Application analysis of electrical and electronic technology in automobile maintenance field

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Abstract: In recent years, China's economy is in the stage of continuous growth. People focus more on the quality of life. In terms of travel tools, more and more people choose cars, which promotes the development of the automobile industry. People not only have higher requirements for vehicle quality, but also have greater demand for vehicle maintenance because it will inevitably lead to vehicle damage during use as a long-term consumable. Under the influence of this background, it is particularly important to reasonably use electrical and electronic technology in the field of automobile maintenance. It can effectively and reasonably maintain the automobile and weaken the damage caused by long-term use.

1. Introduction

With At this stage, although automobiles are becoming more and more popular, the automobile related service industry has not kept pace with the times, and it lacks a large number of relevant professionals in automobile maintenance. Therefore, at present, higher vocational colleges attach great importance to the construction and construction of automobile maintenance specialty, and have built a series of relevant courses for automobile maintenance, especially electrical and electronic technology, because electrical and electronic technology is closely related to automobile structure, design and maintenance. Only by learning relevant basic knowledge of electrical and electronic technology. Can lay a good foundation for the study of automobile maintenance technology. Only by learning electrical and electronic devices in the automobile, so that we can improve the effectiveness of learning in the study and mastery of automobile maintenance technology, master relevant automobile maintenance technology skillfully and quickly, and apply it to the actual automobile maintenance work [1].

At present, although the automobile repair industry has a very good market prospect, the popularization speed of automobiles and the number of automobiles are increasing, which has created good conditions for the development of the automobile repair industry, there is a lack of relevant professionals, and the number of professional and technical automobile repair talents is relatively small. Therefore, it is necessary to strengthen the training of professional automobile repair talents at this stage, Actively construct and improve the relevant automobile maintenance education system. At the same time, there are many parts to be improved in maintenance technology, which still need innovation and optimization. Automobile is composed of various components, including various circuits and electronic components, which are closely related to electrical and electronic technology. Therefore, in the current automobile maintenance training system, automobile maintenance personnel are required to fully master relevant electrical and electronic technology. Only in this way can they lay a relevant foundation for the subsequent study of professional maintenance skills and knowledge. At the same time, electrical and electronic technology is not a pure theoretical discipline, which is closely related to specific practice. In the current application of electrical and electronic technology, it has been verified that it can provide effective help for the development of automobile maintenance and greatly improve the efficiency and quality of maintenance. However, in the specific technical application, Due to the influence of some reasons, the technology application is difficult to achieve the expected effect. Therefore, in the current application of electronic and electrical technology, it is necessary to combine it with the

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relevant actual situation and give full play to the value and effect of electronic and electrical technology in maintenance. Therefore, the article analyzes the specific application of electronic and electrical technology in automobile maintenance.

2. Fundamentals of electrical and electronic technology

2.1 Electrician Foundation

The electrical foundation in the field of automobile maintenance mainly refers to the basic laws of circuit analysis and electromagnetic phenomena. Circuit analysis and design Ohm's law, circuit composition, circuit diagram, power supply, switch, guidance, electrical equipment, etc. In the automotive system, there are many complex electrical circuits. It is difficult for ordinary people to distinguish the circuit path, connected power supply and controlled electrical equipment, which requires the automotive maintenance personnel to master the electrician foundation. Automobile maintenance involves fault detection and maintenance of power supply, tail lamp, small, connector, combination switch, insurance and other electrical equipment and their electrical circuits. The power consumption trend of general automobile circuit is as follows: the lamp switch E1 is placed in gear 1 or gear 2. Small lamp The working current in the tail lamp starts from the positive pole (+) of the battery and passes through the main fuse $S301 \rightarrow line 30 \rightarrow 30$ terminal of the lamp combination switch \rightarrow gear 1 or 2 of the lamp switch \rightarrow 58L terminal and 58R terminal of the lamp combination switch \rightarrow fuse S13 and S14 \rightarrow left and right small filaments of the headlamp and left and right tail filaments \rightarrow grounding \rightarrow negative pole of the battery (-) and finally light up the front and rear small lights and tail lights. If you know the circuit direction, it is easy to find the fault by using a universal meter to detect the fault in the order of circuit direction in vehicle maintenance. The universal meter is mainly used to detect the contact of the line. If the contact is good, continue to detect forward. If the contact is bad, check the switch, and then move forward in turn Test until the fault is found. The basic laws of electromagnetic phenomena include basic theories such as electromagnetic induction, electromagnetic force and magnetic field. Automobile speedometer, automobile speed sensor and AC engine can be analyzed according to the basic law of electromagnetic phenomenon. If the solenoid valve has obvious electromagnetic force when it is powered on, and the electromagnetic force cannot be detected when it is powered off or short circuited.



Figure 1 Power consumption trend of automobile circuit

2.2 Fundamentals of Electronics

Basic electronics mainly refers to automobile fault maintenance involving electronic components,

and analyzes faults according to the basic knowledge of diode and triode electronic circuits. The general automobile AC engine has $6 \sim 11$ diodes. Detecting diode fault can analyze the safety of automobile rectifier circuit. The triode is the signal transmission line of the computer version of the vehicle. The control of electronic components by automobile ECU is realized by triode, so the fault of electronic components can be understood by detecting triode. The main executive electronic components of triode control include transmission solenoid valve, relay, waste recirculation valve, idle speed control valve, engine fuel injection, generator rotor coil, electronic coil, etc. Understanding the fundamentals of automotive electronics, such as the working principle of triode electrode control machine, can detect and repair automotive faults according to its working principle and control mode, which will help to improve the efficiency and accuracy of automotive maintenance.

3. Current situation of automobile maintenance industry and the importance of electronic and electrical technology

In the current auto repair industry, although it has a very good market prospect, the popularity of cars and the number of cars are increasing, which has created good conditions for the development of the auto repair industry, there is a lack of relevant professionals, and the number of professional and technical auto repair talents is relatively small. Therefore, it is necessary to strengthen the training of professional auto repair talents at this stage, Actively construct and improve the relevant automobile maintenance education system. At the same time, there are many parts to be improved in maintenance technology, which still need innovation and optimization. Automobile is composed of various components, including various circuits and electronic components, which are closely related to electrical and electronic technology. Therefore, in the current automobile maintenance training system, automobile maintenance personnel are required to fully master relevant electrical and electronic technology. Only in this way can they lay a relevant foundation for the subsequent study of professional maintenance skills and knowledge. At the same time, electrical and electronic technology is not a pure theoretical discipline, which is closely related to specific practice. In the current application of electrical and electronic technology, it has been verified that it can provide effective help for the development of automobile maintenance and greatly improve the efficiency and quality of maintenance. However, in the specific technical application, Due to the influence of some reasons, the technology application is difficult to achieve the expected effect. Therefore, in the current application of electronic and electrical technology, it is necessary to combine it with the relevant actual situation and give full play to the value and effect of electronic and electrical technology in maintenance. Therefore, the article analyzes the specific application of electronic and electrical technology in automobile maintenance

4. Application of electrical and electronic technology in automobile maintenance

4.1 Application analysis of Electrical Technology

Linear, electronics and other related knowledge belong to electrical technology, especially circuit analysis, and automobile repair is an important link of automobile maintenance. Only by mastering relevant electrical technology can we do a good job in the analysis of automobile maintenance related circuits and find out the fault lines and causes. For example, in order to clearly grasp and analyze the fault line of automobile tail lamp, the maintenance personnel must have the basis of electrical technology, and carry out insurance analysis and fault diagnosis for various relevant components such as contactor, insurance and power supply. At present, the current detection of relevant lines is generally completed through the digital universal meter. In the specific detection, if the tail lamp flows through the current, check whether the connector and other relevant devices have poor contact. After the detection, the tail lamp does not pass through the current. In the specific detection, if the tail lamp flows through the current, check whether the connector and other relevant devices have poor contact, There is no current passing after the test. Specifically, test whether there is current passing. To effectively analyze the specific faults, causes and faults of automobile circuits, we must fully understand the knowledge and technology of automobile circuits. The wide application of electrical and electronic technology in automobile maintenance will fill the domestic technological innovation and improving the fit between them, the quality level of electrical and electronic technology can be improved, so as to improve the efficiency of automobile fault maintenance, which is conducive to the smooth progress of practical work. At present, the efficiency and quality of automobile maintenance is a very key problem, and the scientific application of Electrotechnics and electronic technology is becoming more and more important. The automobile repair industry has broad prospects and great development potential, but to be competent for automobile repair work, we must have corresponding electrical and electronic technology knowledge, and ensure the efficiency and quality of automobile repair work through the study and effective practice of electrical and electronic technology in study and work.

4.2 Application analysis of electronic technology

The development environment of electronic information technology mainly depends on the domestic technical environment and the achievements of foreign developed countries in electronic technology. The advantages of China's technological environment are shown in two aspects. First, the continuous improvement of China's comprehensive national strength and the development of computer network communication technology have played an important role in China's economic informatization. Second, the popularization and application of China's public digital data network, China's public computer Internet and public packet switching data network in modern network technology marks the interconnection between China and the Internet. Shortcomings: there is still a big gap in the opening level of foreign software compared with foreign countries. Although most application software have made a lot of breakthroughs, the development of domestic software market still needs to rely on foreign technology for guidance and reference. The main reason for this situation is that the development scale of Chinese software enterprises is smaller than that of foreign countries, The international software market does not look up to China's software technology, which leads to the low sales proportion of China's software in the international market. In addition, piracy is common in all countries in the world, which directly affects the enthusiasm and innovation consciousness of China's software developers. As a means of transportation, especially in recent years, the rapid development of automobile in China has led to China's automobile becoming a universal and extensive means of transportation. Therefore, there are more and more research topics on Electronic Technology in the automobile field. With the increasing number of research topics, the automobile industry has high hopes for electronic technology and is the main object of attention, Indeed, in recent years, the development of automobile industry has also driven the rapid development of electronic technology. The automobile has gradually changed its application value direction, making it not only the main modern means of transportation, but also the carrier of scientific and technological development, providing a new direction for the development of science and technology. Nowadays, there are more and more external electronic configurations of automobiles, which is not only the embodiment of automobile brands, but also the sign of the entry of automobile electronization into automobiles. Electronic technology has also contributed a lot in the field of automobile maintenance, which makes the innovation and development of automobile maintenance work.

4.3 Application of digital multimeter during vehicle maintenance

At present, in the auto repair industry, the application of electronic and electrical technology is also closely related to the digital multimeter. The use of digital multimeter can more accurately and effectively complete the measurement and judgment of relevant current, voltage, resistance and circuit, find faults and solve problems in time. Today's auto maintenance workers should strengthen their study and application, Master the use methods and skills of multimeter. Therefore, the specific application of digital multimeter is further discussed. ① In automobile maintenance, the performance of automobile parts is judged by resistance test. It is to judge the performance of parts by measuring the resistance of relevant components, so as to determine the fault point and cause. For example, use a digital multimeter to detect the coil resistance of the relay. If there is a great difference between the resistance and the calibration resistance, it indicates that the relay has a fault. Then use a digital multimeter to detect the speed regulation resistance value of the fan. If the resistance value does not meet the calibration resistance value, it indicates that there is a fault in the operation of the fan. ② Measure the pressure to judge the vehicle fault; There are various electric equipment in the vehicle. According to the measured extreme voltage, whether the equipment is faulty can be judged. The voltage measurement can be realized by multimeter. The multimeter in practical application can quickly complete the power-off detection of the line, so as to judge whether there is a fault in the line. Therefore, there are many keys in the specific application of digital multimeter. As an automobile repairman, we must constantly learn the relevant application skills and knowledge of multimeter, so as to make the multimeter the most effective weapon in our work.

5. Conclusion

In short, the wide application of electrical and electronic technology in automobile maintenance will contribute to the convenience and efficiency of maintenance work. It is not only conducive to improve the application of technology in maintenance work, but also stimulate the wide application of technology to more industries. In addition to the use of electrical and electronic technology in automobile maintenance, the outbreak period of other industries is also lurking. Electrical and electronic technology is widely used, but it is highly compatible with automobile maintenance. It is really no exaggeration to say that the emergence of electrical and electronic technology is the destiny of automobile maintenance. During this period, the development of new energy in the automotive industry is also quite rapid. It is precisely because new energy conforms to the environmental protection principles to be adhered to in the automotive industry, and the combination of these three will open the automotive maintenance work to the next automotive new era.

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