PART DESCRIPTIONS
As of
October 17, 2006

The difference between equally and unequally spaced hole assemblies

There were two bolt hole configurations pertaining to the 6 bolt holes which surrounded the circumference of the Universal Joint Housing Cap—inner (A-4513), and outer (A-4520), and the Transmission Main Shaft Bearing Retainer (A-7085) assemblies and related gaskets.

The equally spaced holes, from the top hole around the assembly clockwise, hole to hole, are 2-3/4 inches respectively.

The unequally spaced holes, from the top hole around the assembly clockwise, hole to hole, are 3 inches, 2-1/2 inches, 2-3/4 inches, 2-3/4 inches, 2-1/2 inches, and 3 inches respectively.

With this in mind, only the top half of each part was affected as far as the equal or unequal hole spacing was concerned.

The reason Ford did this is pointed out in the June, 1929, Ford Service Bulletin on page 350 which related that the change "eliminates the necessity of unequally spacing the bolt holes in both this part and its corresponding gaskets as the unequal spacing was used simply to insure that the housing cap being assembled with the extension lug toward the top".

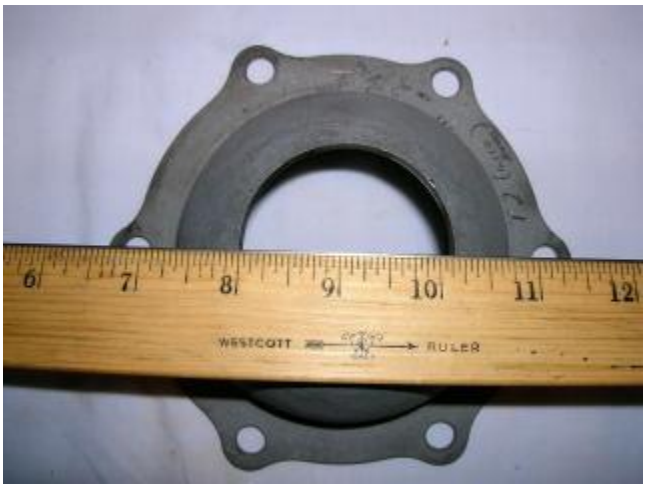
A-4513: Universal joint housing cap—inner

There are three (3) known types of A-4513 Universal joint housing cap—inner:

Type 1: **Equally** spaced holes with no side holes for lubrication in bell.

Started as part number A-4513, A-4513-A, A-4513-AR, AA-4513.

This Universal joint cap—inner has **equally** spaced holes with no side holes for lubrication. It has "disc grinds" on the front face of the flange. The center hole measures 2-5/32 inch diameter.



November 10, 1927, Release # 4447: A-4513 became A-4513-A and was for use on first 1000 cars.

NOTE: The December 19, 1927, Release # 5926, indicated a change from "1000" cars to "3400" cars. The 3400th engine was stamped on December 21, 1927. All finished engines included a transmission along with the Transmission main shaft bearing retainer, which was also equally spaced. After "3400" cars (engines) it changed to Type 2.

March 29, 1928, Release # 7993: The part was indicated as A-4513-AR (the part record does not reflect this change from A-4513-A to A-4513-AR). However it is thought that the "R" was added on November 10, 1927 when A-4513-B was introduced (below). It was also specified that the disc grind be removed from the front face of the flange and that the center hole be 2-9/32 diameter (an increase of about 1/8th of an inch). It was also indicated that the part number A-4513-AR be changed to AA-4513.

Used October to mid-December, 1927—Used on first 3400 units.

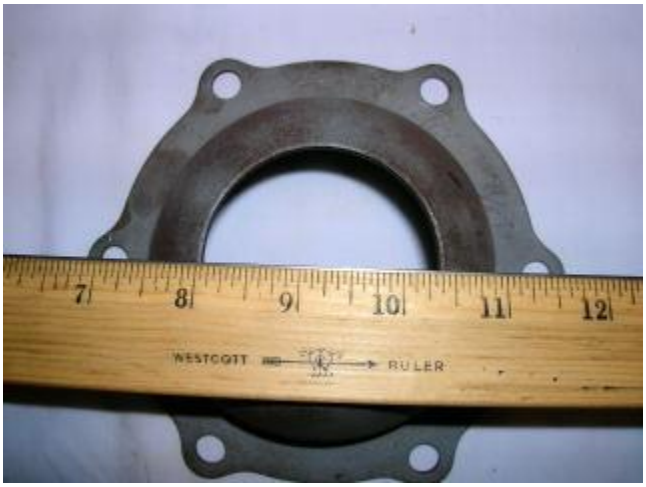
Type 2: **Unequally** spaced holes with no side holes for lubrication in bell.

Part numbers: A-4513-B, A-4513-BR.

November 10, 1927, Release # 4447: A “New number and new design was adopted”. This was A-4513-B.

December 19, 1927, Release # 5926: Specified that this part was to be used **after** 3400 cars instead of 1000 cars. This is an interesting statement because it may change a few things. First of all, the “first 1000 car” statement, indicated above and in part number A-7085, Transmission main shaft bearing retainer, should be the “first 3400 cars”. And second, the “**after** the first 1000 cars” statement in A-7085-B, Transmission main shaft bearing retainer, should be “**after** the first 3400 cars”. Why the change was not reflected on the Transmission main shaft bearing retainer part information is unknown.

March 29, 1928, Release # 7993: Specified to remove the disc grind from the front face of the flange and that the center hole to be 2-9/32 diameter (an increase of about an 1/8th of an inch).



March 15-18, 1929, Release # 12326: Specified that an “R” be added to the symbol number, in which it became A-4513-BR, and was to be used for repairs.

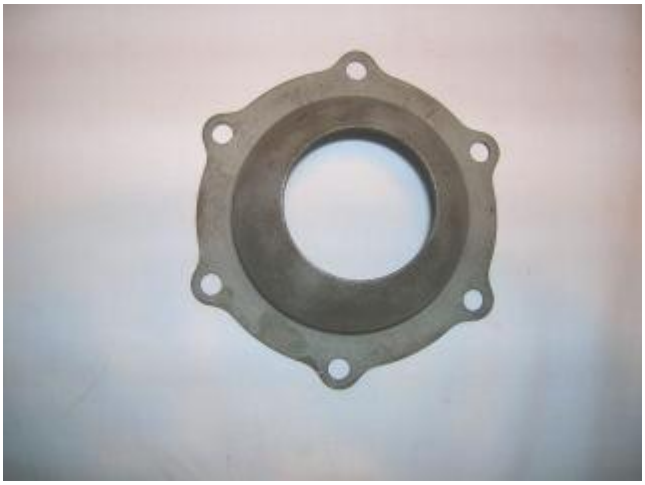
Used from mid-December, 1927 to mid-March, 1929.

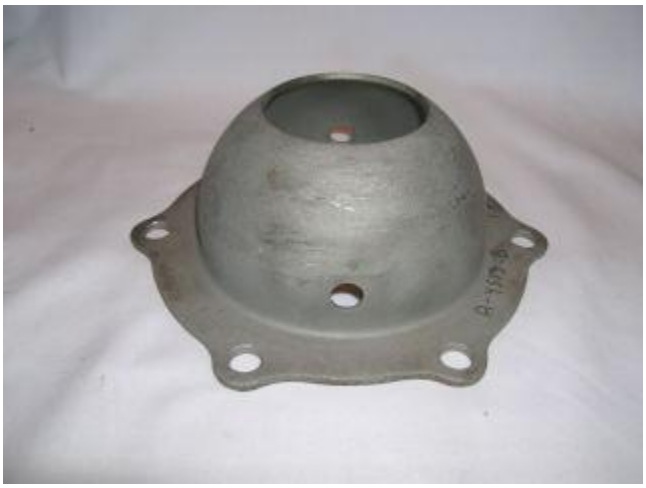
2a. **Unequally** spaced holes with 2 side holes for lubrication in bell.

June, 1929, Ford Service Bulletins: These caps, for the most part, may not have been used in production, but the 2 holes were punched for lubrication when serviced due to the June, 1929, Ford Service Bulletin announcement that "Two 3/8" holes have been added to this part (A-4513-A) for lubrication, the same as in A-4513-BR. Any old style caps that you have on hand without these holes may be used at the front end of trucks where the coupling shaft or dual high connects to the transmission".

Type 3: **Equally** spaced holes with 2 side holes for lubrication in bell.

March 15-18, 1929, Release # 12326: The symbol number was changed from AA-4513 back to the original A-4513-A. Two 3/8 punched holes (which were located the same as A-4513-BR) were added for lubrication. Specified 2 instead of 1 req. for "AA". This replaced A-4513-B, above, for all production requirements. The center hole remained at 2-9/32 inch diameter.





PICTURE OF HOLES
Shows the two (2) 3/8 inch punched holes in the bell of the Universal joint housing cap—inner as per Release # 12326.

May 13, 1929, Release # 12932: Changed number required on “AA” Chassis from 2 to 1.

Used from mid-March, 1929 through production.

All types of the Universal Joint Housing Cap—inner, had the same flange thickness.

The finish was unfinished natural steel.

NOTE: As a “lubrication safety feature”, all Universal joint housing caps—inner should have the two 3/8” holes put in the bell portion of the part for the extra lubrication for the Universal Joint Assembly, A-7090, itself. This added feature will not affect the judging status of the vehicle as it is a feature which is not visible.

A-4520: Universal joint housing cap—outer assembly

There are four (4) known types of A-4520 Universal joint housing cap—outer assemblies:

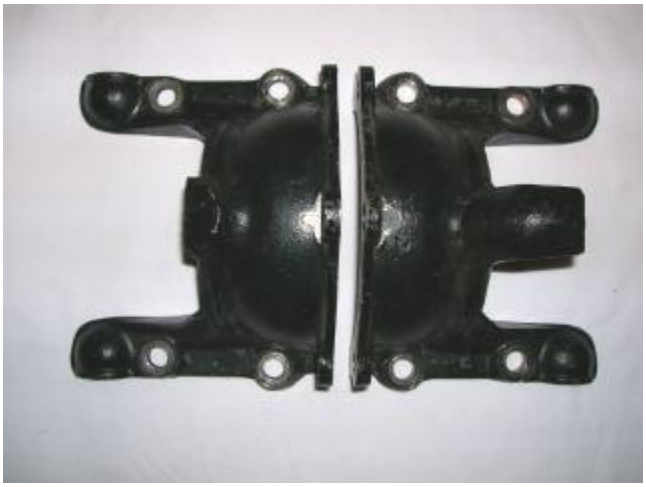
There are two specific parts to this outer assembly, a upper and a lower.

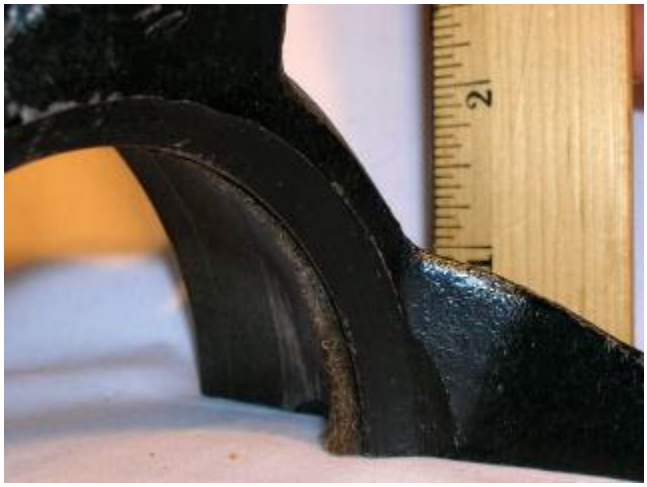
Type 1: **Equally** spaced holes; ***variety 1***: upper half has safety lug WITH a raised rib going up the center of the lug itself, the lower half has a "T" shaped raised area where safety lug was not welded on; ***variety 2***: upper half has revised welded on safety lug with NO raised rib going up the center and the lower half has a "D" shaped raised area where the safety lug was not welded on; arms; and used with "Service Brake Equalizer" brake system and Forged Design. Both varieties have ¼ inch wide oil grooves in lower half. The ribs in the corner of the arms, upper and lower, were 1-1/16 inch in height on ***variety 2*** but 1-3/16 inch in height on ***variety 1*** lower.

Started as part number A-4514-C.

Variety 1 has no visible part number or "Ford" script.

Variety 2 has no visible part number or "Ford" script.



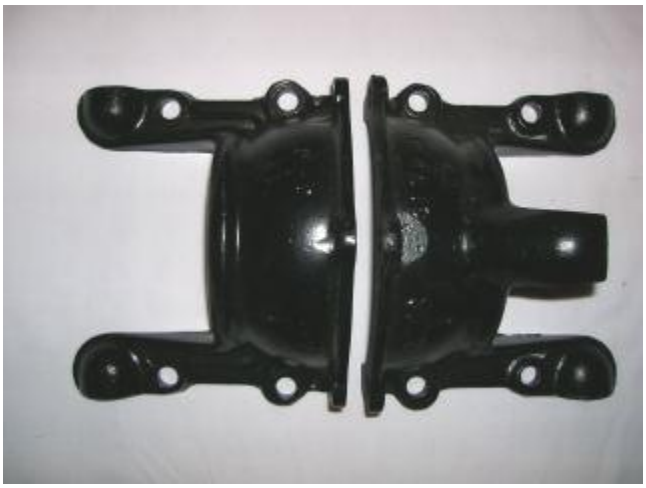


PICTURE OF RIB HEIGHT
Universal joint housing—outer lower rib height of 1-1/16 inch.

Used from October to mid-December, 1927—Used on the first 3400 units.

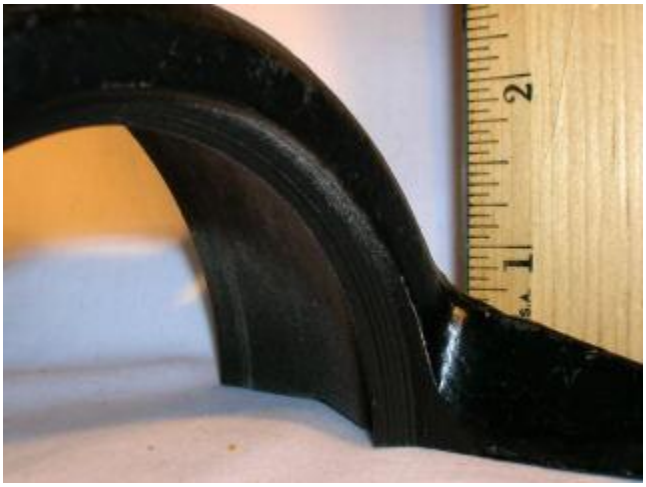
Type 2: **Unequally** spaced holes; upper half has the revised welded on safety lug (as does Type 1 ***variety 2***) as the "rib" was removed; the lower half has no indication of a safety lug boss as the "D" area was removed; arms; and used with "Service Brake Equalizer" brake system and Forged Design.

Part assembly number A-4520.



November 18, 1927, Release # 4931: Indicated that this assembly was a "New number, new drawing, adopted". At this time the assembly went from being **equally** spaced to **unequally** spaced holes (upper half only).

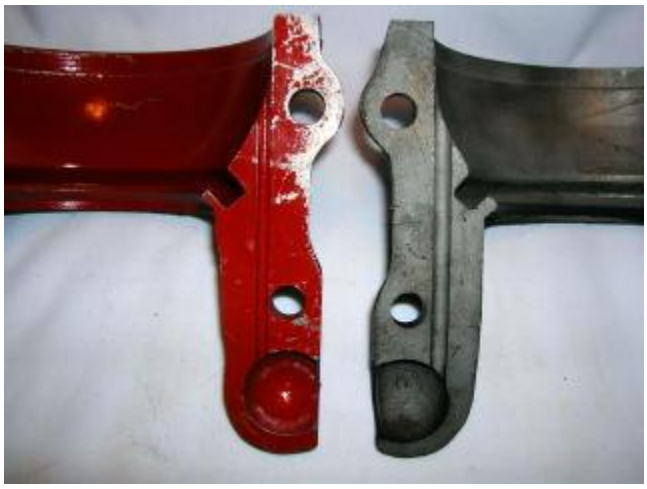
December 19, 1927, Release # 5926: Indicated that the Universal joint housing cap—outer lower was to change the height of ribs on arms from 1-1/16 inch to ¾ inch.



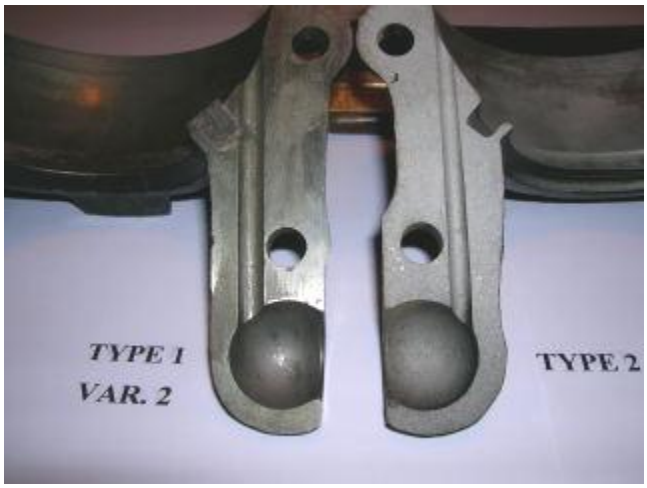
PICTURE OF RIB HEIGHTS
This shows the difference of the height of the ribs from 1-1/16 inch (see Type 1 picture above) to ¾ inch on the arms of the Universal joint housing cap—lower parts. The upper halves started out within Type 2 assembly as being 15/16 inch in height but was reduced down to 13/16 inch in height on December 30, 1927.

December 22, 1927, Release # 6027: Indicated "Changed number required on A-20915 Bolt, A-21741 Nut, and A-22245 Lock Washer from 4 to 2". *Interesting case here. It is thought that this set-up was for the AA Truck. This assembly went from 4 to 2 holes for attachment when the chassis converted from the "Service Brake Equalizer" brake system to the "Solid Service Brake Cross Shaft" brake system in November, 1928.*

February 13, 1928, Release # 7200: Indicated that the oil grooves in the arms of the lower half changed from 1/8 wide and 1/8 deep to 3/16 wide and 3/32 deep. **Note: Early oil grooves in the lower half (Type 2) may be ¼-1/8 inch.**



Comparing 1/8 inch and 3/16 inch wide grooves in Type 2 U-joint lower halves.



PICTURE OF OIL GROOVES
This shows the difference in size of the oil grooves in the lower half of the Universal joint housing cap—outer lower. Type 1 or the first generation caps, both variety 1 and variety 2, have ¼ inch wide grooves and Type 2 has 1/8 and/or 3/16 inch wide grooves.

September 12, 1928, Release # 10155 (Supplement # 2): Added "AR" to symbol number indicating use for repairs. Added note, "Used with Service Brake Equalizer" brake system.

October 23, 1928, Release # 10735: The assembly became "Obsolete".

Upper part of assembly A-4520:

The ***upper*** part with the lug has on it the following known part numbers: A-4518 with "Ford" script, A-4518-AR, AA-4518, or no part number.

There is no significant difference among these parts.

Lower part of assembly A-4520:

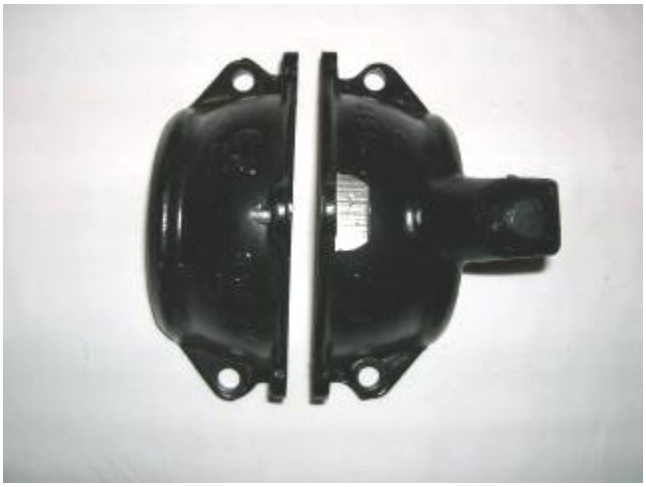
The ***lower*** part without the lug has on it the following known part numbers: A-4514 with "Ford" script, or no part number.

NOTE: All part numbers should be "raised" due to being a forging.

Used from mid-December, 1927 through mid-October, 1928 (when the service brake system changed from the "Service Brake Equalizer" brake system to the "Solid Service Brake Cross Shaft" brake system).

Type 3: **Unequally** spaced holes, top lug, no arms, and used with the "Service Brake Cross Shaft" brake system.

Part assembly number A-4520-B:



September 10, 1928, Release # 10155 (Supplement #1): Indicated that this was a "New number and was adopted".

March 15-18, 1929, Release # 12326: Changed to confirm with details.
Note: Those "details" were that the upper half with lug was obsoleted and was replaced with A-4514-B2 which made the assembly equal spacing.

March 25, 1929, Release # 12326 (Supplement # 1): Added suffix "R" to symbol number and specified for repairs only. Specified 1 req. A-4517-B2R Universal Joint Housing Cap—Outer Upper (upper cap **without** safety lug and with **unequally** spaced bolt holes). Changed number required to 1 instead of 2, A-4514-B2, Universal Joint Housing Cap—Outer Lower. **NOTE:** This assembly must be held for repairs as Upper and Lower caps are machined in pairs and are not serviced individually.

The ***upper*** part with the lug has on it the following known part numbers: A-4518-B with "Ford" script (Forging Design), or A-4517-B2 (Malleable Iron Design). ***There was mention of A-4517-B1, but not sure what the difference is between this part and A-4517-B2 unless A-4517-B1 was a Forging Design and with equally spaced holes (?).***

There is no known significant difference in appearance among these parts except for being either a Forging or Malleable Iron Design. However…the "forgings" (Forging Design) have raised part numbers on the part and the "safety lug", A-4519, is welded onto the part. The "castings" (Malleable Iron Design) have stamped part numbers on the part and the "safety lug" was formed with the part (not welded on).

A-4518-B (upper) with "Ford" script (Forging Design):

September 10, 1928, Release # 10155 (Supplement #1): Indicated that it was a "New number and was adopted".

September 19, 1928, Release # 10319: The thickness of the web between the bolt boss and the rear corner was changed thus making it the same thickness as the boss (See below). It also specified that the edge between the bolt boss and the rear corner be straight instead of curved. Was replaced byA-4517-B2.

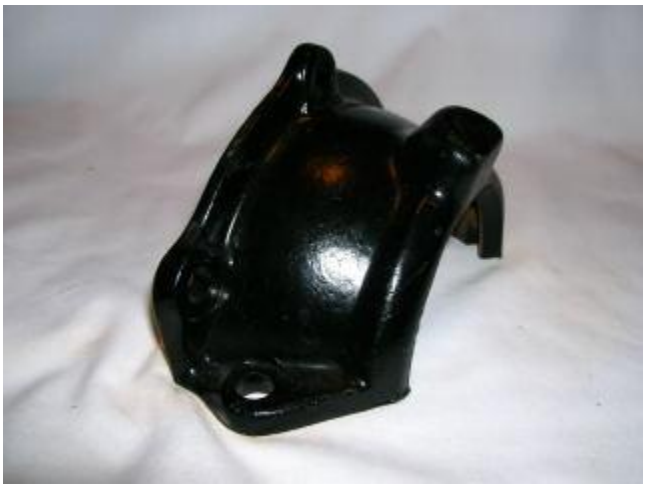
March 15-18, 1929, Release # 12326: This part became obsolete and was replaced by A-4514-B2 (Malleable Iron Design) **without** the safety lug and with **equally** spaced bolt holes.

A-4517-B2 (upper) (Malleable Iron Design) (casting):

September 19, 1928, Release # 10319: Indicated that it was a "New number, new alternate design to replace the forging design (A-4518-B) for full production, adopted".

March 15-18, 1929, Release # 12326: An "R" was added to the symbol number (making it A-4517-B2R) and specified for repairs. The safety lug was removed at this time. It was replaced by A-4514-B2.

NOTE: Some upper caps may be found without the safety lug, A-4519, welded on the part as seen in the picture below.



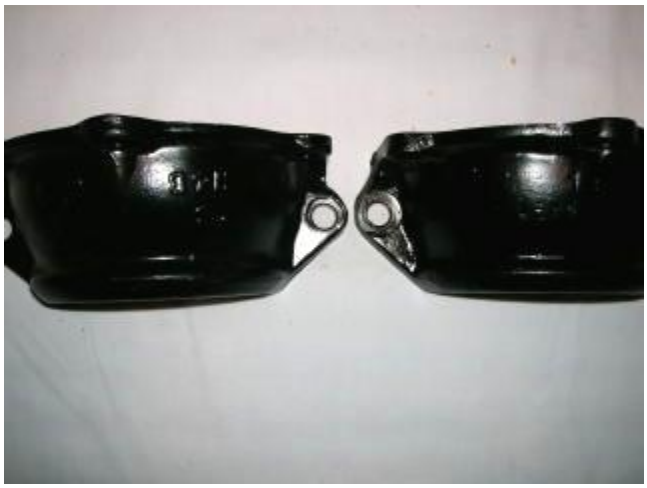
The ***lower*** part without lug has on it the following known part numbers: A-4514-B with "Ford" script, A-4514-B1 or A-4514-B2.

There is no known significant difference in appearance among these parts except for being either a Forging or Malleable Iron Design. However…the "forgings" (Forging Design) have raised part numbers on the part and the "castings" (Malleable Iron Design) have stamped part numbers on the part.

A-4514-B with "Ford script (Forging Design):

September 10, 1928, Release # 10155 (Supplement # 1): Indicated that it was a "New number and was adopted".

September 19, 1928, Release # 10319: Changed suffix of symbol number from “B” to “B1” (now A-4514-B1) and added a note indicating the Forging Design. The thickness of the web between the bolt boss and the rear corner was changed thus making it the same thickness as the boss. It also specified that the edge between the bolt boss and the rear corner be straight instead of curved.



PICTURE OF CORNERS

This shows the difference in the rear corners of the Universal joint housing cap—outer lower. A-4514-B being curved and A-4514-B2 being straight.

March 15-18, 1929, Release # 12326: This part, A-4514-B1, became “Obsolete” (and was replaced) by A-4514-B2 (Malleable Iron Design).

A-4514-B2 (Malleable Iron Design) (casting):

September 19, 1928, Release # 10319: Indicated that it was a “New number, new alternate design to replace the forging design (A-4514-B1) for full production, adopted”.

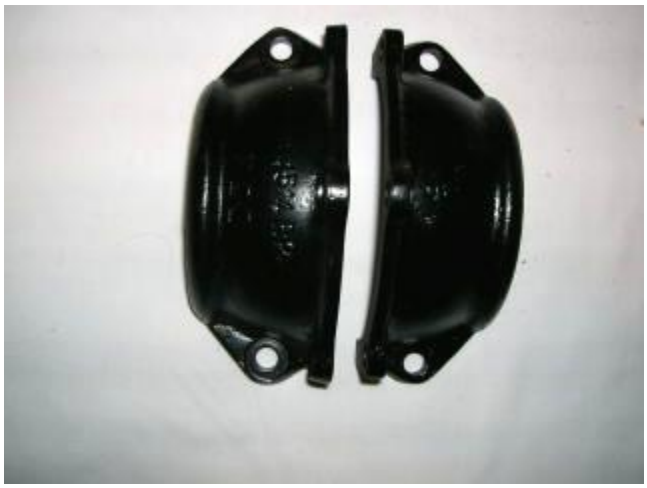
March 15-18, 1929, Release # 12326: Removed “Lower” from title (is now known as Universal joint housing cap—outer) and specified 2 req. instead of 1 req. for “A” chassis and 4 req. instead of 3 req. for AA chassis. This part, A-4514-B2, replaces A-4517-B1 and A-4517-B2 (Upper Cap with Safety Lug) Forging and Malleable Iron Designs, also A-4514-B1 (Forging Design).

May 13, 1929, Release # 12932: Changed number required on AA chassis from 4 to 2.

Used mid-October, 1928 to mid-March, 1929.

Type 4: **Equally** spaced holes, no lug, no arms, used with the “Service Brake Cross Shaft” brake system and Malleable Iron Design (casting).

Part assembly number: A-4520-C



Both halves, ***upper*** and ***lower***, are the same part number A-4514-B2.

Used from mid-March, 1929 through production.

All types of the Universal Joint Housing Cap—Outer have the same flange thickness.

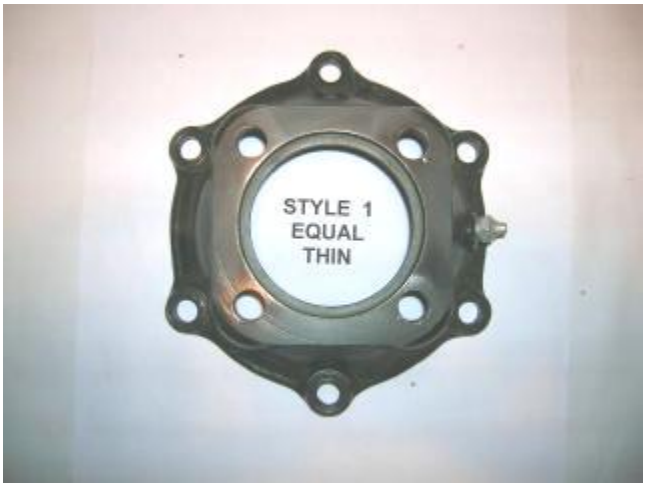
All caps and or housings were sprayed with moderate gloss black enamel.

A-7085: Transmission main shaft bearing retainer

There are five (5) known types of A-7085 Transmission main shaft bearing retainers:

Style 1: **Equally** spaced holes, **thin** flanges, large center hole, and Forging Design.

Started as part number A-7085.



No part numbers seen on original examples.

This Transmission main shaft bearing retainer has **equally** spaced holes, thin flanges, large center hole, "Ford" script, raised "hump like" center area on all four sides of retainer (unlike later retainers where they are flat), grease zerk is on the middle right side of the retainer. This feature, or placement of grease zerk, can be seen in the pictures on page 223, Fig. 454, and page 236, Fig. 484 of the Ford Service Bulletins. For detailed view's of the inside of the backside of the retainer, see page's 225, Fig. 460 and page 234, Fig. 475 of the Ford Service Bulletins. It can be seen that the retainer contains 4 small and 4 large quarter like circles (unlike the later retainers where the inside has an almost round appearance) which cause the "hump like" effect on the outside of the retainer.

The "Ford" trademark was also included on this part which are stamped on the outside or the inside.

No part number seen on example.

November 10, 1927, Release # 4447: A-7085 became A-7085-A.

Was specified for use on the first 1000 cars only.

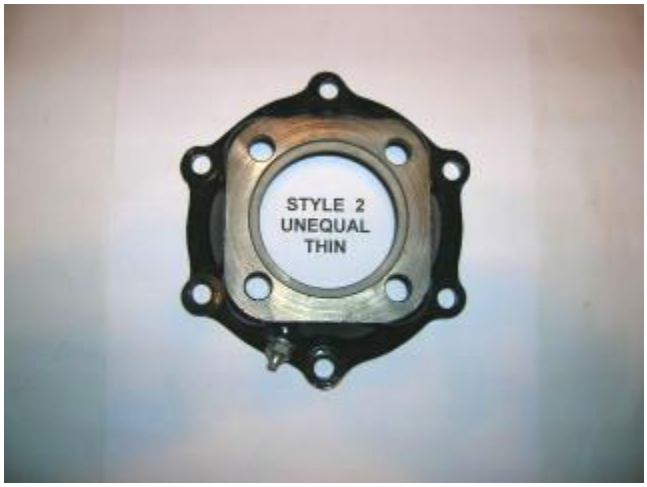
NOTE: The December 19, 1927, Release # 5926, indicated a change from "1000" cars to "3400" cars. The 3400th engine was stamped on December 21, 1927. All finished engines included a transmission along with the Transmission main shaft bearing retainer, which was also equally spaced. After "3400" cars, it changed to Type 2.

NOTE: This part was redesigned and reinstated on March 15, 1929 under Release # 12326 to part numbers A-7085-A/A-7085-A1. At this time it went from a “Forging Design” to a “Malleable Iron Design”, bolt holes returned to **equally** spaced but with “**thick**” flanges.

Used October to mid-December 1927.

Type 2: **Unequally** spaced holes, **thin** flanges, large center hole, and Forging Design.

Known samples are unmarked with no part number for the most part.



Was also known as part number A-7085-B.

This Transmission main shaft bearing retainer has **unequally** spaced holes, thin flanges, large center hole, “Ford” script on the early ones, raised “hump like” center area on all four sides of retainer (unlike later retainers where they are flat), grease zerk is on the bottom as with later retainers. This was a clockwise rotation change of about 60 degrese from the right to the left. For detailed view’s of the inside of the backside of the retainer, see page’s 225, Fig. 460 and page 234, Fig. 475 of the Ford Service Bulletins. It can be seen that the retainer contains 4 small and 4 large quarter like circles (unlike the later retainers where the inside has an almost round appearance) which cause the “hump like” effect on the outside of the retainer.

November 10, 1927, Release # 4447: A-7085-B was released as a “new number, new design and adopted. It differed from the “A” design (A-7085-A) only in position of bolt holes”.

Was to be used **after** the first 1000 cars.

NOTE: The December 19, 1927, Release # 5926, indicated a change from “1000” cars to “3400” cars.

March 28, 1928, Release # 7970: The “Ford” trademark was removed for the convenience in exporting.

April 27, 1928, Release # 8461: The radius at the top of the six lugs changed shape and were reduced from 3/8 to 5/16.

October 9, 1928, Release # 10529: A-7085-B became “Obsolete”.

Used from mid-December, 1927 through mid-October, 1928.

THIN FLANGED VS. THICK FLANGED
TRANSMISSION MAIN SHAFT BEARING RETAINERS

For some unknown reason, Ford changed the thickness of the six bolt hole flanges on the Transmission main shaft bearing retainers. At the start of production, the flanges were about ¼ inch in thickness. By October, 1928, Ford went to thicker flanges which made them about 5/16 inch thick. An increase of 1/16 inch in thickness. This also changed the bolt lengths which were used to connect the Universal joint housing caps—inner and outer by 1/16th of an inch as seen in the data above.

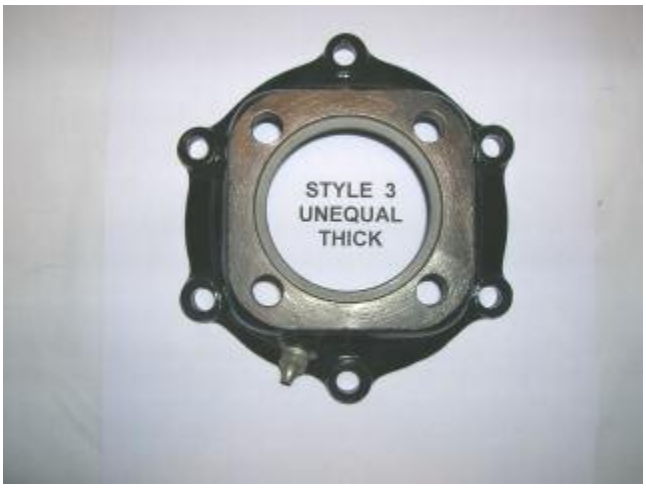
One thought for the change in thickness was the change from forged designed parts to the malleable iron designed parts. The malleable iron designed parts were made cheaper and were not as strong as the forged parts thus the thicker flanges for that extra strength.

The Universal joint housing caps—inner and outer flanges, remained the same thickness throughout production.

PICTURE OF THIN AND THICK FLANGES
This shows the difference between the thin and thick flanges of the Transmission main shaft bearing retainer.

Type 3: **Unequally** spaced holes, **thick** flanges, large center hole, and Forging Design.

Has A-7085-C on inside of part.



The “hump like” effect, which was evident on the outside of Type 1 and 2 above, was eliminated (on known examples) thus leaving the outside of the retainer flat and the inside of the retainer with a round appearance which continued through production.

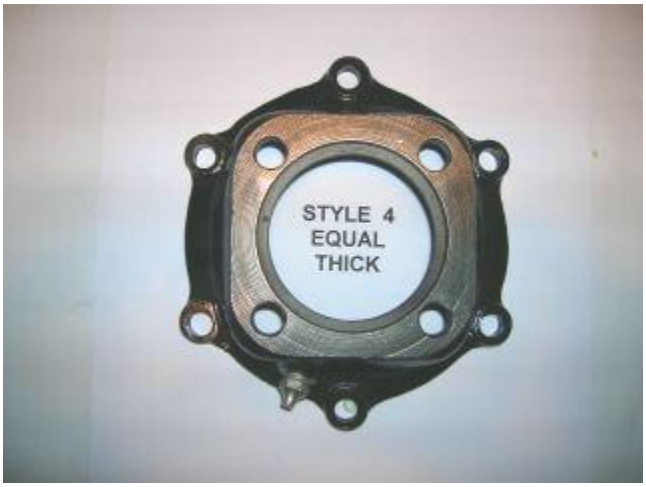
October 9, 1928, Release # 10529: A-7085-C was released as a “new number and was adopted” and replaced A-7085-B.

March 15-18, 1929, Release # 12326: A-7085-C became “Obsolete”.

Used mid-October, 1928 to mid-March, 1929.

Type 4: **Equally** spaced holes, **thick** flanges, large center hole, and Malleable Iron Design (casting).

Has A-7085-A on inside of part.



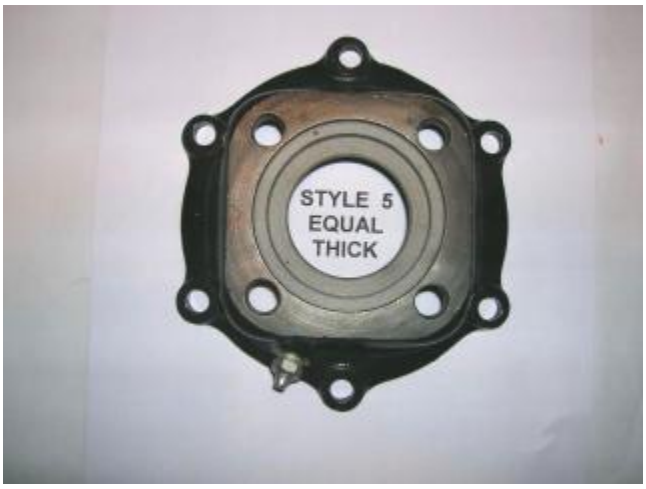
Some have been found with the part number of A-7085-A1 on them.

March 15-18, 1929, Release # 12326: A-7085-C, was redesigned and reinstated or replaced by A-7085-A/A-7085-A1 which was identical to A-7085-C except with **equally** spaced bolt holes. By being redesigned it meant that the part went from a “Forging” to a “Malleable Iron Design” (casting). By being reinstated it meant that the part went from **unequally** spaced holes back to **equally** spaced holes AND that the part number, A-7085-A, carried forward as with the first generation Transmission Main Shaft Bearing Retainer. The only difference is the thicker flanges and being of the Malleable Iron Design (casting).

Used from mid-March, 1929 through late June, 1929.

Type 5: **Equally** spaced holes, **thick** flanges, small center hole, and Malleable Iron Design (casting).

Has A-7085-A1 on inside of part.



June 22, 1929, Release # 13297: A-7085-A1, had a flange added at the center which changed the diameter of the bearing retainer hole from 2-1/2 to 1-27/32.

Used from late June, 1929 through production.

This is the only known part of this assembly where the flanges increased in thickness of 1/16 inch thus requiring a bolt length change from A-20931 to A-20953. The thin flanges were about ¼ inch in thickness where the later thicker flange was about 5/16 inch thick.

All retainers were painted Ford Engine Green.

Grease zerk was unfinished or cadmium plated.

Bolts used with the above assemblies:

A-20931: Universal joint housing cap to transmission bolt—6 used
3/8—24 S.A.E. x 1-5/32 hex head bolt (W/cotter hole)

This was used with the "thin" flanged style, A-7085 and A-7085-B,
Transmission main shaft bearing retainer.

Used from start of production to early October, 1928.

A-20953: Universal joint housing cap to transmission bolt—6 used
3/8—24 x 1-7/32 hex head bolt (W/cotter hole)

This was used with the "thick" flanged style, A-7085-C, A, A1,
Transmission main shaft bearing retainer.

Used from early October, 1928 through production.