HOW TO PROPERLY SET UP 1928-1948 FoMoCo AND COLUMBIA REAR AXLE ASSEMBLIES USING THE GASKETS AS SHIMS.

1. CENTER SECTION.
   A. Remove pinion from actual center section with which rear end will be built.

   or

   B. Use another "empty" center section. Using a 3" to 4" micrometer, "mike" the width of this empty center section and "mike" the actual center section with which the rear end will ultimately be assembled. Compensation for any difference in these widths will have to be made later.

2. ESTABLISH THE CORRECT "TOTAL" GASKET THICKNESS.

   This gives the proper support or preload on the carrier bearings and will later be split between the two sides of the center section.

   A. SINGLE SPEED REAR END:
      Using empty center section, bolt passenger-side axle housing to center section with no gasket and tighten all bolts. Assemble axles, ring gear, carrier mechanism, etc. and insert through center section. Using some arbitrary amount of gasket thickness (say a .010" & a .006" or 2 .010" 's) bolt the driver's side axle housing in place and tighten all bolts.

   or

   B. COLUMBIA REAR END:
      In a Columbia application the center section is "sandwiched" between the ring gear and the planetary assembly so the procedure differs from that for a single speed rear end, but the principle is the same.
      Slip the Columbia side axle shaft through the complete planetary assembly, then install the Columbia spider cross with spider gears and brass washers. Hold this up to the passenger's side of the center section and bolt the ring gear and driver's side axle to it using the 8 special Columbia ring gear cap screws. Be sure the thrust washer is between the axle and the ring gear and that the "ears" on the thrust washer are properly engaged in the correct slots.
      It is now arbitrary which side you choose to work from to determine the "total" gasket thickness. Personally, I prefer to bolt the Columbia carrier casting assembly to the center section with no gaskets and work from the driver's side as in the instructions for the single speed rear end (see above).

then

C. Reach through the pinion-bearing bore in the center section with your fingers and attempt to pull the ring gear around by hand. NOTE: Use a screwdriver or pry bar to move the ring gear the first quarter turn each time in order to get the bearing rollers to "seat."
WARNING: In the event that you have too much gasket thickness at this stage, the ring gear will spin or at least coast and there is a very real danger of pinching your fingers badly between the ring gear and the center section. BE CAREFUL: Don't attempt to pull the ring gear with your fingers until you have checked it first with a screwdriver or pry bar.
When you have the correct "total" gasket thickness, you should be able to pull the ring gear around one full revolution (one or two teeth at a time) with a substantial amount of effort using only your fingers. If you can't pull the ring gear around by hand, you must increase the "total" gasket thickness used. If the ring gear turns too easily or spins, you must reduce the "total" gasket thickness. Remove and replace the driver's side axle housing as many times as necessary to change the "total" gasket thickness until you can just barely "tug" the ring gear around by hand one full revolution after moving it the first quarter revolution with a prying tool each time.

Just for the purpose of some examples later, we will arbitrarily say that the correct "total" derived by this method turned out to be .026".

D. DISSEMBLE ALL PARTS FROM CENTER SECTION>

3. FINAL ASSEMBLY (or splitting the "total" gasket thickness between the 2 sides of the center section).

A. INSTALL PINION AND PINION BEARINGS IN CENTER SECTION and preload

or

Switch the "real" center section with pinion in it for the empty center section. You will have to adjust the total gasket thickness arrived at earlier by any difference in the widths of the center sections as measured and recorded in step 1-A.

B. ESTABLISH BACK LASH BETWEEN RING GEAR AND PINION. (NOTE: With genuine Ford ring and pinions and genuine Timken bearings the gasket between the driver's side the center section has always worked out between
→ .006" and .010" in my experience). The passenger's side must be assembled first. Subtract .010" from the "total" arrived at earlier and put the balance

on the passenger's side of the center section and assemble (e.g.: .026" total minus .010" equals .016"; put a .010" and a .006" on the passenger's side).

After assembling passenger's side housing to center section put the .010" gasket on the driver's side and assemble. Grab the pinion by its splines and rock back and forth with wrist action. Listen and "feel" for backlash between ring gear and pinion. If you get no backlash with a .010" gasket on the driver's side, something is wrong: CALL ME.

Now do it all over again but this time plan to use a .006" gasket on the driver's side. Subtract .006" from your "total" and put the balance on the passenger's side and assemble (e.g.: .026" total minus .006" equals .020"; put 2 .010" gaskets on the passenger's side). Now assemble the driver's side using the .006" gasket. Again grab the pinion by its splines and "rock" it back and forth. Listen and feel for backlash again; there should be less than before. If you get the distinct sensation that backlash still exists between the ring and pinion, then this "split-out" is acceptable for final assembly. If there is no longer discernable backlash, you will have to go back to the .010" gasket on the driver's side and the lesser amount of gasket(s) on the passenger's side.

As a final step, the housings should be removed from both sides one last time and gasket sealer (I recommend and sell ("Gas-Ga-Cinch") applied to all mating surfaces and between all gaskets. While you are at it coat the threads of all the bolts ("cap screws" if you prefer) with gasket sealer and "wrench" things together for the last time. Your rear assembly should be ideally set-up and between the use of my superior gaskets and the gasket sealer should never leak the first drop!

NOTES: Once you have determined the correct "total" gasket thickness, this "total" should be maintained within plus or minus .002" when dividing the total between the two sides of the center section. If in the examples previously given, you had replaced the .010" gasket on the driver's side with a .006" gasket without a compensating change on the passenger's side, you not only would not get the proper backlash*, you would have overloaded ("over-squeezed") the carrier bearings which would lead to excessive wear and premature bearing failure.

Conversely if you make changes that add to the "total" thickness by more than the plus or minus limits just stated, you remove the preload on the carrier bearings

HOW TO PROPERLY SET UP 1928-1940 FoMoCo AND COLUMBIA REAR AXLE ASSEMBLIES USING THE GASKETS AS SHIMS.

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   or

   B. Use another "empty" center section. Using a 3" to 4" micrometer, "mike" the width of this empty center section and "mike" the actual center section with which the rear end will ultimately be assembled. Compensation for any difference in these widths will have to be made later.

2. ESTABLISH THE CORRECT "TOTAL" GASKET THICKNESS.

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   In a Columbia application the center section is "sandwiched" between the ring gear and the planetary assembly so the procedure differs from that for a single speed rear end, but the principle is the same. Slip the Columbia side axle shaft through the complete planetary assembly, then install the Columbia spider cross with spider gears and brass washers. Hold this up to the passenger's side of the center section and bolt the ring gear and driver's side axle to it using the 8 special Columbia ring gear cap screws. Be sure the thrust washer is between the axle and the ring gear and that the "ears" on the thrust washer are properly engaged in the correct slots. It is now arbitrary which side you choose to work from to determine the "total" gasket thickness. Personally, I prefer to bolt the Columbia carrier casting assembly to the center section with no gaskets and work from the driver's side as in the instructions for the single speed rear end (see above).

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   C. Reach through the pinion-bearing bore in the center section with your fingers and attempt to pull the ring gear around by hand. NOTE: Use a screwdriver or pry bar to move the ring gear the first quarter turn each time in order to get the bearing rollers to "seat." **WARNING:** In the event that you have too much gasket thickness at this stage, the ring gear will spin or at least

coast and there is a very real danger of pinching your fingers badly between the ring gear and the center section. BE CAREFUL: Don't attempt to pull the ring gear with your fingers until you have checked it first with a screwdriver or pry bar. When you have the correct "total" gasket thickness, you should be able to pull the ring gear around one full revolution (one or two teeth at a time) with a substantial amount of effort using only your fingers. If you can't pull the ring gear around by hand, you must increase the "total" gasket thickness used. If the ring gear turns too easily or spins, you must reduce the "total" gasket thickness. Remove and replace the driver's side axle housing as many times as necessary to change the "total" gasket thickness until you can just barely "tug" the ring gear around by hand one full revolution after moving it the first quarter revolution with a prying tool each time.

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D. DISASSEMBLE ALL PARTS FROM CENTER SECTION

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A. INSTALL PINION AND PINION BEARINGS IN CENTER SECTION AND PRELOAD

or

Switch the "real" center section with pinion in it for the empty center section. You will have to adjust the total gasket thickness arrived at earlier by any difference in the widths of the center sections as measured and recorded in step 1-A.

B. ESTABLISH BACK LASH BETWEEN RING GEAR AND PINION.

(NOTE: With genuine Ford ring and pinions and genuine Timken bearings the gasket between the driver's side the center section has always worked out between .006" and .010" in my experience). The passenger's side must be assembled first. Subtract .010" from the "total" arrived at earlier and put the balance on the passenger's side of the center section and assemble (e.g.: .026" total minus .010" equals .016"; put a .010" and a .006" on the passenger's side).

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Now do it all over again but this time plan to use a .006" gasket on the driver's side. Subtract .006" from your "total" and put the balance on the passenger's side and assemble (e.g.: .026" total minus .006" equals .020"; put 2 .010" gaskets on the

passenger's side). Now assemble the driver's side using the .006" gasket. Again grab the pinion by its splines and "rock" it back and forth. Listen and feel for backlash again; there should be less than before. If you get the distinct sensation that backlash still exists between the ring and pinion, then this "split-out" is acceptable for final assembly. If there is no longer discernable backlash, you will have to go back to the .010" gasket on the driver's side and the lesser amount of gasket(s) on the passenger's side.

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Conversely if you make changes that add to the "total" thickness by more than the plus or minus limits just stated, you remove the preload on the carrier bearings required to hold the ring gear and other rotating parts stable. This leads to excessive wear between the ring and pinion and in extreme cases can cause actual tooth breakage!

* CALL ME IF YOU WANT TO KNOW WHY THIS IS.