

INTERNATIONAL TRUCK AND ENGINE CORPORATION		
TMS (TRUCK MATERIAL SPECIFICATION)		NUMBER: TMS- 1056
TITLE: Rear Axle Housings		REVISION: B - 1
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1.0 APPLICATION

This specification covers wrought steel rear axle housings fabricated by welding.

2.0 SCOPE

This specification covers the requirements for material, mechanical properties, heat treatment, induction hardening, quality, cleanliness, repair welding, and protective coatings for two optional types of construction (Class 1 and 2). See General Information for further description of method of construction.

3.0 REFERENCE DOCUMENTS

Unless otherwise specified, the latest issue of all referenced standards shall apply. The following standards, specifications and regulations are referenced in this specification.

Quality System Standard QS-9000 (ISO 9001)	INTERNATIONAL CEMS G-5, Part III
INTERNATIONAL IQR Quality Standard	INTERNATIONAL CEMS A-41
INTERNATIONAL Manufacturing Standard D-13	INTERNATIONAL TMS-9505
CFR Title 29, Part 1910	INTERNATIONAL TMS-9009
INTERNATIONAL CEMSA-43	INTERNATIONAL TMS-9514

4.0 REQUIREMENTS

4.1 Material

Materials selected for thin wall housings requiring heat treatment (Class 1A), shall be capable of meeting the applicable mechanical properties listed in Table 1. All steels shall be killed, of fine grain (5 or finer) practice, unless otherwise specified herein or approved by Truck Development and Technology Center, with a max sulfur and phosphorus content of 0.050% and 0.040%, respectively. The carbon content shall be as follows:

<u>Part</u>	<u>Required</u>
Body, Class 1	0.38% max
Body, Class 2	0.26% max
Spindle End	0.50% max
Brake Flange	0.35% max
Reinforcing Ring	0.35% max
Cover	0.35% max

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4.1.1 Steels Used for Reinforcing Rings and Covers: may be either killed or non-killed steels.

4.2 Mechanical Properties

The body and spindle end* shall meet the following mechanical properties:

TABLE 1

	Class 1A	Class 2A	Class 2B
Tensile Strength, min, MPa (psi)	725 (105 000)	480 (70 000)	480 (70 000)
Yield Strength, min, MPa (psi)	620 (90 000)	310 (45 000)	415 (60 000)
Brinell Hardness, Unmachined	223-269	156-217	N/A

Note 1: Class 1B housing, the heavy wall version of this class, has no specific requirements for mechanical properties.

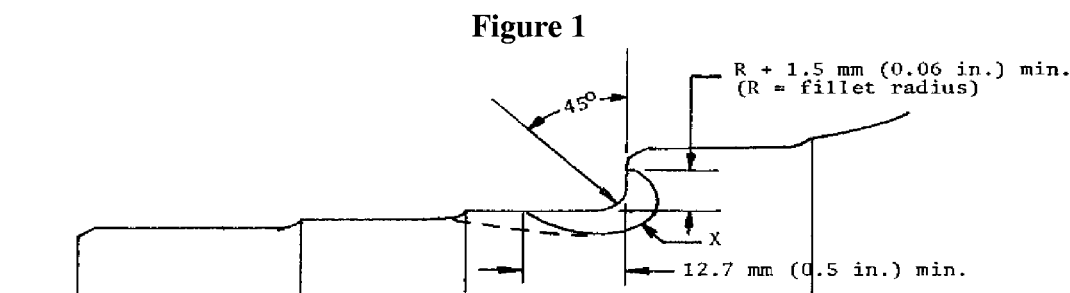
* Mechanical properties are waived for spindle ends of Class 2 (A and B) housings.

Note 2: Class 2 is divided into two sub-classes, A and B, depending upon the grade of steel selected by the housing manufacturer.

4.3 Induction Hardening (all classes)

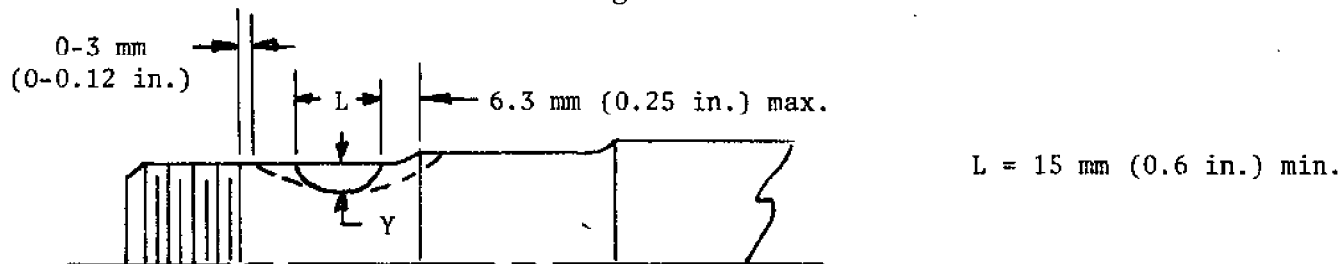
After machining, the axle housing assembly shall be induction hardened, Class 60 (Rc 40) Rc 45 min, per CEMS A-41. Tempering after induction hardening is optional.

4.3.1 Hardening Pattern: The minimum hardening pattern shall include the fillet radius as indicated by the solid line in **Figure 1**. The preferred pattern includes the additional area indicated by the dashed line. Case depth shall be measured at point X.



4.3.2 Optional hardening Pattern: Hardening* of the outer bearing diameter, [* Required: Class 60 (Rc 40) Rc 45 min per CEMS A-41] as indicated in **Figure 2**, is optional and must be specified on the engineering drawing if required. In this case, the preferred pattern includes the additional area indicated by the dashed lines. Case depth shall be measured at point Y. For convenience, the hardening pattern may extend to include the zone between the inner and outer bearing diameters.

Figure 2



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