



PFITZNER

Performance Gearboxes

HONDA K-SERIES // TRANSFER CASE INSTALLATION MANUAL 2021



#coolgearsforcoolcars

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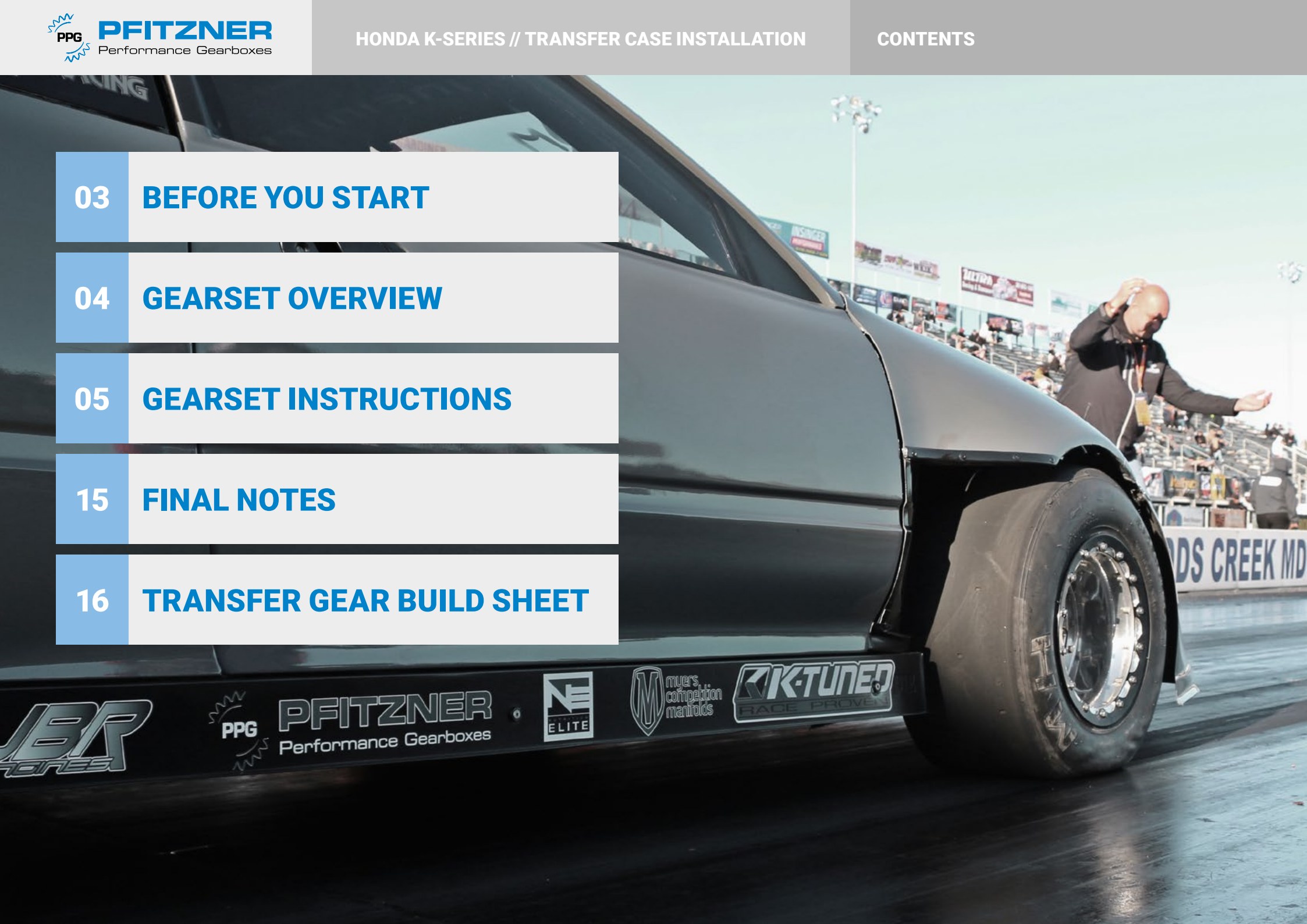
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JBR
RACING



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DOCUMENT NOTES

All measurements are in metric. All torque settings are as per OEM assembly, unless otherwise stated.

HONDA K-SERIES TRANSFER HYPOID GEAR SET CONTENTS

- ▶ 1 x Input Hypoid Gear
- ▶ 1 x Output Hypoid Gear
- ▶ 1 x 35mm diameter steel bearing spacer
- ▶ 1 x Heavy Duty Cup and cone roller bearing
- ▶ 1 x Billet Driven Gear Shaft Spacer

TOOLS AND CONSUMABLES REQUIRED

- ▶ Engineers Blue
- ▶ Assembly Oil
- ▶ 32mm Socket
- ▶ 36mm Socket
- ▶ Vernier Caliper & Micrometer
- ▶ 6mm Allen Key
- ▶ Clean Cloth
- ▶ Heat Oven or Heat Gun
- ▶ Please note that some OEM parts will need to be reused from your existing housing



GEARSET OVERVIEW

1. The Honda K-Series Transfer Case Hypoid Gears are supplied with a 35mm diameter bearing spacer, a cup and cone and a solid driven gear shaft spacer. These parts must be used when assembling this kit.
2. The figures given below are baseline settings only. The tolerance and the shims required, may change in different applications.
3. The below settings are intended for motorsport and race application ONLY and should not be applied to a street driven vehicle.
4. For street application please contact our sales team: sales@ppgearbox.com.au



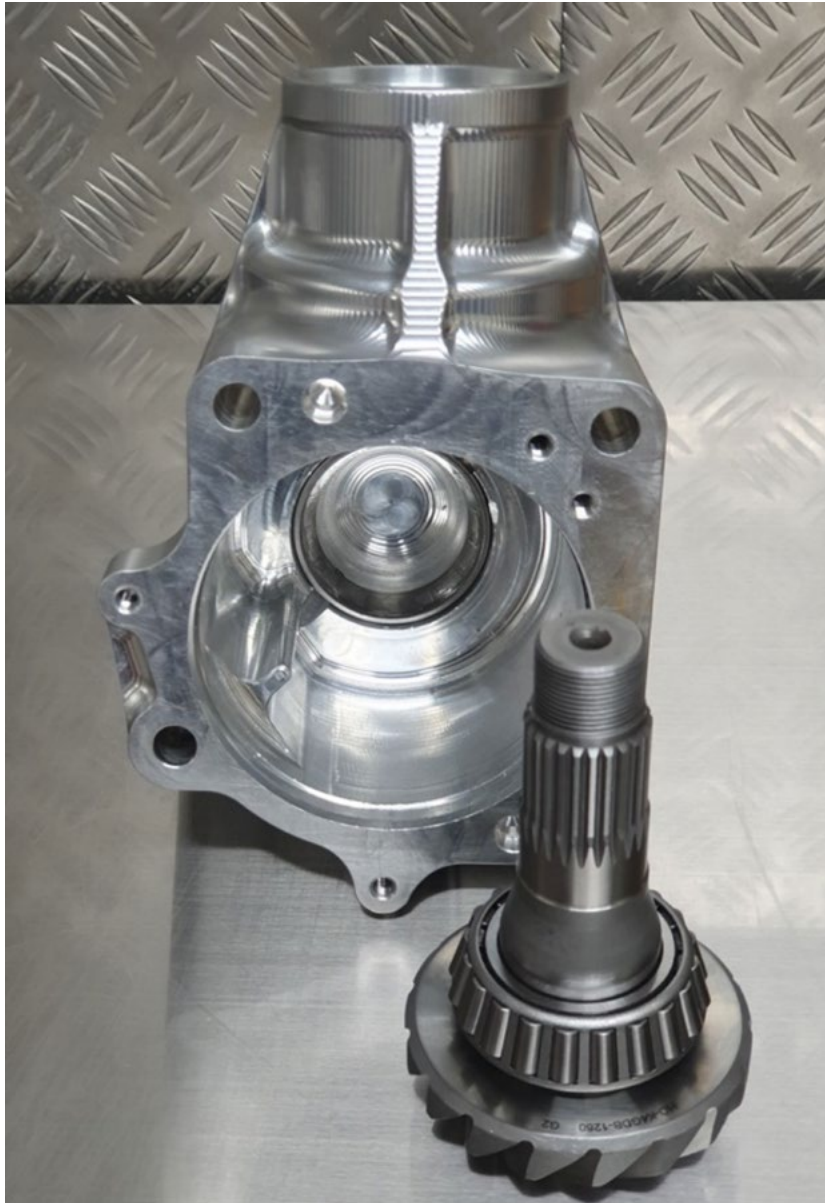
FIG 1
 Components supplied with
 the Pfitzner Performance
 Transfer Hypoid Gearset.

GEARSET INSTRUCTIONS

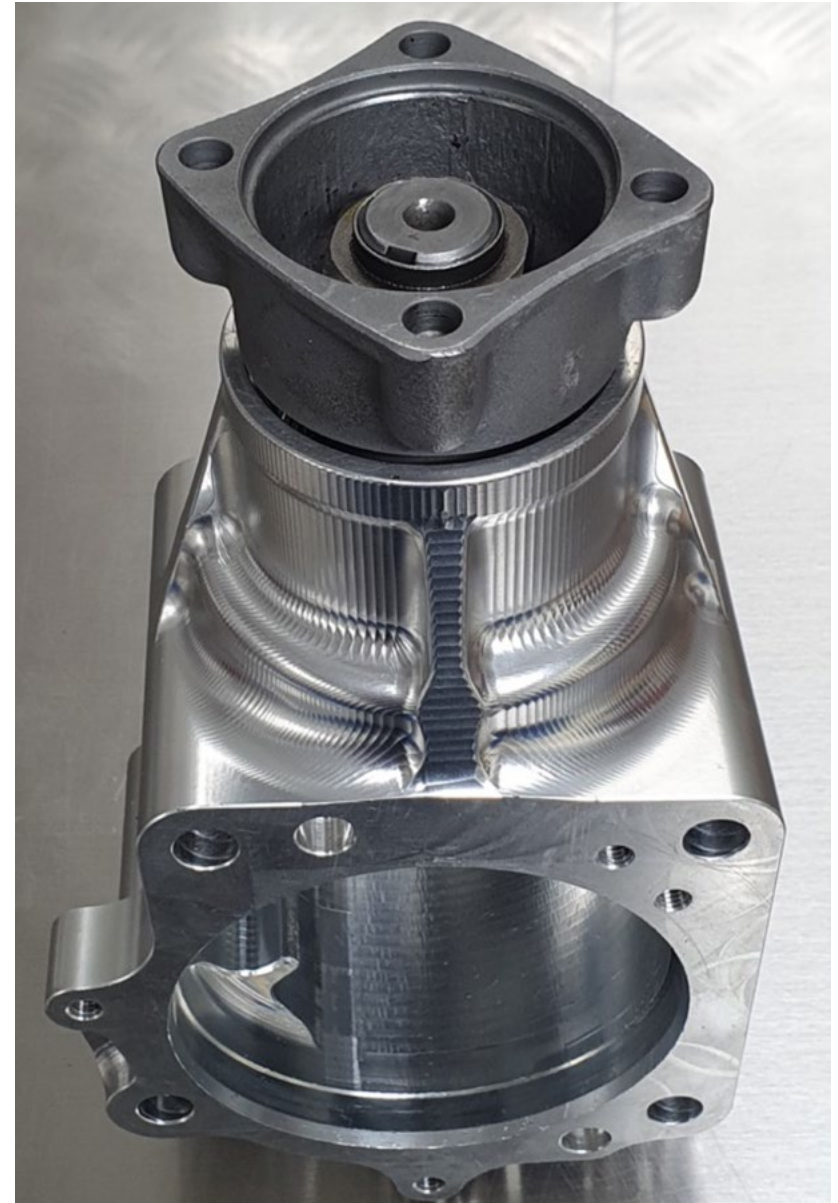
1. Fit the Supplied 35mm diameter spacer to the driven wheel, you will need to run a shim with this component also. Start with a 1mm shim. This shim will adjust the mesh of the driven wheel.
2. Fit the supplied bearing to the driven wheel, this bearing should slide on and of the shaft easily you may have to polish the shaft slightly to achieve this. Don't fit the solid shaft spacer at this stage, it's not required.
3. Fit the cups to the housing, you may have to heat the housing up to do this, let the housing completely cool down before trying to obtain any measurements.
4. Fit the shaft to the housing fit the coupling and do the nut up hand tight.



FIG 2
Hypoid gear driven
wheel & 35mm spacer



*FIG 3
Billet Transfer Gear
housing & hypoid gear
with installed heavy-
duty roller bearing and
35mm diameter spacer*



*FIG 4
Billet Transfer Gear
housing and output
flange installed*

5. Fit the OEM bearing to the drive wheel, you may need to heat the bearing slightly to fit this easily.
6. Assemble the rest of the shaft and fit into the lower housing
7. The shim that sits under the drive wheel cup adjusts the backlash; you want to set the backlash between 0.05 mm to 0.10 mm - (.002 - .004 in)
8. When building this unit in the factory we ended up with a 2.14 mm shim, this may vary in different housings.



*FIG 5
Drive wheel Input OEM
housing & hypoid gear and
heavy duty bearing and cup
with 2.14mm steel shim*

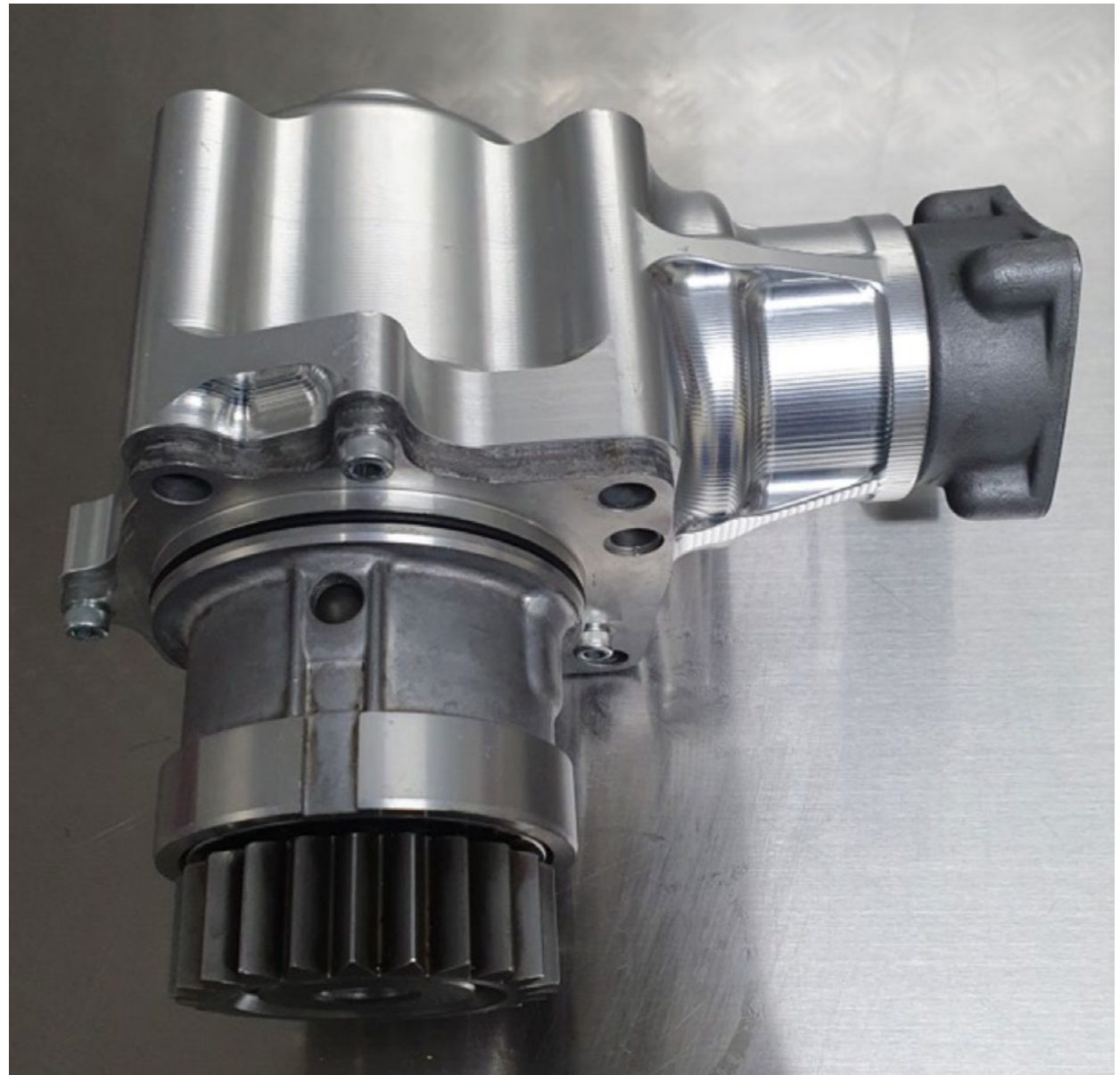
9. Fit and bolt the housings together



FIG 6
Drive wheel Input OEM housing
assembly ready for assembly

10. Rotate the unit a couple of times so everything is seated correctly, now check you backlash and adjust the shim until you reach the correct tolerance.
11. Once the correct backlash has been achieved you will need to mark the gears and check the contact patch to ensure the gears are meshing correctly.
12. The contact patch on the Gear, Fig 9 (HO-K4GDB-1259) needs to be in the center of the tooth face. If you have Heal or toe, contact you will need to adjust the 35mm diameter shim on the driven gear to achieve the correct contact patch, adjusting this will change your backlash so this will need to be re-adjusted and checked before re-checking your contact patch. For race application aim for the contact patch on the Pinion, Fig 8 (HO-K4GDB-1259) to be in the center about 2/3rds up the tooth face.
13. If you have flank or face (refer to images on page 11), contact you will need to adjust the shim under the drive wheel and adjust your backlash.

FIG 7
 Fully assembled Billet
 Transfer case & PPG
 hypoid gears installed





*FIG 8
Engineers blue applied to highlight the installed contact patch. Optimizing this contact is key to longevity*



*FIG 9
This indicates a good central tooth face contact patch and correct shim thickness for optimal performance.
Need to try and not use, toe contact, flank contact, heel contact & face contact, unless you are directly describing the outcome based on the images from page 11*

14. Once the correct meshing has been achieved you will need to set the pre-loads for both shafts.

TOE CONTACT

Use a thicker 35mm diameter thrust shim to move the transfer driven gear shaft toward the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear away from the transfer driven gear shaft to adjust the transfer gear backlash as follows:

- Increase the thickness of the 25mm diameter thrust shim.
- Reduce the thickness of the 76mm diameter thrust shim by the amount of increased thickness of the 25mm diameter thrust shim.

FLANK CONTACT

Use a thinner thrust shim to move the transfer drive gear toward the transfer driven gear shaft. Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Heel Contact.

HEEL CONTACT

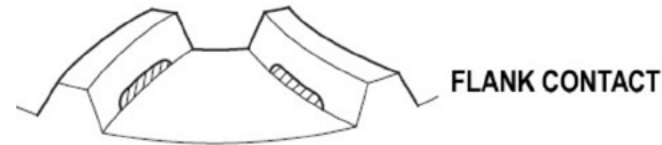
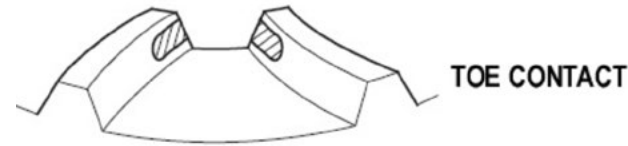
Use a thinner 35mm diameter thrust shim to move the transfer driven gear shaft away from the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear toward the transfer driven gear shaft to adjust the transfer gear backlash as follows:

- Reduce the thickness of the 25mm diameter thrust shim.
- Increase the thickness of the 76mm diameter thrust shim by the amount of reduced thickness of the 25mm diameter thrust shim.

FACE CONTACT

Use a thicker thrust shim to move the transfer drive gear away from the transfer driven gear shaft. Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Toe Contact.

FIG 10



15. To set the driven wheel shaft you will need to shim on top of the bearing supplied with the kit. You will be able to use the 35mm OEM shims for this.
16. The ideal preload is 2nm, I achieved this by using a 0.36 mm shim, this figure may vary slightly.



FIG 11
 Installing the correct
 measured shim for
 2nm preload

17. Fit the solid spacer supplied with the kit and fit the shaft into the housing and tension the nut.
18. Rotate the shaft a couple of times to ensure everything is seated correctly and check the preload, adding more shimming will reduce preload removing shimming will increase load.
19. Once the correct tolerance has been achieved remove the shaft from the housing.
20. The drive gear shaft has a shim that sits under the bearing for the main case. I used a 1.55 mm shim to achieve the correct preload, assemble the shaft, tension the nut, and fit the shaft to the housing.
21. Rotate the shaft a couple of times and check the preload. Adding shimming will increase preload reducing shimming will decrease load.



*FIG 12
The supplied billet
spacer installed*

22. Once you have set the preload on both shafts re-assemble the unit and re-check your contact patch markings to ensure nothing has moved. Once this has been done and everything is within specification the unit is ready for final assembly

Complete assembly, torqued up & ready to install. We recommend only quality Motul 75w-140 Gear Oil



*FIG 13
Complete assembly, torqued
up & ready to install. We
recommend only quality
Motul 75w-140 Gear Oil*

Final Shimming on Test Unit	Measured - Shim - Preload - Backlash
Driven Wheel 35mm Diameter Shim	1.03 mm
Driven Wheel Pre Load Shim	0.36 mm
Drive Wheel Pre Load Shim	1.55 mm
Drive Wheel Backlash Shim	2.14 mm
Shaft Pre-Load	2 Nm
Backlash	0.05 - 0.10 mm (0.002 - 0.004 in)

INSTALLATION TO THE CHASSIS

1. We recommend only the very highest quality MOTUL Lubricants at www.motul.com
2. Check and change oil often
3. You are now ready to race!
4. Good luck!

FINAL NOTES

If you are unsure or require clarification on any aspect of this installation guide, please email our sales team: sales@ppgearbox.com.au

To help record all the information on your new hypoid transfer gears, we have a build and setup sheet you can print and fill in on page 16 of this installation manual.

TRANSFER GEAR BUILD SHEET

To help record all the information on your new hypoid transfer gears, we have a build and setup sheet you can print and fill in.

GENERAL DETAILS

Date	
Customer Name	
Built & assembled by	
Tamper Seal Number	
Project Name	
Serial Number - ID	

BUILD RECORD

	Dry Assembly	Final Assembly
Driven Wheel 35mm Diameter Shim	mm	mm
Driven Wheel Pre Load Shim	mm	mm
Drive Wheel Pre Load Shim	mm	mm
Drive Wheel Backlash Shim	mm	mm
Shaft Pre-Load	Nm	Nm
Backlash	mm	mm
Is contact patch within spec?	Yes / No	Yes / No

Recommended: 2nm

Recommended: 0.05-0.10mm(0.002-0.004in)

Record Picture for visual reference

STRIPDOWN RECORD

Driven Wheel 35mm Diameter Shim	mm
Driven Wheel Pre Load Shim	mm
Drive Wheel Pre Load Shim	mm
Drive Wheel Backlash Shim	mm
Shaft Pre-Load	Nm
Backlash	mm
Is contact patch still within spec?	Yes / No

Recommended: 2nm

Recommended: 0.05 - 0.10 mm (0.002 - 0.004 in)