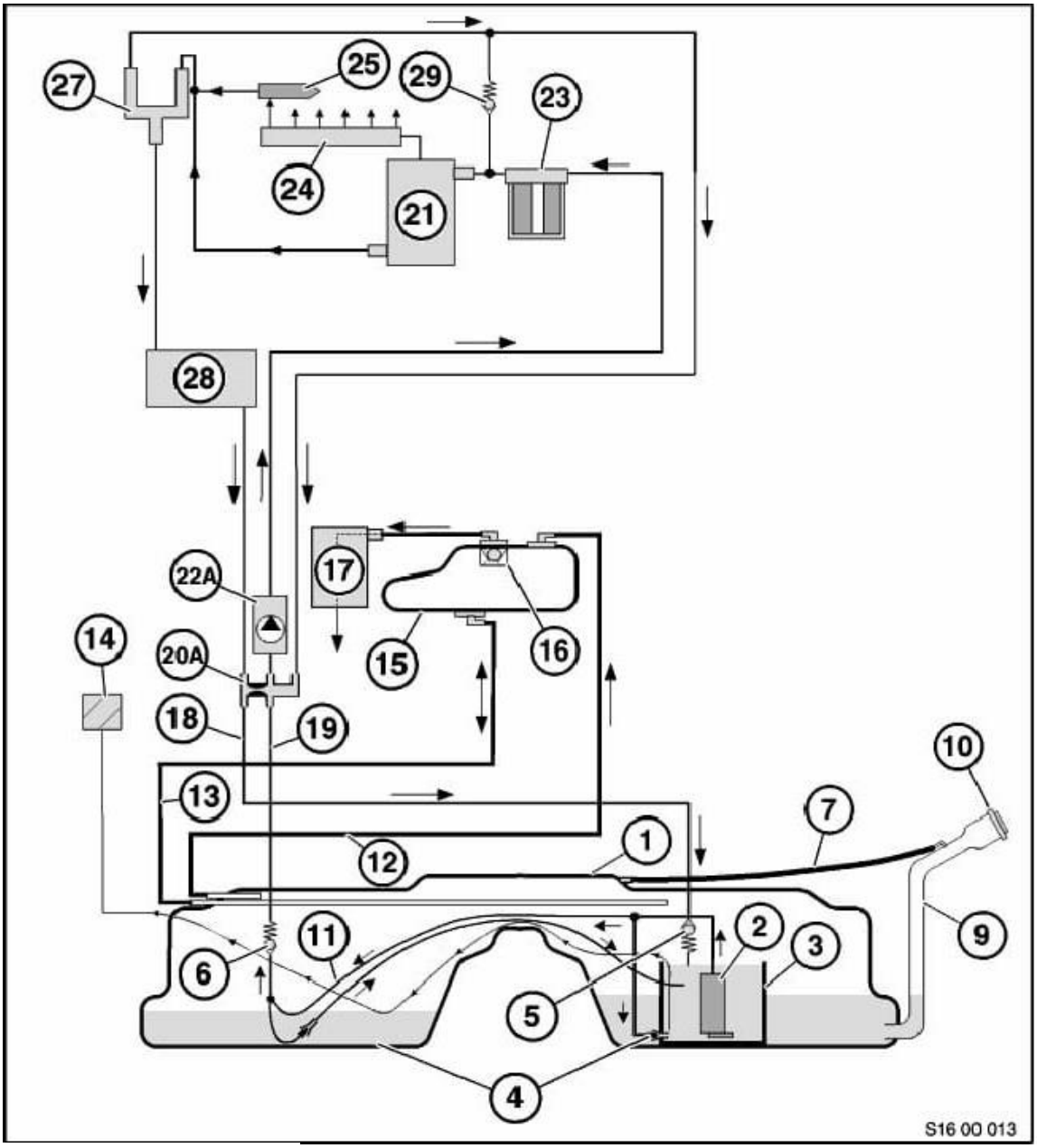
Fuel supply system E39 M57



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Description of parts

1. Fuel tank	16. Rollover valve
2. Electric fuel delivery pump	17. Dust filter
3. Surge chamber	18. Fuel return line
4. Suction jet pump	19. Fuel feed line
5. Overflow protection valve	20A. 5-section distributor
6. Pressure relief valve	21. High-pressure pump
7. Refuelling vent line	22A. Inline pump
9. Filler neck	23. Fuel filter
10. Fuel filler cap	24. Fuel rail
11. Tank expansion line	25. Injector
12. Operating vent line	27. Bimetal valve
13. Operating vent line	28. Fuel cooler
14. Heater booster	29. Pressure relief valve
15. Expansion tank	

Functional description

The right-hand side of the saddle-shaped fuel tank has a surge chamber (**3**) with the electric fuel delivery pump (**2**). The surge chamber guarantees correct fuel supply from the fuel delivery pump in all operating states of the vehicle.

The suction jet pump (**4**) installed in the base of the surge chamber supplies the surge chamber with fuel. Fuel is transferred from the left-hand side of the fuel tank to the surge chamber by the suction jet pump integrated in the tank expansion line (**11**). Both suction jet pumps are driven by the fuel return line (**18**).

The pressure relief valve (**6**) controls the pressure required for the suction jet pumps to operate. The overflow protection valve (**5**) protects the fuel return line. Should the pressure drop in the event of damage or the fuel return line becoming separated, the valve will close. This prevents the fuel from overflowing from the fuel tank in extreme vehicle positions (rollover, inclination).

The fuel is fed from the electric fuel delivery pump to the high-pressure pump (**21**) via the fuel feed line (**19**), the inline pump (**22A**) and the fuel filter (**23**). The high-pressure pump supplies the injectors (**25**) with fuel through the fuel rail (**24**).

On common rail systems, the so-called inline pump has been incorporated between the high-pressure pump and the electric fuel delivery pump. This pump supplements the fuel delivery pump in the fuel tank when large quantities of fuel are required. The inline pump generates the necessary fuel delivery pressure for the high-pressure pump. This delivery pressure is maintained at a constant level by the pressure relief valve (**29**) in the engine circuit.

The return from the injectors and the high-pressure pump is fed into the bimetal valve (**27**). The bimetal valve separates the fuel in the fuel return line according to the fuel temperature.

At low fuel temperatures, the larger proportion of the fuel is returned through the 5-section distributor (**20A**) to the fuel feed line at a point in front of the inline pump. In this way, the fuel is warmed up more rapidly at low ambient temperatures.

At high fuel temperatures, the larger proportion of the fuel flows back to the fuel tank via the fuel cooler (**28**) and the fuel return line. This prevents the fuel from being warmed up too much at high ambient temperatures.

Large quantities of heated fuel occur in the return line in extreme operating conditions, for example, in mountainous terrain or when towing a trailer. For this reason, the throttle in the 5-section distributor diverts a portion of the fuel directly into the fuel feed line. This process also has the effect of countering an excessive heating of the fuel in the fuel tank.

When refuelling, the fuel tank is vented through the refuelling vent line (**7**) in the fuel filler neck (**9**).

While driving, the fuel tank is ventilated through the operating vent lines (**12**, **13**), the expansion tank (**15**) and the dust filter (**17**).

The condensed components of the fuel vapours are fed back from the expansion tank into the fuel tank (**1**) through the left-hand operating vent line (**13**).

In the event of overfilling, the float valve in the refuelling vent line will be closed by the rising fuel level. This prevents the expansion tank from filling. The rollover valve (**16**) on the top of the expansion tank will close in the event of the vehicle turning over. This prevents the fuel from escaping into the activated carbon filter.

Additional heater boosters (**14**) use independent supply line from fuel tank.