

Unit Standard **30563**

Demonstrate knowledge of automotive charging and starting systems

Level 3 Credit 4 v1

Student Name:

School:

Date:

Marked By: _____ **Mark** _____ **%**

Feedback: **Excellent work**

Good work

Please attempt all questions

Please resubmit

USEFUL WEBLINKS

Magnetic Fields

<http://youtu.be/uj0DFDfQajw>

<http://youtu.be/tKxFLH2Nhe4>

<http://youtu.be/gfJG4M4wi1o>

Right Hand Rule

<http://youtu.be/9Zy0VHBXxLU>

<http://youtu.be/bBwM3Q6zGag>

<http://youtu.be/8VFFmsFwvb0>

Mutual Inductance

<http://youtu.be/ZDBfDTEMGaQ>

<http://youtu.be/Z8P1vbsUOF8>

<http://youtu.be/tJQTEpVYNok>

Transformers

http://youtu.be/vh_aCAHThTQ

<http://youtu.be/ZjwzpoCiF8A>

<http://youtu.be/b6uru1IYUeI>

Starting and Charging

<http://youtu.be/y20ANfRMJ8A>

<http://youtu.be/tiKH48EMgKE>

<http://youtu.be/HLNugJwBRow>

http://youtu.be/8WD5Q_Pf3pM

<http://youtu.be/znrN2mgtxoM>

<http://youtu.be/ITFW2PkqXWw>

Stators

<http://youtu.be/MWU2TbEePsY>

Diodes

http://youtu.be/MVy_MG0X2h4

<http://youtu.be/sThCKFmCUyc>

Voltage Regulator

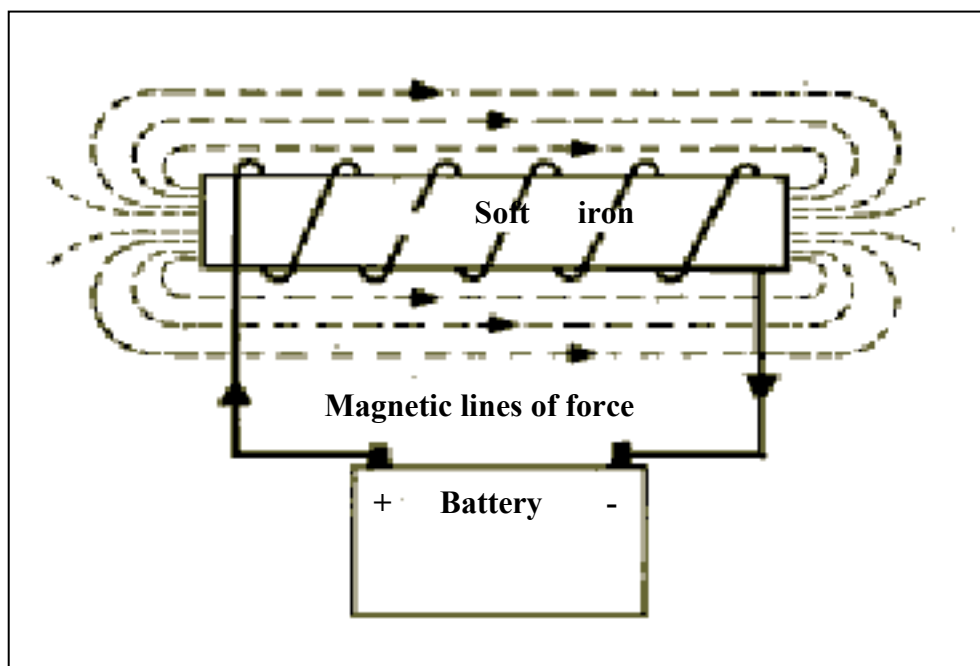
<http://youtu.be/UxXuKOQTASE>

REVIEW QUESTIONS ONE

- Q1 What will happen if two N poles of a permanent magnet are brought together?
- Q2 Magnetic lines of force have five properties. These are?
- Q3 Why will a bar magnet that is pivoted at its centre, move when it is placed in the magnetic field of a horse shoe magnet?
- Q4 In which direction will the magnetic field around a current carrying conductor rotate if the current in the conductor is flowing away from you?

Q5 What happens to a magnetic field when a coil is used rather than a permanent magnet?

Q6 (a) If a solenoid is connected to a battery as shown, indicate the north and south poles?



(b) Which rule is used to determine the polarity?

Q7 There are three conditions that induced EMF can be produced in a wire. These are?

Q8 What is meant by the term “Mutual Induction”?

REVIEW QUESTIONS TWO

Q9 List seven components of a typical charging system.

Q10 State the function of the following components in a charging system.

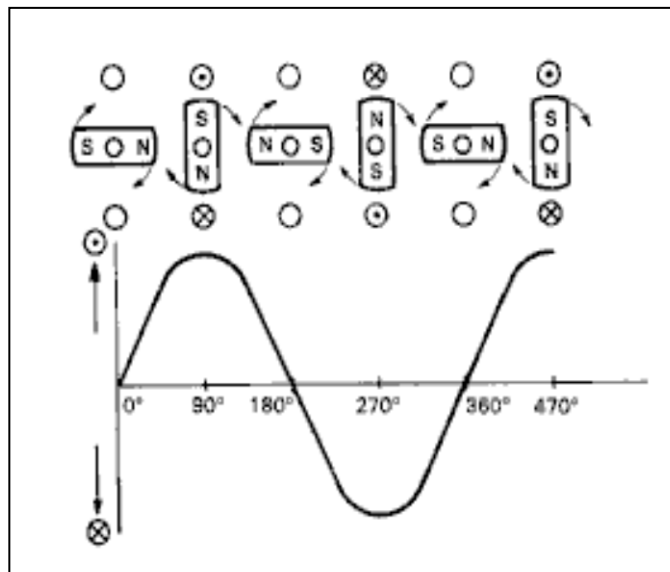
Alternator

Voltage regulator

Warning lamp.

Q11 The magnitude of the current induced in a coil by a changing magnetic field is dependant on three factors. These are:

Q12 At what two points on the sine wave shown below is current output at its maximum? Please answer in degrees.



Q13 What is meant by the terms

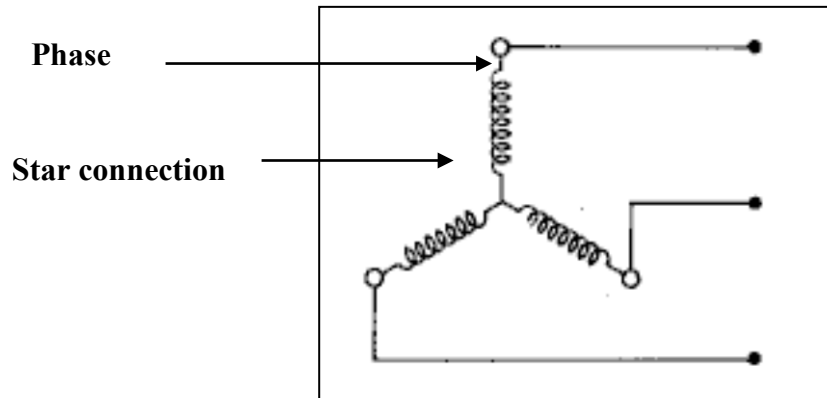
(a) Three phase.

(b) Cycle.

(c) Frequency.

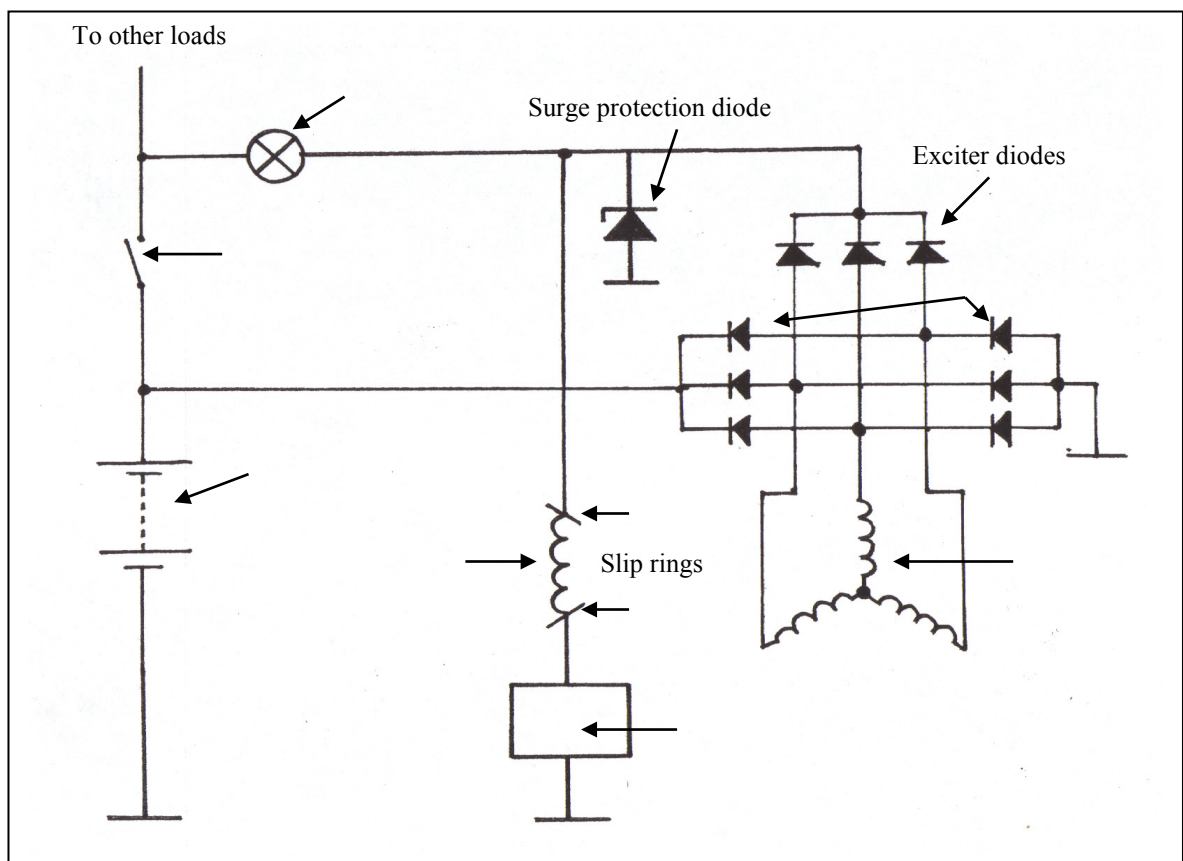
Q14 Describe how a rotor produces a north and a south magnetic pole.

Q15 The circuit diagram shows a star connected stator. What is the output of this stator?



Q16 Complete the diagram below by entering the appropriate component from the list provided

Battery - Diodes - Ignition switch - Stator - Rotor - Voltage regulator - Warning lamp

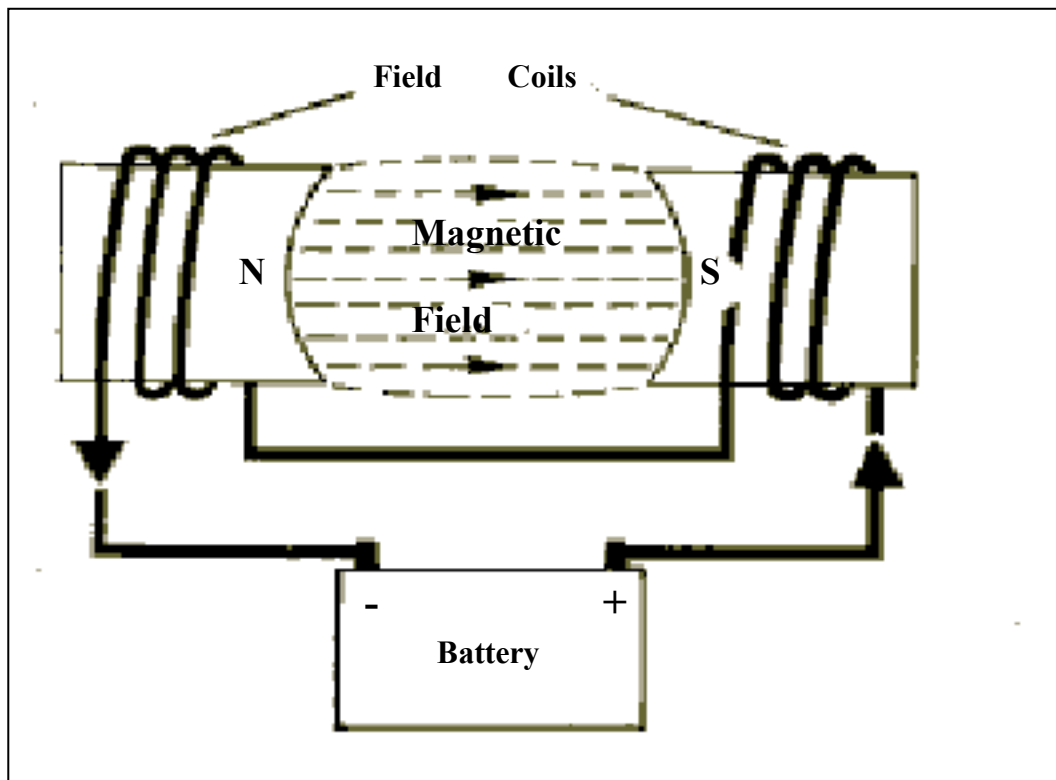


Q17 What is the range of voltages that the voltage regulator normally controls the alternator's voltage output to?

REVIEW QUESTIONS THREE

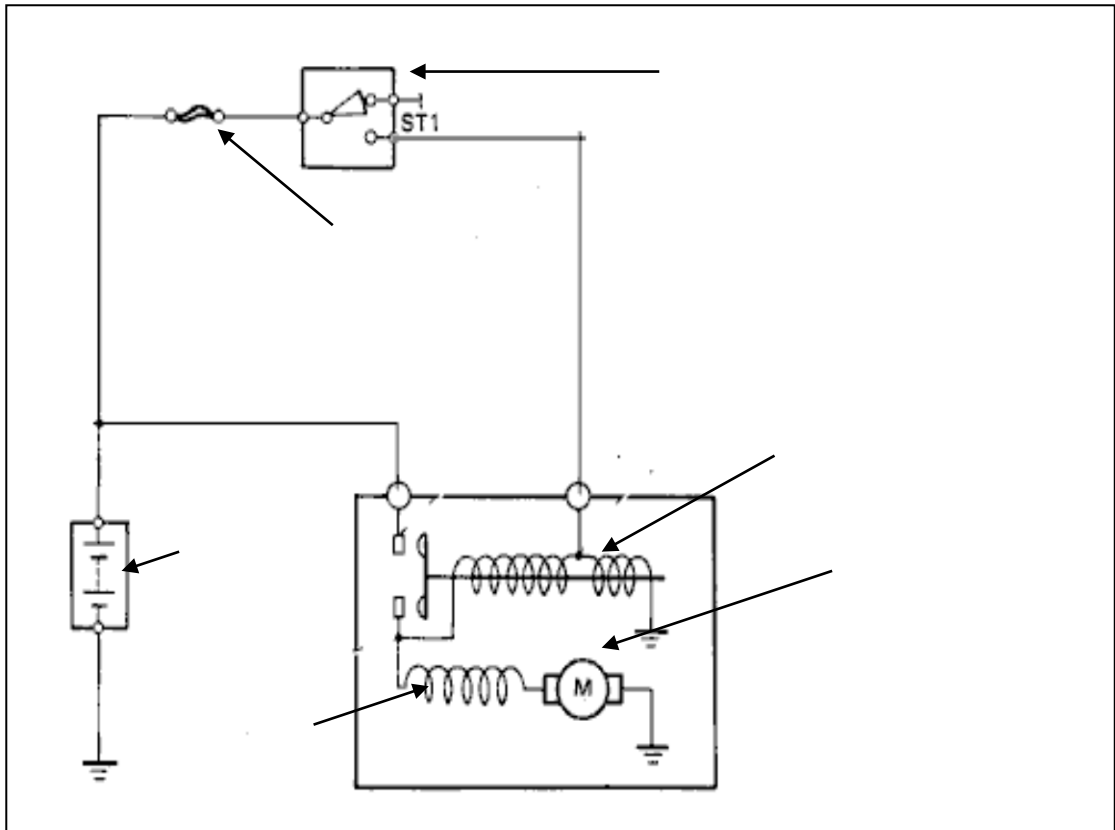
Q18 When must the torque of a starter motor be at its maximum?

Q19 Explain why the pole shoes shown below have a curved shape.



Q20 Complete the diagram below by entering the appropriate component from the list provided

Battery - Armature - Fusible link - Starter switch - Solenoid coils - Field coils



Q21 Describe the function of the following in a starter motor.

Solenoid switch

Field coils

Brushes

Armature

Q22 Describe how an inertia starter motor engages and disengages the flywheel.

Q23 State three functions of the pre-engaged starter solenoid.

Q24 Complete the following statement on pre-engaged starter operation.

Turning the _____ to the START position connects the

_____ to the starter solenoid _____ coil. A

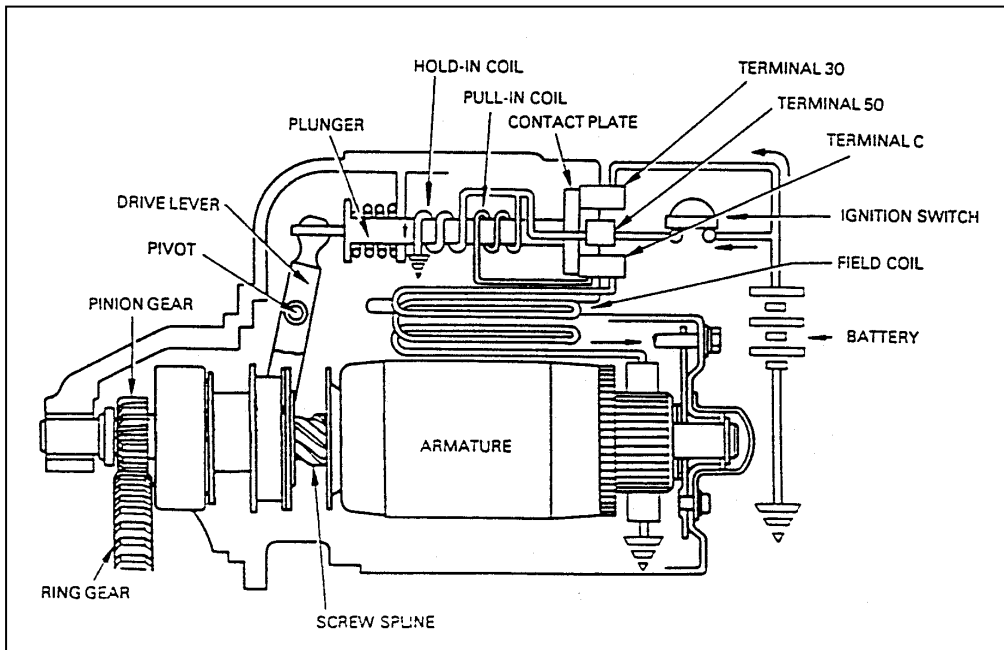
_____ is created in the solenoid _____ and the iron

_____ is drawn into the solenoid coil and a lever connected to the

_____ engages the drive pinion gear into the

ring gear.

Q25 Identify the starter motor type shown below and explain how it operates



Q26 What is the purpose of the overrunning clutch in a starter motor?