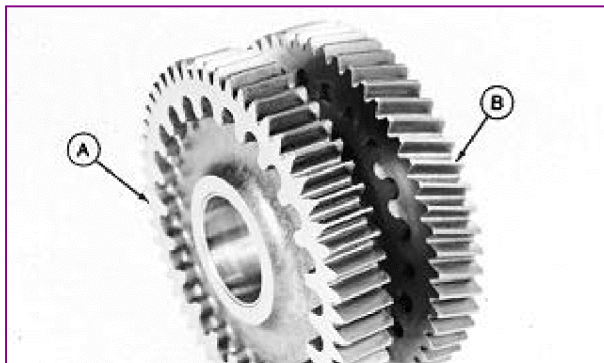


## CTM8 - Series 300 3029 (S.N. -499999), 4039, 4045, 6059 and 6068 Diesel Engines

### Measure Timing Gear Backlash

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#### Measure Timing Gear Backlash



RG6323-UN: Spur and Helical Gears

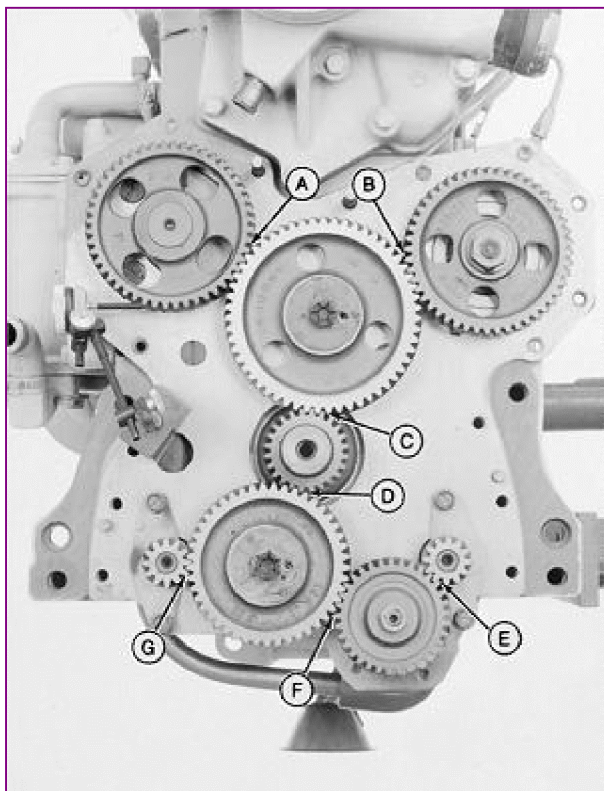
#### LEGEND:

- A - Spur Gear
- B - Helical Gear

Spur gears (A) have different backlash specifications than helical gears (B).

Only earlier Saran-built engines had spur timing gears. All Dubuque-built engines and later Saran-built engines have helical timing gears.

#### Helical Timing Gears



T94704-UN: Engine Gear Train

**LEGEND:**

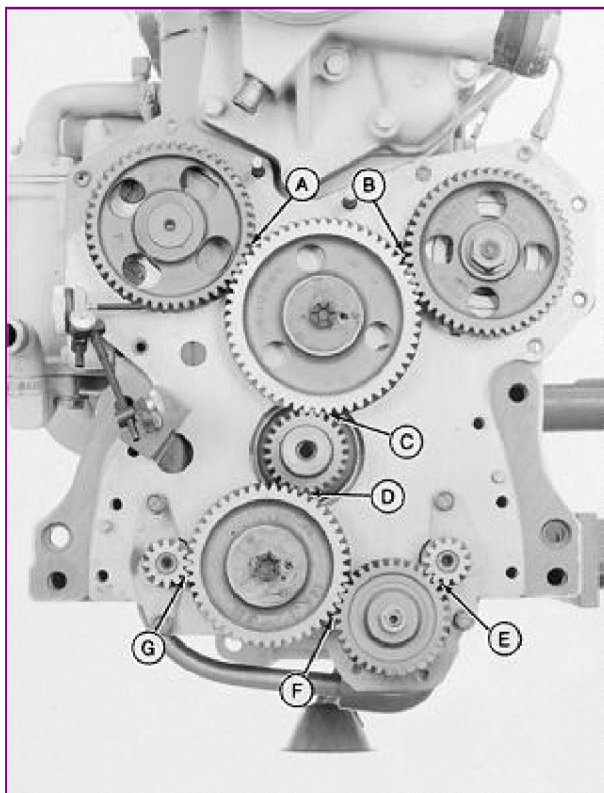
- A - Camshaft Gear-to-Upper Idler Gear
- B - Injection Pump Gear-to-Upper Idler Gear
- C - Upper Idler Gear-to-Crankshaft Gear
- D - Crankshaft Gear-to-Lower Idler Gear
- E - [Balancer Shaft Gear-to-Oil Pump Gear4-cylinder engine only]
- F - Oil Pump Gear-to-Lower Idler Gear
- G - [Lower Idler Gear-to-Balancer Shaft Gear4-cylinder engine only]

Measure timing gear backlash.

For engines with helical gears, compare measurements taken to the following specifications:

Item	Measurement	Specification
<b>Helical Gears:</b>		
Camshaft-to-Upper Idler (A)	Backlash	0.07—0.35 mm (0.003—0.014 in.)
	Wear Limit	0.51 mm (0.020 in.)
Injection Pump-to-Upper Idler (B)	Backlash	0.07—0.35 mm (0.003—0.014 in.)
	Wear Limit	0.51 mm (0.020 in.)
Upper Idler-to-Crankshaft (C)	Backlash	0.07—0.30 mm (0.003—0.012 in.)
	Wear Limit	0.40 mm (0.016 in.)
Crankshaft-to-Lower Idler (D)	Backlash	0.07—0.35 mm (0.003—0.014 in.)
	Wear Limit	0.51 mm (0.020 in.)
Balancer Shaft-to-Oil Pump (4-Cyl Only) (E)	Backlash	0.05—0.36 mm (0.002—0.015 in.)
	Wear Limit	0.51 mm (0.020 in.)
Oil Pump-to-Lower Idler (F)	Backlash	0.04—0.36 mm (0.0016—0.015 in.)
	Wear Limit	0.40 mm (0.016 in.)
Lower Idler-to-Balancer Shaft (4-Cyl Only) (G)	Backlash	0.05—0.40 mm (0.002—0.016 in.)
	Wear Limit	0.51 mm (0.020 in.)

## Spur Timing Gears



T94704-UN: Engine Gear Train

**LEGEND:**

- A - Camshaft Gear-to-Upper Idler Gear
- B - Injection Pump Gear-to-Upper Idler Gear
- C - Upper Idler Gear-to-Crankshaft Gear
- D - Crankshaft Gear-to-Lower Idler Gear
- E - [Balancer Shaft Gear-to-Oil Pump Gear4-cylinder engine only]
- F - Oil Pump Gear-to-Lower Idler Gear
- G - [Lower Idler Gear-to-Balancer Shaft Gear4-cylinder engine only]

For the following Saran-built engines with spur gears, compare measurements taken to specifications listed:

5300 Tractors (—242551)

5200/5400 Tractors and All 3-Cyl Engines (—270818)

5500 Tractors and All 4-Cyl Engines (—286631)

Item	Measurement	Specification
<b>Spur Gears (Saran-Built Engines): 5300 Tractors (—242551), 5200/5400 Tractors and All 3-Cyl Engines (—270818), 5500 Tractors and All 4-Cyl Engines (—286631)</b>		
Camshaft-to-Upper Idler (A)	Backlash	0.08—0.45 mm (0.003—0.018 in.)
	Wear Limit	0.85 mm (0.033 in.)
Injection Pump-to-Upper Idler (B)	Backlash	0.08—0.45 mm (0.003—0.018 in.)
	Wear Limit	0.85 mm (0.033 in.)
Upper Idler-to-Crankshaft (C)	Backlash	0.04—0.35 mm (0.0016—0.014 in.)
	Wear Limit	0.60 mm (0.024 in.)
Crankshaft-to-Lower Idler (D)	Backlash	0.04—0.35 mm (0.0016—0.014 in.)
	Wear Limit	0.65 mm (0.025 in.)

Oil Pump-to-Lower Idler (F)	Backlash	0.08—0.40 mm (0.003—0.016 in.)
	Wear Limit	0.75 mm (0.030 in.)
Camshaft-to-Auxiliary Drive	Backlash	0.09—1.24 mm (0.004—0.049 in.)
	Wear Limit	1.34 mm (0.053 in.)

For the following Saran-built engines with spur gears, compare measurements taken to specifications listed on the following page:

5300 Tractors (242552— )

5200/5400 Tractors and All 3-Cyl Engines (270819— )

5500 Tractors and All 4-Cyl Engines (286632— )

Item	Measurement	Specification
<b>Spur Gears (Saran-Built Engines): 5300 Tractors (242552— ), 5200/5400 Tractors and All 3-Cyl Engines (270819— ), 5500 Tractors and All 4-Cyl Engines (286632— )</b>		
Camshaft-to-Upper Idler (A)	Backlash	0.01—0.52 mm (0.000—0.20 in.)
Injection Pump-to-Upper Idler (B)	Backlash	0.01—0.52 mm (0.000—0.020 in.)
Upper Idler-to-Crankshaft (C)	Backlash	0.01—0.49 mm (0.000—0.019 in.)
Crankshaft-to-Lower Idler (D)	Backlash	0.01—0.46 mm (0.000—0.018 in.)
Balancer Shaft-to-Oil Pump (4-Cyl Only) (E)	Backlash	0.01—0.47 mm (0.000—0.018 in.)
Oil Pump-to-Lower Idler (F)	Backlash	0.01—0.49 mm (0.000—0.019 in.)
Lower Idler to Balancer Shaft (4-Cyl Only) (G)	Backlash	0.01—0.53 mm (0.000—0.020 in.)
Camshaft-to-Auxiliary Drive	Backlash	0.01—0.54 mm (0.000—0.021 in.)

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