

5.3 CRANKCASE, CRANKSHAFT, TRANSMISSION

Inspection

Inspect drive pinion gear and output driven gear teeth for rusting, scratches, wear. Replace if necessary.

Inspect if bearing turns freely and smoothly. Replace if necessary.

When replacing any of crankcase, drive pinion gear, and drive pinion gear carrier, the adjustment shim should be readjusted. Refer to the content further.

Installation

Reverse the removal procedure for installation. Oil bearing and tighten nut to specified torque.

Tightening Torque: **145N·m**

Service tool:

Drive pinion gear bearing(6305) installer:

0180-062103-921-002

5.3.11 Shim Adjustment Procedure

When crankcase and/or drive pinion gear and/or ring gear and/or bearing carrier are replaced, the shim must be adjusted.

WARNING

Both gear backlash and tooth contact should be in specification.

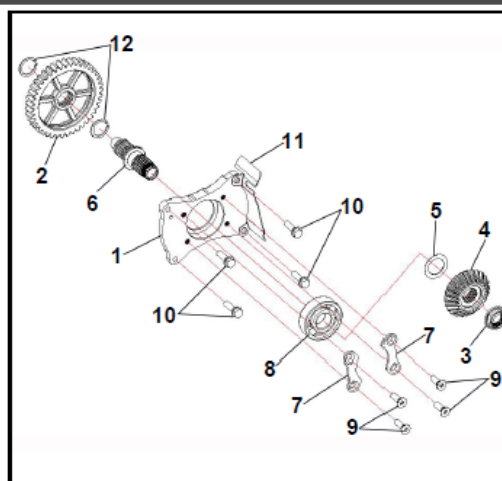
Gear clearance

Install drive pinion gear and ring gear then install crankcase gasket; Close crankcase and install some screws; To lock drive pinion gear, using a clean screwdriver, reach the hole of drive pinion gear seat through speed sensor hole, then pry output driven gear out of place in its axial direction; Install gear backlash measurement tools and dial gauge; Rotate ring gear shaft from engagement to engagement to measure gear backlash.

NOTE: Measure the gear backlash at 4 positions. Rotate the shaft 90° each time.

If gear backlash is out of specification, make the adjustment by adjusting the thickness of ring shim. Gear Backlash: 0.1mm~0.2mm(0.004in~0.008in)

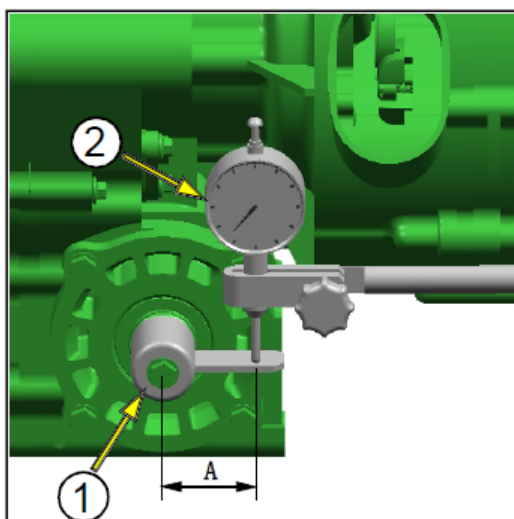
Adjusting method



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| 1. Drive Pinion Gear Carrier | 8. Ball Bearing |
| 2. Output Driven Gear | 9. Screws |
| 3. Drive Pinion Gear Nut | 10. Bolts |
| 4. Drive Pinion Gear | 11. Plate |
| 5. Adjustment Shim | 12. Circlips |
| 6. Drive Pinion Gear Shaft | |
| 7. Bearing Retaining Plate | |



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1. Gear clearance Measurement Tool
(P/N: 0800-062000-922-001)
2. Dial Gauge
A. 46mm(1.81 in)

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Gear Backlash	Shim Adjustment
$< 0.1 \text{ mm}$	Increase shim thickness
$0.1 \text{ mm} \sim 0.2 \text{ mm}$	Correct
$> 0.2 \text{ mm}$	Reduce shim thickness

Tooth Contact

After backlash adjustment is carried out, the tooth contact must be checked. Pay attention to the following procedures

Remove bevel gear from crankcase.

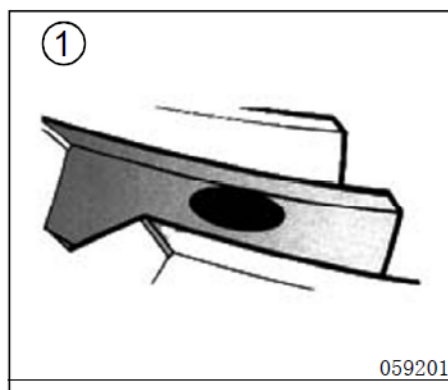
Clean and degrease drive pinion gear and ring gear teeth.

Apply a coating of machinist's layout dye or paste to several teeth of the driven gear

Install bevel gear

Rotate the ring gear several turns in both directions

Remove drive pinion gear and ring gear, then inspect the coated teeth of the drive pinion gear. The tooth contact pattern should be as shown below:



Rotate the ring gear several turns in both directions
Remove drive pinion gear and ring gear, then inspect the coated teeth of the drive pinion gear. The tooth contact pattern should be as shown below;

Pattern 1	Contact at tooth top	Incorrect
Pattern 2	Contact at tooth middle	Correct
Pattern 3	Contact at tooth root	Incorrect

If gear tooth contact is found to be correct (pattern 2), continue the next step.

If gear tooth contact is found to be incorrect (pattern 1 and pattern 3), the shim thickness between the drive pinion gear and ring gear must be changed and the tooth contact re-checked until correct.

NOTE: Clean the dye coated on the gear teeth after the tooth contact adjustment is finished.

Adjustment Steps

Gear touching	Adjusting washer thickness
Touching situation①	Get thinner
Touching situation③	Get thicker

CAUTION

Make sure to check the backlash after the tooth contact has been adjusted, since it may have changed. Adjust the tooth contact and backlash until they are both within specification. If the correct tooth contact cannot be maintained when adjusting the backlash, replace the drive gear and ring gear.

