



GM Locomotive Group

LOCOMOTIVE POINTERS

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HANDHOLE COVER INSPECTION

Due to an inconsistency in tapping of threads in handhole cover crossbar to handwheel stem pin 8262316, Figure 1, EMD recommends that all handhole covers made since 1986 be inspected at a scheduled routine inspection.

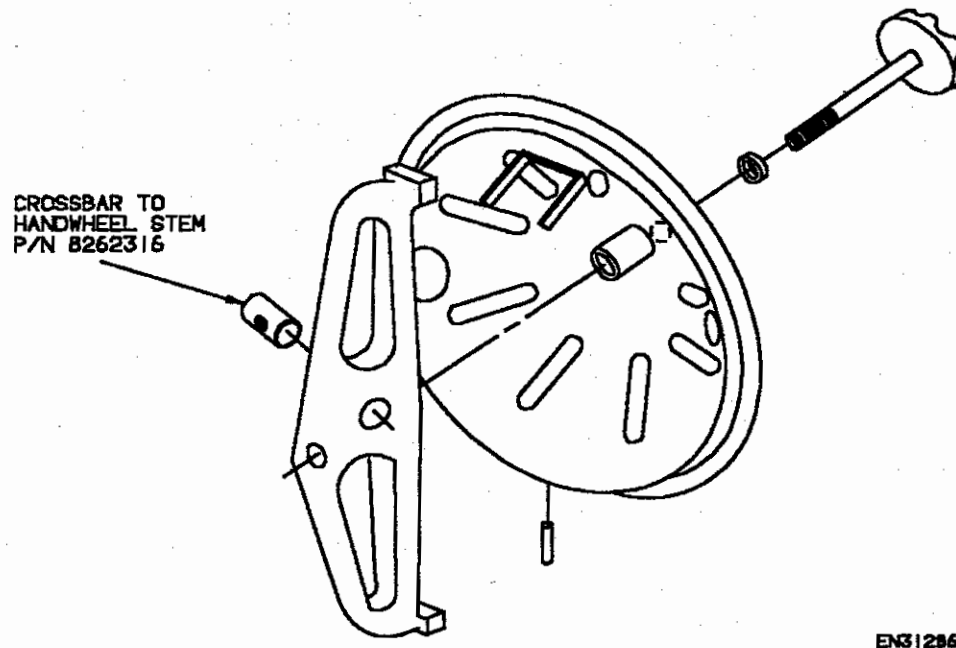
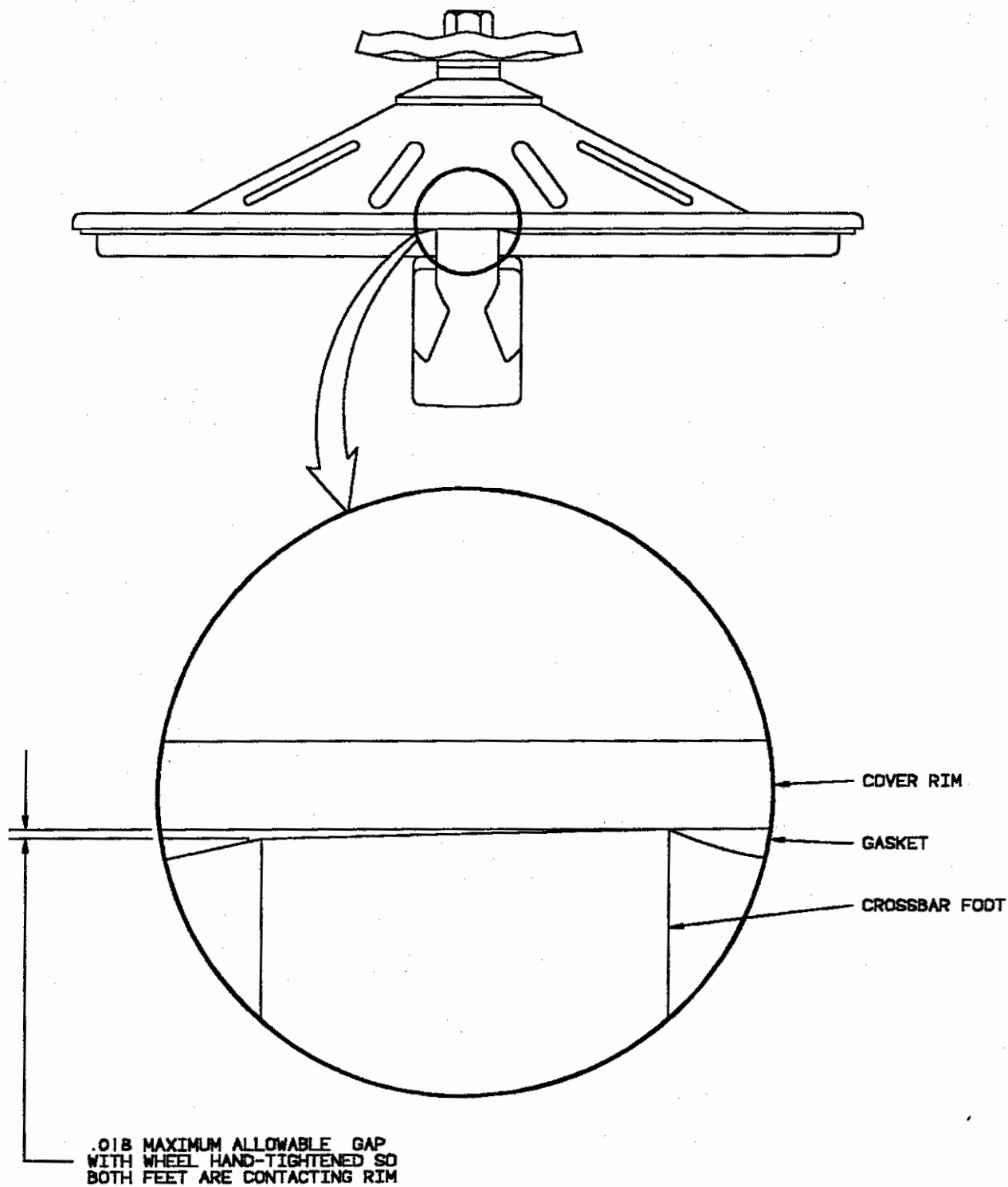


Figure 1. Handhole Cover Assembly

The subject pins may have been tapped on a angle which is not perpendicular to the axis of the pin resulting in a bending fatigue in the handwheel stem when applied to the air box. Under these conditions, the stem is subject to a fatigue fracture and, due to the high air box pressure exerted, can blow out at high engine speeds.

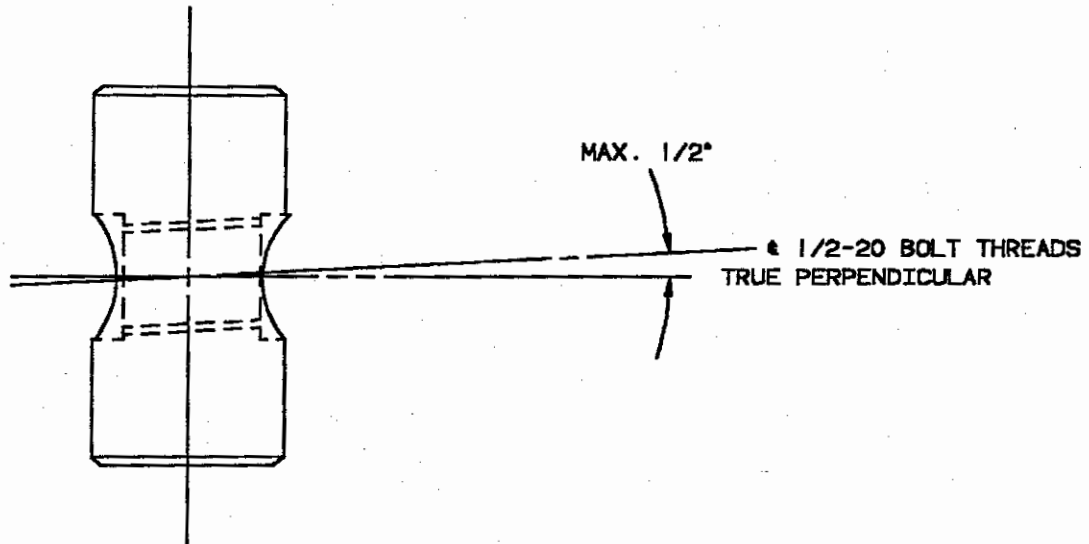
To perform the inspection, it is necessary to remove each handhole cover, turn the handwheel in until both flat surfaces of the crossbar are close to or touching the outer rim of the cover, as shown in Figure 2 on page 2. If these two surfaces are not parallel within the specified limit, the cover assembly should be disqualified for use until the crossbar to handwheel stem pin and handwheel assembly are replaced with qualified pieces. It is important that the handwheel assembly be replaced since fatigue cracking within the bolt threads may have been initiated while in service with the defective pin.



EN31287

Figure 2. Handhole Cover Qualification

If further qualification of the threads is necessary, the crossbar to handwheel stem pin must be removed from the handhole cover and qualified as shown in Figure 3. A threaded bolt or pin can be turned into the 1/2"-20 threads of the pin to determine the perpendicularity of the threads. The maximum angle the handwheel stem can be off the perpendicular centerline of the pin is one half ($1/2^\circ$) degree.



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Figure 3. Handwheel To Stem Pin

WARNING

All 645F, 645FB, and 710G engine applications must utilize cover assemblies with the higher strength crossbars only (identified by an embossed "9-million" part number, Figure 4) in order to ensure an adequate margin of safety against fracture. Do not tighten handhole cover bolts more than the 27-41 N.m (20-30 ft-lbs) recommended in the Engine Maintenance Manual EMM.

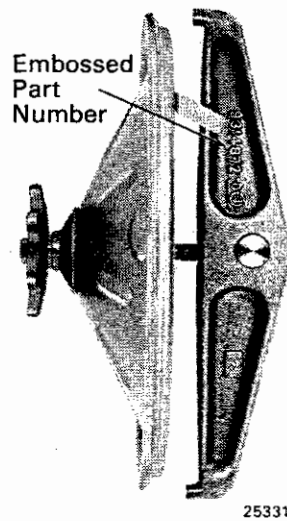


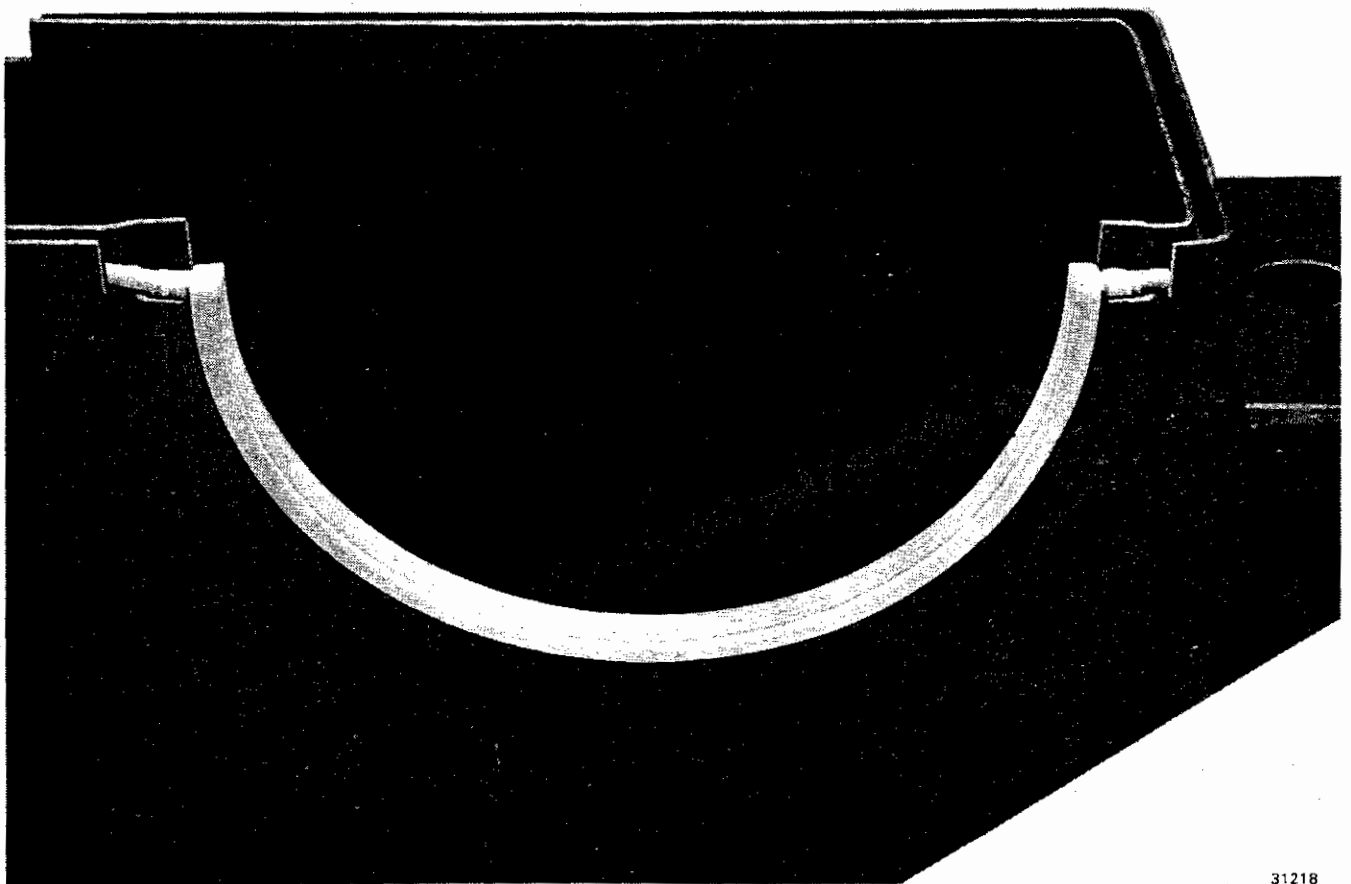
Figure 4. Typical High Strength Crossbar Identification

NEW GEAR CASE PINION SEAL

A new gear case pinion seal P/No. 40012790, Figure 5, replaces felt seal P/No. 8250270 and fits into gear case channels without any modifications. The new seal is made of a molded plastic material and provides approximately 50% more sealing area than the felt seal.

This new seal will provide sealing improvements over the felt seal in both grease and oil filled gear cases, although the improvement is most evident when using oil.

The new pinion seal can be used on all D77, D87, and E88 type traction motors, or wherever felt seal P/No. 8250270 was used.



31218

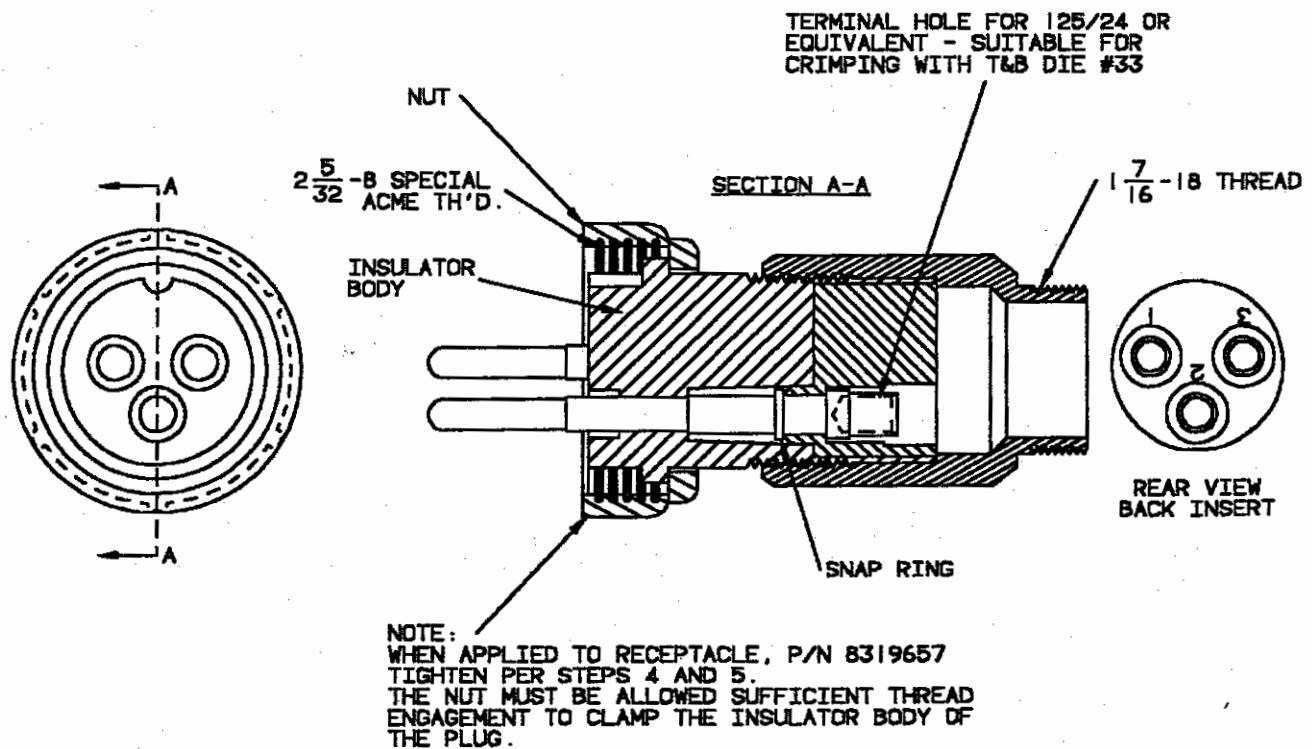
Figure 5. Plastic Gear Case Pinion Seal. (P/ No. 40012790)

LOCOMOTIVE COOLING FANS and BLOWER MOTOR PLUGS and RECEPTACLES

The purpose for the following information is to notify EMD customers of a procedure to be used in connecting auxiliary motors to locomotive wiring when the connection is made by a plug and receptacle. Presently, radiator cooling fan motors and inertial filter blower motors are connected to locomotive wiring in this manner.

This procedure should be followed whenever such motors are applied to a locomotive or when a plug and receptacle connection is identified as being loose.

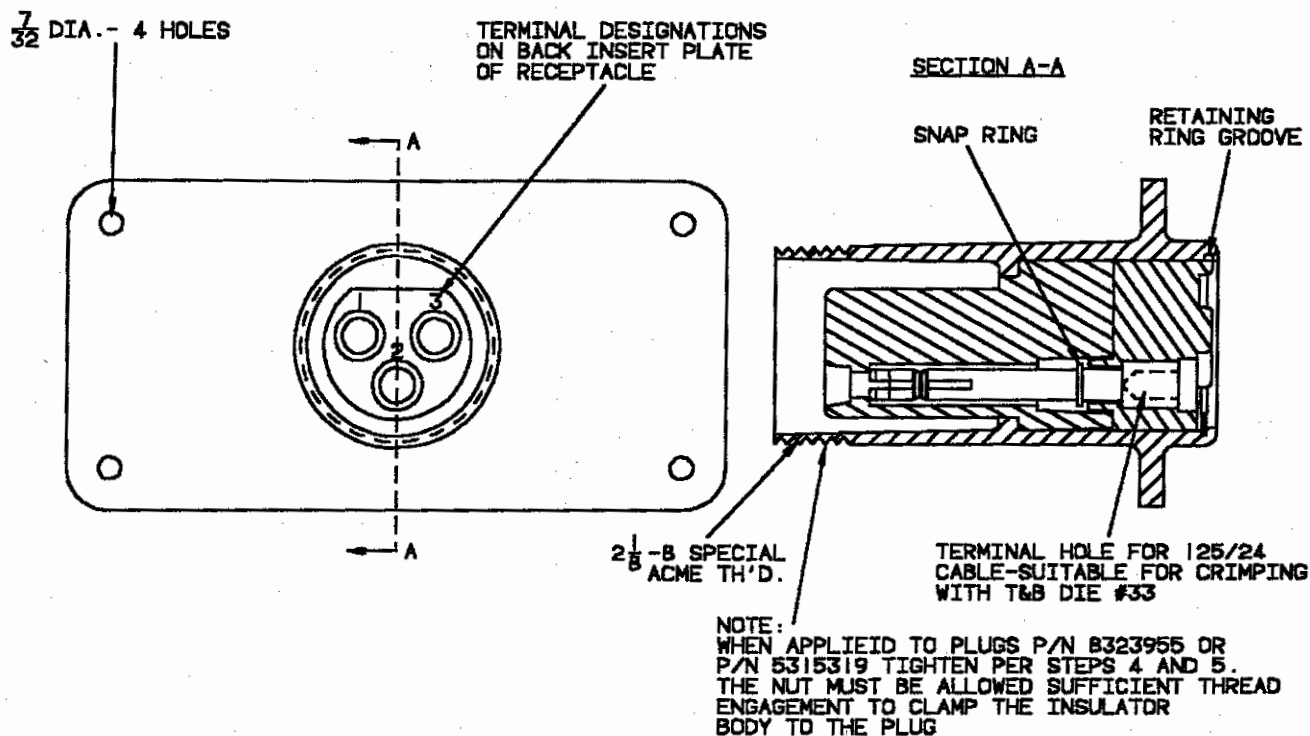
1. Inspect the plug (P/ No. 8323955 or 5315319) for physical damage and proper assembly. Such damage could include bent or dirty pins or a smashed nut and/ or plug body due to handling damage. Proper assembly is shown in the plug diagram, Figure 6. When pushed toward the plug body, pin protrusion should be a minimum of 1.375". Also, inspect the braided conduit for handling damage. Correct any problems before proceeding.



EE31196

Figure 6. Typical Plug Assembly

- Inspect the receptacle (P/ No. 8319657) for thread damage and proper assembly. Proper assembly is indicated when the insulating body of the receptacle is held solidly in place by the retaining ring and is approximately 7/16" from the face of the receptacle body as shown in the receptacle diagram, Figure 7. Correct any problems before proceeding.



EE31197

Figure 7. Typical Receptacle Assembly

- Insert the plug into the receptacle so that the plug insulator body seats against the face of the receptacle body.
- Tighten the nut hand tight. The insulating body of the plug should be clamped between plug nut and receptacle face when the nut is hand tight. If it is not, push the plug body into receptacle body to ensure seating and retighten. If the insulating body of the plug is still not clamped, it is likely that the problem is due to a thread taper problem on the receptacle and it will require replacement.
- After the plug insulating body has been clamped against the receptacle by hand tightening, per step 4 above, tighten the nut an additional 1/8th of a turn using a pipe wrench, or channel lock pliers.
- The prescribed method for plug and receptacle application should eliminate the potential for a loose connection which could result in a fan or motor failure from a high resistance connection and subsequent burning of the plug pin and receptacle.

7. If a fan or motor is removed from a locomotive and any of the plug pins are burnt, a loose connection should be suspected. In some cases, the fan or motor has already failed from single phase burning due to the burnt pin. To eliminate a reoccurrence of a failure, it is suggested that the receptacle be repaired or replaced as the mating portion to the burnt pin is also burnt and damaged.
8. It is recommended that fans and motors on all locomotives be inspected for the possibility of a loose plug. If found loose, remove plug from receptacle and inspect for burnt pins. If acceptable, reapply plug and tighten per step 5 above.

CARRIER INSERT BEARING ASSEMBLY PROCEDURE

On blower-type engines and early model turbo-type engines (those without "rocking" type piston pins), the piston pin insert bearing is installed into the carrier assembly in a broached slot, Figure 8. Tangs at each end of the bearing insert are bent into a counterbore on the carrier to prevent endwise movement. Service tool part number 8311268 is available for the staking of the insert tabs.

When the tabs of the insert are bent or deformed into the counterbore and allowed to make contact with the carrier, zero bearing end play results. This often leads to bearing "lift off" from the carrier bearing bore, resulting in bearing misalignment. Further, this misalignment may result in excessive bearing loading at either end of the bearing insert at the 12 o'clock position.

This procedure is being revised, specifying a 0.005" minimum gap after staking between the tab and carrier seating surface, along with a 0.015" maximum bearing end play. This revised installation procedure should result in positive bearing retention without bearing misalignment, with minimal bearing movement.



17968

Figure 8. Piston Pin Bearing Insert Installation