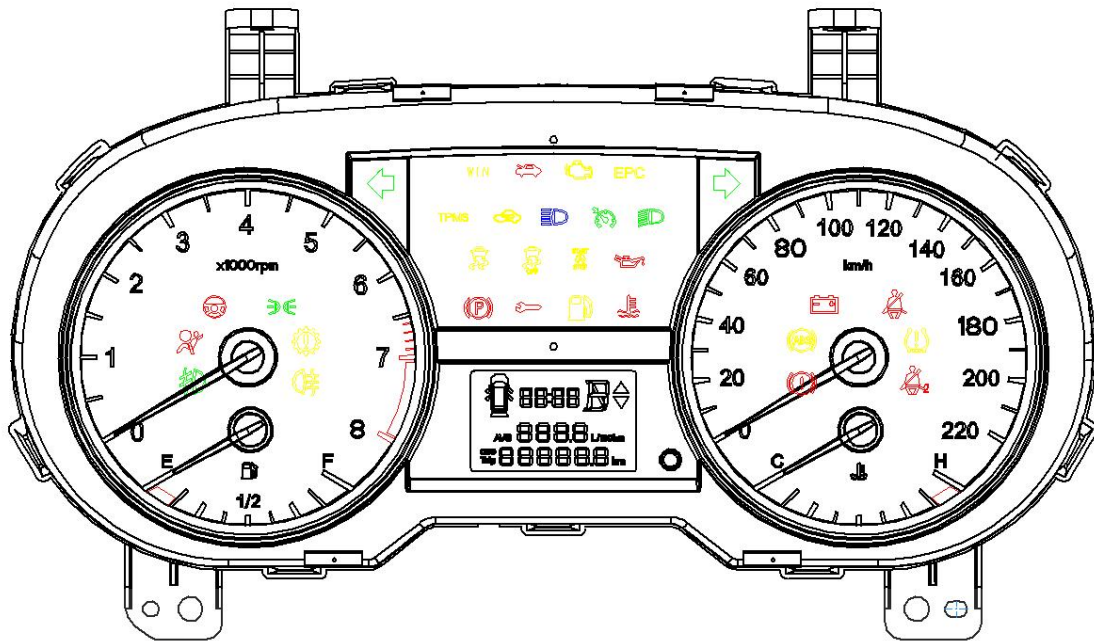


## Combination meter

### Function Instruction






Combination meter component diagram

The combination instrument can indicate the following functions:



















1. Speedometer: The speedometer pointer moves according to the CAN signal sent from the ABS, indicating the speed at which the vehicle is traveling.
2. Tachometer: The tachometer hand moves according to the CAN signal sent from the engine EMS, indicating the engine speed.
3. Water temperature gauge: The water temperature gauge pointer moves in accordance with the CAN signal sent from the EMS, indicating the engine coolant temperature.
4. Fuel gauge: The fuel gauge pointer moves in accordance with the resistance signal from the fuel sensor, indicating the amount of fuel remaining in the fuel tank.
5. LCD display: Time, mileage accumulation, mileage subtotal, average fuel consumption, door opening (five doors), shifting tips.
6. Combination instrument related parameters

Item		Instructions
Dial	Color	Black
	Instrument Panel Technology	2D
	Scale Line/Figure	White, refer to the effect picture
	Red Zone	Red, refer to the effect picture





## Combination Meter

Back Light	Dial	White		
	Pointer	White		
	LCD	White On Black		
Odometer	Movement Type	Stepper motor Wei Li VID29-05		
	Signal Source (ON)	ABS		
	Speed Unit	Km/h		
	Maximum Scale (Km/h)	220		
	Minimum Scale (km/h)	10		
	km/h Symbol	Yes, with back light		
Tachometer	Movement Type	Stepping Motor		
	Signal Source (ON)	Engine ECU		
	Maximum Speed Scale	8000		
	Minimum Scale	500		
	Red Zone	6500~8000		
	x1000r/min Symbol	Yes, with back light		
LCD Display	Total Mileage(ON)	0~999999Km		
	Mileage Subtotal (ON)	0~999.9Km		
	Fuel consumption quantity information (ON)	Average fuel consumption L/100Km		
	Door open display (B+ or ON)	Signal source: CAN signal		
	Time	24 hours		
	Gear position display (ON)	Signal source: CAN signal		
Coolant temperature gauge	Movement Type	Stepping Motor		
	Signal Source (ON)	Engine ECU		
	Range	50°C~120°C		
	Red Zone	120°C~130°C		
Fuel gauge	Movement Type	Stepping Motor		
	Signal Source (ON)	Fuel sensor		
	Range	E~F		
	Red Zone	E~1/8		
Warning	Left turning (B+ or ON)	CAN signal	Green	
	Right turning (B+ or ON)	CAN signal	Green	
	High beam (ON)	CAN signal	Blue	

## Combination Meter

indicating symbol on dial scale	Rear fog light (ON)	CAN signal	Yellow	
	Front fog light (B+ or ON)	CAN signal	Green	
	Lower beam	CAN signal	Green	
	Position Lamp	CAN signal	Green	
	Charging indicating (ON)	Hard wire	Red	
	ABS failure (ON)	CAN signal	Yellow	
	Driver safety belt (ON)	Low effective	Red	
	Engine emission system failure (ON)	CAN signal	Yellow	
	Air bag failure (ON)	High or floating	Red	
	Coolant temperature high/low coolant (ON)	Meter driving	Red	
	Low fuel level (ON)	Meter driving	Yellow	
	Engine oil pressure warning (ON)	Hard wire	Red	
	Engine failure indicating (ON)	CAN signal	Yellow	EPC
	Brake Malfunction	CAN signal, low effective	Red	
	ESC Electronic Stability Control	CAN signal	Yellow	
	ESC OFF Electronic Stability Control Off	CAN signal	Yellow	
	Front passenger's safety belt (ON)	Low effective, resistance signal	Red	
	Engine anti-theft indicator (B+ or ON)	CAN signal / hard line	Yellow	
	TPMS system status indicator	CAN signal / hard line	Yellow	TPMS
	Tire pressure management system	CAN signal / hard line	Yellow	
	Cruise control	CAN signal	Green/white	
	Speeding alarm	Meter driving	Red	

Combination Meter

	Handbrake	CAN signal	Red	
	EPS electronic power steering	CAN signal	yellow / Red	
	Automatic transmission failure	CAN signal	Yellow w	
	Snow mode	CAN signal	Yellow w	

### Pin description of combination meter

Combination meter terminal description table (some terminals are reserved)

No	Function	No	Function
B1	Wheel speed signal output	B17	Communication
B2	Driver seat belt switch (low level)	B18	B+
B3	Front passenger seat belt (low level)	B19	IGN+
B4	Passenger seat sensor	B20	Vacant
B5	TPMS system failure (low level)	B21	Internal illumination (-)
B6	Engine anti-theft (low level)	B22	Internal illumination (+)
B7	Tire pressure alarm (low level)	B23	Instrument
B8	CAN_H	B24	Fuel sensor ground
B9	CAN_L	B25	Fuel signal
B10	Vacant	B26	Vacant
B11	Brake level (low level)	B27	Vacant
B12	Vacant	B28	Vacant
B13	Vacant	B29	Charge and discharge (low level)
B14	Airbag (low level)	B30	Oil pressure (low level)
B15	Reversing radar +	B31	Vacant
B16	Vacant	B32	Vacant

## Speedometer and Odometer

Experimental Testing:

- ① Adjust the tire pressure to the specified value
- ② Place the vehicle on the speed test bench
- ③ Confirm that the parking brake is operated correctly
- ④ In order to prevent the vehicle from moving left and right, the left and right side of the vehicle should be fixed.
- ⑤ To prevent the vehicle from driving out of the bench, fasten the rear end with a chain or wire rope, and be sure to fasten the end of the chain or wire rope.
- ⑥ Check whether the speedometer indication range is within the standard value or not.

Speedometer indication standard range and CAN comparison table

Speed (Km/h)	Frequency (Hz)	Vehicle speed indication range (km/h)
20	0x164	20~23
60	0x42A	60~65
100	0x6F2	100~105
160	0xB1C	160~168

### Attention:

- Do not suddenly operate the clutch or rapidly increase and decrease the speed during the test.
- Confirm the variation of vehicle speed value

## Tachometer

Tachometer Inspection

Compare the readings between the engine tachometer and the on-board tachometer at each engine speed to see if the difference between them is within the standard values.

Tachometer indicating standard range and CAN information table:

Engine rotation speed	CAN signal value	Allowable error range
1000	0x7D0	±60
2000	0xFA0	±100
3000	0x1770	±100
4000	0x1F00	±150
5000	0x2710	±150
6000	0x2EE0	±150
7000	0x36B0	±200
8000	0x3E80	±200

**Coolant temperature gauge****1. Water temperature meter description****Below C - low temperature zone**

During the warm-up process, the engine will work in this area for a short time. In this temperature zone should avoid the engine running at high speed, at the same time, the engine work load must not be too large.

Between C and H - Under normal driving conditions, the pointer should be within this range.

When the outside temperature is high and the engine load is heavy, the pointer may deviate from this range. As long as the coolant alarm light is off, the car can still run normally. If the coolant warning light turns on, you must turn off the engine and check the cooling system.

**Above H - overheated zone**

If the pointer enters this red range, the engine is overheated. Immediately stop the car safely, turn off the ignition and look for the cause of the problem after the engine has cooled down.

**Description:**

Auxiliary headlamps installed in front of the front bumper cold air inlet will affect the flow of cooling air is not conducive to engine cooling. If the outside temperature is high, the engine is in heavy-duty work, the engine can easily overheat. The front spoiler also acts as a cooling air guide. If it is damaged or even broken due to a collision, it may cause the engine to overheat.

**2. Check of water temperature meter**

Measure the information sent by the EMS.

Water temperature meter indicating standard range and CAN information comparison table

Engine rotation speed	CAN signal value	Allowable error range
C	0x82	50
1/4	0x9D	70
3/8	0xAA	80
1/2	0XD2	110
3/4	0xD9	115
7/8 (red zone)	0Xe0	120
H	0xED	130

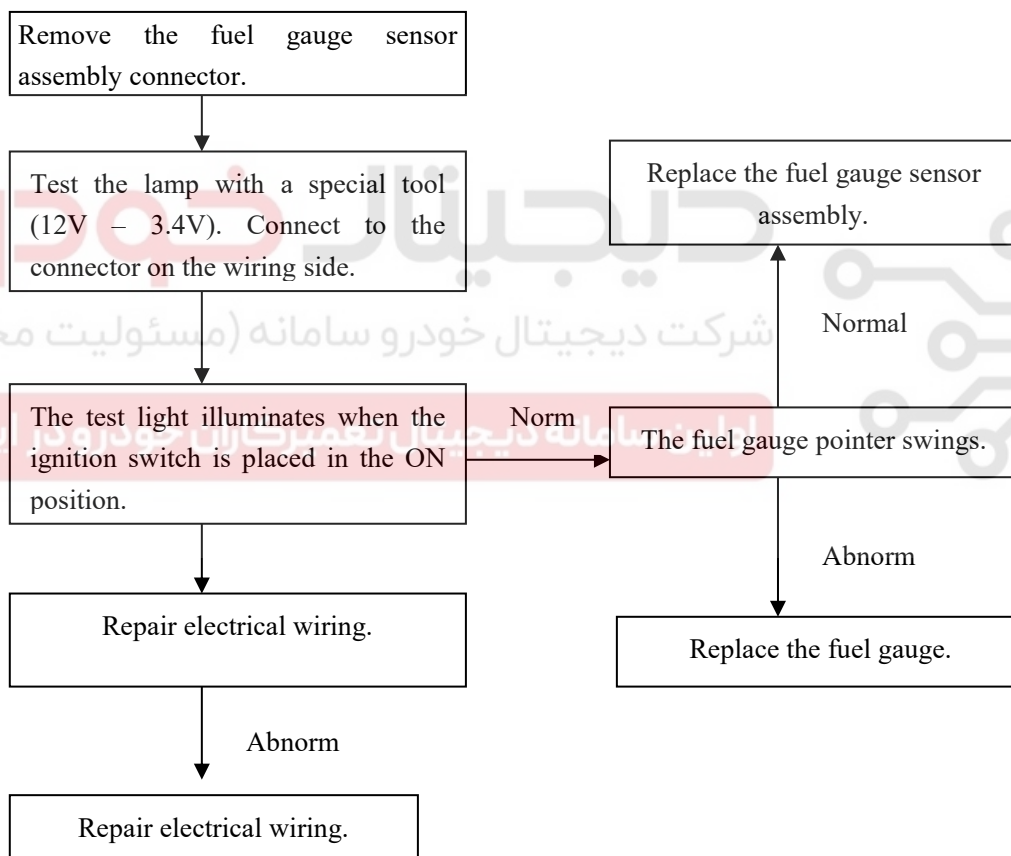
## Fuel gauge

When the float changes with the height of the oil level in the fuel tank, the sliding contact in linkage with the float rod responds to change the resistance of the thick film resistor. When the fuel tank is filled with fuel, the resistance value of the thick film resistor is the smallest, and the fuel gauge pointer points to the maximum scale value F. Conversely, when the fuel in the fuel tank is depleted, the resistance of the thick film resistor is the highest and the deflection of the fuel gauge pointer is minimum E.

### 1. Inspection methods:

When the pointer reaches the empty oil level (E), there is still about 10 liters of fuel in the tank. After filling the tank car for some distance, the pointer will move out of full position (F). When in refueling, due to the remaining oil, so it can be added less fuel than the marked capacity.

### 2. Simple check procedure for fuel gauge



### 3. Fuel gauge sensor assembly inspection

For inspection, remove the fuel gauge sensor assembly from the fuel tank.

### 4. Fuel gauge sensor assembly resistance

1) Check if the resistance between the fuel gauge sensor terminals is within the standard range when the fuel gauge sender float is in the F (highest) position and the E (lowest) position.

Fuel gauge sensor resistance value and instrument indication table

Fuel key	Fuel resistance input ( $\Omega$ )	Designed volume (L)	Instrument designed value ( $\Omega$ )
E-STO	315 $\pm$ 3	1	312
PE	265 $\pm$ 2	5	263
1/8(Alarm)	245 $\pm$ 2	7.8	245
2/8	205 $\pm$ 2	14	205
3/8	175 $\pm$ 2	19	175
4/8	150 $\pm$ 1.5	24	150
5/8	125 $\pm$ 1.5	29	125
6/8	100 $\pm$ 1.5	34	100
7/8	75 $\pm$ 1	39	75
F	55 $\pm$ 1	43	55
F-STOP	40 $\pm$ 1	46	41

2) Check if the resistance value changes smoothly when the float slowly moves between F (highest) and E (lowest).

## Disassemble of Combination Instrument

### Disassembly steps:

1. Remove the battery negative.
2. Remove the instrument shield.

Before removing the instrument cover, turn the steering wheel down to the end (easy to disassemble). The instrument cover is fixed by two screws. Remove the screw with a short Phillips screwdriver or cross sleeve and remove the cover.



## 3. the combination of instrumentation

The instrument cluster is fixed by four screws and removed by a Phillips screwdriver.

Disconnect the combination meter connector and remove the combination meter assembly.

**Installation steps:**

Install in the reverse procedure of disassembly.

**Malfunction Diagnosis**

Instrument troubleshooting table

No	Main fault	Reasons	Troubleshooting
1	The whole combination meter doesn't work	(1) The circuit is disconnected The instrument circuit is damaged	(1) Check the battery and ground, whether the battery voltage is 12V or connected (2) Instrument Exchange
2	The light and indicating light are off	(1) The circuit is not connected (2) Control signal flow fault Damaged instrument circuit	(1) Check if the circuit and connection pieces are connected (2) Check if there is a level signal (3) Instrument Exchange
3	The indicating instrument error or not working, the mileage LCD does not work	(1) System Malfunction (2) Damaged instrument circuit	(1) Check if the relevant frequency signal is normal (2) Instrument Exchange
4	Mileage LCD is lack of stroke	Damaged instrument circuit	Instrument Exchange