

## Bevel Pinion Carrier Improvement - PA55 & PA56

An improvement was made to the design of the bevel pinion carrier with regards to the dual tapered bearing support of the pinion. For more than 25 years, Carco used a Timken "set-right" matched bearing set with cup and cone spacers. The .005 - .010 in. (.13 - .25 mm) typical end-play that was always present in the "set-right" bearing set could at times make setting bevel gear back-lash difficult. The bearing cups were arranged with the thick ends (small ID) against a matched shoulder spacer held in position by a retaining ring in the carrier bore. The bearing cones were separated by a spacer ground to a pre-determined thickness. When the bearing lock-nut was tightened to 150 lb-ft (203.4 N-m) torque, the bearing cones were firmly clamped against the spacer. The end-play mentioned above resulted from the retaining ring-to-groove clearance and the shoulder spacer-to-retaining ring clearance.

The new bevel pinion carrier contains a shoulder machined in the bore that locates and separates the bearing cups. The bearing cones no longer use a cone spacer between them. The bearings are adjusted by carefully tightening the bearing lock-nut to produce a 10 lb-in (1.3 N-m) rolling torque. The bevel pinion has no end-play so the bevel gear back-lash and contact adjustments are easier and more accurate. The bearing cone close to the pinion head supports the axial thrust of the bevel gear set and the bearing cone toward the tractor can resist thrust that may be induced by the tractor PTO shaft.

The original design carrier housing is no longer available and is fully serviced by the new "rolling torque" bevel pinion carrier. Refer to the chart below for replacement carrier part numbers.

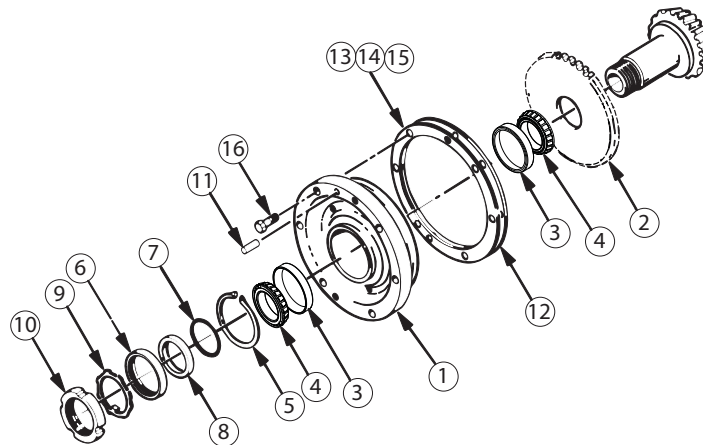
Original	Current	Typical Application
118-7222	317-7551	Caterpillar D4H, D5H, D5M, D6M, D5N, D6N, D6H, D6R, D6T
130-0042	107178 *	Caterpillar D6D, D6E, D6G (Not D6GII)

\* PACCAR part number. Caterpillar part number not available at this time.

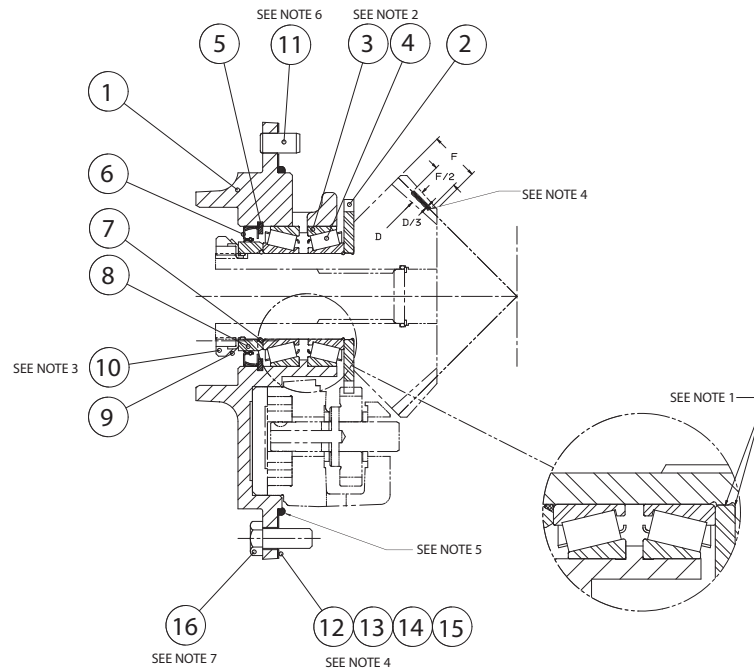
ITEM	PART NO.	DESCRIPTION	QTY
1	317-7551	BEVEL PINION CARRIER	1
	107178 *	BEVEL PINION CARRIER	
2	118-6589	PUMP PINION	1
3	7K-5448	TAPER ROLLER BEARING CUP	2
4	7K-5449	TAPER ROLLER BEARING CONE	2
5	119-2157	RETAINING RING	1
6	120-7638	OIL SEAL	1
7	118-5804	O-RING	1
8	118-8381	SEAL SPACER	1

ITEM	PART NO.	DESCRIPTION	QTY
9	119-1618	LOCKWASHER	1
10	119-1617	BEARING LOCKNUT	1
11	123-4403	DOWEL PIN	1
12	118-5854	SHIM, GASKET	1
13	118-5855	SHIM .005 in. (.13 mm)	2
14	118-5856	SHIM .007 in. (.18 mm)	2
15	118-5857	SHIM .020 in. (.51 mm)	2
16	8T-8917	CAPSCREW, HEX HD (1/2 - 13 X 1-1/4 GD8 Z)	6

\* PACCAR part number. Caterpillar part number not available at this time.



(over)



### Assembly Notes:

1. Clean press-fit mounting surfaces on bevel pinion and pump drive pinion (2) with Loctite Cleaner 7070. Apply Loctite 609 to the pump pinion mounting surface on the bevel pinion and press pump pinion onto bevel pinion and seat securely against pinion shoulder.
2. Clean preservative oil off of bearing cups and cones. Press bearing cone (4) onto bevel pinion and fully seat against pump drive pinion as shown. Install bearing cups (3) into bevel pinion carrier (1) with thick edge; small inside diameter against the shoulder. Install the bevel pinion sub-assembly into the carrier. Install the remaining bearing cone onto the bevel pinion. Install o-ring (7) onto pinion against the outer bearing cone. Install retaining ring (5) into bevel pinion carrier bore. Apply Permatex Aviation Form-A-Gasket liquid sealant to the outside surface of seal (6) and press into carrier bore with the open spring side of the seal facing the bearings. NOTE: Bevel pinion carriers used with an adapter gearbox or "drop-box" for Komatsu tractors will install seal (6) with the open spring side toward the tractor. Apply light grease to the inside and outside surface of seal spacer (8) and install with inside diameter chamfer for o-ring (7) toward the bearings.
3. Install bearing lockwasher (9) and bearing locknut (10) onto pinion. Clamp pinion gear in workshop vise equipped with aluminum or bronze jaw protectors. Rotate bevel pinion carrier to align bearing cone rollers as you slowly tighten the bearing lock nut. When a slight drag is noticed as the bevel pinion carrier is rotated, remove carrier from vise and wrap nylon cord around the bevel pinion and slowly pull the cord at a steady rate and measure the resistance with a "fish scale". At the pump drive pinion diameter, the rolling torque should be approximately 3 pounds (1.4 kg). If a dial-type torque wrench is available, install the PTO adapter shaft into the bevel pinion and fabricate an adapter or find a socket that fits the torque wrench/meter and can turn the PTO shaft. The rolling torque should be 8-10 lb.-in. (1.1 N-m). Bend bearing lockwasher tang up to lock nut in correct position.
4. Install shim gasket (12) onto pilot of bevel pinion carrier. Install shims (13, 14, and 15) as required to produce a bevel pinion/gear contact pattern as shown with .006 - .012 in. (.02 - .04 mm) average bevel gear back-lash checked in three different locations on bevel gears.
5. Apply approximately .20 in. (5 mm) continuous bead of Dow RTV 732 or equivalent silastic sealant to carrier pilot as shown.
6. Clean dowel pin (11) with Loctite Cleaner 7070 and apply Loctite 242 or 243 to dowel pin and install into winch case.
7. Install completed bevel pinion carrier assembly into winch case. Clean capscrews (16) with Loctite Cleaner 7070. Apply Loctite 242 or 243 to capscrews and evenly tighten to 80 lb.-ft. (108 N-m) torque.