbox:

- Improved driving comfort through hot-end decoupling of the rotational imbalance of the engine by means of a centrifugal pendulum.
- Improved shifting comfort through slightly increased gear steps (2 modified planetary gear sets).
- Increased efficiency through optimum gear spread and gear stepping.
- Reduction of vehicle-specific insulation measures due to acoustic encapsulation on the transmission.
- Functional enhancements in the area of ConnectedShift.
- Enhanced customer experience due to new operating possibilities with the driving experience switch or shift paddles.

### 7.3. Designation

The following table provides an overview of the composition of the different transmission codes:

Position	Meaning	Index	Explanation
1	Designation	G	Transmission
2	Type of transmission	A	Automatic transmission
3	Number of gears	6 8	6 forward gears 8 forward gears

# G30 Powertrain

## 7. Automatic Transmission

Position	Meaning	Index	Explanation
4	Type of transmission	HP	Hydraulic planetary gear train
5 + 6	Transferable torque	19 26 32 45 (General Motors Powertrain) 45 (Zahnradfabrik Friedrichshafen) 50 70 75 90 95	300Nm 600 Nm 720Nm 350 Nm 450 Nm 500Nm 700 Nm 750 Nm 900Nm 950Nm
7	Manufacturer	G J R Z H	Getrag Jatco General Motors Powertrain Zahnradfabrik Friedrichshafen In-house part

### 7.4. Sport automatic transmission

In the standard Steptronic Sport automatic transmission, the customer additionally receives 2 shift paddles on the steering wheel and additional functions such as:

- Launch Control
- Manual activation of coasting
- Driving into the speed limiter

### 7.5. ConnectedShift

ConnectedShift uses the following systems for a predictive shift strategy:

- Use of the navigation data
- Use of the radar sensors

Use of the navigation data is already known from the 5 Series LCI. Since the introduction of the G12, the radar sensors have been used for an anticipatory gear shift strategy.



# G30 Powertrain

## 7. Automatic Transmission

### 7.6. Configuration options

#### 7.6.1. Stepped Sport shift mode

This graduated sport shift mode is already known from the G12 and is offered with the same functionality in the G30.

#### 7.6.2. Influence of the driving experience switch

Many drive variants have a SPORT PLUS mode in order to support sporty driving with more powerful engines. The shift characteristics are adapted as follows in the SPORT PLUS mode:

- Sharper design of downshifts on braking.
- Further increase of the engine speed in the direction of maximum power.

Mode	Powertrain variantsG30	
	530i	540i & M550i
SPORT PLUS	—	●
SPORT	●	●
COMFORT	●	●
ECO PRO	●	●

### 7.7. Transmission emergency release

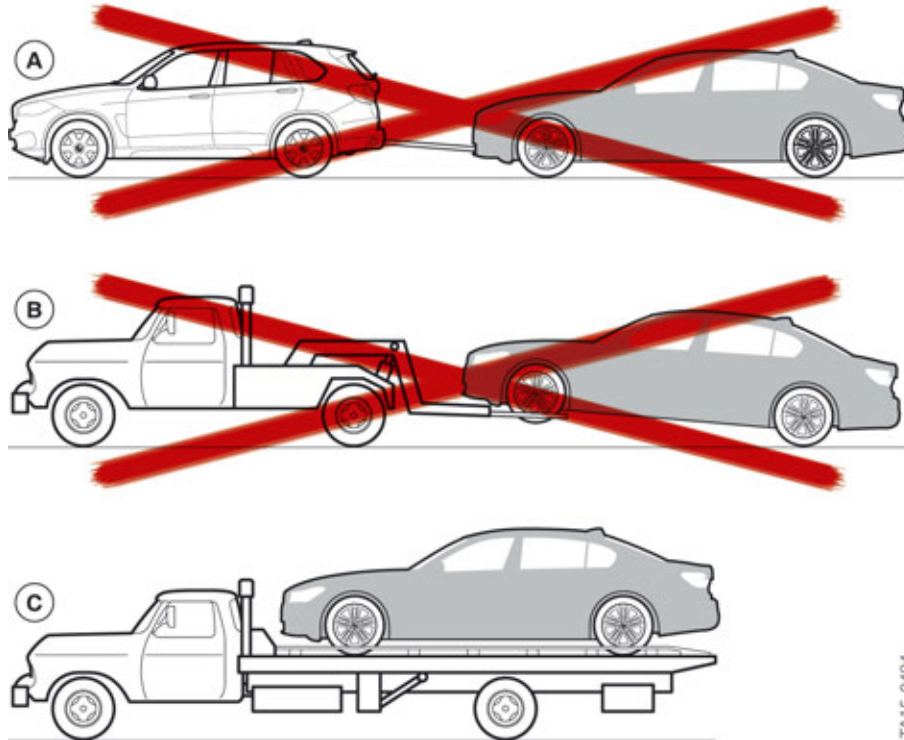
In the event of a breakdown, emergency release of the automatic transmission is possible in 2 different ways.

- 1 Mechanical transmission emergency release.
- 2 Electronic transmission emergency release.

# G30 Powertrain

## 7. Automatic Transmission

### 7.8. Towing



Towing away the G30

TA15-0484

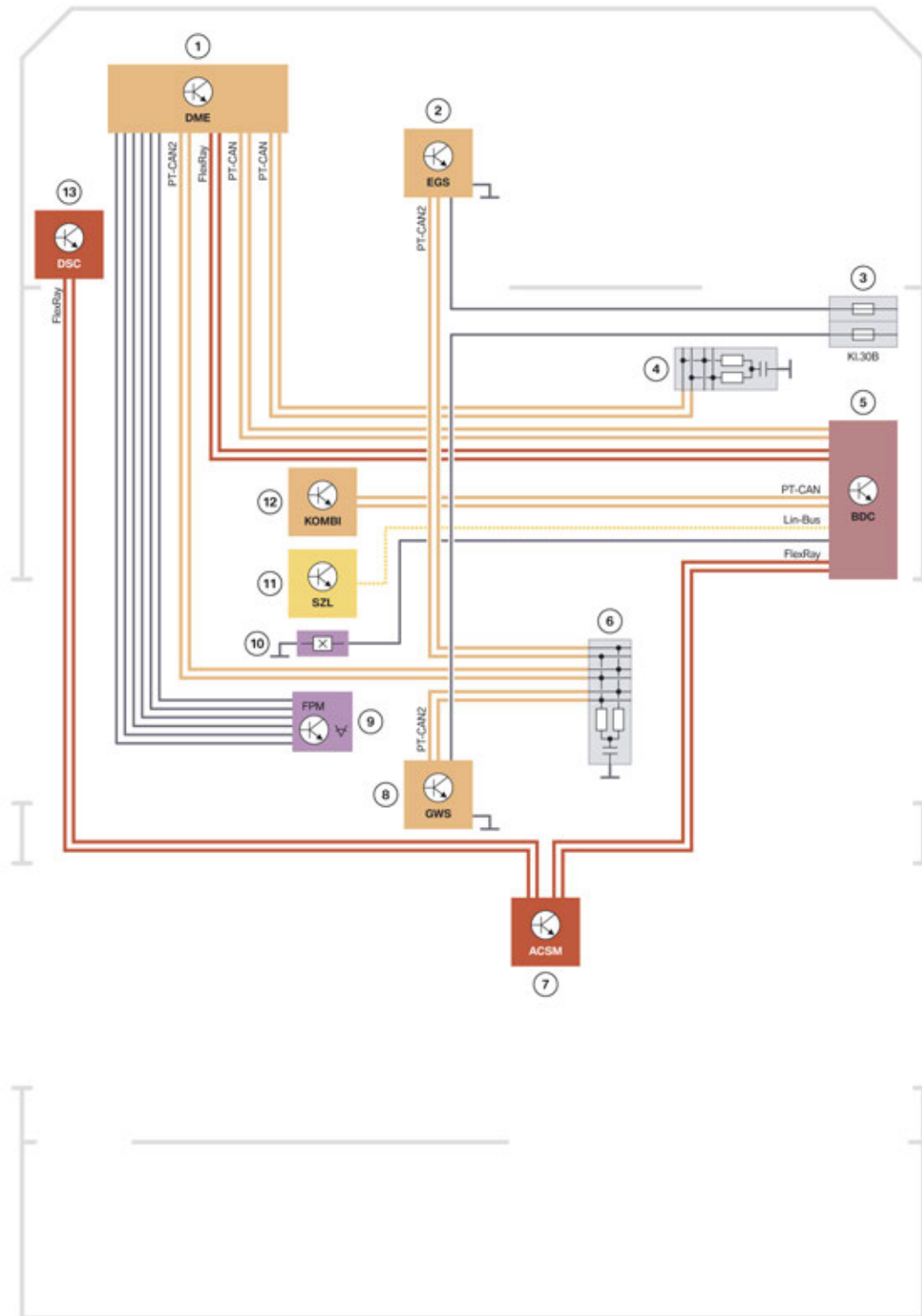
Index	Explanation
A	Towing on both vehicle axles
B	Towing on the rear vehicle axle
C	Recovery on a transport deck

Towing of the automatic transmission on the driven vehicle axle is **not** permitted. Limited time- and speed-dependent towing would not technically damage the automatic transmission, but permanent release of the parking lock cannot be guaranteed due to the changed mechanical and electronic transmission emergency release. Sudden engagement of the parking lock during a towing operation on the driven vehicle axle can lead to damage to the vehicle and to serious accidents.

# G30 Powertrain

## 7. Automatic Transmission

### 7.9. System wiring diagram



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System wiring diagram of electronic transmission control EGS in the G30

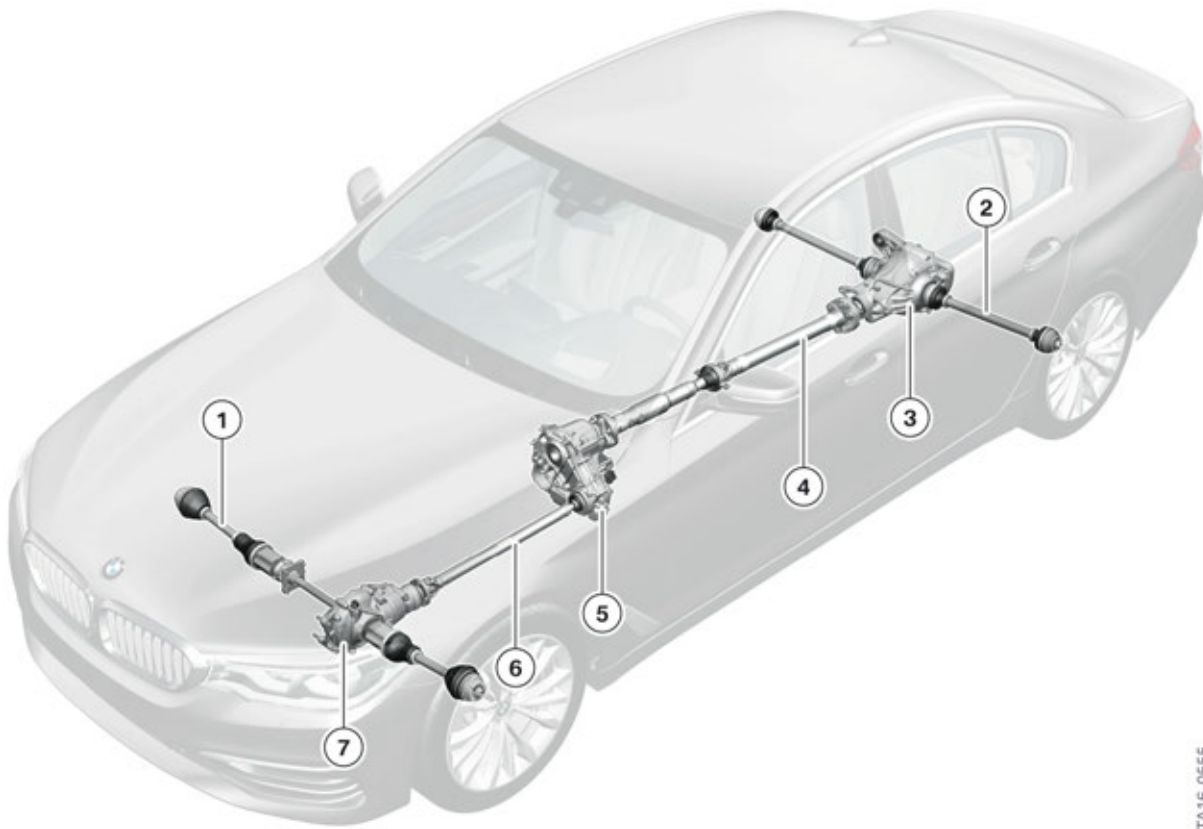
# G30 Powertrain

## 7. Automatic Transmission

Index	Explanation
1	Engine control unit (DME)
2	Electronic transmission control (EGS)
3	Power distribution box, front right
4	CAN terminator 4
5	Body Domain Controller (BDC)
6	CAN terminator 5
7	Advanced Crash Safety Module (ACSM)
8	Gear selector switch (GWS)
9	Accelerator pedal module
10	Brake light switch
11	Steering column switch cluster
12	Instrument panel (KOMBI)
13	Dynamic Stability Control (DSC)

# G30 Powertrain

## 8. xDrive



TA16-0555

Overview of xDrive in the G30

Index	Explanation
1	Output shaft, front
2	Output shaft, rear
3	Rear axle differential
4	Drive shaft
5	Transfer box
6	Drive shaft
7	Front axle differential

The designation of the transfer box is ATC13-1. The ATC13-1 is a standard transfer box and was first used in the G12.

One special feature of this transfer box is the Efficiency Mode introduced in the G12, which leads to a reduction of the splash losses and to reduce fuel savings. It was possible to adopt the measures introduced in G12 for the G30.

# G30 Powertrain

## 8. xDrive

### 8.1. Oil change on the transfer box

The oil filling of the transfer box is designed for the entire unit service life. This corresponds to a mileage of approximately 150,000 km / 92,000 miles. A fault code entry with an oil change recommendation for the transfer box is stored when this mileage is exceeded.



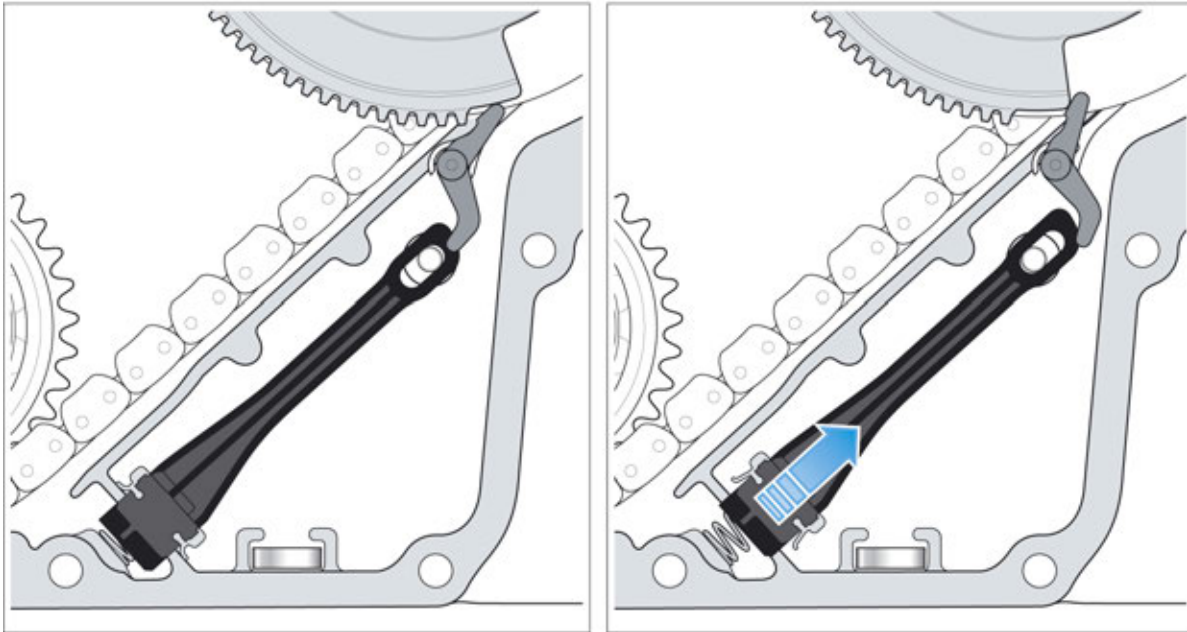
Suction hose with hand pump  
Part number 83 30 0 493 337

The transfer box does not have an oil drain plug. The oil filling to be renewed must be drawn off using a hand pump via the opening of the oil filler plug.

TA16-0675

# G30 Powertrain

## 8. xDrive



In order to ensure that the entire oil filling has been exchanged, the oil sump must remain open for the duration of extraction and filling.



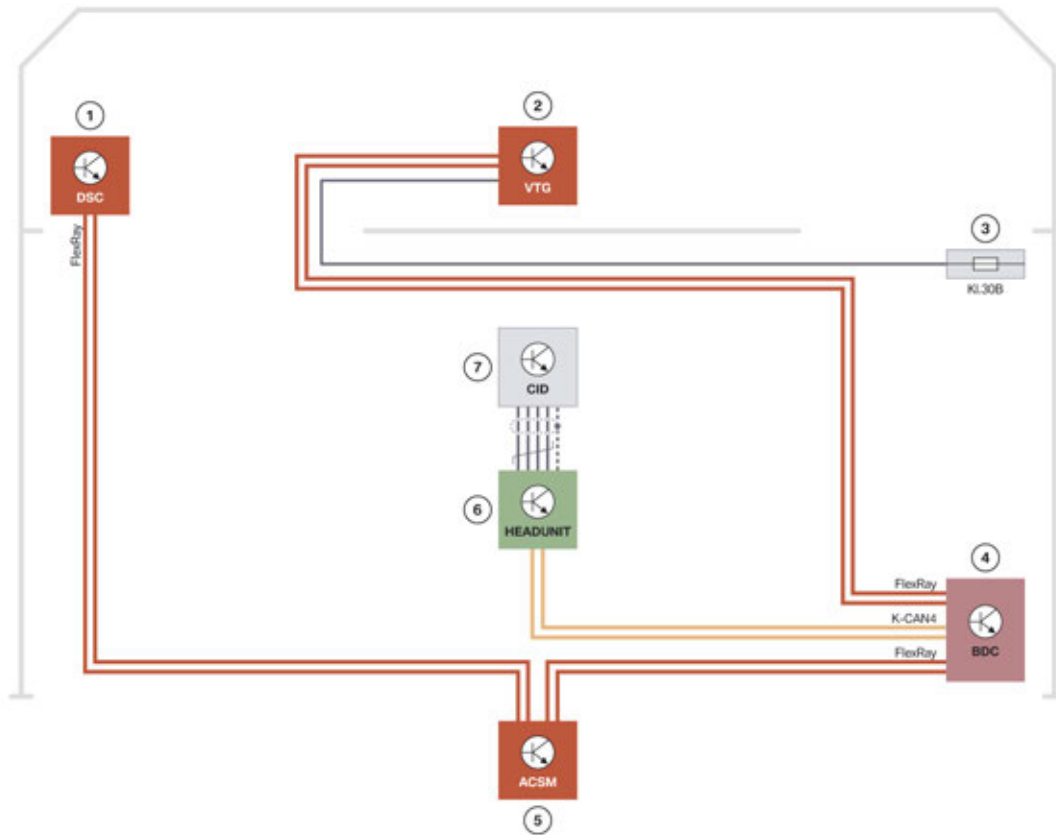
The Service employee can move the oil sump to the open position by means of the “Service function > Transfer box VTG > Oil change” in the BMW diagnosis system ISTA.

Refer to the currently valid repair instructions for the exact procedure.

# G30 Powertrain

## 8. xDrive

### 8.2. System wiring diagram



xDrive system wiring diagram in the G30

Index	Explanation
1	Dynamic Stability Control (DSC)
2	VTG control unit
3	Power distribution box, front right
4	Body Domain Controller (BDC)
5	Advanced Crash Safety Module (ACSM)
6	Head Unit
7	Central Information Display (CID)
FlexRay	FlexRay bus
K-CAN4	Body CAN4





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