RESTRICTED

(DRAFT/PROVISIONAL)

QUALITY ASSURANCE PLAN

FOR

MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.

DRG.NO. 172.44.003CB-ACB

(LF No. 6206405002)

No. HVF/T-72/QAP/44/MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY./391132-00

ISSUE NO:00

DATE: SEPTEMBER 2021

QUALITY ASSURANCE (RIG ASSEMBLY)

HEAVY VEHICLES FACTORY

AVADI, CHENNAI – 600 054

RESTRICTED

(DRAFT/PROVISIONAL)

QUALITY ASSURANCE PLAN (QAP)

FOR

MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.

DRG . NO. 172.44.003CB-ACB

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HEAVY VEHICLES FACTORY

AVADI CHENNAI – 600 054

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1. IMPORTANT NOTES

Note-1

This is only a provisional and will be amended from time to time according to the requirement. No addition, deletion and reproduction will be done without the permission of The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 54.

Note-2

Any instruction contained in this does not prejudice the terms and conditions of the contract what so ever. In case of any contradiction between the contents of this QAP and the clause in the contract, the latter will prevail.

Note-3

The stores should be manufactured strictly as per the drawings supplied by the Inspection Authority only and not as per the samples, if any received by the manufacturer for guidance purpose.

Note-4

Any amendment issued by the Inspection Authority shall be incorporated in the QAP and the records for the amendments carried out should be maintained as per Appendix 'A'.

2. INTRODUCTION

This quality plan lays down the inspection and testing procedure to be carried out on the **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG.NO. 172.44.003CB-ACB used in T-72 tank and its varients** and the major electrical assembly Electric Speedometer Sending Unit to drg.no. 172.44.001 is inspected according to **QAI No.CQA(HV)/QAI/44/ES SENDING UNIT** being procured indigenously.

Electric speedometer sending unit МЭ 301b is housed in the left wheel crank housing. It is held by looking pin. Axial displacement is restricted by the aluminium bushing and locking pin.

Rotation from the idler wheel to the sending unit of electric speedometer is transmitted by the drive pins through the flexible shaft and reduction gears. When the sending unit shaft rotate at different rotational velocity it produces 3 phase AC voltage according to the drive speed. The AC output voltage developed by the sending unit is being fed to the indicating instrument (i.e. speedometer СП 110) which in turn measure the vehicle speed and registering the distance (KM) covered by the vehicle .

TECHNICAL REQUIREMENTS

The **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.** should comply with the technical requirements of drawing No. 172.44.003CB-ACB and Electric speedometer sending unit should comply with requirements of specification QAI No. CQA(HV)/QAI/44/ES SENDING UNIT and drawing 172.44.001.

All the completing articles and materials used for manufacturing the Electric speedometer sending unit should comply with the acting standards and their specifications.

Basic parameters and dimensions:

Electric speedometer sending unit:

The Electric speedometer sending unit is used in MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to drawing No. 172.44.003CB-ACB and Electric speedometer sending unit should comply with requirements of specification QAI No. CQA(HV)/QAI/44/ES SENDING UNIT.

Basic parameters:

a)	Type	- 3ϕ Alternator splash proof.
b)	Torque required to rotate the sending unit shaft	- 0.6 kgf/cm maximum.
c)	Operation	- Continuous operation.
d)	Input voltage to the sending unit	- 26.5 ± 1.
e)	Output voltage at 60 Kmph speed	- 18.5 ± 1 volt across phases.
f)	Environmental proof	- CVRDE/DSL/0007/81.
g)	Mass	- 0.550 Kg.

This QAP is prepared, based on the acceptance standards and inspection parameters laid down in collaborators documents and on the inspection test standards followed in respect of similar indigenous items. The details of the materials of the various components forming part of assembly are given in the collaborators specifications such as GOST, OST, TYs etc. The various manufacturing processes adopted by the collaborators are available in the technological process sheets. These process instruction sheets are available with the AHSP/DDO, HVF. All clauses of this process documents having relevant to the quality of the assembly should be taken note and guidance taken for implementation while manufacturing and assembly the stores. The performance and other requirements laid down in this QAP are generally as per the relevant specifications and standards of the collaborators.

This QAP is the property of Government of India and is liable for amendments as and when required. The Sr. General Manager, Heavy Vehicles Factory, Avadi, Chennai – 600 054 is the inspecting Authority for this assembly. Any query / clarification on the content of this QAP shall be referred to this Factory. Any departure from these instructions is allowed only after written approval from the above authority. Notwithstanding the tests indicated in this QAP, the inspecting Officer has the right to carry out any test to check conformance to the paper particulars quoted in the Supply Order, which he may consider necessary to satisfy himself about the stores which he has to accept.

SEVERITY

The Assembly/unit is liable for storage, transportation and operation in all of Climates where the environmental temperature is -50°C to +70°C and relative humidity is up to 98%.

3. AIM

This QAP is aimed at standardizing the Inspection procedure and acceptance norms for **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG.NO. 172.44.003CB-ACB** and also aims at giving adequate information to the manufacturer on the quality requirements so that the required quality control methods are established. This is also meant to guide authorized Inspection Officer in his routine inspection and to set out main points to which his attention must be drawn to ensure that the accepted stores meet the stipulated standards.

4. SCOPE

This QAP outlines in general terms, the checks and methods to be used during inspection of **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG.NO. 172.44.003CB-ACB** including the technical requirements of the drawings. The recommended Quality Plan stipulated herein is mandatory and should be strictly adhered to. For inspection purpose only the latest issue of this QAP will be made applicable and number of copies of this QAP can be obtained from the issuing authority i.e. The Sr. General Manager, Heavy Vehicles Factory, Avadi, and Chennai.

5. DRAWING

On placement of supply order, a set of applicable certified drawings will be forwarded to the contractor and the respective Inspection officer.

6. SPECIFICATIONS

A set of TY specifications/QAI and texts connected with the store can be obtained from the DDO, HVF. This comprises of GOST, OST, TYs, texts etc. Any clarification required on these documents should be obtained from the DDO. Equivalence of the specifications and standards will be decided only by the AHSP/DDO, HVF and should not be unilaterally decided. For any change in the specifications, standards or written texts, the AHSP/DDO, HVF should be approached in writing. Only based on the AHSP/DDO, HVF written approval any alterations in the specifications can be effected and not otherwise.

7. PROCESS SHEETS

The contractors, after scrutiny of the concerned process sheets and connected paper particulars, should establish the necessary production and inspection facilities. Particularly the inspection test stands, fixtures, templates, gauges etc, should be provided as recommended in the process sheets.

8. TEST STANDS

Gauges, templates, test stands, inspection fixtures and instruments required for the quality assurance testing should be provided by the contractor. Any information available in the

technological documents about the inspection requirements and test stands can be obtained from the AHSP/DDO, HVF. Contractor is at liberty to use any equivalent inspection system provided it meets the technical requirement of testing with the approval of inspection authorities.

9. MATERIAL

1. The material used for the components of the stores (BOM) should be as per the materials indicated in the individual part drawings. All precautions should be taken by the manufactures to use the correct grade of material as stipulated in the design documents. In exceptional cases, any changes, considered essential with regard to the material or grade should be referred to the AHSP/DDO, HVF for their approval in writing before undertaking the manufacture of the part.

2. The AHSP/DDO, HVF and the Inspection officer will be at liberty to draw material test specimens and samples from any stage of manufacture.

10. INTERCHANGEABLITY

1. The contractors should generally comply with the requirements indicated in the design documents with regard to material, construction and performance.

2. Efforts should be made by the manufacturer to adhere to the documents for the manufacture. However, due to any manufacturing constraints, if equivalents are to be used for marginal variations are to be adopted, the same will be done after getting approved from the AHSP/DDO. But all the requirements given in the inspection schedule will be fully complied with.

11. STANDARDS

The technical supply conditions for material and parts of the stores are given in the drawings& specifications. Manufacturers should ensure that the standard of manufacture and process employed are sufficient to meet the functional and reliability requirements.

12. SPECIAL NOTES

1. Fitment and performance of the assembly/unit should be compatible to the system.
2. Stores should be strictly manufactured only as per the drawings and specifications supplied by the AHSP/DDO, HVF and not as per samples, if any received by the manufacturer for guidance purposes.
3. Integrated system check will be carried out as per the directions of the AHSP/DDO, HVF.
4. All bought-out articles should be checked by the incoming quality control section of the contractor. The scope and methodology of quality control of the incoming materials and parts should be established in consultation with the AHSP/DDO, HVF and the Inspection officer.
5. Any technical documents that should be made available to the AHSP/DDO, HVF and inspection officer will be intimated by the concerned authorities. The contractors should provide free access to these documents for the scrutiny.

6. The requirements of technical documents such as operating instruction, service instruction, workshop-manuals, system layout etc, for the item and assemblies covered by this QAP, will be intimated by the AHSP/DDO, HVF and should be prepared and provided by the contractor. Sufficient copies of these documents should be supplied to the AHSP/DDO, HVF along with the first bulk supply. Vetting of these documents will be carried out by the AHSP/DDO, HVF.
7. Only after 100% pre-inspection by the contractor the stores should be offered to the inspection officer for inspection.
8. While tendering the stores for inspection, a test certificate indicating the tests carried out by the contractor should be given to the Inspection officer.
9. Before undertaking any testing, Inspector should ensure that they are using only NABL calibrated measuring instruments and gauges. The contractor should maintain a calibration record sheet for all the measuring instruments and gauges. This record sheet will be periodically checked by the inspection officer. Inspection officer may also under-take calibration tests under his supervision and control. Inspection officer will also check the Inspection fixtures, gauges and templates periodically.
10. Inspector should punch the acceptance mark on the body of the stores only after ensuring that the stores comply with the requirement of this QAP.
11. The working place and the environment of the inspection area should be clean and be such that it does not affect the test-stands instrumentation or components under inspection.
12. The minimum testing time for completing the Climatic and Dynamic tests is approximately 3-4 months. Contractor is advised to complete all the testing taking into account this lead time.
13. Samples which have under-gone the Climatic, Dynamic and Endurance test should be "YELLOW BANDED" on the outer casing. These yellow banded samples should NEVER be consumed in production or service. For all queries on yellow banding of samples, inspection authority should be consulted in writing. Proper records for co-relating the Sl.No. & date code of the yellow banded samples should be made available to the inspection authority.
14. Any sample which has failed in the Climatic, Dynamic and Endurance test should NOT be yellow banded, but should be kept aside.
15. All marking on the parts, assemblies, name plates, inspection plates, etc. Should be done only in **ENGLISH** and not in any other language. In case of any doubt, AHSP/DDO should be consulted in writing. The location of markings, name plate, and instruction plates, should be as per the connected parts of assembly drawings.
16. Type approved/MIL grade connectors, plugs, cables, switches, relays, diodes, transistors, circuit breakers, fuse units, bulbs and other electrical and electronics hardware shall only be used. Type approval certification for the electrical and electronics hardware should be obtained from the electronics discipline AHSP/DDO, HVF. Suppliers of the main articles will be responsible for obtaining the type approval certification from the concerned AHSP/DDO.
17. Accepted and cleared stores should bear the stamp or stenciling mark of the inspection staff. This acceptance marking should be placed in a visible location of the articles cleared.
18. The packing of all supplies should be made such as to withstand the climatic, transportation and handling severities. Deterioration of the articles in storage is NOT permissible.
19. The package should bear the full identification of the supplies and the contractor.

13. QUALITY ASSURANCE PROGRAM

Quality assurance program is a continuous process envisaging the entire stages of manufacture right from the receipt of components till the fabrication of the end product by the manufacturer. Successful launching of such program depends upon proper quality audit checks of the records of the manufacturer at appropriate stages in a systematic manner, before the equipment is offered to the inspector for inspection.

The inspector should arrange with the manufacturer so that his representative would visit at regular intervals to check the quality control records. Inspector will also give the firm the areas and stages where such audit is intended to be carried out. Broadly the areas may cover

1. Inward goods check on components/materials.
2. Inward goods check on sub-assemblies inter-stage.
3. Check on adequacy of accuracy of instruments/calibration.

Soon after the manufacturer accepts a contract, starts planning in all possible ways to meet the target date of supplies. Apart from design drawing, machine shop works and turning out a few hardware components, his major efforts would be directed towards purchasing large quantity of components, materials and sub-assemblies which are not manufactured in his premises. Inspector has to obtain in the first instance from the manufacturer the list of components and the sources of supplies from the approved sources as far as possible.

On obtaining the adequate first hand information of the planning from the manufacturer, the inspector would decide the areas and stages of quality control audit.

The Proforma 'A' attached with this instruction is meant to exercise check on the manufacturer's quality control on the incoming materials/components. In the case of a new firm, through scrutiny should be carried out about the system adopted by the firm. The stages and periodicity of checks should be decided by the inspector taking into consideration the factors prevailing.

The Proforma 'B' is meant to cover the QC audit of the inter stage sub-assemblies. It will be interesting to note whether the firm is adopting sampling methods of quality checks or 100 percent quick tests are done on each sub-assembly. In this case the inspector may advise the firm regarding the particular assembly being critical/non-critical and the amount of check is adequate or inadequate.

In certain cases, it may be advisable to subject these to screening/ageing process as well. By now since the final product is invariably governed by a test schedule/specification, the tests and the parameters are more specific. The firm is expected to thoroughly test the end product before the same is offered for inspection. Inspector may therefore check whether such a testing has been done by the firm before tendering the store for inspection and records of such testing would be made available to the inspector. Inspection of the final product will be done by the inspector and the firm will provide the necessary facility and assistance.

The Proforma 'C' is meant to check the adequacy of the test instruments/equipments available with the firm. The system adopted by the firm to get his instruments calibrated

periodically and the source from where he is getting it done should be checked before starting any inspection activity. It is important to record such noting and the inadequacies should be brought to his notice.

Through these checks right from planning of procurement of stores and inward goods inspection by the manufacturer to the end product and with the full cooperation of the manufacturer in such program, it could be optimistically anticipated that the final product would not only meet the specified parameters but a high and sustained quality of the product can be maintained.

Such systems working successfully would help both the supplier and the purchaser alike instead of getting into complications at a later stage.

14. INSTRUCTIONS FOR INSPECTION

i. This test schedule is issued to assist and guide the inspector in his acceptance inspection, nothing in the schedule absolves the inspector from his responsibility to ensure that inspection is carried out strictly as per terms of contract and the accepted stores are up to the specification in every respect.

ii. Before commencing inspection, the inspector will make himself fully conversant with all the terms and conditions of contract, the specifications, drawing and maker's literature. In advance, he must obtain from AHSP/DDO, HVF any clarifications as regards the contract and about any discrepancies he might find in the quality assurance Program.

iii. In the course of inspection, if the inspector finds any point which could advantageously be included in the QAP he should bring such points to their notice of the AHSP/DDO, HVF

iv. The manufacturer/supplier may be shown this QAP in order to acquaint himself with the standard of inspection so that he endeavors to improve his products.

v. Before rejecting stores for not meeting a requirement set forth in this schedules a careful check must be made to assure that no contractual waiver or change in the specification has been issued authorizing the deviation.

vi. List of test equipments necessary for conducting the tests included in this schedule is given in Appendix 'B' (suitable equivalent may be used).

vii. Any doubt, controversy in the inspection of the equipment or store, shall be immediately brought to the notice of the AHSP/DDO, HVF for decision/instructions. Changes or deviations to this schedule shall not be made without prior approval.

viii. The inspector may carry out additional test which he consider necessary to satisfy himself that the quality of store which he is accepting is up to the specification quoted in the contract in every respect. At his discretion he may carry out test on components to their relevant specifications.

MATERIAL TEST

Random samples should be drawn at regular intervals to monitor the quality of materials put into use for the manufacture of parts. Samples can be drawn either from raw stock or from any other stage of manufacture or assembly.

Test specimens should be made out as per the relevant specification mentioned in the part drawings. The material specifications are quoted in the part drawings. The results obtained should conform to the material specified in the part drawings.

Testing method should be as suggested in the relevant materials specifications or its equivalent since the values specified therein has got correlation with this particularly physical and mechanical testing should be undertaken as per the collaboration specifications for proper interpretation of the results.

Material test specimens for insulating varnished clothes, capacitor paper, adhesive, and metal finishing chemicals should be drawn at random and to be tested .

The inspection officer at his discretion can draw a common test samples for items made from the same grade of material .If the contractor is stocking the entire raw material covering the full ordered quantity sample from the raw material stock can be checked once during the pilot stage and subsequently once from the bulk supplies.

COMPONENT INSPECTION

Component drawn at random from the production line will be checked for the characteristics referred to in the concerned part drawings.

PROCESS INSPECTION

Inspection officer should draw samples from the process lines for checking the quality of surface treatment and heat treatment provided to the parts. Surface protective coating can be checked against specifications indicated in the special notes of the parts drawings. Heat treated parts can be checked for surface hardness, micro structures and for any surface crack.

The process employed for providing surface treatment of chromatizing, if any, should be carried out as per the approved methods. The surface treatment process, if any, should be regularly examined for its adherence to the recommended methods.

Heat treatment process, if any, adopted in the manufacture of parts should be witnessed prior to clearance of pilot samples.

The heat treatment process should be witnessed at regular interval, during bulk supplies.

DIMENSIONAL CHECK AND CHECKING OF TR POINT

Manufacturer has to ensure components are manufactured as per relevant drawings and manufacturing process book. Conformance as per drawings and TR points, as per BOM of item **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG. NO. 172.44.003CB-ACB** will have to be ensured by HVF Inspector as per the BOM enclosed as Appendix "C".

CHECKING FOR STANDARD COMPONENT

If manufacturer uses commercially of the self components or standard item like fasteners (i.e. component which need not to be manufactured against a drawing number as per original BOM, such components fall under this category. Manufacturer has to ensure the equivalence of such component to original components and proof for equivalence need to be submitted by the

manufacturer. Further, the standard component has to be procured from any renowned source. The same to be approved by GM/HVF and he reserves the right for its acceptance or otherwise.

QA CHECKS FOR NON-METALIC COMPONENTS

Non-metallic components, the manufacturer has to ensure that the component proposed is conforming to original specification. Testing as per OEM specification has to be carried out and the same may be witnessed by HVF, if required. However, GM/HVF reserves the right for its acceptance or otherwise.

QA CHECK FOR SUB ASSEMBLYS

Manufacturer has to ensure components are assembled as per relevant drawing and assembly process books. QA check for sub assembly will be carried out as per Drawings, Process book and TR points with reference to BOM of item **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG. NO. 172.44.003CB-ACB.**

QA CHECK FOR ASSEMBLY

Manufacturer has to ensure that assembly of item **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG. NO. 172.44.003CB-ACB** is carried out as per Assembly Drawing and Assembly Process book. Assembly will be subjected to QA check as per Technical Specification/QAP/ drawings of **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG. NO. 172.44.003CB-ACB**

a) Firm has to maintain all the documents as per QAP/TY with respect to the Sl.No.to have traceability.

b) Vendor has to submit Bill of materials, Material test reports (Chemical and mechanical properties), Calibration reports, Class 'C' /Endurance test reports (wherever specified in drg. /TY specification/QAP) and Complete PIR (pre-inspection report) at the time of offering the item for inspection. HVF will commence the inspection only after scrutiny of these documents.

c) The testing/inspection responsibility to test all the parameters as per QAP and drawing specifications as mentioned in Appendix 'E' (enclosed).

d) Pre inspection reports (PIR) of firm like, 1. Chemical analysis & Mechanical properties obtain from NABL as per Bill of materials 2. Pre-forming process report as per process sheet 3. Coating certificates 4. Calibration reports of instruments 5. Dimensional inspection as per Appendix 'E'

15. INSPECTION LEVEL

SAMPLING

Selection of sample from the lot tendered for inspection should be made as per the random sampling tables.

1. All system Sub-assembly tendered for inspection will be checked for characteristics affecting fitment and routine performance.

2. Sample for machined parts, will be drawn for inspection as per IS 2500-Part I Level II AQL 1.5.
3. 100%inspection will be carried out on the heat treated parts till such time methods and process are streamlined and established.
4. Heat treatment, plating and finishing quality of part will be assessed process batch-wise. Representative sample drawn at random from a process-batch will be sent to laboratory for test.

16. CLASSIFICATION OF TEST

The various test to be carried out are classified as 'A', 'B' and 'C tests based on the procedure for inspection of equipment produced to Defence requirements, proc/L/100A. These are as follows:-

CLASS (A) TEST:

These tests are to be carried out for 100% of store normally at the firm's premises.

CLASS (B) TEST:

These are fitment and functional tests to be carried out on 10% of the total number of stores picked up at random from those which have passed class 'A' Tests.

CLASS (C) TEST:

These tests are to be carried out for 1% of total number of stores picked up at random by the Inspection Officer from those which have passed class 'A' Tests & Class 'B' tests.

Type Test:

In case of major changes of diagram, design or technology of manufacturing the unit, which may have effect on its operating properties, then the Type Test shall be conducted with the aim to check the compliance of unit with requirements as per TY specification.

17. PILOT SAMPLE INSPECTION

This clause is applicable if the condition of pilot sample is mentioned in tender/supply order or if it is project sanction order (Make – II). Contractor should tender three PILOT samples representing the bulk supplies to the Inspection officer for the pilot sample evaluation. Contractor should intimate in writing to the Inspection officer and all concerned about the tendering of the pilot samples. The pilot samples tendered should bear the regular Sl. No. and in addition to this Sl.No. These samples should also bear identification number in red paint as under:

"PS1, PS2 and PS3".

Principally, all the pilot sample evaluation will be carried out at the contractors manufacturing premises. As such, the contractor should provide all inspection facilities for this. Contractor should inform in writing, about the facilities available with them for evaluation of pilot samples. Any additional facilities that are required for the pilot sample evaluation will be

intimated by the Inspection officer and the AHSP/DDO. Instruction for the system check will be intimated by AHSP/DDO. Vehicle trials will be conducted as per the direction of the AHSP/DDO.

If required, Inspection officer will conduct stage inspection of pilot sample with manufacture of these pilot samples. It would be preferable to conduct material test, component inspection, process inspection and assembly inspection as "STAGE INSPECTION" during manufacturing on the pilot sample.

The pilot sample evaluation will constitute the following test:

TEST	INSPECTION LEVEL
a) Material test	Samples or material specimens will be drawn from the production line during the manufacture of the pilot samples.
b) Component inspection	Samples will be drawn from the production line before assembly of the pilot sample.
c) Process inspection	Sample will be drawn from the process line.
d) Assembly inspection	Sub assemblies can be drawn from the pilot batch during production and assy.
e) Visual examination	All 3 samples
f) Dimension check	All 3 samples
g) Performance test	All 3 samples
h) Electrical test	All 3 samples
i) Parameter test	All 3 samples
j) Climate and dynamic test	1 Sample (PS2)
k) Endurance test	1 Sample (PS2)
l) System check on vehicle	1 Sample (PS1)
m) Preservation check	ALL samples
n) Identification check	ALL samples
o) Packing check	ALL samples
p) Sample retention	1 Sample (PS3)

ACCEPTANCE

The result of the test should be scrutinized in detail before deciding acceptance or otherwise of the batch of the store tender for inspection.

The stores and other parts will qualify acceptance only if they meet all the technical requirements as indicated in this QAP and documents of the collaborators.

During the sampling inspection, if any article assembly or part is found to be not meeting the technical supply conditions, the batch representing the sample will be rejected as per the governing clauses of IS 2500-part 1.

Inspection officer and contractor will make a detailed report on any rejection of a consignment clearly indicating the cause of the defect and remedial measures that should be followed to avoid the re-occurrence of the defect.

During, line process or assembly inspection, if the inspection reveals any short-coming further operation should be suspended immediately and corrective measure should be taken up. Only on satisfactory proof of this, further inspection can be taken up.

Incase, the defect noticed on any consignment is attributable to manufacture warranting rectification of earlier supplies, the contractor should restore to rectification of these defect in the supplies already made. This should be done in consultation with the AHSP/DDO and the consignee.

Any rejection noticed in 100% inspection will warrant rejection of the defective units and the inspection will be continued for the accepted quantity but 100% inspection will be restored to only in case of critical parameters.

Wherever 100% inspection (segregation inspection) is not warranted, in the inspection will be as per IS-2500 PART 1. The AQL and the level of inspection for different attributes are dealt with separately.

In this case, the rejected stores will be re-tendered for inspection only after 100% pre-inspection by the contractor. If the stores are rejected for second time, that lot will not be tendered for inspection again and will be considered as rejected.

QACHECKS IN TANK

Pilot sample will be integrated into the tank and subjected to running for 100 Km or as per Tank Testing Procedures. During trial the sample will be tested for various functional trials as per Assembly Process book and Tank Testing Procedures.

Pilot samples will be accepted and BPC will be accorded, if the pilot samples conform to testing's laid down in this QAP of **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. to DRG. NO. 172.44.003CB-ACB**.

18.CLASS A TEST(Acceptance Tests)

18.1 VISUAL TEST

General points applicable as to the requirement only:

1. Check for completeness and correctness of the item as per Assembly Drg. **172.87.134 CB- ACB**. Check the rating of electrical components for its correctness.
2. Check that mounting of components are as per Drawings **172.44.003CB-ACB**.
3. Check the overall dimension and mounting are as per the relevant drawings **172.87.134CB-ACB**.
4. Check the following as per the relevant Drawings and specification:-
    i. Material and quality casting.
    ii. Dimensions , Workmanship
    iii. Finishing/painting, plating, coating etc.,
    iv. Correctness and quality of rubber components
    v. Name plate as per drawing approved by AHSP/DDO
    vi. Marking, Engraving: Ensure that they are legibly correct and size of letters are maintained as per drawing.
    vii. Orientation of connectors/plugs.
    viii. Components and layouts as per drawing (it was observed fouling each other in the prototype. This may not be permitted).
    ix. Wiring, routing, bunching and screwing of wire bunches.
    x. Proper, correct size, standard, leaving of wires at soldering points and jumpers.
    xi. Correctness of screws, washers, nut &spacers etc.
    xii. Correct marking of components and circuit reference on the body.
    xiii. Type approval status of components.
    xiv. Mechanical parts/items are free from blow holes, cracks and sharp edges.
    xv. Interchangeability of screws and back plate of the unit.

Ensure that the improvements suggested in the BPC report are incorporated in the bulk.

18.2. Checking the complete set and corresponding drawings

1) MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY. as per overall, established dimensions and external appearance should correspond to drawing **172.44.003CB-ACB**.

2) During external inspection, check the complete set, corresponding drawings, quality of assembly, external parts, quality of soldering, absence of loose fittings, visually conformity of assembly as per electrical assembly drawings, with the help of measuring means and checking of overall dimensions.

3) All the components as per the part list of drawing **172.44.003CB-ACB** shall be checked for dimension and material with respective individual drawings. Block or connector, Wires and any other electrical/electronic components shall be Imported/ Type approved and corresponding documents shall be verified.

4) The workmanship and finish should be satisfactory.

5) Connector dimensions and configuration of pins may be checked as per relevant specifications.

6) The Rubber Gaskets used should be as per Drg. regarding the dimensions and approved Indian Equivalent material shall be used.

7) Material test certificates issued by the authorities shall be verified.

8) Generally, it may be noted that when drawings are provided for items like Nuts, Bolts, Screws, cable Lugs etc., they may inspected as per drawing, since in most of such cases, these items are special and standard items does not meet the requirements.

9) Ensure that each item is marked with Drg. No., Nomenclature, Qty and the Assembly on a tally plate and packed separately. In case of assemblies like Micro-switches, the firm should list out all the items and Ref. Drg. Nos. used in the assembly for identification purpose.

18.3. Inspection of Reduction Gear Unit with Electric Speedometer Unit Assy. to Drg. No. 172.44.005C-B-ACB

The inspection of **Reduction gear unit with Electric Speedometer unit Assy.** to Drg. No. **172.44.005CB-ACB** is to be carried out as below:

The inspection of **Reduction gear unit with electric speedometer unit Assy.** is to be carried out as per drawing **172.44.005CB-ACB**. All the components are to be checked as per the respective drawings for dimensions and material.

18.3.1. Inspection of Cable Assy. to Drg. No. 172.44.007CBCB

The inspection of **Cable Assy.** is to be carried out as per drawing **172.44.007CBCB**. All the components are to be checked as per the drawing for dimensions and material.

a) All the dimensions should be confirmed as per drawing and specifications.
b) All Technical requirements (T.R) points to be ensured as per drawing.
c) Other requirements are as per 172.TY13.
d) Continuity, Insulation resistance and Insulation strength to checked as per 172.TY 13.
e) Class C tests on 1% of stores are to be carried out as per JSS 55555 specification.
   1. Bounce test (Test no.4: Condition A)
   2. High temperature (Test No- 17: Procedure-5, Condition-H)
   3. Low Temperature (Test No-20: Procedure-4, Condition-H)
   4. Rapid temp cycling (Test No.-22: Procedure-1, Condition-B)
   5. Tropical Exposure (TestNo-27: Condition-B)
   6. Mould Growth (Test No-21 (3.6.5)) &
   7. Corrosion test (Test No. 9: Procedure-2.)

(Ref. No.CQA(AVL)/CABLES/001/2010)

18.3.2. Inspection of Electric Speedometer Sensor МЭ-301Б to Drg. No. 172.44.001

The inspection of **Electric Speedometer Sensor МЭ-301Б** to **Drg. No. 172.44.001** is to be carried out as below:

Electric Speedometer Sensor МЭ-301Б is to be checked/tested as per the QAI No. **CQA(HV)/QAI/44/ES SENDING UNIT**. The instructions given on the drawing should be adhered to.

18.3.3. Inspection of Cover to Drg. No. 172.44.011-2

The inspection of **Cover** to **Drg. No. 172.44.011-2** is to be carried out as below:

The inspection of **Cover** is to be carried out as per drawing **172.44.011-2**. All the components are to be checked as per the drawing for dimensions and material.

18.3.4. Inspection of Sensor Case Electric Speedometer to Drg. No. 172.44.013

The inspection of **Sensor Case Electric Speedometer** to **Drg. No. 172.44.013** is to be carried out as below:

The inspection of **Sensor Case Electric Speedometer** is to be carried out as per drawing **172.44.013**. All the components are to be checked as per the drawing for dimensions and material.

18.3.5. Inspection of Ring to Drg. No. 172.44.020

The inspection of **Ring** to **Drg. No. 172.44.020** is to be carried out as below:

The inspection of **Ring** is to be carried out as per drawing **172.44.020**. All the components are to be checked as per the drawing for dimensions and material.

18.3.6. Inspection of Ring to Drg. No. 172.44.023

The inspection of **Ring** to **Drg. No. 172.44.023** is to be carried out as below:

The inspection of **Ring** is to be carried out as per drawing **172.44.023**. All the components are to be checked as per the drawing for dimensions and material.

18.3.7. Inspection of Ring to Drg. No. 172.44.027

The inspection of **Ring** to **Drg. No. 172.44.027** is to be carried out as below:

The inspection of **Ring** is to be carried out as per drawing **172.44.027**. All the components are to be checked as per the drawing for dimensions and material.

18.3.8. Inspection of Cover to Drg. No. 175.44.002-1

The inspection of **Cover** to **Drg. No. 175.44.002-1** is to be carried out as below:

The inspection of **Cover** is to be carried out as per drawing **175.44.002-1**. All the components are to be checked as per the drawing for dimensions and material.

18.3.9. Inspection of Driving Gear to Drg. No. 175.44.003-1

The inspection of **Driving Gear** to **Drg. No. 175.44.003-1** is to be carried out as below:

The inspection of **Driving Gear** is to be carried out as per drawing **175.44.003-1**. All the components are to be checked as per the drawing for dimensions and material.

18.3.10. Inspection of Driving Gear to Drg. No. 175.44.004-1

The inspection of **Driving Gear** to **Drg. No. 175.44.004-1** is to be carried out as below:

The inspection of **Driving Gear** is to be carried out as per drawing **175.44.004-1**. All the components are to be checked as per the drawing for dimensions and material.

18.3.11. Inspection of Prizm Bolt to Drg. No. 175.44.017

The inspection of **Prizm Bolt** to **Drg. No. 175.44.017** is to be carried out as below:

The inspection of **Prizm Bolt** is to be carried out as per drawing **175.44.017**. All the components are to be checked as per the drawing for dimensions and material.

18.3.12. Inspection of End Piece 4.3 to Drg. No. 520.08.003-01

The inspection of **End Piece** to **Drg. No. 520.08.003-01** is to be carried out as below:

The inspection of **End Piece** is to be carried out as per drawing **520.08.003-01**. All the components are to be checked as per the drawing for dimensions and material.

18.3.13. Inspection of Screw M4-6gx14.46.016 to GOST-1491-80

The inspection of **Screw M4-6gx14.46.016** to **Drg. No. GOST-1491-80** is to be carried out as below:

The inspection of **Screw M4-6gx14.46.016** is to be carried out as per specification **GOST-1491-80**. All the components are to be checked as per the drawing for dimensions and material.

18.3.14. Inspection of Screw M3-6gx10.46.016 to GOST-17473-80

The inspection of **Screw M3-6gx10.46.016** to **GOST-17473-80** is to be carried out as below:

The inspection of **Screw M3-6gx10.46.016** is to be carried out as per specification **GOST-17473-80**. All the components are to be checked as per the drawing for dimensions and material.

18.3.15. Inspection of Nut M6-6H.10.38XC.016 to Drg. No. GOST-5927-70

The inspection of **Nut M6-6H.10.38XC.016** to **Drg. No. GOST-5927-70** is to be carried out as below:

The inspection of **Nut M6-6H.10.38XC.016** is to be carried out as per specification **GOST-5927-70**. All the components are to be checked as per the drawing for dimensions and material.

18.3.16. Inspection of Washer 3 65Г 016 to Drg. No. GOST-6402-70

The inspection of **Washer 3 65Г 016** to **Drg. No. GOST-6402-70** is to be carried out as below:

The inspection of **Washer 3 65Г 016** is to be carried out as per specification **GOST-6402-70**. All the components are to be checked as per the drawing for dimensions and material.

18.3.17. Inspection of Washer 4T 65Г 016 to Drg. No. GOST-6402-70

The inspection of **Washer 4T 65Г 016** to **Drg. No. GOST-6402-70** is to be carried out as below:

The inspection of **Washer 4T 65Г 016** is to be carried out as per specification **GOST-6402-70**. All the components are to be checked as per the drawing for dimensions and material.

18.3.18. Inspection of Washer 6T 65Г 016 to Drg. No. GOST-6402-70

The inspection of **Washer 6T 65Г 016** to **Drg. No. GOST-6402-70** is to be carried out as below:

The inspection of **Washer 6T 65Г 016** is to be carried out as per specification **GOST-6402-70**. All the components are to be checked as per the drawing for dimensions and material.

18.3.19. Inspection of Bending Shaft ГВ 301 M-01 to Drg. No. TY-37.003.430-91

The inspection of **Bending Shaft ГВ 301 M-01** to **Drg. No. TY-37.003.430-91** is to be carried out as below:

The inspection of **Bending Shaft ГВ 301 M-01** is to be carried out as per specification **TY-37.003.430-91**. All the components are to be checked as per the drawing for dimensions and material.

18.3.20. Inspection of Sleeve 305 ТВ-40, 3.5(White) to Drg. No. GOST-19034-82

The inspection of **Sleeve 305 ТВ-40, 3.5 (White)** to **Drg. No. GOST-19034-82** is to be carried out as below:

The inspection of **Sleeve 305 ТВ-40, 3.5 (White)** is to be carried out as per specification **GOST-19034-82**. All the components are to be checked as per the drawing for dimensions and material.

18.3.21. Inspection of Wire MM-1.0 to Drg. No. TY-16.K71-087-90

The inspection of **Wire MM-1.0** to **Drg. No. TY-16.K71-087-90** is to be carried out as below:

The inspection of **Wire MM-1.0** is to be carried out as per specification **TY-16.K71-087-90**. All the components are to be checked as per the drawing for dimensions and material.

18.3.22. Inspection of Stainless Steel Wire 1 to 1.2 x 100mm to Drg.No.AISI-304

The inspection of **Stainless Steel Wire 1 to 1.2 x 100 mm** to **Drg. No. AISI-304** is to be carried out as below:

The inspection of **Stainless Steel Wire 1 to 1.2 x 100 mm** is to be carried out as per specification/Drawing No. **AISI-304**. All the components are to be checked as per the drawing for dimensions and material.

18.3.23. Inspection of Spring Washer 3 IS:6735-72 Zing Coated to Drg. No. IS:6735-72

The inspection of **Spring Washer 3 IS:6735-72 Zing Coated** to **Drg. No. IS:6735-72** is to be carried out as below:

The inspection of **Spring Washer 3 IS:6735-72 Zing Coated** is to be carried out as per specification **IS:6735-72**. All the components are to be checked as per the drawing for dimensions and material.

18.3.24. Inspection of Spring Washer-B6 IS:6735-72 Zing Coated to Drg. No. IS:3063-94

The inspection of **Spring Washer-B6 IS:6735-72 Zing Coated** to **Drg. No. IS:3063-94** is to be carried out as below:

The inspection of **Spring Washer-B6 IS:6735-72 Zing Coated** is to be carried out as per specification **IS:3063-94**. All the components are to be checked as per the drawing for dimensions and material.

18.4. Inspection of Ring, Locking to Drg. No. 172.44.008

The inspection of **Ring, Locking** to **Drg. No. 172.44.008** is to be carried out as below:

The inspection of **Ring, Locking** is to be carried out as per drawing **172.44.008**. All the components are to be checked as per the drawing for dimensions and material.

18.5. Inspection of Bushing to Drg. No. 172.44.024

The inspection of **Bushing** to **Drg. No. 172.44.024** is to be carried out as below:

The inspection of **Bushing** is to be carried out as per drawing **172.44.024**. All the components are to be checked as per the drawing for dimensions and material.

18.6. Inspection of Cotton Pin to Drg. 175.44.009-1

The inspection of **Cotton Pin** to **Drg. No. 175.44.009-1** is to be carried out as below:

The inspection of **Cotton Pin** is to be carried out as per drawing **175.44.009-1**. All the components are to be checked as per the drawing for dimensions and material.

18.7. Inspection of Nut to Drg. No. 175.44.010-2

The inspection of **Nut** to **Drg. No. 175.44.010-2** is to be carried out as below:

The inspection of **Nut** is to be carried out as per drawing **175.44.010-2**. All the components are to be checked as per the drawing for dimensions and material.

18.8. Inspection of Ring to Drg. No. 175.44.013

The inspection of **Ring** to **Drg. No. 175.44.013** is to be carried out as below:

The inspection of **Ring** is to be carried out as per drawing **175.44.013**. All the components are to be checked as per the drawing for dimensions and material.

18.9. Inspection of Coupling Nut to Drg. No. 175.44.016

The inspection of **Coupling Nut** to **Drg. No. 175.44.016** is to be carried out as below:

The inspection of **Coupling Nut** is to be carried out as per drawing **175.44.016**. All the components are to be checked as per the drawing for dimensions and material.

18.10. Inspection of Cone to Drg .No. 432.44.027

The inspection of **Cone** to **Drg. No. 432.44.027** is to be carried out as below:

The inspection of **Cone** is to be carried out as per drawing **432.44.027**. All the components are to be checked as per the drawing for dimensions and material.

18.11. Inspection of Ring to Drg. No. 432.44.058

The inspection of **Ring** to **Drg. No. 432.44.058** is to be carried out as below:

The inspection of **Ring** is to be carried out as per drawing **432.44.058**. All the components are to be checked as per the drawing for dimensions and material.

18.12. Inspection of Ring to Drg. No. 432.44.065

The inspection of **Ring** to **Drg. No. 432.44.065** is to be carried out as below:

The inspection of **Ring** is to be carried out as per drawing **432.44.065**. All the components are to be checked as per the drawing for dimensions and material.

18.13. Inspection of Bolt M8x1-6gx16.88.38XC.016 to GOST-7796-70

The inspection of **Bolt M8x1-6gx16.88.38XC.016** to **Drg. No. GOST-7796-70** is to be carried out as below:

The inspection of **Bolt M8x1-6gx16.88.38XC.016** is to be carried out as per specification **GOST-7796-70**. All the components are to be checked as per the drawing for dimensions and material.

18.14. Performance Test as MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.

After inspection of Electric Speedometer Sending Unit and all other components, assembly of MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY is to be done and the performance test is to be carried out as per the technical requirements of the drawing 172.44.003CB-ACB.

19.CLASS "B" TEST

These tests are to be carried out for 10% of total number of stores picked up at random by the Inspection Officer after passing the class 'A' tests.

The item Electric Speedometer sending unit, will undergo Class B tests as per the respective QAI No. CQA(HV)/QAI/44/ES SENDING UNIT of August 96.

Class B tests on any other item is carried out according to the respective specification if any applicable.

20.CLASS "C" TEST

These tests are to be carried out for 1% of total number of stores picked up at random by the Inspection Officer after passing the class 'A' & Class 'B' tests.

The item Electric Speedometer sending unit, will undergo Class C tests as per the respective QAI No. CQA(HV)/QAI/44/ES SENDING UNIT of August 96.

Class C tests of Cable Assy to Drg.No.172.44.007CBCB is to be carried out as mentioned.

21. MARKING

Marking of unit should be conducted incompliance with complete set of documentation/drawings.

The major assembly Electric Speedometer sending unit is to be marked according to the QAI No. CQA(HV)/QAI/44/ES SENDING UNIT of August 96 and respective drawings.

22. PACKING, PRESERVATION & STORAGE

Packing:

Packing and Preservation of assembly/unit should be carried out according to the requirement of OST B3 1164-72 and GOST 9014-78 and valid packing drawings.

The packages box shall contain the Packing Slip. The Packing slip should bear acceptance mark of the inspection staff.

Preservation:

Ensure the following:

a) That the surface treatment given to parts and assy. are as per the part assembly drg;
b) That the varnishes, insulating materials, lubricants, adhesives used have sufficient storage life;
c) The threaded parts of the accepted electric speedometer sending unit before packing are applied with the thin layer of grease.

Storage:

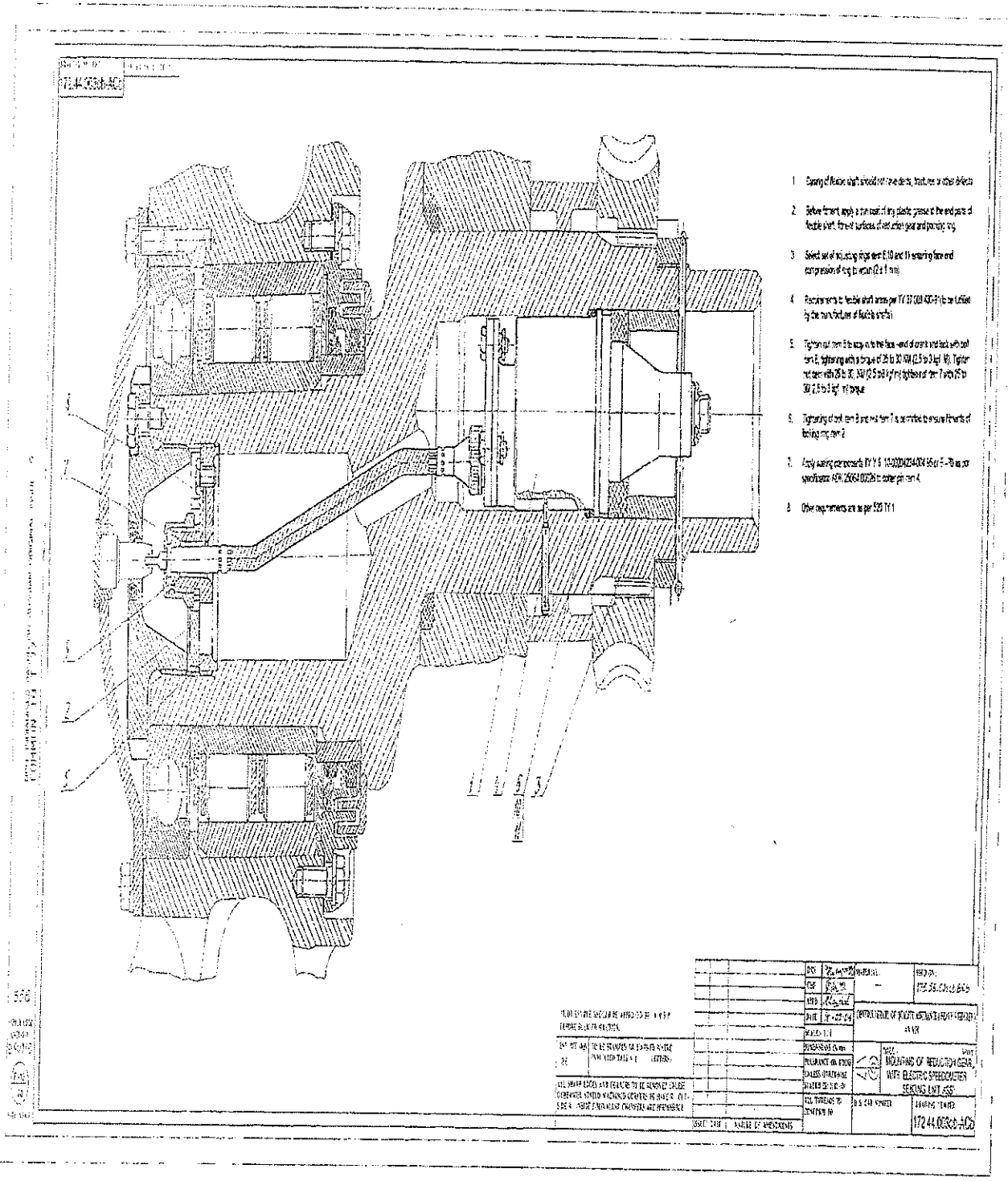
Storage time of assembly/unit preserved taking into account GOST 9014-78 in user stores must not exceed 5 years or in case of packing in sealed covers as per GOST 9014-78 not more than 8 years.

23. MANUFACTURER's GUARANTEE

Manufacturer (supplier) guarantees the conformity of Assembly/unit as per requirements of present QAP while following the customer's conditions of transportation, storage, assembly and operation.

Guaranteed operating time of assembly/unit (for major unit Electric Speedometer sending unit) is as per the respective QAI/QAP/TY.

24. ASSEMBLY DIAGRAM



PROFORMA "A"

QUALITY AUDIT SHEET

(Inward Material / Components)

S .No	Incoming stores Material/ Components	Supplier	Lot No and date	Qty	Mfg. Ref of QC Record	Status Satisfactory/ Unsatisfactory	*Remarks

This may also indicate:

a) If there has been a change in the supplier / sub contractor.

b) If there has been a change in the specification.

c) If the Inspector has carried out any test at his discretion.

d) Any screening /Ageing/ Burring in test carried out.

PROFORMA "B"

QUALITY AUDIT

(Inter change sub- assembly)

Interstage Sub – assembly	Subcontractor if any	Batch No and date	Qty	Mfg. Ref of QC record	Status Satisfactory/ Unsatisfactory	Remarks(Change of supplier , specification etc may be noted/ Analyzed screening/ Ageing if done may be also noted)

PROFORMA "C"

RECORD SHEET FOR CALIBRATION OF TEST EQUIPMENTS/ MEASURING DEVICES AVAILABLE WITH THE MANUFACTURER

Sl. No	Test equipments/device available with the manufacturer	Last Date of calibration	Agency by whom calibrated	Manufacturer's reference of records	Remarks (satisfactory/ unsatisfactory)

This will include all those which have been used for manufacture, testing of the process, subassemblies/assemblies and main equipment.

APPENDIX 'A'

SHEET FOR RECORDING AMENDMENTS

Amendments	No. of sheets pages				Total No. Of sheets (pages) in document	No. of document	Incoming No. of accompanying document and date	Signature	Date
	Amended	Replaced	New	Deleted					

APPENDIX 'B'

List of equipments:

1. Multimeter
2. Megger
3. Test stands for checking the Electric Speedometer sending unit
4. Special test stand for checking the MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.
5. Timer
6. Power supply
7. Ammeters
8. Voltmeters
9. High Voltage tester
10. Tachometer
11. Standard Dimensional measuring instruments
12. Weighing instrument, weights, etc.

APPENDIX' C'

Part list

USED ON	ZONE	ITEM No.	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
172.56.001 cb-Bcb			172.44.003cb-ACb		MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.		
		1	172.44.005cb-ACb		REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.	1	
Ⓐ		2	~~172.42.008~~ 172.44.008		~~LOCKING RING~~ RING, LOCKING	1	
		3	172.44.024		BUSHING	1	
		4	175.44.009-1		COTTER PIN	1	
		5	175.44.010-2		NUT	1	
		6	175.44.013		RING	2	
		7	175.44.016		COUPLING NUT	1	
		9	432.44.027		WIRE CONE	1	Rectified
		10	432.44.058		RING	2	
		11	432.44.065		RING	2	

COMMON TO T-72.
I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
A	07.9.07	D.O CORRECTION			

356
SUPPLY CODE
U-01-1-1
D90013
F-13 / 81

DRN	Pushparaj	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.		
CHD	Pushparaj	TITLE: **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.**		
APPD	Chanchal			
DATE	03-04-04	SHT. No.1 OF 2	D S CAT NUMBER	ITEM LIST FOR **172.44.003cb-ACb**

USED ON

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - NIL

ZONE	ITEM No.	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
	8	GOST-7796-70		BOLT M8x1-6gx16.88.38XC.016	1	

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS

356
SUPPLY CODE
U-01-1-1

D90013

F-13
81

DRN	G Hussparaj
CHD	G Hussparaj
APPD	Chanchal
DATE	03-04-04

CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.

TITLE: **MOUNTING OF REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY.**

SHT. No.2 OF 2

D S CAT NUMBER

ITEM LIST FOR
172.44.003cb-ACb

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
172.44.003cb-ACb			172.44.005cb-ACb		REDUCTION GEAR		
					UNIT WITH ELECTRIC		
					SPEEDOMETER		
					SENDING UNIT ASSY		
		1.	172.44.007cbCb		CABLE ASSY	1	
		3	172.44.001		ELECTRIC SPEEDOMETER SENSOR МЭ - 301Б	1	
		4.	172.44.011-2		COVER	1	
		5.	172.44.013		SENSOR CASE ELECTRIC SPEEDOMETER	1	
		6.	172.44.020		RING	1	
		7.	172.44.023		RING	1	
		8.	172.44.027		RING	1	
		9.	175.44.002-1		COVER	1	
		10.	175.44.003-1		DRIVING GEAR	1	
		11.	175.44.004-1		DRIVING GEAR	1	

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE – 13 COMMON TO T-72.

356
SUPPLY CODE
U-01-1-4

D90211

F-105
26

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
13B	5-11-09	I/L SHT 3 OF 3 AMENDED			
13A	5-11-09	I/L SHEET 2 OF 3 & 3 OF 3 AMENDED			

DRN		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	
CHD		TITLE: **REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY**	
APPD			
DATE	13.9.04	SHT. NO. 1 OF 3	D S CAT NUMBER / ITEM LIST FOR 172.44.005cb-ACb

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		12.	175.44.017 ✓	↑	PRIZM BOLT	3	
		23	520.08.003-01 ✓	↑	END PIECE . 4.3	2	
		15	GOST-1491-80 ✓		SCREW M4-6gx14.46.016	3	
		14	GOST-17473-80		SCREW M3-6gx10.46.016	4	
		16	GOST-5927-70 ✓		NUT M6-6H.10.38XC.016	3	
	(13A)	17	GOST-6402-70		WASHER 3 65Г 016	4	ALTERNATE TO ITEM. 26
		18	GOST-6402-70 ✓		WASHER 4T 65Г 016	3	
	(13A)	19	GOST-6402-70 ✓		WASHER 6T 65Г 016	3	ALTERNATE TO ITEM 27
		13	TY-37.003.430-91 ↑		BENDING SHAFT ГВ 301 M - 01	1	

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE – 13

ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
13B	5-11-09	I/L SHEET. 3 OF 3 AMENDED			
13A	5-11-09	N OF A. CQA(HV)/SPECN/001/1			

356
SUPPLY CODE
U-01-1-4

D90211

F-105
26

DRN	V Dave	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	
CHD	Pillai M	TITLE : REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY	
APPD	Chanchal		
DATE	13-9-04	SHT. NO. 2 OF 3	D S CAT NUMBER
			ITEM LIST FOR 172.44.005cb-ACb

USED ON	ZONE	ITEM NO	DRAWING NUMBER	D S CAT NUMBER	DESCRIPTION	QTY	REMARKS
		~~20~~	~~GOST-792-67~~		~~WIRE KO 1-1.2~~	~~0.1 m~~	
		25	GOST-19034-82		SLEEVE 305 TB-40,3,5 (WHITE)	25 mm	
		21	TY-16.K71-087-90		WIRE MM-1,0	50 mm	
	(13B)	20	AISI - 304		STAINLESS STEEL WIRE 1 TO 1·2 X 100 mm	1	
	(13A)	26	IS:6735-72		SPRING WASHER IS:6735-72 ZING COATED	4	ALTERNATE TO ITEM 17
	(13A)	27	IS:3063-94		SPRING WASHER-B6 IS:6735-72 ZINC COATED	3	ALTERNATE TO ITEM 19

I/L CREATED BASED ON RUSSIAN ORIGINAL ISSUE - 13

356
SUPPLY CODE
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ISSUE	DATE	NATURE OF AMENDMENTS	ISSUE	DATE	NATURE OF AMENDMENTS
13B	5-11-09	N OF A. CQA(HV)/44/001			
13A	5-11-09	N OF A. CQA(HV)/SPECN/001/1.			

DRN		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI.	
CHD		TITLE: **REDUCTION GEAR UNIT WITH ELECTRIC SPEEDOMETER SENDING UNIT ASSY**	
APPD			
DATE	13.9.04	SHT. NO. 3 OF 3	D S CAT NUMBER / ITEM LIST FOR 172.44.005cb-ACb

APPENDIX 'D'

List of documents, for which references are given in present QAP

1. QAI No. CQA(HV)/QAI/44/ES SENDING UNIT
2. GOST-7796-70
3. GOST-1491-80
4. GOST-17473-80
5. GOST-5927-70
6. GOST-6402-70
7. TY-37.003.430-91
8. GOST-19034-82
9. TY-16.K71-087-90
10. AISI-304
11. IS:6735-72
12. IS:3063-94

APPENDIX –'E

SL. NO	CATEGORY	TESTS/INSPECTION PARAMETERS	STANDARDS TO BE REFERRED	ACCEPTANCE CRITERIA	INSPECTION RESPONSIBILITY			REMARKS
					Firm	HVF	DGQA	
1	**Pre inspection reports (PIR) of firm**	Firm has to produce all the document as per QAP	As per the relevant drawing and QAP.	Conform to drawing and QAP as per bill of material	P	V	R	100% by firm/ vendor.
2	**Bill of material (BOM)**	Firm has to prepare the BOM as per QAP	Refer QAP Appendix C.	Conform to QAP	P	V	R	100% by firm/ vendor.
3	**Dimensional checks**	Dimensions as per the drawing	As per the relevant drawing and QAP.	Conform to drawing and QAP	P	W/V	R	100% by firm/ vendor andas per sampling plan.
4	**Material tests**	Chemical composition& Mechanical Properties	As per the relevant drawing and QAP	All the values to conform with QAP and Drawings	P	W/V	R	As per sampling plan.
5	**Calibration status of test equipments**	Firm has to produce all the calibration certificates.	As per NABL certificates.	As per NABL certificates.	P	V	R	100% by firm/ vendor
6	**Class A Test**	Firm has to carry out all Class A Test in 100%, as per the relevant drawing and QAP	As per the relevant drawing and QAP	As per the relevant drawing and QAP	P	W	R	100% by firm/ vendor
7	**Class B Test**	Firm has to carry out all Class B Test in 10%, as per the relevant drawing and QAP	As per the relevant drawing and QAP	As per the relevant drawing and QAP	P	W	R	10% by firm/ vendor
8	**Class C Test**	Firm has to carry out all Class C Test in 1%, as per the relevant drawing and QAP	As per the relevant drawing and QAP	As per the relevant drawing and QAP	P	W	R	1% by firm/ vendor
9	**Marking / traceability checks**	Marking / traceability	As per the relevant drawing and QAP	As per the relevant drawing and QAP	P	V	R	100% to be done
10	**Preservation & packing checks**	Preservation & packing	As per the relevant drawing and QAP	As per the relevant drawing and QAP	P	V	R	100% to be done

Note:

1. One sample per heat/batch raw material shall be tested under NABL Lab/Govt. Approved lab by firm. In case of non-compliance to standards entire lot will be rejected or not to use in production further.
2. For cross conformation, manufacturer has to submit test sample for metal part /HVF will draw samples from supplied lot on receipt for Witnessing (W) at HVF premises. In case of non-compliance to standards entire lot will be rejected.

P- Perform **W- Witness** **V-Verify** **R-Review**