Allison Transmission

Revisions to this document are noted by a stripe in the left-hand margin

SUBJECT: P2 Planetary Carrier Design Change

MODELS AFFECTED: 1000 Series™ and 2000 Series™ Transmissions

SERIAL NUMBERS AFFECTED: Beginning with S/N 6312054254 (Indianapolis) and S/N 6330078889 through 6330080697 and 6330080816 to Current (Chennai)

Introduction:

As a part of Allison Transmission's commitment to continuous product improvement, changes have been made to the design and manufacturing process of the P2 carrier assembly for 1000 Series and 2000 Series transmissions shown in Figure 1.

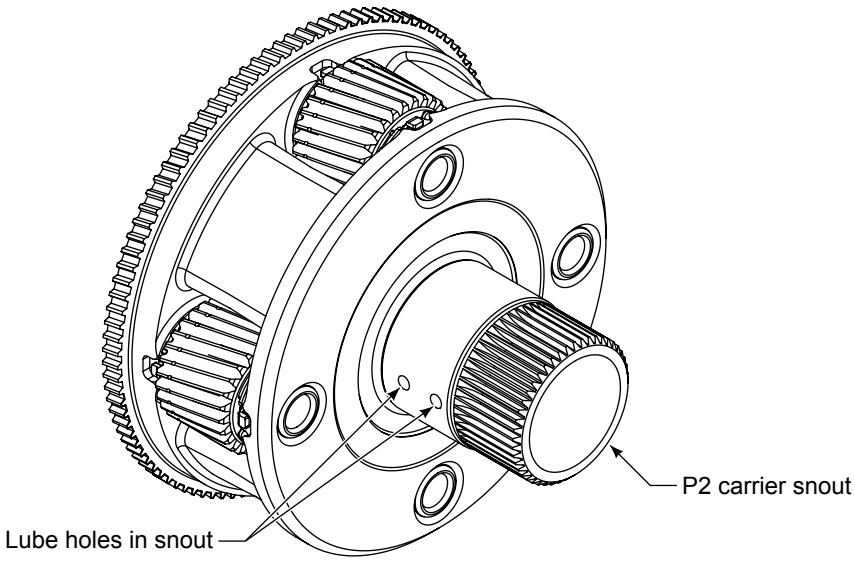


Figure 1. Current P2 Carrier Assembly (P/N 29568182)

Background:

The internal oil annulus ("groove") found within the former P2 carrier snout allowed for lube flow around the bushing and out the P2 carrier snout, irrespective of former bushing orientation. Refer to Figure 2 to locate the oil annulus in

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the former P2 carrier. This former lubrication groove provided circumferential flow around the former bushing and out the snout lube holes to lubricate P1 pinion gears.

In contrast, the current P2 carrier assembly design does not include an oil annulus and has critical bushing lube hole alignment requirements as outlined in this document.

Parts Modification:

The P2 carrier assembly has been redesigned for 1000 and 2000 Series transmissions. The current P2 carrier contains larger diameter lube holes for pinion lubrication, but no longer contains an interior oil annulus where the bushing rides. Instead, lubrication flows through burnished holes in the snout and pre-drilled holes of the bushing. Refer to Figure 2 for design comparison and Table 1 for P/N cross reference. 'Planetary Gears' engineering group numbers (14-1144 with PTO Drive Gear-MY2022, and 14-1145 without PTO Drive Gear-MY2022) remain unchanged.

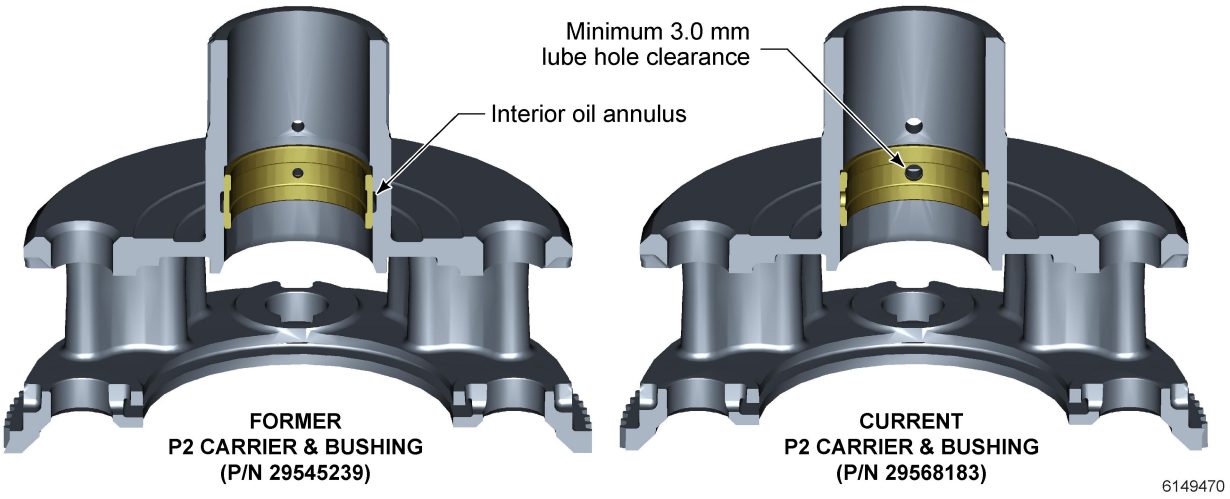


Figure 2. Comparison of Former P2 Carrier and Bushing (Left – P/N 29545239) and Current P2 Carrier and Bushing (Right – P/N 29568183)

Table 1. Parts Catalog of Current and Former P2 Carrier Assemblies

Part Description	Former P/N	Current P/N	Qty
Carrier Assembly, P2 Planetary	29545240	29568182	1
Carrier And Bushing Assembly, P2	29545239*	29568183*	1
Carrier, P2 Planetary	29544821*	29568184*	1
Bushing, 36.0 mm ID	29546598	29568185	1
Washer, Thrust, P2	29536581	29536581	4
Bearing Assembly, Roller, P2	29531116	29531116	4
Gear Set, P2 Pinion. Set Contains Four 29531113 Gears	29534365	29534365	1
Washer, Thrust, P2	29536581	29536581	4
Spindle, P2	29537889	29537889	4

* Serviced Only As An Assembly -- Not Available As A Detail Part.

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The current P2 carrier bushing (Figure 3 – Right) contains four, enlarged lube holes. The current design requires proper orientation and alignment of the bushing inside the current P2 carrier snout to ensure adequate lubrication flow to the surrounding P1 carrier pinions.

NOTE: Only two (of the four) bushing lube holes need to be aligned with the lube holes found in the current P2 carrier snout.



Figure 3. Comparison of Former 2-Hole, P2 Carrier Bushing (Left – P/N 29546598) and Current 4-Hole, P2 Carrier Bushing (Right – P/N 29568185)

Compatibility and Availability:

Current P2 carrier assembly (P/N 29568182) is backward compatible with former P1 and P3 carriers. Additionally, the current bushing (P/N 29568185) is backward compatible with former P2 carriers. As such, the former P2 carrier assembly (P/N 29545240) and former P2 carrier bushing (P/N 29546598) have been cancelled. Part stock of these former designs has been exhausted. Only current P2 carrier assemblies (P/N 29568182) and current P2 carrier bushings (P/N 29568185) are stocked at Global Parts Distribution Centers.

With this design improvement, there are compatibility rules to follow. Table 2 should be used as an aid to assemble only compatible parts when overhauling or remanufacturing P2 carriers.

CAUTION: Failure to follow these compatibility rules can lead to premature failure of P1 carrier and surrounding components.

Table 2. Compatibility of P2 Carrier and Bushing Designs

	Former P2 Carrier with Lube Annulus (29544821)	**Current P2 Carrier without Lube Annulus (29568184)**
Former, 2-hole P2 Carrier Bushing (29546598)	Compatible	Incompatible
Current, 4-hole P2 Carrier Bushing (29568185)	Compatible	Compatible Lube holes need alignment

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P2 Carrier Bushing Kit and Replacement:

P2 Carrier Bushing Service Kit (P/N 29569987) has been released for bushing replacements in current and former P2 carriers. This service kit includes one current bushing (P/N 29568185) along with abbreviated instructions (Instruction Sheet #373).

Use the following instructions to install a current P2 carrier bushing (P/N 29568185) into a current 1000 Series and 2000 Series, P2 planetary carrier (P/N 29568184).

CAUTION: Lube hole alignment is critical on P2 carriers that do not contain the oil annulus within the snout of the carrier. Be sure to follow these instructions (or instructions found in the latest Service Manual), and check for proper lube passage clearance following installation. Failure to align and verify appropriate lube hole clearance in this combination can lead to transmission damage.

Design changes to the P2 carrier assembly and bushing as outlined in SIL 09-1K2K-22 require revised service procedures for the current P2 carrier bushing. Procedures for removing and installing the current bushing from current P2 carriers can also be found in the latest revision of the 1000 Series and 2000 Series Service Manual (SM5818).

Tools Required:

- J-43785 P2 Bushing Remover/Installer
- J-8092 Universal Driver Handle

The preferred method for removing and installing the P2 planetary bushing is to use J-43785 P2 Bushing Remover/Installer and a press. If a press is not available, use J-43785 P2 Bushing Remover/Installer and J-8092 Universal Driver Handle.

Bushing Removal:

1. Position the P2 planetary carrier (3) on wooden blocks on the press with the external splines facing up.

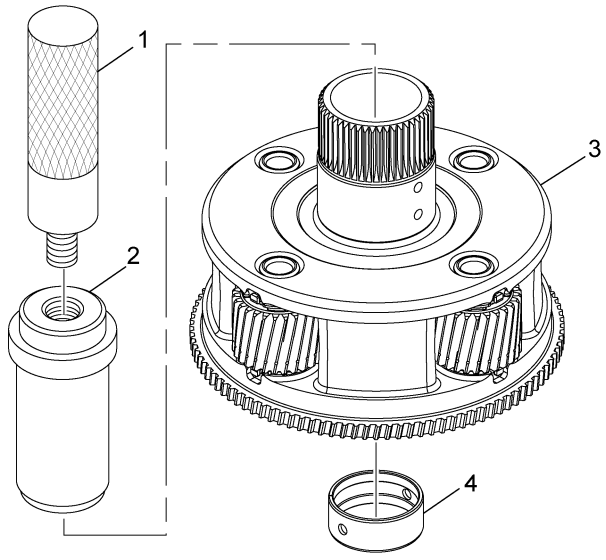


Figure 4. Removal Of Bushing From P2 Carrier

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2. If the bushing is removed without a press, attach the short end of J-43785 P2 Bushing Remover/Installer (2) onto J-8092 Universal Driver Handle (1).
3. Using the longer end of J-43785 P2 Bushing Remover/Installer, press or drive the bushing (4) out of the P2 planetary carrier (3).

Bushing Installation:

1. Position the P2 planetary carrier (3) on wooden blocks on the press with the external splines facing down.

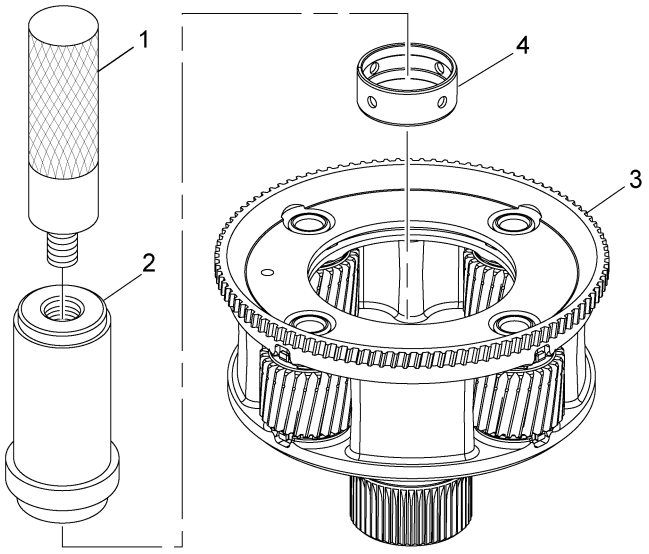


Figure 5. Installing Current Bushing Into P2 Carrier

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2. Locate the oil lube holes on the P2 planetary carrier snout. Position yourself over the carrier and visually align the lube holes between those of the bushing and the P2 carrier. Mark with a paint marker to use as a visual reference for bushing alignment as shown in Figure 6.

NOTE: Carrier pinion spindles 180 degrees apart can also be used as reference points for lube hole alignment.

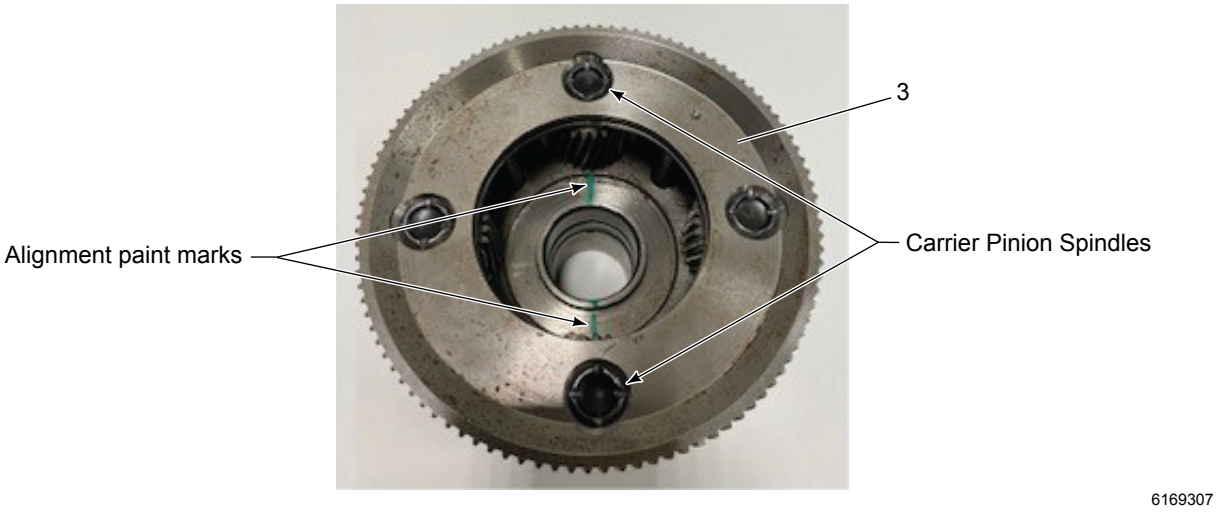


Figure 6. Alignment Paint Marks on P2 Carrier (3)

3. Current bushings will contain four lube holes. Using a current P2 carrier bushing (4), orient either set of lube holes with the alignment paint marks made on the P2 carrier as shown in Figure 7.

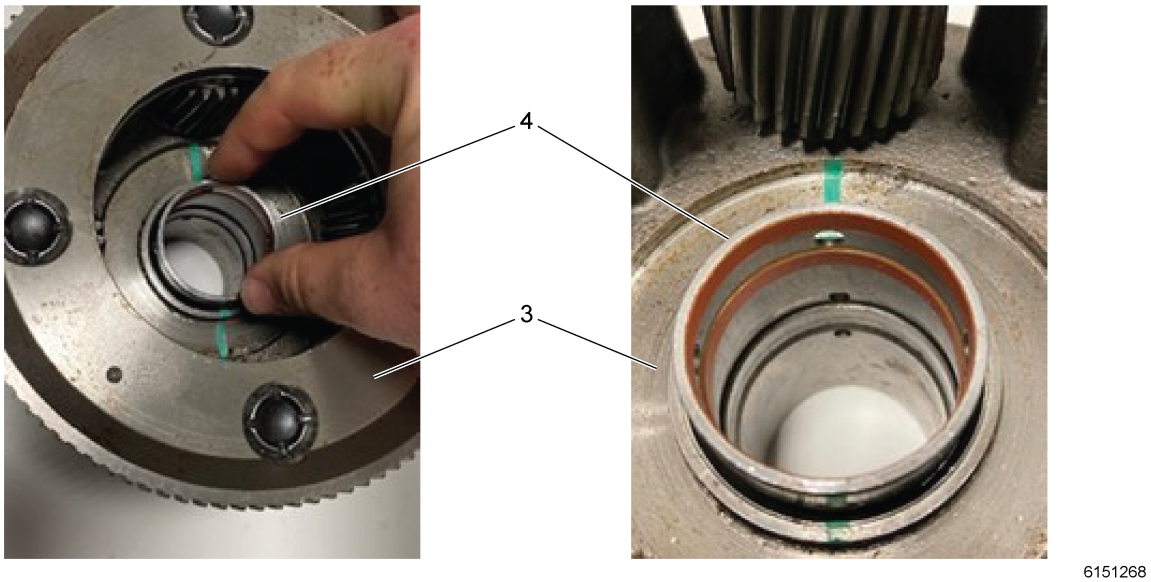
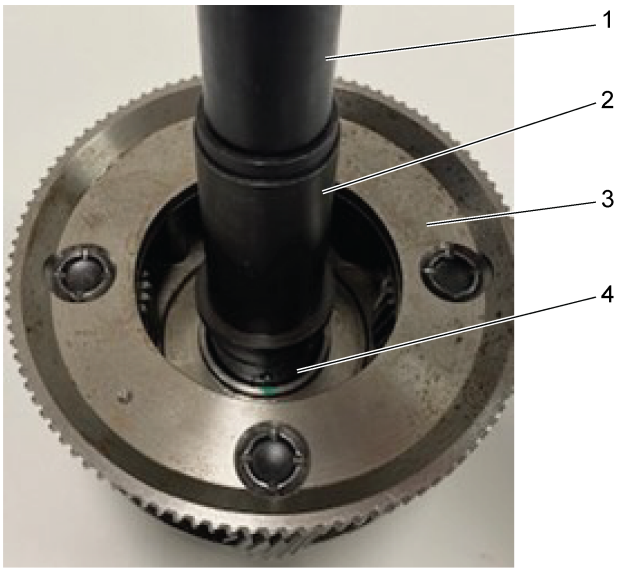


Figure 7. Current Bushing (4) Orientation And Alignment Into Current P2 Carrier (3)

4. If the current bushing (4) is installed by hand, attach the long end of J-43785 P2 Bushing Remover/Installer (2) onto J-8092 Universal Driver Handle (1).

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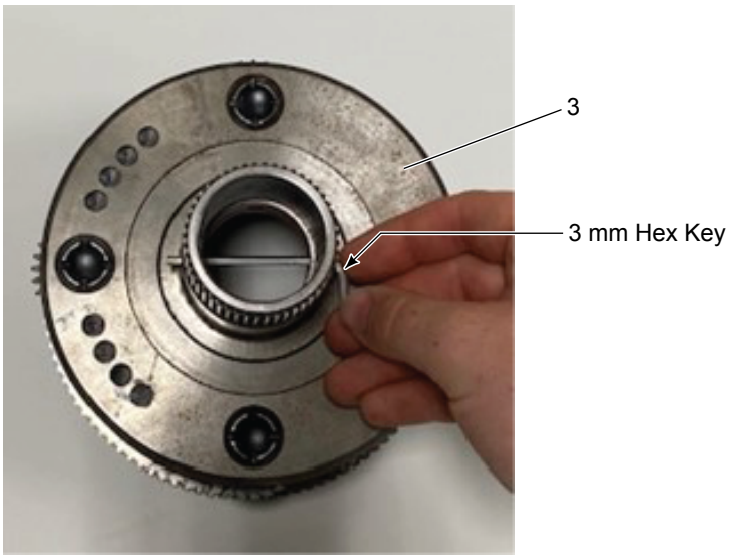
5. Insert the shorter end of J-43785 P2 Bushing Remover/Installer (2) into a current bushing (4) while maintaining bushing alignment with paint marks on P2 carrier as shown in Figure 8.



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Figure 8. P2 Bushing Remover/Installer (2) With Handle (1) Inserted Into Current Bushing (4)

6. Install the current bushing (4) using J-43785 P2 Bushing Remover/Installer (2).
7. After current bushing installation, verify minimum lube hole clearance with a 3 mm Hex Key. Ensure 3 mm Hex Key can pass though each P2 carrier and bushing assembly lube hole. Refer to Figure 9 for checking lube hole clearance.



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Figure 9. Checking For Minimum Lube Hole Requirement

Figure 10 shows proper lube hole alignment after bushing installation. Figure 11 shows incorrect lube hole alignment, where bushing needs to be removed and re-installed until proper clearance is met.

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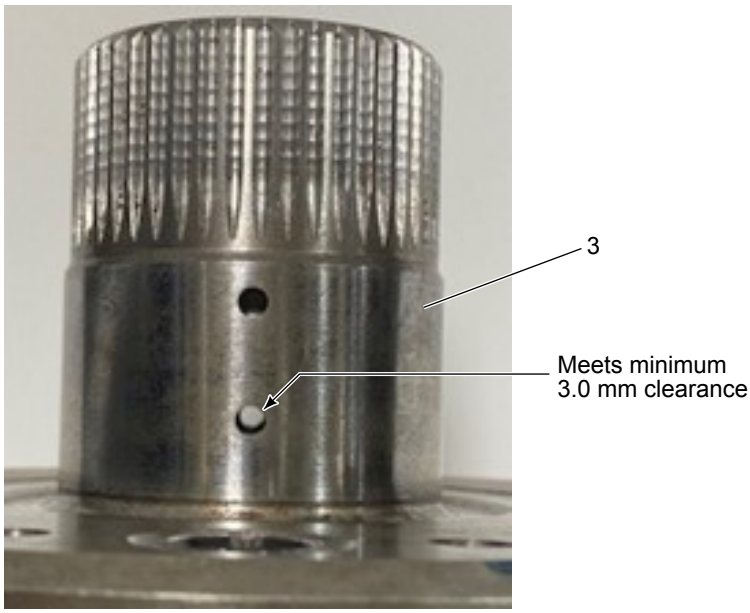


Figure 10. Correct Bushing Lube Hole Alignment

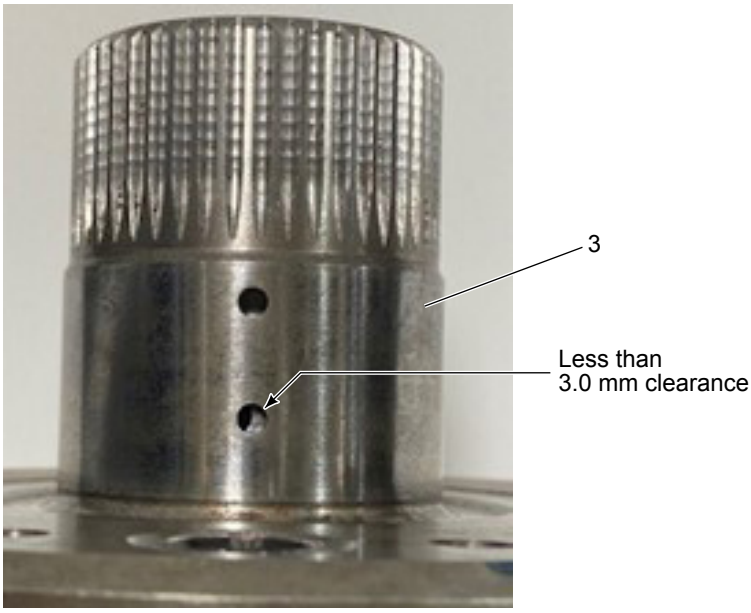


Figure 11. Incorrect Bushing Lube Hole Alignment

8. If the minimum lube hole alignment is not attained during bushing installation (as depicted in Figure 11), return to Step 1 of the Bushing Removal procedure above and repeat the P2 planetary carrier bushing replacement procedures until the minimum lube hole clearance is met (refer to Figure 9 and Figure 10).

CAUTION: A new bushing can only be reused a maximum of three times. If the installer notices minimal effort during bushing installation, then discard bushing and install a new bushing.

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