FROM: SED

TO : MANAGEMENT

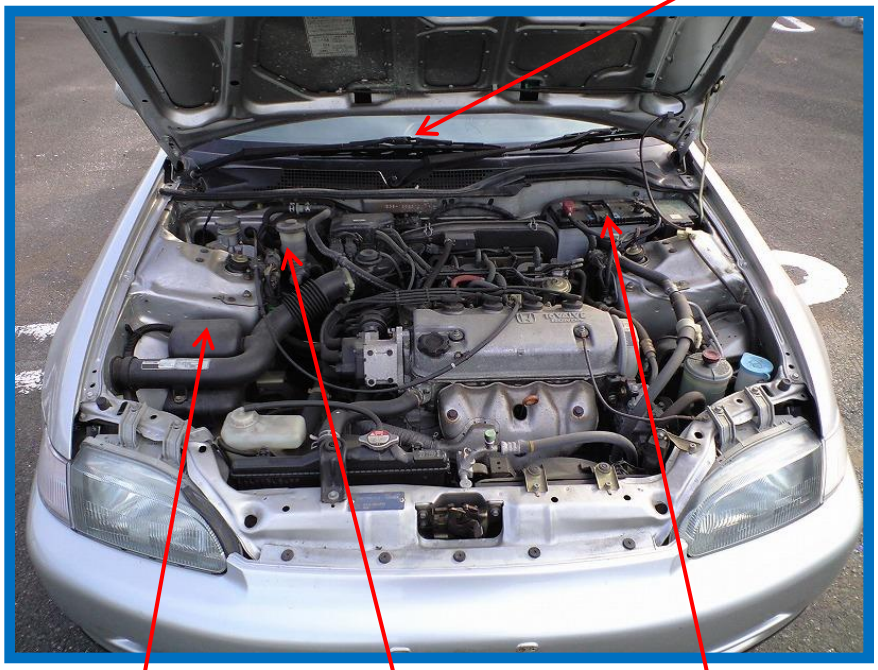
THE SAFETY IMPLICATIONS OF STEERING CONVERSION OF VEHICLES FROM RIGHT TO LEFT HAND DRIVE

INTRODUCTION

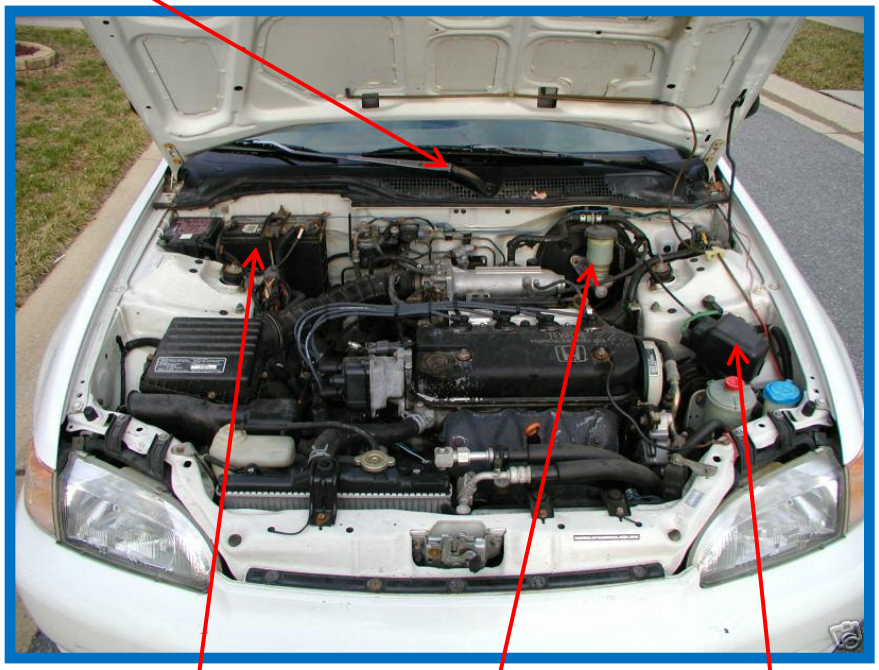
- The Right Hand driving (RHD) system was first introduced by Great Britain and only 52 sovereign states drive on left side of the road
- This makes about 1/4 of the total world driving with RHD vehicles.
- Investigations show that there is no special reason for Left Hand Drive (LHD) whereas the countries including USA claim it to be safer
- Nigeria followed suit in April, 1972.
  - Right Hand Traffic Act of 19th Feb. 1972
  - National Road Traffic Regulation 2004,(Part 1 Section 71 as contained in official gazette No 99 of 21st Sep. 2004, Vol. 91)
- Conversion from a right hand side steering to a left hand side is obviously not so simple, it is risky and has a cost
- Customers who patronizes conversions are those who
  - cannot afford a new car but go for a second-hand
  - look for a second hand high quality vehicle with
  - less mileage
  - and high specifications.
- Japan is the largest market for exporting high quality used cars, but Japan has a traffic system that drive on left side of the road (RHD).
- Customers who desire Japanese vehicles have to either drive a RHD vehicle or do the conversion of steering if there are some strict rules about imports of RHD used vehicles.
- Countries have totally banned the imports of RHD vehicles. All new vehicles in Japan are engineered as RHD, but built up (or assembled) as LHDs before export

THE IMPLICATIONS OF STEERING CONVERSION FROM RIGHT TO LEFT HAND DRIVE

A RIGHT HAND DRIVE CAR



A LEFT HAND DRIVE CAR



STEERING CONVERSION

- The steering conversion process is technical and is not limited to mechanicals but electrical also. The vehicles having center-locking, electric windows and power-assisted steering have to be reinstalled after the conversion so that the driver does not feel any different from the original.
- In the conversion process, the following are involved;
  - The Dashboard will be removed and replaced with LHD dashboard.
  - The Steering Rack assembly will have to be replaced with LHD one.
  - The Wiring Harness behind the Dashboard could be saved and simply inverted (turned around). Safety air bag will also be affected.
  - The Brake Master Cylinder will have to be repositioned and re-lined
  - The Pedal assembly will be removed and repositioned
  - Door panels and door mounted Electric Controls (depends on car) will be replaced with LHD door panels and controls (cars with electric control in the center console may not have this problem)
  - Wiper motor and mechanism must be repositioned or replaced.
  - Engine and transmission have to be removed to allow access to firewall and accessories.

STEERING CONVERSION

- Firewall is the wall between the passenger compartment and the engine bay, right under the windshield
  - All secondary accessories located on the firewall such as Blower motor, Heater core, AC duct, wires and cables will have to be re-positioned.
  - The firewall in European-made cars were made asymmetrical and the fitting holes for all accessories were pre-stamped and could simply be punched out when moving steering to the other side. This suggests that European car's firewalls are made in a generic manner anticipating either LHD use or RHD use. However in Japanese cars, the firewalls are specifically designed and dedicated to only one type – either RHD or LHD. This reality makes Japanese cars much more difficult to convert since the only way to do a professional job is to remove the entire RHD firewall and replace it with a LHD firewall.
- If a car is automatic, then gear selector may have to be replaced with one facing the right direction or entire floor console may have to be replaced to allow emergency brakes and Gear selector indicators to be properly positioned (but this varies with each car's design peculiarities)
- The airbags are very sensitive therefore extra care has to be taken while taking off the steering bracket and re-fixing it.
- Lastly the full checks to make sure that all the electrics are functioning properly after the new dashboard is fixed and the new steering bracket is welded properly to the passenger side. Once all the functions are tested the door trims have to be fixed and the job is nearly over. In Japan there are speed road testers which will tell electronically about the drive; this saves the risks on the road. After the test proves OK your converted Left-Hand Drive car is ready for a safe drive.
- There are few garages in Japan who provides this extra ordinary service under qualified mechanics.

STEERING CONVERSION

Examples of steering kits

AN AUTO ELECTRICIAN WORKING ON THE WIRING SYSTEMS OF A RIGHT HAND DRIVE VEHICLE DURING CONVERSION

ISSUES

- Before the right hand drive vehicles are imported to Nigeria, it is very important to make some basic enquiry concerning the conversion of the car when it arrives Nigeria. But if you are planning to convert it to left drive, then
  - Make enquiry about the availability of the car dashboard in the Nigerian market, if the dashboard cannot be sourced locally and you are not willing to import from abroad, save yourself the stress of importing such car.
    - **DO NOT CUT YOUR RIGHT HAND DRIVE DASHBOARD AND FIX IT BACK TO LEFT DRIVE, IT IS RISKY.**
    - Do not allow the person converting the car to use the old right hand drive dashboard and steering in converting to left drive. This has severe implication on the alignment of the wheels and balance of the car after conversion
  - Make sure that the persons converting the car knows about auto rewiring very well, this together with panel beating work are the two most technical aspect of drive conversion.
    - Most operations of modern day cars are electronic based and during drive conversion, all the wiring connections in a car are disengaged.
    - It takes an auto technician who is well grounded in the art to accurately fix those wires together without the car having code problem in some cases.

DANGERS

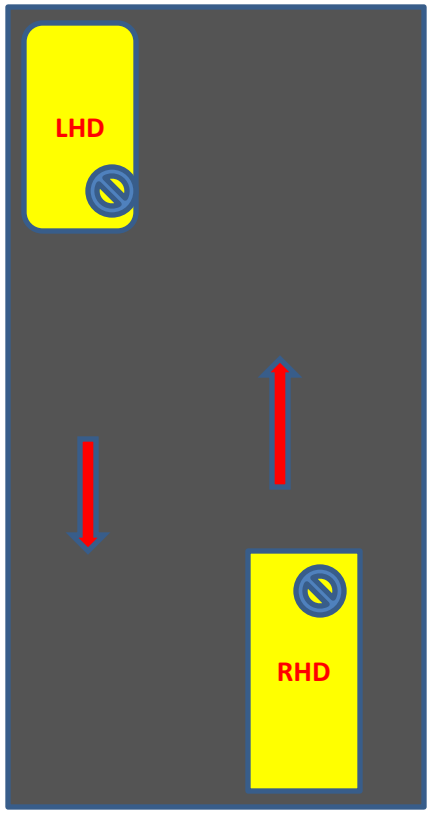
- Conversion of a vehicle from right hand to left hand drive configuration involves modification of the vehicle's brake and steering systems. This has the potential to seriously affect the safe operation of the vehicle in the following ways;
  - Steering can disengage during motion, lose control and cause accident, and that conversion is never 100% successful.
  - **Reduced Component Strength**
  - Loads applied in an emergency situation, e.g. panic stop or loss of power assistance to steering can be very high. A component which is modified and does not retain the strength of the original design may operate satisfactorily under everyday driving loads. However, under high loads it may fail catastrophically.
  - **Susceptibility to Fatigue Failure**
    - Poor design can lead to fatigue failure. Vehicle manufacturers invest a great deal of time and money in producing components which will not be affected by fatigue failures. They do this through design, material selection, manufacturing controls and endurance testing using manufacturing techniques not readily adaptable to low volume modification procedures.
    - Fatigue can lead to the catastrophic failure of a component which performed satisfactorily for many years after modification
  - **Reduced Primary Safety**
    - Modifications to steering can radically alter a vehicle's handling by introducing undesirable traits such as increased bump steer and poor self centering.
    - Even minor alterations to braking components can reduce the system's effectiveness
  - A lot of cars converted in Nigeria lose the OBD / OBDII / EOBD capabilities, as the "technicians" that carry out the work have no idea how to integrate the system, and often leave wires either cut, or removed completely, as long as the car runs.
    - OBD/OBDII/EOBD -means Onboard Diagnostics. OBDII is a later version of OBD and EOBD is the European version of onboard diagnostics. On-Board Diagnostic systems are in most cars and light trucks on the road today. During the '70s and early 1980's manufacturers started using electronic means to control engine functions and diagnose engine problems. This was primarily to meet European Pollution Agency emission standards. Through the years on-board diagnostic systems have become more sophisticated. OBD-II, a new standard introduced in the mid-'90s, provides almost complete engine control and also monitors parts of the chassis, body and accessory devices, as well as the diagnostic control network of the car.

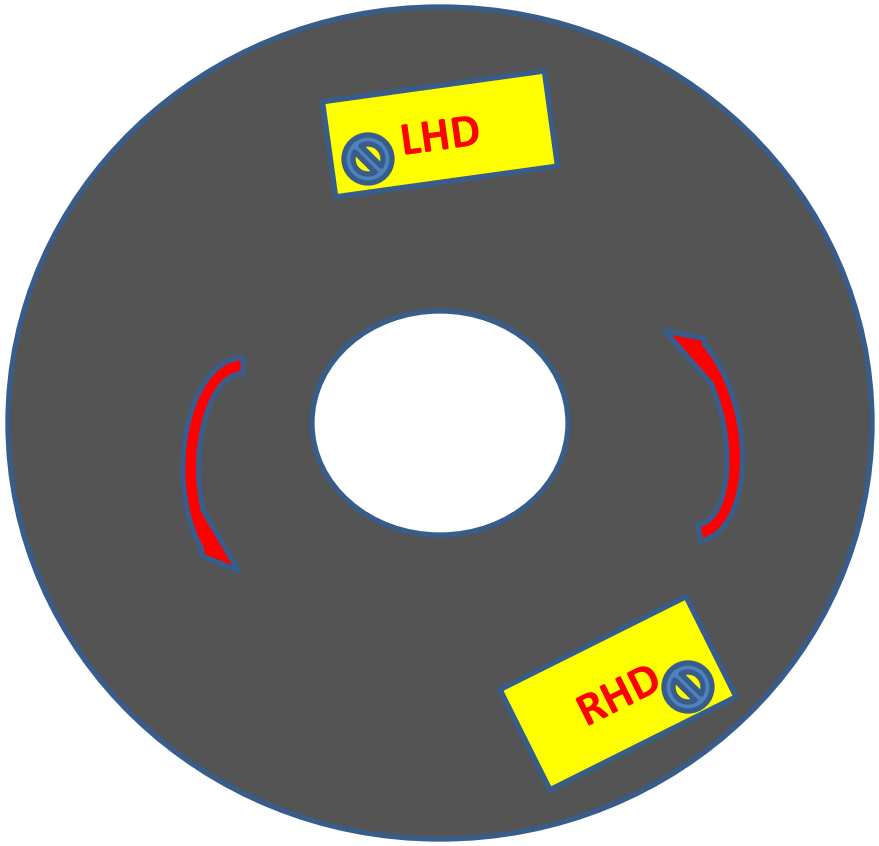
TELL TALES ON RECOGNISING RIGHT HAND STEERING CONVERTED TO LEFT

1. Wipers end in front of the drivers
2. Control panel on door often on the passenger's door
3. Manual radio antenna often is not accessible to driver
4. Fuel tank is on the reverse side of original let hand version
5. Exhaust is on the other side of original left hand version
6. Fuse box is on the other side of original left hand version
7. Battery compartment is on the other side of original left hand version
8. Automatic gear lever has release knob on the right

SOURCE: CPL, HQ

CONFUSION IF THE TWO DRIVE SYSTEMS CO-EXIST, RHD MUST GIVEWAY FOR LHD





All the countries that signed the Geneva Convension on Road Traffic Signs and Markings (1949) have agreed to a uniform direction of traffic in each country -Articles 9 (1), and Nigeria acceded to the convention in December 2010

CONCLUSION

- Many countries with LHD rules like USA, United Arab Emirates, and South America have banned the imports on Japanese vehicles i.e. RHD vehicles, while Canada has real strict policies on not only driving a RHD but also importing one.

- RHD cars can only be converted perfectly by the manufacturers.
  - The conversions in Nigeria are not durable.
  - Most of the time Nigerian Technicians destroy the moto-tronics and wiring system. So after you use them for a while you start having problems.
  - In Nigeria, the conversion is not handled neatly and professionally.
  - Therefore it is not worth the trouble.
- It should still remain banned from entering the Country in other to save lives and property on our roads.

REFERENCE

- Right Hand Drive to Left Hand Drive Conversion – Car Talk – Naira Land 2005 – 2012 http://www.nairaland.com/240841/rhd-lhd-conversion-facts/6
- ExportJapaneseCar.com http://exportjapanesecar.com/
- Steering Conversion Of Right Hand Drive Land Cruiser | Right Hand Drive Vehicles In Europe And Uae http://hand.ezinemark.com/steering-conversion-of-right-hand-drive-land-cruiser-right-hand-drive-vehicles-in-europe-and-uae-31a73475fa4.html
- What's Involved in Right Hand Drive Vehicle Conversions? http://driving.ezinemark.com/whats-involved-in-right-hand-drive-vehicle-conversions-7d363e962af3.html
- Geneva Convension on Road Traffic Signs and Markings (1949) -Articles 9 (1)
- Right Hand Traffic Act of 19th Feb. 1972
- National Road Traffic Regulation 2004,(Part 1 Section 71 as contained in official gazette No 99 of 21st Sep. 2004, Vol. 91

THANK YOU FOR LISTENING