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Title: **MV Chassis Lean Complaint - IROS Suspension**

Applies To: **MY2018, MY2019, MY2020, MY2021, MY2022, MY2023, MY2024, MY2025, MY2026 MV w/ IROS rear suspension**

CHANGE LOG

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

03/30/2026 - Initial Article Release

DESCRIPTION

This article addresses chassis lean conditions on MV with IROS suspension. **It does not include any diagnostics for body leans, such as a cab lean.** Keep in mind that a chassis lean may cause or accentuate a cab lean.

Filling out the printable form will help determine the cause(s) of the lean and identify the actions and parts required to correct it.

- Some trucks are intentionally manufactured with different front axle spring rates on the driver and passenger sides. If so, the Parts Catalog will show different PN springs on the left and right sides. Many MV's have this design feature.
  - **If a chassis has a front lean complaint of less than 1/2 inch, AND there is no body installed, AND the parts catalog shows that it has different part number springs on the front driver's side versus the front passenger side, then DO NOT troubleshoot the lean until the body is installed or significant weight is loaded on the chassis**
- It is critical to take accurate measurements for **all** steps to determine if the issue is being caused by the rear suspension. Adding a spacer to the front, changing a rear seat, or correcting a frame issue are the possible repair paths depending on the measurements.
- Some IROS and other rear air suspensions have OPTIONAL DUAL RIDE HEIGHT CONTROL VALVES, meaning that there is a leveling valve on the left rear and right rear of the vehicle. These should be checked for proper adjustment before trying to correct a chassis lean by adding or removing parts.
- These procedures are intended to assist the service technician in making industry-acceptable corrections for nominal lean issues and are not intended to compensate for over/uneven loading or unrepaired vehicle damage
- There is an orderable option that may create a lean for a purpose to compensate for a heavy body install. If the unit is leaning, refer to the component section of the unit in Service Portal. This feature is added for most 8k front ends with batteries, DEF tank, Air Tanks, and Fuel Tank all on the Left side.
  - 0003WAM - Typically, a 1" spacer is installed on the Front Left.
  - 0503013 - May be built with different rate springs on left versus right or a 1/2" spacer is installed on the Front Left.

If unable to resolve the lean after following this iKNow article, please open a case file and provide:

- Completely filled out the IROS lean form
- Wide-angle photos of the front, both sides, and rear of the vehicle
- Fuel tank levels and DEF tank levels
- Details of any equipment or modifications made to the vehicle

NOTE:

- Replacing an IROS air spring or the MSM (main support member, aka – rear spring) will not have any effect on lean.
- Springs are very rarely found to be the cause of a lean.
- Warranty will NOT COVER replacing a spring for the following complaints:

Weak spring	Leaning
Bottoming out	Lost arch

DIAGNOSTIC STEPS

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.

Proper locations to measure for chassis lean:

Right Front Spring Shackle Bolt

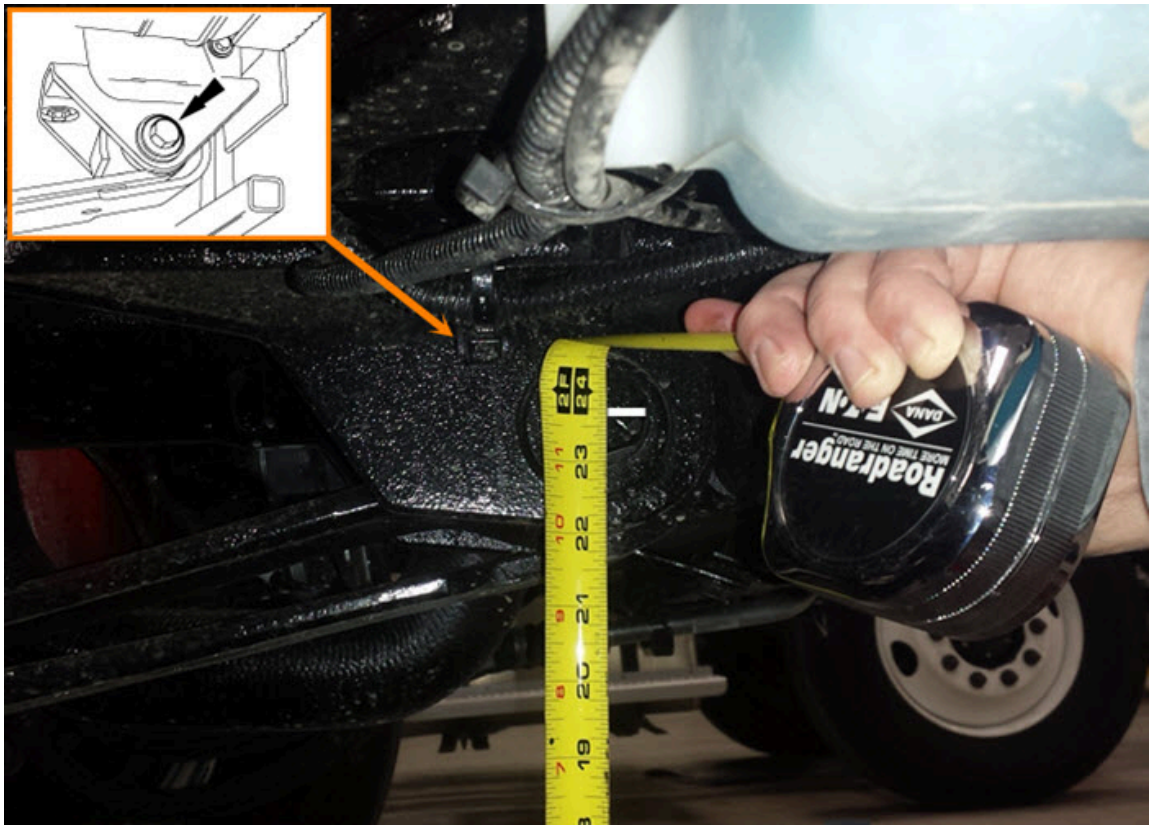
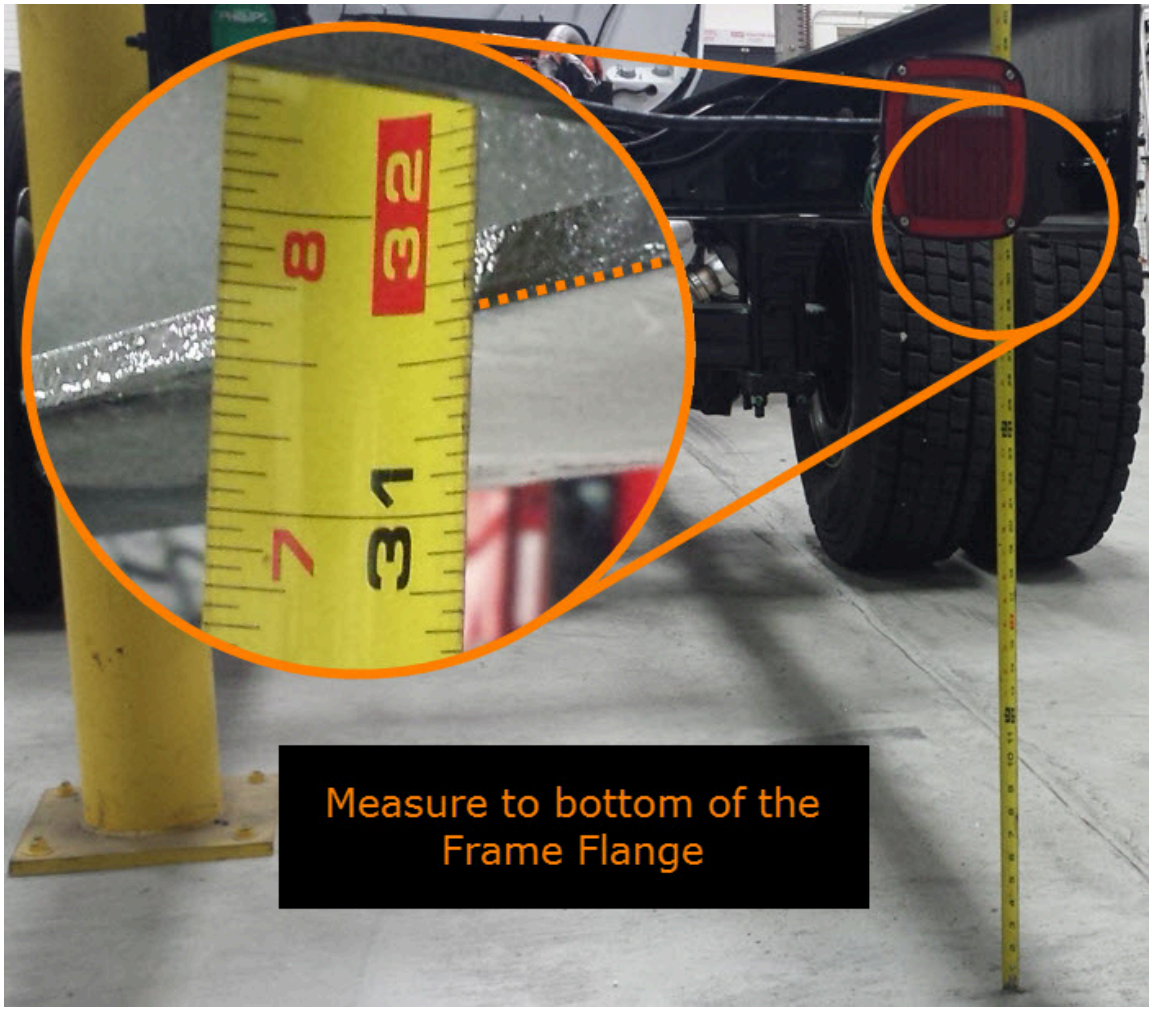


Figure 5
Left Front Spring Shackle Bolt

Figure 6
Aft Frame Straight Truck



IROS Suspension Form Information and Diagnostics

Printable Form	
IROS Suspension	Click Here

1. Check the front axle suspension weight rating.
    - For any lean issues with a front suspension rating of 8,000 LBS or less, please refer to IK0300061 - 8,000 LBS Front Suspension Lean Correction.
2. Check the unit for any offset loading.
    - Note any items that may cause offset loading.
    - *If offset loading is present, advise non-warrantable cause. Advise installing 14WAS – Dual leveling valves to correct the issue.*
3. Inspect the suspension for any third-party (bodybuilder) installed components, such as stabilizer bars.
    - International does not install stabilizer bars on most suspensions.
    - *Advise non-warrantable to remove components. Recommend the removal of components to confirm they are causing the lean.*
    - *Also, a 3rd party component could be an item causing an offset load.*
4. Check the tire pressure for all tires.
    - Adjust pressures if needed.
    - Record current tire pressures.
    - *It is recommended that each axle be with 5% of each other. Especially if the lean is marginal.*
5. Check Ride Height
    1. Refer to the Technician Manual for procedure and specifications.
        - Park the vehicle unloaded on a level surface with a light application of the brakes.
        - Do not apply the parking brake. Chock steer axle wheels to prevent vehicle movement.
        - Make sure the vehicle's air system is at 120 psi, then shut off the engine.
        - Dump air from the system, then re-pressurize and allow it to return to the ride height.
        - When possible, use the laser-based ride height tool that was shipped to many dealers in 2025
6. Once the proper ride height is set and air bags are inflated with 120 psi, measure each corner of the vehicle as shown in Figures 4-7 and record measurements.

6.
    - The front tires MUST be pointed straight forward to prevent any influence on the lean from the King Pin Inclination.
    - Measure the front suspension at the spring shackle bolt as shown in Figures 4 and 5. Mark the bolt with a paint pen so you have a reference point for future measurements that may be required.
    - Measure the rear of the vehicle at the aft frame flange (bottom of the flange) as shown in Figures 6 and 7. Location may vary slightly by application.
    - *If the lean is less than or equal to 3/8” Front and/or Rear, the vehicle is in spec. The repair is not warrantable.*
    - *You can still advise on what repair would correct the lean, but at the customer's expense.*
7. Dump the air from the suspension and verify the frame stop is touching the axle U-bolt on both sides of the truck. If the u-bolts only make contact with one axle stop, please notate which side is touching and which side is not on the IROS form.
    - Remeasure from the same locations used in Step 6 and record (Measurements are taken with suspension dumped).
    - This will help show if the rear suspension is contributing to the lean (Especially 4x2 chassis), or help confirm a frame issue as the cause.
    - *Looking to see if opposite corners are still low (e.g., LF low RR low), which may help show a frame twist. Lean must be greater than 3/8".*
    - *Looking to see if the rear goes into specification with suspension dumped. This may help show the Bar Pin Height is contributing, or show the frame is not twisted (Where a front shim may correct).*
    - *If the front and rear both level out and the Bar Pin Height is not equal (Step 9) suspect an issue with a rear seat (4x2).*

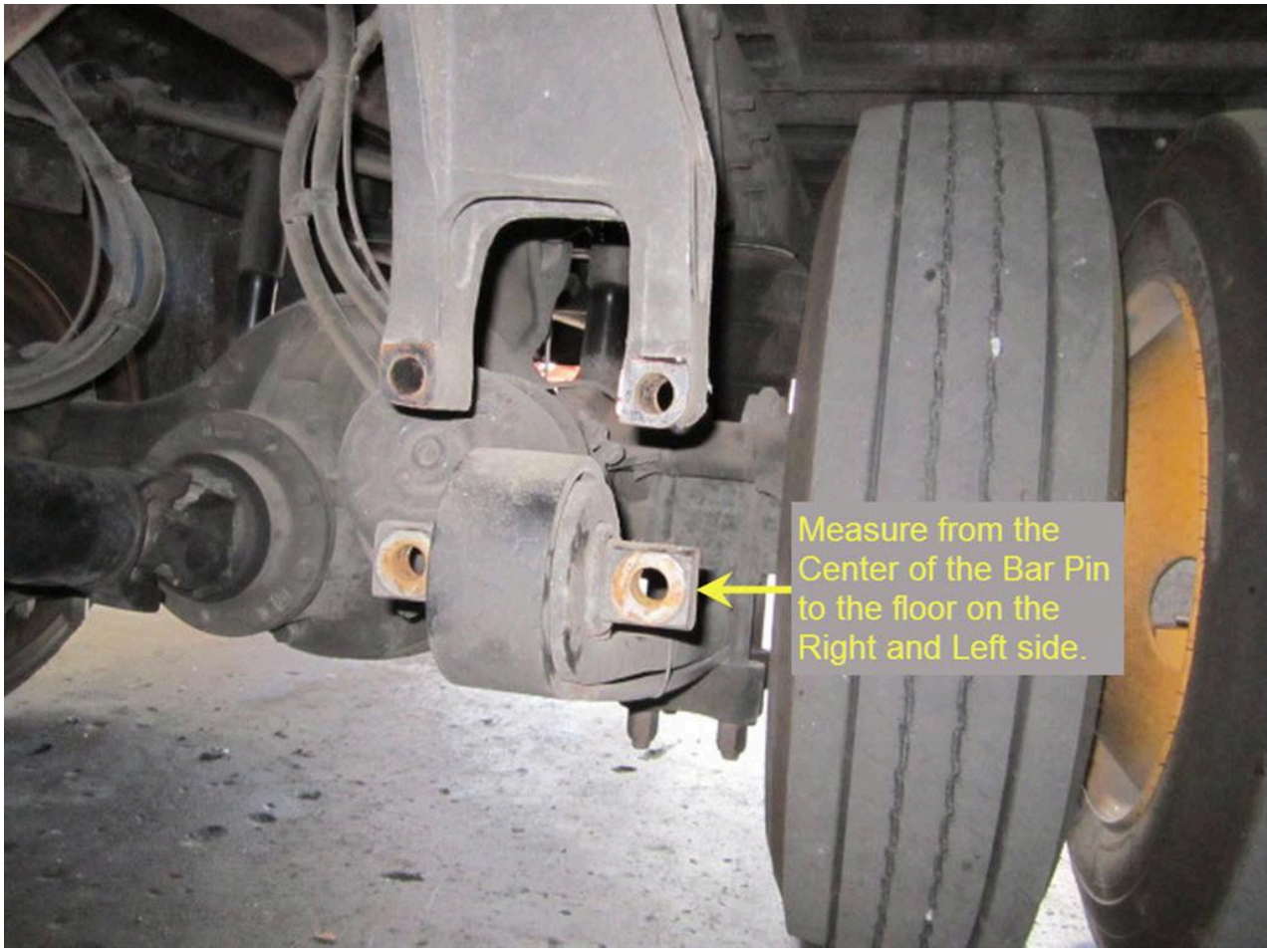
Re-inflate the air suspension before continuing

8. Use a jack and place a 1 1/2" inch block under the **Front** tire with the lowest reading. (Do not drive the vehicle onto the block.)
    - Remeasure from the bottom of the frame to the ground and record.
        - This will show us how the rear suspension reacts and if shimming will help to correct the issue. (If the lean is prevalent in the front).
    - *Looking at the reaction in the rear here. (e.g., If the LF has a block, the weight transfer should cause the RR to be lower than the measurement at #6).*

- *Use this information together with #7. Suspension reaction with a block, together with the suspension difference when the suspension is dumped.*

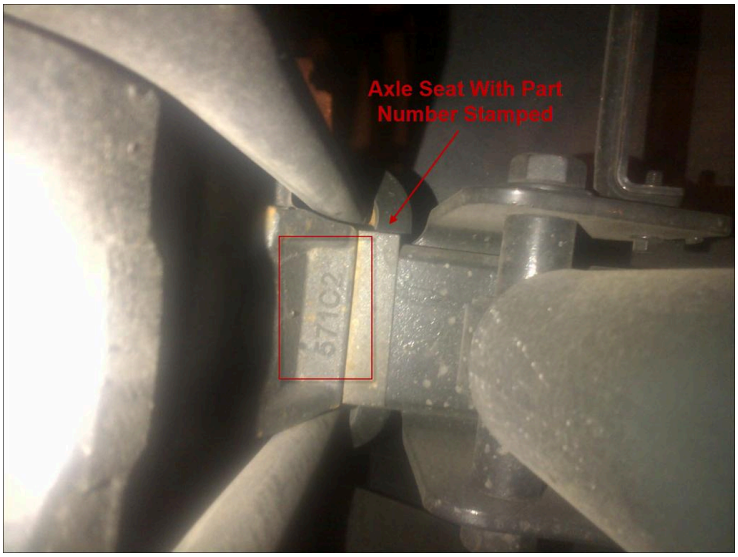
9. Measure from the center of the bar pin to the ground and record. (This step only applies to Single Rear Axle vehicles.)
   - Remove the wooden block if previously installed.
   - You must remove the Spring Eye Bushing mounting bolts.
   - Using a frame jack at the rear of the vehicle, raise the frame evenly until the Bar Pin clears the Mounting Bracket on both sides.
     - The rear tires should still be on the ground during this procedure. Only lift the rear of the frame until the Bar Pin clears the mounting bracket.
     - This will help determine if there is an issue with a rear seat or rear seat mounting.
   - See Figure 8 below.
   - Do not perform this step on 6x4 configurations.
   - *If the Pin Bar Height is greater than 7/16" difference, the repair will require changing a seat out on one side.*
   - *If the Pin Bar Height is 7/16" or less, shimming the front suspension (steer axle) will be required to correct the lean.*
   - *You will need to watch what the result is in #8 closely when this measurement is off.*

Figure 9



10. Record the axle seats' degrees or part number on the physical part if possible. See Figure 10 and Figure 11 below.
    - *If a seat change is required to correct the lean, only change 1 seat size. (Only 1 seat will be replaced, and it must be a 1-degree or larger change).*
    - *The seat that needs to be changed is the Pin Bar measurement that is smaller. (Only 1 seat will be replaced).*
    - *The change should increase the Pin Bar height on the Low Side.*
    - *If the seat is changed, measure drive line angles BEFORE and AFTER, as these measurements may change.*
    - *If the seat is changed, make sure the correct Seat Plate is installed or changed if needed.*
    - *If the thicker side of the seat is facing forward (towards the steer axle) choose a seat one size smaller.*
    - *If the thicker side of the seat is facing rearward (away from the steer axle), choose a seat one size larger.*

Figure 10 **Figure 11**



11. Take 4 photos of the unit. Please ensure the photos clearly show the lean. (Only perform this step if a case file is needed.)
    - Front, Rear, Left Side, Right Side.
    - *For documentation purposes. This will help show any potential offset loading (A/C system in a commercial bus, hydraulic tank, etc) and the severity of the observed lean.*
    - *This is especially true if you have a case file with a front suspension less than or equal to 8000 lbs, and shimming did not resolve the issue.*

SERVICE PARTS INFORMATION

Front Leaf Spring Spacer Part Numbers

Figure	Kit Description	Part Number	Quantity Required	Notes
1	3 Inch Wide x 1/2 Inch Thick Front Spacer (has center dowel in it)	2512808C1	1	As Needed
2	4 Inch Wide x 5.8 x 1/8 Inch Thick Front Spacer	442078C2	1	As Needed
2	4 Inch Wide x 5.8 x 3/8 Inch Thick Front Spacer	322019C4	1	As Needed
2	4 Inch Wide x 8.8 x 1/8 Inch Thick Front Spacer	442388C1	1	As Needed
2	4 Inch Wide x 8.8 x 3/8 Inch Thick Front Spacer	1618382C1	1	As Needed
3	4 Inch Wide x 1/4 Inch Thick Rear Spacer	493720C3	1	As Needed
3	4 Inch Wide x 3/8 Inch Thick Rear Spacer	540069C3	1	As Needed
3	4 Inch Wide x 1/2 Inch Thick Rear Spacer	493721C3	1	As Needed
	4 inch wide x 1 inch spacer	500871c2	1	As Needed
	4 inch wide x 1.5 inch spacer	3894346c2	1	As Needed
	4 inch wide x 2 inch	3956545c2	1	As Needed

Figure 1

Figure 2

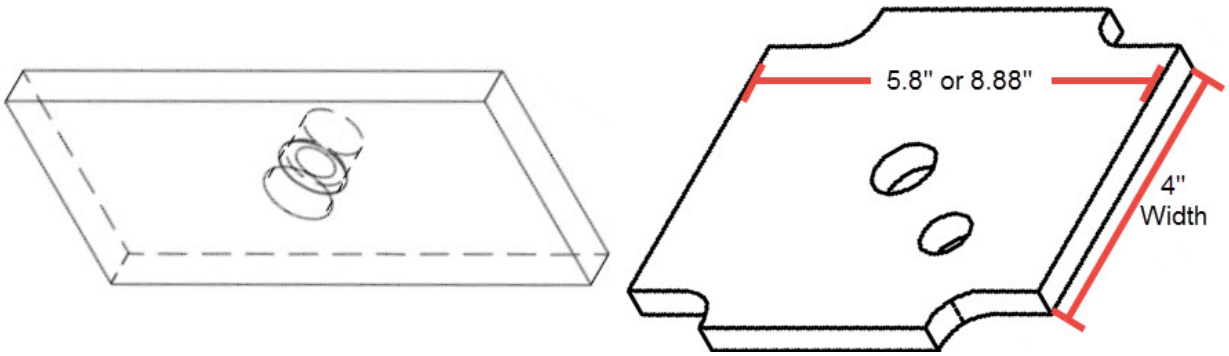
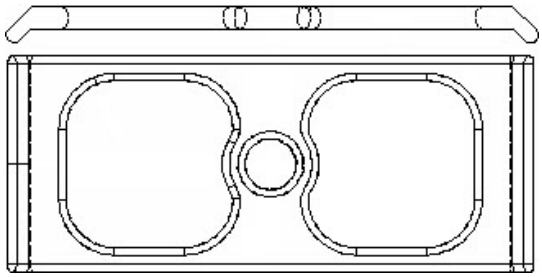


Figure 3



Inboard Shock IROS Seat and Plate Part Numbers

Seat Parts Information				Plate Parts Information		
Pinion Angle Loaded	Machined Part Number	Cast Part Number	Cast Pinion Angle (As listed in parts catalog)	4x2 HD Plate	4x2 MD Plate (with Shock Mount)	
					Left Side	Right Side
0.60	3601570C2	3548295C1	2	3541719C3	3541725C3	3541726C3
2.26	3601571C2			3541720C3	3541727C3	3541728C3
2.50	3601572C2	3548296C1	4	3541720C3	3541727C3	3541728C3
2.75	3601573C2			3541720C3	3541727C3	3541728C3
3.23	3601574C2			3541720C3	3541727C3	3541728C3
3.47	3601575C2			3541721C3	3541729C3	3541730C3
4.45	3601576C2	3548297C1	6	3541721C3	3541729C3	3541730C3
5.42	3601577C2			3541721C3	3541729C3	3541730C3
8.33	3601579C2	3548298C1	10	3541722C3		
9.55	3601581C2			3541723C3		
10.28	3601583C2	3548299C1	12	3541723C3		
10.52	3601584C2			3541723C3		
11.49	3601585C2			3541724C3		
12.20	3601586C2	3548300C1	14	3541724C3		
12.46	3601587C2			3541724C3		

Outboard IROS Seat and Plate Part Numbers

These seats can be identified by the shock mount being cast into the top seat that sits between the axle and the MSM. Feature codes are 0014TDE, 0014TBS, 0014TDV, 0014TBL, 0014TBM, 0014TBN, and 0014TBJ. *MV outboard shock with feature code 14TDU, the 6-degree seat crosses from 4529557C1 to 3789563C2.*

Degrees	Seat PN	Plate PN
-6	3789563C2	3541719C3
-4	3789567C1	3541720C3
-2	3789571C2	3541721C4

CV and Lightweight Rear IROS Seats and Plate Part Numbers

Seat Parts Information for 107.9mm (4.25IN) width Axle				Plate Parts Information		
Pinion Angle Loaded	Machined Part Number	Cast Part Number	Cast Pinion Angle (As listed in parts catalog)	4x2 HD Plate	4x2 MD Plate (with Shock Mount)	
					Left Side	Right Side
0.60	3601567C2		2	3541719C3	3541725C3	3541726C3
2.50	3601568C2		4	3541720C3	3541727C3	3541728C3
4.45	3601569C2		6	3541721C3	3541729C3	3541730C3
7.50	4028015C1			3541721C3	3541729C3	3541730C3

WARRANTY INFORMATION

Warranty Claim Coding:
Refer to the Warranty Coding Manual for Group and Noun Codes.

Standard Repair Time(s):
Refer to the SRT Manual for Repair Times

OTHER RESOURCES

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