VEHICLE SERVICING AND REPAIRING

NTQF Level II

Learning Guide-#10

Unit of Competence: - Use Garage Information System

Module Title: - Using Garage Information System

LG Code: EIS VSR2 M04 LO1-LG-10

TTLM Code: EIS VSR2 TTLM 0919v1

LO1: Identify characteristic of surface of System

Instruction Sheet	Learning Guide#13

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Identify characteristic of surface of System
- Identify operation of system
- Apply for Information

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Identify characteristic of surface of System
- Identify operation of system
- Apply for Information

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 13.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page __.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #2.
7. Submit your accomplished Self-check. This will form part of your training portfolio.
8. Read the information written in the “Information Sheet 2”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
9. Accomplish the “Self-check 2” in page __.
10. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 2).
11. Read the information written in the “Information Sheets 3 and 4”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
12. Accomplish the “Self-check 3” in page __.

13. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks.

Information Sheet-1	Identify range of capacity

Identify range of capacity

Capacity is the maximum output rate of a facility
Capacity planning is the process of establishing the output rate that can be achieved at a facility
Capacity is usually purchased in “chunks”Strategic issues: how much and when to spend capital for additional facility & equipmentTactical issues: workforce & inventory levels, & day-to-day use of equipment

Forecasting Capacity: Long-term capacity requirements based on future demand Identifying future demand based on forecasting at this level, relies on qualitative forecast models Executive opinion Delphi method Forecast and capacity decision must included strategic implications Capacity cushions Plan to underutilize capacity to provide flexibility Strategic Implications How much capacity a competitor might have Potential for overcapacity in industry a possible hazard.

Capacity alternatives include

- ✓ Cou.ld do nothing,
- ✓ expand large now (may include capacity cushion), or
- ✓ expand small now with option to add later

Use decision support aids to evaluate decisions (decision tree most popular

Vehicle info, Diagnosis, troubleshooting circuit Diagrams and Equipment Vehicle characteristics

Basic Troubleshooting

Most circuit problems are due to incorrect assembly, always double check that your circuit exactly matches the drawing for it. Be sure that parts with positive or negative markings are positioned as shown in the drawings. Be sure that all connections are securely fastened. Always use a power switch to remove power when building circuits. Always check circuits before turning on power. Use my DAQ digital multi-meter (DMM) to test My Snap components if they appear to be damaged or not

working properly. Use eye protection when experimenting on your own circuits. Always remove power if circuit does not perform properly, and then use my DAQ DMM to check circuit for shorts or opens.

A **wiring schematic,** sometimes called a diagram, shows electrical components and wiring using symbols and lines to represent components and wires.A wiring schematic, sometimes called a diagram, shows electrical components and wiring using symbols and lines to represent components and wires.

In a schematic drawing, photos or line drawings of actual components are replaced with a symbol that represents the actual component.
Electrical wiring is shown as straight lines and with a few numbers and/or letters to indicate the following:

- Wire size
- Grounds and splice
- Circuit numbers
- Wire Color
- Terminals
- Wire Connections
- Connectors

Wire Color

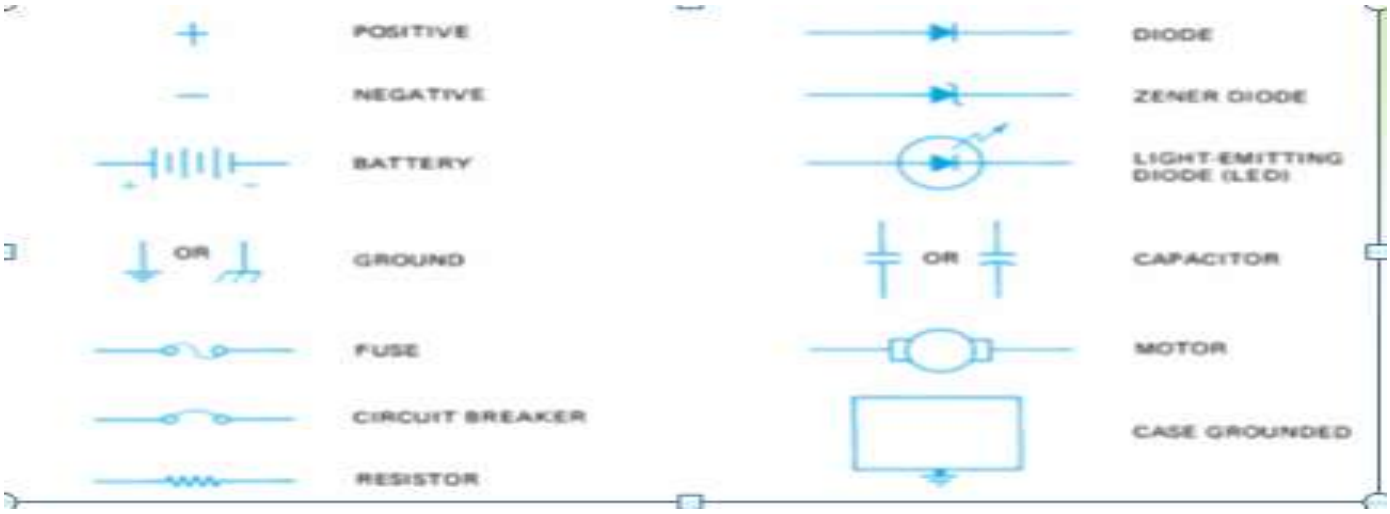
Abbreviation	Color
BRN	Brown
BLK	Black
GRN	Green
WHT	White
PPL	Purple
PNK	Pink
TAN	Tan
BLU	Blue
YEL	Yellow
ORN	Orange
DK BLU	Dark blu
LT BLU	Light blu
DK GRN	Dark gre
LT GRN	Light gre
RED	Red
GRY	Gray

WIRING SCHEMATICS
Circuit Information

Many wiring schematics include numbers and letters near components and wires that may confuse readers of the schematic.

The center wire is a solid color wire, meaning that the wire has no other identifying tracer or stripe color. The two end wires could be labeled “BRN/WHT,” indicating a brown wire with a white tracer or stripe.

Typical section of a wiring diagram. Notice that the wire color changes at connection represents the metric wire size in square millimeters.



- Vehicle restraint system information
- Vehicle systems operation capacities
- Basic service information
- Component identification
- Diagnostic information
- Fluid capacities
- Service information on CDs
- Software driven
- Covers multiple manufacturers
- Technical service bulletins (TSB) procedure
- Customer warranty information
- Maintenance schedules and fluid
- Owner manuals
- Service procedures Specifications
- Component location
- VIN information
- Volumes of information available
- covers multiple vehicle years
- Parts and labor guides
- Modified component and service

Up-to-date corrections for service manuals Manufacturers' upgrades and changes to

Vehicle lines

Starting at the top, the wire from the ignition switch is attached to terminal B of connector C2, the wire is 0.5 mm2 (20 gauge AWG) and is yellow. The circuit marker is 5. The wire enters connector C202 at
Terminal B3.

- ✓ Two wires that cross at the dot indicate that the twoare electrically connected.
- ✓ Wires that cross, but do not electrically contact each other, are shown with one wire bridging over the other.

Four vehicle types are considered: Hybrid, Electric, Diesel, and Gasoline .*Gasoline Cars* Gasoline vehicle works by burning the gasoline inside an engine in which anenginecombustiontakesplaceinternally.Table13describestheaverage characteristics ofa Gasoline Car in the US in 2009.

Diesel Cars:

Dieselcarstypicallyhavehigherexhaustlevelsofnitrogenoxidethangasolinecars.Automakerscitethehighcostofdevelopinganenginecleanenoughtomeet theUSstandards.Understandably,thishasmadealotofthemlukewarmaboutdieseenginesasasolutionforboostingfueleconomy.That,alongwiththefactthat

HybridCars:Ahybridcarfeaturesasmallfuel-efficientgasenginecombinedwithanelectricmotorthatassiststheenginewhenaccelerating.Theelectricmotorispoweredbybatteriesthatrechargeautomaticallywhileyoudrive.Therearetwotypesofgasolineelectrichybridcars:theparallelhybridandtheserieshybrid.Inaparallelhybridcar,agasolineengineandanelectricmotor worktogethertomovethecarforward,whileina serieshybridthegasolineengineeitherdirectlypowersanelectricmotorthatpowersthe vehicle or charges batteries that willpower the motor.

Electric Cars: An electric car is a car powered by an electric motor rather than a gasoline engine. The differences between gasoline and electric cars are:

- ✓ The gasoline engine is replaced by an electric motor.
- ✓ The electric motor gets its power from a controller.
- ✓ The controller gets its power from an array of rechargeable batteries
- ✓ The reasons for the growing interest in these vehicles are:
- ✓ Electric cars create less pollution than gasoline-powered cars,sotheyarean

Environmentally friendly alternative to gasoline- powered vehicles (especially in Cities)

- ✓ Hybrid cars development is strictly related to the progress of electric cars.
- ✓ Vehiclespoweredbyfuelcellsareelectriccars,andfuelcellsaregettingalotofattention rightnow.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1. Write the advantage of characteristic of surface System?[5]
2. Write the information which can be Capacity alternatives includes?[5]
3. What is the purpose range of capacity?[5]
4. Write four types vehicle are considered? [5]
5. What is the function of information system?[5]

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 1	Vehicle info, Diagnosis, troubleshooting circuit Diagrams and Equipment

Troubleshooting circuit Diagrams and Equipment

Purpose:

To enable the learners familiarize themselves in Vehicle info, Diagnosis, troubleshooting circuit Diagrams and Equipment from a technical job orders or on a given sample.

A sample production or a technicaljob orders with complete specification are given to learners

Tools and Equipment

- Hydrometer
- Open end wrench set
- Multi-meter/voltmeter, test light
- Battery analyzers
- Multi-meter/voltmeter, test light

Procedures

Basic Troubleshooting

1. Most circuit problems are due to incorrect assembly, always double check that your circuit exactly matches the drawing for it.

(a)

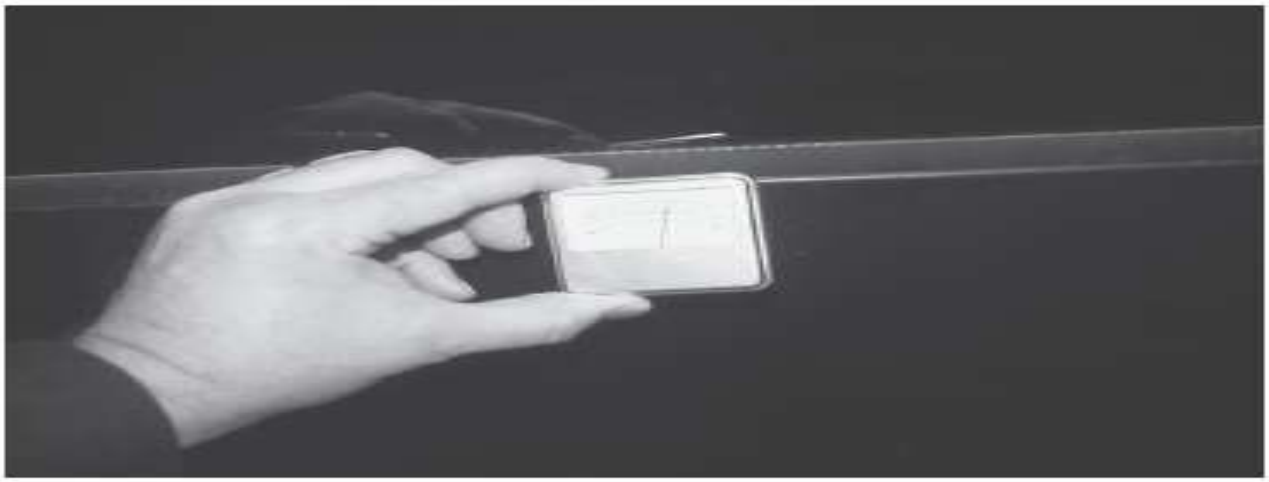
2. Be sure that parts with positive or negative markings are positioned as shown in the drawings.

3. Be sure that all connections are securely fastened.

4. Always use a power switch to remove power when building circuits.

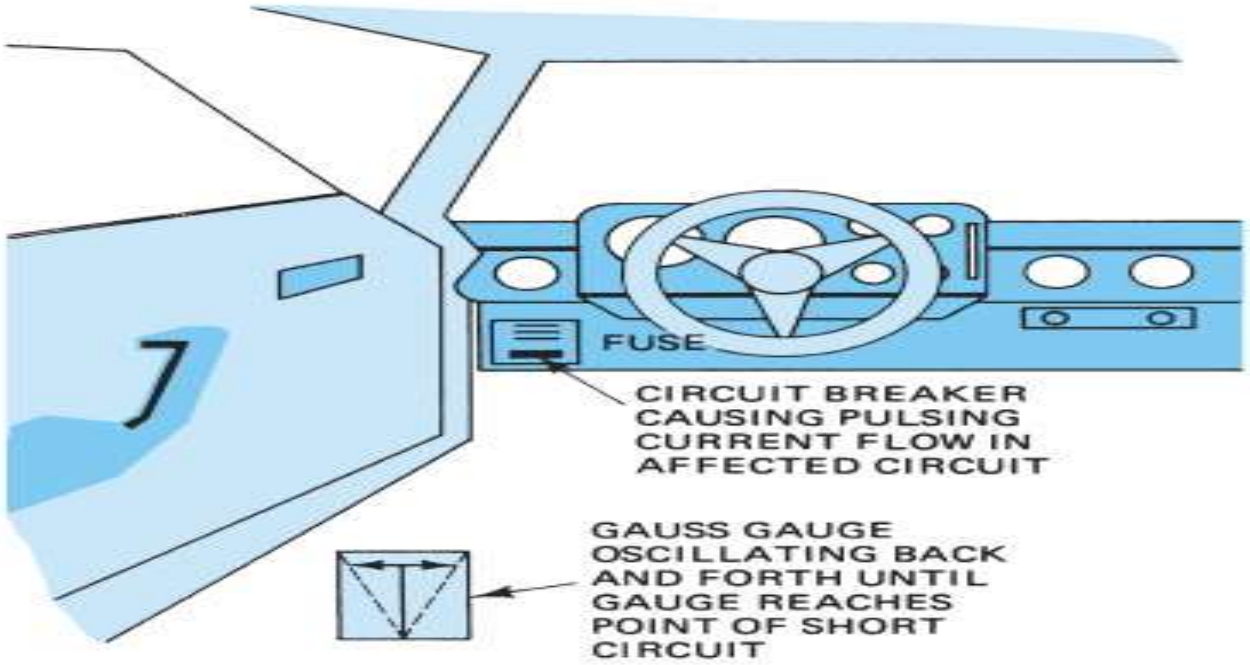
5. Always check circuits before turning on power.

6. Use my DAQ digital multi-meter (DMM) to test My Snap components if they appear to be damaged or not working properly.



(b)

7. Use eye protection when experimenting on your own circuits. 8. Always remove power if circuit does not perform properly, and then use my DAQ DMM to check circuit



Prepare By _____

Date _____

LAP Test 1	**Practical Demonstration**

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1:00 hour.

Task1. Identify terminals and check functionally (Normal resistance, Zero ohms or electrically open) by visually and instrumental (1:00 minute)

Information Sheet-2	Identify a certain model and type

Identify a certain model and type

DEFINITIONS

Manufacturer' means the person or body who is responsible to the approval authority for all-aspects of the type-approval and for ensuring conformity of production, and in whose name the whole vehicle certificate of compliance to CMVR is issued.

It is not essential that the person or body be directly involved in all stages of the construction and sale of the-vehicle, system, component or separate technical unit which has been offered for approval.

‘Model(Typeofvehicle)’meansagroupofvehicles,constructedbythesamemanufacturer,includingvariantsandversionsofaparticularcategory which do not differ in at least the essential respects specified in Annex A. A type of vehicle may contain variants and versions.

Note: A change in company’s name of manufacturer or a change in the legal form of owner ship of the company or mere transfer of certification of a model to other company are not considered as a change of manufacturer.

‘New Model (Type of vehicle)’means vehicle model(s) belonging ‘Model (Type of vehicle),as defined in 2.10, type approved after New Model implementation date. ‘New model implementation date’ means the date specified for the applicability of the provision for “New Model (Type of vehicle) for a provision. “Existing mode

l(typeofvehicle)’meansvehiclebelongingto‘Model(Typeofvehicle),asdefinedin2.10,typeapprovedonorbeforetheNewModelimplementationdate.‘Existing model (type of vehicle) implementation date’ means the date specified for the applicability of the provision for Existing model (type of vehicle) for a provision.

Note1 In the past, various expressions were used to indicate “New Model Type of vehicle)”and “Old Model Type of Vehicle”. Wherever such expressions are used to indicate different dates of implementation for “New Model Type of vehicle)”and “Old Model Type of Vehicle”,the above definition shall apply. These conditions apply irrespective of date of manufacture of the Vehicle. A compilation of such examples of such expressions is given in Appendix A for illustration.

The vehicle type classification methods in the previous research mainly consists of five Different categories:

- models that only consider very general classes of vehicles, such

As small car, compact car, large car, sporty car ,etc;

- models that consider general

Classes and vintages of vehicles, such as small old car, large new car, etc;

- models that Randomly select chosen alternative plus a certain number of alternatives from the total Number of combination of makes and models (i.e. Toyota, Camry)

- model that Randomly selectchosenalternativeplusacertainnumberofalternativesfromthetotal

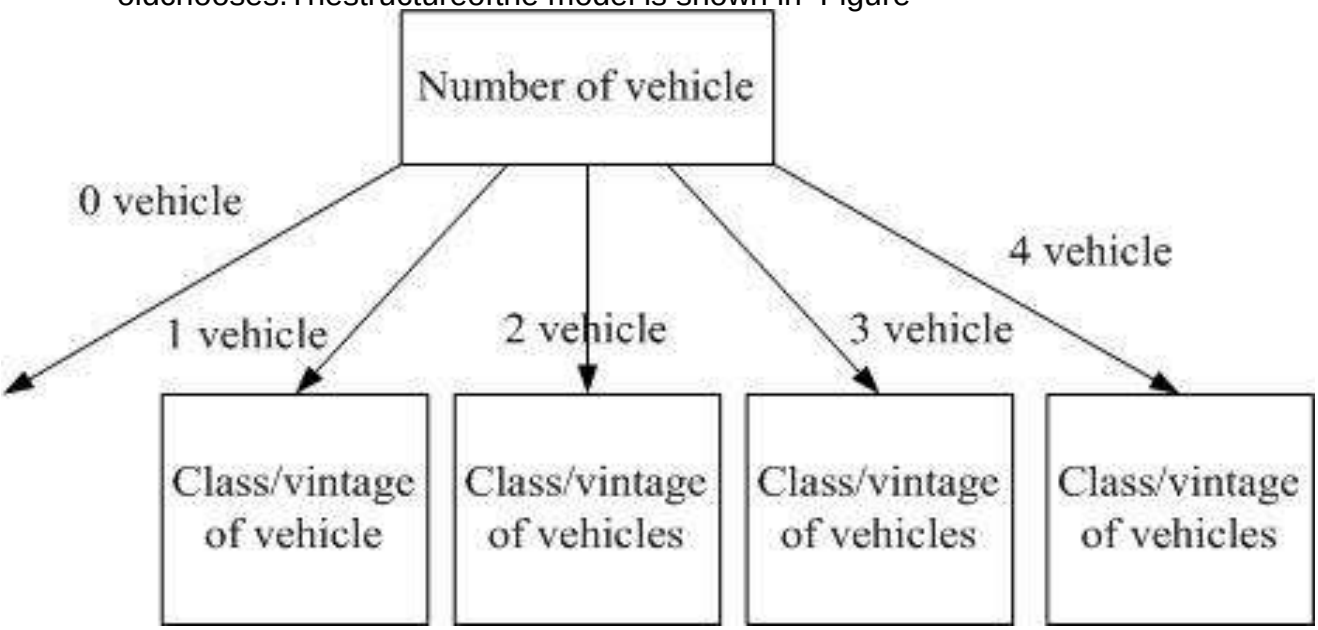
Number of combination of make, model and vintage (i.e.2003HondaCivic);(5)model that consider vehicle classes and vintages, such as 2005 mid-size car, 2007 SUV, etc.

Thepreviousstudieshavedifferentstandardsforvehicleclassification.Train(1986)distinguisheddomesticandimportedvehicles,whichreflectsthebrandloyalty.Thisisreasonablebecausewhenpeoplemakedecisionstheyfirstconsiderneworusedcar,theclass,andwhetheritisdomesticorimported.Brandloyaltyisbecominganimportantfactor in vehicle ownership modeling

.

***The Car Ownership Model* Structure of the Model**

Thecarownershipmodelisbasedon Nestedlogitmodel.Themodelconsistsofsubmodelsthatseparatelydescribethenumberofvehiclesowned,andtheclassandvintageofeachvehicle.Thefirstlevelistopredicthowmanyvehiclesahouseholdowns.Thesecondlevelistodecidewhichclassandvintageahouseholdchooses.Thestructureofthe model is shown in Figure



Structure of the Model

Accordingtothestructureofthemodel,first,thenumberofvehiclesthatthehouseholdownsispredicted.Ifthehouseholdispredictedtoownnovehicles,thennofurthercalculationsaremade.Ifthehouseholdispredictedtoownonevehicle,theclassandvintageofitsvehicleisthenpredicted.Ifahouseholdispredictedtoownmorethanonevehicle, then the model predicts the class and vintage of each of the vehicles.

Vehicle Quantity Model (1stlevel)

Thevehiclequantitymodelcalculatestheprobabilitythatahouseholdwillchoosetoownacertainnumberofvehicles.Thechoicesetthatahouseholdfacesiszero,one,two,three,fourormorevehicles.Theprobabilityofowningeachnumberofvehiclesdependsonfactorsthatreflectthehousehold'sneedforvehiclesanditswillingnessorabilitytoPurchase vehicle

Vehicle Type Choice Model (2ndlevel)

The vehicle type choice model calculates which class sand vintage vehicle(s) a household owns, given the number of vehicles. The probability and the utility function can be

written similarly:

$$P_i = e^{V_i} / \sum_{j \in J} e^{V_j}$$

$$V_i = \beta_i z_i$$

Where V_i s weighted sum of factors affecting the desirability to the house hold of Owning a vehicle of class and vintage combination .z_i is vector of characteristics of vehicles in class/vintage *I* and characteristics of household ,and is a vector of parameters to be estimated.

For estimation ,each household is as sumed to have a choice among 12 classes of vehicle for each 10 vintages, making a total of 120 alternatives from which to choose .In our models the vehicles are classified as follow:

1. small domestic car;
2. compact domestic car
3.mid-size domestic car
4. large domestic car;
5. luxury domestic car;
6.small imported car;
7. Mid-size imported car;
8.large imported car;
9. sporty car;
10. Min van/van;
11.pick up trucks
12.SUVs.

Identifying model of Vehicle

By description, VIN- Identification, country specific identification code, Last number of vehicles

What is a VIN?

The vehicle identification number (VIN),

Since model year1981,is aseriesof17letters

and numbers.Accepted as the North American

standard for identifying vehicles, the

VIN provides key information about

The manufacturer, model, model year,

Make equipment and class of a vehicle.

Very similar to a fingerprint, the VIN uniquely

Identifies a specific vehicle to the insurance

Industry, law enforcement, government,

Consumers and concerned stakeholders.

TheVINservesavarietyofpurposes.Aswellasprovidingidentificationinlicensingandinsuringthevehicle,the histo-ryofthevehiclecanbetracked.VINcodesprovidecom-pletevehicleinformationincluding:•isthevehicledefective(lemoncar)•hasthevehiclebeentotaledorhadmajoraccidentdamage•hasthevehiclehdflooddamage•hasthevehiclehadodometerfraud has the vehicle been stolen

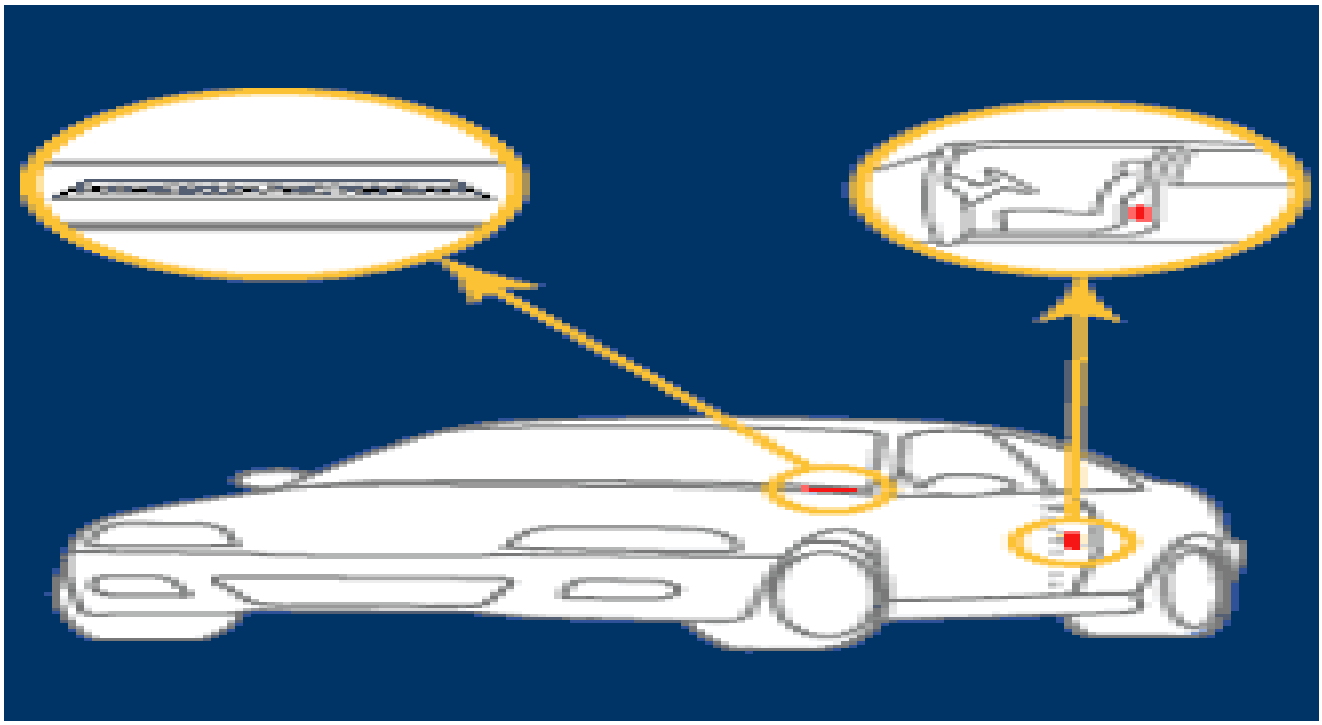
VIN's purpose cont.

It displays a car's uniqueness and heritage and provides a form of factory to scrap yard identification.

It can be used to track recalls, registrations, warranty claims, thefts and insurance coverage.

Understanding the cars vehicle identification number has become very popular with car collectors for new and old vehicles alike.

Typical locations



Location
The Vehicle Identification Number is also imprinted on the:
Vehicle Safety Certification Label. And Frame rail.

Parts
Many OEM and aftermarket parts distributors need the VIN to find the correct parts, and some need the VIN to gain access into there parts system.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1 Write the advantage of characteristic of surface System.?
2 Write the information which can be Vehicle Identification Number.?
3 What is the purpose **VIN's** system?
4 Write types VIN's system?
5 What is the function of Vehicle Identification Number.?

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-3	**Select certain model and type**

Select certain model and type

Vehicle modeling

General models of various complexities can be found in most vehicle dynamics books. In Wong [25], one and two track vehicle models consisting of one to three

degrees of freedom are covered. The linear quarter car model and its resonance frequencies are studied for various parameters. Pitch and roll behavior of a vehicle is covered as well. A lot of work has been done on vehicles of various complexity and degrees of freedom. Vandi et al. [23] for instance, develops a 14-degree of freedom vehicle model that is to be used for simulation. It was desired to simulate individual
Torques and loads on each wheel for high performance prediction.

The developed model was compared to commercial software and good correspondence was established. Saglam and Unlusor [17], on the other hand, develop a 3-degree of freedom vehicle model in order to compare it to commercial software. Their results found that even simple model could stand up to more advanced multi-body models.
This is in agreement with the conclusions of Allen and Rosenthal [1] that compare simple and complex vehicle models. It is found that for regular driving, simple models are sufficient. However, as soon as the driving nears the vehicle dynamics capability limits, more complex models are required.

DOMESTIC VEHICLE IDENTIFICATION NUMBER (VIN) (Cont'd)

FORD TRUCK

1980 on

1970- 1981-

ENGINE CODE (Fourth Character) ENGINE CODE (Eighth Character)

1975- (from SN# 10000)

10000)

ENGINE CODE

Character) (Seventh Character)

J5A15E

1971- 1980

(up to SN#

ENGINE CODE

(Eighth

J4A154CN 00001

HUMMER

1995-

ENGINE CODE

(Fourth Character)

1989- 1988 1981- on

ENGINE CODE 1J7 E82H*TE013212

Character) (Eighth Character)

1J4ET37L*LT438789

ENGINE CODE

(Fourth

1JTH E811*HT309520

IMPORTED VEHICLE IDENTIFICATION NUMBER (VIN)

DAIHATSU

1988-

LAND ROVER

1992_____ ENGINE CODE (Eighth Character)

JD1FG120*J4200020

1987- _____ ENGINE CODE (Seventh Character)

SALHV124*MA123456

[redacted] MERKUR

1986-

on _____ ENGINE CODE (Eighth Character)

KMHBF31S*MU000001

1985- _____ ENGINE CODE (Eighth Character)

WF1BT81V *H1000010

[redacted] MG

1990-

79

1980 ENGINE CODE (Fifth Character)

on _____ ENGINE CODE (Fourth Character)

JNKN G01C*M1100001

1970- _____ ENGINE CODE (Second Character)

GN N5UH000001G

[redacted] MITSUBISHI

1981-on

SUZU (EXCEPT OASIS)

1983- ENGINE CODE (Eighth Character)

JABRT697*FU015643

JA4MT41P *WP123456

[redacted] NISSAN (EXCEPT QUEST)

1980 on 1995-on

1979- _____ ENGINE CODE (Fifth Character)

1981- _____ ENGINE CODE (Seventh Character)

_____ ENGINE CODE (Fourth Character)

JAVLN 49C000001

SAJAV13N*00000100

JN1P S245*GW000001

[redacted] PEUGOT

1994-

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1. Write the advantage of characteristic of model System?
2. Define the term certain model and type?

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____