



Special Edition Modeling Reference

External Features of the Italian Medium Tanks M 13/40 and M 14/41

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AMPS #1632**

"The Wildcat"
Special Edition Modeling Reference:
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Introduction.

The following lists of externally visible features are compiled based on either written descriptions found in the works listed in the bibliography, identified by close scrutiny of the photos contained in those same references, or both. In addition, I have examined photos of many of the surviving Italian M-series vehicles that are found in some collections and museums today. Other points were noted by Mario Raspagliesi, Daniele Guglielmi, and Steve Tegner in emails to the author. In all cases, where I found a seeming contradiction or omission in any of these sources, wartime period photos were used as the final arbitrator. What I observed (or did not observe) in wartime photos trumped all other considerations.

Note that there are many features listed here that are not mentioned or described in the text of the references, and some of my conclusions directly contradict the text, captions, or illustrations in those same references. For example, the tank shown in the fronts-piece, page 3, of Squadron/Signal "In Action 39" is captioned as an M 13/40 whereas I believe it to be an M 14/41 (based on fender and muffler details). This same photo is also captioned as an M 13/40 on page 43 of Squadron/Signal "book #6089." In both cases, I disagree with Dr. Pignato, the author of those works. Another example is that I disagree with the otherwise excellent technical plans and drawings in the Tallillo, et al, book *Carro M* where the side steps on many of the later vehicles are shown with their bottom portions parallel to the ground. These later side steps were clearly redesigned so that they were not "handed" and therefore when correctly drawn their bottoms angle slightly up towards the vehicle's front. (Interesting enough, Pietro "Pico" Compagni's cover art for the same book is correct in this detail. Contrast this with Don Greer's cover art for Squadron Signal's In-Action 39 which shows a later M 13/40 or M 14/41 with the two-piece glacis of the M 13/40 prototype.) There are other instances where my conclusions about a vehicle's features disagree with a book's author.

Given the dearth of available wartime photos and the poor quality of many that are available, coupled with the inability to accurately date and place many of those same photos, some errors in my conclusions are probably inevitable. However, I do not place any blame or intend any criticisms on the authors and researchers cited in the text and listed in the bibliography. All of these gentlemen have done yeoman's work in the field of Italian AFV history, and they (and many others) have kept the subject alive for future generations of enthusiasts. While I hope that my own small effort here advances the knowledge of the subject, it should be considered derivative, and I freely admit that it is founded on the work of these earlier pioneers and subject matter experts. Having said that, if I am in error about the features I've identified or the contradictions I make or imply with previously published information, those errors are mine alone.

The lists of external features are primarily compiled to assist builders in constructing accurate scale models of the Italian WWII M (*Medio* = "medium") 13/40 and M 14/41 gun tanks. The lists are based on, and are for, wartime vehicles. This small monograph is not intended to be an operational or technical history of these tanks, their development, or their employment. My intent is merely to assist other model-builders by describing the externally visible features that indicate where a particular M 13/40 or M 14/41 falls in the sequence of production when compared to other tanks. So, although this work may be helpful in determining other technical or operational facts, that is not its purpose.

Both tanks, along with their assault gun derivatives, were used by the *Regio Esercito* (renamed the *Esercito Italiano* in 1949) in limited numbers for a short period of time after WWII. After studying many photos, it is my belief that some of the preserved M-series vehicles found in museums and collections today display repairs and improvements resulting from this post-war service. The main

exceptions to this belief were the Italian tanks which were held in the collection of the Aberdeen Ordnance Museum, and those vehicles have varying degrees of damage, deterioration and / or missing parts. Finally, on the subject of preserved vehicles, I should note that I did not study photos of every known M-series tank still existent. Somewhere there may be a more-or-less pristine example of an M-series tank in its wartime configuration. I did not include any features on these lists that I noted on preserved or restored vehicles that I believed were post-war additions.

This methodology suited my purposes since I concentrated only on the wartime M 13/40 and M 14/41. For these reasons, the lists of external features here should certainly not be considered the "final" word on the subject.

The Italian designations for their tanks used a letter to indicate the general weight class, here M for *Medi* or medium. This was followed by two digits indicating the vehicle's weight in metric tons. This was followed by two digits indicating the year the vehicle was put into service. In 1943, the Italians changed this system dropping the second two digits, the year, and simply using the metric weight. Therefore, for example, the M 14/41 simply became the M 14. Additionally, there is no consistency between sources about the "official" Italian use of the "/" (forward slash), the "-" (dash), or the "." (period) with or without spaces in these designations. For consistency, I have decided to use the forward slash between the two sets of digits with a space between the "M" and the digits. I use the term "M-series" vehicles to indicate all versions of the M 13/40 through the M 15/42 including their associated assault gun and command vehicles. However, when referring to other references (including the works cited herein), be aware that the designations "M14," "M.14," "M-14," "M14-41," "M14/41" and "M 14/41" all refer to the exact same vehicle.

Some explanation is in order in regards to the use of the terms "Series One," "Series Two," and "Series Three." As first used, these are terms coined by Dr. Pignato to help organize his personal researches into the subject. These terms were not official or used during wartime and are thus simply used for convenience in dividing the production life of the M 13/40 and M 14/41 into groups of changes introduced. In places, I've also used the descriptives "Initial / Early," "Intermediate," "Final," and "Standard" for their convenience and clarity. Again, these are also not official or wartime terms.

It is interesting to note that these same kinds of series descriptions are used by Tallillo, et al, in their two-volume set *Carro M*. I will point out here that the series break down that I'm using is not the same as is used by these authors. For example, they used the break at chassis number 0951 (engine number 000 617) to differentiate between their "Series two" and "Series Three" (externally identified by the "mushroom" radiator cover). However, Tallillo, et al, concentrate their "Series Three" description mostly on the internal changes that are not visible.

I have chosen to break-down my series changes based on the most obvious, externally visible changes as this was most useful to me as a model-builder. Although my breakdown more closely follows Dr. Pignato's, it is still my own. Readers and researchers should not allow themselves to become confused when trying to compare and contrast the different series breakdowns. They only have the significance that each author has given them. The reality is that the Italians simply considered an M 13/40 to be just an M 13/40 – no more, no less, and they never applied any such distinctions to their production. *

As with all such lists of model "tweaks" or corrections, these should be used as a starting point, and the builder should confirm his or her model's features through his own studies of available photos and other written works.

Anyone using these lists is encouraged to send any errors or additions to the author for inclusion in potential up-dated versions.

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* Email correspondence concerning Dr. Pignato with the Mario Raspagliosi. See also Tallillo, et al, page 50.

A Note about the Lists and Sketches.

In each of the lists, the features are lettered from "a" through whatever. Generally speaking, the features appeared in production and on the tanks in the order that they appear in the lists. That is, feature "a" appeared before (or possibly at the same time as) feature "b," and so on. Also, later tanks generally have all of the features listed up to the start of their own lists. Most exceptions to these rules, like a later fender style replacing an earlier style, should be obvious. For all others, I hope that my explanations don't leave the reader scratching his head.

The drawings and sketches that I have included here are not to scale. I have tried to make them proportional and they are intended to illustrate clearly the particular details in question. They are also intended to supplement the photographs and other information included in the various references cited. I have not included any copies of the photos, drawings or plans in these references in order to honor their copyright holders. Readers and modelers are encouraged to refer to these other works when using this monograph.

M 13/40 Prototype* (ca. October 1940, starting with hull # 651 [assumed])

The M 13/40 was an evolutionary development of the earlier M 11/39 gun tank design. As such, it shared several common components with its predecessor. Despite these commonalities, the M 13/40 did not share the M 11/39's hull and chassis.

All of the features listed below appear on the prototype.

- a. The prototype appeared with the M 11/39-style idler wheels. These wheels were composite constructions made of numerous cut, formed, and machined steel parts bolted and riveted together.
- b. The prototype appeared with the M 11/39-style long fenders with "wide" side steps which had a "safety" foot-guard. This foot-guard has an oval opening (which allows maintenance access to the center return roller). Note that these fenders did not have a reinforcing rib embossed along their side bottom edges. These fenders have smooth sides. (The absence of a reinforcing rib on the fender sides is a distinguishing feature between the early long fenders and the later, M 14/41 long fenders.)
Sketches 1 and 2.
- c. The prototype had two spare road wheels on its rear hull.
- d. The jack was mounted on left front fender in a position that almost touches the left front hull corner.
Sketch 2.
- e. "Rounded" radiator cover with filler cap in center. This style radiator cover had no side overhangs. (See Squadron/Signal "In-Action #39" pg 21 for sketches of the two styles of radiator covers used on the M 13/40 and M 14/41.)
- f. There was no "hump" in the front center of the turret roof. **Sketch 3.**
- g. The prototype appeared with horizontally oriented, cylindrical-shaped pistol ports that look identical to those used on the M 11/39 in the door and on the superstructure rear corners. **Sketch 4.**
- h. The prototype appeared with a rear turret pistol port (prototype only). – This feature is based on a written description found only in "In Action 39", pg. 12. I could not find any photo in my references of this feature to confirm its existence on the prototype.
- i. The prototype did not have any pistol ports on turret sides (prototype only). I consider the absence of pistol ports on the turret sides to be the distinguishing feature between the prototype and the initial / early production or "Series One" tanks described in the next section. **Sketch 4.**
- j. The prototype had a flat plate, riveted hull MG barbette on its right front hull.
- k. The cooling grates on the prototype and all other M 13/40 tanks had lateral running slats that were parallel to vehicle centerline. These grates were located to either side of the radiator and provided cooling air to the engine. Each lateral opening grate had 20 slats that were tilted at their top edges toward the vehicle centerline. (See photos, "Iron Coffins" pp 15-16 for views of a "late" Series Three M 13/40 [Aberdeen Proving Ground collection not prototype] lateral cooling grates.) **Sketch 5.**
- l. The prototype and other early M 13/40's had exhaust mufflers with a wide circumferential strap with mounting bracket in their centers (giving the muffler body a "ribbed" as opposed to a "smooth"

appearance in photos). The nature or design of the bracket which attached the mufflers to the hull sides was not visible in any of the photos in my available references. As far as I can tell, none of the preserved M-series vehicles in museums or collections still have these early style muffler mounting straps and brackets. **Sketch 6.**

m. The prototype was factory painted in overall red-brown (~ FS 30108 or FS20109 ‡) with wide, vertical gray-green (~ FS 34159 or FS14036) stripes. None of the photos in my references of this tank show any markings or number plates.

n. The prototype is the only M-series vehicle that has no taillights. **Sketch 8.**

o. At least one prototype (if more than one was constructed) was photographed with a radio and an "early" design for the folding antenna base. This tank also had a "Y" shaped bracket to support the antenna (when folded) on the upper right rear side of its superstructure. The designs of both of these fixtures were different than the standard "factory" designs used later with the "Series Two" and "Series Three" tanks. **Sketch 7.** (See photo in "In-Action #39" pg 12, bottom left.)

p. At least one prototype had a two-piece nose glacis. This part was split horizontally with the seam running side to side and spaced top-to-bottom at the center of the two front tow hooks and the front center tow ring. This split is demarcated by two rows of conical head rivets (the same size as used on the rest of the hull), one row each on the top and bottom edges of this split. The rivets on these two rows are staggered with the top row slightly to the right and the bottom row slightly to the left (when facing the front of the tank) so that the rivets above and below the split do not fall on the same vertical line. (See Tallillo, et al, "Carro M" vol. 1 page 30 and "In-Action #39" pp. 12-13.) **Sketch 17.**

q. On the same prototype tank with the split, two-piece nose glacis, the two front tow hooks are mounted with three (vice four) conical head rivets. These rivets are arranged two at the top edge and one on the bottom center of the hook. The hook mounting plate is also designed like a triangle with the point facing down (vice a rectangle). (See Tallillo, et al, "Carro M" vol. 1 page 30 and "In-Action #39" pp. 12-13.) **Sketch 17.**

* Note: There may have been more than one "prototype" M 13/40 built, and the Italians may have actually considered the "Series One" vehicles (see next section) to have been "prototypes" or pre-production vehicles (similar to a "Series O" in some German designs). None of my references addressed the details of Italian tank development and production or clarified these points. I consider the photos of the singular M 13/40 with all of the above features to be the "prototype" tank. All of photos that I have examined that show these features (to include the camouflage pattern of wide, vertical stripes) appear to me to be of the same, singular "prototype" vehicle. Other photos in various references that are captioned as "prototypes" have at least one or more features as noted in the "Series One" list below (the most prominent and visible are the pistol ports in the turret sides and no camouflage pattern).

‡ The Federal Standard (FS) paint color matches come from Dr. Pignato and Tallillo, et al, references and descriptions.

Prototype photos can be found in: "Carro M" vol. 1, pp 30-31; "In-Action #39" pp 12-13; Riccio, pg 27; "Profile 14" pg 4; and "Iron Coffins" pg 19 (bottom).

M 13/40 Initial / Early Production ("Series One") (First 15 vehicles completed by mid-July 1940, hull # 652- 666?)

Note that the initial / early production, or "Series One," M 13/40 tanks retained the M 11/39 style horizontal pistol ports on the hull and the M 11/39 style long fender side steps. Note that in many references, photos of these tanks are captioned as "prototypes," whereas I believe that these vehicles are part of the initial, 15-tank production run.

a. The early production, or "Series One," tanks appeared with pistol ports on turret sides. These ports were similar to the later, standard, hull door and hull rear corner pistol ports. However, the turret pistol ports had horizontal oval-shaped holes instead of the smaller round holes that appeared on the later hull ports. **Sketch 4**

b. There was no pistol port on turret rear of the standard production M 13/40 or later tanks.

c. At least one of these early production tanks still had the flat plate, riveted hull MG barbette. (See Riccio, pg 27, bottom.)

d. At some point in the initial production run, the idler wheels were changed from the M 11/39 style wheels to the "standard production" type. The standard production idler wheel was cast and machined, undoubtedly simplifying its production. The exact point when this change was implemented is unknown, but it was certainly very early. Photos of "Series One" tanks with the M 11/39 idler wheel are scarce.

e. The initial multi-part, flat riveted plate hull MG barbette was changed to the standard cast barbette design. As with the idler wheel change, the introduction point of the cast barbette is unknown, but it must have very early in production. Again, photos of "Series One" tanks with the riveted barbette are scarce.

f. All regular production tanks were painted at the factory in gray-green (~ FS 34159 or FS 14036). They were delivered to the Italian army in this same solid color.

g. All production M 13/40 and later tanks had two, small round taillights. One is centered above the rear number plate and the other is usually hidden in photos by the rear overhang of the spare wheel. Lenses appear to be red (from preserved vehicles), and the left side taillight over the number plate may have a section on its lower side that illuminates the number plate. **Sketch 8.**

Initial / early "Series One" photos can be found in: "Carro M" vol. 1, pg 31 (bottom); Riccio, pg 27 (bottom); "In-Action #39" pg 14 (top left); and "Iron Coffins" pg 3 (bottom).

M 13/40 Intermediate Production ("Series Two" Starting mid-July 1940 with hull # 667?)

With the exception of the track connection tool on the rear hull between the two spare road wheels, all of the features listed below are present on all "Series Two" tanks.

a. The hull door and rear corner cylindrical pistol ports were changed to simple, small circular openings on door and superstructure rear corners. These pistol ports are distinguishable by the six armored (pointed) bolts arranged in a hexagon around the small circular opening. These openings are closed by a rotating armored disk on the inside wall of the tank. Other than the shape and size of the openings, these appear identical to the turret side pistol ports introduced in the "Series One" tanks. **Sketch 4.**

b. The long M 11/39 style fender side steps were simplified to narrow "hoops" without the sheet metal "safety" foot-guards with their oval return roller inspection / maintenance openings. However, these simplified steps continued to be welded to the upper edges of the fenders themselves. **Sketch 9.**

c. All "Series Two" tanks now appear with cast hull MG barbettes. Some of these early cast barbettes appear to have "sharper" top and front edges than later barbettes. This "sharper-edged" appearance may be the result of the lighting and angles of the photos and not actual physical differences.

d. Starting with hull # 702, a track connection tool was added to rear hull between spare road wheels on the lid of the rear stowage box. A very few "Series Two" tanks appear without the track tool or its mounting brackets. (See "In-Action #39" pp 14 [top right] and 15 [top left] for photos of "Series Two" tanks without either the track tool or its mount.)

e. Starting with this same hull number (# 702), the inertial starter (hand starter) was changed from the Fiat design to the Onogo design. All prototypes and "Series One" and "Two" tanks to this point had the Fiat starter. The external features of these two designs are different. The Fiat design is an oval "egg" shape with the pointed end up, and the Onogo design is a more regular oval shape with its long axis tilted down slightly on its right (starboard) end. (See "In-Action #39" pg 15 [top left] for a clear photo of the Fiat inertial starter.) **Sketch 18.**

f. At least one of these "Series Two" gun tanks was photographed with an installed radio. The antenna base and support bracket were the same as described above for the prototype†. **Sketch 7.**

† Some general references state that after the German Africa Corps (DAK) arrived in North Africa, the Germans insisted that the Italian tanks be retrofitted with radios. Other references simply state that some Italian tanks in North Africa were retrofitted with radios. In any event, it seems likely that there exist other photos of early, "Series One" and "Series Two" M 13/40 tanks with retrofitted radios that simply have not been published.

"Series Two" photos can be found in: "In-Action #39" pg 14 (top right and bottom left), pg 15 (top left), pg 17 (all) and pp-18-20; "Carro M" vol. 1 pg 34 (bottom), pg 50 (without track tool), and pg 85 (bottom, tank has no turret); and "Iron Coffins" pg 23 (misidentified as an M 14/41).

M 13/40 Final Production ("Series Three") (Starts in approximately November 1940 with Vehicle / hull # 752*)

The "Series Three" tanks are distinguished by the short fenders. When these fenders were introduced, the jack was repositioned from the left front fender to the left rear hull, replacing one of the spare road wheels. At this point, the "Series Three" tanks had all of the other features listed above for the "Series One and Two" tanks (as they were modified).

a. Vehicle / hull # 752 – Starting with this tank, the long fenders which had appeared with the prototype were replaced with short fenders. These short fenders were installed with new, narrow, hoop shaped side steps which brought back the "safety" foot-guard. On these steps, this guard took the form of a bent sheet metal shield welded on the back edges of the step tubes. Presumably these guards prevented the user from slipping into or stepping onto the track. These new side steps were bolted directly to the hull sides and were no longer welded-on parts of the fenders. Note that the new short fenders appeared with embossed reinforcing ribs along their side bottoms. ("Series One and Two" long fenders do not have any embossed side details.) **Sketch 11.**

b. "Series Two" tanks now only had a single spare road wheel on right rear hull.

c. As mentioned above, the jack repositioned to left rear hull (in place of second spare road wheel). However, the jack mount could be un-bolted from this position, and many "Series Three" tanks appear to have had the jack removed or moved (often to one of the short front fenders) in order to free up stowage space for fuel cans or other items. "Series Three" (and M 14/41) tanks with the jack stowed anywhere but on the rear hull should be considered "field modifications."

d. At some point after the introduction of the "Series Three" short fenders, the early muffler with circumferential mounting strap and hull-side bracket replaced with "standard" muffler with bottom rear ventral mounting strap and hull-side "L" bracket. This change appears to have occurred shortly before the factory paint color was changed from gray-green. **Sketch 6.**

e. In March 1941 the factory color for tanks intended for Africa was changed from gray-green (~ FS 34159 or FS 14036) to *cachi-sahariano* (Saharan khaki ~ FS 20260 or FS 33434). The practical effect of this was that all Italian AFVs were now painted in Saharan khaki (a sand color), even those that were sent to fight on the Eastern Front. (Note that no *Medio* tanks were sent the Eastern Front.) (See "Book #6089" pg 37 for a clear wartime color photo of early "Series Three" M 13/40 tanks in overall gray-green.)

f. At about this time, the grab handle on the upper top right edge of the superstructure was changed from vertical to horizontal. It also appears to have been made slightly larger. **Sketch 19.**

g. Starting with vehicle / hull # 802, a "hump" was added to center front turret roof between front edge of hatches and front turret edge. This "hump" was a cast part bolted to the turret roof and which provided increased internal breach clearance needed to get greater main gun depression. (See "Book #6089" pg 43 [center] for a clear photo of the turret "hump" and horizontal hull-side grab handle.) **Sketch 3.**

h. Starting in 1941 (estimate around hull # 825), all tanks are equipped with Marelli RF1 CA radios. These radios had a "Y" shaped bracket on the upper right rear superstructure side to support the antenna when it was folded down. The antenna base was the "standard" type included in both the Italeri and Tamiya kits. **Sketch 10.**

i. Starting with vehicle / hull # 951, a "mushroom" shaped radiator cover replaced the "rounded" style cover. On this later design, the filler cap was repositioned more to rear, indicating that the radiator was also redesigned. The side overhangs which give this cover its shape and name, provided additional air flow to engine compartment. See the sketches on page 21, Squadron/Signal "In Action 39," for details in the differences between the "rounded" radiator cover and the "mushroom" shaped cover. (For photos of early covers, see "In-Action #39" pg 22 [all]; "Profile 14" pg 8 [center] and pg 9 [bottom]. For photos of "mushroom" covers, see "In-Action #39" pg 28 [bottom – Note also the "lateral" cooling grates on this tank].)

* Note that Tallillo, et al, make their break between "Series One" and "Series Two" with chassis # 752. All previous long-fender tanks are considered by them to be "Series One." Beginning with chassis # 951, Tallillo, et al, make their break between "Series Two" and "Series Three." The only externally visual feature at this point is the introduction of the "mushroom" shaped radiator cover.

M 14/41 Initial Production (Production started with Vehicle / hull #1801* in August-September 1941)

Starting with the 711th vehicle, the tank's engine was changed from SPA 8T to SPA 15T.† At this initial point of introduction, there were no externally visible changes to differentiate the final M13/40 from the initial M 14/41. This makes it impossible to tell with certainty if a tank is either a late production M 13/40 or an early production M 14/41. In any event, according to Dr. Pignato, only the first 50 M 14/41's are externally the same as the late M 13/40.

According to Tallillo, et al, the initial M 14/41 tanks even had their internal data plates stamped with the designation "M 13/40." (See foot note 23, page 37, *Carro M.*) Tallillo, et al, also state that production of the M 13/40 overlapped that of the M 14/41 with 170 M 13/41's completed concurrently with the start of M 14/41 production (*Carro M.* pg. 37).

* Tallillo, et al, pg 37 state that M 14/41 production started with chassis # 1801, the 711th tank produced. This second number, 711, fits the production total of 710 tanks for the M 13/40. However, the chassis number, # 1801, does not fit the M 14/41 chassis numbers cited by Dr. Pignato (In-Action 39, pg. 35, M 14/41 chassis # 1402 as the 50th production M 14/41, book 6089, pg. 35).

† Fiat (*Fabbrica Italiana Automobili Torino*) SPA (*Societi per azioni* – i.e. Joint Stock Company or "Inc.")

Interestingly, Tallillio, et al, in "Carro M" vol. 1, pg 41, provide an extensive extract from the Fiat SPA manual, "no. RS 264, Supplement to the *Carro Armato* type M 13/40 Operator's Manual." This extract contains instructions for replacing the SPA 8T engines of the M 13/40 with the SPA 15T engine of the M 14/41. These instructions are broken down by engine serial number and provide detailed requirements for the necessary changes to the M 13/40. These changes include items such as new motor mounts, radiators, oil coolers, etc.

Thus, it was entirely possible to have earlier production M 13/40's with M 14/41 engines and other up-grades. This helps to explain why the Italians did not go to any great lengths to differentiate between the various production "series" since each tank could essentially be brought up the latest automotive standards in the field. Just how often, or even if, such up-grades were done is unknown.

M 14/41 Standard Production

a. Starting with vehicle / hull # 1852, there was a return to early, long *style* fenders with simplified side steps ("Series Two" *style* fenders and bolted on side steps without foot guards).

The new long fenders appeared with an embossed reinforcing rib running along their bottom side edges. The original "Series Two" long fenders were smooth on their sides. These embossed reinforcing ribs or stiffeners are the distinguishing features between the M 14/41 and M 13/40 with long fenders. Long fenders with "standard" mufflers – rear bottom ventral mounting bracket – are another distinguishing feature between the early and late vehicles. Finally, the newer M 14/41 long fenders "tilt" forward from the vertical at their front ends. If the front ends of the fenders can be seen in a photo, and these tilt forward from the vertical, then the tank can be identified with certainty as an M 14/41 (the opposite is not true, though). **Sketches 12 and 13.**

This change back to long fenders was described by Dr. Pignato as starting with the 50th production M 14/41 (see pg. 35, "book 6089"). Using the chassis number from Tallillo, et al, this change was implemented starting with hull #1852.¹

b. There was no change to the rear hull spare road wheel or jack locations. As with the M 13/40 "Series Three" tanks, there was one spare road wheel on the right rear hull with the jack mounted on the opposite, left side. This is also a feature that distinguishes early and late vehicles. However, again note that the jack (and spare wheel) mount could simply be un-bolted from its rear hull location and bolted to either front fender. This was done in the field on some "Series Three" M 13/40's and M 14/41's to free up space on the rear hull often to mount spare 20 liter fuel cans.

c. The new long fenders receive lozenge-shaped covers over the oval track inspection holes on insides above drive sprockets. The design of the embossed side reinforcing rib may have been changed at about the time that these covers were introduced. The revised reinforcing rib was now narrower with double embossed top and bottom edges.

There were at least three sub-variant designs of the lozenge-shaped covers – 1) simple rivet on rear end that the cover pivots up and down on 2) rivet on front end with thumb-screw on rear end 3) rivet on rear end and a "tab" or "leg" extending down from the front end to prevent the cover from sliding open from vibrations or gravity.

In photos, variant 1) appears first, followed by 2) and 3) in order. Variant 3) with the tab or leg may not have been used on the M 14/41 and only on some M 15/42's. Variant 2) seems to have been the final design carried to the end of M 15/42 production. **Sketch 12.**

Photos of these inspection cover variations can be found: Variant 1 – "In-Action #39" pg 36 (top right); Variant 2 – "In-Action #39" pg 43 (bottom – Semoventi), "Carro M" vol1 pg 60 (bottom – Carro Commando) and pg 67 (bottom – Semoventi); Variant 3 – "In-Action #39" pg 43 (top left – Semoventi).

d. Starting with the 492nd M 14/41 (approximately hull #2293), the cooling grates changed from lateral openings to transverse (running perpendicular to vehicle center line) openings. These openings were still formed from armored slats, but the number of slats was now decreased from 20 to 9. These slats appear in photographs to have been made of thicker armored material, with wider spaces between them. This redesign perhaps both increased air flow (improving cooling) and armored protection.

These new slats now tilt at their top edges toward the front of the tank. (Pignato, "book 6089" pg. 35)
² **Sketch 5**.

e. At some point after the introduction of the new transverse cooling grates, the fenders receive inverted "L" shaped mounting brackets on their front ends. These brackets were welded to the fenders and were therefore an integral part of their design. (See "In-Action #39" pg 37 [top left and right] and pg 34 [bottom right]; "Carro M" vol. 1 pg 95.) **Sketch 12**.

f. Starting with vehicle / hull # 1952, the M 14/41 received mud scrapers added to hull sides just to rear of drive sprockets. These may have been introduced in anticipation of operations in temperate climates. This change was described by Dr. Pignato as starting with the 500th production M 14/41. (In-Action 39, pg 34 and book 6089, pg. 35 – Again, the chassis numbers cited by Dr. Pignato would seem to contradict the M 14/41 chassis number cited by Tallillo, et al.)³

g. Towards the end of production, collapsible racks added to right superstructure side to hold three 20 liter fuel cans. Dr. Pignato described this change as "fitted to final production series M 14/41s". These fuel can holders were hinged strap metal designs that were also fitted to other Italian AFVs starting at about the same time. †

h. At some unidentified point during the production of the M 14/41 latches to limit the opening of the hull side hatches were added to the bottom, inside front corners of the hull side hatches. These latches are simple hinged levers that normally hang down vertically under their own weight and caught the inside edges of the hatch opening and prevented the hatch from opening fully forward. When desired, the crew could rotate the latch which would then allow the hatch to open all the way forward. **Sketch 23**

i. Finally, the long fenders were improved by adding "double-X" stiffening ribs on their tops, one set of these ribs on the front and rear ends of each fender. Some of these "final pattern" long fenders may also have received additional triangular braces on the front and rear superstructure corners. **Sketch 12B** (Tallillio, et al, "Carro M" vol 1, pg 55 and pg 57) ‡

¹The long M 14/41 pattern fenders are the first known visible external feature to differentiate between M 13/40 and M 14/41. A tank with long fenders with reinforced edges, jack on the rear, and a "mushroom" shaped radiator cover must be an M 14/41. Any tank with long fenders with embossed reinforcing ribs along their bottom side edges must be an M 14/41.

²Any tank with transverse cooling grates must be an M 14/41. As only 376 M 14/41's were produced in 1941 (+ an additional 376 or 319 in 1942 for a total of 752 or 695 – source dependent), and transverse cooling grates began with the 492nd, any tank with transverse cooling grates must also have been produced in 1942. (See production figures cited by Dr. Pignato in In-Action 39, pg. 34 and Tallillo, et al., in *Carro M*, pg 95.)

³Any tank with mud scrapers must be an M 14/41. Again, any such tank must have been produced in 1942.

†Any tank with FACTORY installed collapsible fuel can racks on the right side of the superstructure must be an M 14/41. However, care should be taken with some photos. From certain front angles, the M 15/42 can be hard to distinguish from a final production M 14/41. Once again, any tank with FACTORY installed fuel can racks on the right hull side must have been produced in 1942.

‡ Author Daniel Guglielmi was kind enough to send me a copy of a previously unpublished photo of Semoventi, M41 da 75/18, RE 5798, "Culobina." All of the wartime photos of M 14/41 tanks with the "double X" embossed fenders that I could identify location were from operations in Tunisia. This suggests that this change was perhaps introduced during the final month of M 14/41 production, November, 1942, that overlapped the start of M 15/42 production.

This fender type is quite evident on M 15/42 tanks and M 42 Semoventi. A difference that has been observed between the M 14/41 and M 15/42 "double X" fenders is that the rearmost half of the rear "X" of the M 15/42 right front fender was omitted to allow for a flat spot used to mount the vehicle jack on the M 15/42 right front fender.

Miscellaneous Notes on Changes / Variations

a. Road Wheel Hole Spacing.

This curious feature was first noted by Adam Geibel in "Iron Coffins," pg 8, in an observation of the Aberdeen Proving Ground's M 13/40. Apparently, some road wheels were manufactured with the holes between the cast ribs drilled either touching or overlapping. This has the effect of making these holes appear either as sideways figure "8" or ovals. Such road wheels are scarce in photos, and, as opined by Geibel, they are probably the result of simple manufacturing errors, probably resulting from misaligned drilling jigs or machinists' errors.

See the photos on the top right of page 13 and the bottom of page 34, Squadron/Signal "In Action 39" for additional photos of these manufacturing variations (deviations?) for the road wheels – Also see the photo in the center of page 43, "Book ##6089" for the same oval hole wheel. Finally, see the excellent photo on pg 14, Osprey Men-at-Arms 349, "The Italian Army" showing all of the visible road wheels on a single tank drilled out into oval shapes. These photos represent all stages of the *Medio* tank's production life. Therefore it's a reasonable assumption that these wheel variations occurred throughout the tank's manufacture. **Sketch 14.**

This may seem to be an extremely trivial observation. However, since the road wheels on the Tamiya M 13/40 and Semoventi kits need to have their lightening holes drilled out, some modelers may find the prototypical deviations welcome.

b. Exhaust Mufflers.

The variation in design appears to have involved the method of mounting the mufflers to the tank. The early (M 11/39 style) design appears to have a wide mounting strap around its center (circumferential) that probably forms a bracket between the muffler and the hull side.

On the L 6/40 tankette, after curving down and around the outside of the muffler, this wide strap goes straight from the bottom of the muffler to the hull side where it then bends up at a right angle. This right angle bend then forms an "L" shaped bracket that is bolted to the side of the L 6/40. This same method and design may have been how the early M 13/40 mufflers were attached. (See photos in the L 6 albums posted on the *Modelisimo Più* website.)

The second "standard" design appears to have replaced the circumferential strap with a longitudinal bracket, ventral to the bottom rear of the muffler. This strap had a "loop" bent under the rear bottom edge that appears to have offered a degree of "shock absorption" to the muffler installation (i.e. this ventral strap functioned like a single leaf spring). This ventral strap was then attached to the hull side by way of a second, separate inverted "L" shaped bracket bolted to the hull.

The exact point when the muffler mounts changed appears to have come after the introduction of the short fenders, but just before the change to factory sand camouflage paint. **Sketch 6.**

c. Factory Installed Radios.

The date of introduction of the radio is somewhat vague and may not be tied to the "Series two" vehicles, per se, but might have been introduced either earlier or later. Radios may also have been retro-fitted to earlier tanks. **Sketches 7 and 10.**

d. Desert Compass.

The "Putin" desert compass was supposed to be installed on the M 14/41, but the first compass was not installed until December 1942. This was too late for service in North Africa (Squadron Signal #6089, pg. 35). I could not find any information on the appearance of the Italian "Putin" compass, but assume it to be some type of "sun" compass similar to the British designs.

e. M 14/41 Long Fenders.

The return of the "long" fenders shortly after the introduction of the M 14/41 was possibly a result of anticipating operations back in temperate climates. The long fenders would have undoubtedly been useful in muddy conditions as opposed to just desert sand and dust where the short fenders were perhaps adequate.

In any event, the first M 14/41 long fenders appear *similar* to the "series two" M 13/40 fenders, to include the oval track inspection holes inside the front edges over the drive sprockets. However, the M 14/41 long fenders have a pronounced and easily observed reinforcing rib embossed along their bottom side edges. As noted, though, the jack and spare wheel remained on the rear hull.

Sketch 12.

As noted earlier, the M 14/41 long fenders tilted forward at the front ends in contrast to all of the M 13/40 fender types which have vertical front fender ends.

Shortly after the long fenders were reintroduced, lozenge-shaped covers were installed over the oval inspection holes. The first covers were hinged at their rear points by a simple rivet. Later variations are already described above.

Some photos of the long M 14/41 fenders show many with a "double" embossed rib edge reinforcement. That is, the rib has pronounced top and bottom edges whereas the initial embossed rib has only a distinctive top edge. See the photo on the bottom of page 36 and the photo on the bottom of the facing page 37, "In Action 39," for examples of these "double" embossed edges ribs.

I believe these "double" embossed ribbed fenders were actually the next minor change in the M 14/41 long fender design. None of the photos that I have examined show these "double" embossed ribbed fenders with open oval inspection holes (all have covers). However, I have examined too few photos to make a definite determination on this.

At some time after the introduction of the transverse slats on the engine cooling grates, inverted "L" shaped mounting brackets were added to the front ends of the long fenders. See the production line M 14/41's in the photo on page 6, "book #6089" and the Semovente de 75/18 on page 43, "In-Action 39" for examples of transverse slats and long fenders without front mounting bracket. All photos that I have examined that are clear enough to discern the details show embossed double ribbed fender reinforcements without these front brackets. None of the earlier single embossed edged fenders appear to have the front fender brackets.

Finally, at some point near the end of M 14/41 production, fenders with double-X embossed ribs on their tops were introduced. As described in the M 14/41 section, I have only seen one clear photo of a Semoventi M41 da 75/18 with this feature. However, there are two photos of M 14/41's in Tunisia published in Walker's "Iron Hulls, Iron Hearts" that are suggestive, but not definitive evidence of these "final pattern" fenders used on M 14/41's. (See Walker, plate pg 3 and plate pg 4)

Thus, the M 14/41 long fenders undergo several modifications over the course of their production. When these details are visible, they may provide clues about the tank's placement in the production run – 1st) Single embossed top edge on reinforcing rib with open inspection holes; 2nd) Single embossed top edge on reinforcing rib with covered inspection hole; 3rd) Double embossed edges on top and bottom of reinforcing rib with covered inspection hole; 4th) Double embossed edges on top and bottom of reinforcing rib with covered inspection plate and front "L" shaped mounting brackets; and 5th) Double-X embossed ribs added to the tops of the front and rear fenders. All of these M 14/41 fender types tilt forward from the vertical at their front ends.

f. Taillights.

The taillights are often difficult to see on most period photos. In addition, they appear to have been of simple sheet metal construction with exposed wires and were mounted in exposed positions suggesting that many were damaged or destroyed while in use. Many "preserved" museum and collection M-series vehicles only have remnants of the taillight housings (usually rusted away leaving only hints of their mounting screws) and the wire grommets (with or without any traces of the wires). On preserved vehicles, the remains of the wires and grommets often appear under coats of paint as "flat" rivets or large screw heads. However, in all wartime photos that I have examined, where the rear of the vehicle is clear enough to show details, the taillights are visible. Only the M 13/40 prototype does not have them. **Sketch 8.**

g. Jack Mount Variations.

There appear to be at least two different designs for the jack mount. The standard, wartime design has a prominent bent rod loop on one side (that holds one side of the jack) and a finger latch (similar to a tool box or German tool clamp latch) on the opposite side. The second design, which I have only observed on preserved post-war M-vehicles has two finger latches on opposite sides, doing away with the bent rod loop. I could not identify this design on any wartime photo. **Sketch 15.**

There may have been a variant of the wartime design with the bottom disk fashioned in a semi-circle vice a full circle. I have noted this semi-circular feature in at least two photos of rear jack mounts (but never on a series one or series two left front fender mount). Also, the initial design appears to had a full disk shaped bottom, the second variation had a wide side-to-side strap, the third with the semi-circular bottom and side-to-side strap, and the last (M 15/42) a simple open circle welded to the front fender. These bolt hole variations were identified on clear post-war photos of museum collection vehicles. **Sketch 16.**

Additionally, the wartime jack mount appears to have been mounted with the loop portion randomly facing either left or right (rear mounts) or front or rear (front fender mounts). I could not discern any patterns in the direction the mount faced that I could associate with other production features or specific time periods.

Note that the clamp of latch shown in Sketch 15 hooks onto a horizontal grab handle made on the jack opposite of the screw handle universal joint. This universal joint was placed through the inverted loop on the mount. (See "Iron Hulls, Iron Hearts" plate pg 1 [bottom].)

h. Headlight Blackout Covers.

Tallillo, et. al., describe the introduction of headlight blackout covers being occasionally installed starting in 1941 (*Carro M*, pg. 34). Photos of these covers are fairly scarce. Two good photos of the factory manufactured blackout covers, can be found in *In-Action* 39, page 37. Both of these photos show late M 14/41's with the strengthening bracket on the front ends of the fenders. Two other photos of the factory headlight covers installed on a "short fender" M 13/40's or M 14/41's are on pages 13 and 14, *Osprey Men-at-Arms* 349. The headlight covers appear to be metal and are similar in design to an early US Army blackout light with a half-cylindrical protrusion on the top of the lens and the bottom completely covered leaving what may have been a small "marker light" hole (lens?) in the front bottom center.

Apparently the tank crews almost never installed these covers on the headlights. Photos of the lights without them are almost universal. In any case, I did not bother making sketches of these.

j. Turret Periscopes.

During my research, I became fascinated trying to find out the details of the periscopes used in the turrets of the M-series tanks. Unfortunately, the external details are very small and hard to see in period photos, and I know of only one of the many still existent vehicles which actually has the periscopic device installed (the *Autoblinda* AB 43 in the collection of the Association of San Marino.)

Even more frustrating, the on-line photo albums of various restored and conserved vehicles contain only a single, poor, low-resolution photo of the internal parts of the periscope and its mount. (see "*Modellismo Più*" link in the bibliography). Fortunately, Steve Tegner, the Senior Restorer for the South African Museum of Military History, was gracious enough to share numerous photos of his museum's restoration of their *Autoblinda* AB 41. These photos included many detailed shots of the turret periscope mount and armored cover.

The turret periscopes used on the M-series tanks were identical (i.e. they were a common component) to the ones used on the *Semoventi*, the AB 41 and 43 armored cars, and the L-6 tankette. This was fortunate, because as I said above, good period photos of these are scarce, so I used composites of many photos of various types of Italian AFV's to develop this information. I was forced to make some assumptions about the details of the actual periscopes and their rain-sun guards. Also note that there were at least two variations in the periscope mounts (compare photos of the San Marino AB 43 and the South African Museum's AB 41). I chose to use the South African Museum's mount for my sketches since I had much better details for it.

In regards to the periscopes molded on the Tamiya and Italeri M 13/40 kits, both are somewhat inaccurate with the Italeri renderings closer to the prototypes than the Tamiya ones. Both kits have the armored guards depicted as perfectly round, cone-shapes in plan-view. **See sketch 21 and Photo 1 for the correct prototype design and shape.** At their bases, the Italeri guards measure about 3.82 mm in diameter and the Tamiya guards measure about 2.8 mm in diameter. The prototype guards measure 121 mm across their sides and 149 mm front to rear, creating an oval plan view.

In use, the periscope heads were often (but not always) covered with caps that acted as guards against rain and sun. The flanged bases of these prevented rain from entering the top opening on the armored guards, and there were small, inverted "U" shaped openings on their fronts for the periscope objective lenses. These caps appear to have been made in two slight variations. The earlier design appears to have been machined and finished like a fine gun part. It has sharper edges, a smaller diameter base flange, and the flange connects across the bottom of the "U" shaped

objective lens opening. **Sketch 20.** (See also In-Action #39, pages 18 and 30 for photos of these earlier rain-sun guards.)

The later rain-sun guards appear to have been made from a sheet metal stamping. It has a rounded edges, a larger diameter base flange, and the flange does not close or connect across the bottom of the "U" shaped objective lens opening. This stamped rain-sun guard may also have a "tin can" like seam running vertically up its sides. (See Carro-M, Vol. 1, page 68 for a photo of one of these later rain-sun guards on a Semoventi.)

I assume that the rain-sun guards were either a press-fit onto the actual periscope heads or that there was some type of circular spring that kept them fixed to the scopes.

According to references, the turret periscopes could be rotated through 360° of azimuth. The May, 1943 School of Tank Technology report on the AB 40 (published in part in Guglielmi's "Autoblindo, et al.) states that "the direction of vision ... is engraved on the eyepiece screen." Also, many photos, both period and of the restored AB 43 in the San Marino collection, clearly show the turret periscopes pointed in various directions. The photo of the periscope posted on the "*Modellismo Piū*" website (see bibliography) shows a small knob that might have been for the traverse / azimuth lock. **Sketch 22.** The traverse / azimuth movement of the periscope was independent of the elevation movement in the periscope turret roof mount.

Although the periscopes could be traversed through a full 360°, it could not have been practical (nor probably very useful) to swing the scope to look across the top of the turret roof towards the opposite side of the vehicle. All of these periscopes on the AFV's that had them are mounted very close to the outboard edges of their turrets or superstructures (for Semoventi). If the periscope was traversed to view across the turret roof, there would not be enough room for the crewman's head to fit between the inside of the turret wall and the ocular lens of the periscope. Any use of the periscope traversed to the side or rear would have required the crewman to move his entire body around in the turret, and, since the head pad was fixed to the rear of the mount, this use would have been without the support or protection of the head pad. This was certainly possible in an emergency, but I wouldn't think that it was really practical in regular use except for a limited amount to the left and right front. The School of Tank Technology report gives the normal field of view through the periscope as 30° and no measurement is given for the amount of elevation / depression possible. (In fact, no mention of this elevation / depression feature is made in any of my references.) Magnification is given in the same report as one (x1) power. (Guglielmi, pg. 58)

In addition to movement in traverse / azimuth, these periscopes were adjustable in elevation. However, this feature was only usable on a direct line fore and aft (i.e. the internal periscope roof mount was fixed in azimuth). A knob and a spring-loaded plunger on the internal scope mount could be manipulated to allow the periscope to tilt up and down. **Sketch 21.** The School of Tank Technology report gives no measurement for the amount of elevation / depression possible. (Again, no mention of this elevation / depression feature is made in any of my references.)

Finally, it should be noted that the periscope head pads were "handed." Sketch 22 shows a left-hand / port side mounting. In use, the crewman would place his head into the pad with his left temple in about the middle of the pad, the left end of the pad over his ear and the right end at about the center of his forehead. He would look through the periscope using his left eye. The scope mount on the right side would reverse this. I assume that the right side periscope mount also had the locations of the elevation locking knob and plunger reversed. However, since I could not find any

photos of both right and left side mounts inside one of the M-series tanks, I cannot confirm this assumption.

Production Figures and Hull Numbers:

	Squadron/Signal In-Action 39 Page 34*				Squadron/ Signal Book #6089 Page 6			
	M13 /40	M14 /41	Semoventi Both Types	Carro Comando Both Types	M13 /40	M14 /41	Semoventi Both Types	Carro Commando Both Types
Totals A	710	752	222	113	710	695	222	64
Totals B	1462		335		1405		286	
Totals C	1797				1691			

* Squadron/Signal "In Action 39" breaks the production figures down by years from 1940 through 1942. "Book #6089" does not give this break down. However, it has greater detail on the production numbers of "other than" gun tanks.

Hull / chassis numbers for the M 13/40 cited by Tallilo, et al are #0652 through #1362, or 710 total tanks. These authors state that production of the M 14/41 started with hull / chassis #1801.

Dr. Pignato cites many of the same hull / chassis numbers for various descriptions of M 13/40 changes. Matching production totals for the M 13/40 and M 14/41 are cited by Pignato in "book 6089" and Tallillo in *Carro M* (710 and 695 respectively).

However, Dr. Pignato cites some M 14/41 hull / chassis numbers in the 1400-range (#1402, In-Action 39, pg 35) and at least one in the 1900-range (# 1952 on pg. 34, In-Action 39).

It's not possible for me to say that one set of M 14/41 hull / chassis numbers is correct and the other is not. On the following timeline, I have chosen to use the M 14/41 chassis / hull numbers cited by Tallillio, et al.

In any event, the production chassis / hull numbers and sub-totals for when various M 14/41 changes were introduced must be viewed with some skepticism no matter which source is cited or referred to.

M13, M 14 and M15 Production Timeline

The following timeline is divided by year from 1939 to 1943. All of the features listed in the earlier sections are not shown on the timeline. However, the major visual differences are shown. The purpose of this timeline is to allow the model builder to place the production series in time to determine when tanks with particular features might have appeared during significant combat events and battles.

Since I often like to place my models on vignettes and dioramas depicting particular historical events, I find such a timeline useful in order to get the details "right" and avoid technical anachronisms.

I have tried to note the chassis or hull number that a particular change started on the timeline when these changes were identified in the various references.

The start dates for features have been, in most cases, estimated by dividing the cited annual production totals by the number of months that that series was produced that year to derive the approximate monthly totals. Specific chassis numbers were then plotted along these estimated monthly figures to come up with estimated dates when features were introduced. Of course, this method can only produce rough estimates of the dates in question, and I've restricted my timeline dates to the nearest month.

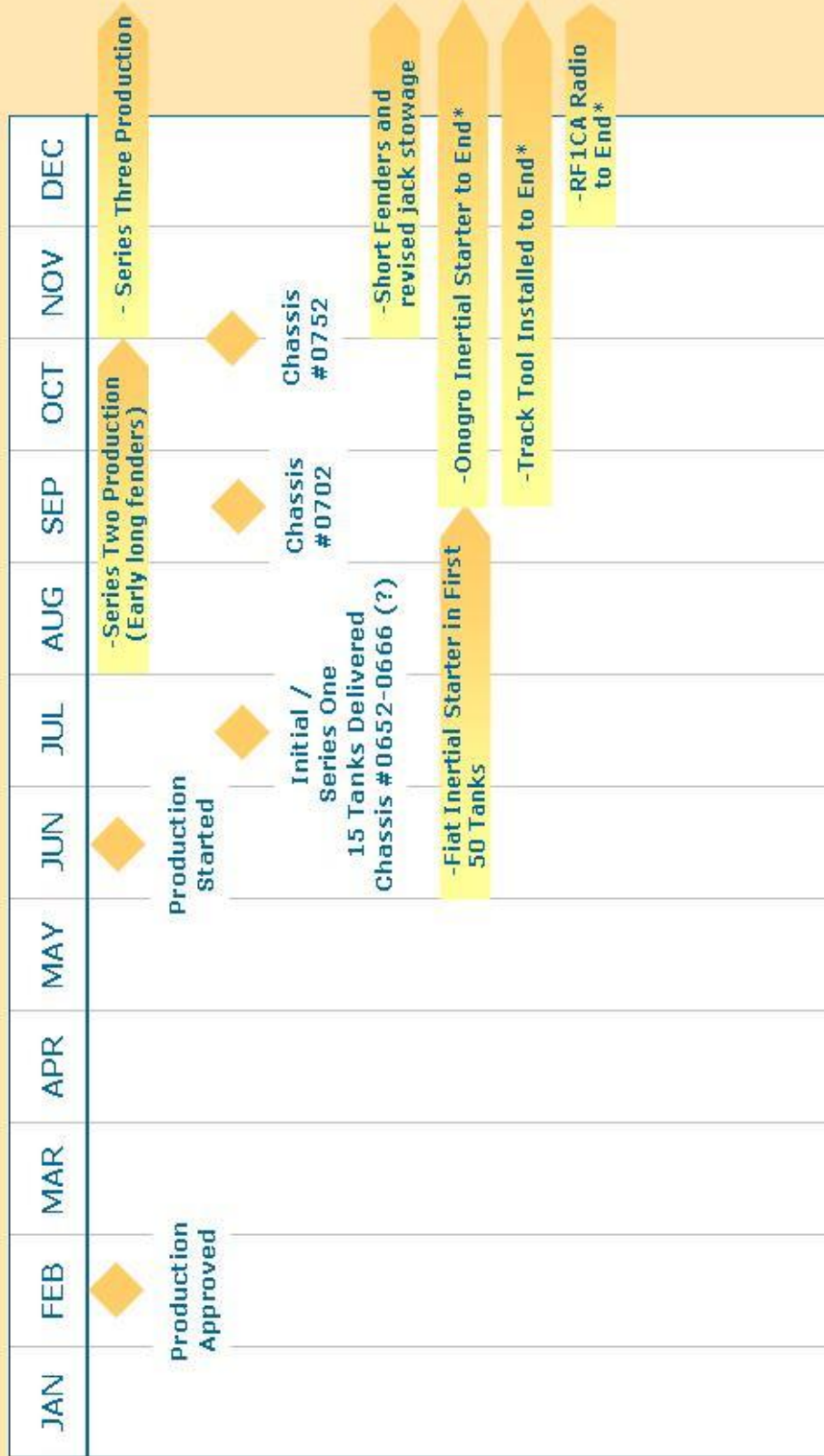
Few actual monthly production totals are cited in any of the references. Where they are, these monthly figures are not particularly useful. For example, on page 95, "Carro M" vol. 1 gives an average M 14/41 monthly output figure of 56 tanks. If production of the M 14/41 ran from September 1941 until November 1942, then we have a production run of 16 months x 56 tanks per month, or 896 total tanks. Actual total production for the M 14/41 is cited in the same reference as 695 (a difference of over 200 tanks). Obviously, there were either fewer than 56 tanks produced each month or the production start and end months are incorrect, or both. The likeliest answer is that there were probably fewer than 56 tanks a month produced – i.e. there were variables in the month to month outputs not accounted for in the cited average monthly production figure.

A more realistic monthly production figure would probably be closer to 45 tanks (695 divided by 16 months equals 43-44 tanks per month). This figure allows for a slower build up at the beginning of production and for other delays over the course of the entire run. Ansaldo might have averaged 56 tanks a month for much (or even most) of the run, but using the lower figure should give us a better idea of when particular chassis or hull numbers came off the assembly line, and therefore a better idea of when tanks with features associated with those chassis numbers could have appeared on the battlefield.

M13, M14 & M15 Tank Production Timeline 1939

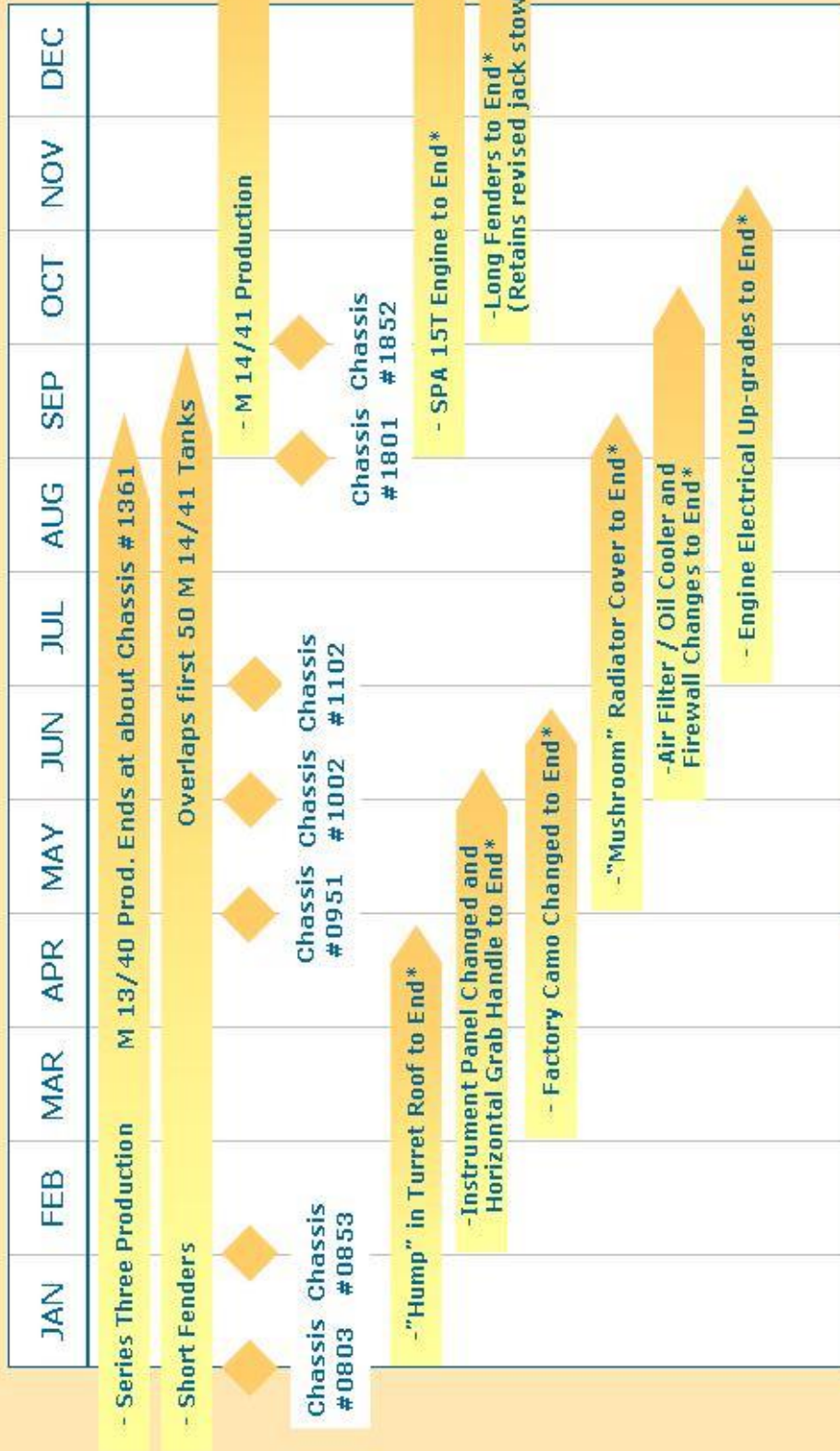
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
									 Prototype Delivered Chassis #0651 (?)		 Initial Order Placed for 400 M 13/40 tanks

M13, M14 & M15 Tank Production Timeline 1940



*Note "To End" indicates this Feature was carried through Entire production runs of Both the M 13/40, M 14/41, and M 15/42

M13, M14 & M15 Tank Production Timeline 1941



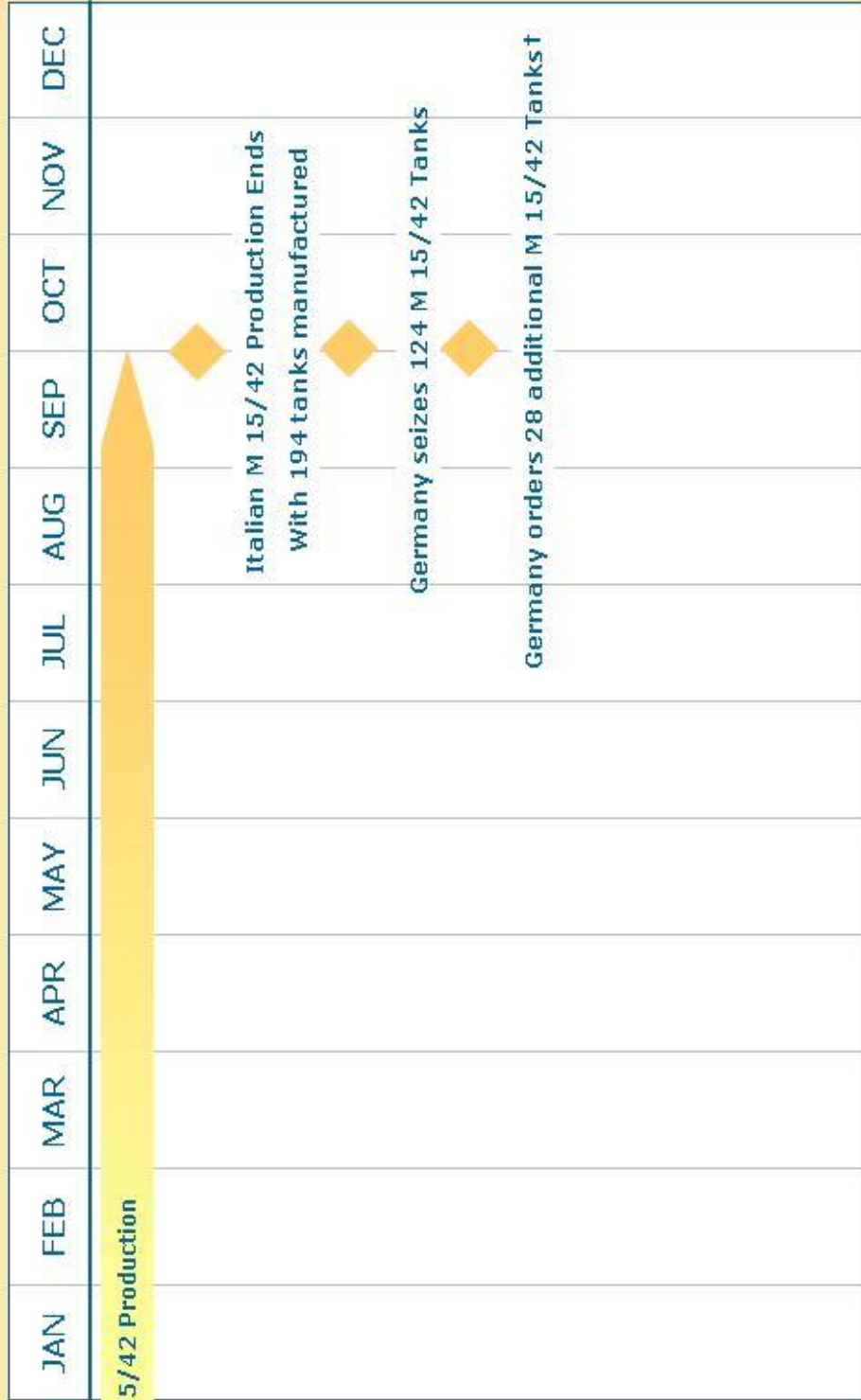
*Note "To End" indicates this Feature was carried through Entire production runs of Both the M 13/40, M 14/41, and M 15/42

M13, M14 & M15 Tank Production Timeline 1942

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
- M 14/41 Production		- M 15/42 Production									
Chassis #2293		Chassis #2301									
		-Cooling Grates Changed to End*		-Mud Scrapers Added to End*				-Factory Installed Fuel Can Racks to End* (No exact date or chassis number)		-“Final Pattern” Double-X Fenders to End* (No exact date or chassis number)	

*Note "To End" indicates this Feature was carried through Entire production runs of Both the M 13/40, M 14/41, and M 15/42

M13, M14 & M15 Tank Production Timeline 1943

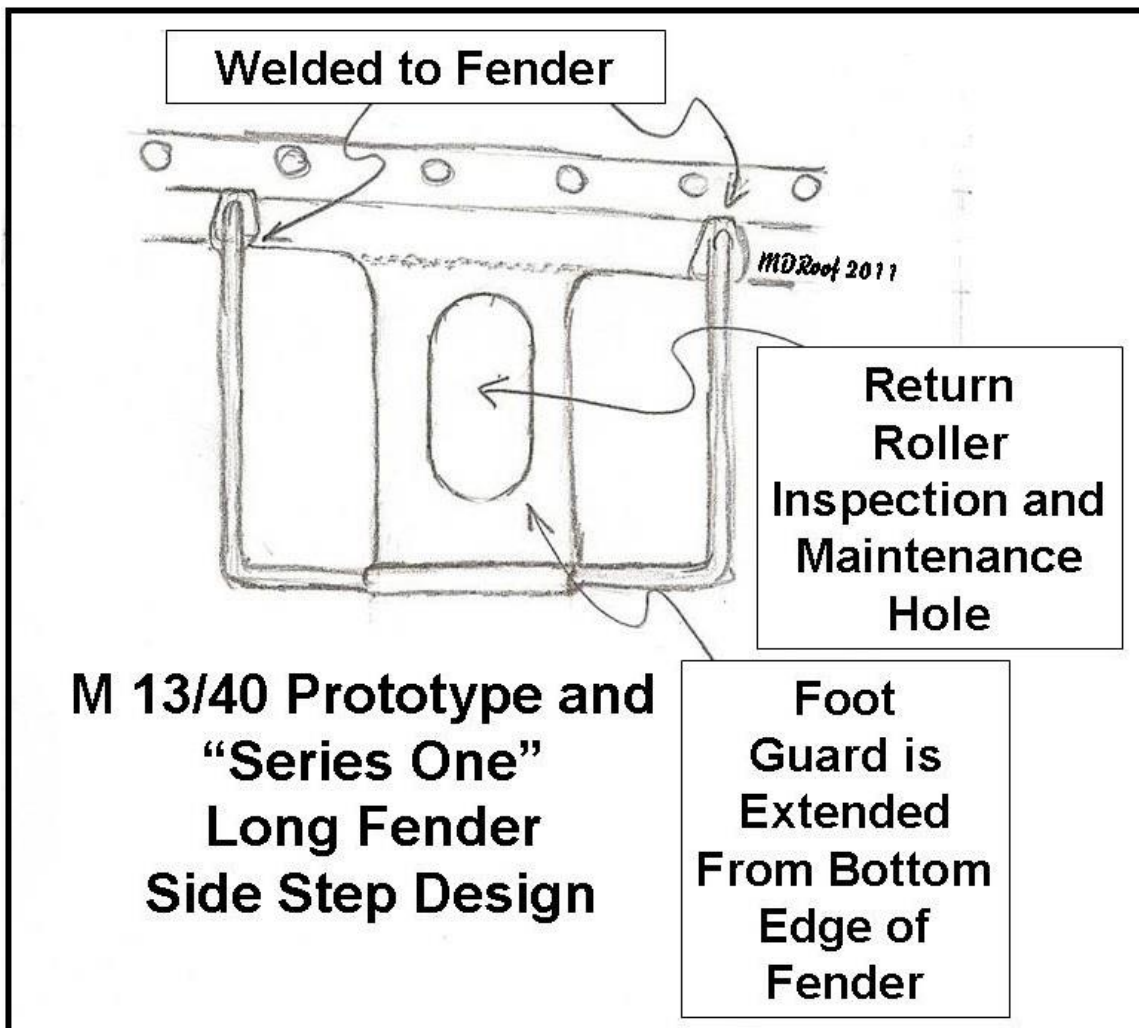


† Talliio, et al, "Carro M," vol. 1, pg 45.

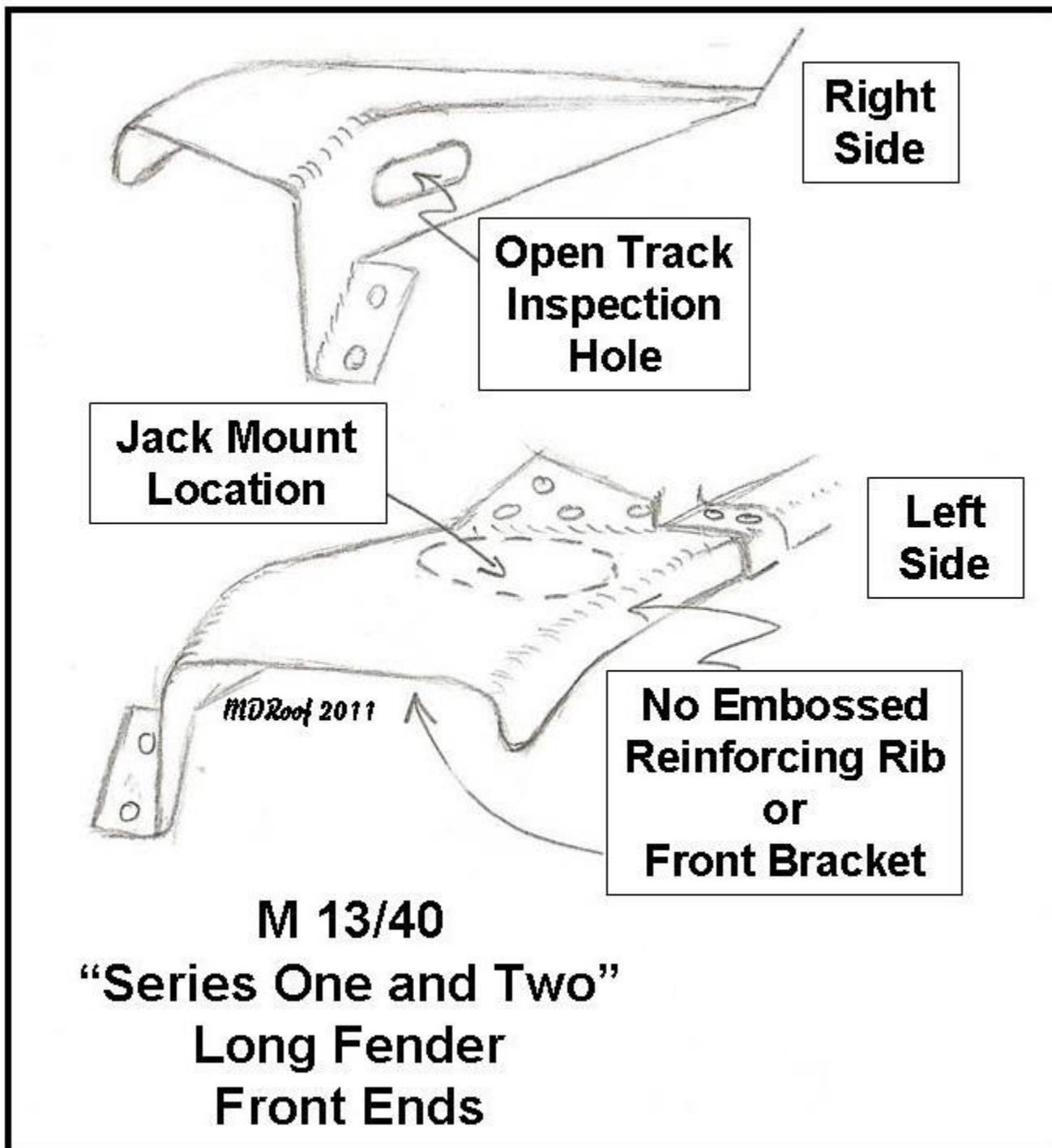
Sketches

The following sketches have been prepared to assist in identifying the various features mentioned in the above lists. I am no artist or mechanical engineer and these sketches are really only slight improvements on the types of drawings that I make for myself usually in the margins of my notes as I research and study any particular subject. I do these sketches to help me remember particular details or features that I want to be sure to include or modify on my own models. For the M 13/40 through M 14/41 series of tanks, I was interested in back-dating one of the Italeri or Tamiya M 14/41 models into an earlier M 13/40, so my effort was oriented to identifying those details that I might want to change or incorporate in my model. Consequently, these sketches mostly show those features.

These sketches are not to scale although I have tried to make their proportions as "visually" correct as my limited abilities allowed. Additionally, I have simplified or omitted extraneous details that are common across vehicles or easily identified in photos. My intent was to note in the sketches those features and changes that occurred between the different production series, and I was surprised at just how many small changes were implemented in the M 13/40 through M 14/41 tanks.



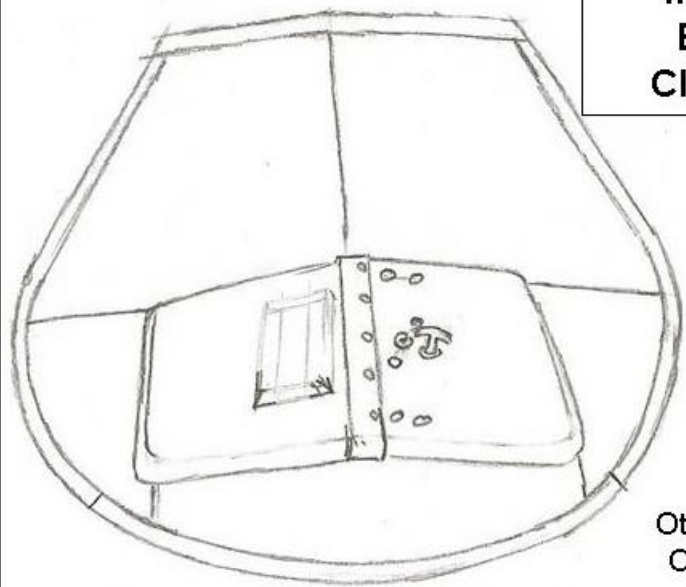
Sketch 1



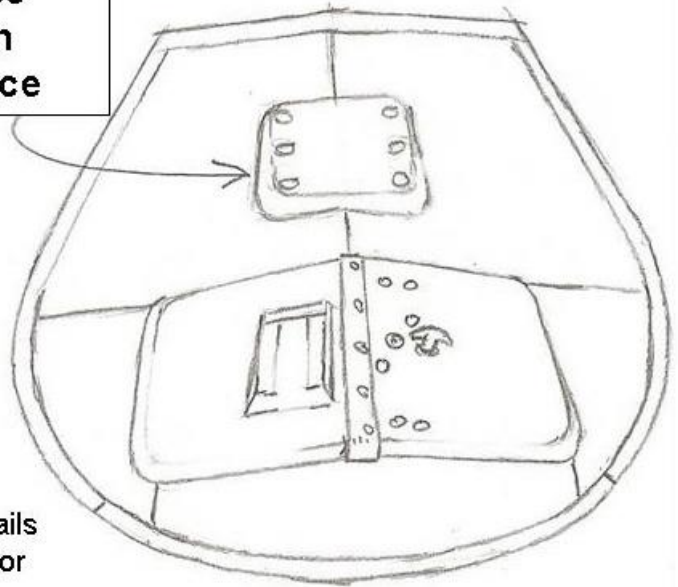
Sketch 2

Turret Roof Changes

Hump Added to Increase Breach Clearance



M 13/40 "Series Three" And Earlier



M 13/40 "Series Three" And Later

Other Details Omitted for Clarity
MDRoof 2011

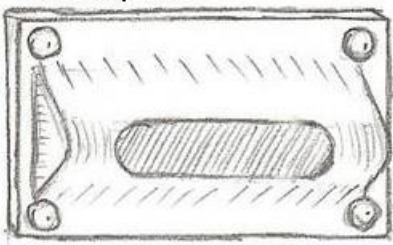
Sketch 3

M 13/40 and M 14/41 Pistol Ports

Hull Door and Rear Corners

Turret Sides

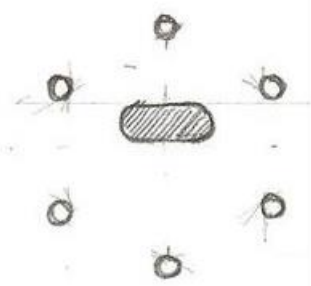
MDRoof 2011



M 13/40 Prototype and Some "Series One" Tanks



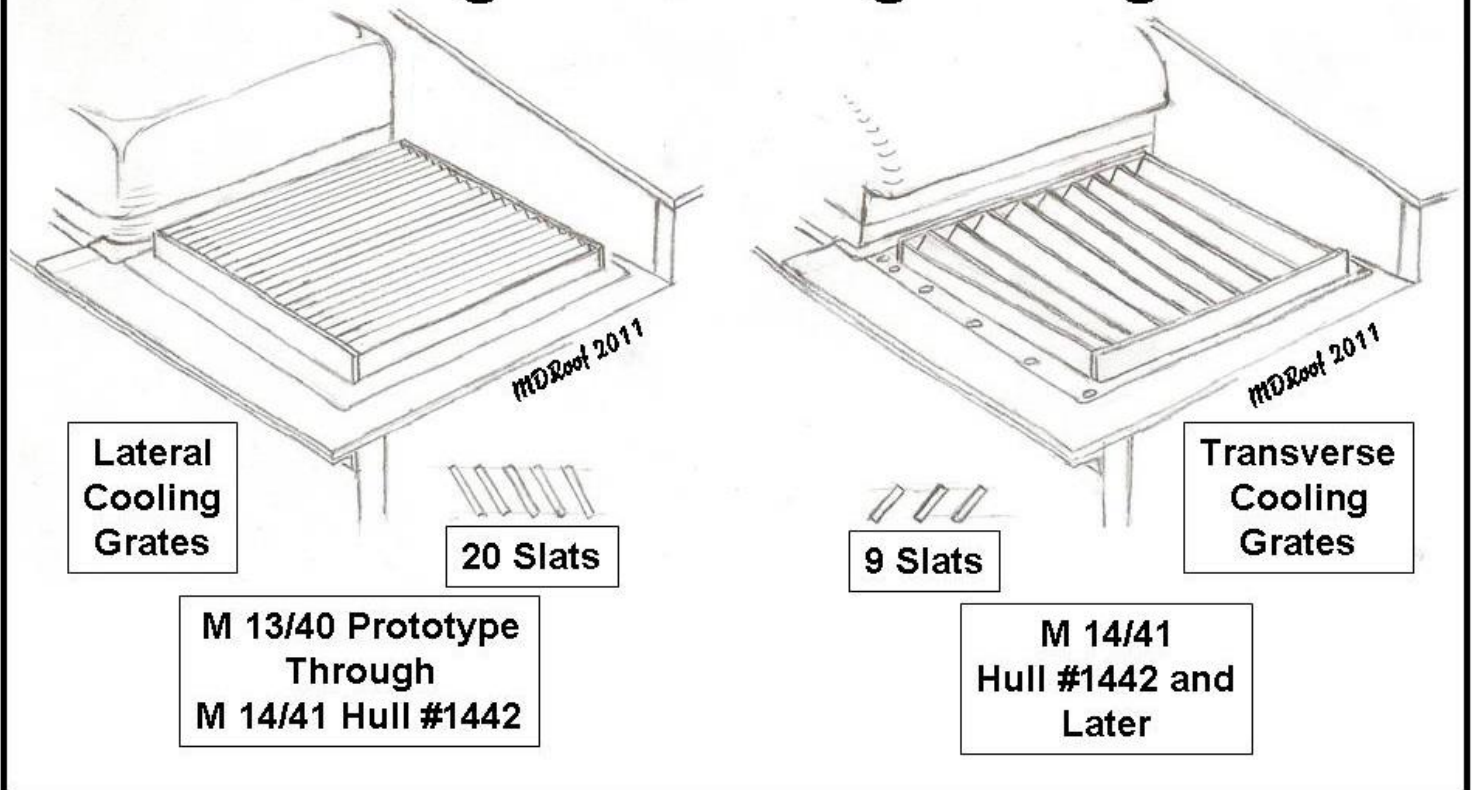
"Series One" and Later Tanks



Not Present On Prototype

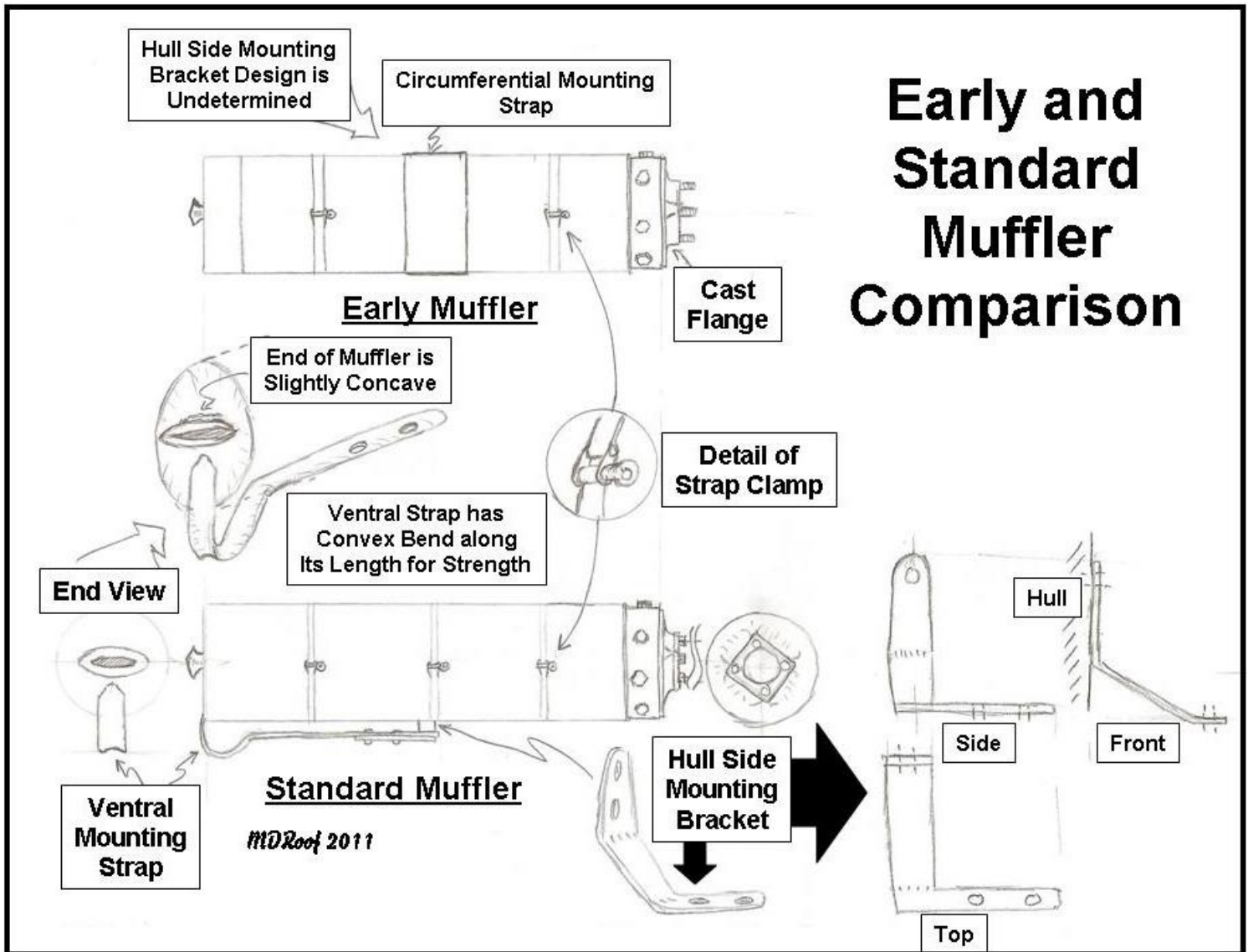
Sketch 4

Cooling Air Grating Changes



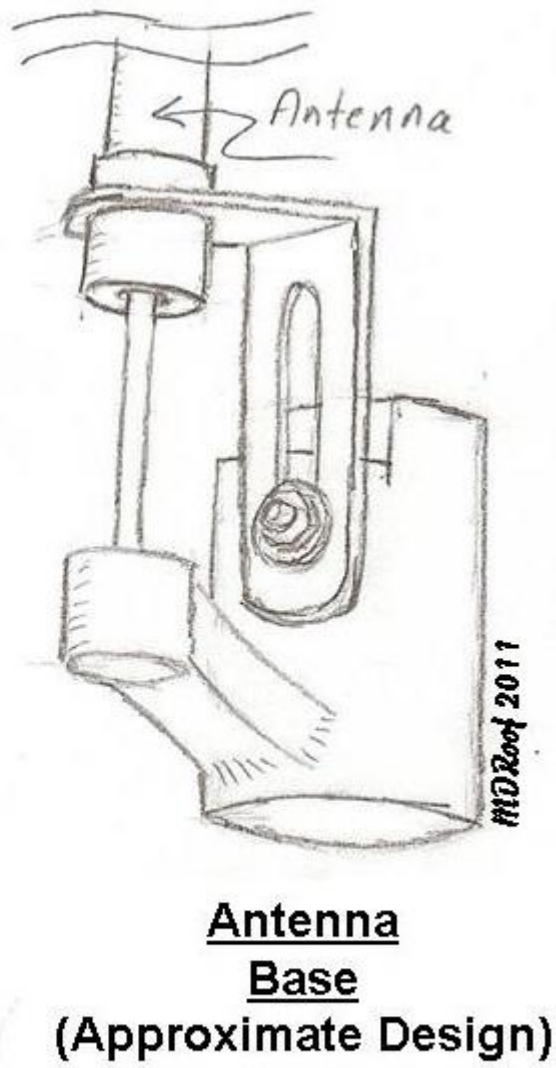
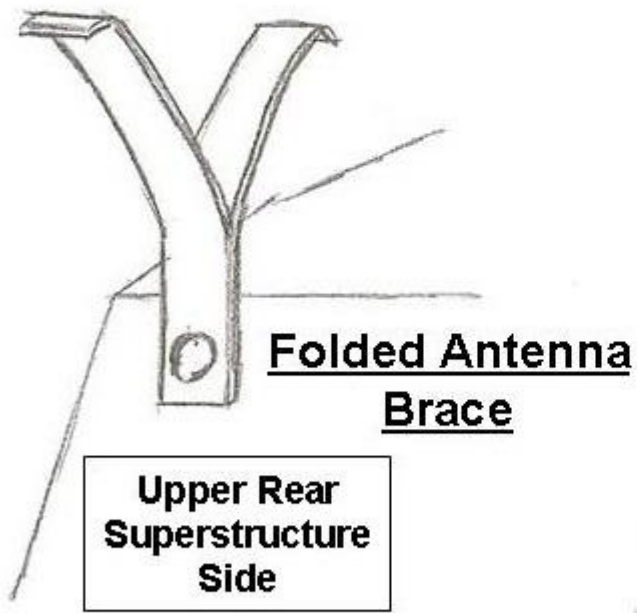
Sketch 5

Early and Standard Muffler Comparison



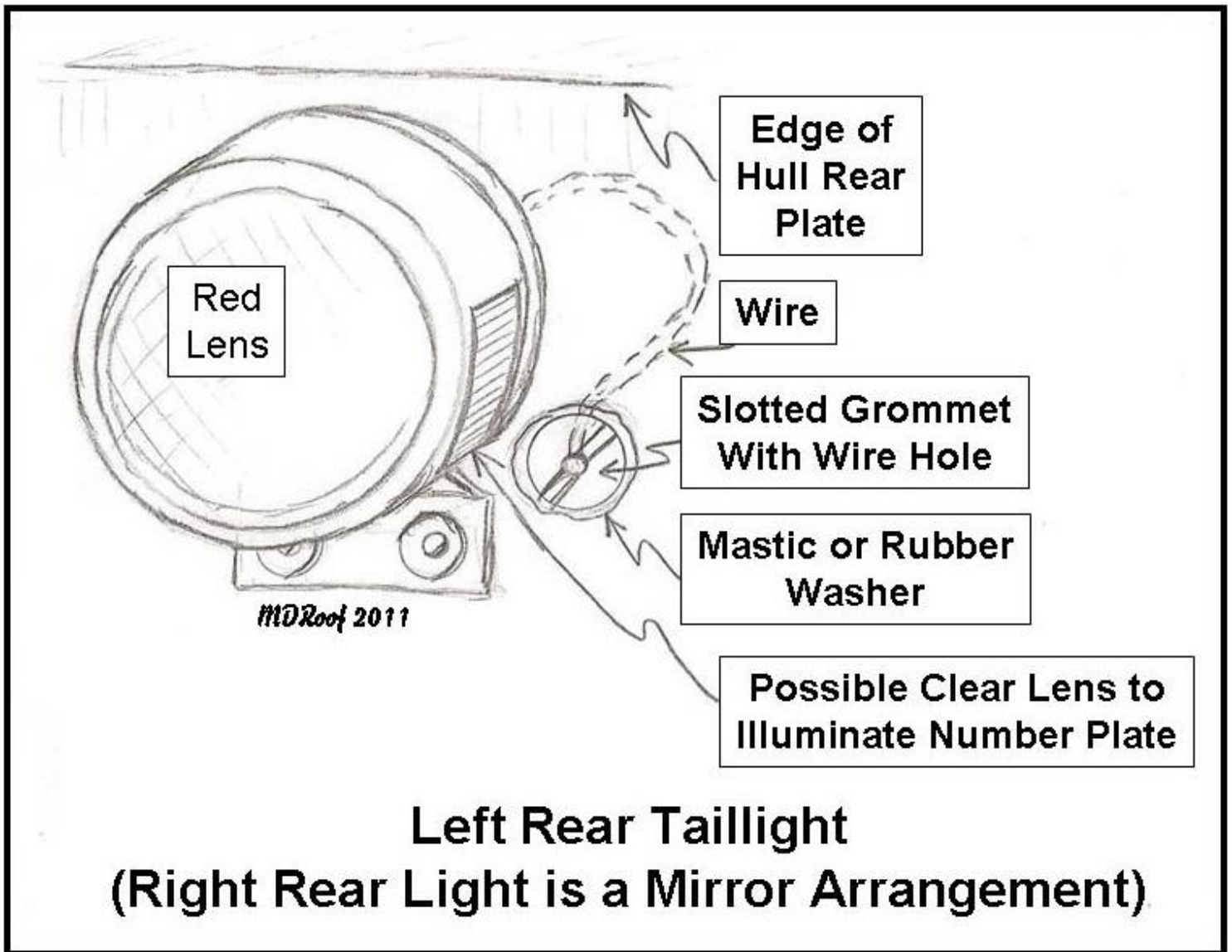
Sketch 6

M 13/40 Prototype and Some "Series One" Tanks



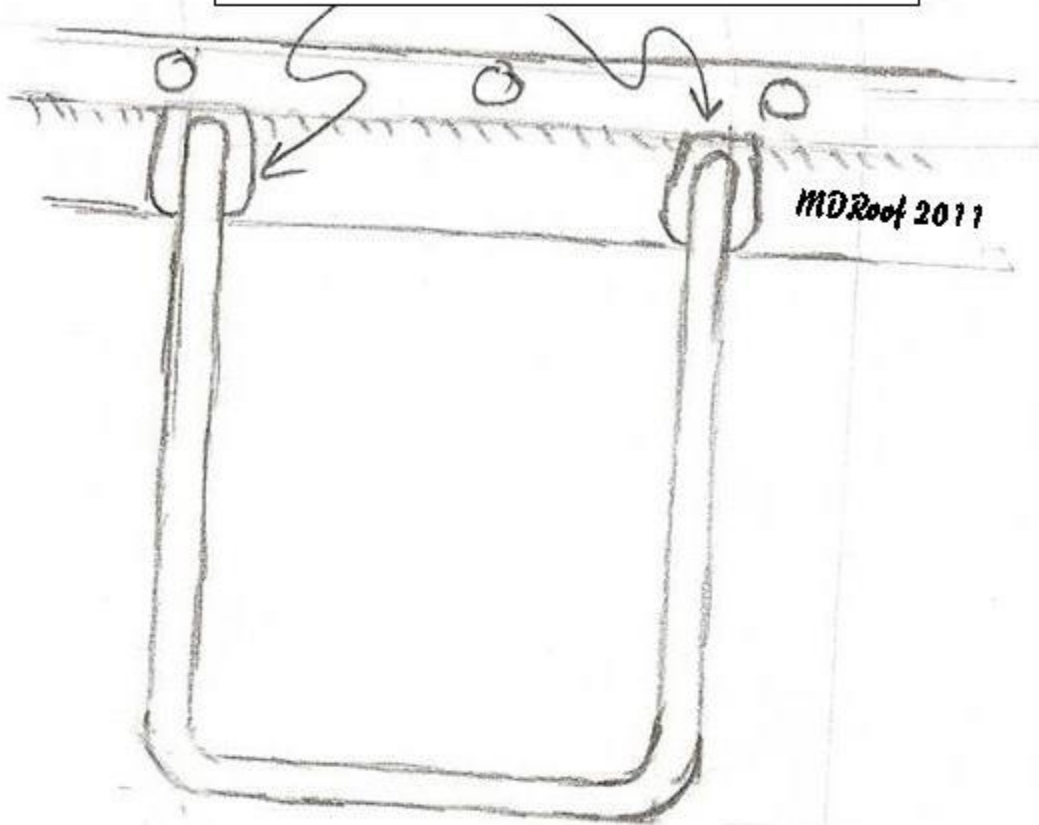
See pages 12 and 14 Squadron/Signal "In Action #39"

Sketch 7



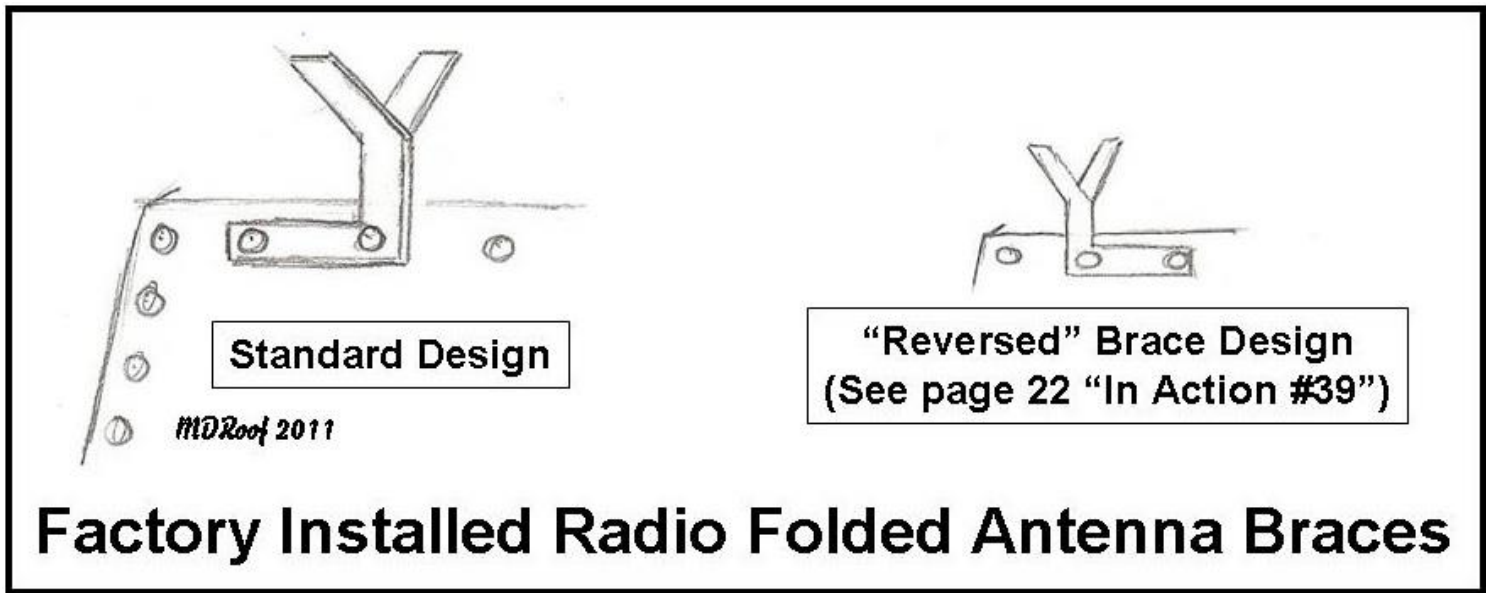
Sketch 8

Welded to Fender

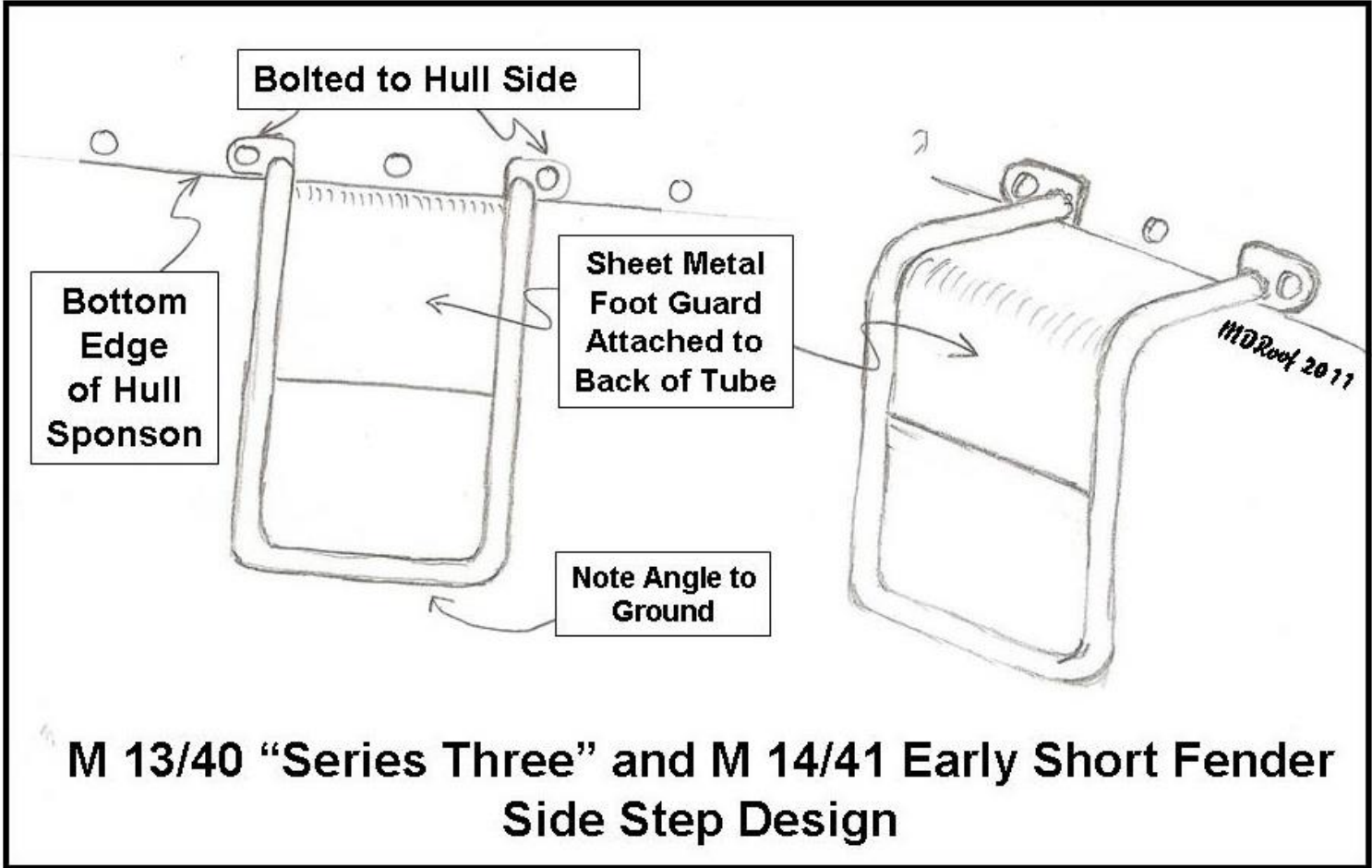


**M 13/40 "Series One"
And "Series Two"
Long Fender
Side Step Design**

Sketch 9



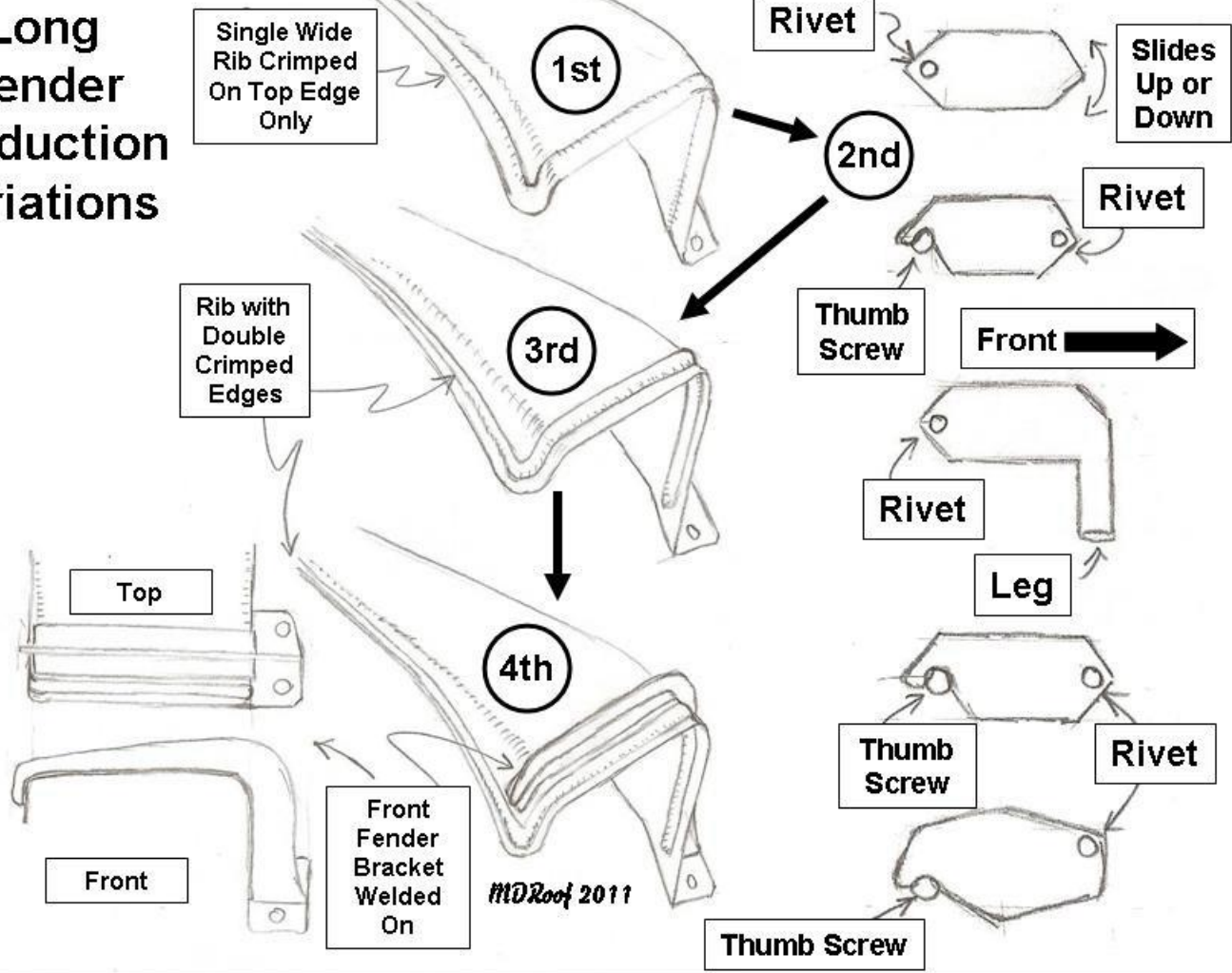
Sketch 10



Sketch 11

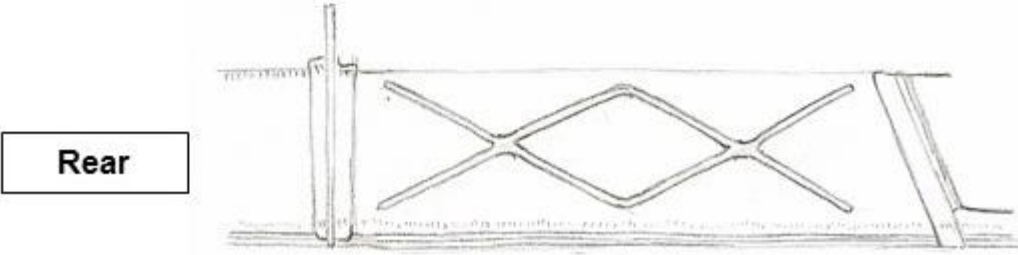
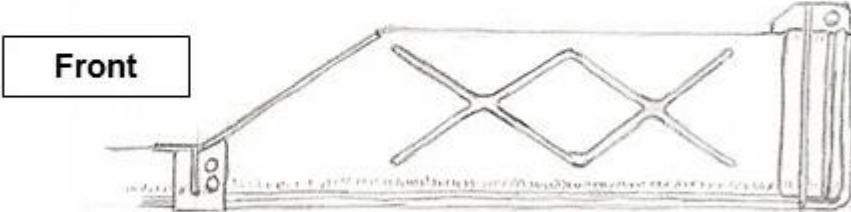
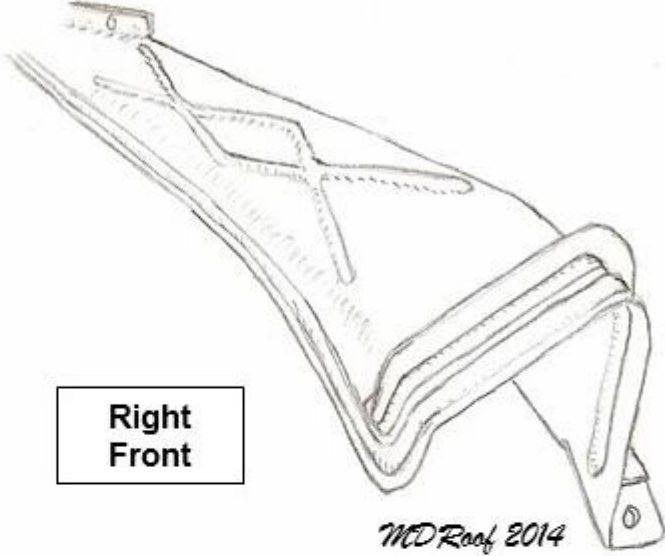
**M 14/41
Long
Fender
Production
Variations**

Track Inspection Hole Covers



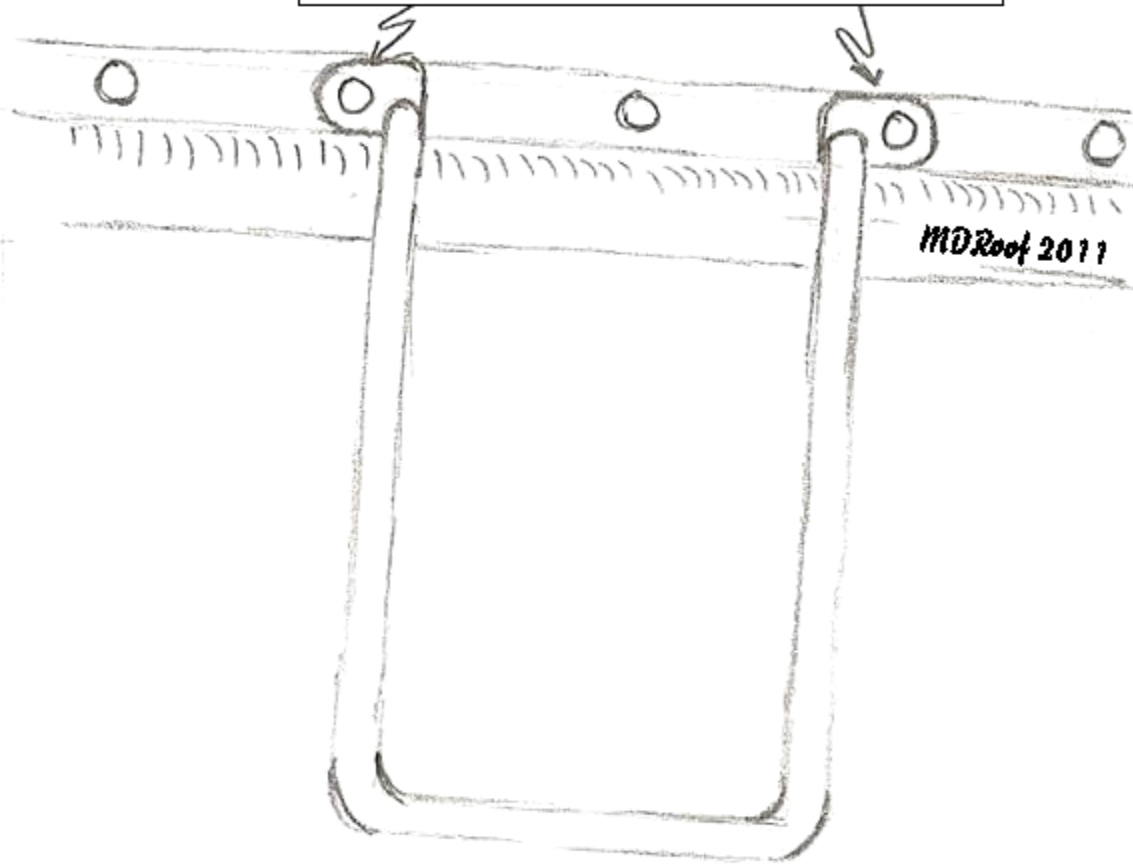
Sketch 12

**Final
M 14/41
Long
Fender
Production
Variations**



Sketch 12B

Bolted to Hull Side

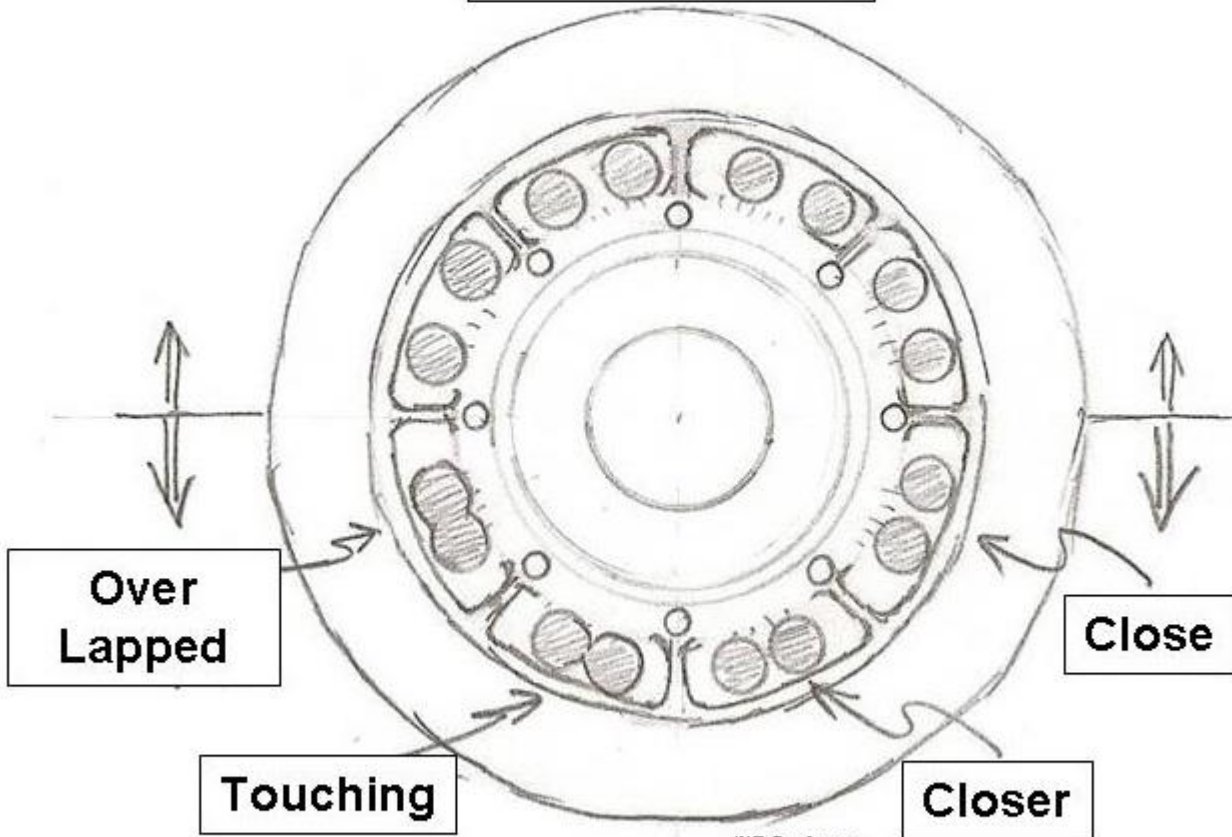


**M 14/41 Long Fender
Side Step Design**

Sketch 13

Road Wheel Hole Spacing

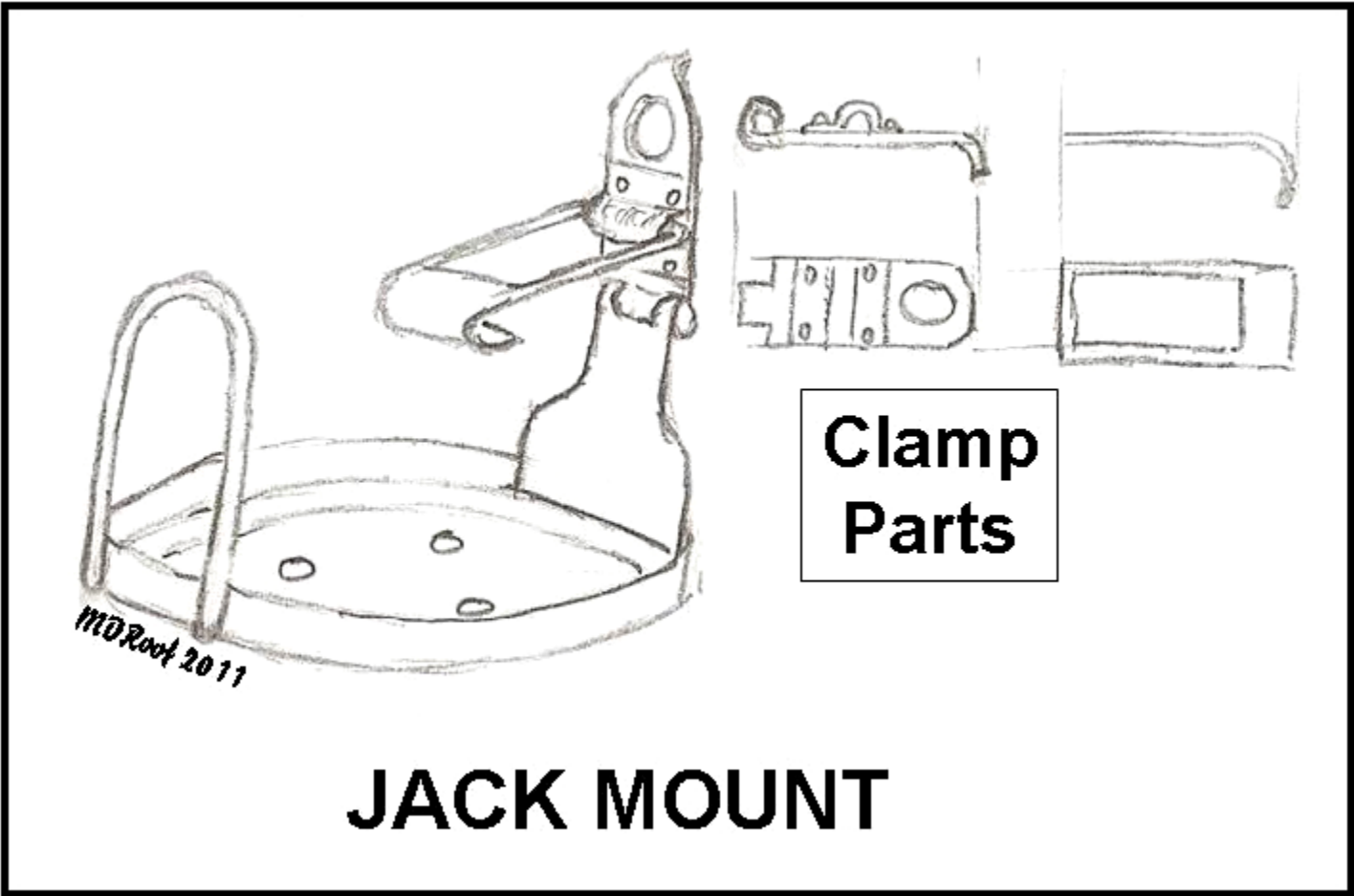
Normal Spacing



HD Rev 2011

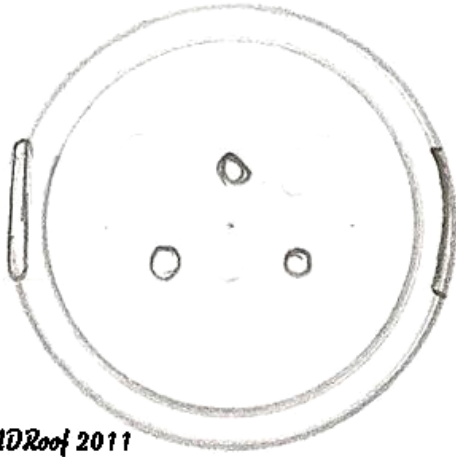
Spacing Deviations

Sketch 14



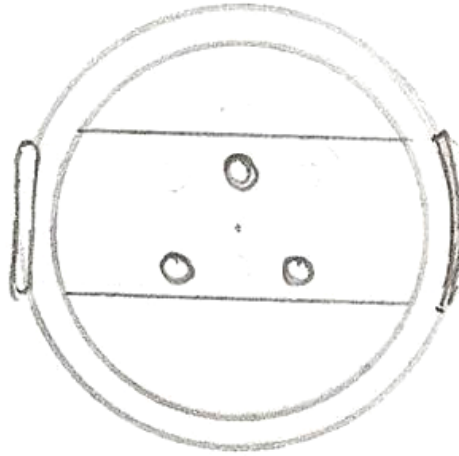
Sketch 15

JACK MOUNT VARIATIONS

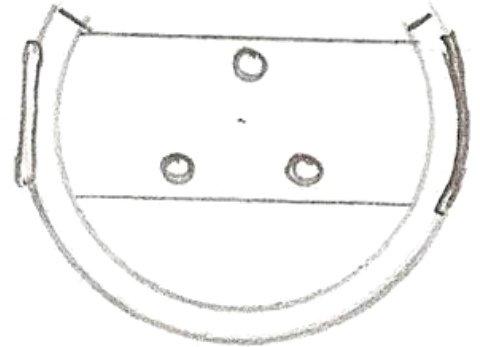


MD Roof 2011

**Solid
Bottom**

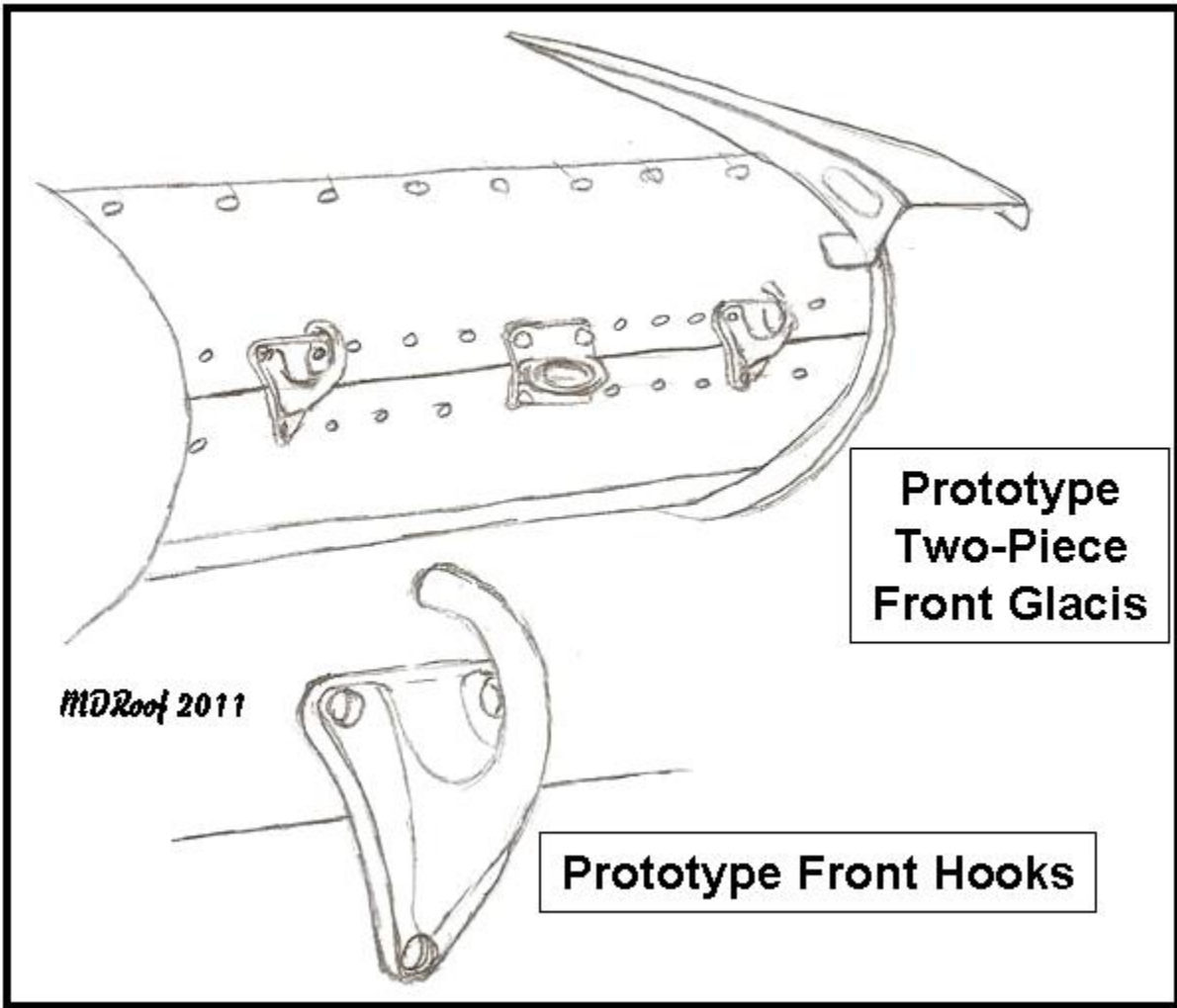


**Open
Bottom**

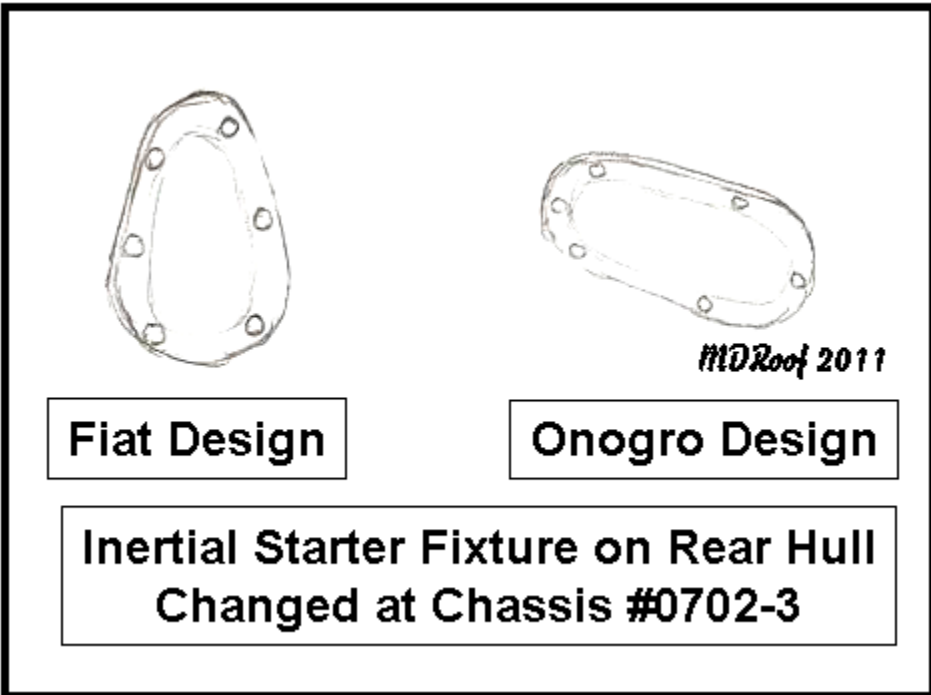


**Semicircular
Design**

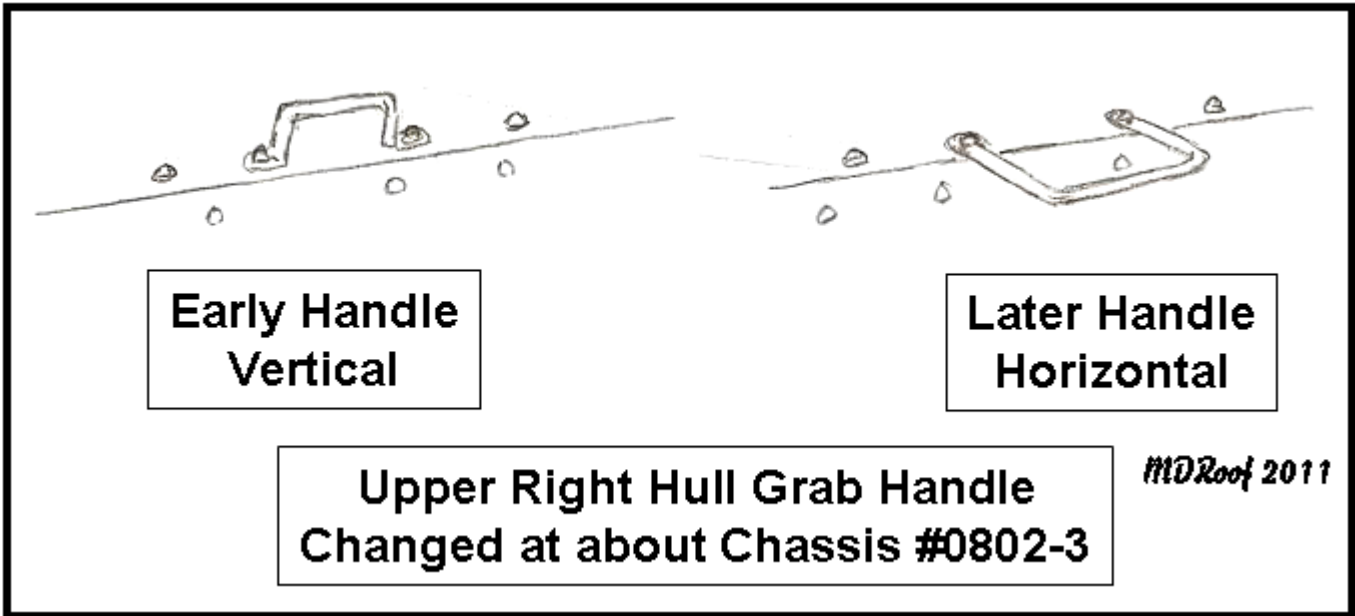
Sketch 16



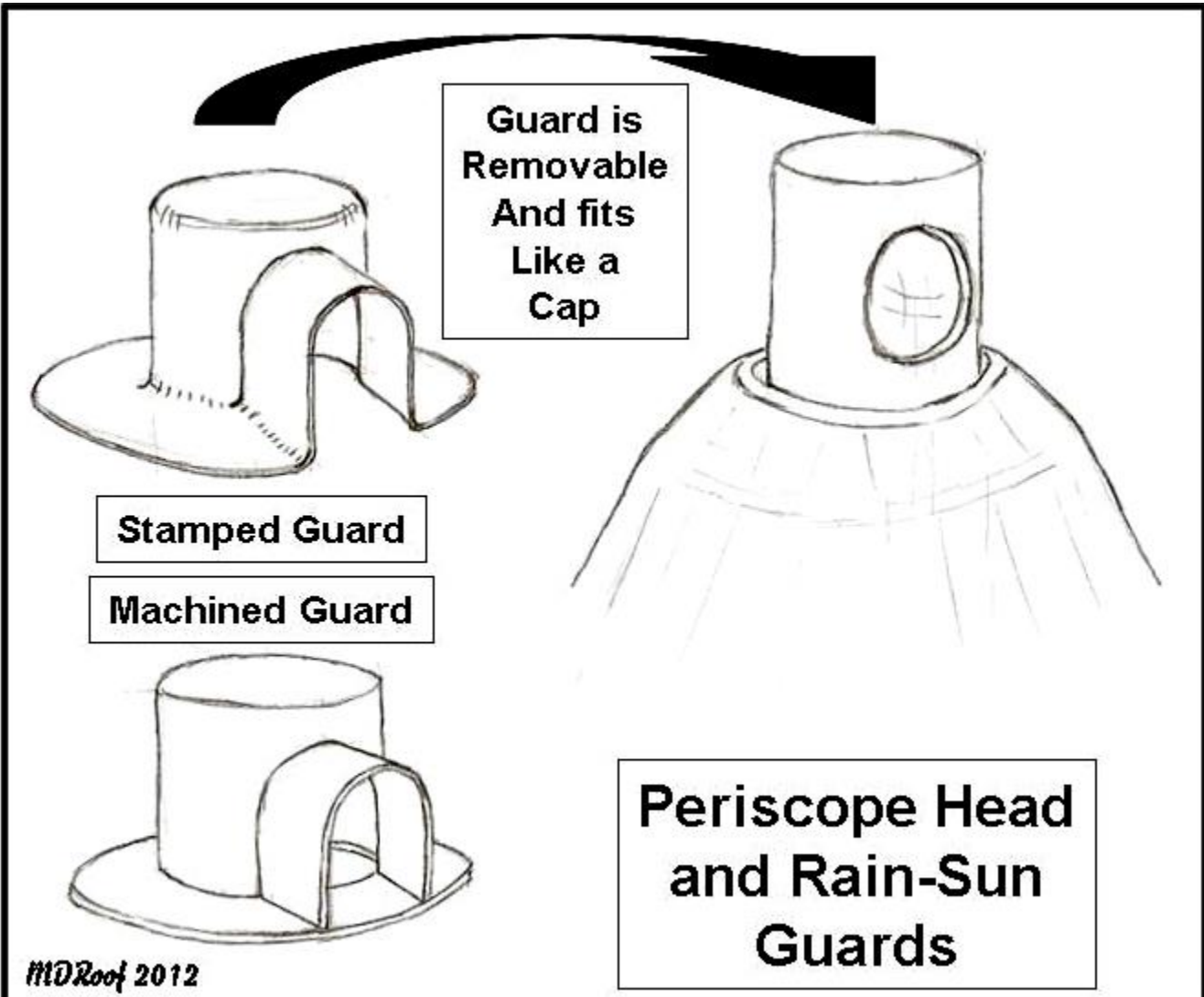
Sketch 17



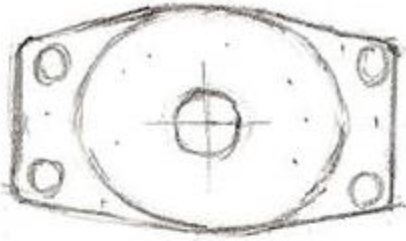
Sketch 18



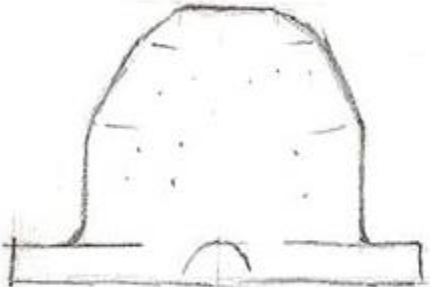
Sketch 19



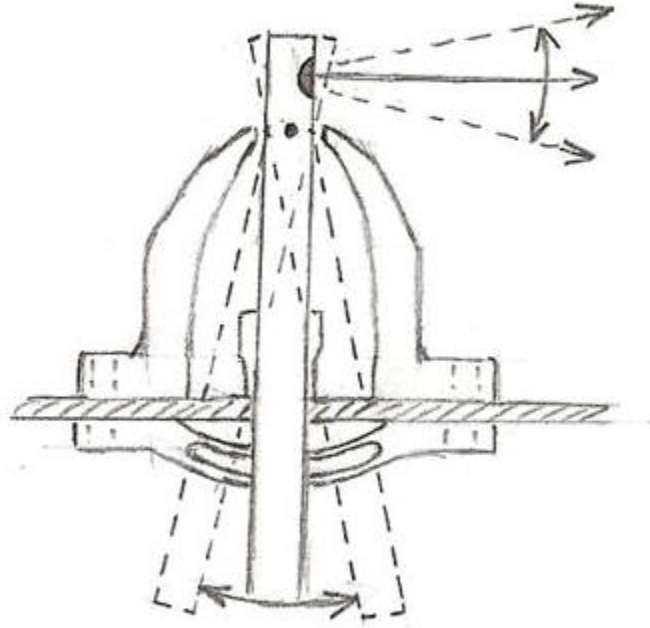
Sketch 20



**Periscope Tilts Fore and Aft
To change Vision Elevation.
This movement is fixed in Azimuth.**



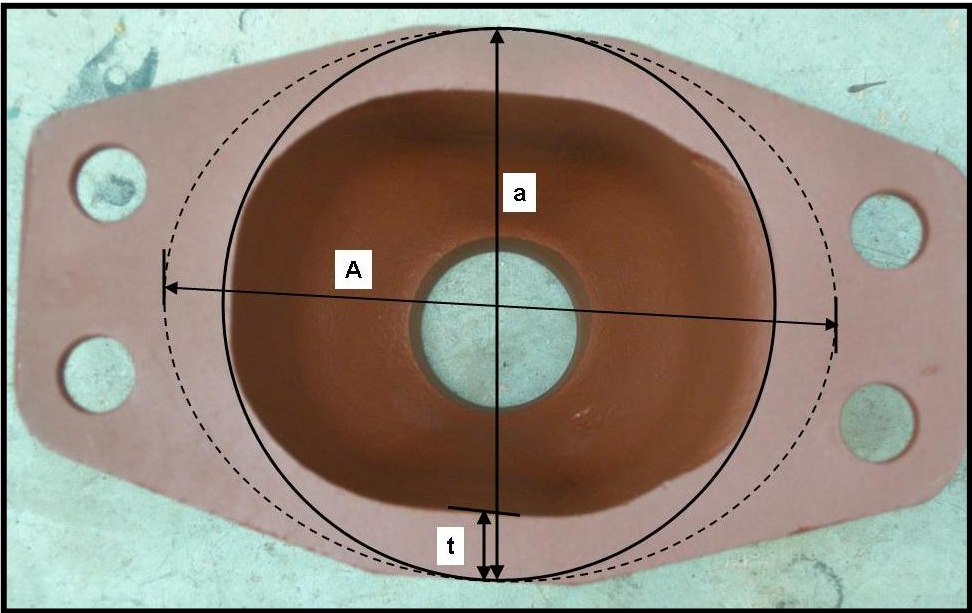
**Cast Guard
Has Oval
Plan-View
Shape**



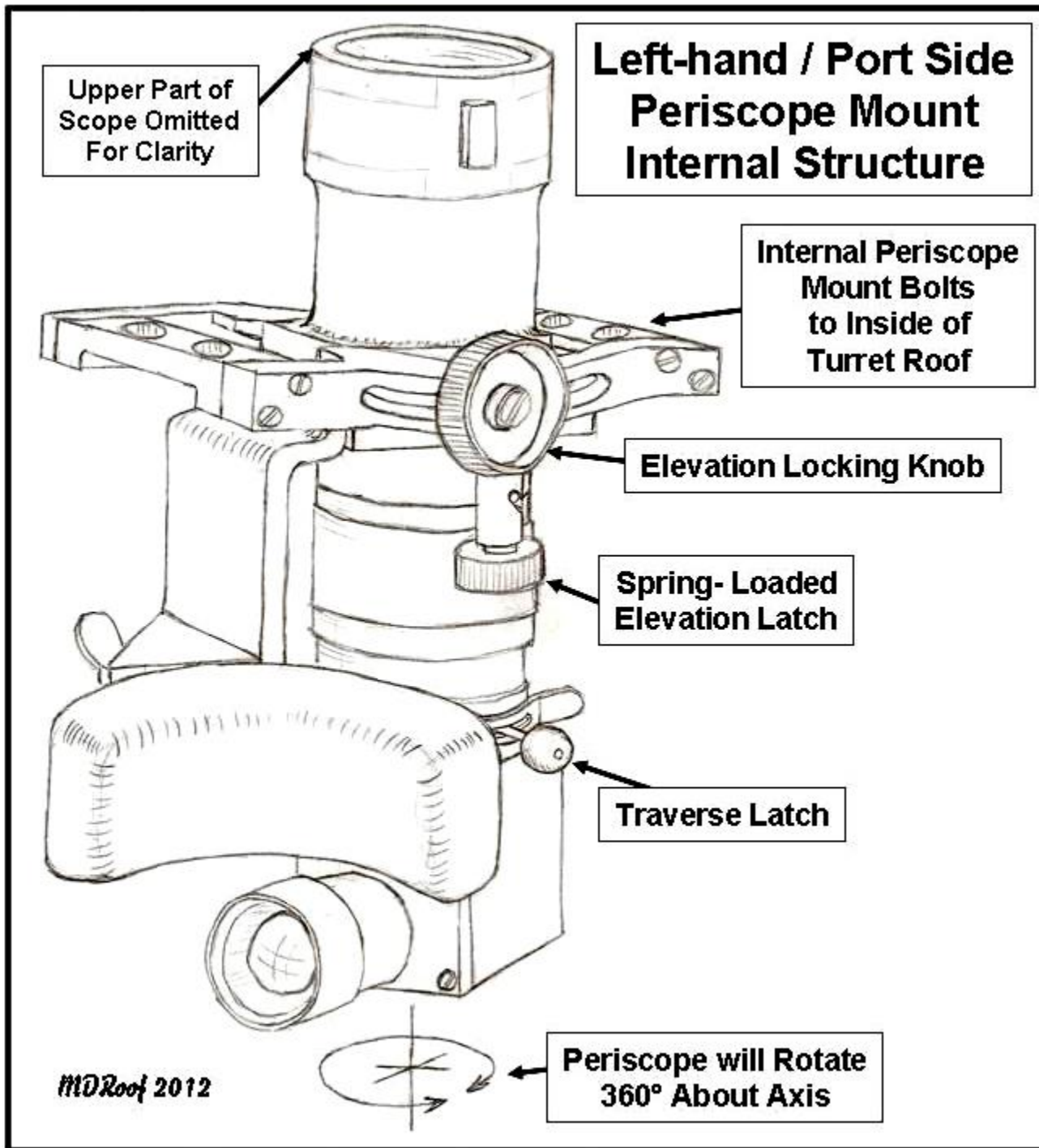
Armored Periscope Guard

MD Roof 2012

Sketch 21

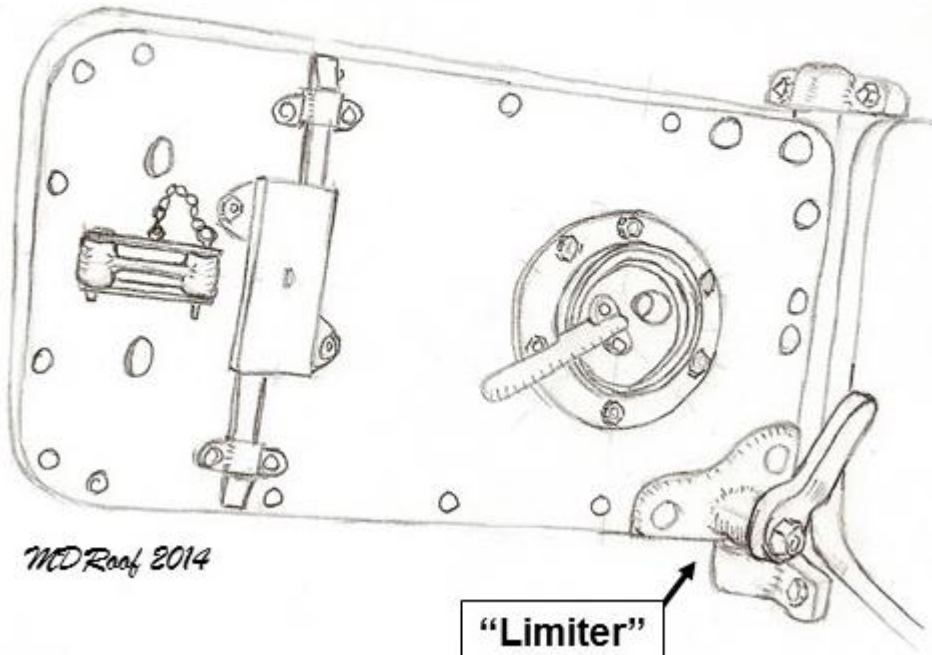


**Photo 1: Interior view of armored cover. Note oval shape to provide clearance for periscope to tilt fore and aft.
Credit: Steve Tegner (with permission).**



Sketch 22

**M 14/41 Hull Door
"Limiter"**



MD Roof 2014

"Limiter"

Sketch 23

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