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**LABORATORY**  
**TECHNICAL REPORT**

NO. 12653



FABRICATION OF T-156 TRACK BUSHING ASSEMBLIES

FINAL REPORT

JULY, 1982

U. S. ARMY

TANK - AUTOMOTIVE COMMAND

CONTRACT NO. DAAE07-81-C-4095

by C. E. LYNN

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**U.S. ARMY TANK-AUTOMOTIVE COMMAND**  
**RESEARCH AND DEVELOPMENT CENTER**  
**Warren, Michigan 48090**

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| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                    |                       | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------|
| 1. REPORT NUMBER<br>12653                                                                                                                                                                                                    | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER                                                      |
| 4. TITLE (and Subtitle)<br><br>Fabrication of T-156 Track Bushing Assemblies                                                                                                                                                 |                       | 5. TYPE OF REPORT & PERIOD COVERED<br>Final                                        |
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| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>The Goodyear Tire & Rubber Company<br>P. O. Box 288<br>St Marys, Ohio 45885                                                                                                   |                       | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS<br><br>DD Form 1423 |
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| 18. SUPPLEMENTARY NOTES                                                                                                                                                                                                      |                       |                                                                                    |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br><br>Components<br>Process<br>Rubberizing                                                                                               |                       |                                                                                    |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><br>This report gives a brief description of the manufacturing process<br>for rubberizing 1500 T-156 pins according to drawing P3-18483 |                       |                                                                                    |



## SUMMARY

The Goodyear Tire & Rubber Company, a manufacturer of component products for military tracked vehicles, rubberized 1500 T-156 track shoe pins (Ref Dwg 12274418) to a given configuration as shown on Dwg P3-18483.

Material used in the rubberization process was Goodyear's QPL rubber - SM7541 as specified on Dwg P3-18483.

Materials and processing were monitored according to Military Specification Mil-T-11891 and Goodyear's QCI - No. 25.

Manufacturing technology applicable to this part is similar to that used in the fabrication of other military track-shoe-pin bushing assemblies.

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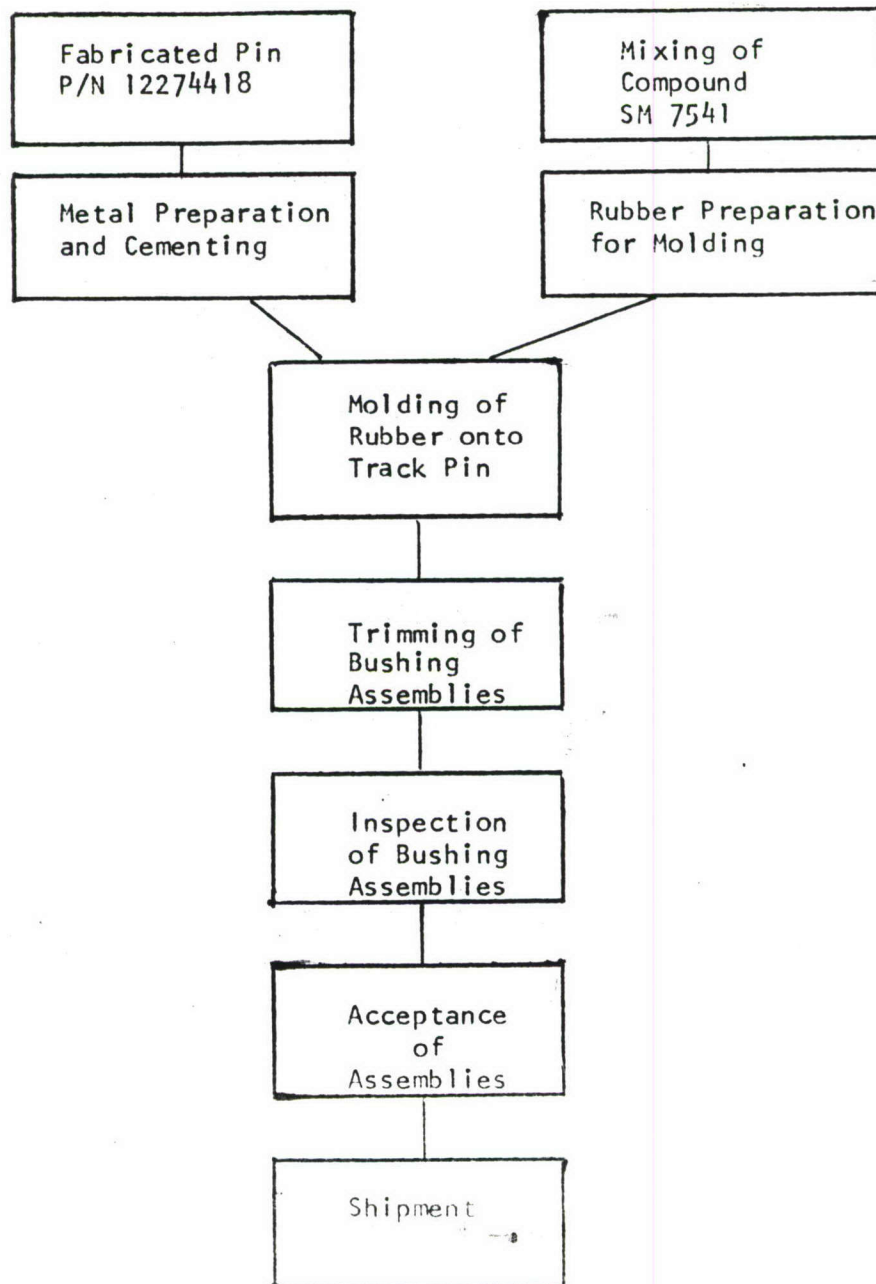
OBJECTIVE

The purpose is to identify the manufacturing processes of a T-156 track shoe bushing assembly and denote problem areas within that procedure.

An independent contractor, not an agent of the Government, shall provide the personnel, materials and manufacturing facilities to fabricate 1,500 T-156 track pins and rubberize them per drawing P3-18483.

# DESCRIPTION OF ASSEMBLY PROCEDURE

The description of assembly procedures is presented in the following flow chart.



## CONCLUSION

The assembly and molding process for the 1,500 T-156 track-shoe-pin bushing assemblies was accomplished at the manufacturing facilities of The Goodyear Tire and Rubber Co., St Marys Plant, St Marys, Ohio.

No particular problems were encountered in any of the various production processes.

All phases were monitored under Mil-T-11891 and Goodyear's QCI 25.



## PHYSICAL TESTING RESULTS

### Shot Peening Intensity Values

(Checks per MIL-S-13165 to 0.010 A to 0.020# A)

Results: 0.012 - 0.013 Range

Average Value - 0.0125

### Bushing Adhesion Pull Values

(Checks per MIL-T-11891 - Outer Bushings - 33 lb/min)  
- Inner Bushings - 37 lb/min)

Results: 40 - 65 Range - Inner

Average Value - 52 lb

Results: 34 - 62 Range - Outer

Average Value 50 lb

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DRAWINGS

Attachment I - Dwg No. P3-18483, Rev 3, Dated 1-20-81

Attachment II - Dwg No. 12274418, Rev C, Dated 5-12-80



**NOTE:**

L. MATERIAL: RUBBER QPL - SM 7541  
GOODYEAR TIRE & RUBBER Co.  
ST. MARYS. OHIO

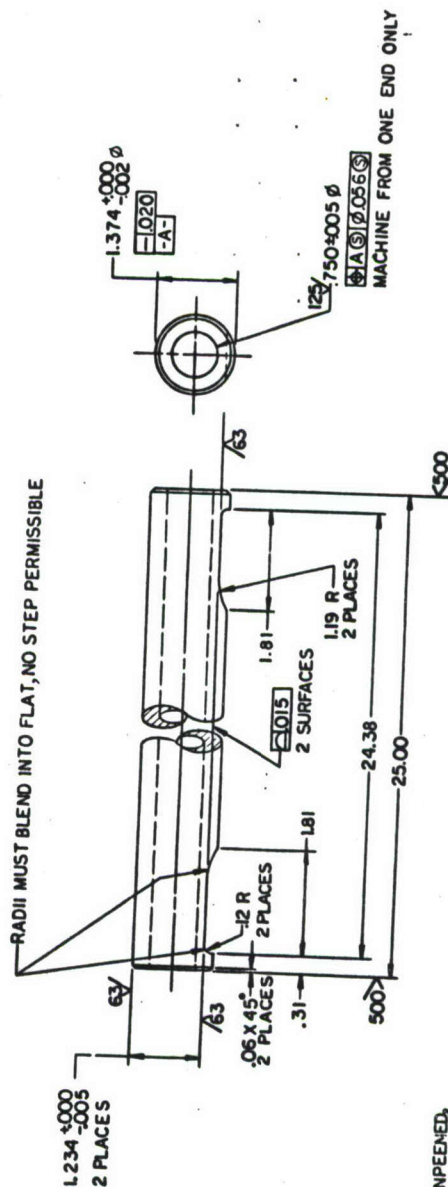
## 2. TOLERANCE

3. WORK PERFORMED UNDER CONTRACT.  
Nº. DAAK30-79-C-0143

|        |        |                                                                                                                        |                                                                       |                                                                            |                                                                                                                        |                                                                                                                                            |
|--------|--------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| REV. 2 | 2-6-80 | DIM. (2) WAS 1.855"<br>DIM. (2) WAS 1.002"<br>DIMS. (4) WERE .855"<br>DIM. (5) WAS 1.030"<br>NOTE ADDED.<br>CEL 4-7-82 | REV. 3<br>LYNN 1-20-81<br>DIM. WAS<br>1.090 - 2 PLACES<br>CEL 1-20-81 | JAN 1-15-80<br>STATIC WIRES AND RESPECTIVE<br>NOTES REMOVED<br>CEL 1-15-80 | DIM. (2) WAS 1.855"<br>DIM. (2) WAS 1.002"<br>DIMS. (4) WERE .855"<br>DIM. (5) WAS 1.030"<br>NOTE ADDED.<br>CEL 4-7-82 | REV. 2<br>2-6-80<br>DIM. (2) WAS 1.855"<br>DIM. (2) WAS 1.002"<br>DIMS. (4) WERE .855"<br>DIM. (5) WAS 1.030"<br>NOTE ADDED.<br>CEL 4-7-82 |
|--------|--------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|



| REVISIONS |                                                       | DATE   | APPROVED |
|-----------|-------------------------------------------------------|--------|----------|
| B         | REDRAWN WITHOUT CHANGE<br>WAS 1" SIZE PER ECP XM-A003 | 7-7-78 |          |
| C         | DWG APPVL SGRN ADDED                                  |        |          |
| C8        | 1) NOTE 8 REMOVED (2) NOTE 6 REVISED                  |        |          |
| B8        | ECP A511                                              |        |          |



- QUALITY ASSURANCE REQUIREMENTS  
MAY APPLY TO THIS DRAWING.  
PART NO. SAME AS PART NO.
2. REMOVE ALL BURRS AND SHARP EDGES
3. IF STRAIGHTENING IS REQUIRED IT  
MAY BE PERFORMED AT  
ROOM TEMPERATURE
4. SHOT PEEN ENTIRE PIN, EXCEPT ENDS MAY BE UNPEENED,  
PER SPEC MIL-S-13165 TO 010A TO 020A,  
95% MINIMUM COVERAGE MEASURED  
BY POLISHED ARC HEIGHT STRIP
5. SURFACE ROUGHNESS VALUES ARE  
PRIOR TO SHOT PEENING
6. NO TOTAL AND NOT MORE THAN .005 PARTIAL  
DECARBURIZATION PERMITTED BEFORE SHOT PEENING
7. HEAT TREATMENT:  
QUENCH AND TEMPER  
AS QUENCHED HARDNESS 52 RC MIN  
AS TEMPERED HARDNESS 40/45 RC
8. MATERIAL:  
STEEL ALLOY BAR 8650H,  
SPEC ASTM A322 OR A331.
- NOTES:

[illegible]

ХМ-ЕСР  
А6511