

KES

Impact Protection for
the Driver from the
Steering Control System

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1. Scope of Application

This standard determines all required items to process the test as FMVSS 203 requires.

The standard FMVSS 203 explains the minimal requiring conditions for Steering Control System that can minimize driver's damage on chest, neck, and face when impact.

1.1 Housekeeping

The equipment used for the test (Testing place, equipment and machine) shall be maintained clean and safe.

Testing equipment shall be installed orderly and professionally and shall be maintained with its best condition by painting. The testing products shall be maintained clean during the test.

1.2 Calibration of Measuring Instruments

For the measuring instruments and test procedure, Kia shall execute its functions according to the requirements of KSIR.

1.3 Requirements

Personal vehicle, lighter than 10,000 lbs, with GVWR, multi purpose vehicle, truck and bus shall satisfy the requirements of 1.3.1 and 1.3.2 below.

1.3.1 When the body block crashes to the steering control system with a relative speed of 15 miles / hour, the impact load on the chest of the body block shall be less than 2500 lbs. Here, if it is over 2500 lbs, the occurring time shall not be over 3 msec.

1.3.2 Driver's clothes or accessories shall not be caught by the random elements or a

ttachments on the steering control system including horn and trim hardware during normal operation.

2. Testing

2.1 Prepared Vehicle Checking

Testing vehicle shall be kept in a clean place, and mark on it about following check items.

- ① Option checking for vehicle
- ② Installed tire and wheel is the ones already set.
- ③ Damage, shape change and control miss, etc. shall affect the test results and processing procedures.
- ④ Steering Wheel shall not be fixed so that it shall move freely.
- ⑤ Steering Lock System shall operate correctly.

2.2 Photographs

Have photographic records of the situations before and after the test about following items.

- ① 1/4 view of front and back of vehicle
- ② Whole view of both side
- ③ Whole view of both side of specimen attached on the equipment.
- ④ Load Cell and Tilt System, and attached Steering Assembly
- ⑤ Around the steering assembly before/after the test
- ⑥ Instruments installed around the steering assembly before/after the test
- ⑦ Steering Column Shear Capsule (Coating Plate) before/after the test
- ⑧ Driver side view of the equipment and specimen before/during the test

- ⑨ Machine set-up scenes
- ⑩ Damages not seen on the above pictures, and when it is needed to explain details.

2.3 Environmental Condition

The entire test shall be done at 65 ~ 90 °F (18 ~ 32 °C), and relative humidity shall be less than 90%.

It shall be done in atmospheric pressure.

2.4 Preparation of Specimen

Execute all the test as the designed conditions around is accurately simulated with the steering system installed.

Cut the vehicle in half in order to install equipment due to limited inside space.

2.4.1 Preparation of Vehicle

- (a) Wash the vehicle. Check the vehicle according to the check procedures for function, operation and perfection.
- (b) Check whether driver's clothes or accessories shall not be caught by the random elements or attachments on the steering control system including horn and trim hardware during normal operation.

Record the results on the data sheet on table III.
- (c) Take all the pictures needed.
- (d) Check the accurate tire pressure.
- (e) Weigh the vehicle.
- (f) Set the vehicle on flat surface, and record the ride attitude of normal vehicle. Have this by measuring the angles made by the flat surface and front-to-back and left-to-right.

Front-to-back angle shall be measured along with the instrument fixed on steering column, and left-to-right angle shall be measured along with the center of bottom of windshield frame.

- (g) Empty the fuel tank.
- (h) Remove the windshield, front door and front seat.
- (i) Remove the drive shaft. (For rear wheel drive)
- (j) Check the floor panel and underside in order to decide a part to be cut as figure 1 shows a typical example.

When lateral cutting that crosses floor panel, the spot shall be selected as to minimize the underbody obstacles, such as transmission. Components that can affect the strength of steering control system shall not be removed or damaged.

(Examples, steering box, steering linkage, etc.)

- (k) Select the cut line following the "A" Pillar on Lower Windshield Frame (Both sides).
- (l) If the cut line that crosses floor panel is in the back of the front seat anchor, reinforcement shall be set on both sides between the "A" pillar and door sill as shown on figure 1. This is to maintain the original condition of steering control system after the vehicle is cut in half.
- (m) After reinforcement is installed, the front and back of the vehicle shall be supported. In this condition cut the vehicle in half following the cut line. Be cautious when you pass the brake line and fuel line.
- (n) In order to prevent the translation and rotation of test buck during the test, tie up the underbody and "A" pillar with buck, and set a test buck reinforced on a fixture, which is stable and flat.

The vehicle shall be set on a test fixture, using wire rope, turnbuckle and strap plate.

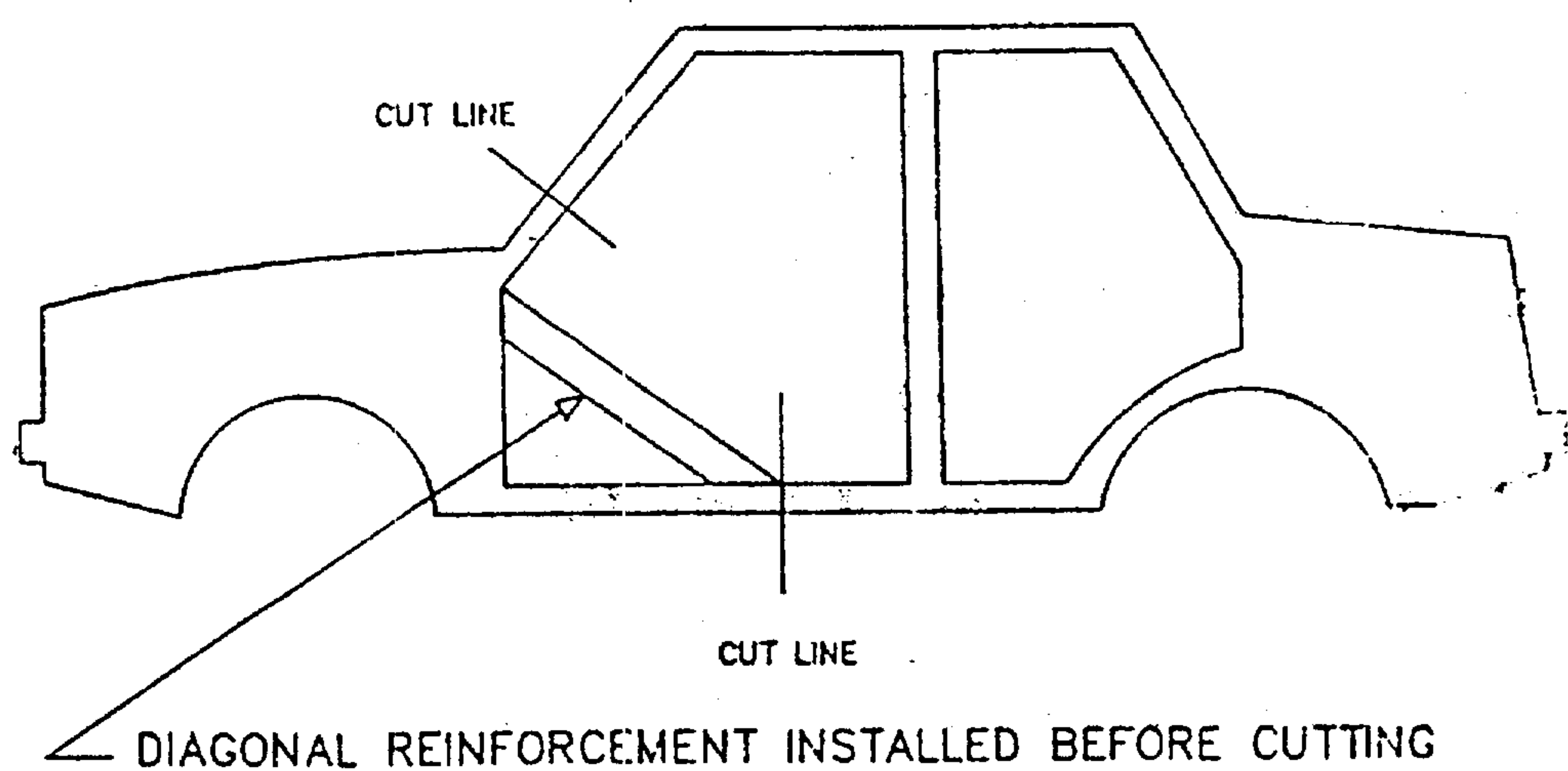


Figure 1. Diagonal reinforcement installed before cutting

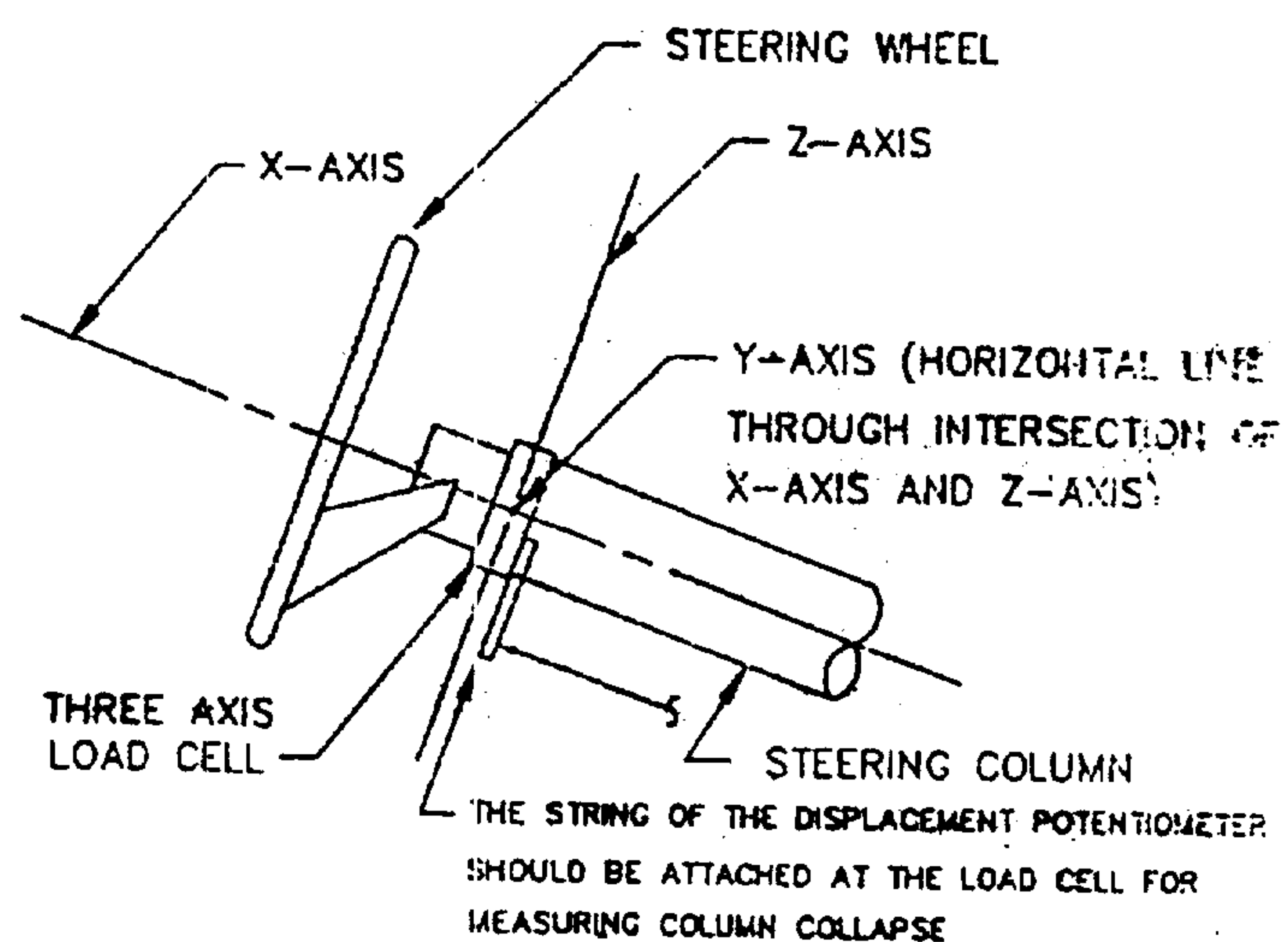


Figure 2. Load Cell Installation