# Task 2

## Vehicle Information Displaying System and Services
## 汽车信息显示系统及检修

**学习目标：**

1. 掌握汽车仪表板的组成、作用等的英文术语、词汇；
2. 掌握汽车信息显示屏中用英语标识的术语、词汇；
3. 能读懂汽车信息显示系统相关的英文资料并能进行中英文互译；
4. 能根据汽车信息显示系统维修的英文指示进行维修操作；
5. 能读懂汽车信息显示屏中用英语标识的报警状态。

The vehicle information displaying system is one of the important systems of the automobile. The driver can know whether the cars, especially the various operating parameters of the engine are normal or not in order to take timely measures to prevent the occurrence of physical and mechanical accidents.

Traditional instruments widely use the combination analog displaying instruments, and various measuring instruments are fixed on the dashboard in front of the driver's seat. The instrumentations in different vehicle instrument panels are not the same. As is shown in Figure 2 – 1, it is a typical combination car instrument panel.

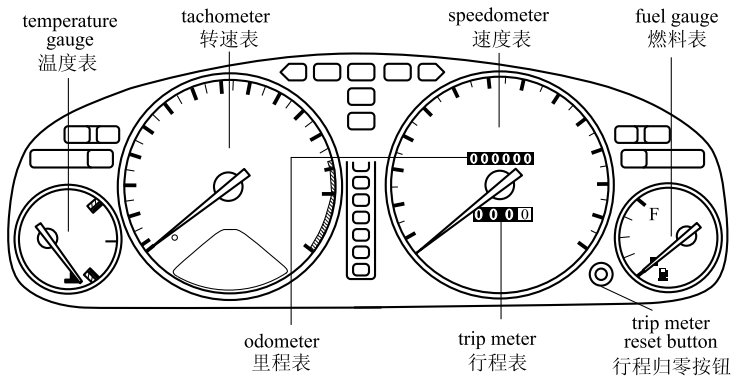



**Figure 2 – 1　A typical combination car instrument panel**

The instruments commonly used include speedometer, engine tachometer, oil pressure gauge, water temperature gauge, fuel gauge, ammeter, etc. Changes of the monitored object's status are directly shown in most instruments through the sensors.

With the development of automotive electronic technology, multifunctional, high-precision instruments with intuitive readings, which are shown by electronic digital and image, have been used in vehicles continuously. Let's know relevant knowledge about the instrument panel of Citroen C5 (Figure 2 – 2).


**Figure 2 – 2 The instrument panel of Citroen C5**

Using the aviation digital combined dashboard on Citroen C5, the displayed information of the operating parameters is clear and accurate; the innovative model is quite trendy and has a high-tech feeling. The dashboard uses a three-table show's style, integrates the self-luminous system. Three LCD screens with a red background are located in the center of each meter. On the left is the water temperature gauge, and on the right is the fuel temperature gauge and gear position display. The speedometer and car computer are on the middle screen which is the largest in the three screens.

## Toyota Corolla Repair Manual

### 1. Speedometers

The speedometer shows your speed in kilometers per hour (km/h) and/or miles per hour (mph) depending on type.

Inspect Speedometer

(1) Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.

(2) Check the deflection width of the speed meter indicator: Below 0.5 km/h.

| Standard Indication (km/h) | Allowable Range (km/h) |
|---|---|
| 20 | 21 – 25 |
| 40 | 41.5 – 46 |
| … | … |
| 160 | 166 – 173 |

Note

Tire wear and tire over or under inflation will increase the indication error.

Inspect the Output Signal of Vehicle Speed (As Is Shown in Figure 2 – 3.)

While driving the vehicle at the speed of 10 km/h, check the voltage between the terminals C11 – 9 and C11 – 1 of the combination meter assy. Fluctuation from 10 to 14 V or less is repeated 7 times within 1 sec.

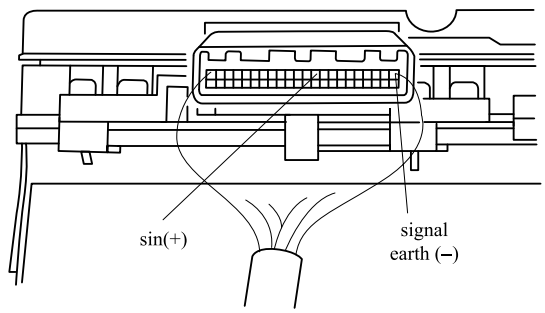



**Figure 2 – 3 Inspect the output signal of vehicle speed**

Note

Check it with the ignition switch ON and the connector connected.

**2. Tachometer**

The tachometer shows the engine speed in revolutions per minute (rpm). To protect the engine from damage, never drive with the tachometer needle in the red zone.

Inspect Tachometer

(1) Connect a tune-up test tachometer, and start the engine.

(2) Compare the test with tachometer indications: DC 13.5 V, 25 ℃.

| Standard Indication (r/min) | Allowable Range (r/min) |
|---|---|
| 700 | 630 – 770 |
| 1, 000 | 900 – 1, 100 |
| … | … |
| 7, 000 | 6, 700 – 7, 300 |

If normal, replace the combination instrument panel; otherwise, repair or replace the wirings and connectors.

### 3. Fuel Gauge

The fuel gauge displays approximately how much fuel you have in the fuel tank.

Note

For proper fuel gauge operation, the ignition switch must be in the OFF position before you add fuel to the fuel tank.

The fuel gauge indicator may vary slightly while the vehicle is in motion. This is the result of fuel movement within the tank. An accurate reading may be obtained with the vehicle on the smooth, level ground.

#### Inspect the Fuel Gauge (As Is Shown in Figure 2 – 4.)

(1) Disconnect the connector from the sender gauge.

(2) While turning the ignition switch ON, check the position of the receiver gauge needle which should be in "empty" status.

(3) Connect terminals 2 and 3 on the wire harness side connector and turn the ignition switch ON, then check the position of the receiver gauge needle which should be in "full" status.

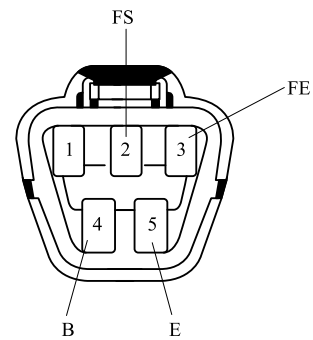



Figure 2 – 4 Inspect the fuel gauge

#### Inspect Fuel Level Warning

(1) Disconnect the connector from the sender gauge.

(2) Turn the ignition switch ON. Check the fuel level needle indicates EMPTY and fuel level warning lights light on.

### 4. Temperature Gauge

This shows the temperature of the engine's coolant. During normal operation, the pointer should rise from the bottom blue mark to about the middle of the gauge. In severe driving conditions, such as very hot weather or a long period of uphill driving the pointer may rise to the upper white mark. If it reaches the red (Hot) mark, the engine is overheated and may be damaged.

If your engine overheats:

(1) Pull off the road as soon as it is safely possible.

(2) Turn off the engine.

(3) Let the engine cool.

(4) Check the coolant level following the instructions on checking and adding coolant to your engine, and see the Engine Coolant in the Index.

Inspect the Water Temperature Receiver Gauge Warning Light

(1) Disconnect the connector from the sender gauge.

(2) Turn the ignition switch ON, and check the position of the water temperature receiver gauge needle which should indicate "cool."

(3) While ground terminal 2 is on the wire harness side, check the water temperature receiver gauge needle which should indicate "hot."

**5. Engine Oil Pressure Warning Light**

This light indicates the engine oil pressure, not the oil level. However, if your engine oil level is low, it could affect the oil pressure. The light should come on every time your ignition key is turned to ON or START and go out when the engine starts. If the light stays on or turns on while the engine is running, you have lost oil pressure and continued operation will cause severe engine damage.

If you lose oil pressure:

(1) Pull off the road as soon as it is safely possible.

(2) Shut off the engine immediately. If you do not stop the engine as soon as possible, severe engine damage could occur.

(3) Check the engine oil level, following the instructions under Checking and Adding Engine Oil in the Owner Guide. To ensure an accurate reading, your car should be on level ground.

(4) If the level is low, add only as much oil as necessary before you start the engine again. Do not overfill. Do not operate the engine again, if the light is on, regardless of the oil level.

Inspect the Oil Pressure Warning Light

(1) Disconnect the connector from the low oil pressure switch.

(2) Turn the ignition switch ON.

(3) While connecting the terminal of wire harness side connector and ground, check the low oil pressure warning light.

**6. Inspect the Brake Warning Light**

Inspect the Parking Brake Warning Light

Disconnect the connector from the parking brake switch and ground terminal on the wire harness side connector. Turn the ignition switch ON and check that the warning light lights up.

### Inspect the Brake Fluid Level Warning Light

Disconnect the connector from the brake fluid level warning switch and connect terminals on the wire harness side connector. Turn the ignition switch ON and check that the warning light lights up.

**7. Inspect the Key Unlock Warning Buzzer (As Is Shown in Figure 2 – 5.)**

### Check the Operation

While the driver side door is open, insert the ignition key, set the ignition switch to OFF and check for the buzzer sound whether it is intermittent.

### Check the Function

Remove the combination meter. Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminals 1 and 2. Connect the negative (–) lead to terminals 16 and 17, and check whether the buzzer sound is intermittent. While the buzzer is sounding, connect the battery positive terminal to terminal 4 and check that the buzzer sound is stopped.

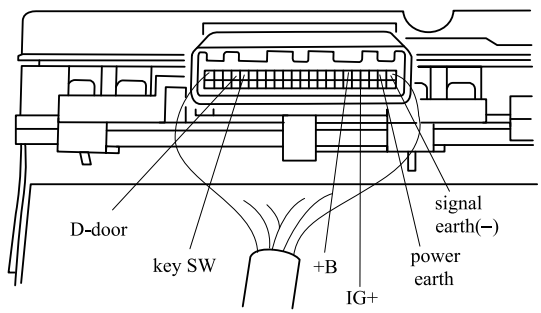



**Figure 2 – 5 Inspect the key unlock warning buzzer**

**Note**

When the key unlock warning and light auto turn off warning are output simultaneously, the key unlock warning precedes the other.

**8. Inspect the Light Auto Turn off Buzzer (As Is Shown in Figure 2 – 6.)**

### Check the Operation

Remove the ignition key with the tail light switch ON and the driver side door open and check whether the buzzer sound is continuous. While the buzzer is sounding, perform any of the following:

(1) Turn the tail light switch OFF;

(2) Close the driver side door;

(3) Insert the ignition key into the key cylinder.

If the buzzer sound is stopped, replace the combination instrument panel.

### Check the Function

Remove the combination meter. Connect the positive (+) lead from the battery to terminal 5 and the negative (−) lead to terminals 1 and 2. Connect the positive (+) lead from the battery to terminal 18 and the negative (−) lead to terminals 16 and 17. Check that the buzzer sound is continuous. While the buzzer is sounding, connect the battery positive terminal to terminal 4 and check that the buzzer sound is stopped.

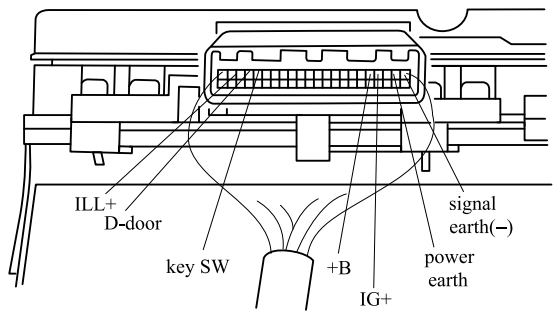



**Figure 2−6 Inspect the light auto turn off buzzer**

## New Words

1. various [ˈvɛəriəs] *adj.* 不同的，各种各样的，多方面的
2. parameter [pəˈræmitə] *n.* 参数，参量
3. occurrence [əˈkʌrəns] *n.* 发生
4. speedometer [spiˈdɔmitə] *n.* 速度表
5. tachometer [tæˈkɔmitə] *n.* 转速表
6. ammeter [ˈæmitə] *n.* 电流表
7. intuitive [inˈtju(ː)itiv] *adj.* 直觉的
8. continuously [kənˈtinjuəsli] *adv.* 不断地，连续地
9. deflection [diˈflekʃən] *n.* 偏斜，偏转，偏差
10. fluctuation [ˌflʌktjuˈeiʃən] *n.* 波动，起伏
11. needle [ˈniːdl] *n.* 指针
12. accurate [ˈækjurit] *adj.* 正确的，精确的
13. buzzer [ˈbʌzə] *n.* 蜂鸣器
14. positive [ˈpɔzətiv] *adj.* 肯定的，实际的，[电]阳的
15. negative [ˈnegətiv] *adj.* 否定的，消极的，负的，阴性的
16. image [ˈimidʒ] *n.* (肖)像，塑像，石像，影像，图像
17. hazardous [ˈhæzədəs] *adj.* 危险的，冒险的，碰运气的

## Phrases and Expressions

| | |
|---|---|
| 1. combination car instrument panel | 汽车组合仪表板 |
| 2. oil pressure gauge | 机油压力表 |
| 3. water temperature gauge | 水温表 |
| 4. fuel gauge | 燃油表 |
| 5. tune-up | 调整 |
| 6. fuel tank | 燃油箱 |
| 7. wire harness | 线束 |
| 8. brake fluid | 制动液 |
| 9. light-emitting diode | 发光二极管 |
| 10. electronic digital | 电子数字 |
| 11. navigation system | 导航系统 |

## Text Notes

1. The driver can know whether the cars, especially the various operating parameters of the engine are normal or not in order to take timely measures to prevent the occurrence of physical and mechanical accidents.
   驾驶员能随时了解汽车的状况,特别是发动机的各种工作参数是否正常,以便及时采取措施,防止发生人身和机械事故。
2. Traditional instruments widely use the combination analog displaying instruments, and various measuring instruments are fixed on the dashboard in front of the driver's seat.
   传统仪表广泛使用组合式模拟显示仪表,各种测量仪表集中在驾驶员座位前方的仪表板上。
3. The instruments commonly used include speedometer, engine tachometer, oil pressure gauge, the water temperature gauge, fuel gauge, ammeter, etc.
   常用的仪表有车速里程表、发动机转速表、机油压力表、水温表、燃油表、电流表等。
4. Changes of the monitored object's status are directly shown in most instruments through the sensors.
   被监测对象的状态变化通过各种传感器获得,在大部分仪表中直接显示出来。
5. Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.
   用车速表测试仪检查车速表的允许指示误差,并检查里程表的工作情况。

6. While driving the vehicle at the speed of 10 km/h, check the voltage between the terminals C11 – 9 and C11 – 1 of the combination meter assy.
以 10 km/h 的车速驾驶车辆,检测组合仪表总成端子 C11 – 9 与 C11 – 1 之间的电压。
7. During normal operation, the pointer should rise from the bottom blue mark to about the middle of the gauge.
正常驾驶时,表的长针应从表的下端蓝色标记指到大约中间的位置上。
8. Disconnect the connector from the parking brake switch and ground terminal on the wire harness side connector.
脱开停车制动开关连接器,并将配线侧的连接器端子接地。

## Safety Tips

**用电安全:**

(1) 操作电力工具时,应使用接地正确的三相插孔和加长导线,而对于某些工具则仅使用两相插头。

(2) 对切断或受损电线进行维修或更换时,应确保它们双层绝缘,以免触电。

(3) 不使用时,勿将电线放置在地上,以免将人绊倒。

(4) 若电线位于人流量大的地方,则应把它用带子扎起来进行保护。

## Exercises

**Part Ⅰ Choose the best answers from the following choices according to the text.**

1. The _____ tells you how many miles (kilometers) per hour your vehicle is moving.
A. odometer B. trip meter C. speedometer D. tachometer
2. The _____ tells you the total number of miles (kilometers) your vehicle has been driven.
A. odometer B. trip meter C. speedometer D. tachometer
3. The _____ tells you how many miles (kilometers) your car has been driven since the last reset.
A. odometer B. trip meter C. speedometer D. tachometer
4. The _____ shows you the engine speed in revolutions per minute (rpm).
A. odometer B. trip meter C. speedometer D. tachometer
5. To protect the engine from damage, never drive with the tachometer needle in

the _____.

A. white mark B. red zone C. blue mark D. yellow zone

6. The _____ displays how much fuel you have in the fuel tank.

A. oil pressure gauge B. fuel gauge

C. water temperature gauge D. ammeter

7. The temperature gauge shows the temperature of the engine's _____.

A. oil B. coolant C. incoming air D. exhaust

8. The engine oil pressure warning light indicates the engine _____, not the oil level.

A. low fuel B. oil pressure C. temperature D. overheating

**Part Ⅱ Translate the following into English.**

1. 线束
2. 组合仪表总成
3. 连接器
4. 燃油液位警告灯
5. 蜂鸣器
6. 机油压力警告灯
7. 接线柱(端子)
8. 负极导线
9. 燃油表
10. 平地

**Part Ⅲ Translate the following into Chinese.**

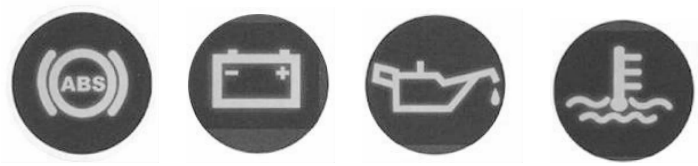
1. speedometer tester
2. disconnect
3. ground
4. on board computer
5. brake fluid level
6. warning light
7. tail light switch
8. overheat
9. shut off
10. instrument panel

**Part Ⅳ Translate the following sentences into Chinese.**

1. Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.
2. Check the deflection width of the speed meter indicator.
3. Tire wear and tire over or under inflation will increase the indication error.
4. While ground terminal 2 is on the wire harness side, check the water temperature receiver gauge needle which should indicate "hot."
5. Disconnect the connector from the parking brake switch and ground terminal on the wire harness side connector. Turn the ignition switch ON and check that the warning light lights up.
6. Do not operate the engine again, if the light is on, regardless of the oil level.

**Part Ⅴ Complete the question based on the graphs below.**

Now, most of the freshmen often can not read a variety of indicator lights on the instrument panel. There are some indicator lights as follows. Please depict their purposes respectively.




**Part Ⅵ Vocabulary and structure.**

1. To protect the engine _____ damage, never drive with the tachometer needle in the red zone.
   A. to B. from C. however D. consequently
2. Compare the test _____ tachometer indications.
   A. with B. and C. to D. that
3. The fuel gauge indicator may vary slightly while the vehicle is in motion. This is the _____ fuel movement within the tank.
   A. result of B. result in C. because D. result
4. During normal operation, the pointer should rise from the bottom blue mark to about the middle _____ the gauge.
   A. in B. to C. of D. on
5. _____ his surprise, the manager found nobody in the meeting room.
   A. At B. For C. To D. With
6. This company has two branches: one in Paris and _____ in New York.
   A. another B. the other C. one other D. other
7. _____ to find the proper job, he decided to give up job-hunting in this city.
   A. Failed B. To fail C. Being failed D. Having failed
8. The proposal _____ , we'll have to make another decision about when to start the project.
   A. having been accepted B. to accept
   C. accepting D. be accepted
9. We don't deny that your products are superior in quality to _____ of Japanese make.
   A. the one B. these C. that D. those
10. It is required that anyone applying for a driver's license _____ a set of tests.
    A. take B. took C. takes D. will take

## 译文

# 汽车信息显示系统及检修

汽车信息显示系统是汽车系统中一个重要的系统。司机能够了解汽车，特别是发动机的各种工作参数是否正常，以便适时采取措施来防止人身和机械故障的发生。

传统仪表广泛使用组合式模拟显示仪表，各种测量仪表均安装在驾驶员座椅前方的仪表板上。不同汽车仪表板的仪表不尽相同，如图 2－1 所示，这是一块典型的组合式汽车仪表板。

常用的仪表有车速表、发动机转速表、机油压力表、水温表、燃油表、电流表等。大部分仪表通过传感装置获得被监测对象的状态变化而直接表述出来。

随着汽车电子技术的发展，多功能、高精度、读数直观的电子数字显示及图像显示的仪表已不断应用于汽车上。让我们来了解一些雪铁龙 C5 车型的仪表板的相关知识（如图 2－2 所示）。

C5 仪表盘采用航空式数字组合仪表，信息精准清晰，创新造型引领潮流，凸显科技感。表盘采用三表显示，集成了自发光系统，3 块红色背景的液晶屏位于每个表盘的中央，最左边还是水温显示，右侧是油温显示和挡位显示，速度显示和行车电脑集中在中间面积最大的显示屏中。

### 丰田卡罗拉维修手册

**1. 速度表**

速度表根据汽车类型显示每小时行驶的千米数或每小时的英里数。

**检查速度表**

（1）用车速表测试仪，检测车速表的允许指示误差，并检查里程表的工作状况。

| 标准示值（km/h） | 允许范围（km/h） |
| --- | --- |
| 20 | 21～25 |
| 40 | 41.5～46 |
| … | … |
| 160 | 166～173 |

（2）检查速度表指针的误差范围：低于 0.5 km/h。

**注意：**轮胎磨损和轮胎过分充气或充气不足均会增加示值误差。

**检测车速信号的输出，如图 2－3 所示（图略）**

以 10 km/h 的车速行驶，检查组合仪表总成连接器端子 C11－9 与 C11－1 之间的电压。电压值从 10 V 到 14 V 或更小之间波动，每秒钟内重复 7 次。

**注意:**要在点火开关处 ON 位置、连接器连接上的情况下,检查输出信号。

**2. 转速表**

转速表显示发动机每分钟的转速。驾驶时,不要使转速表的指针指向红色区,以免发动机受到损伤。

**检测转速表**

(1) 连接校准测试转速表,启动发动机。

(2) 比较测试值和转速表显示值:直流电压 13.5 V,在 25 ℃。

| 标准示值(r/min) | 允许范围(r/min) |
| --- | --- |
| 700 | 630 ~ 770 |
| 1 000 | 900 ~ 1 100 |
| … | … |
| 7 000 | 6 700 – 7 300 |

如果检查数据正常,则替换组合仪表板;否则,就修理或替换电线和连接器。

**3. 燃油表**

燃油表可大约显示油箱中现存的油量。

**注意:**加油前点火开关须在"关"(OFF)位置,燃油表才可正常显示。行车时燃油表有少许摆动是由于油箱内燃油波动的缘故。当汽车在平坦路面上行驶时,油量读数较精确。

**检查燃油表,如图 2 – 4 所示(图略)**

(1) 从发送仪表上断开连接器。

(2) 将点火开关扭至"开"(ON)位置,然后检查接收仪表指针的位置应处于"空"状态。

(3) 将线束侧连接器端子 2 和 3 连接,并将点火开关扭至"ON"位置,然后检查接收仪表指针的位置,应处于"满"状态。

**检查燃油液位警告灯**

(1) 从发送仪表上断开连接器。

(2) 将点火开关扭至"ON"位置,检查燃油液位指针是否指示 EMPTY(空),以及燃油液位警告灯是否点亮。

**4. 温度表**

这个表显示发动机冷却剂的温度。正常驾驶时,表的长针应从表中蓝色标记下端指到大约中间的位置上。在恶劣的驾驶条件,例如非常炎热或长时间爬坡过程中,表的指针会指向上面的白色范围内。如果指针指向红色(热)范围内,则发动机已过热,可能会损坏发动机。

若发动机过热:

(1) 尽快安全地停在路边。

(2) 关闭发动机。

（3）让发动机冷却。

（4）根据有关检查及加注发动机冷却剂说明，检查冷却剂液面，可参照索引中的发动机冷却剂。

**检查水温表警告灯**

（1）从发送仪表上断开连接器。

（2）将点火开关扭至“ON”位置，检查水温表指针的位置，应指示“冷态”。

（3）将线束侧端子 2 接地，然后检查水温表指针的位置，应指示“热态”。

**5. 发动机油压警告灯**

油压警告灯显示发动机油压，而不是机油液位，然而若发动机机油液位低，就会影响油压。每次点火钥匙扭至“ON”或“START”位置时，油压警告灯亮，发动机启动时应该熄灭。如果警告灯持续亮或发动机运转时仍亮着，则表明汽车油压过低，如果继续工作将会给发动机带来严重的损害。

如果油压过低：

（1）尽快安全地停在路边。

（2）立即关闭发动机。如果未尽快停止发动机，则发动机可能会发生严重损伤。

（3）依照用户指南中检查和添加发动机机油的说明，检查发动机机油液面。为了获得精确读数，请将汽车停在平坦路面。

（4）如果液面过低，在再次启动发动机之前，请按需求添加机油。不要溢出。油压警告灯亮时，无论液面怎样，都不要再次启动发动机。

**检查油压警告灯**

（1）从油压过低警告灯开关上断开连接器。

（2）将点火开关扭至“ON”位置。

（3）将线束侧连接器端子接地，然后检查油压过低警告灯。

**6. 检查制动警告灯**

**检查驻车制动警告灯**

从驻车制动开关上断开连接器，并将线束侧连接器端子接地。将点火开关扭至“ON”位置，检查警告灯能否点亮。

**检查制动液液位警告灯**

断开制动液液位警告灯开关上的连接器，并连接线束侧连接器端子。将点火开关扭至“ON”位置，检查警告灯能否点亮。

**7. 检查钥匙开锁警告蜂鸣器（如图 2－5 所示）（图略）**

**检查工作情况**

当驾驶员侧门开时，插入点火钥匙，将点火开关扭至“OFF”位置并且检查蜂鸣器声音是否间歇。

**检查功能**

拆下组合仪表。将蓄电池正极（＋）导线连接至端子 5，负极（－）导线连接至

端子1和2。将负极(－)导线连接至端子16和17,检查蜂鸣器声音是否间歇。蜂鸣器发出响声时,将蓄电池正极端子与端子4相连,并检查蜂鸣器声音是否停止。

**注意:**当未锁警告和灯自动关闭报警同时输出时,未锁警告优先。

**8. 检查灯自动关闭蜂鸣器(如图2－6所示)(图略)**

**检查工作情况**

将尾灯开关位于"ON"并且驾驶员侧门开时,取下点火钥匙,检查蜂鸣器声音是否连续。当蜂鸣器发出声音时,执行下列操作:

(1)将尾灯开关扭至"OFF"位置;

(2)关闭驾驶员侧门;

(3)将点火钥匙插入锁芯。

如果没有蜂鸣器声音,更换组合仪表板。

**检查功能**

拆下组合仪表。将蓄电池正极(＋)导线连接至端子5,负极(－)导线连接至端子1和2。将蓄电池正极(＋)导线连接至端子18,负极(－)导线连接至端子16和17,检查蜂鸣器声音是否连续。当蜂鸣器发出声音时,将蓄电池正极导线连接至端子4,检查蜂鸣器声音是否停止。

**电器实训学习工作单(一)**

| 课程:汽车专业英语 | 班级: | 组别: |
|---|---|---|
| 学习任务:<br>1. 熟悉汽车仪表系统电路图<br>2. 熟悉电路图中所对应的英文表达 | 日期: | 得分: |
| | 组员: | |

Translate the following Chinese into English.

汽车仪表系统电路图: