

Problem - Drum Fatigue

The most common premature failure of a brake drum is illustrated in the top photo. A crack has propagated across the center of a wheel stud hole and extends down the side of the drum. This is caused when a drum is not properly seated on the hub and is misaligned or cocked during assembly.

Root Cause

1. During installation the drum can hang up on the small step between the wheel and drum pilot diameters on the hub. Therefore the portion of the drum at the 12:00 position does not rest on the flange of the hub leaving a gap between these mating surfaces. When the wheel & wheel nuts are installed and torqued it creates a high concentration load on the area of the drum flange that is not supported by the hub. If a stud hole is in this location there is less cross sectional area to resist the load and the drum can crack.
2. Improper cleaning of the hub before installing a new drum. During normal operation the drum pilot diameter on the hub gets rusty and encrusted with road debris. If the pilot diameter is not cleaned, the material build-up can make it difficult to slide the drum into position. The drum may appear to be in full contact with the hub flange, when in fact it is seated against a heavy build up of road debris. This is especially true in areas where urea and other de-icing chemicals are used in the winter.

Corrective Action

1. Clean the hub's pilot diameter with a wire brush before mounting. Chemicals can form rock hard material build up which may require a chisel to remove.
2. The wheel nuts should be installed and snugged to about 50 ft- lbs in the sequence shown in Figure 1. The crisscross sequencing allows the drum to properly seat itself if not fully seated prior to installing the wheels. After all of the nuts are installed, tighten the nuts to the recommended torque shown in Table 1 using the same crisscross sequence. If the wheel nuts are fully torqued without the 50 ft-lb step, the drum can cock and remain misaligned during the remaining nut torquing.

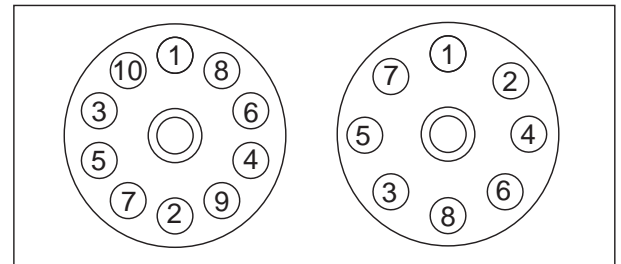


Figure 1: Nut Tightening Sequence for Hub Piloted Disc Wheels

TABLE 1 RECOMMENDED MOUNTING TORQUE FOR DISC WHEELS		
Mounting Type	Nut Thread	Torque Level Ft-Lb (Oiled*)
Hub Piloted with flange nut	11/16" - 16	300-400
	M20 x 1.5	280-330
	M22 x 1.5	450-500
		Ft-Lb (Dry)
Stud-Piloted, double cap nut Standard type (7/8" radius)	3/4"-16	450-500
	1-1/8"-16	450-500
Stud-piloted, double cap nut Heavy duty type (1-3/16" radius)	15/16"-12	750-900
	1-1/8"-16	750-900
	1-5/16"-12	750-900

* See "Disc Wheel Installation Procedure-Hub Piloted Disc Wheel System", Step 10

Notes:

1. If using specialty fasteners, consult the manufacturer for recommended torque levels.
2. Tightening wheel nuts to their specified torque levels is extremely important. Under tightening which results in loose wheels can damage wheels, studs and hubs and can result in wheel loss. Over tightening can damage studs, nuts and wheels and result in loose wheels as well.
3. Regardless of the torque method used, all torque wrenches, air wrenches and any other tools should be calibrated periodically to ensure the proper torque is applied.

OTR Drums are the SMART choice
because there's NO TIME FOR DOWNTIME.