

OMNISCIENT TECHNOLOGY, PUNE

Design & Manufacturing of Test Equipments / Rigs and Engineering Consultancy.

Vendor Code : **210 156**

Date: 30.11.2022

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To

M/s Endurance Transmission Ltd

(Transmission Division)

K – 226 / 1, M. I. D. C. Area Waluj,
Aurangabad – 431 136, Maharashtra, INDIA.

Sub : Method Statement

Dear Sir,

We hereby declare that ours is small proprietary unit, normally engaged in Engineering Design and Consultancy.

Ours is not either manufacturing unit or workshop unit, we are service unit to carry out design, development, manufacturing and AMC.

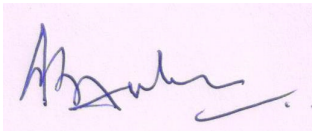
We work on AMC of our designed products, under supervision of user's team.

Therefore,. Herewith as below are giving engineering equipment standard "Method Statement" for reference.

Thanking you

Yours truly,

For OMNISCIENT TECHNOLOGY, PUNE



L B Salunkhe

Proprietor,

Mo No +91 98504 20094,



GST No : 27ADAPS0139B1Z1

Our Associate Companies, involved in these project since inception / DAP

- 1) **M/s Autodata Technologies Private Limited, Navi Mumbai.**
- 2) **M/s EV revolution, Pune**

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Method Statement

Method statements are used as a means of demonstrating that the hazards and risks associated with a particular task or series of tasks have been properly considered and evaluated. Method statements should outline the appropriate risk control strategies that are required to be implemented in order to ensure the health, safety and welfare of the workforce and others affected by the works. A method statement can only be prepared once the potential hazards have been identified and the risks assessed. This therefore requires the completion of a properly considered risk assessment for each activity, or series of activities, which identifies not only the hazards, but also the required controls measures that are necessary to manage the residual risks.

General Precautions

To be observed by all staff at all times, any deviation from these control procedures must be authorised by the management or safety representative.

Communication with Other Workers on Site.

Complete team will report to the site user-endurance manager for induction on arrival at the site. The ETL manager will inform team of any hazards that are present on site. Team will inform the user-ETL manager of the work to be carried out and how it could affect others on the site. User ETLmanager, wherever necessary notices will have to be displayed advising of any hazards present during the works.

First Aid

It is the responsibility of the ETL company to ensure adequate First Aid provision for the service team. Adequate means provision of a trained first aider, suitable first aid equipment along with authorised First Aider. A trained First Aider will be a suitable person who has attended an approved course. First Aider is a person provided by the user company to take charge of the situation (e.g. to call an ambulance) if a serious injury/illness occurs. All service team members when inducted will be made aware of the location of the First Aid kit.

Manual Handling

All the team members have been instructed on the potential dangers of manual handling and the user team members must help as they are trained in manual handling of various material handling and safety equipment available in the user company. Heavy or awkward items will be split into smaller units wherever possible. It is the responsibility of the company manager to identify and control manual handling activities as they occur on site on a day to day basis.

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Material Handling

All materials required for site will be unloaded to a designated unloading and storage area which will be away from the work area as far as is practicable. This area will be kept tidy to minimise trip hazards. Materials as and when required will be collected from the storage area and transferred to the work area. All staff will take care when handling materials and will use mechanical aids wherever possible. When stacking materials particular care must be taken to ensure that the stack is secure and that the product does not get damaged.

Personal Protective Equipment (PPE)

PPE will be provided as a last form of protection against a hazard. Team member will use the appropriate PPE for the task as identified in the risk assessment. All service team members will wear Safety Boots, Hard Hats and Goggles as and where necessary as determined by the risk assessment.

Preparation & Induction

A risk assessment will be carried out for all tasks which will be discussed with members of service team and the user company team. Any queries or concerns will be raised with the company manager who will ensure it is dealt with. Both side teams will be inducted onto site in order to understand the hazards present on site and the tasks that are to take place.

Tools and Electrical Equipment

All tools and equipment will be visually inspected on a regular basis, defective or damaged equipment will be removed from service. User company should keep required electrical tools of either 110V or battery operated wherever possible on their own risk – this will be the responsibility of user company manager. User company will inspect all their tools and equipment at every 3 months

Welfare

The user company is responsible for providing adequate washing, toilet, drying and refreshment facilities for Service Team. Team are responsible for ensuring that such welfare facilities are maintained in a clean and wholesome manner, it may be necessary occasionally to identify suitable local amenities.

Service Teams Safety

Endurance Transmission Limited i. e. the user company will liaise with all team members on a day to day basis and ensure they are aware of the risks present during the work area. Both Side Team Members will not leave any area of work in a dangerous condition or with risks to themselves, others, tenants, or visitors,

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all tools and equipment will be cleared to storage at the completion. Heavy plant, scaffold, ladders and any other access to height will be made inaccessible.

Emergency Information & Procedure

Nearest Accident and Emergency: Out of hours office number:

In the event of an accident / incident, the following procedures are to be followed:

- Report to Endurance Manager and call for First Aiders.
- Follow emergency procedures, as required by incident.
- Name and details of Nearest Hospital.
- Call the Emergency Services. Give name, phone number and location of incident.
- All injuries are to be noted in the accident book by responsible person.

First Aid boxes are located in all test cell / area

Preparation

1. Load all equipment required for task
2. Carry out all safety checks and ensure
3. Transport material if any and store to site
4. Report to ETL manager and receive permit to work (wherever required)
5. Put on personal protective equipment (PPE)
6. Inform all other persons concern in the work area.
7. Liaise with the ETL and Service Team to ensure safe operation
8. Cordon off work area if practical and necessary to do so.
9. Ensure the area to be worked and exit points are clear of obstruction
10. Ensure that safe access and egress is maintained

Test and Handover

1. Test all equipment for successful operation
2. Snagging works will be carried out to satisfaction
3. Remove all tools and equipment from work area.
4. Clean area test rig and work area.
5. Ensure waste is disposed of in accordance with user company instructions.
6. Remove all waste and recycle wherever and if possible
7. Handover to user
8. Sign out if applicable

Ladders

Ladders will only be used as an access to scaffold or for carrying out light work of short duration. Ladders must be tied and or footed. Ladders must only be set at a ratio of 1 metre out at the base for every 4 metres in height. All team members are required to read and understand the Safe use of Ladders & Stepladders. Ladders will be removed or boarded off at the end of each task to prevent risk.

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Damaged or unsuitable ladders will be removed immediately. Ladders must be stored in such a way that they cannot be damaged by either objects or elements.

Site Access and Egress

The user company is responsible for providing safe access and egress to the test rig site, Endurance will ensure safe access and egress is maintained for their and others in the working area, good standards of housekeeping will be maintained. Endurance will be responsible for safe access and egress. Access routes will be sign posted and barriers will be put in place wherever necessary.

Working at Height

All ETL members and service team members have been made aware of the dangers and consequences of falling from height. Working at height will be properly planned, organised and supervised; only competent members will be allowed to work at height and it is the responsibility of the Endurance to ensure conditions are safe before allowing any work at height to take place. The ETL manager will carry out a risk assessment before carrying out work at height and put in place equipment and measures to prevent falls occurring. Where he can not eliminate the risk of a fall he will put in place measures and equipment to minimise the distance. All company access equipment will be inspected on a regular basis and any damaged equipment will be withdrawn from service immediately.

Test Feasibility

This FSTR / RLS CD suitable for carrying out following tests:

- ✓ Road Load Simulation
- ✓ Drive Cycle Simulation
- ✓ Power at Clutch / Wheel / Tractive Effort at Clutch / Wheel
- ✓ Maximum Slip / Friction Co-efficient / speed
- ✓ Acceleration
- ✓ Fuel Consumption Measurement
- ✓ Emission Measurement
- ✓ Noise / Leakage if any (observation or with specific instrumentation)
- ✓ Drivability (Gear Shiftability)
- ✓ Functioning of Vehicle speed measuring system
- ✓ Functioning of Vehicle accessories & indicating system

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Apart from these tests other checks / observations can also be made.

Do's & Don'ts

Do's

- Warm-up the Chassis Dynamometer for about 30 minutes before the start of friction calibration & further testing.
- Ensure dry air at sufficient pressure is available all the time.
- Check that the safety interlocks are operational.
- Ensure correct tire air pressure.
- Strap the vehicle before starting the test.
- Ensure that the flywheel bolts are tightened properly.
- Clean the Chassis Dynamometer before use.
- Ensure the power supply is proper.
- Ensure that the covers / safety railing are screwed.
- The calibration is done & is not disturbed.
- Provide safety equipment/s, instruction, signboards & first aid box.
- Train the operator/s.
- The vehicle exhaust extraction system is working.
- Grease the bearings with only specified grease/s only.

Don'ts

- Don't apply brake while roller is rotating (especially at higher speed).
- Don't touch / walk on to the roller while rotating.
- Don't overload the load while calibration or otherwise.
- Avoid use of general-purpose grease for bearings.
- Do not use more than the defined amount of grease, as overfilled bearings are liable to overheat.

Calibration

Tractive Force Calibration

The calibration kit is provided so as to measure the tractive force at the roller surface in Newton (N). The Full-scale calibration range is 240N for 12kg of calibration weights.

Calibration accuracy: Better than $\pm 1\%$.

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Speed Calibration

The encoder used to measure roller speed is to calibrate to 100 km/h for 1304.4 rpm of the roller.

Chassis Dynamometer Friction Calibration

The friction calibration should be done after warm-up.

This has to be done if the inertia to be simulated is changed.

Flywheel Inertia Calibration

The flywheel inertia (Vehicle Equivalent Mass) can be calibrated by Coastdown with constant force & / or acceleration with constant force methods.

Calibration accuracy: Better than $\pm 1\%$.

AMC - Maintenance

AC or DC Motor

Greasing as per requirement, 10cc per bearing, every after 3 months.

Tacho-generator

- No day-to-day adjustments need be made to tacho-generator. However the accuracy should be checked periodically, alignment should be ensured & the mounting screw tightness should be checked.

Load Cell or Torque Transducer

- The Load cell rod bearings and Torque Transducer should be cleaned & inspected annually. A small quantity of grease or oil should be put over the bearing.
- The load cell / Torque Transducer should be removed properly whenever the AC or DC motor is being overhauled or is to be dismantled for repair.

Encoder

- No day-to-day adjustments need be made to this sensor. However the alignment should be ensured & the mounting screw tightness should be checked.

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Lubrication

Shaft Bearings

- The bearings used in the FSTR or Chassis Dyno are lubricated by **KLUBER grease Isoflex–Topas NB52** applied through grease nipples. Lubrication should be carried out after **500 hours** of operation or at three months interval by injecting **10cm³** of above grease using a suitable grease gun.
 - After lubrication the FSTR / Chassis Dynamometer should be run at approximately 500rpm for sufficient time, while monitoring each temperature of each of the bearings to ensure overheating of the bearings is avoided.
 - If the bearings are exposed during overhaul or maintenance they should be washed in white spirit or similar fluid drained & allowed to dry naturally. A measured quantity of grease should then be evenly distributed around the bearings.
- Overfilling of grease may result in overheating, therefore do not overfill.

Guidance notes for users on the safety of personnel

The user should ensure that apparatus it supplied is designed, tested & installed to be safe & without risk to health when properly used with the information provided to ETL on the conditions necessary for safety and any hazards, which could arise during normal use & how these are to be avoided.

The user on his part shall ensure that the employees are informed; trained, supervised & proper working procedures are adopted for their safety. The user should comply with the information provided in order to maintain the plant in a safe condition.

With certain categories of apparatus, safety hazards may arise, when it is necessary to gain access by opening enclosures, removing covers etc. This is especially the case when the apparatus cannot be completely isolated from all services before working on it, as an example, where circuits must be energized for the purpose of carrying out tests / checks. As it is often impossible to achieve hazard free conditions when working with circuits, the responsibility for the safe conduct of those carrying out the work rests on those under whose authority they act.