Analysis on Application of Electrical and Electronic Technology in Automobile Maintenance

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Abstract: Electrical and electronic technology has been widely used in the field of automobile maintenance. Because of the convenience brought by electronic technology, the staff has greatly improved their working efficiency, and electrical and electronic technology plays a great role in the field of automobile maintenance. It is an inevitable trend for the development of fine management of automobile industry to make effective reform of enterprise maintenance construction by using electrician processing technology. In order to meet the basic requirements of product quality in automobile industry, the maintenance management work of automobile industry must be done well, because the maintenance work is the prerequisite demand that can help the steady development of automobile industry. This paper also focuses on the application of electrical and electronic technology in the field of automotive maintenance to discuss and study, hoping to provide a favorable help for the future development of the automotive industry, lay a solid foundation.

1. Introduction

With the continuous growth of car ownership, there is a shortage of talents in the post-auto market. Therefore, at all levels, various institutions also follow the automotive maintenance market theme, carrying out a series of automotive maintenance courses, including automotive engine, chassis and other aspects of teaching, one of the most basic courses is electrical engineering and electronics. This shows that learning and mastering the basic knowledge of electrical and electronic technology is already the basic requirement to engage in maintenance work. Therefore, for the construction of maintenance system to always carry out the idea of people-oriented sustainable development, at present, the progress of automobile maintenance construction in China is gradually improving, so the demand for technology is also gradually rising, gradually appeared to the technical problem of automobile maintenance system, this problem is the first task to be solved urgently.

2. Basic Content of Electrician

2.1. The Electrical Foundation Mainly Includes Two Basic Rules: Circuit Analysis and Electromagnetic Phenomena

Circuit analysis includes circuit composition, Ohm's law and so on. This knowledge is very common in automobiles. For example, the composition of the circuit, and the understanding of the circuit, the basic everything starts with reading the circuit diagram of the car. If you don't have an electrician's foundation, then you see the circuit diagram of the whole car, which is a dense line and doesn't know how to do it. The circuit consists of other basic components, such as power supply, switch, wire, electrical equipment, etc. Based on the electrician, you can analyze the circuit of the car [1]. For example, Analysis of a small Santana 3000 lamp and circuit diagram of the taillight, According to the basic knowledge of the electrician, The circuit is powered, Insurance, Electrical equipment, electrical equipment, etc. composition. Combination switch, Connectors, Light and taillights, then place all output lights from the positive pole. At this point, Light, light positive

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battery main safety S30130 line - lamp combination switch 30 terminals - lamp switch 1 or 2 lamp combination switches 58 L terminals and 58 R terminals - fuse S13 and S14- left and right headlamp small filament and left and right tail filament Rie(-),. So before and after the lights, Analyze the current direction of the circuit, Finding faults is very simple. If Santana's 3,000 lights are n' t on, You can test the safety S13 and S14 without electricity with a test light or a digital multimeter, if it has no electricity. Electricity, Then check that the lights are normal, Whether the phenomenon is good or not; If there's no electricity, And then forward, See if you combine the switches, If there's electricity, Then check the combination switch is correct; If there's no electricity, Keep testing, Check for master insurance, 30 lines, If there's no electricity, You must test the main insurance and 30 lines; If there's electricity, Check the bulb, whether the lamp holder and iron are intact. Therefore, According to the basic knowledge of the electrician, circuit faults can be easily identified.

Electromagnetic phenomena mainly introduce magnetic field, electromagnetic force, electromagnetic induction and other knowledge. This knowledge. applied in what aspects of the car, mainly the car alternator, the speed sensor in the ABS system and the car speedometer. Getting knowledge is based on these electromagnetic aspects, and you can simply analyze how it works. For example, the vacuum solenoid valve in the automobile air conditioning system, the solenoid valve, plays the role of electromagnetic clutch circuit in the air conditioning at the same time, the electromagnetic coil of the vacuum converter valve is connected [2]. Vacuum transfer valve to improve idle speed. The working principle of the solenoid valve is: when the power is activated, the electromagnetic coil produces the forced electromagnet, which is used to lift the seat closing part and the valve opening; when the power supply is closed, the electromagnetic force disappears and the spring is pressed on the part, the seat and valve are closed. And these, based on the electrician's basic knowledge of electromagnetic phenomena. After learning these basic knowledge, they are first able to analyze the principle and function of some unit circuits.

Figure 1 Maintenance tool

2.2. Power Supply

The power supply design of the detection circuit is also one of the important technologies for on-line detection of bus temperature and high voltage switch contacts.State Electric Power Laboratory according to the long-term electric power detection research and design.mainly considering the actual needs in the power system, a special high frequency switching power supply with multiple high insulation voltage outputs is designed. this power supply has applied to the state for patent intellectual property protection.

2.3. Temperature Detection Circuit

Temperature detection circuits usually use integrated temperature sensors with good performance AD590, This device is a temperature-controlled current source that converts temperature sensors into μA current values in the same unit as absolute temperature values, with temperatures ranging from -55°C to +150, and temperature errors generally not exceeding 0.5°CC.. AD590 type is a small, easy to install and connect temperature sensitive current source device. The temperature transmission characteristics of busbar and contactor are high. hence, AD590 can be

respectively connected to the high voltage total line (or conductive copper strip as close as possible to the high voltage switch contacts) and 2 pins can be connected to the detection circuit. Test circuit and output transform on 40 mm×60 mm×30 mm circuit board [3]. in size, the detection circuit board (including the power supply) is located in the fixed part of the temperature sensor in the M and is respectively fixed on the conductive copper strip near the contact of the high voltage switch. the contact and bus bar to be detected on the temperature detection circuit and the SW have the same potential.[3]. Since the original side of the output conversion is only a few turns, only a high voltage cable is required between the two conversions. In order to maintain sufficient length, you can ensure easy and flexible installation of the temperature detection circuit without contact with the original switch, so its installation is very fast, convenient and safe and flexible.

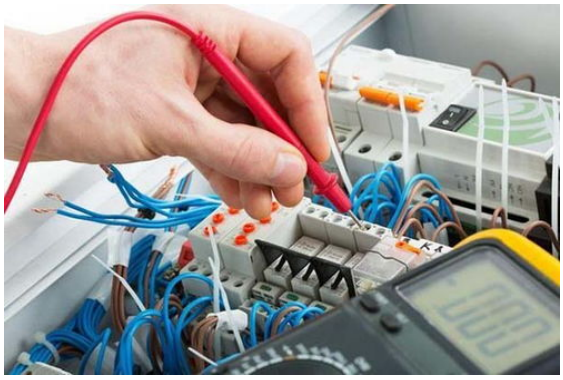

Figure 2 Maintenance process

Figure 3 Maintenance machinery

3. The Use of Digital Multimeters

As a professional automobile maintenance personnel, digital multimeter is one of the most widely used testing tools, so it is very important to learn to use it skillfully. Use it. Digital multimeter is also an important field of study in electrical engineering and electronics [4]. Digital multimeters in electrical and electronic technology are used to measure resistance, voltage, short circuit, diode and transistor circuits are good or bad, learn the basics for repairing cars. Very common.

3.1. Determination of the Quality of Automobile Components by Measuring Resistance

in automotive repair technology. measuring resistance on digital multimeter is very common, by measuring the resistance of relay coil to determine the quality of rel; we can measure the speed resistance of air conditioning fan to detect abnormal work of fan, etc.

3.2. Fault Diagnosis of Automobile Circuit by Voltage Measurement

The most common digital multimeter measuring voltage in a car is to measure the battery voltage is normal; other applications, such as boot, detection battery voltage, detection battery voltage, etc.

Electrical tests were carried out on electrical equipment to detect whether the voltage drop at both ends of the electrical equipment is normal. Digital voltmeter. A multimeter n is used to measure the operation/stop of the line and to quickly determine whether the car line is faulty [5]. You can use a digital multimeter resistor file with 200 files, or a digital multimeter for detecting circuits. When measuring resistance with a resistance file, the normal conductance line resistance should be less than 0.5 ohms, tan when the line is normal, there should be a buzzing sound, and the voltage drop of the digital multimeter should be observed at the same time, as long as the e voltage drop does not exceed 0.001 V. When using the digital multimeter, why rely on the voltage drop shown by the multimeter, because the multimeter shows a voltage drop resistance of 20-30 ohms, measuring with the buzzer multimeter also sounds good, but the wire with a resistance of 20-30 ohms is not normal.

4. Conclusion

Electronic and electrical technology plays a great role in automobile maintenance industry in China. Through this article, we also understand the close relationship between the application scenario of electronic and electrical technology and this key technology. To sum up, the emergence of electronic and electrical technology fully meets the higher requirements of network networks in different industries, and its application makes the speed and coverage of network network better than the previous electronic and electrical technology. Therefore, in the practical application of electronic and electrical technology involving various complex advanced technologies, it is necessary to fully understand the key technologies and mastering ways of electronic and electrical technology, combine the characteristics of different application scenarios, select the corresponding technologies, and promote the optimization of application impact. The automobile industry can integrate the big data processing technology with the automobile industry information processing, form the online information processing, and then develop the related network information software, and implement the timely and effective online information processing, so as to promote the development of the automobile industry to implement the network information processing mode. The information processing technology of automobile industry includes three parts: information processing technology, information database technology and security and secrecy technology. It is necessary to establish an information security system to prevent attacks and threats against the processing information system. Establish a complete information database, preferably with full documentation of all information [6]. From the whole process of system research, design, programming, to system debugging, system developers and software developers can fully understand the situation of the company's maintenance management, starting from the actual management, as a result of the operation of the maintenance management personnel to conduct a comprehensive analysis, and the maintenance management personnel in the maintenance management of the role of careful design and development. The system has been popularized and used throughout the company, and has been welcomed by maintenance managers at all levels and improved the management level. improve maintenance management to a new level.

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