Understanding ORTHAPEDIC STRUCTURE *when setting up* OVERDRIVE SELECTIVE *and* INTERMEDIATE SHAFT *End Play* in the Dodge RE Units

by Randall Schroeder

Surgeons are faced daily with time restraints in the operating room (shop) that can produce problems if overlooked. To complicate these issues, sometimes the most basic procedures get over looked or streamlined to where they create to repeat lubrication and durability issues. Let's look at an example: A patient (Truck) comes into the surgery center with over 200K hard towing miles; a routine old age failure in seals has caused it to need reconstructive surgery (rebuild). During tear down and inspection, the tail housing components (OD Section) looked good. Since none of the hard components were replaced, a decision to "save time" was made by the surgeon not to check for proper tolerances in the intermediate shaft and OD selective shims.

Is this the right build procedure?

(The thing we do know is, "everything seemed to look good").

Bad Move: Over time, accelerations and decelerations, especially when towing, typically cause stress, movement and wear on the entire gear train, includes the intermediate shaft. The areas that wear are typically on the top splined seat of the OD planetary (figure 1); the splined seating surface of the intermediate shaft, where the selective spacer rides (figure 2); and even the spacer itself.

There is only one way to assure that the overall gear train end play is within specs, and the lineup of lube oil return, which enters through the rear cooler line and passes through the intermediate shaft, is set properly. This requires the surgeon to take the few moments and measure the intermediate shaft shim properly, so that during the final assembly, the overall gear train end play (measured at the input shaft) is set to specification.

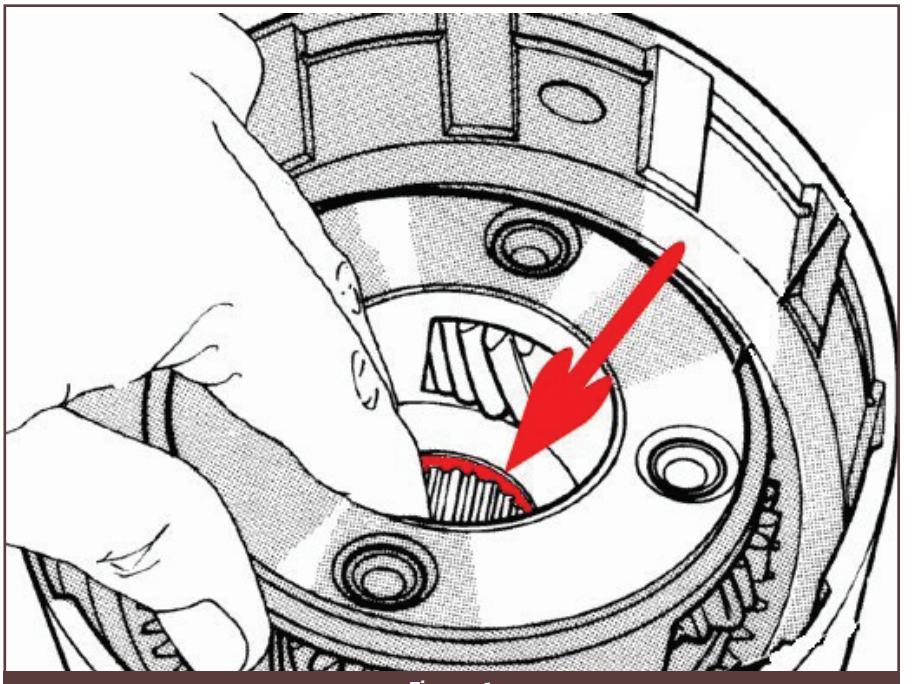

Figure 1

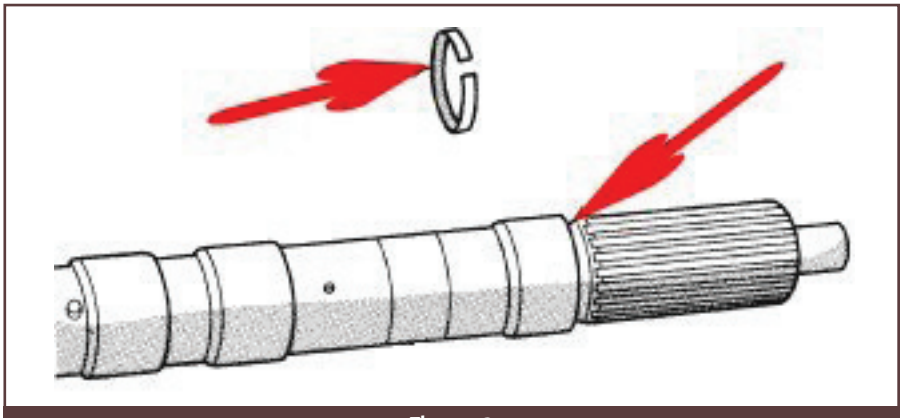

Figure 2

When the first 42-46RH transmissions was introduced, the fact is, proven durability and quality of the TF6 and TF8 transmissions simply had a transplanted overdrive unit installed into the tail/adapter housing. To allow the direct clutch and overdrive clutch assemblies in the output housing to be separated

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from the 3-speed front gearbox, they designed a split output shaft.

Even though the intermediate and output shafts are split; the overall gear train measurement remained the same as the earlier, single output shaft (from the front pump bolted to the case with front and rear drums installed, to the overall selective shim for gear train end play).

In this issue of Doctor, Doctor, we're going to look at proper endplay adjustment in the tail housing of the Chrysler RH/RE transmissions. Some doctors have developed alternate ways to set up the OD selective shim, but the factory settings are so simple that it hardly seems worthwhile.

Setting up the two selectives components in the tail housing requires two special tools:

- Miller 6311 - straight edge
- Miller 6312 – gauge bar

The straight edge (Miller tool 6311) is used for both settings (OD Selective Spacer and Intermediate Selective shim). The gauge bar (Miller tool 6312) is only used for the Intermediate Selective shim.

Let's keep this simple: The straight edge, tool 6311 is 0.500" thick. Knowing this, you can actually use any straight edge (figure 3) to do the job, as long as you know that you may have to add or subtract from your measurement based on the thickness of your straight edge.

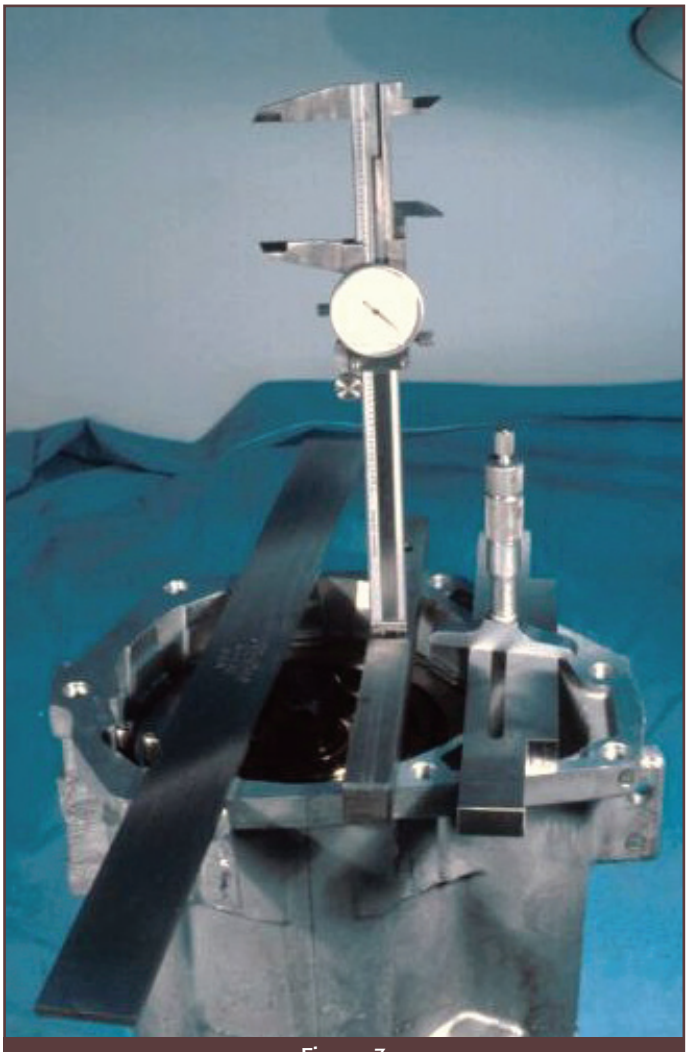

Figure 3

For example, the straight edge we all bought back in the 70's to check the Ford AOD overall end play and intermediate clutch clearance, and for the Ford ATX transaxle to check gear train end play was a 0.700" thick straight edge. You can still use this straight edge, as long as you subtract 0.200" from your measurement before comparing it to the Chrysler OE specs.

The gauge bar, Miller tool 6312 is 5.500" long. Your best bet is to use the factory tool here but, there are alternatives if you're creative.

When assembling the direct clutch assembly, you'll also need an alignment tool to align the splines of the OD planetary with the splines of the OD roller clutch inner race. These have to line up in order to insert the intermediate shaft during assembly.

If you have an extra intermediate shaft lying around, you can cut a tool to help you assemble and measure for the selective shim. Simply, leave a shim on the shaft, measure from the shim up and cut the shaft to an exact length of 5 ½ inches long (remember the gauge bar is 5.500" long). Once we have the measurement all we have to do is look at the selective charts for proper shim selection. There are 4 different shims available (figure 4). (Wow, this sounds too simple!) If the straight edge happened to be narrower than the 0.500", add the difference to your measurement. It is much easier if you actually use the proper tools so that there is no adding or subtracting from your actual measurement to determine the correct shim setting.

Be sure you get an accurate reading, there shouldn't be any weight on the output shaft once you have the tail housing assembled (figure 5). The

Figure 4

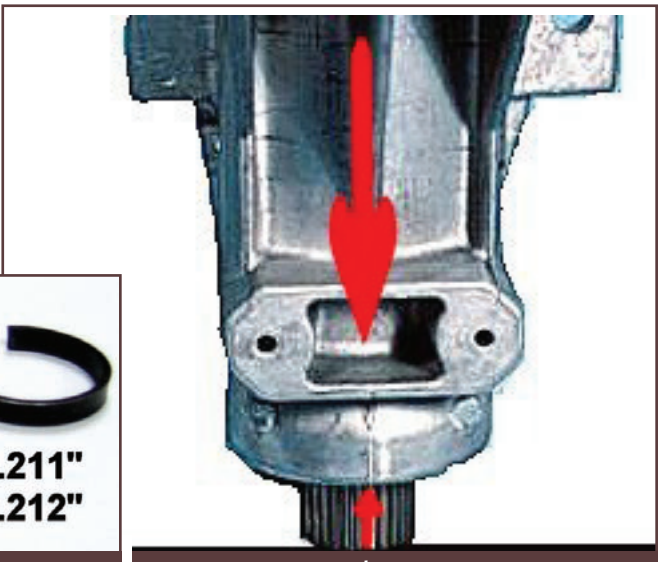

Figure 5

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weight of the assembly needs to ride on the roller bearing snap ring that is used to retain the output shaft bearing in the housing (figure 6). Over time, the snap ring groove widens with movement of the gear train and effects settings, since it is in the aluminum housing.

That's why you should use a holding fixture while assembling the unit; it keeps all of the weight off the output shaft, to make sure you're getting a proper measurement. If you do not have a holding fixture, a simple alternative is to use an old drive shell from a TF8 (figure 7) with the sun gear removed (be careful balancing the housing on the shell).

Now, lets look how simple setting this endplay can be:

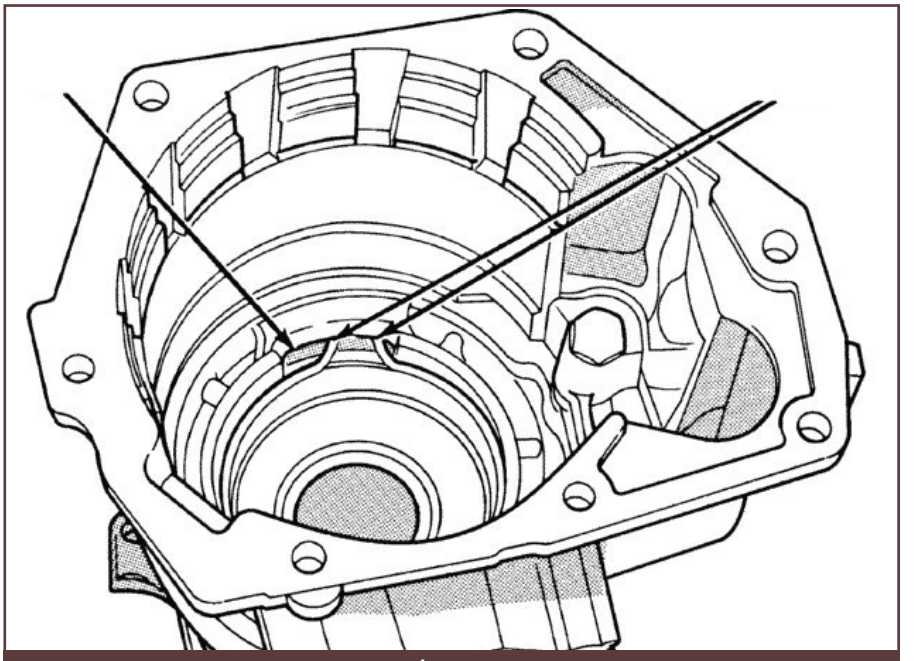

Figure 6

Setting Up the Intermediate Shaft Selective

1. Balance the tail/adapter housing on your holding fixture so there is no weight on the output shaft.
2. Insert the gauge bar Miller Tool 6312 (5.500" long) or equivalent through the direct clutch sun gear tube and rest it on top of the overdrive planetary.
3. Tap it lightly to make sure it is seated against the planet carrier.
4. Lay the straight edge (Miller Tool 6311 (0.500" thick) across the flat surface of the tail/adapter housing.
5. Measure from the top of the straight edge to the top of the gauge bar using a caliper or depth micrometer (figure 8).

If you do not have a holding fixture, a simple alternative is to use an old drive shell from a TF8 with the sun gear removed (be careful balancing the housing on the shell).

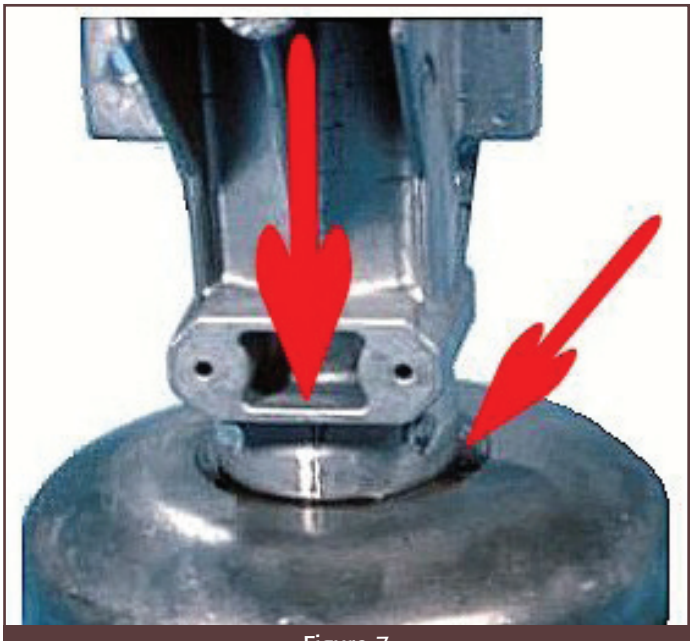

Figure 7

Figure 8

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6. Compare your measurement to the selective chart (figure 9).
7. Install the correct shim onto the intermediate shaft and set it aside for assembly.

That's all there is to it; no adding and subtracting, it's that simple with the correct tools. If you happened to use an alternative straight edge, remember do the math!

Setting Up the Overdrive Selective Shim

You can usually save time by making both measurements at the same time, since you already have the straightedge on the housing. To set up the overdrive selective shim:

1. Remove the bearing from the top surface of the direct clutch housing (figure 10).
2. Take four (4) measurements around the surface that the bearing will be sitting on (12-3-6-9 o'clock positions).
3. Add the four measurements together and divide the total by four (4) to get an average setting. If needed, use a calculator.
4. Check the selective shim chart (figure 11) and install the proper shim onto the overdrive piston.
5. Reinstall the bearing onto the direct drum.

Again, if you are using any straight edge other than the factory tool (0.500"), you will have to add or subtract to from your measurement before checking the chart.

With both these settings set aside and done, reassemble the unit and make sure that the overall gear train end play is set to specification. As surgeons (builders) we don't want to overlook something so simple that we cause or build into it, a failure of OD shift qualities and lubrication failures.

I read a quote recently, and it made a ton of sense: "The best way not to fail is to be absolutely positive that when you do it, you're going to do it right". That says a lot, and truth be told, it's simple to do. Until next time, keep those transmissions in good working health.

The Doctor

Intermediate Shaft End Play Spacer Selection

End Play Measurement (In.)	Spacer Thickness (In.)	Manufacture Part #
0.7339" – 0.7505"	0.158" – 0.159"	4431 916
0.7506" – 0.7657"	0.175" – 0.176"	4431 917
0.7676" – 0.7855"	0.193" – 0.194"	4431 918
0.7856" – 0.8011"	0.211" – 0.212"	4431 919

Figure 9

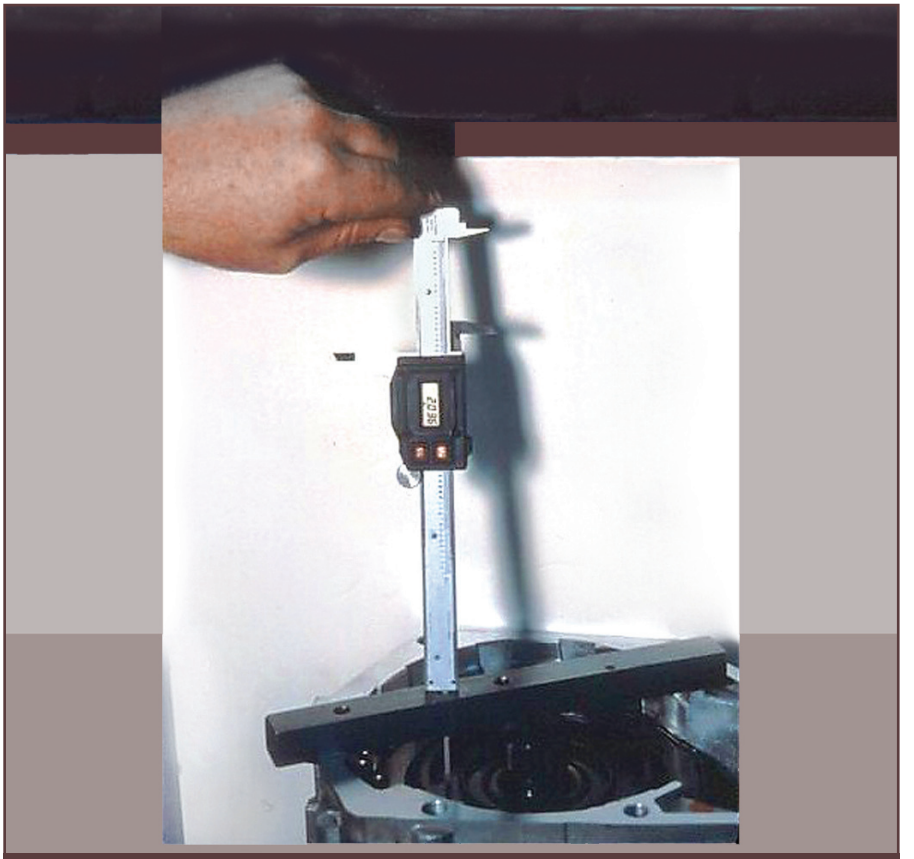
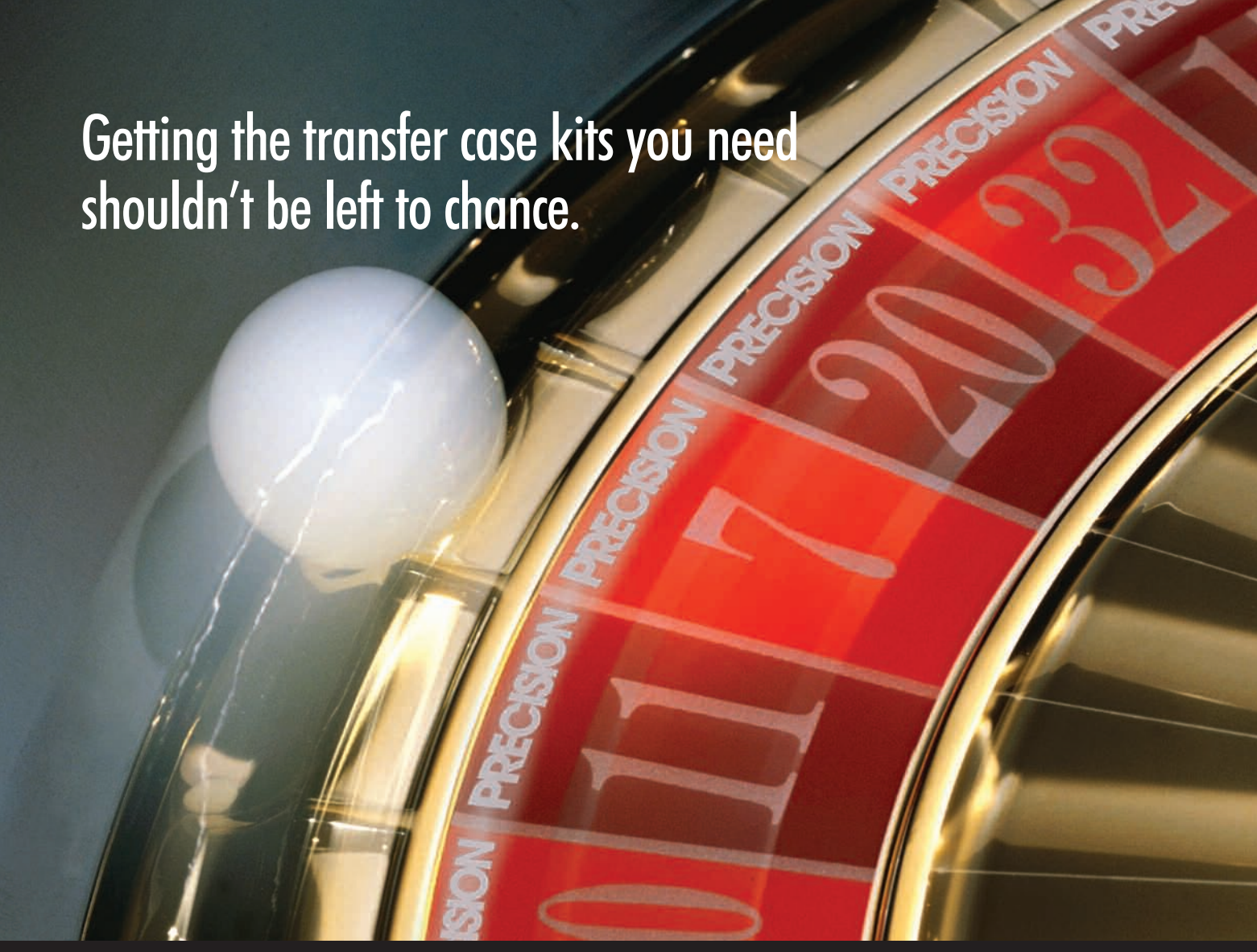


Figure 10

Overdrive Thrust Plate (Selective Spacers)

End Play Measurement (In.)	Spacer Thickness (In.)	Manufacture Part #
1.7500" – 1.7649"	0.108" – 0.110"	4431 730
0.7650" – 0.7799"	0.123" – 0.125"	4431 585
0.7800" – 0.7949"	0.138" – 0.140"	4431 731
0.7950" – 0.8099"	0.153" – 0.155"	4431 586
0.8100" – 0.8249"	0.168" – 0.170"	4431 732
0.8250" – 0.8399"	0.183" – 0.185"	4431 587
0.8400" – 0.8549"	0.198" – 0.200"	4431 733
0.8550" – 0.8699"	0.213" – 0.215"	4431 588
0.8700" – 0.8849"	0.228" – 0.230"	4431 734
0.8850" – 0.8999"	0.243" – 0.245"	4431 590

Figure 11



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