Foundry Symbols and Trademarks, 1940 – 1945

The foundry or “casting” marks that appear in various places on American military equipment have long been a mystery to enthusiasts as they generally bore no discernable relation to the final manufacturer of the vehicle. Through my experience working with foundries, I knew that either the Government or a trade association must have kept a listing of these symbols to allow identification and to avoid duplication. Searches of Government data were fruitless, so I turned to Our Friend The Internet. Eventually I came across the Steel Founder's Society of America, a casting trade group that was started in 1902. An email to their researcher earned me a copy of their 1944 "Directory of Steel Foundries in the United States and Canada". I later found several pre- and post-war editions at the Carnegie Library of Pittsburgh. With these documents I was able to identify the foundries responsible for many of the parts on American tanks and artillery from their symbols or company name.

Background

In maintaining a truly global army such as that fielded by the United States during World War II (and today), it is essential that every supply item be tracked, coded, and cataloged. To do this, every item is assigned a "part number" that is used as the primary identifier of that item in lieu of a name. On parts of any size, these part numbers are stamped or formed into the piece itself allowing more or less permanent identification of that item, even after assembly into an airplane, tank, or ship. These numbers are very useful in determining whether two similar but not identical pieces are different designs or merely the normal variations between different manufacturers.

Armor steel castings receive a further level of identification. To perform properly, they must not only be of the correct size and shape but also of the correct chemical composition and processing sequence. This information is included along with the part number directly on the piece. Even today, the military specification governing armor steel castings states *"To provide positive traceability and identification, the individual castings shall be marked with the following:*

(a) Foundry's name or trademark
(b) MIL-C-24707
(c) Pattern or part number
(d) Heat number [identifies what batch of steel is used]
(e) Final heat treat lot number or equivalent traceable code" [identifies what sort of processing was done]

So, if you can find the “decoder ring” you can tell what a part is and who made it. With enough data, you can catalog variations, see that some foundries were used predominantly by one manufacturer or another, and other arcane info useful to the modeler or historian.

Notes to the Tables

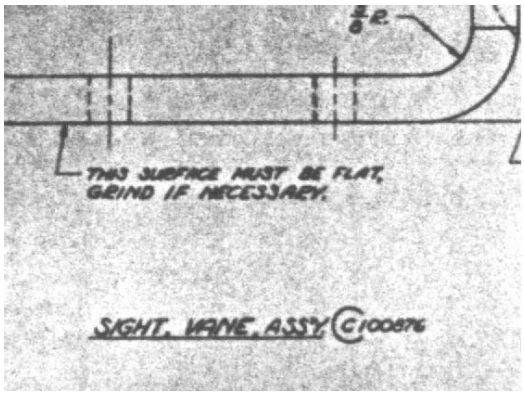
The following table shows the symbols already found on various parts as well as all foundries listed in the 1944 directory as producing “Army”, “Ordnance”, or “War” castings. Trademarks from these later groups may not have actually appeared on any parts. In addition, I have included some symbols and information from the 1937 and 1946 editions of the directory.

In addition to the tabulated symbols, foundries sometimes used the initials of the company name as their identification when the part size would not allow their trademark to be cast clearly.

Drawing Numbers

There has been confusion in the past due to the appearance of a circled letter appearing before a known part number.

Although this appears to be a foundry symbol, the fact is a little more mundane. Looking at some Ordnance Department drawings for Sherman parts, I noticed that several had a large circle around the leading characters of the part numbers on the drawings, an unusual drafting practice.



At about the same time, I came across a Military Specification from 1950 that contained the following text:

3.6.1 Ordnance part numbers. – Unless otherwise specified, each finished component shall be clearly and legibly marked by a permanent Ordnance part number. [. . .] The part number will be shown on the part drawing after the name of the part and with the first letter or figure encircled in a 0.45-inch circle. The 0.45-inch circle identifies but is not part of the part number and shall not be included in the marking.

So, it appears that the circled letter sometimes seen was simply a case of the foundry following an instruction to “mark with the part number as shown on the drawing” a little too literally. Also, it seems that this mistake was quite common – common enough for the Ordnance Department to specifically warn against it!

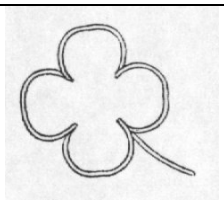
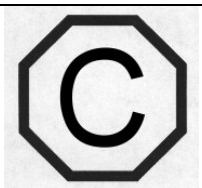
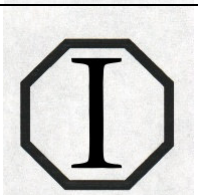
Multiple Symbols

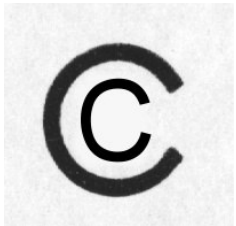
Frequently two symbols that are identifiable as belonging to distinct foundries may be seen on the same part.

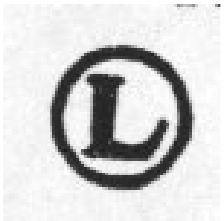
It is not uncommon for a company, when pressed to complete orders, to subcontract some of their work to another company in order to deliver on schedule. This appears to be the inclusion of both companies’ symbols for to be placed on the part for traceability.

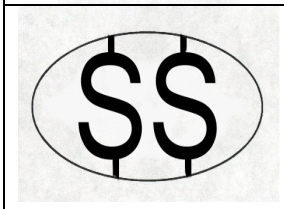
Principal Cast Armor Producers

These companies supplied most of the large cast armor pieces found on American vehicles in WW II. In late 1940, the eight largest of these foundries had a combined capacity of 7,473 tons of cast armor per month. By June of 1942, a crash program of Government-financed plant expansions and new suppliers boosted monthly capacity (in being and under construction) to 73,000 tons. This level quickly dropped by 50% a few months later with the cancellation of the heavy assault tank and a more realistic appraisal of the Army’s needs, and remained around this level until the end of the war.

Trademark	Foundry	Found On	Notes
 **ARSS**	American Radiator and Standard Sanitary Corporation, Buffalo, New York	Pistol ports, Gun shields and mounts, HVSS bogies, Hull pieces	Company initials seem to be used in preference to trademark.
	American Steel Foundries Cast Armor Plant, East Chicago, Indiana	Turrets	
	American Steel Foundries Granite City (Illinois) Works	Turrets, Differential housings	
	American Steel Foundries Indiana Harbor Works, East Chicago, Indiana	VVSS bogies, Hull pieces	Usually appears with three letter heat lot code, e.g. HYL, OJT, OKH, OKM.
	Buckeye Steel Castings Company, Columbus, Ohio	Turrets, Differential housings	
 	Continental Foundry & Machine Company, Coraopolis, Pennsylvania	Differential housings	This plant was originally the Duquesne Steel Foundry, hence the “D”. Around 1945 the “D” was replaced with a “P” for Pittsburgh (Coraopolis is a suburb of Pittsburgh).

Trademark	Foundry	Found On	Notes
 	Continental Foundry & Machine Company, East Chicago, Indiana	Differential housings	This plant was originally the Hubbard Steel Foundry, hence the “H”. Around 1945 the “H” was replaced with a “C” for Chicago.
	Continental Foundry & Machine Company, Wheeling, West Virginia	Turrets, Hulls	

Trademark	Foundry	Found On	Notes
GAD	Ford Motor Car Company, Dearborn, Michigan	VVSS bogies, Hull pieces	This identification is still open to question, but on the preponderance of evidence points to Ford. Ford apparently used a three-letter code for their military projects, with the well-known examples GAA, GAF, GAN, and GAZ. GAD appears to be code for the M4A3 medium tank.
	General Steel Castings Corporation, Eddystone, Pennsylvania and Granite City, Illinois	Turrets, Hulls	Some parts included a C or E suffix to the serial number which may indicate which foundry cast the part.
	Lebanon Steel Foundry, Lebanon, Pennsylvania	Differential housings	
	National Roll & Foundry, Avonmore, Pennsylvania	Gun shields and mounts	

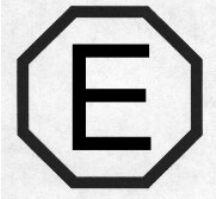
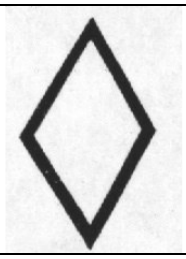
Trademark	Foundry	Found On	Notes
OSF	Ordnance Steel Foundry Company, Bettendorf, Iowa	VVSS Bogies, Hull pieces	The Bettendorf Company, a large producer of railroad running gear, sold their entire plant to the US Government for war production. Their manufacturing facilities became the Quad Cites Tank Arsenal, run by the International Harvester Company, while their foundry became OSF.
	Pacific Car & Foundry, Seattle, Washington		Symbol is unknown.
	Pittsburgh Steel Foundry Corporation, Glassport, Pennsylvania	Turrets	Originally a seven-pointed star in a circle (ca. 1937), later simply **PSF** (ca. 1952).
	Pratt & Letchworth Company, Inc., Buffalo, New York	Gun shields and mounts, M4 driver's hoods, sprockets	
	Scullin Steel Company, St. Louis, Missouri	Differential housings, Turrets	Scullin Steel's pre-war logo was two S overlaid at 90-degrees within a circle, not unlike the Nazi swastika. Apparently a decision was made to change to this design during the war, but it can hardly be considered an improvement.

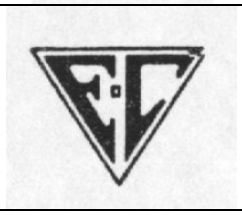
Trademark	Foundry	Found On	Notes
	Sivyer Steel Casting Company, Chicago, Illinois and Milwaukee, Wisconsin	Hull pieces	
	Symington-Gould Corporation, Depew, New York	Hull pieces, M5 idler brackets	
	Symington-Gould Corporation, Rochester, New York	Hull pieces	
	Union Steel Castings, A Division of Blaw-Knox Company, Pittsburgh, Pennsylvania	Turrets, Differential housings, Gun shields	
WS	Wehr Steel Company, Milwaukee, Wisconsin	M5 hull pieces, gun mounts	This identification is tentative because Wehr had a symbol ("WEHR" inside a shield). It is also suspected that they used a "X" within a shield as well.

Other Cast Steel Producers

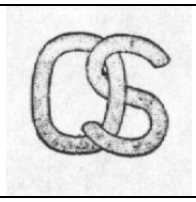
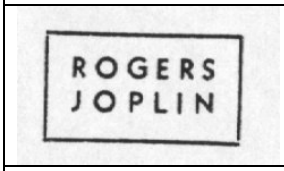
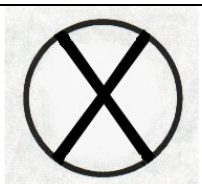
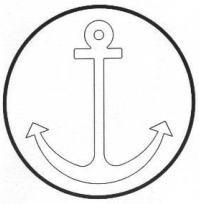
These companies produced both armor and non-armor pieces or simply were listed in the 1944 Directory as being a supplier of "Army", "Ordnance", or "War" castings. Others in the table have been found on surviving hardware.

Trademark	Foundry	Found On	Notes
	American Steel Castings Company, Newark, New Jersey		Owned by American Steel Foundries, hence the octagon.

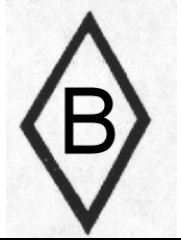
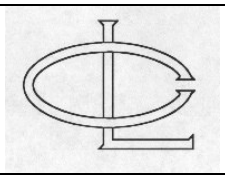
Trademark	Foundry	Found On	Notes
	American Steel Foundries Alliance (Ohio) Works		
	American Steel Foundries East St. Louis (Illinois) Works		
	Auto Specialties Manufacturing Company, St. Joseph, Michigan		
	Burnside Steel Foundry Company, Chicago, Illinois	Periscope housings	
	Columbia Steel Company, Pittsburg and Torrance, California		
	Crucible Steel Casting Company, Milwaukee, Wisconsin	Artillery	
	Dominion Foundries and Steel Limited, Hamilton, Ontario, Canada	Modified VVSS bogies used on Sexton self-propelled guns	
	Eastern Malleable Iron Company, Wilmington, Delaware		
	Electric Steel Foundry Company, Portland, Oregon	M5 idler housings	
	Enterprise Engine & Foundry Company, San Francisco, California		

Trademark	Foundry	Found On	Notes
	Falk Corporation, Milwaukee, Wisconsin		
	Farrell-Cheek Steel Company, Sandusky, Ohio	AA MG mounts	
FISHER	Fisher Tank Division of General Motors Corporation, Detroit, Michigan	Turret pieces	
F	Fort Pitt Steel Casting Company, McKeesport, Pennsylvania	M3 idler housings	
	Hanford Foundry Company, San Bernadino, California		
	Hartford Electric Steel Corporation, Hartford, Connecticut		
	Hughes Tool Company, Houston, Texas	MG ball mounts	
	Keokuk Steel Casting Company, Keokuk, Iowa	Sprocket hubs	
	Kincaid-Osburn Electric Steel Co., Inc., San Antonio, Texas		
	Lakey Foundry & Machine Company, Muskegon, Michigan		

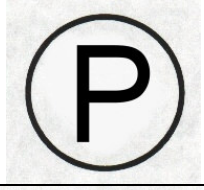
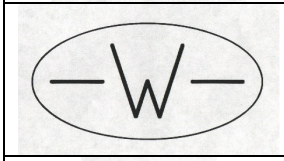
Trademark	Foundry	Found On	Notes
LA	Los Angeles Steel Casting Company, Los Angeles, California	Hull parts, Gun shields	
	McConway & Torley Company, Pittsburgh, Pennsylvania	VVSS bogies, Hull parts	
M	Michigan Steel Casting Company, Detroit, Michigan	Sprocket hubs	
MS	Mountain State Steel Foundries, Parkersburg, West Virginia	M5 idler housings	
HC	National Malleable and Steel Castings Company, Cicero, Illinois	VVSS bogies	
C	National Malleable and Steel Castings Company, Cleveland, Ohio		
M	National Malleable and Steel Castings Company, Melrose Park, Illinois	VVSS bogies	
N	National Malleable and Steel Castings Company, Sharon, Pennsylvania	VVSS bogies	

Trademark	Foundry	Found On	Notes
	Ohio Steel Foundry Company, Lima, Ohio	Gun travel locks (?)	Similar to the International Harvester Company logo, it may be confused with it if the casting is not crisp.
	Omaha Steel Works, Omaha, Nebraska		
	Pettibone Mulliken Corporation, Chicago, Illinois	Artillery	
	Rogers Iron Works Company, Joplin, Missouri		
	Ross-Meehan Foundries, Chattanooga, Tennessee	Hull parts	Note CRMO symbol.
	Roxbury Steel Casting Company, Boston, Massachusetts		
	Standard Steel Works Division of The Baldwin Locomotive Works, Burnham, Pennsylvania		
	Sterling Steel Casting Company, East St. Louis, Illinois	Artillery	
	Texas Electric Steel Company, Houston Texas		

Trademark	Foundry	Found On	Notes
	Unitcast Corporation, Toledo, Ohio	Hull pieces	

Trademark	Foundry	Found On	Notes
	Utility Electric Steel Foundry, Los Angeles, California	Hull parts	
	Western Alloyed Steel Casting Company, Minneapolis, Minnesota		
	Zimmerman Steel Casting Company, Bettendorf, Iowa	Artillery	Pre-war symbol was a Z in oval. This logo includes Z, S, C, and Co, which would be their monogram.
	Unknown	VVSS bogies	
	Unknown	Gun travel locks	The Bettendorf Company (see OSF) used a similar logo.
BU	See Notes	Differential housings	Probably Buick Motors, a major producer of differentials and transmissions. This symbol has only been seen in combination with another recognized symbol, frequently XXXXXX. This combination likely indicates that the differential housing was cast on a Buick subcontract.
	Unknown	VVSS bogies	Possibly Carnegie Illinois Steel, Lorain works.

Trademark	Foundry	Found On	Notes
cTc	See Notes	Differential housings	Probably the Caterpillar Tractor Company, a major producer of differentials and transmissions. This symbol has only been seen in combination with another recognized symbol, frequently Scullin Steel. This combination likely indicates that the differential housing was cast on a Caterpillar subcontract.
FORD	See Notes	Differential housing	Undoubtedly the Ford Motor Company, this mark has only been seen on an early E4186 differential housing cast by Scullin Steel. It is believed that this indicates a part made on a Ford contract yet Ford did not manufacture differentials.
HYL **OJT** **OKH** **OKM**	American Steel Foundries Indiana Harbor Works, East Chicago, Indiana	Various parts	Probably heat lot codes.
	Unknown	VVSS bogies	
LOL	Unknown	Small non-armor	

Trademark	Foundry	Found On	Notes
MT	Unknown	HVSS and VVSS bogies	
	Unknown	Gun shields and mounts	Possibly Pacific Car & Foundry
	Unknown	AA MG mounts	Possibly Washington Iron Works, Seattle, Washington
	Unknown	Hull parts	Probably Wehr Steel, Milwaukee, Wisconsin

Non-Foundry Symbols and Material Textures

These marks are commonly seen but are not unique to a particular foundry or part.

Marking	Notes
DXXXXX for example **D50878**	Pre- to Mid-war Ordnance Department part number. The letter prefix (ranging from A to E) refers to the sheet size of the paper used on the drawings showing that part. This system was replaced by the seven-digit numbering system on 14 September 1943.
D7XXXXXX or **7XXXXXX**, for example **7054366**	Late and post-war Ordnance Department part number. “D” was still the paper sheet size (a holdover from the previous system) and was seen less often as time went on.

Marking	Notes
MNMO	Possibly designates a manganese molybdenum (Mn-Mo) alloy casting. CRMO has been seen postwar and likely stands for a chromium manganese alloy.
HT	Indicates the “heat” or lot number of the steel used to make the casting.
LO	Believed to be a mark indicating a particular type of heat treatment.
SER	Cast adjacent to a number or raised pad with a stamped in number, this indicates the serial number of the casting.
	This is the typical as-cast surface texture seen on American vehicles. It results from the molten steel solidifying while in contact with the packed sand of the mold.
	The top portion of the photo is NOT a cast surface, but the remains of a rubber-like preservative/sealant applied to the tank for storage and incompletely removed before placing it on display. Compare this with the smooth texture of the bare cast surface in the lower half of the photo
	This is a weld. Although it was also molten, the surface cooled in air, not in a mold, leaving the irregular surface visible.

Marking	Notes
	This is a machined surface. Note the straight surface and regular pattern caused by a rotating tool traveling across the edge of the metal. Machining is used on surfaces that match with other parts or those requiring accurate dimensions.
	The dimples seen here are nail heads. They result either from casting nails driven into the packed sand of the mold to hold the sand together or sheet metal sheathing nailed to the pattern to give it a better surface.