



M.I. 9656



# MAINTENANCE INSTRUCTION

## MODERNIZATION RECOMMENDATION

### GEAR CASE MODIFICATION & APPLICATION OF PLASTIC GEAR CASE SEALS

- PURPOSE:** To modify felt-type-seal gear cases for application of the new plastic gear case seal.
- APPLICATION:** This modification is applicable to all EMD gear cases except 8301946 and 8302645. These gear cases have small axle bores intended for use on 36" wheels with 12" hubs.
- REFERENCES:** WS42778, WS42779, Figs. 1 - 11 of this publication.
- NEW MATERIAL REQUIRED:** Parts to modify one gear case assembly.

<u>QUANTITY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
2	9540735	Adapter (Lower Gear Case Half)
2	9540736	Adapter (Upper Gear Case Half)
1	9540737	Channel
1	9535375	Outer Seal
1	9535376	Inner Seal
1	8407505	Clamp For Inner Seal
As Needed	8366747	RTV (One Caulking Cartridge, 12 oz.)

The above components are all included in Kit 9547749.

**FIXTURES  
REQUIRED:**

- 1 - Adapter locating fixture.
  - 1 - Burn out template.
- Fixtures are not available from EMD. They can be fabricated locally using WS42778 and WS42779, which are available from EMD Service Department Publications, Electro-Motive Division General Motors Corporation P.O. Box 430 La Grange, IL 60525 Attn: C. J. Costa.

## PROCEDURE

### GEAR CASE MODIFICATION

A step by step description of the conversion is as follows:

1. Burn out the felt channels and gutter retainer to the 8-1/2" radius shown in Fig. 1 and Fig. 2 using the burning template (WS42779). This template is sized to remove the channels and associated weld entirely from the gear case. The radius of the template is less than 8-1/2" to compensate for the width of the torch used to

make the cut. The template is positioned by centering it over the axle bores and setting its straight edge flush with the machined parting line of each gear case half. Note that the machined parting line of the upper gear case half is below the edges of the parting line seals, Fig. 3. Grind all burned edges smooth.

2. On the upper gear case half, the outer parting line seals have to be trimmed back, Figs. 2 & 7, to allow the adapters to overlap the side sheet. Burn off existing gutter stops, if necessary.

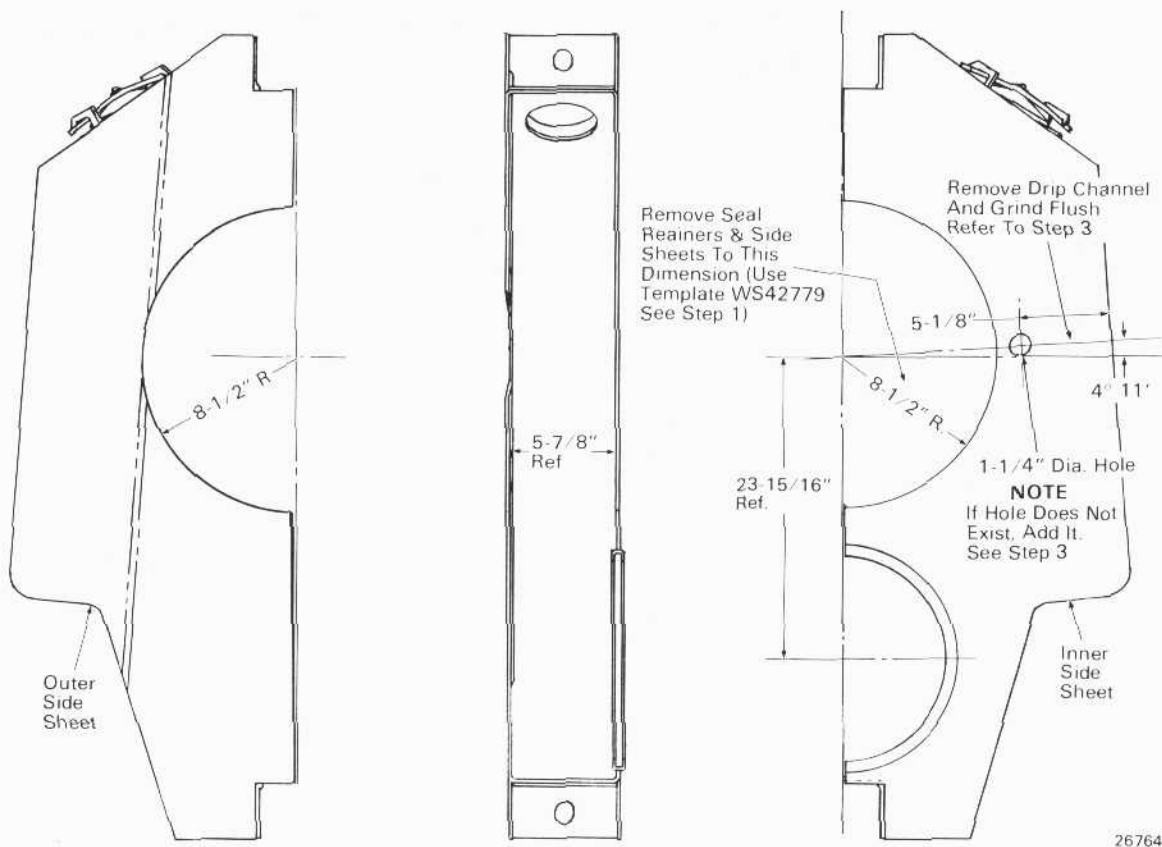
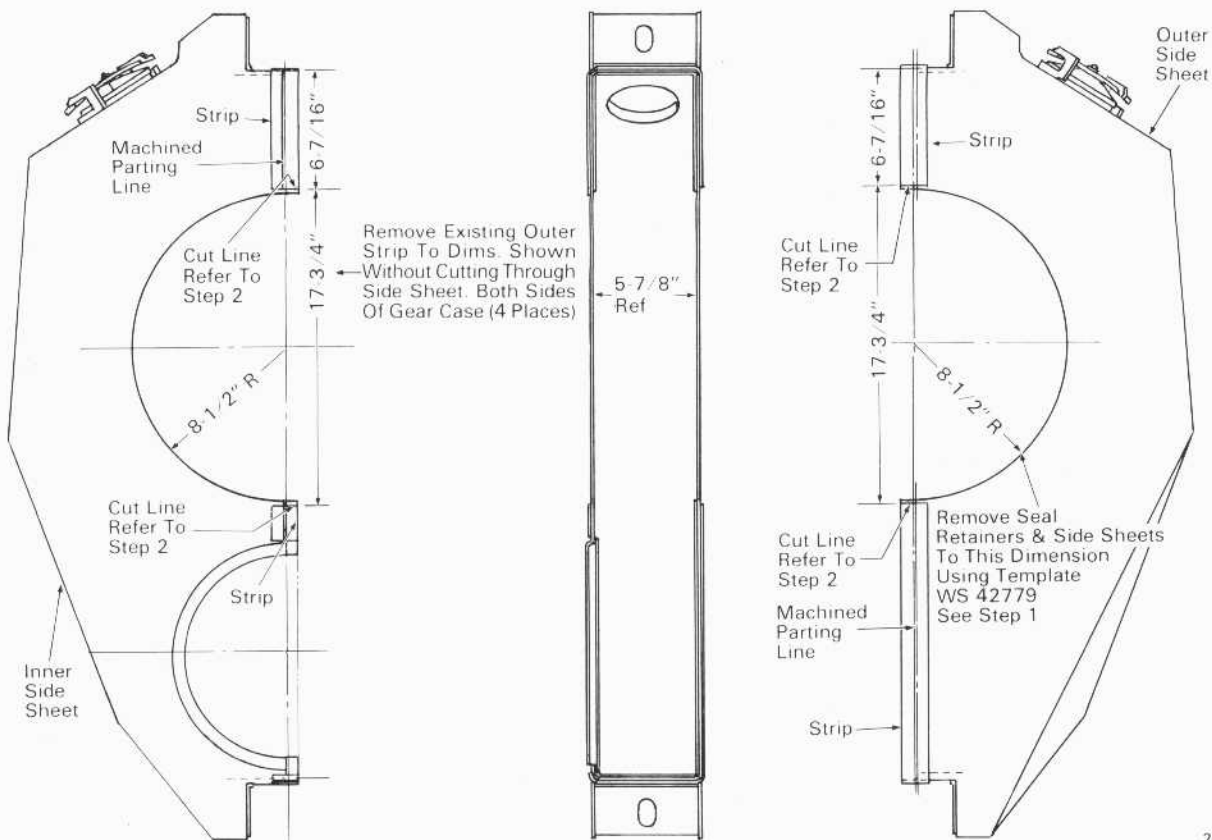
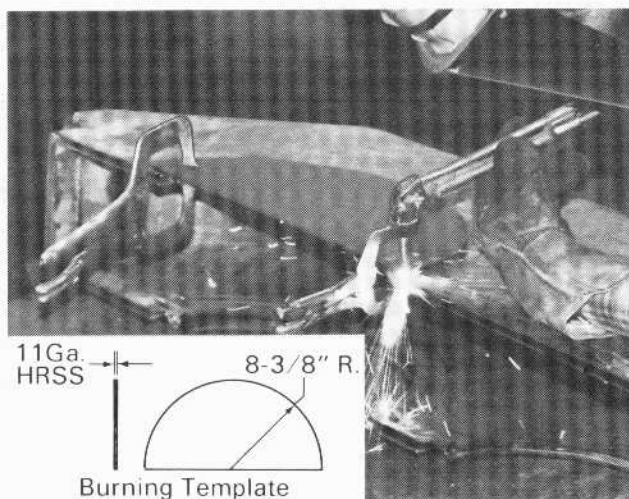


Fig.1 - Lower Gear Case Half, Old Seal Channel Removal



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Fig.2 – Upper Gear Case Half, Old Seal Channel And Gutter Retainer Removal



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Fig.3 – Burn-Out Of Felt Channels

3. On the lower half, burn off the old overflow channel and grind the area smooth. If no overflow hole is present, cut one to the dimensions shown on Fig. 1. This is recommended, as the plastic seals are so effective in sealing that gross overcharging will be likely without the overflow.

4. Refer to Figs. 4 and 5 and apply adapters as shown. Adapter 9540735 is applied to the lower gear case half. Adapter 9540736, with the locating key for the seal ring, is applied to the upper gear case half. The locating fixture (WS42778) is used to accurately locate the adapters in relation to the pinion bore, Fig. 6. The ends of the adapters must be positioned flush with the machined parting lines of the gear case halves, as shown in Fig. 7. Tack weld the aligned adapters and remove the locating fixture. Weld adapters in place as shown in Figs. 4 and 5. To minimize distortion, make the interior welds first and then make the outer weld in a series of short passes. Note that the locator bars on the locating fixture are positioned for either upper or lower gear case halves (see WS42778).

5. Apply the new 9540737 overflow channel to the lower half to dimensions shown in Fig. 4. This new duct will cover the overflow hole and will protect the oil run-off slot in the bottom of the inner plastic seal from contamination. For this reason, proper positioning of the overflow channel is important.

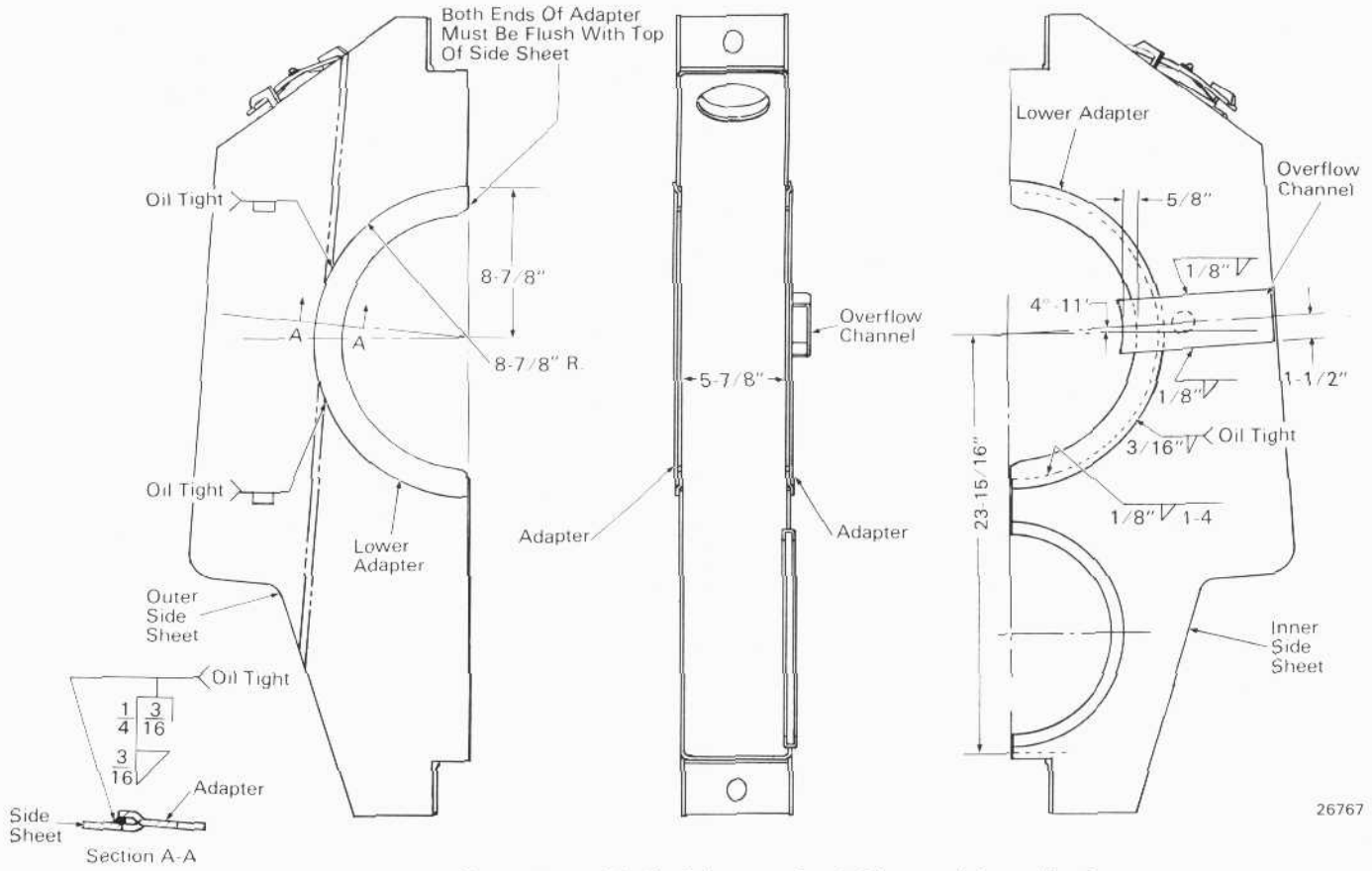


Fig. 4 - Lower Gear Case Half, Adapter And Channel Installation

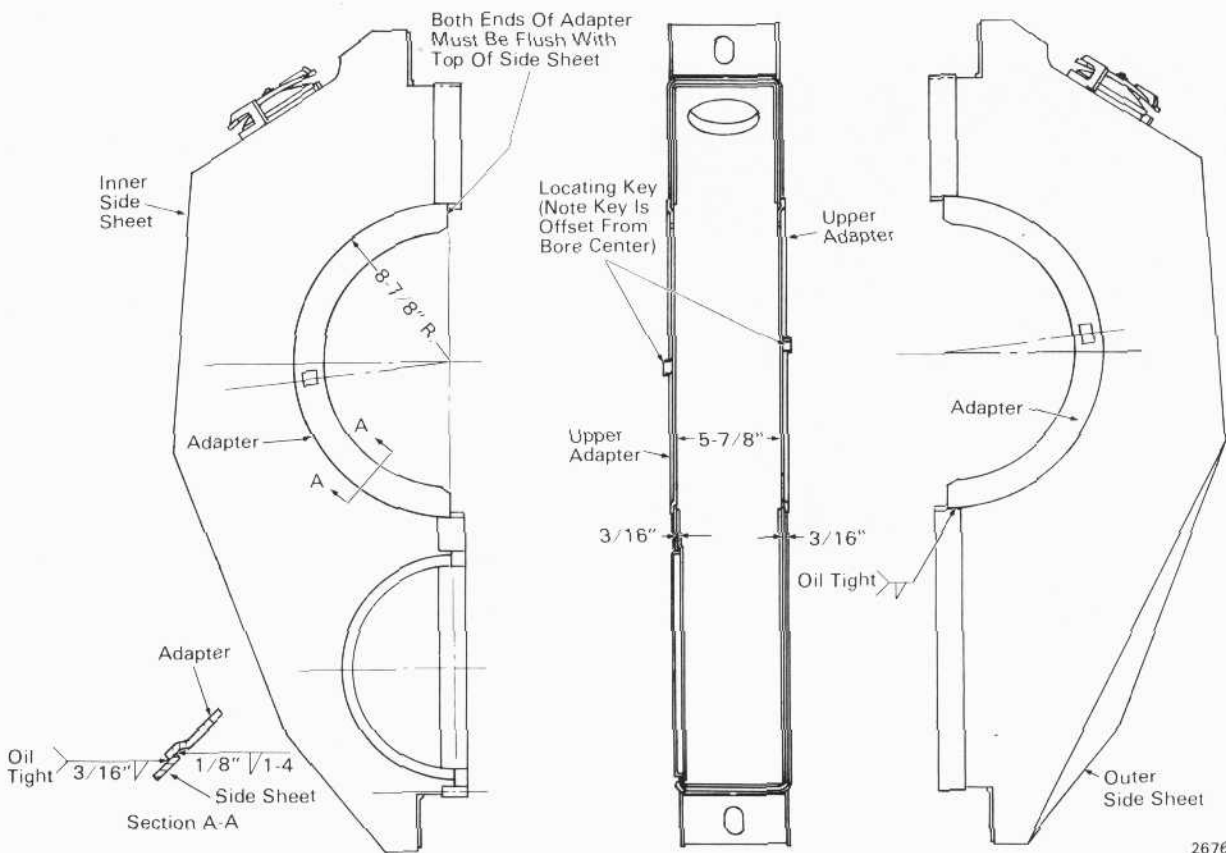
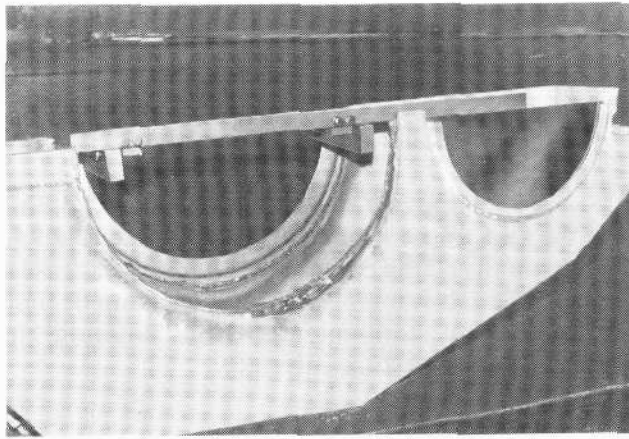


Fig. 5 - Upper Gear Case Half, Adapter Installation



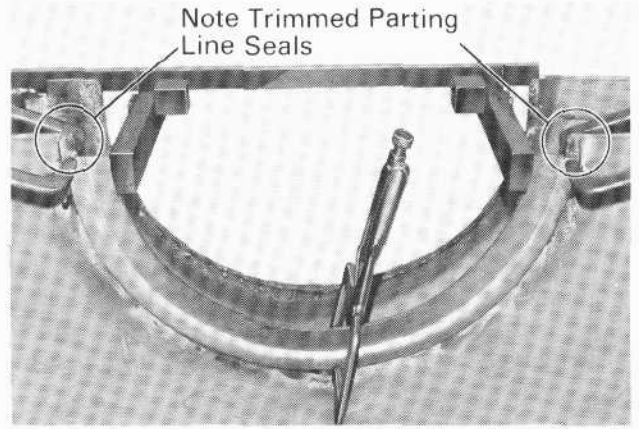
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Fig.6 - Adapter Locating Fixture In Place

- 6. Thoroughly clean the gear case halves, removing all slag and weld spatter.

**SEAL INSTALLATION**

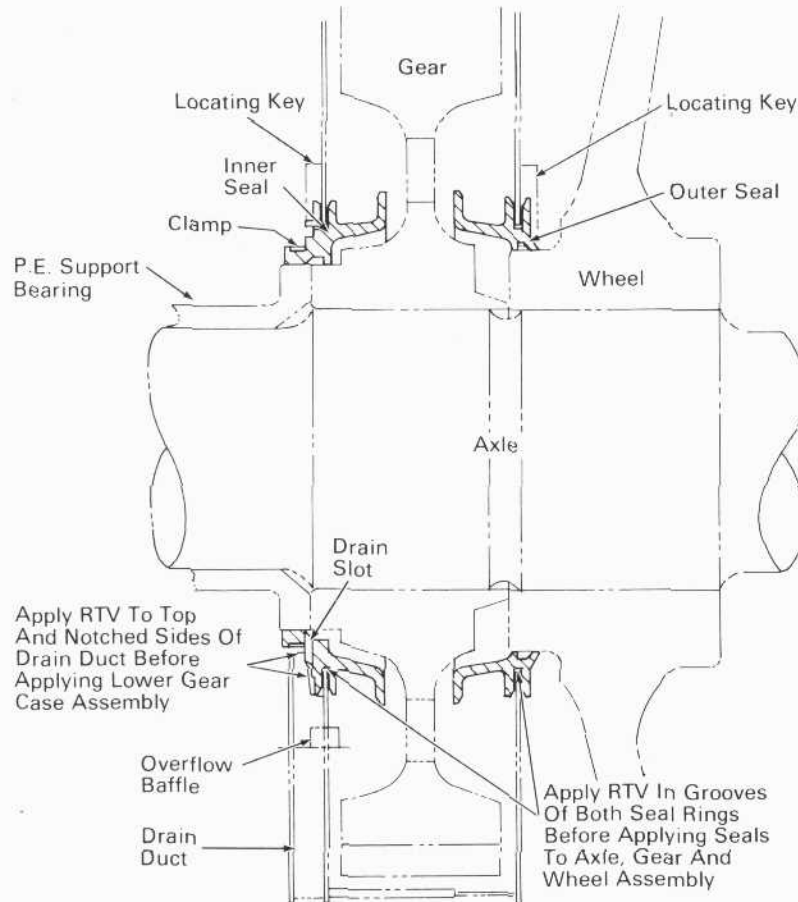
Once the modification is complete, the plastic seals can be installed in the same manner as with new gear cases. The following provides a step by step procedure for plastic gear case seal installation.



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Fig.7 - Adapter Positioned For Welding

- 1. Prepare the gear case halves in the normal fashion by applying the pinion felt seals and the rope to the parting line seals of the upper gear case half. Use RTV 8366747 to hold down the loose ends of the rope seal. On the lower gear case half apply RTV around the edge of the drain duct that mates up with the drain slot in the inner seal Fig. 8. This will prevent contaminants from getting into the drain slot.



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Fig.8 - Cross-Section Of Applied Gear Case With Plastic Seal

2. Apply RTV into the side sheet groove of each seal ring.
3. Install the seals onto the motor/axle assembly around the axle with outer seal 9535375 between the gear and wheel and inner seal 9535376 between the gear and support bearing. The seals are flexible and can be twisted or "snaked" into position. Fasten the seal latches making sure that they are at the 6 o'clock position. The pins on the inner seal should be engaged with the holes in the support bearing

flange Fig. 9. Check to see that the notch on each seal will engage with the locating keys on the upper gear case half, Figs. 9 and 10. Finally, the lip on the outer seal should ride on the wheel hub and should not be folded under.

4. Apply clamp 8407505 to the inner seal, holding the seal to the support bearing flange. Tighten down the clamp completely after the gear case is installed. It is important that the clamp be tight to prevent contaminants from entering the seal/bearing flange interface.

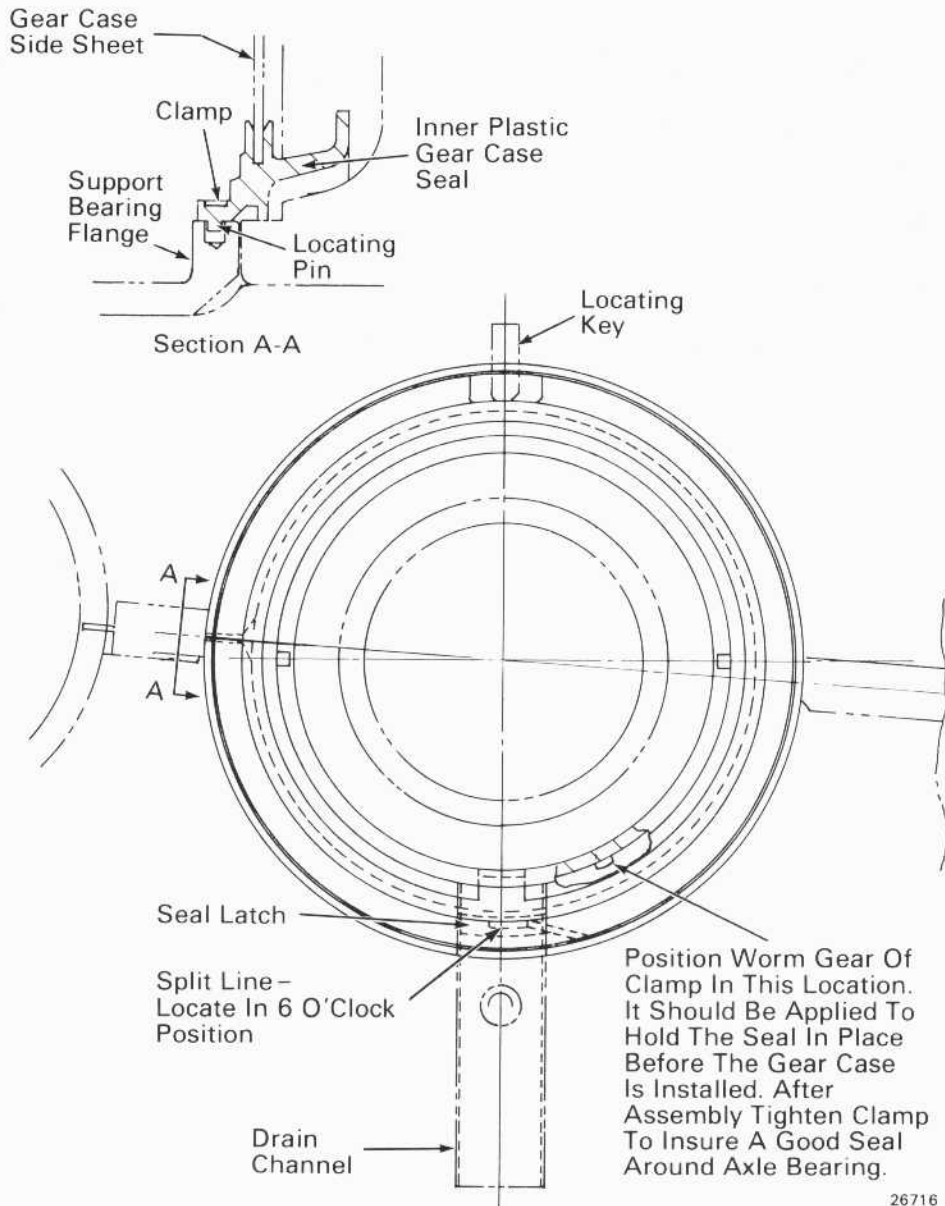


Fig.9 - Inner Seal (Traction Motor Side)

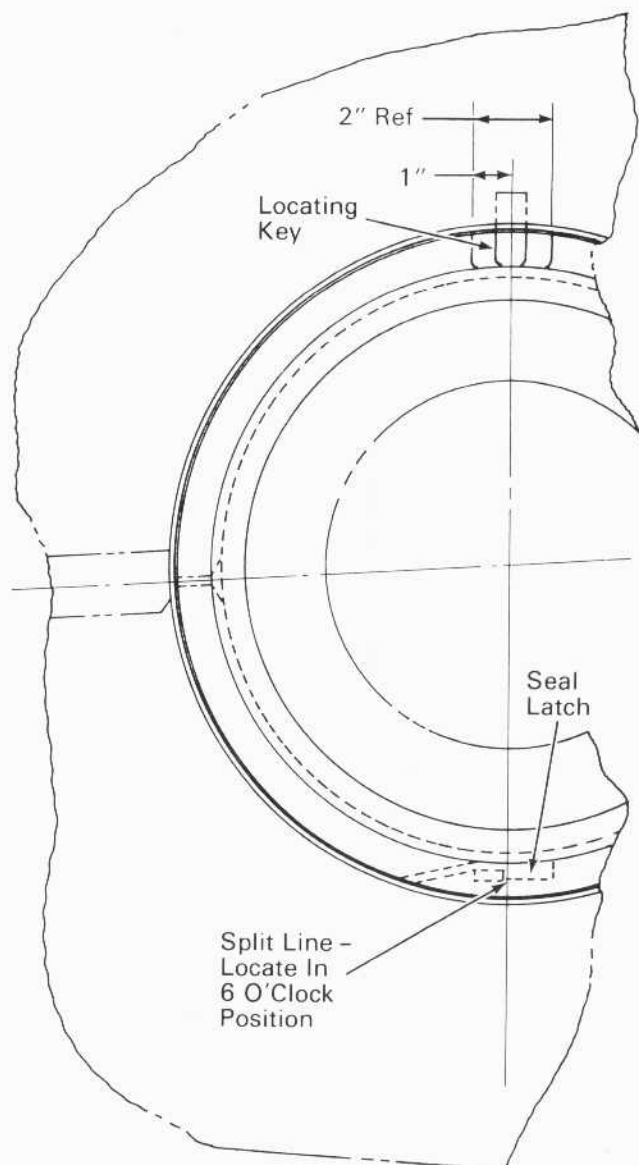


Fig.10 - Outer Seal (Wheel Side)

5. Install the upper half of the gear case, making sure that the keys engage the slots in the seals and that the side sheets engage the circumferential groove in each seal. If the side sheet falls outside the groove, the seal gutter will be pushed against the gear web, causing gross leakage.
6. Install the lower gear case half, again making sure the side sheets engage the circumferential grooves. Apply additional RTV around the joint between the drain duct and seal drain slot if necessary to insure a good seal.
7. Apply safety straps to gear case mounting flanges and fasten in normal manner.

A completed gear case with installed plastic seals is shown in Fig. 11.

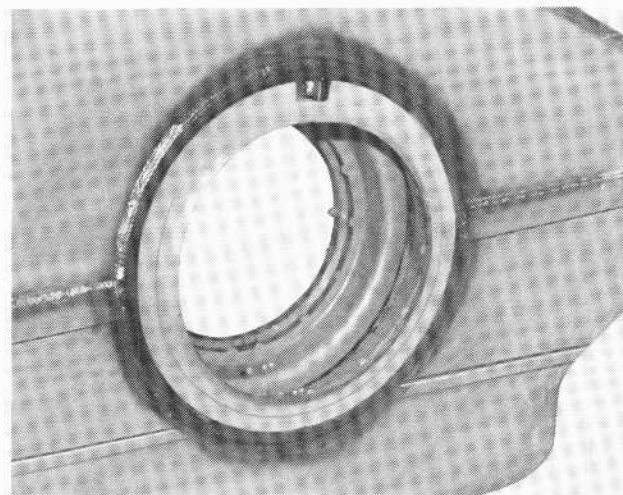


Fig.11 - Modified Gear Case With Plastic Seals Installed