Countries:	AUSTRALIA, BAHAMAS, BOLIVIA, BRAZIL, BELIZE, CANADA, CHILE, TAIWAN, COLOMBIA, COSTA RICA, DOMINICAN REPUBLIC, ECUADOR, EL SALVADOR, GUAM, GUATEMALA, GUYANA, HAITI, HONDURAS, JAMAICA, KOREA, SOUTH KOREA, MEXICO, ARUBA, NEW ZEALAND, NICARAGUA, PANAMA, PERU, PUERTO RICO, RUSSIA, SOUTH AFRICA, TRINIDAD AND TOBAGO, UNITED STATES, URUGUAY, VENEZUELA, Curaçao	**Document ID:**	IK1400005
Availability:	ISIS, Bus ISIS, FleetISIS, IsSIR	**Revision:**	29
Major System:	REAR AXLE	**Created:**	5/16/2008
Current Language:	English	**Last Modified:**	8/25/2025
Other Languages:	Français, Español, Portuguese,	**Author:**	David Horner
Viewed:	37412		

Less Info

Hide Details Coding Information

Copy Link	Copy Relative Link	Bookmark	Add to Favorites	Print	Provide Feedback	Helpful	Not Helpful
		View My Bookmarks				1769	2133

Title: Driveline Information Center and Troubleshooting Procedures

Applies To: All Vehicles

CHANGE LOG

Dealers: Please refer to the change log text box below for recent changes to this article:

05/22/25- added new images and new ride height tool.
9/09/2024 - Added info about Allison Calc replacement.
08/25/2020 - Added seat and plate information for Hendrickson HAS with Air Disc Brakes (ADB), specified parts for Henrickson HAS with Drum Brakes
12/23/2019 - No content change. Verified links for worksheets on step 5 are all working.
08/20/2019 - Updated author for feedback purposes
12/17/2018 - Added IK0300071 link to measure non-IROS air suspension procedure
11/13/2018 - Updated ride height adjustment procedure
11/07/2018 - Updated article owner
03/16/2018 - Updated coding
05/24/2016 - Updated to LRN

DESCRIPTION

This article provides information to properly check driveline angles and driveline runout, and how to use that information to properly repair the vehicle and bring the driveline into specification. The information is to assist in resolving a vibration complaint that may be caused by the driveline. This article does not address other possible vibration issues, such as vibrations caused by the engine.

- For engine vibrations, cab vibrations, or mirror shake issues, please refer to IK0300008 - Vibration Troubleshooting

SYMPTOMS

- Vibration, unexplained power divider or transmission failures, poor u-joint life, poor carrier bearing life, and noises

SPECIAL TOOLS / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
Digital Protractor	ZTSE4329		
Dial Indicator		Obtain Locally	

INSPECTING AND MEASURING THE DRIVELINE

WARNING! To prevent property damage, personal injury, and / or death, park vehicle on a hard, flat surface, turn the engine off, set the parking brake, and install wheel chocks to prevent the vehicle from moving in either direction.

WARNING! To prevent property damage, personal injury, and / or death, if the vehicle must be raised, do not work under the vehicle supported only by jacks. Jacks can slip or fall over.

WARNING! To prevent personal injury and / or death, always wear safe eye protection when performing vehicle maintenance.

WARNING! To prevent property damage, personal injury, and / or death, keep flames or sparks away from vehicle and do not smoke while servicing the vehicle's batteries. Batteries expel explosive gases.

WARNING! To prevent property damage, personal injury, and / or death, remove the ground cable from the negative terminal of the battery box before disconnecting any electrical components. Always connect the ground cable last.

Troubleshooting

1. Check and record the air ride height setting.

   - If the air ride is not adjusted properly, then readjust to the proper specifications and road test to determine if the problem has now been fixed.
   - Refer to the Truck Manual for proper ride height measurement procedures and ride height settings.
   - For Non-IROS air suspension instructions, if not already in the truck technician manual, please follow: IK0300071 - Non-IROS Rear Air Suspension Ride Height Specifications and Adjustment Procedures (includes CV) to properly adjust the ride height:
   - Steer axle tires must be chocked and the parking brake released when air suspension is raised and lowered for ride height setting and driveline angle measurements.
   - Ride height check for most air suspensions should be measured with this new tool (April 2025) LINK

   If ride height is higher specification:

   - Do not bend height control system brackets or rods to adjust suspension height.
   - Loosen lever arm bolt that holds arm to height control valve.
   - Pivot lever arm down to exhaust air from suspension, lowering chassis to some point below the correct air spring height.
   - Add air until axle travel reaches the proper value per the truck manual ride height recommendations.
   - When the correct axle travel value has been achieved, retighten the lever arm bolt.

   If ride height is less than specification:

   - Do not bend height control system brackets or rods to adjust suspension height
   - Loosen lever arm bolt that holds arm to height control valve.
   - Push the lever arm up to add air to the suspension, raising the chassis, until axle travel reaches the proper value per the truck manual ride height recommendations.
   - When the correct axle travel value has been achieved, retighten the lever arm bolt.

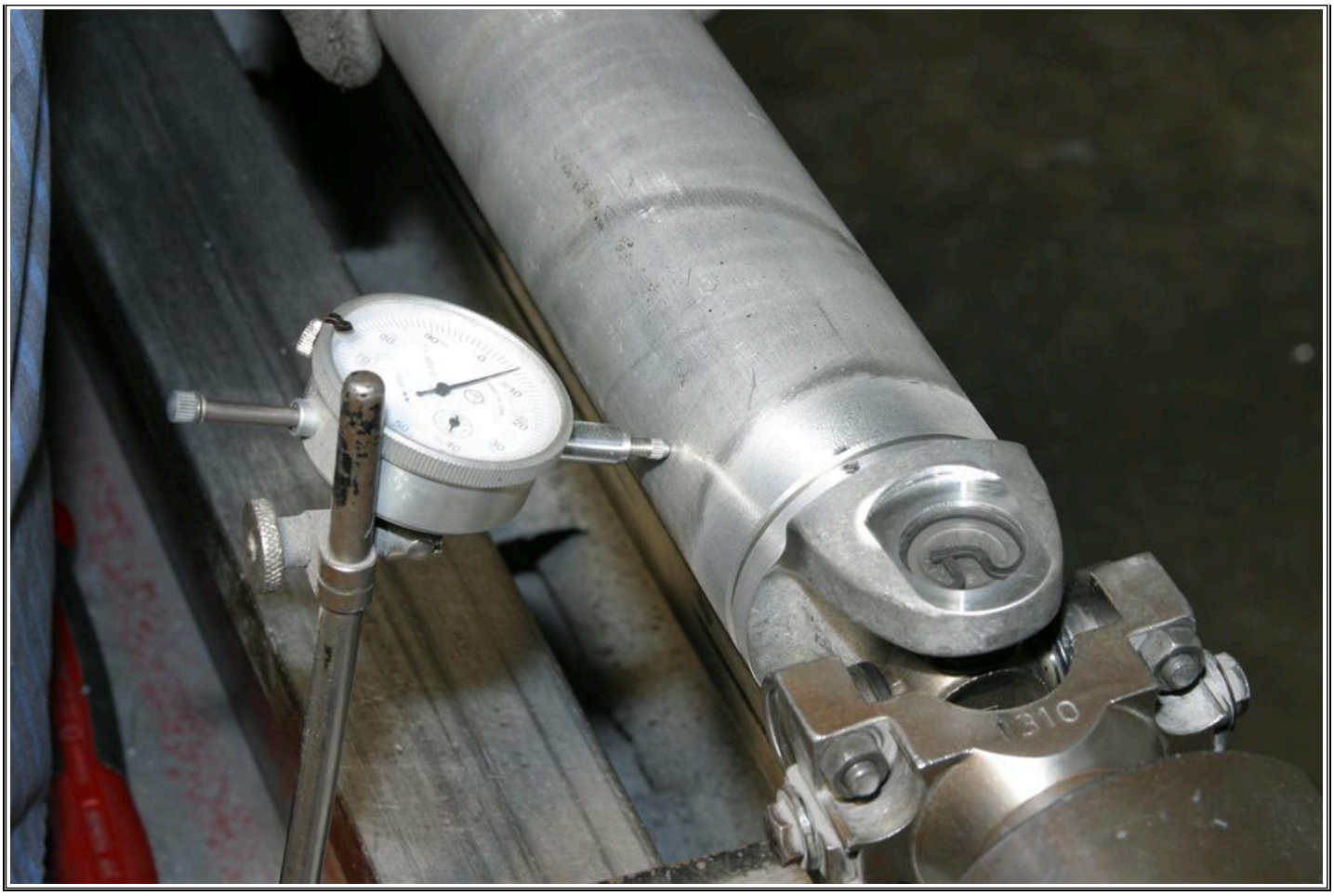
2. Visually inspect the driveline for damage

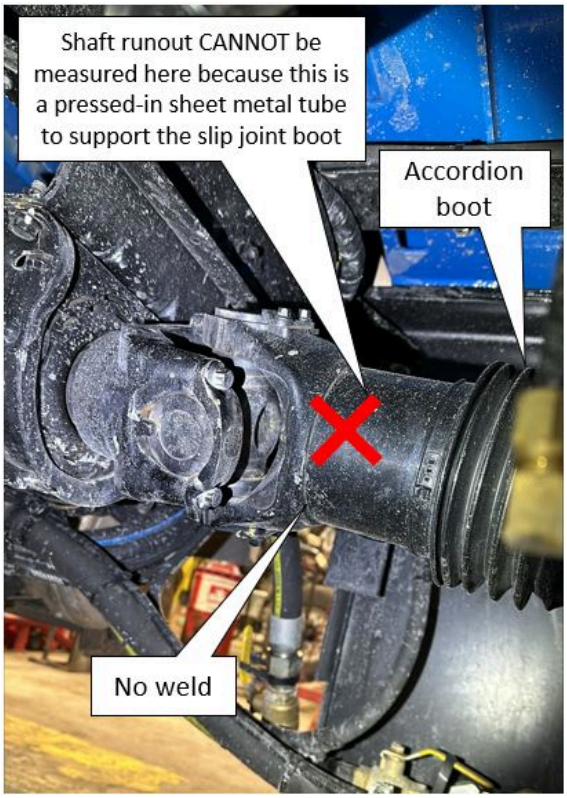
   - Inspect for dents or missing weights, undercoating, and incorrect installation
   - Inspect u-joints and yokes for excessive play and damage. It is important to do this prior to greasing the joints.
   - Ensure the u-joint bearing cups are properly seated in the yokes and that the caps are not spinning.

3. Measure driveshaft runout in three locations on each shaft.

   - 3" from each end of and the center of the tube.
   - Interaxle shafts can be measured in the center only.
   - For accurate measurements, the paint should be removed first.
   - Mark the "high" spots at each location on the tube.
   - The ends should be less than 0.020", ideally below 0.010", and the center should be less than 0.025", ideally below 0.015".
   - If the measurements exceed the limits at either end, the u-joint at the end of the shaft with the high measurement should be removed from the yoke and reinstalled in the yoke after rotating either the yoke or the shaft 180 degrees.
   - Remeasure the runouts and note the location of the high spots.
   - If the runout is still excessive, check to see if the high spot moved on the shaft approximately 180 degrees or if it stayed in the same spot.
   - Moving of the high spot indicates the yoke is out of round, not the shaft. The yoke or the axle pinion shaft/transmission shaft could be the cause.
   - Although you may have a driveline shop rebalance and/or straighten a shaft, if a vibration remains, it is important to again document the runout and verify it is below the previously mentioned "ideal" limits.
   - Click here for a printable worksheet.

Figure 1 - Measuring Driveline Runout





4. Inspect the amount of movement in the spline section of the driveshaft
    - The dial or digital indicator base must be installed on one side of the splines (on the prop shaft), and the needle on the other side of the splines.
    - If the dial indicator base is mounted on a solid surface, erroneous measurements will result.
    - This measurement should read less than 0.015"

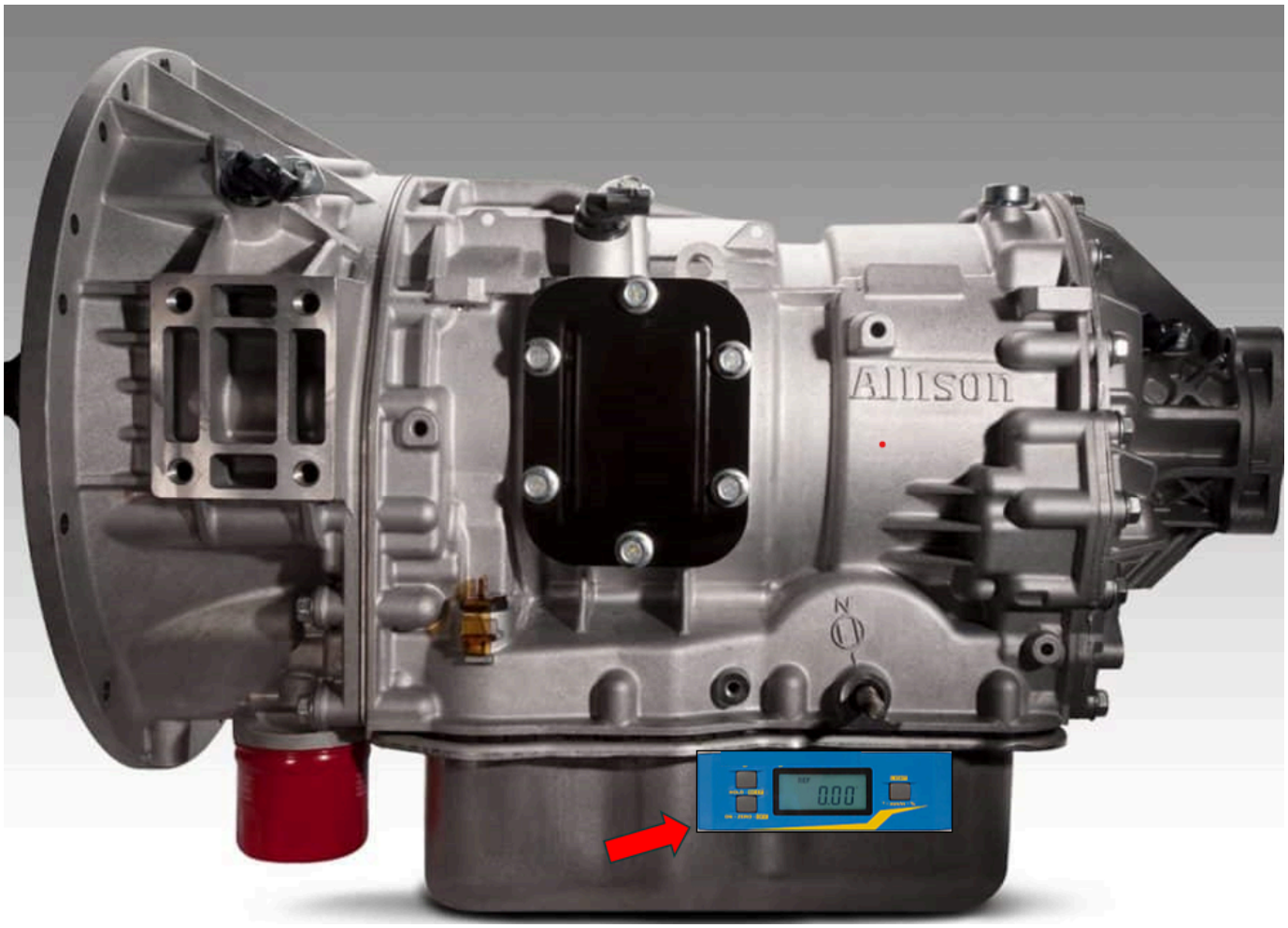
- Trans, T-Case, and axle yoke runout should not exceed .003" (minus any bearing play that exists)

5. Mark every yoke and driveline section before removal so it can be reinstalled in the same location
6. If the problem still exists, then you will need to obtain driveline angle measurements.
   - Choose the appropriate form for the chassis configuration you are working on.

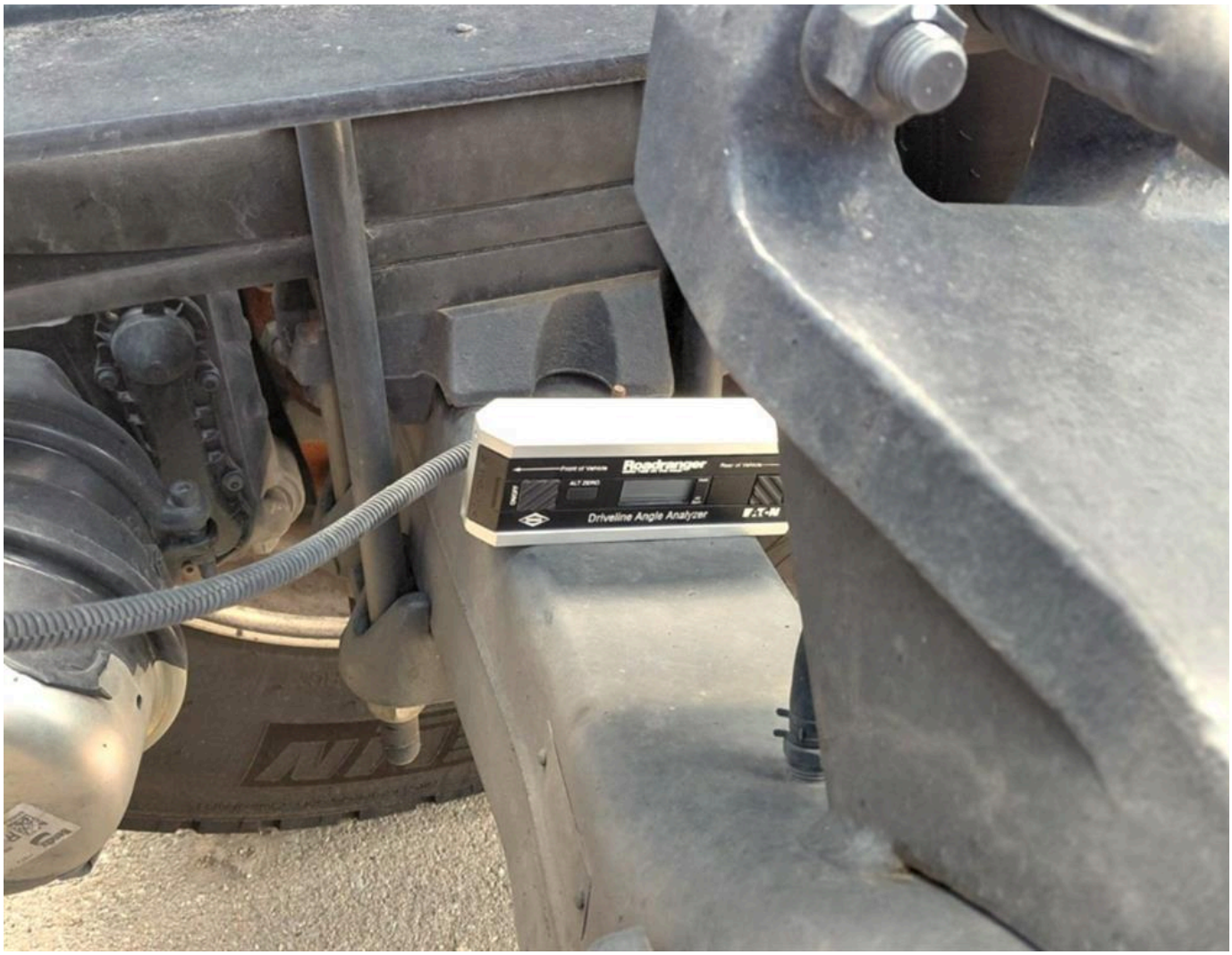
4x2	6x4	4x4 / 6x6	4x2 / 6x4 with Aux Section
1 Piece Driveline	1 Piece Main Driveline	4x4	2 Piece Driveline with 2 Axles
2 Piece Driveline	2 Piece Main Driveline	4x4 with 2 Piece Rear Driveline	3 Piece Driveline with 2 axles
3 Piece Driveline	3 Piece Main Driveline	6x6	
4 Piece Driveline	4 Piece Main Driveline	6X6 with 3 piece rear driveline	
		4X4 or 6X6 with 2 piece to steer axle	

Helpful hints for accurate driveline and angle measuring:

- To properly check your digital inclinometer (angle meter), use a two-foot level on a workbench; level the level, then set the protractor on level and press zero, then turn your protractor around 180 degrees to face away from you and recheck to make sure it still reads zero. The two readings should be within 0.1 degrees of each other. This test is performed to check the accuracy of the digital inclinometer.
- Once you have tested the accuracy of the tool, place the digital inclinometer on the frame rail and zero it. This is done so you always have the same reference. If you zero the protractor at any other location, you would need to verify that the frame angle is the same as the original recorded angle before any adjustments could be made.
- Take all readings from the same surface of the digital inclinometer and keep it pointed in the same direction for every measurement. The example photos show this clearly. The orientation of the writing (do not turn the tool upside down from when you started), and the same end of the digital inclinometer always facing the front of the vehicle.
- Double-check transmission angle measurement, which can be obtained from the u-joint cap on the output yoke, oil pan bolts, and sometimes a flat surface on the head of the engine.

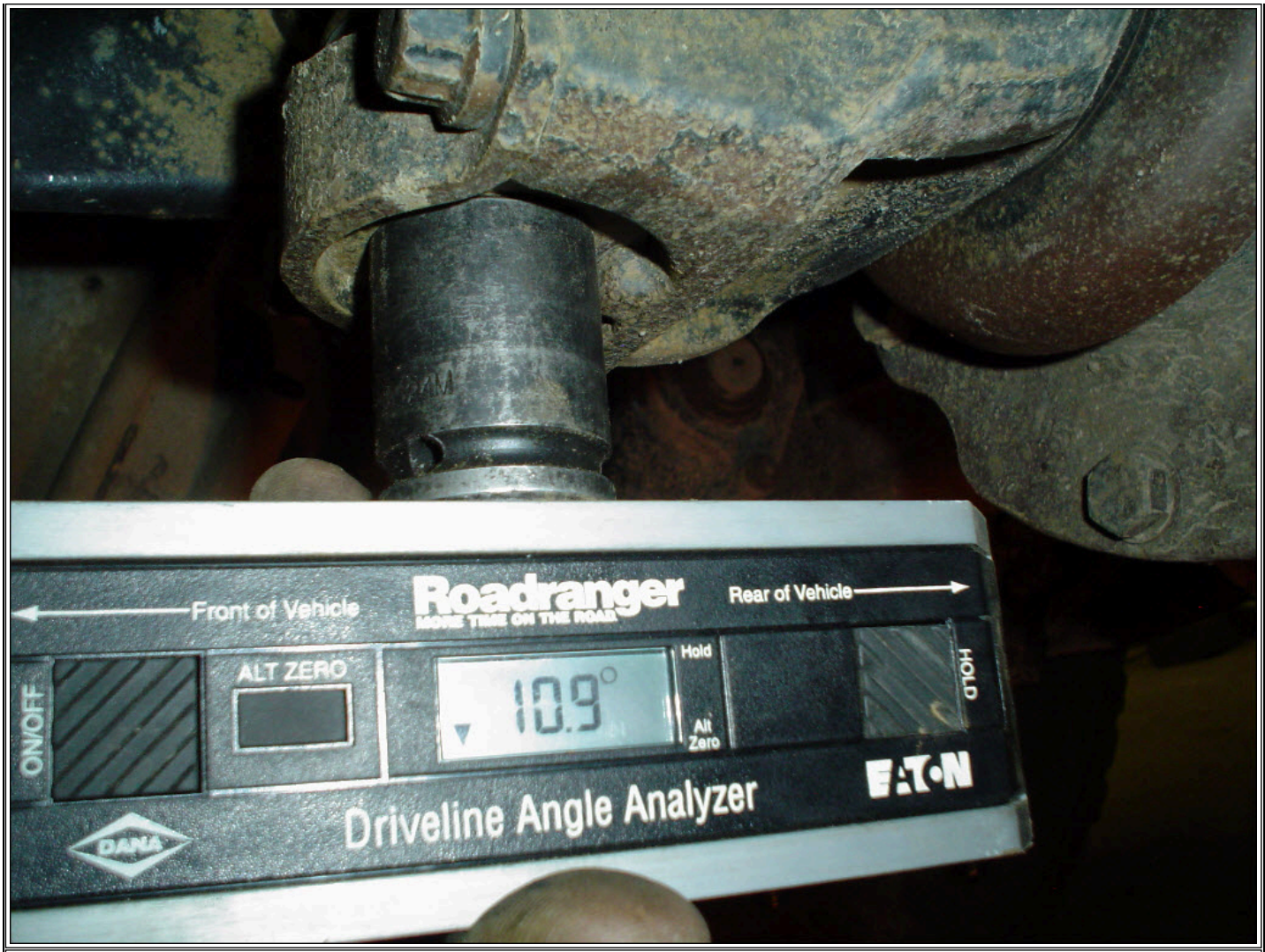


- Be very diligent to get a good reading off the rear end housing. The surface of the cup needs to be properly cleaned to ensure you get an accurate measurement. Use a socket on the u-joint cap. The caps will not all be vertical when the unit is pulled into the work bay. Removing the wheel chocks and rolling the truck forward or backward until the u-joint is vertical is the most acceptable method to obtain an accurate reading.
- In some cases the axle tube/housing (near the u-bolts) has a flat surface that is parallel to the pinion. Below is an example of a pinion angle measurement taken on the axle tube.
  - DO NOT use this method on STEER axles on 4x4 or 6x6 vehicles as it is innacurate on these axles.

- 

- Due to the short tube length of drive shafts between the rear drive axles, it is highly recommended to use the v-block that comes with the Road Ranger driveline angle analyzer kit to keep the digital clinometer from contacting the welds at the end of the tube.
- Be aware that the ARROW in the LCD points towards 0°. The angles in Figure 2 and Figure 3 are positive angles.
  - Arrow pointing down is a positive angle. (Front side of the component is higher than the rear).
  - Arrow pointing up is a negative angle. (Front side of the component is lower than the rear).
  - Example: The transmission will typically have a positive angle.
  - Example: The prop shaft to the steer axle in a 4x4 will typically have a negative angle.

Figure 2 - Measuring Pinion Angle



- This is a positive reading. The arrow points towards 0°. This means the front of the component is higher than the rear.
  - The arrow would point up for a negative reading.
- Use caution with the digital protractor to ensure you do not hit the "Hold" or "Alt Zero" buttons while taking your readings.
- Be diligent to ensure the tool has the same orientation when taking your readings.

Figure 3 - Measuring the Intermediate Shaft

- This is a positive reading. The arrow points towards 0°. This means the front of the component is higher than the rear.
  - The arrow would point up for a negative reading.
- Use caution with the digital protractor to ensure you do not hit the "Hold" or "Alt Zero" buttons while taking your readings.
- Be diligent to ensure the tool has the same orientation when taking your readings.

Filling out the Driveline Angle Worksheet

6. Measure the frame rake. Place a 3-6 foot straightedge on the ground parallel to the frame & between the front (steer) and rear axles. Place angle meter on top of the staight edge. Zero the tool. Next find a clean flat surface on the frame. Verify level is on and the arrow on the level labeled facing toward the front of the vehicle is facing toward the front of the vehicle, and the arrow on the level labeled facing toward the rear is actually facing toward the rear. Once this is verified and you have your frame rake angle, Next hit the zero button on the level. This will allow the level to set the frame rake for the calculation of drive line measurements.
   - Zeroing the digital protractor on the frame will allow you to always have the same reference point to zero if multiple measurements are required. (Even if the truck is moved between each set of measurements).
7. Measure the transmission angle. This will rarely need to be changed; a normal measurement for transmission angle is between 3 and 4 degrees. To take the transmission angle, you will have to get measurements off the transmission pan rail (not bottom of the pan) or engine block surface, and sometimes a boss on the bell housing. Take multiple measurements to make sure you are getting the correct reading.
8. Measure the first prop shaft. Take measurements in the middle of the prop shaft, taking several measurements at each component to get as accurate angles as possible. Depending on the model and drive line setup take the remaining drive line angles at each prop shaft until the differential or the transfer case depending on the setup of the truck. Always remember to keep protractor, or level pointed in the same direction on each component measured.
9. To measure the transfer case angle- use the socket on u-joit cap method.
10. Measure the interaxle driveline angle. There is an attachment in Road Ranger tooling kit used for interaxle shaft due to the prop shaft being so short it is difficult to get good measurement. (Refer to Figure 3 above).
11. Measure the rear differential using the same procedure as forward differential. (see above).

Correcting Driveline Angles

The driveline angles will need to be checked using Eaton Driveline Angle Analyzer Software (DAA) or Meritor's "Driveline Angle Analysis" ,or Allison iScaan. Its recommended use Allison iScaan if the vehicle is equipped with an Allison transmission. It is located inside Allison HUB and all Allison dealers have access to it.

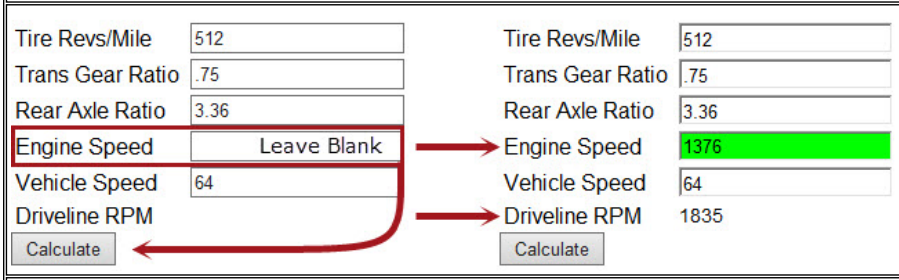
You will need the following information:

- Tire Revs per Mile
- Transmission Top Gear Ratio
- Rear Axle Ratio
- Max Vehicle Speed

Input this information into IK2600160 - Vehicle Speed Calculator.

- Leave "Engine Speed" blank.
- Hit "Calculate" to find the Max Engine Speed in Top Gear (Refer to Figure 4)

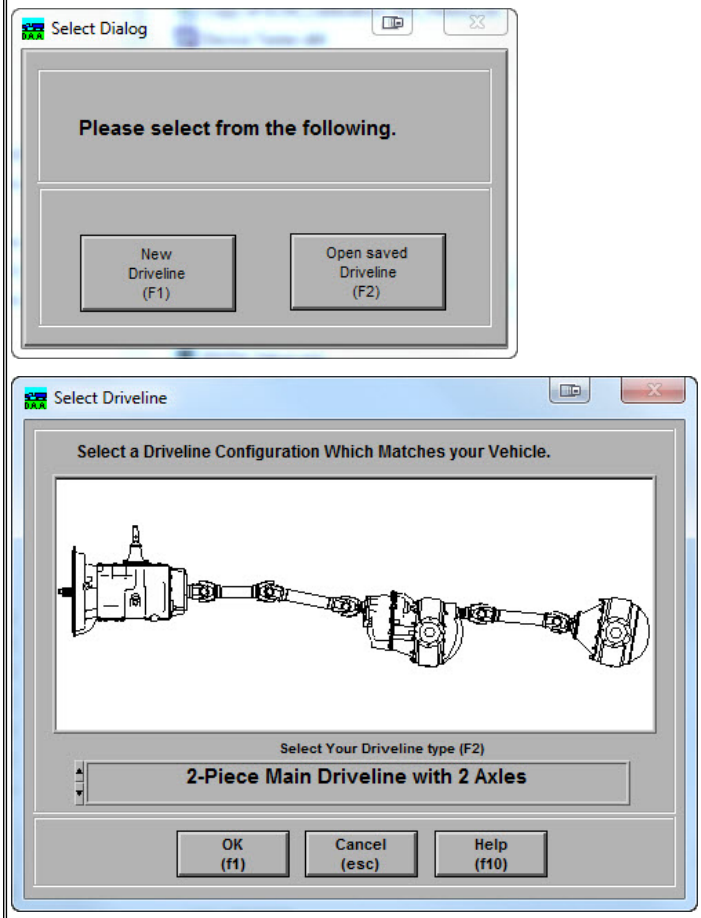
Figure 4 - Vehicle Speed Calculator Example



- This is an example only. You need the information you gathered from NED for accurate calculations.

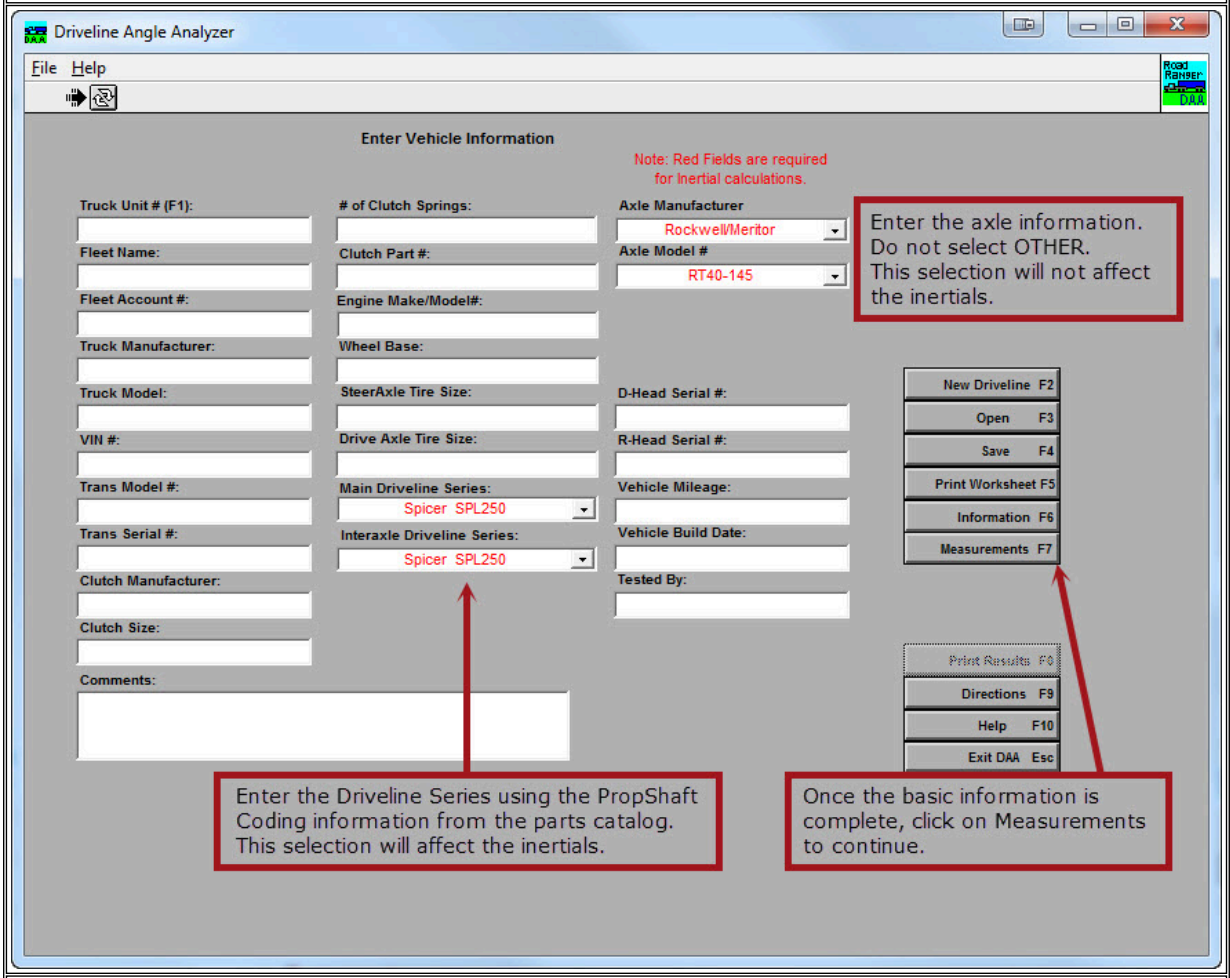
Using Eaton Driveline Angle Analyzer (DAA)

Figure 5 - Open Eaton DAA and Select Driveline Configuration



- Open Eaton Driveline Angle Analyzer, Select New Driveline, Scroll through the Driveline Types until you find the configuration that matches the vehicle you are working on.

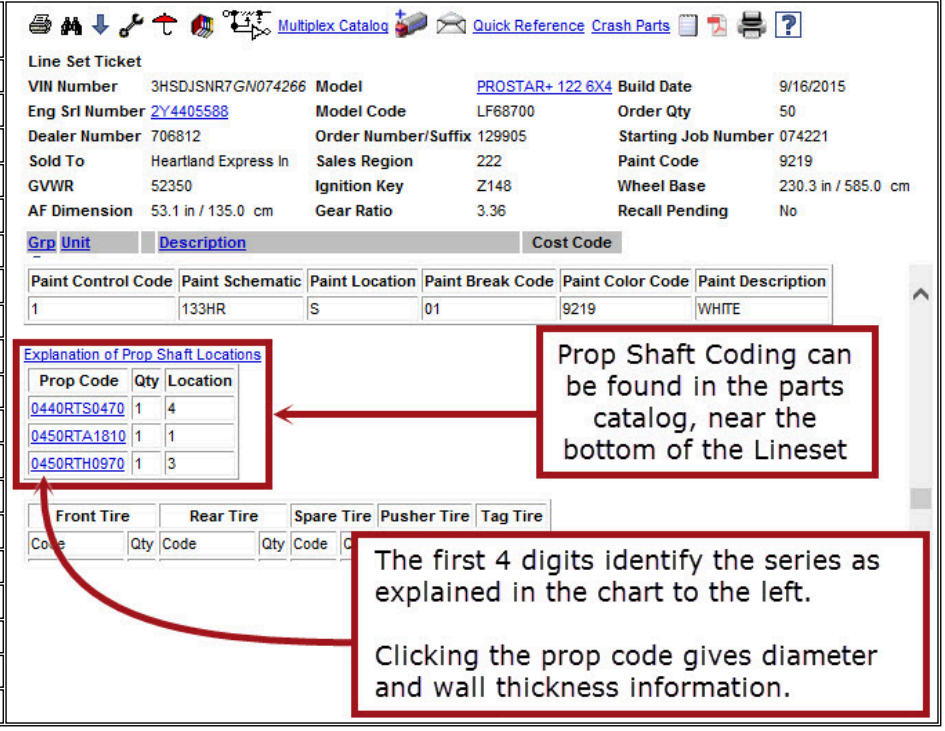
Figure 6 - Enter Driveline and Axle Information



- Enter the basic information for the Driveline and Axle.
- Choosing the incorrect driveline series will affect the inertials when the measurements are inputted.
- Choosing the axle does not affect the inertials. You must not choose "other" or Corrective Mode will not work properly.

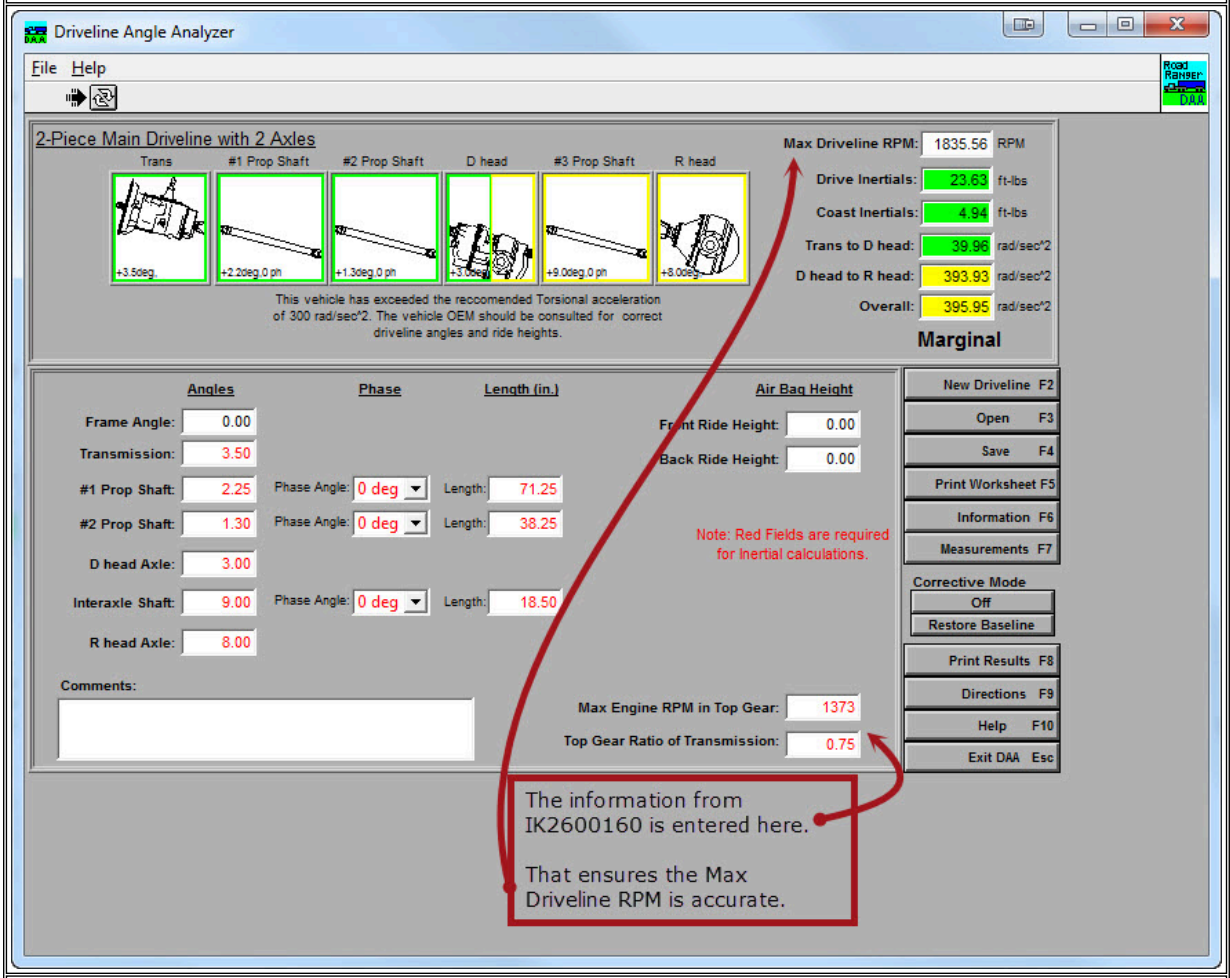
Prop Shaft Information

English	Metric	Series Number
209	409	SPL55
207	407	SPL70
210	410	SPL100
210	410	SPL100
214	414	SPL140
217	417	SPL170
225	425	SPL250
235	435	SPL350
259	459	SPL90
249	449	1480
255	455	1550
259	459	1590
259	459	1590
260	426	1610
270	427	1710
276	428	1760
281	429	1810
	440	RPL20
	450	RPL25



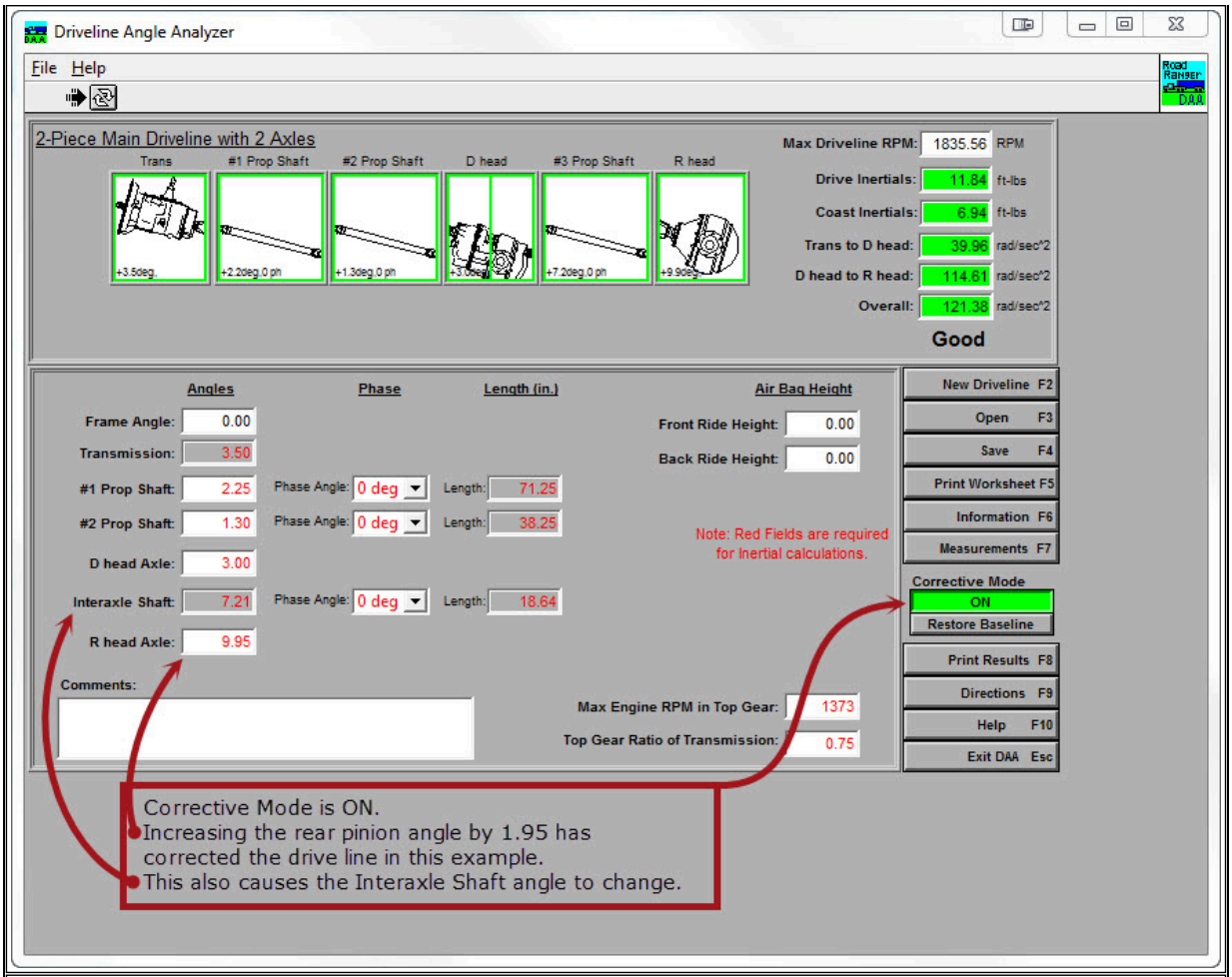
Many Dana driveline Prop Codes can be converted to Dana a part number here

Figure 7 - Entering the Measurements Taken on Vehicle



- Enter the measurements you took on the vehicle and see if any adjustment is required.

Figure 8 - Entering Corrective Mode to Make Adjustments

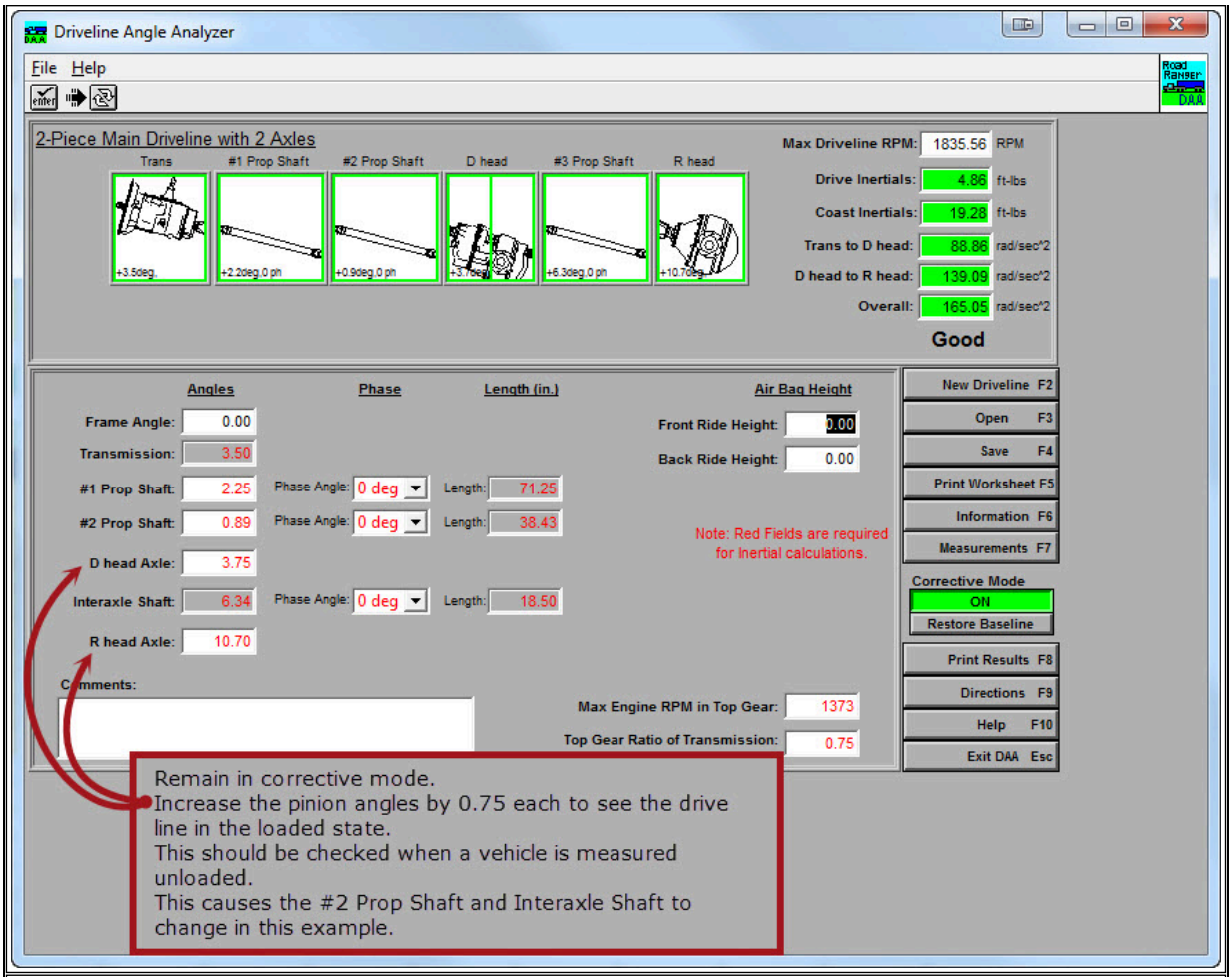


- Enter Corrective Mode.
- Attempt to correct the drive line angles with the least amount of changes.
- Correcting by adjusting the prop shafts is less labor intensive than changing seats and plates.
- If the seats and plates need to be changed to make the correction, you must use the chart below and calculate the difference in pinion angle from the measured pinion angle.
  - Example:
  - 8° was measured on truck. Truck had 3548298C1 Seats installed.
  - Truck is unloaded, 7.58° on the chart. Changing to a 3548299C1 Seat shows 9.53° unloaded.
  - That would give you 1.95° of pinion angle change (9.53 minus 7.58).
  - The 8° measured plus 1.95° increase is 9.95° and brings the driveline into specification.
  - You must also check that when the vehicle is loaded, the angles will stay within specification. (Refer to Figure 9).

NOTE:

0 working angles are not acceptable. Eaton DAA will not catch this error.

Figure 9 - Using Corrective Mode to Check Loaded Angles (If Required)

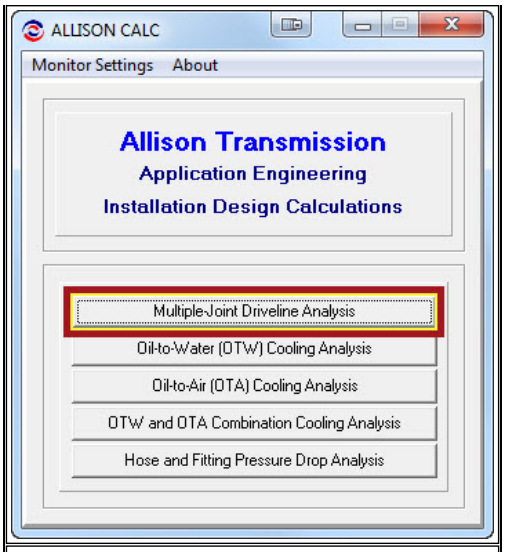


- Verify the angles remain in specification when loaded. (If Required)
  - Example Continued:
  - Front Drive Axle Seats installed: 3548297C1. Pinion angle will increase 0.75° when loaded. (4.45 minus 3.70)
  - Rear Drive Axle Seats now installed: 3548299C1. Pinion angle will increase 0.75° when loaded (10.28 minus 9.53)
  - Increase both pinion angles in corrective mode to see the reaction.
  - In this example the drive line is within specification when loaded.
  - Every seat is 0.75° difference between loaded and unloaded.

Using Allison Calc (Calc has been replaced by Allison iScaan and is only available tthrough an Allison HUB account)

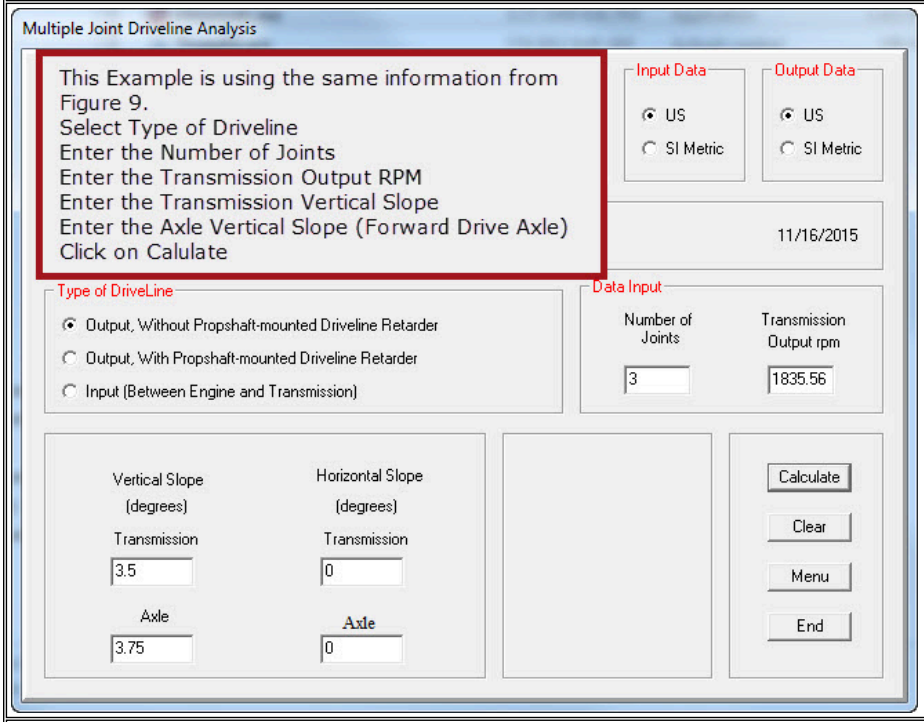
- Allison Calc will only check one single axle at a time.
- For 6x4, 4x4, 6x6 or Drop Box applications you will need to run multiple analysis.
- Refer to the information below which uses the 6x4 from Figure 9 as the example.
- If a drive line needs to be adjusted it is easier to run the adjustments in Eaton DAA, then check using Allison Calc before making any changes to the vehicle.

Figure 10 - Open Allison Calc



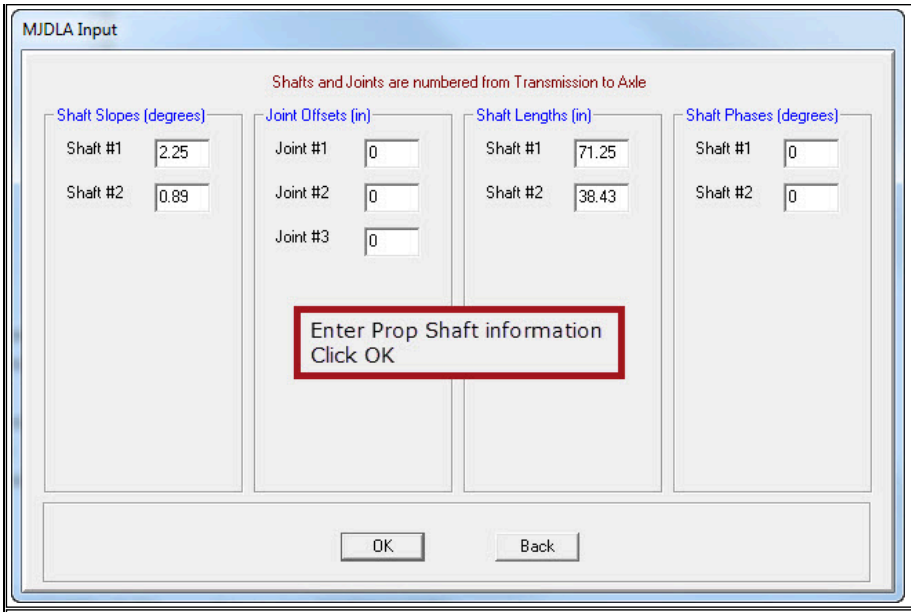
- Open Allison Calc
- Select Multiple-Joint Driveline Analysis

Figure 11 - Transmission and Axle Information



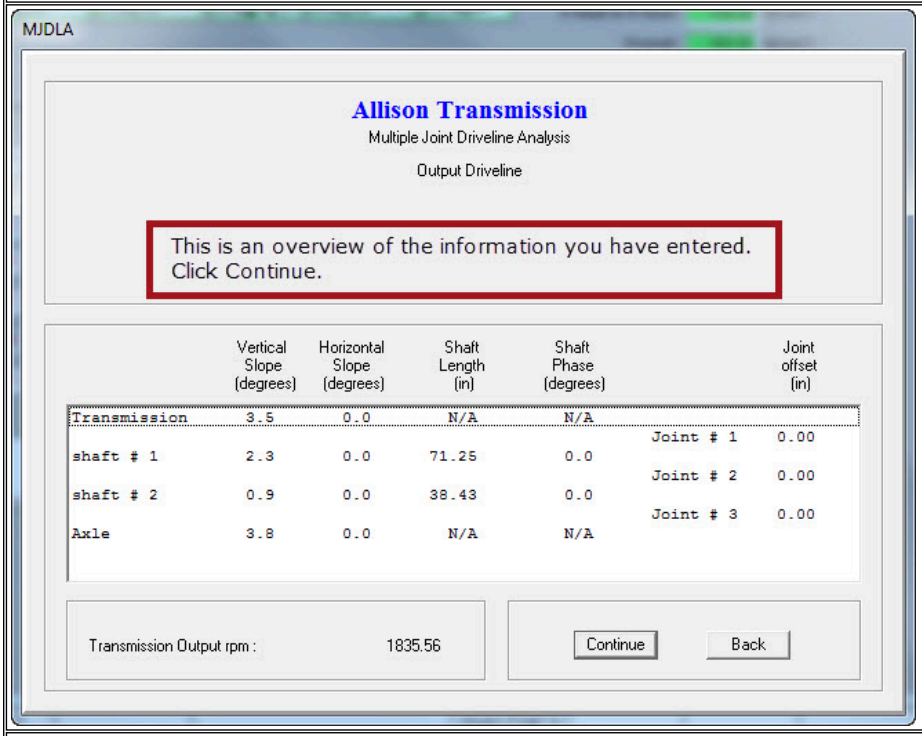
- As this checks to a single axle at a time, the axle vertical slope in this example is the Forward Drive Axle.
- Enter all required information.
- Use 0 for Horizontal Slope.
- There are 2 prop shafts between the transmission and forward drive axle in Figure 9. This gives you 3 joints.
- Transmission Output RPM is calculated using IK2600160 - Vehicle Speed Calculator the same way it is calculated for Eaton Driveline Angle Analyzer.

Figure 12 - Prop Shaft Information



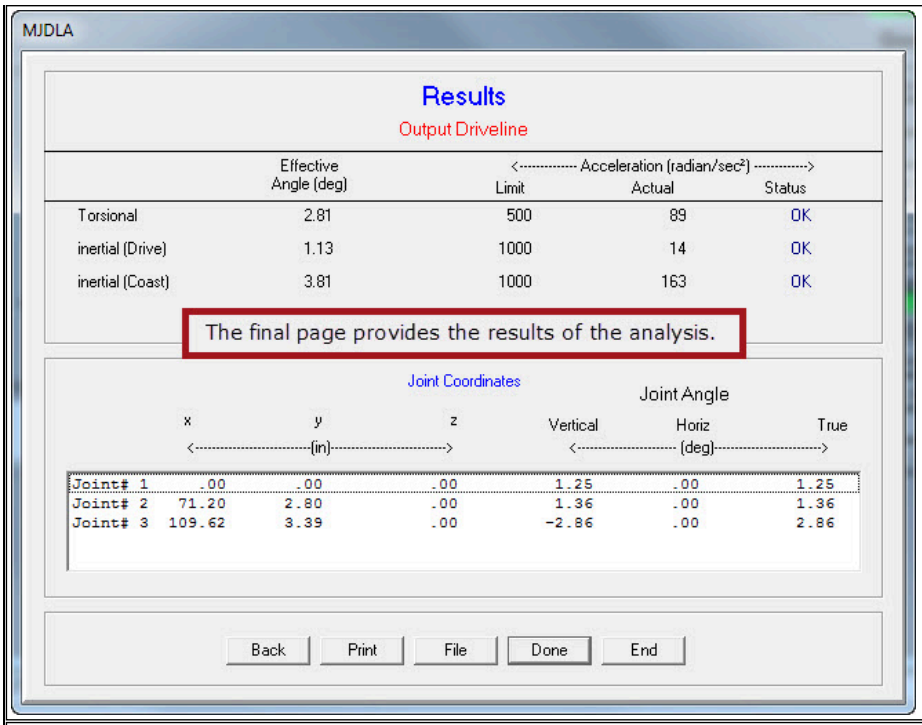
- Enter Prop Shaft angles and lengths.
- Joint Offset is 0.
- Shaft Phasing should match the phasing on the truck.

Figure 13 - Overview



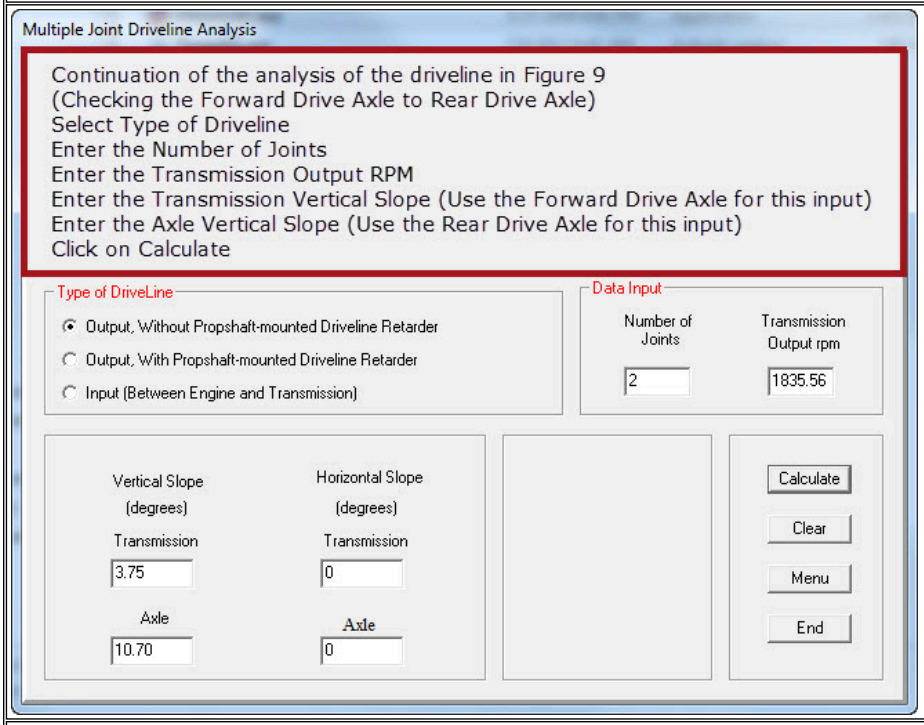
- This provides an overview of the information you have entered.
- Click Continue.

Figure 14 - Results



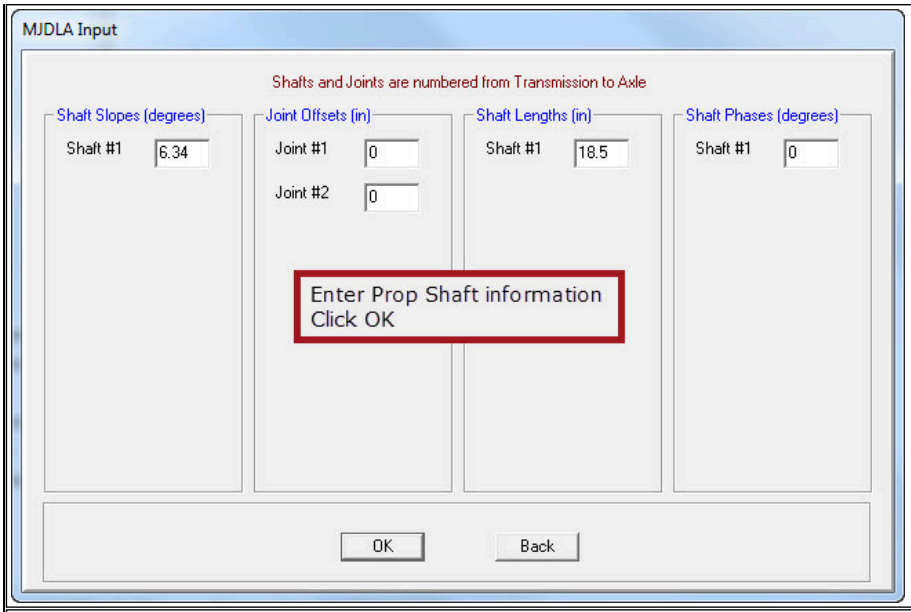
- Results of the First Section of the driveline analysis.
- This example is for a 6x4 and the process have to be completed twice.

Figure 15 - Analysis of the Forward Drive Axle to Rear Drive Axle



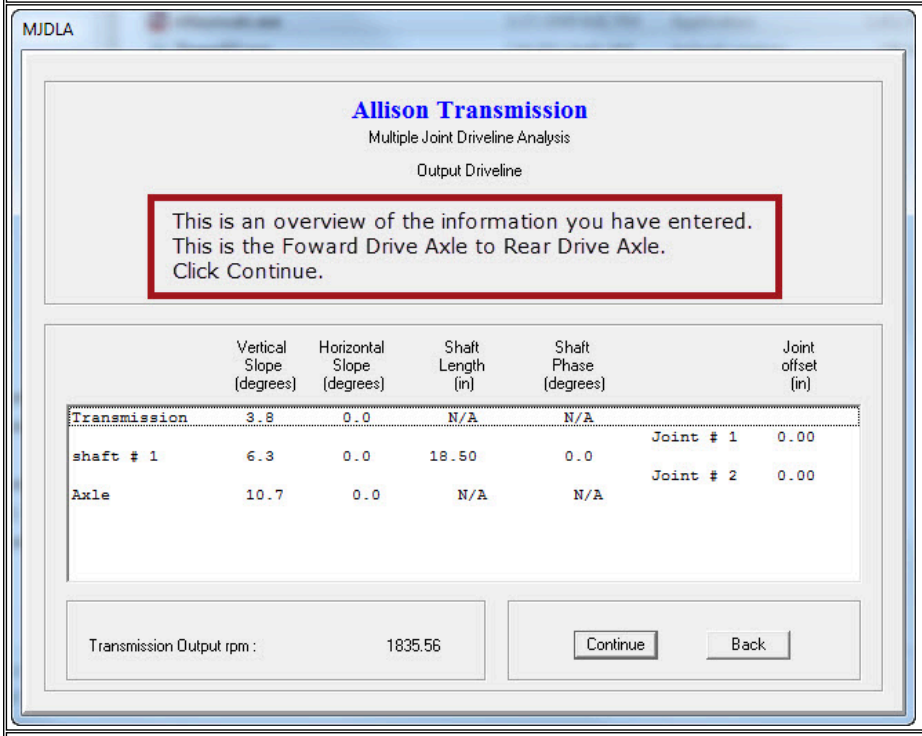
- Still using the drive line example from Figure 9.
- The Forward Drive Axle to Rear Drive axle must be checked.
- There is only 1 prop shaft. This gives you 2 joints.
- The slope of the Forward Drive Axle is entered in the Transmission Vertical Slope box.
- The slope of the Rear Drive Axle is entered in the Axle Vertical Slope box.

Figure 16 - Prop Shaft Information (Interaxle Shaft)



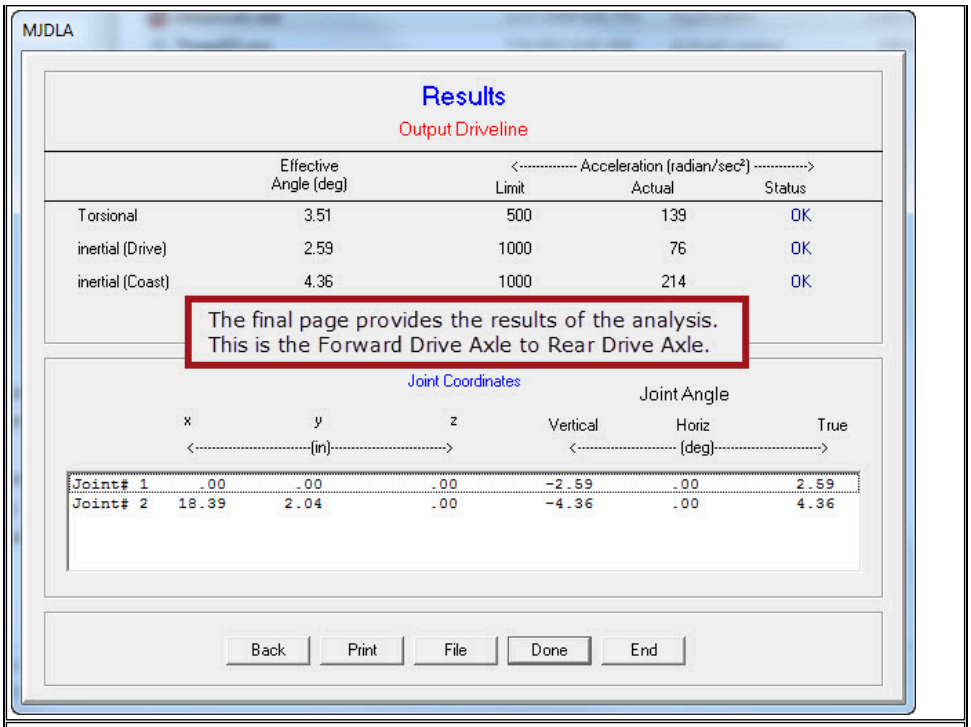
- Enter Prop Shaft angle and length. (This is the Interaxle shaft from Figure 9 in this example)
- Joint Offset is 0.
- Shaft Phasing should match the phasing on the truck.

Figure 17 - Overview of the Forward Drive Axle to Rear Drive Axle



- Open Allison Calc
- Select Multiple-Joint Driveline Analysis

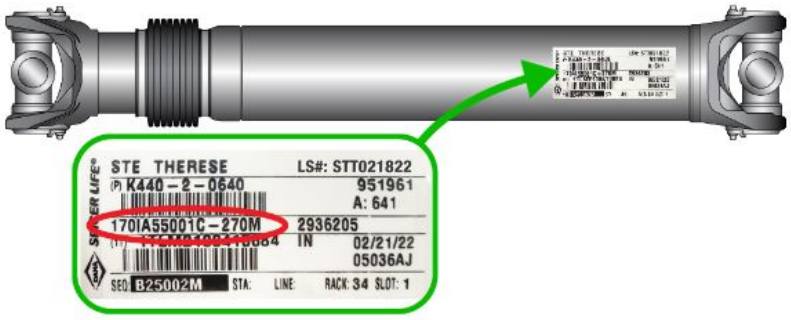
Figure 18 - Results of the Forward Drive Axle to Rear Drive Axle



- Open Allison Calc
- Select Multiple-Joint Driveline Analysis

Other Resources

- S06001 - Propeller Shaft
- S06002 - CF500, CF600 Driveshaft
- Convert Dana Prop Codes to Dana PN here
- Order next day Dana drivelines here and here
- Dana /Spicer drivelines have a decal on them that is painted over at the Navistar assembly plant. Carfully remove the decal cover (painted black) to expose the decal and its data.



- Meritor Driveline-on-Demand here

Pinion Angle			IROS Seat Parts Information				Plate Parts Information		
Loaded	Unloaded	1/3 Load	Part Angle	Machined Part Number	Cast Part Number	Cast Pinion Angle (As listed in parts catalog)	6x4 & 4x2 HD Plate	4x2 MD Plate (with Shock Mount)	
								Left Side	Right Side
0.60	-0.15	0.05	-6.00	3601570C2	3548295C1	2	3541719C3	3541725C3	3541726C3
2.26	1.51	1.71	-4.25	3601571C2			3541720C3	3541727C3	3541728C3
2.50	1.75	1.95	-4.00	3601572C2	3548296C1	4	3541720C3	3541727C3	3541728C3
2.75	2.00	2.20	-3.75	3601573C2			3541720C3	3541727C3	3541728C3
3.23	2.48	2.68	-3.25	3601574C2			3541720C3	3541727C3	3541728C3
3.47	2.72	2.92	-3.00	3601575C2			3541721C3	3541729C3	3541730C3
4.45	3.70	3.90	-2.00	3601576C2	3548297C1	6	3541721C3	3541729C3	3541730C3

5.42	4.67	4.87	-1.00	3601577C2			3541721C3	3541729C3	3541730C3
7.36	6.61	6.81	1.00	3601578C2			3541722C3		
8.33	7.58	7.78	2.00	3601579C2	3548298C1	10	3541722C3		
9.31	8.56	8.76	3.00	3601580C2			3541722C3		
9.55	8.80	9.00	3.25	3601581C2			3541723C3		
10.04	9.29	9.49	3.75	3601582C2			3541723C3		
10.28	9.53	9.73	4.00	3601583C2	3548299C1	12	3541723C3		
10.52	9.77	9.97	4.25	3601584C2			3541723C3		
11.49	10.74	10.94	5.25	3601585C2			3541724C3		
12.20	11.45	11.65	6.00	3601586C2	3548300C1	14	3541724C3		
12.46	11.71	11.91	6.25	3601587C2			3541724C3		

Hendrickson HAS Seat Information - Air Disc Brakes (ADB)		
Degree	**International P/N**	**Required Plate P/N**
Forward Axle Seats		
2	HUD56501001	H50216000
2.5	HUD56501002	H50216000
3	HUD56501003	H50216000
3.5	HUD56501004	H50216000
4	HUD56501005	H50216000
5	HUD56501007	H50216000
5.5	HUD56501008	H50216000
6	HUD56501009	H50216000
6.5	HUD56501010	H50216000
7	HUD56501011	H50216000
Rear Axle Seats		
10	HUD56505005	H50222000
10.5	HUD56505006	H50222000
11	HUD56505007	H50222000
11.5	HUD56505008	H50222000
12	HUD56505009	H50222000
12.5	HUD56505010	H50222000
13	4102339C1	H50222000
13.5	4102340C1	H50222000

Hendrickson HAS Seat Information - Drum Brakes			
Degree	**Hendrickson P/N**	**International P/N**	**Required Plate P/N**
Forward Axle Seats			
2	50970-1	H50970001	H50216000
2.5	50970-2	H50970002	H50216000
3	50970-3	H50970004	H50216000
4	50970-5	H50970005	H50216000
4.5	50970-6	H50970006	H50216000
5	50970-7	H50970007	H50216000
5.5	50970-8		H50216000
6	50970-9		H50216000
6.5	50970-10		H50216000
7	50970-11		H50216000
Rear Axle Seats			
7	50973-13	H50973013	H50222000
8	50973-1	H50973001	H50222000
8.5	50973-2	H50973002	H50222000
9	50973-3	H50973003	H50222000
9.5	50973-4	H50973004	H50222000
10	50973-5	H50973005	H50222000
10.5	50973-6	H50973006	H50222000
11	50973-7	H50973007	H50222000
11.5	50973-8	H50973008	H50222000
12	50973-9	H50973009	H50222000

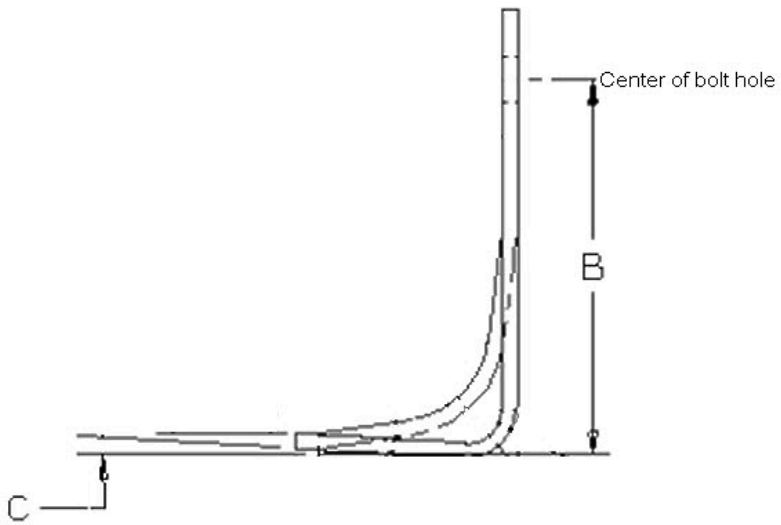
12.5	50973-10	H50973010	H50222000
13	50973-15	H50973015	H50222000
13.5	50973-14	H50973014	H50222000
14	50973-16	H50973016	H50222000

Rear Leaf Spring Seat Information	
Degree	**Part Number**
1	520339C2
2	495364C1
3	3552912C1
6	3518107C1

Center Bearing Brackets

- Here is a list of commonly used Center Bearing Brackets.
- If the center bearing bracket your truck was built with is not on this list it has a different width or offset. If you need a longer bracket you will need a case file.
- If you need a shorter bracket you can move the prop shaft up to the desired angle, then mark and drill new holes in the existing bracket.

Common Center Bearing Brackets			
*Min Height for Clearance = 3.00"			
B" Length	**C = 0° Angle**	**C = 3° Angle**	**C = 6° Angle**
2.50		997986C1	547681C1
3.00	3517669C1	484963C1	2031864C1
3.30	1613108C1	484964C1	3579785C1
3.60	3527899C1	484965C1	3573130C1
3.90	3573124C1	484966C1	3573131C1
4.20	3573125C1	484967C1	484975C1
4.50	546260C1	484968C1	3573132C1
4.80	3573126C1	483973C1	1689958C1
5.10	3573127C1	484969C1	537433C1
5.40	3573128C1	485877C1	3573133C1
5.70	3573129C1	484970C1	484976C1
6.00	1620406C1	484971C1	3530579C1
6.30	1688060C1	484972C1	483971C1
6.60	3530576C1	484973C1	3530580C1
6.90	3517670C1	484974C1	571510C1
7.20	3579776C1	494657C1	496866C1
7.50	3579777C1	485157C1	494667C1
7.80	3527900C1	485158C1	483972C1
8.10	3741398C1	494658C1	494668C1
8.40	3527901C1	494659C1	494663C1
8.70	3527902C1	494660C1	494669C1
9.00	3530577C1	494661C1	494664C1
9.30	3527903C1	3527904C1	494670C1
9.60	3530578C1	3527905C1	3530581C1
9.90	3579778C1	494662C1	494670C1
10.20	3579779C1	3527906C1	2037330C1
10.50	3579780C1	998235C1	2037330C1
10.80	3579781C1	546173C1	3530582C1
11.10	3579782C1	2003081C1	
11.40	3579783C1	3527907C1	
11.70	3579784C1	594555C1	
12.00	2025234C1	546707C1	
12.30	2025269C1	546345C1	
12.60		3527908C1	
12.90		3527909C1	
13.50	3741400C1	3527910C1	
13.80		546708C1	
14.10		3527911C1	
14.40		3527912C1	



14.70	3741401C1		
15.00	3741402C1		
15.30	3741403C1		
15.60	3741404C1		

Hide Details

Feedback Information

Viewed: 37411
Helpful: 1769
Not Helpful: 2133

No Feedback Found