GM Locomotive Group

LOCOMOTIVE POINTERS

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YAW DAMPER APPLICATION INSTRUCTIONS

To ensure the performance and reliability of EMD Yaw Dampers, special procedures are necessary during locomotive assembly which must be practiced during maintenance operations as well.

ALL YAW DAMPERS

1. SAE Grade 5 bolts must be used exclusively, torqued to 156 N.m (115 ft. lbs.) lubricated or 203 N.m (150 ft. lbs.) dry minimum.

2. All mounting hardware used should be original or equivalent, Figure 1.

NOTE

Do NOT omit any washers or use bolts longer than original as this could result in bolt threads bottoming against yaw damper reservoir/ dust tube during truck swings in curves.

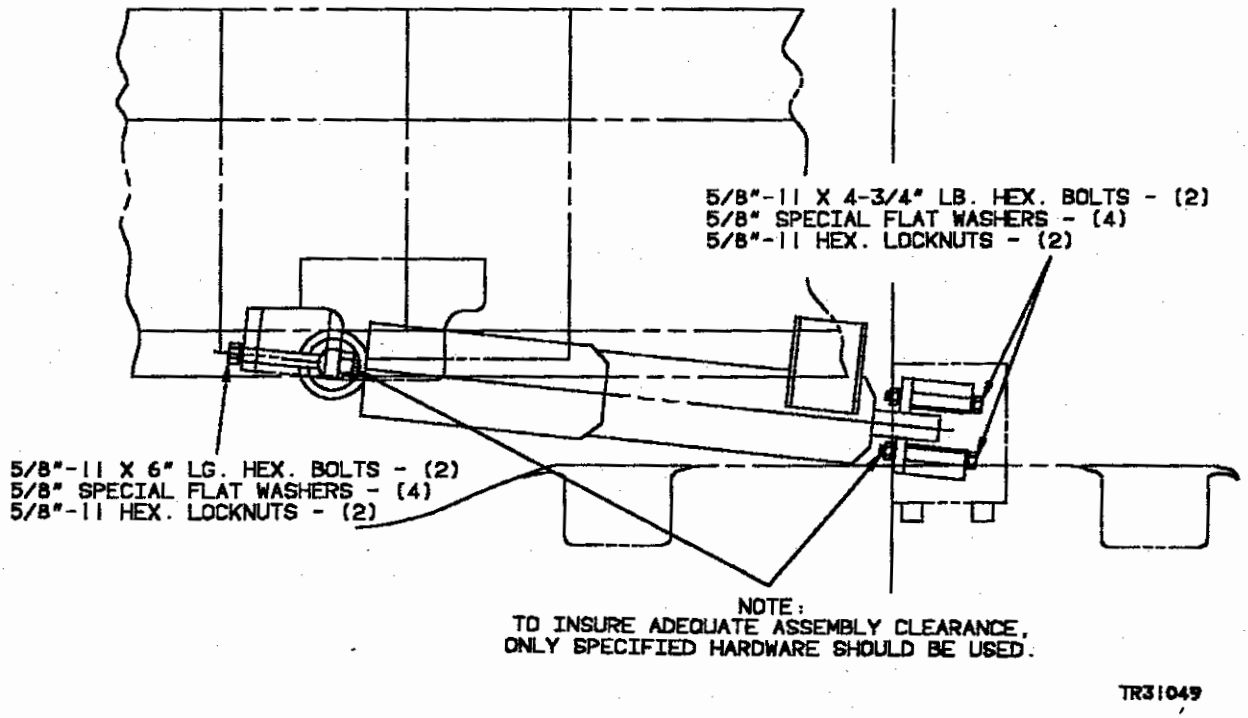

Figure 1. TYPICAL YAW DAMPER APPLICATION

YAW DAMPERS WITH DOME

Yaw damper models with a dome (P/Nos. 9531871, 9557295, and 9582080) are always installed with the dome in an upright position, Figure 2. Failure to install dampers in this manner will reduce the damper force output and its capability to control truck hunting oscillations.

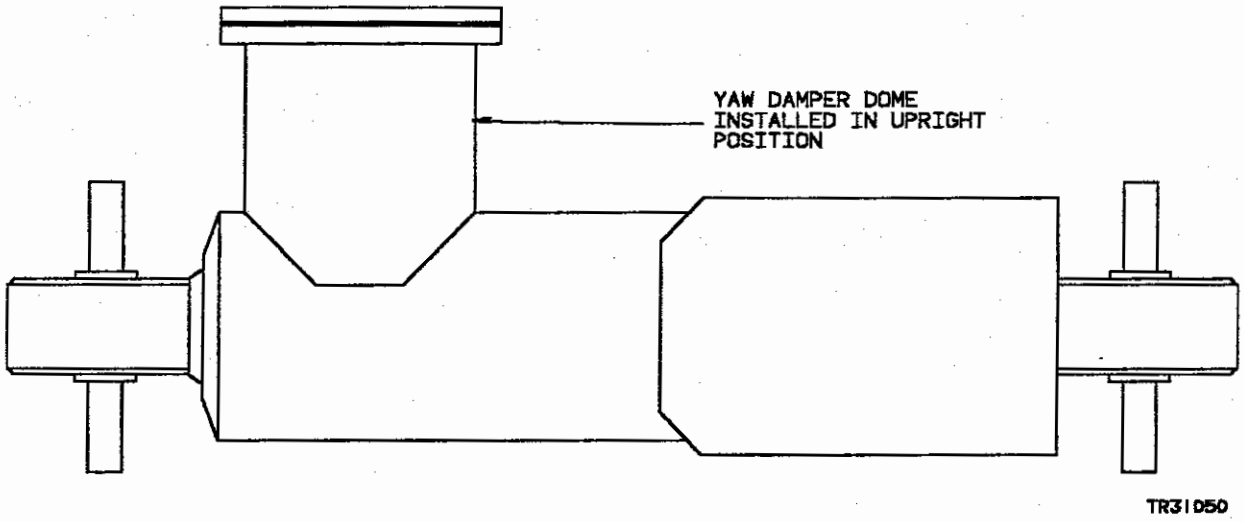

Figure 2. TYPICAL YAW DAMPER WITH DOME

YAW DAMPERS WITHOUT DOME

1. Yaw damper model without a dome (P/N 40005424) uses an internal hydraulic draw which must be oriented downward for the damper to operate properly. The reservoir side of the damper is identified by a yellow label which reads "THIS SIDE DOWN." This label must be in the downward position. Similarly, the dust tube end of the damper has a yellow label which reads "THIS SIDE UP."

> **NOTE**
>
> Older versions of the domeless yaw damper identify the reservoir side with a yellow label that reads "UNDEN" which is to be oriented in the downward position.

2. Mounting bars on domeless yaw dampers are installed at a six (6°) degree angle, as shown in Figure 3 on page 3, to reduce the possibility of bushing damage due to "radial wind up."

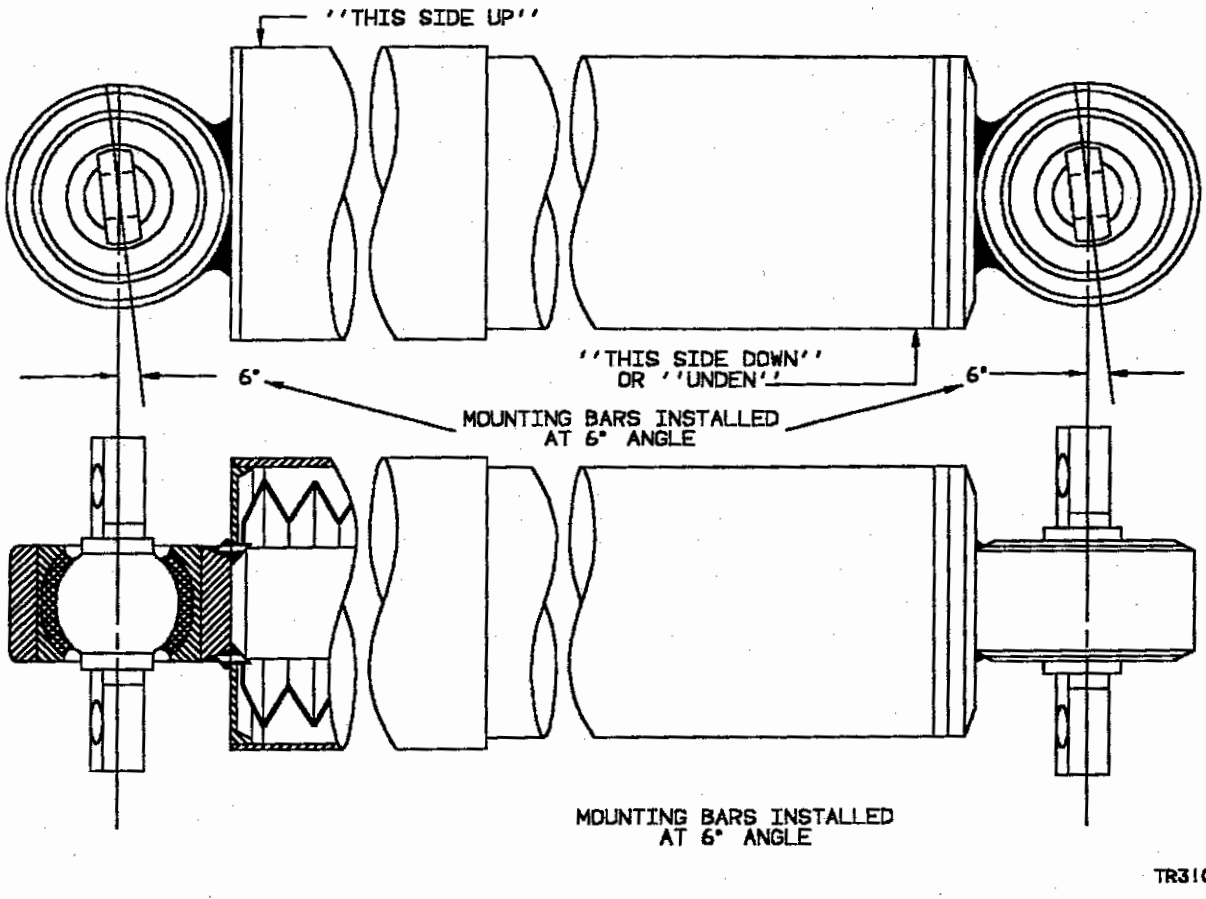

Figure 3. TYPICAL DOMELESS YAW DAMPER

UNIVERSAL INJECTOR HOLDER FOR POP AND LEAK TESTER

The Model 710 Engine uses a larger unit fuel injector which will not mount in Injector "Pop and Leak" Tester P/No. 9549055. A Universal Injector Holder, P/No. 40018091, has been designed to allow use of existing injector testers with all 710 engine injectors, as well as adapt to all 567 and 645 injectors using an insert sleeve provided with the tool. This injector holder will be furnished with all new injector testers, and is also available now for upgrading existing testers.

AXLE GEARS - INCREASED HARDNESS

The original 50 series D87 traction motor gears are being superseded by gears made from a different material. The new material was developed to obtain higher hardness for longer life on these gears. The surface hardness specification was increased from a 53 Rc min. to 58-62 Rc which is achieved by induction hardening.

In-house and field testing of the new gears have demonstrated improved wear characteristics, and they have been released for use on production 60 series locomotives.

For reference, the following gears are being changed:

No. of Teeth	Old Part No.	New Part No.
66	9520042	9556137
67	9520043	9556136
69	9520044	9556135
70	9520045	9556134

710 SPACER FOR CYLINDER HEAD RETAINER RESURFACING TOOL

When crankcase cylinder head retainers develop a wear step exceeding 0.25 mm (0.010″), where the head seat ring contacts the retainer surface, the step can be removed by machining using resurfacing tool P/No. 9509391.

On 710 engine crankcases, resurfacing tool must be positioned in a cylinder pilot bore 38.1 mm (1.50″) higher than in a 645 engine crankcase. Tool spacer (adapter), P/No. 40013508, has been designed, tested, and is now available for this purpose. This spacer fits into the lower liner insert and the resurfacing tool in turn fits into the spacer. Two longer studs, P/No. 8087381 (new length 1/2″-13 x 4 1/4″), are required at the lower end of tool, P/No. 9509391, to secure the two locking bars against the lower pilot bore.

The spacer and the studs will be included with resurfacing tools in the future, however, those customers already owning the tool can purchase the spacer and studs separately.

Maintenance Instruction M.I. 316 provides the information necessary to measure the head retainer wear step and to perform the resurfacing operation. The tools are available for purchase in the Electro-Motive Service Tool Catalog-ST-85, or by lease from the EMD Service Department.

710 INJECTOR NUT WRENCH AND SOCKET

A 710 Injector Nut Wrench P/No. 9555886, Figure 4, and Socket P/No. 9555276, Figure 5, are now available for use in assembly and disassembly of all injectors used on 710 engines. Final assembly of these injectors, using the new socket and a suitable torque wrench, should be to a new torque rating of 190 N.m (140 ft-lbs).

NOTE

Injectors used on 645 engines require a final assembly torque rating of 169 N.m (125 ft-lbs).

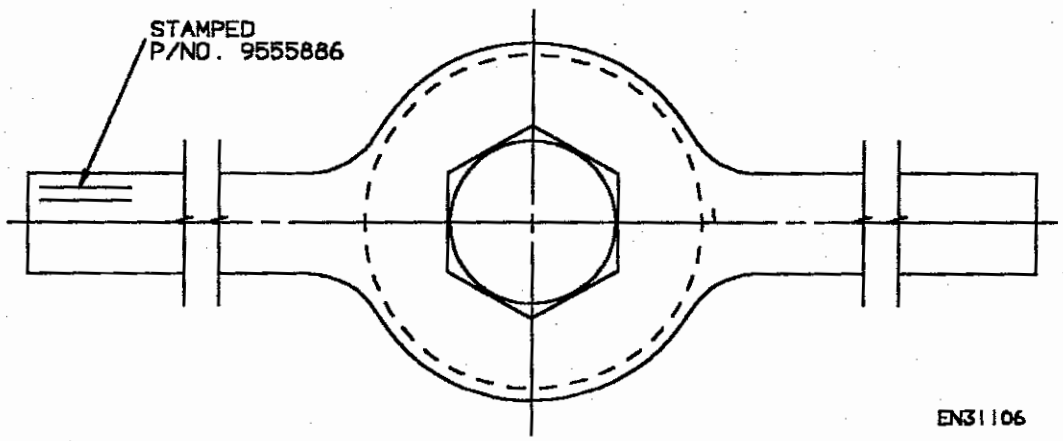

Figure 4. 710 Injector Nut Wrench

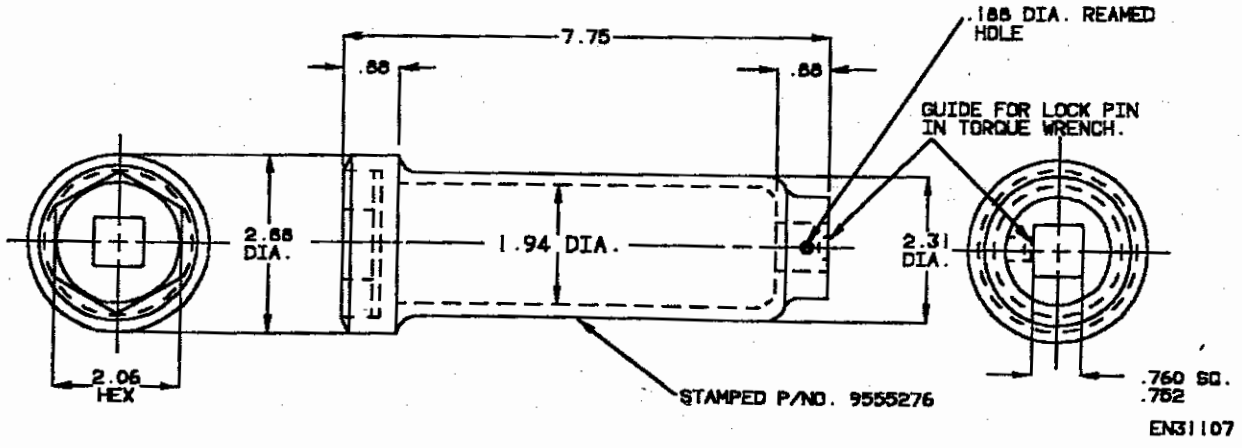

Figure 5. 710 Injector Nut Socket

REVISED TURBOCHARGER OIL DRAIN SCREEN

A new turbocharger oil drain screen, P/No. 9573091, has been developed to more adequately protect the engine's rear gear train from debris in the event of a turbo planetary system failure. The original screen application was that of a small triangular-shaped screen located below the turbo idler gear, Figure 6. The screen covered the planetary system oil drain, so that all oil flowing from the gears passed through the screen. In the event of a planetary system failure, the metal debris was effectively trapped behind the screen.

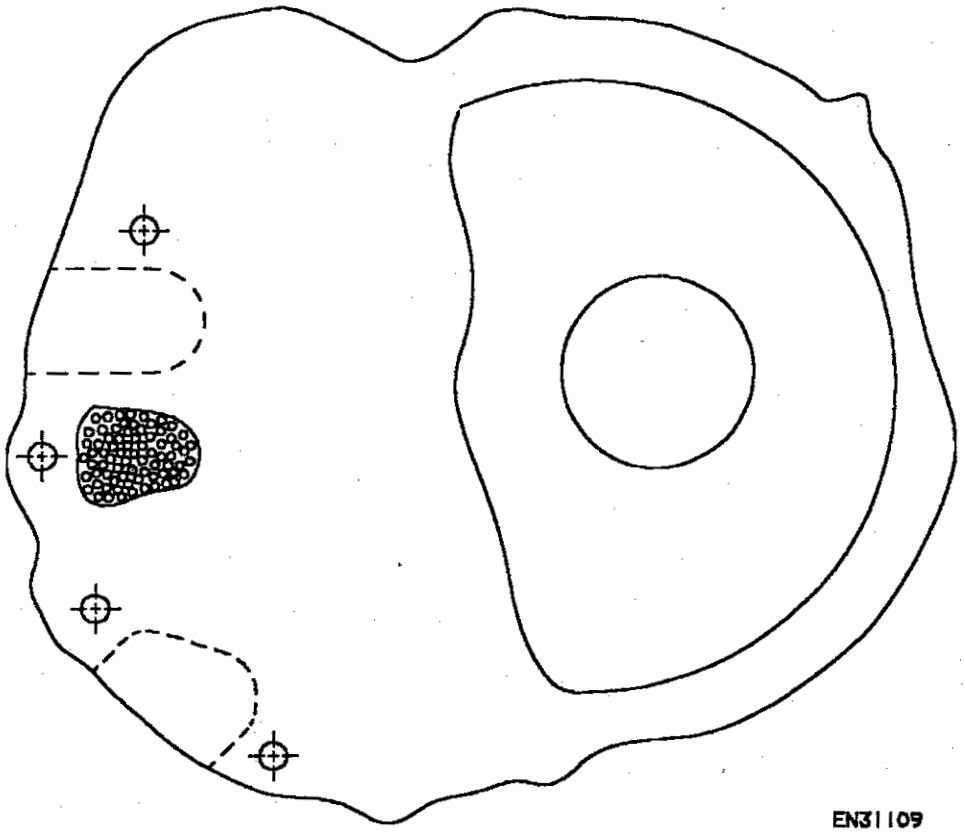

Figure 6. Original Triangular Screen Application

Due to the higher lube oil flow rate experienced with the "high-capacity" type turbocharger planetary systems, the area of the triangular hole beneath the idler gear was insufficient. Consequently, three oil drain slots were machined into the gear support plate to supplement the oil drainage. The triangular screen did not span these additional slots, so an improved screen was developed.

The new design screen, Figure 7, covers the internal side of the gear support plate entirely. It provides effective protection of the engine gear train from debris at all drain openings. Turbochargers equipped with this new screen no longer utilize the previous triangular screen over the original drain hole. Consequently, recently assembled turbos may differ from predecessors in that the triangular drain hole is exposed and no protective screen is visible. However, the improved screen is totally contained within the turbo, and machines so equipped will feature an "open" drain hole.

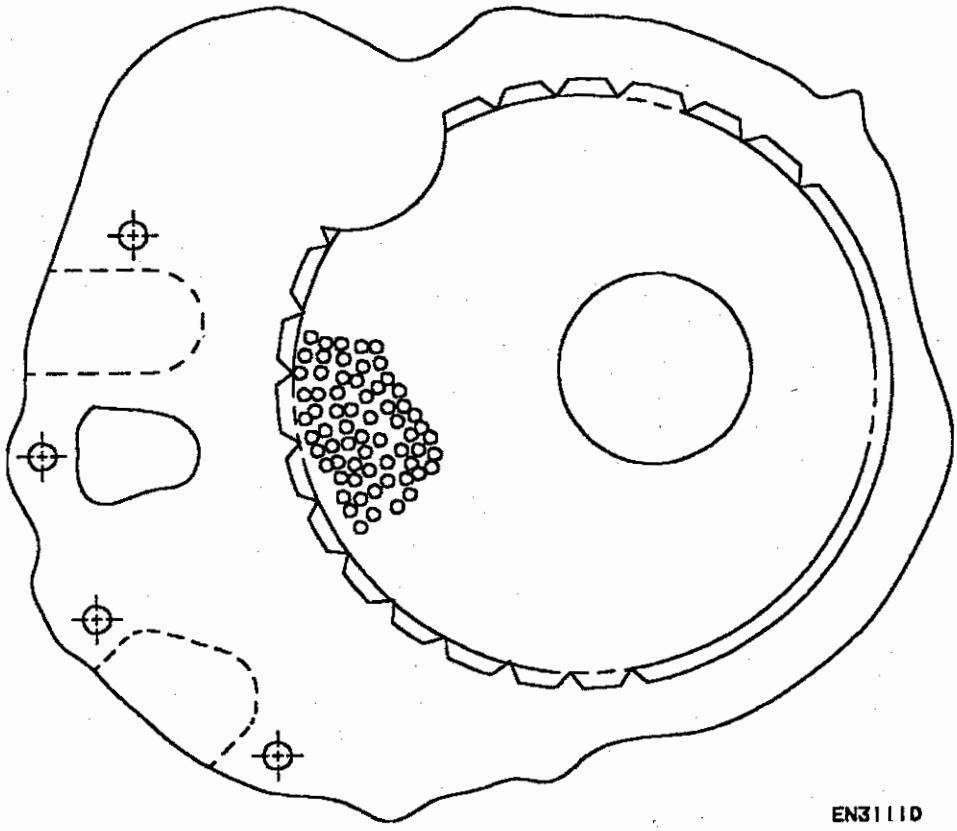

Figure 7. New Design Screen Application

WATER PUMP INLET TEE HOSE REPLACEMENT

A new silicone hose, P/No. 40015024, has been released for service to connect the water tank to the water pump inlet tees. This new hose provides a significantly longer service life than the originally applied hose P/No. 8362588. Hose P/No. 8362588 was primarily used on GP/SD40, SD45, pre-1976 GP/SD40-2, and SD45-2 locomotives. For retaining the new hose, clamp P/No. 8166523 (T-bolt type) is recommended in place of originally applied clamp P/No. 8202285 (thumb-screw type).

NEW IMPROVED ALLOY STEEL SUSPENSION SPRING

Locomotive journal springs using carbon steel are no longer available as replacement parts through EMD for model GP, SD, and HT-C trucks. They are being replaced by springs made of alloy steel material which is superior to the carbon steel. All locomotives built by Electro-Motive over the past several years with these trucks have been equipped with the alloy steel journal springs as standard.

The list below shows the old carbon steel spring part number and its replacement alloy steel equivalent.

DISCONTINUED CARBON STEEL JOURNAL SPRING	SUPERSEDING ALLOY STEEL JOURNAL SPRING
8272084	9085317
8272255	9085319
8272256	9085318
8354464	9094221
8354465	9094220
8413507	9317672
8413508	9317671
8433004	9317678
8433005	9317673
8433006	9317677
8433007	9317681
8484130	9317679
8484131	9317680
8484503	9317675
8484504	9317674
8484505	9317676

BALL BEARINGS - DELCO PRODUCTS ELECTRICAL ROTATING EQUIPMENT

In order to reduce the number of bearing part numbers required for service of Delco auxiliary machines, and to prevent use of obsolete bearings, the following current new equipment bearings should be ordered for replacement purposes:

Current P/No.	Replaces	Obsolete P/No.
908421		907785
908486		907786
908489		907831
9440292		907931

REGRIND/SCRAP LIMITS FOR 50/60 SERIES TRACTION GEARS

Traction gears and pinions used on 50 and 60 series locomotives with D87 type motors have a different tooth form than those used on pre 50-series units with D77 type motors. Because of this, different regrind limits are required on 50/60 series traction gears. In order to retain adequate bending strength and hardness profile, a maximum total wear of .044″-.061″ (.022″-.0305″ per side, depending on original tooth thickness) is allowed. The gear part numbers listed below are the only gears that this regrind limit applies to:

70T	69T	67T	66T
9315723	9332207	9332206	9332205
9520045	9520044	9520043	9520042
9556134	9556135	9556136	9556137

The minimum tooth thickness allowed on these gears is .444″ at the pitch line. To determine if there is sufficient stock for regrinding, it is possible to use gauge part no. 9512412. This gauge was designed for checking 62, 61, 60, & 57 tooth gears, but since the allowable tooth thickness at the gauging diameter is the same, the gauge can be used on the above listed gears also.

As described in M.I.1518, the gauge is placed on a gear tooth and slid along until the tapered jaws contact the sides of the gear tooth. If the gauge comes to a stop in the area marked "REGRIND," there should be sufficient stock for profiling the gear. If the gauge comes to a stop in the area marked "SCRAP," there is insufficient stock for reprofiling and the gear should be scrapped. The gear should be qualified on both ends of the teeth since tooth wear is dependent on the type of service the locomotive has seen and on the alignment of the pinion with the gear.