

INTERPRET PLANS AND DRAWINGS

# ANALYZE SIGNS, SYMBOLS AND DATA

Signs and Symbols are visuals that communicate idea, process or warning. Uses of signs and symbols are the following:

**1. Draw attention to health and safety hazards.** In any place, preservation of life is the most important, whether it is in the workplace or on the road for both the worker and visitors alike.



**2. Point out hazards that may not be obvious.** Extra precautions are reminded at some places or instances to avoid some risks that may not be obvious.



**3. For poor observance of proper use of equipments.** Tools and equipments are designed for some specific purpose and proper use, keep in mind that these tools and equipments may not perform well and may fail or even break when not properly used. A single failure of equipments will result to decreased productivity. Even worst may cause harm to a worker himself.



**4. Provide general information and directions.** In a workplace, signages provide information of the different tools and equipments location as well as emergency exits.



# ANALYZE SIGNS, SYMBOLS AND DATA

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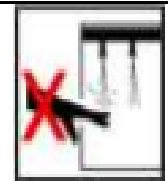
**5. Remind employees where and when personal protective equipment must be worn.** Workers sometimes forget to wear personal protective equipments though it is part of their daily routine.



**6. Show where emergency equipment is located.** Though safety is observed and accident-free environment is monitored. Workers should be familiarized with the emergency equipments location and how to use it.



**7. Indicate where certain actions are prohibited.** Certain actions are restricted in some equipment because of very high potential to cause injury.



## BASIC SIGN CATEGORIES

- **Regulatory** signs are symbols in circle intended to instruct on what one must do (or not do) under a given circumstance. It is also used to reinforce laws, regulations or requirements which apply either at all times or at specific times or places. Ignoring these signs may result to a violation of existing law or regulation.

**Prohibition:** Safety signs with a *black symbol with a white background inside a red circle with a red diagonal line across the circle*. Used to state actions, dress or machinery which **must not** or should be used.



**Mandatory:** Safety signs with a *white symbol in a blue circle*. Indicate actions, dress or precautions which **must be** used.



*Implementing agency may apply penalties when regulatory signs are disregarded.*

## BASIC SIGN CATEGORIES

- **Warning:** Used to warn the public of a hazard or mark a hazardous site or area. Also of actions or potential situations which could lead to danger.

**Caution:** Indicates a **potential hazard**, which is a low level risk that could lead to minor or moderate injury. (Black on yellow)



**Danger:** Indicates a **definite hazard**, which is a high level risk that could result in death or serious injury. (White on red)



*Warning signs are best used to show unnoticeable hazards*

## BASIC SIGN CATEGORIES

- **Information:** This sign is a very legibly printed and very noticeable placard that informs people of the purpose of an object, or gives them instruction on the use of something.

**Emergency:** Indicates first aid, health, fire protection and emergency equipment (White on green).













**General Information** – Indicates permission or public information (White on blue).



*Is it really necessary to use specific color and background for each group of signs?*

# COMMON SAFETY SIGNS

Information Signs				
				
FIRST AID EQUIPMENT	GENERAL WATER TAP	FIRE EXIT	STAIRS GOING UP	INFORMATION
				
MANNED FIRST-AID STATION	MAIN ELECTRICAL SWITCH	EMERGENCY STOP	ACCESSIBLE	TELEPHONE

# COMMON SAFETY SIGNS

## Warning Signs



CORROSION  
HAZARD



HIGH  
VOLTAGE



FLAMMABLE  
MATERIAL



TIP HAZARD



INDUSTRIAL  
VEHICLE



SLIPPERY  
FLOOR



RISK OF  
FALLING



TOXIC  
MATERIAL



# COMMON SAFETY SIGNS

Regulatory - Mandatory Signs				
				
WEAR EYE PROTECTION	KEEP AREA CLEAN	WEAR HAND PROTECTION	LIFT CORRECTLY	WEAR FACE SHIELD
				
SWITCH OFF WHEN NOT IN USE	WEAR FOOT PROTECTION	WEAR PROTECTIVE CLOTHING	WEAR FOOT AND LEG PROTECTION	POSITION GUARDS BEFORE STARTING

# COMMON SAFETY SIGNS

## Regulatory – Prohibition Signs



SMOKING  
PROHIBITED



NO ENTRY



DO NOT  
TOUCH



NO EATING OR  
DRINKING



LITTERING  
PROHIBITED



ALCOHOL  
PROHIBITED



USE OF  
MOBILE  
PHONE  
PROHIBITED



OPEN FLAMES  
PROHIBITED



COMPRESSED  
AIR NOT FOR  
CLEANING


















NO  
UNAUTHORIZE  
ENTRY

## ANALYZE SIGNS, SYMBOLS AND DATA

- Automotive servicing doesn't end on finishing the job in an auto repair shop. When necessary, a road test is performed to conduct a closer observation on a vehicle. To do this, the one who performs the job must be knowledgeable in driving, a holder of a driver's license and knows by heart the meaning of different traffic signs and symbols.
- Traffic signs not just provide information but guide and keep safe the motorist and the community from accident.















# COMMON TRAFFIC LINES

Regulatory – Mandatory Signs				
White symbol on blue circular background				
				
TURN RIGHT	TURN LEFT	KEEP LEFT	AHEAD ONLY	KEEP RIGHT
Regulatory – Prohibition Signs				
Mostly black symbol on white circular background background with red border				
				
NO ENTRY	NO STOPPING	NO LEFT TURN	NO PARKING	NO U-TURN
				
SPEED LIMIT	NO OVERTAKING	NO RIGHT TURN	HORN	MOTORCYCLE PROHIBITED
The marking or figure in the SPEED LIMIT sign is in kilometer per hour				

# COMMON TRAFFIC LINES

## Warning Signs





Mostly black symbol on white triangular background with red border or  
Black symbol in yellow diamond.

				
BEND WARNING	T-JUNCTION AHEAD	TRAFFIC SIGNAL AHEAD	JUNCTION AHEAD	UNEVEN ROAD
				
SERIES OF BENDS	QUARYSIDE AHEAD	STEEP HILL UPWARD	SLIPPERY ROAD	CHILDREN AHEAD
				
PEDESTRIAN	CROSSROAD AHEAD	SHARP CURVE	MERGING TRAFFIC	TUNNEL AHEAD

For traffic signs, according to the "Vienna Convention on Road Signs and Signals", the symbol in yellow diamond with black border is another warning sign in addition to the white triangle in red border.



# COMMON TRAFFIC LINES

Priority signs		
Other provision stated in the "Vienna Convention on Road Signs and Signals"		
YIELD or GIVE WAY SIGN	Inverted equilateral triangle in a white background with red border. It means you must let traffic in the intersection or close to it go first. Stop if necessary and go only when the way is clear.	
STOP SIGN	White text "STOP" in red octagon.  It means you must come to a complete stop. Stop at the stop line if it is marked on the pavement. If there is no stop line, stop at the crosswalk. If there is no crosswalk, stop at the edge of the sidewalk. If there is no sidewalk, stop at the edge of the intersection. Wait until the way is clear before entering the intersection.	
PRIORITY ON ONCOMING	Priority on the traffic flow on the black arrow direction which gives them the "right of way". While in red arrow direction must yield.	
PRIORITY FOR ONCOMING	Priority on the traffic flow on the white arrow direction, which has the privilege of the right of way, than in red arrow direction	

Information, Facilities or Service Signs are signs that use white symbol on blue or green rectangular background.



PARKING



PORT



HOSPITAL



HOME ZONE

# DASHBOARD SYMBOLS

- The dashboard, particularly the instrument panel, represents the easiest way a vehicle talks back to its driver, allowing him to stay up to date with the status of the car and provide him with prior notice on potential mechanical problems.





## COMMON DASHBOARD SYMBOLS AND MEANING



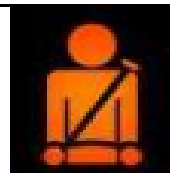
ABS warning light

It is turned on every time there's something wrong with the Anti-lock Brake System. Note that the ABS symbol is activated once the driver starts the engine but it's automatically turned off after a few seconds.



Low fuel notification

This panel is switched on if the fuel level gets very low and refuel is required.



Seat belt reminder

The symbol appears and remains active as long as the engine is started and the seat belt remains unfastened; depending on the car manufacturer and car model, the seat belt reminder is combined with an audio notification.

## COMMON DASHBOARD SYMBOLS AND MEANING



Brake system alert

The notification is powered on if the ECU detects a problem to the brake system



Tire pressure monitor

The warning is turned on in case of low tire pressure which could raise the fuel consumption or affect the grip.



Front airbag

The light monitors the front airbag and, in case it is turned on, signals a problem with it; it usually requires professional assistance.

## COMMON DASHBOARD SYMBOLS AND MEANING



Fog beams indicator

It is activated and remains on once the driver turns on the fog beams



Battery warning

If this light is turned on while driving, it reveals a malfunction concerning the battery charging system.



Emergency indicator






The notification is activated once the driver pushes the emergency button



Power train malfunction

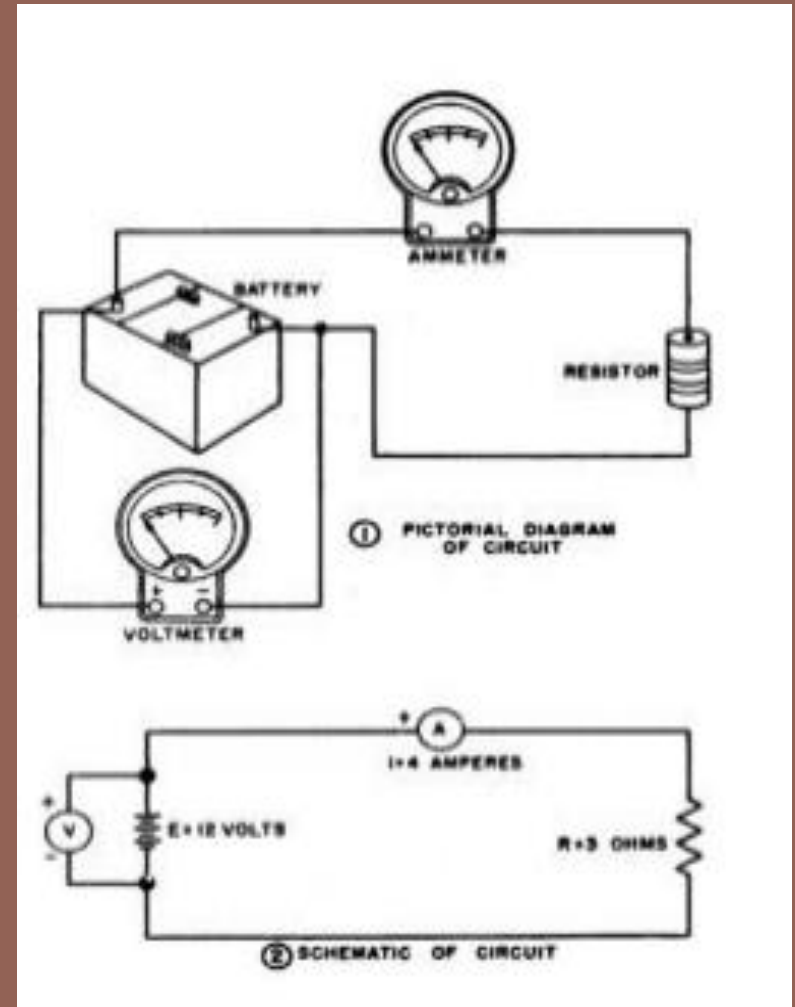
If on, this light shows that the power train has been damaged and the car needs to be serviced as soon as possible.

# COMMON DASHBOARD SYMBOLS AND MEANING

 Open doors indicator	This symbol is usually turned on just after the driver starts the engine and informs him that one or more doors are closed incorrectly
 Temperature warning light	It warns the driver of the possibility of engine overheating and usually demands the driver to stop the vehicle
 High beam light	It is turned on once the driver activates the high beam mode of the headlights.
 Oil pressure warning	This notification is turned on if the ECU detects a problem with the oil pressure; the driver is usually recommended to stop the vehicle and service it as soon as possible.
 Turn signals	Surely the most known instrument panels, the turn signals are activated once the driver changes direction and uses the signal lever

# DIAGRAMS, PLANS AND DRAWING

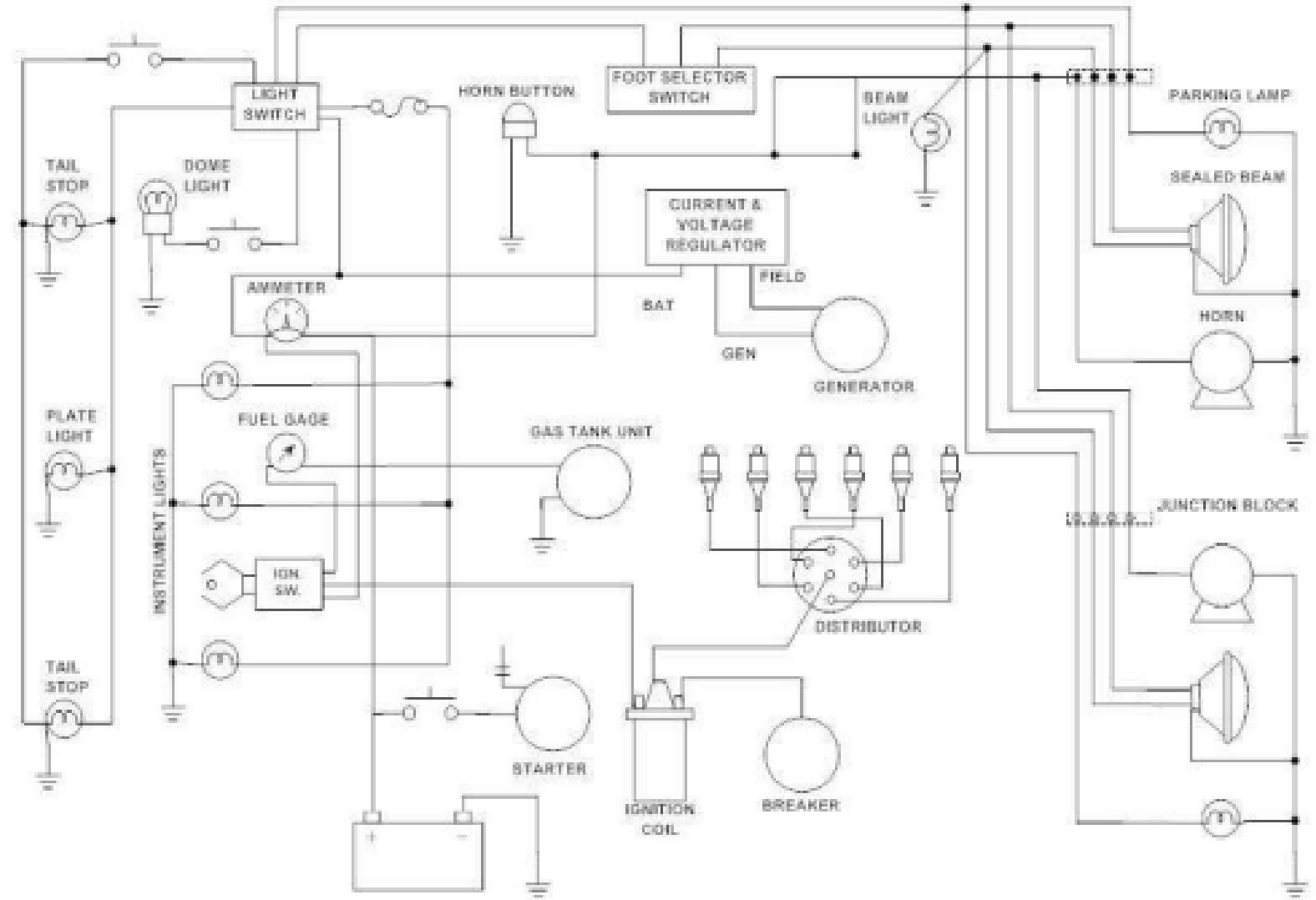
- A **drawing** is a picture of something made with a pencil or pen usually consisting of lines generally without color. **Plan** is used to communicate fabrication instruction. A **diagram** is a “simple drawing” which uses a symbolic presentation of information according to some visualization technique. In automotive servicing, a graph-based diagram is commonly utilized in expressing information such as schematic, pictorial, semi-schematic, and a layout diagram.



## COMMON SCHEMATIC DIAGRAMS

- 1. A pictorial diagram uses simple images of components.
- 2. A schematic diagram uses simplified standard symbols
- 3. A **semi-schematic** diagram combines some of the standard symbols with other elements displayed as simple images.

- Observe that all lamps use standard symbols except the head light (sealed beam) which uses an image. Spark plugs are displayed as images.
- *Advantage of the Semi-Schematic diagram in wiring diagram is making the diagram easy to realize than a pure standard symbol.*

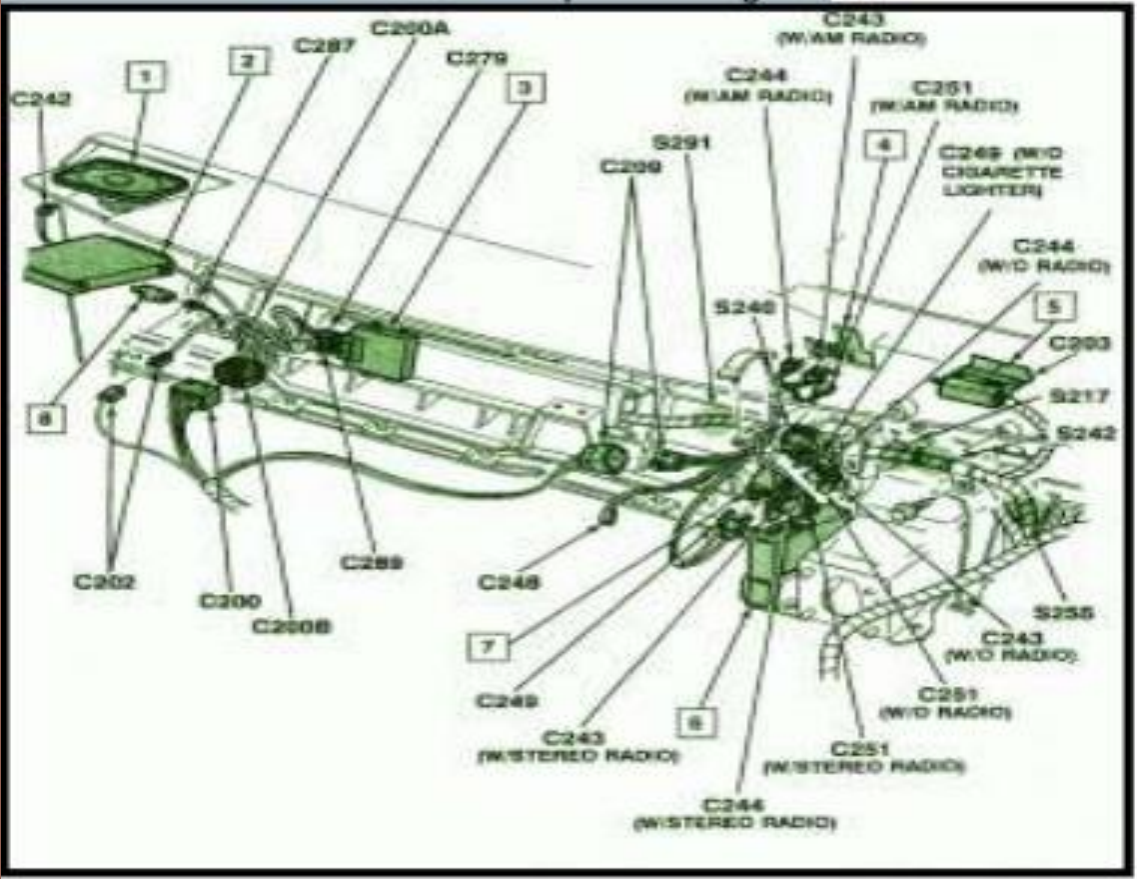


**WIRING DIAGRAM**  
**AUTO ELECTRICAL WIRING DIAGRAM**

DRAWN BY	CHECKED	DATE	SCALE	SHEET NO.

## COMMON SCHEMATIC DIAGRAMS

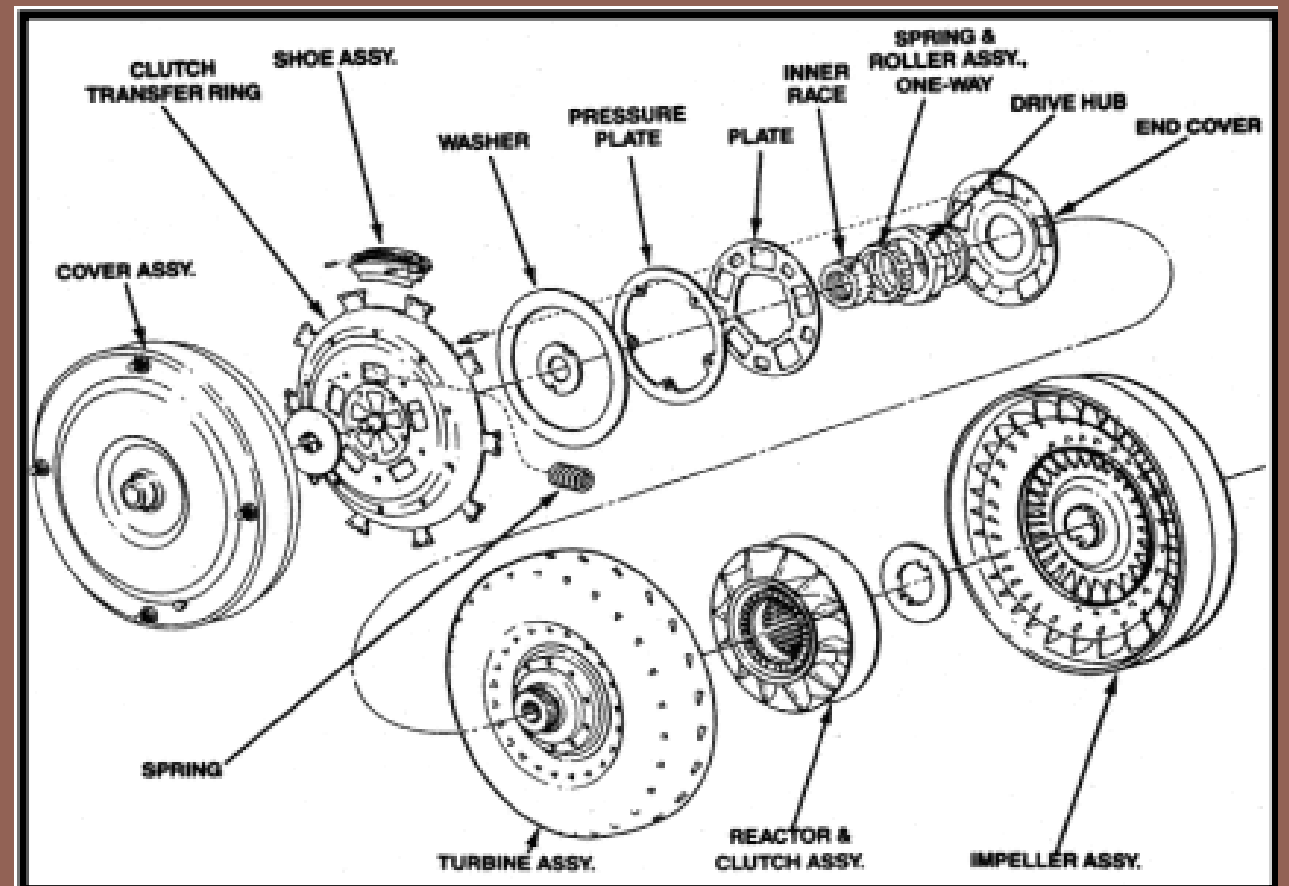
- 4. A **layout** diagram or the “physical design” which shows the actual connection being used. This is more artistic than schematic and pictorial diagram.





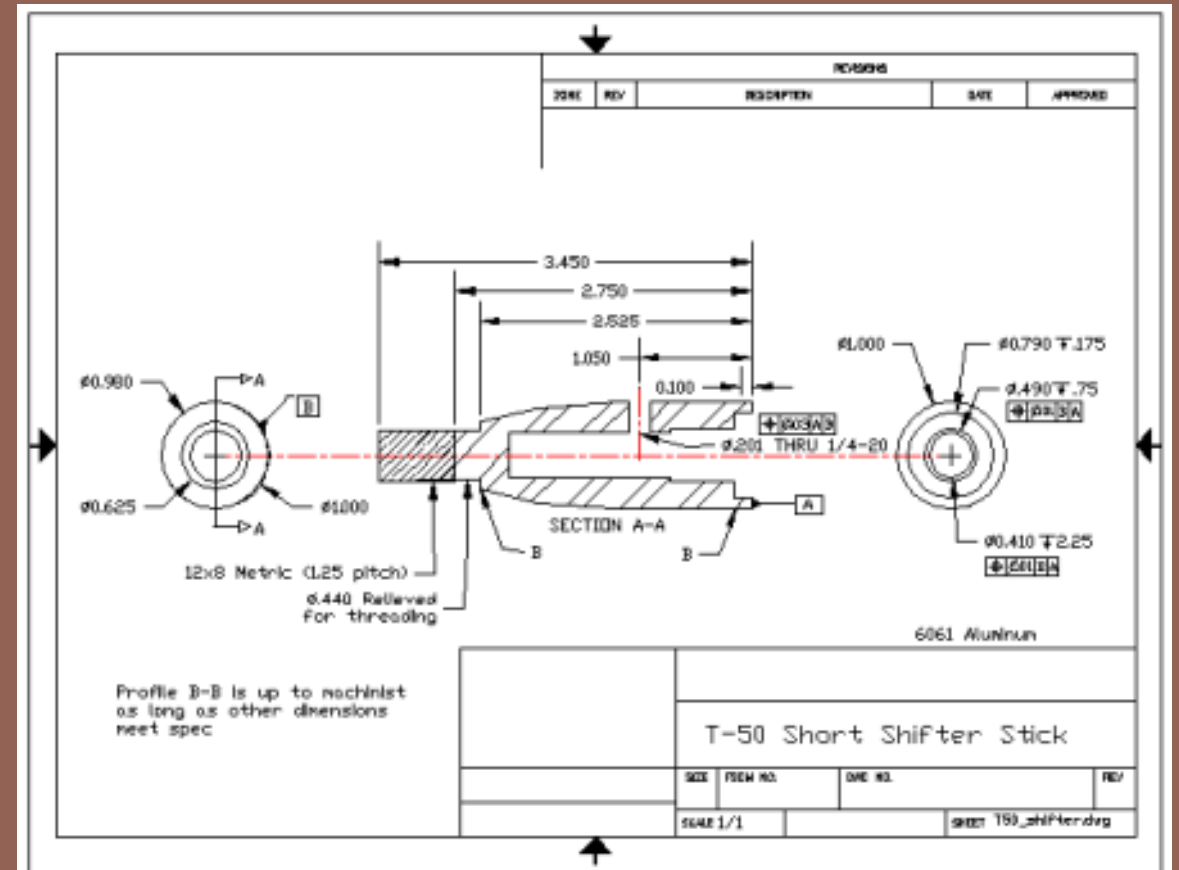
# COMMON SCHEMATIC DIAGRAMS

- **Plans** are a set of drawings or two-dimensional diagrams used to describe a place or object, or to communicate building or fabrication instructions. The purpose of a plan is to capture all the geometric features of a component. This is also for presentation or orientation purposes.

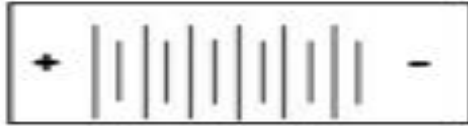


# COMMON SCHEMATIC DIAGRAMS

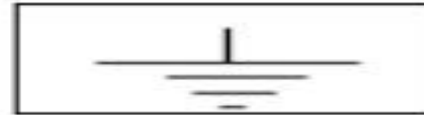
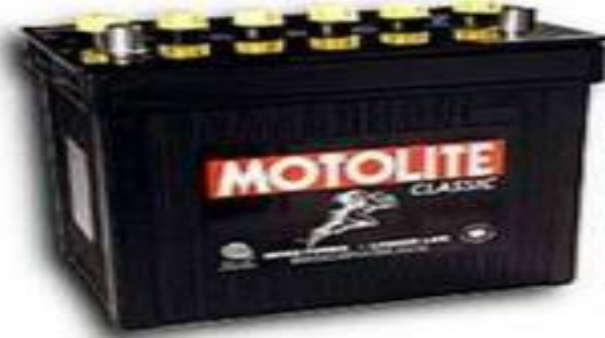
- Common to industrial purposes like in automotive, a **technical drawing** is use to present some components precisely with dimension.
- In this drawing, English System is used for all dimensions except the dimension for the thread given in “12x8 Metric (1.25 pitch)”.
- Design specification is well illustrated in a technical drawing such those in times when necessary replacement has to be considered, the drawing will be the basis of requirement.*



# COMMON ELECTRICAL SYMBOLS



**BATTERY.** The pair of long and short lines represent a cell. A series of cells make up a battery. Long lines represent the positive plates while the



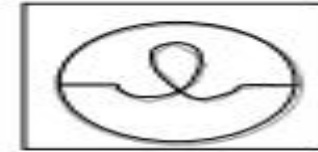
The **GROUND** symbol represents the electrical connection to the metal body or frame of the vehicle. In turn, the negative cable of the battery is connected between the negative battery terminal and the body/frame of the vehicle.



The **FUSE** is a circuit protection device. If the current exceeds the maximum rating for the circuit, the fuse element melts, thereby opening the circuit.



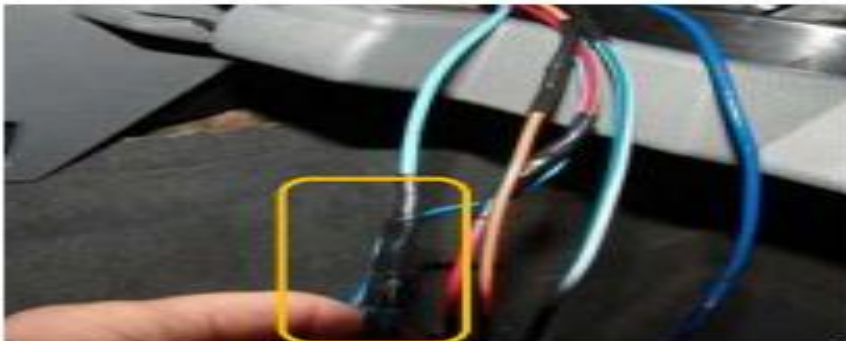
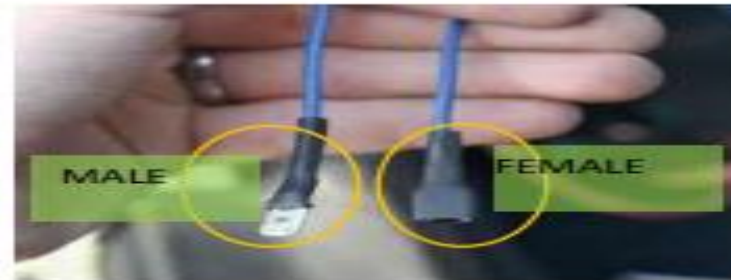
# COMMON ELECTRICAL SYMBOLS



The **BULB** (light bulb) symbol can represent any type of light bulb (headlight, taillight, etc).



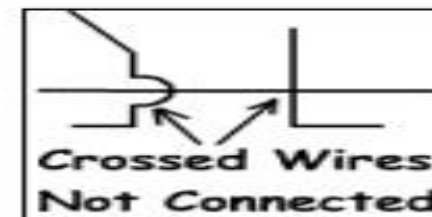
This symbol represents a **MALE-FEMALE CONNECTOR**. If it is a one piece multiple wire connector (harness), the connectors will be surrounded by a box.



If there is no dot at the intersection of the lines, then those wires are not connected.



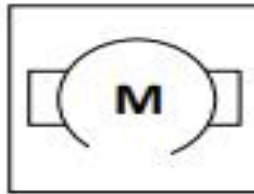
A dot at the intersection of wires is a permanent **CONNECTION** point, or splice



# COMMON ELECTRICAL SYMBOLS



A fixed **RESISTOR** is an electrical device that is used to reduce current flow.

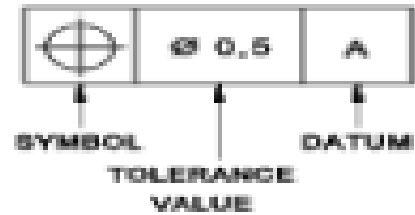


**MOTOR** is an electrical device that converts electrical energy to mechanical energy in a rotary motion



**HORN** is an electrical device that converts electrical energy into sound.

# COMMON DRAWING SYMBOLS



**STRAIGHTNESS**



**FLATNESS**



**CIRCULARITY**



**CYLINDRICITY**



**PROFILE OF LINE**



**PROFILE OF SURFACE**



**COAXIALITY**



**POSITION**



**SYMMETRY**



**PARALLELISM**



**PERPENDICITY**



**ANGULARITY**



**RUN-OUT**



**TOTAL RUN-OUT**

# COMMON DRAWING SYMBOLS

Part Outlines  Heavy

Section Lines  Light

Hidden Lines  Medium

Center Lines  Light

Dimension and Extension Lines  Light  
3.000

Cutting Plane  Heavy

Break Lines  Heavy  
 Light