

Maintenance Instruction



Technical Publications

MODERNIZATION RECOMMENDATION

GEAR CASE MODIFICATION & APPLICATION OF PLASTIC GEAR CASE SEALS — D29, D31, AND D29CC MOTORS —

- PURPOSE:** To modify felt-type-seal gear cases for application of the new plastic gear case seal.
- APPLICATION:** This modification is applicable to gear cases for all narrow gage type traction motors (i.e. D29, D31, D29CC, and D29CC7).
- REFERENCES:** WS44484, WS44485, WS42779, 9573525, Figs. 1 - 11 of this publication.
- NEW MATERIAL REQUIRED:** Parts to modify one gear case assembly.

<u>QUANTITY</u>	<u>D29/D31 PART NO.</u>	<u>D29CC/D29CC7 PART NO.</u>	<u>DESCRIPTION</u>
2	9560651	9573523	Adapter (Lower Gear Case Half)
2	9540736	9573611	Adapter (Upper Gear Case Half)
1	9573526	9573526	Channel
1	9560005	9552603	Outer Seal
1	9560006	9552602	Inner Seal
1	8407505	9566807	Clamp For Inner Seal
As Needed	8366747	8366747	RTV (One Caulking Cartridge, 12 oz.)

The above components are all included in Kit 9584662 for D29/D31 motors and in Kit 9584663 for the D29CC motors.

- FIXTURES REQUIRED:**
- | | | | |
|---|---------|---------|---------------------------|
| 1 | WS44485 | WS44484 | Adapter locating fixture. |
| 1 | WS42779 | 9573525 | Burn out template. |

Fixtures are not available from EMD. They can be fabricated locally using prints which are available from Electro-Motive Division, General Motors Corporation, P.O. Box 430 La Grange, IL 60525. Attention: Department 704, Technical Publications.

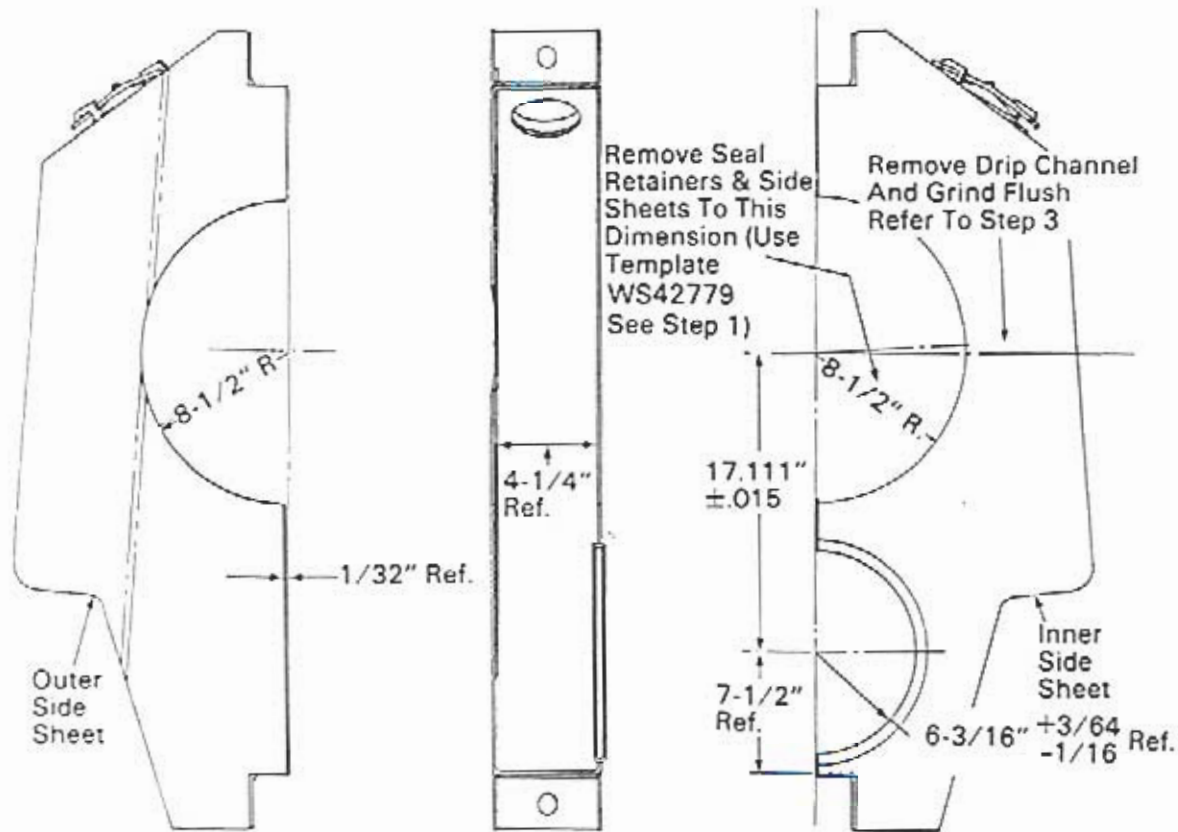
PROCEDURE

GEAR CASE MODIFICATION

A step by step description of the conversion for the D29 gear case is as follows; the D31 and D29CC conversions are very similar. Only minor interpretation is necessary to apply the following to all of the gear cases.

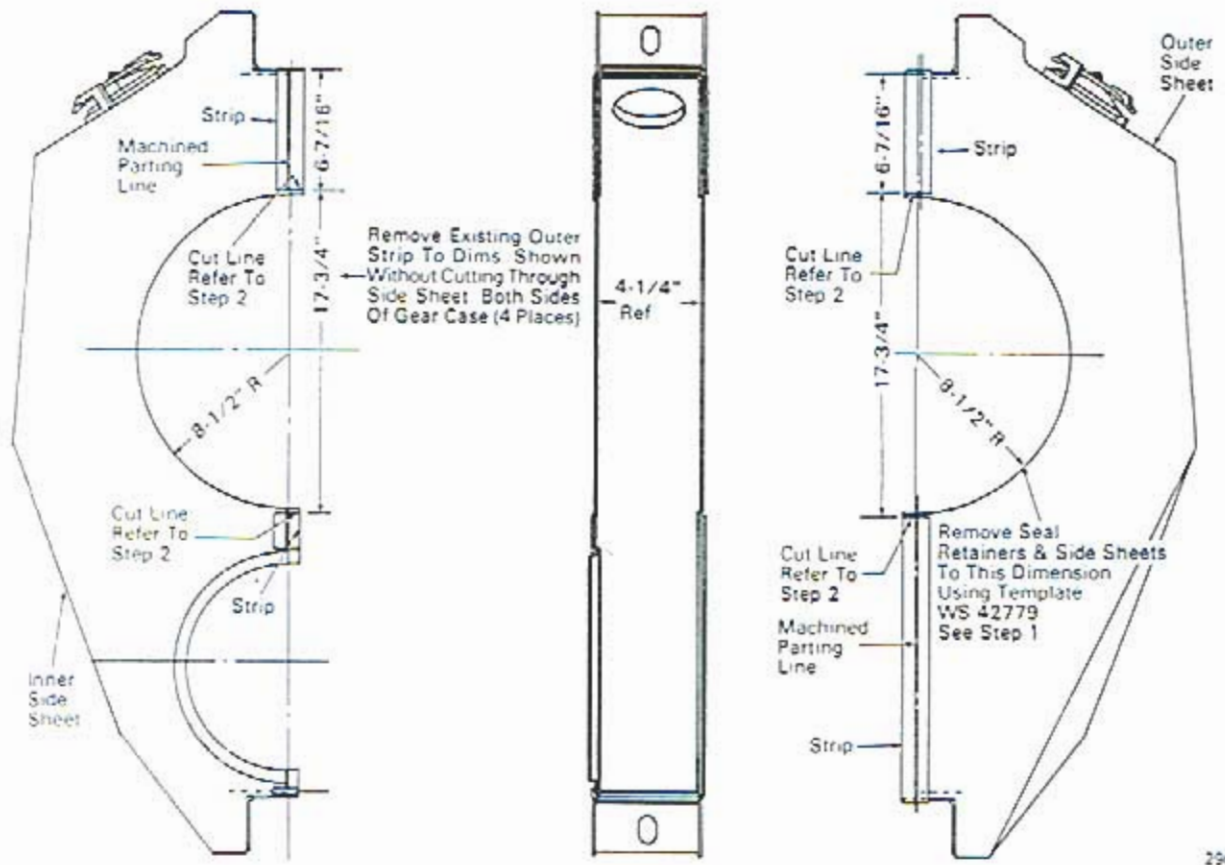
1. Burn out the felt channels and gutter retainer to the 8-1/2" radius shown in Fig. 1 and Fig. 2 using the burning template (WS42779). This template is sized to remove the channels and associated weld entirely from the gear case. The radius of the template is less than 8-1/2" to compensate for the width of the torch used to make the cut as shown in Fig. 3. The template is
2. On the upper gear case half, the outer parting line seals have to be trimmed back, Figs. 2 and 7, to allow the adapters to overlap the side sheet. Burn off existing gutter stops, if necessary.
3. On the lower half, burn off the old overflow channel and grind the area smooth.

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. Grind all burned edges smooth.



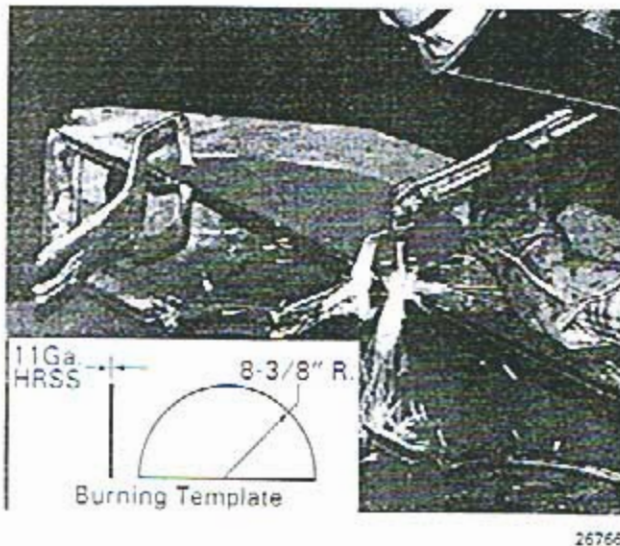
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Fig.1 - Lower Gear Case Half, Old Seal Channel Removal



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



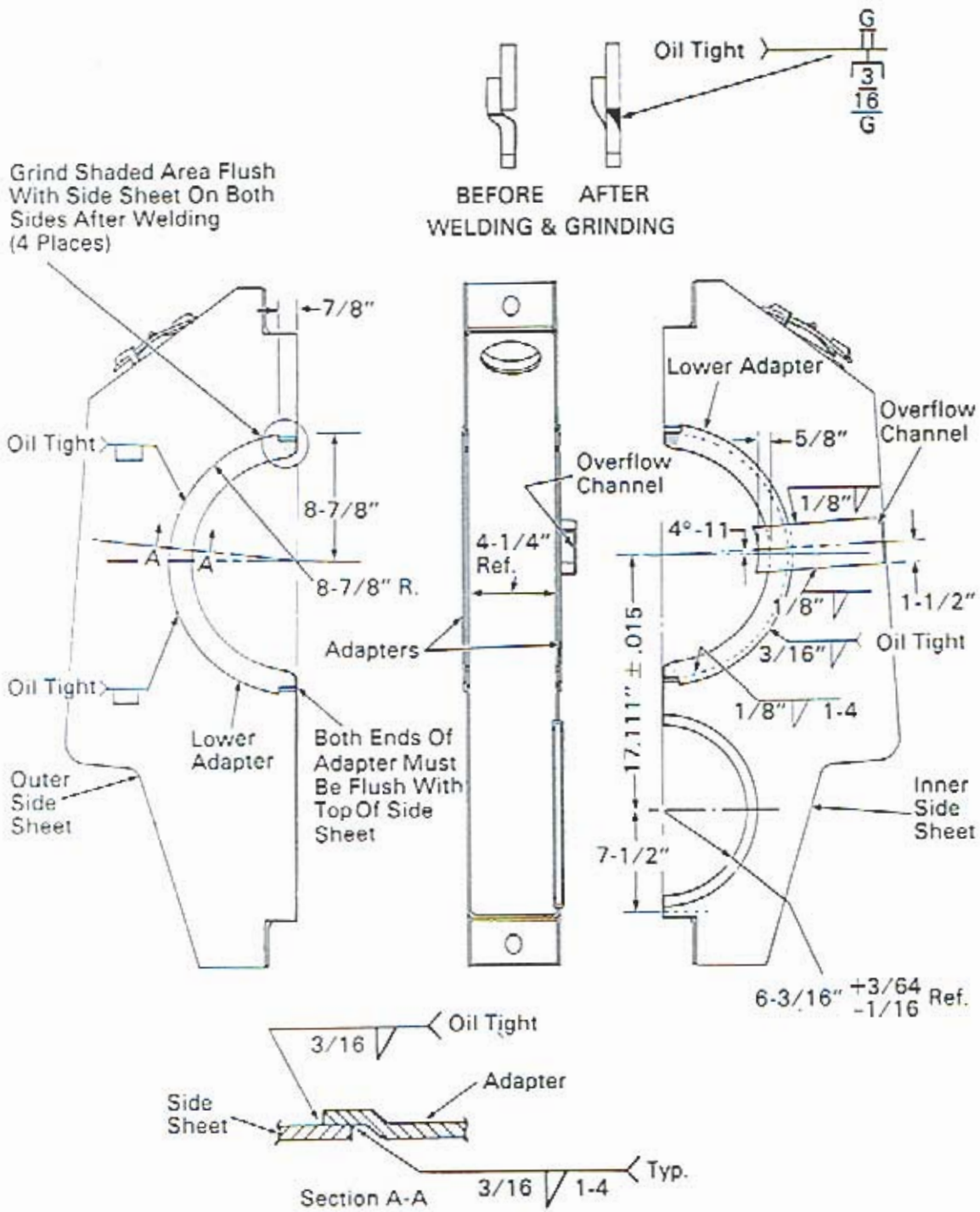
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Fig.3 - Burn-Out Of Felt Channels

4. Refer to, as an example for the D29 application, Figs. 4 and 5 and apply adapters as shown. Adapter 9560651 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 (WS44485) 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 WS44485).

5. Apply the new 9573526 overflow channel to the lower half to dimensions shown in Fig. 4. This new duct will protect the oil run-off slot in the bottom of the inner plastic seals from contamination. For this reason, proper positioning of the overflow channel is important.



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

Remove existing outerstrip to dimensions shown without cutting through side sheet. Both sides of gear case (typical 4 places).

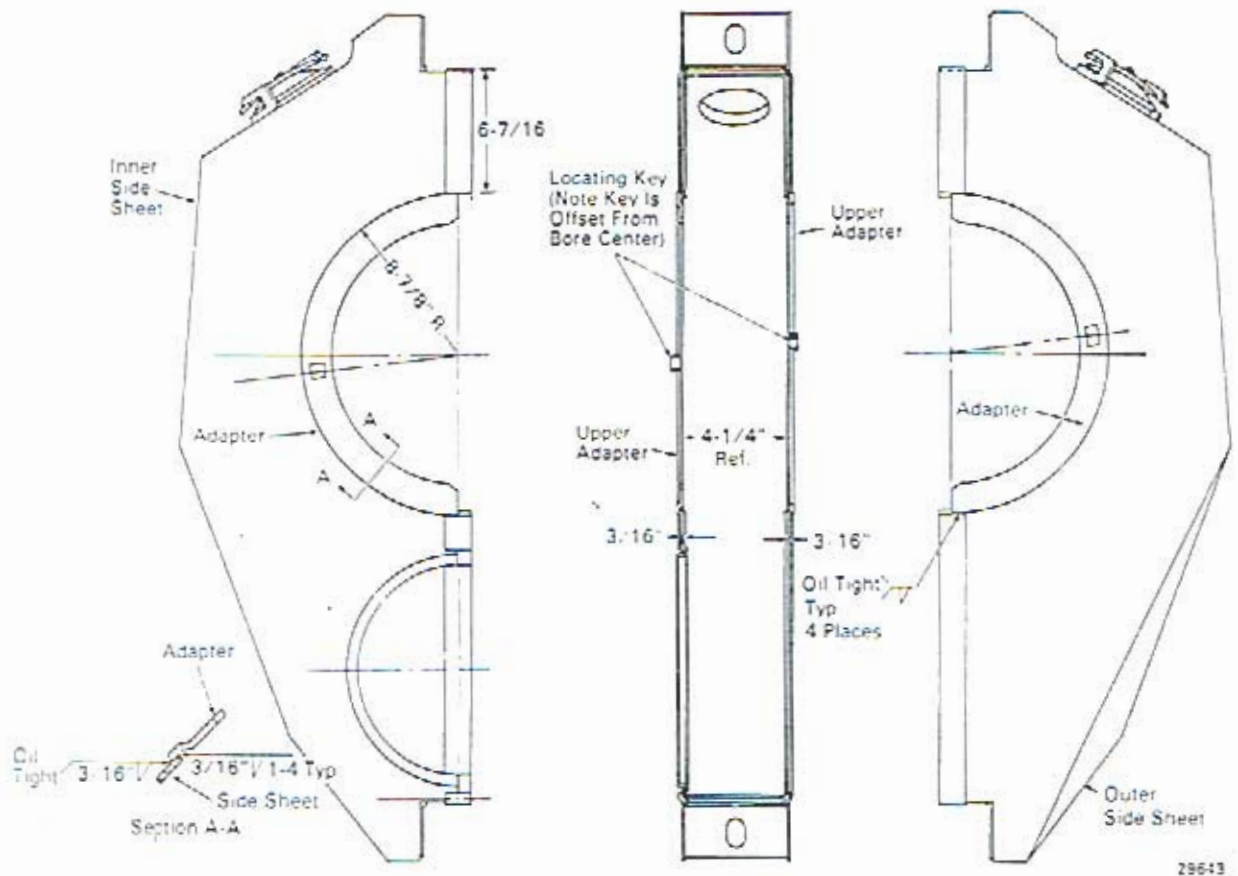


Fig.5 - Upper Gear Case Half, Adapter Installation

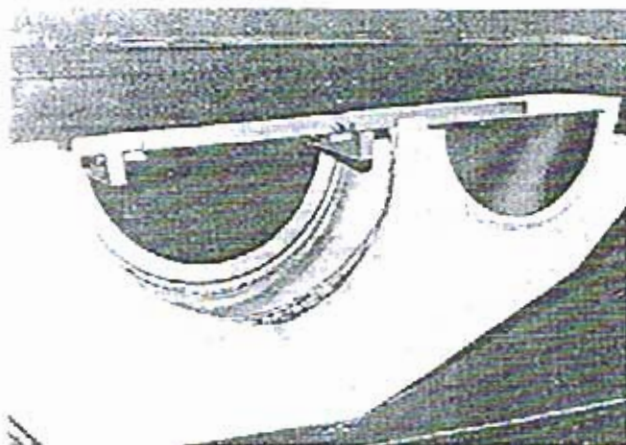


Fig.6 - Adapter Locating Fixture In Place

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.

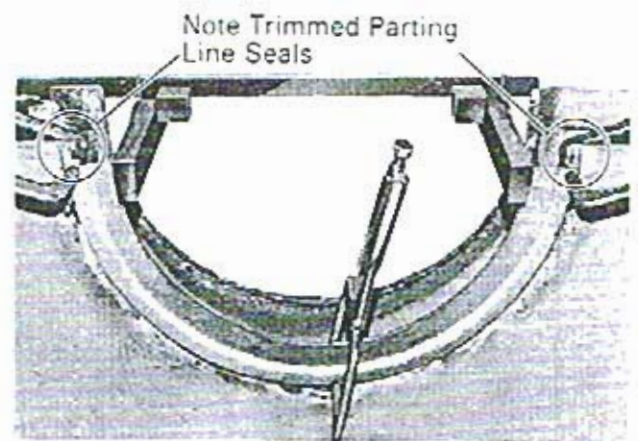
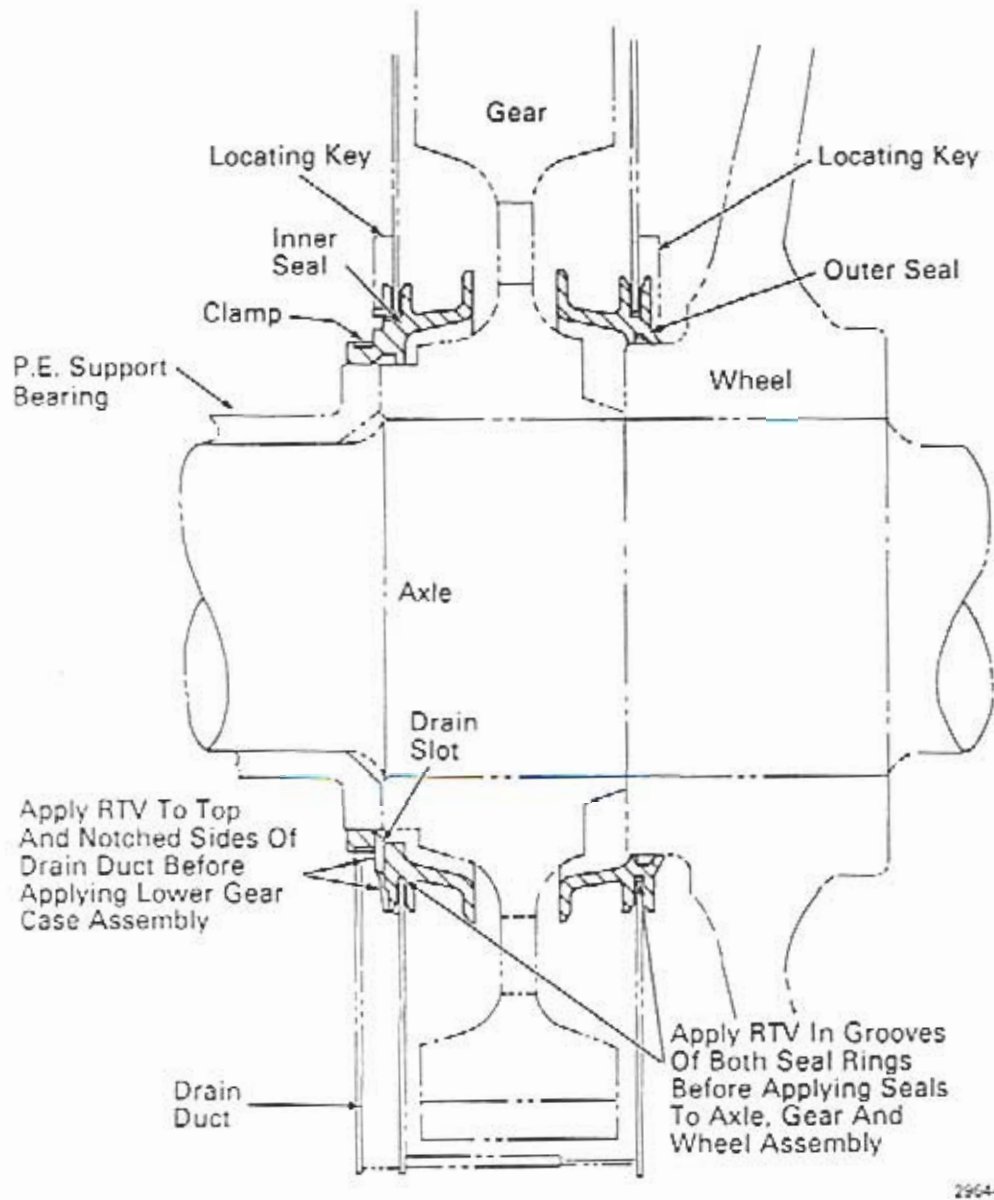


Fig.7 - Adapter Positioned For Welding

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 9560005 between the gear and wheel and inner seal 9560006 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.

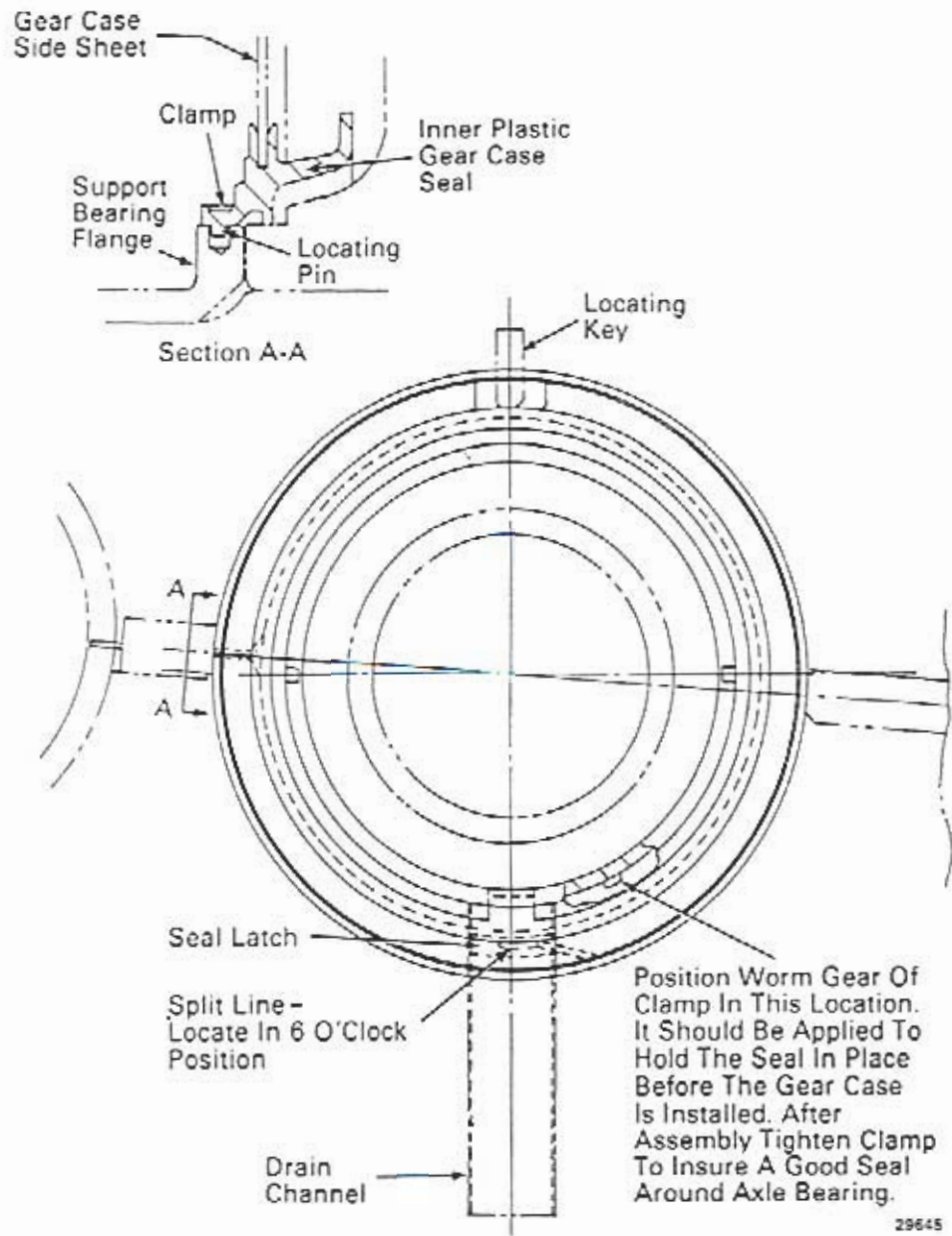


Fig.9 - Inner Seal (Traction Motor Side)

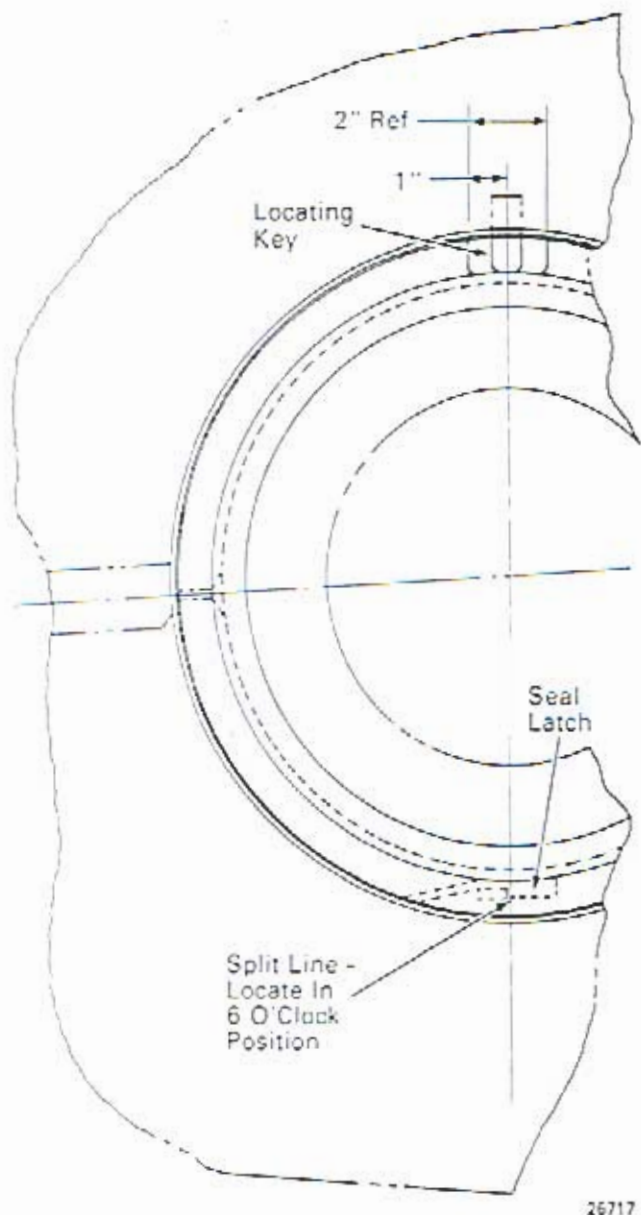


Fig.10 - Outer Seal (Wheel Side)

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.

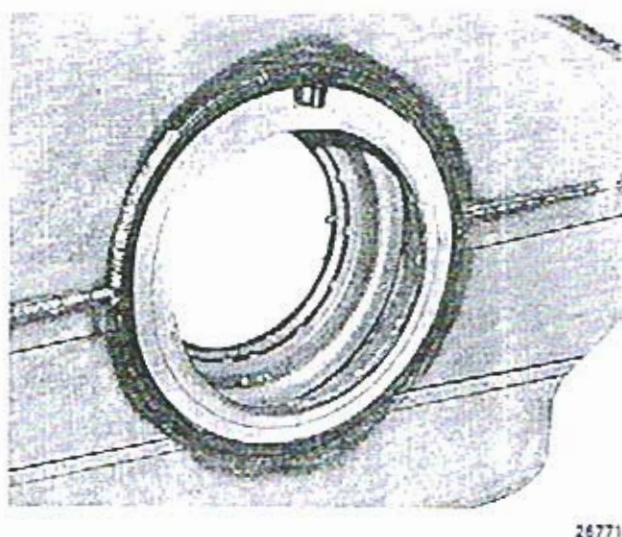
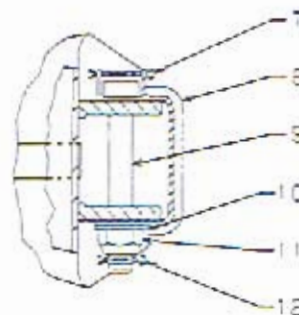
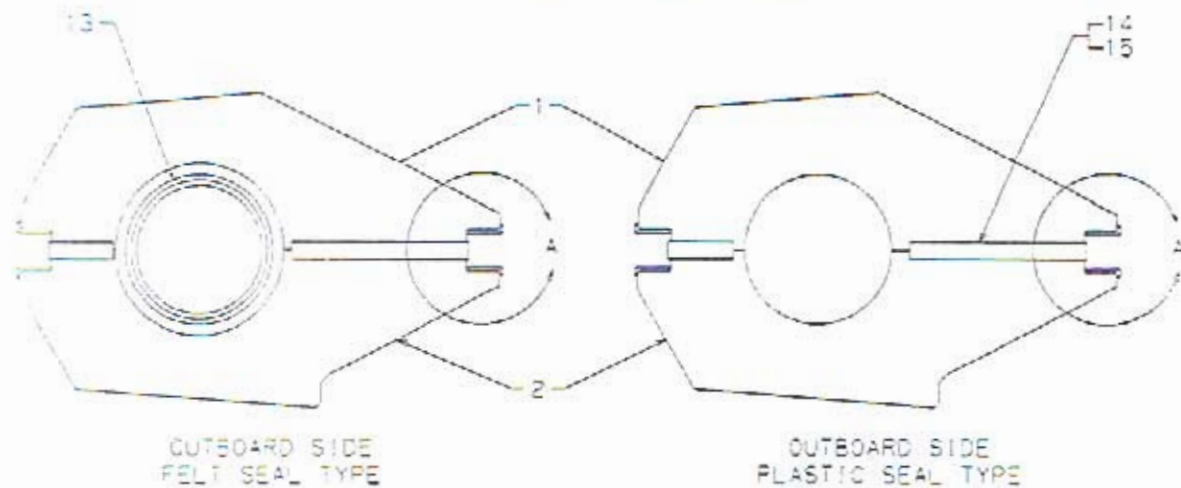


Fig.11 - Modified Gear Case With Plastic Seal Installed

Traction Motor Gear Case



VIEW A
BOLT AND NUT FASTENERS

TR3492T

Asm - Ref.No.	Part Number	Qty.	Description
129-1	9557134	1	GEAR CASE ASSEMBLY.. Traction motor - Upper
-2	9559650	1	GEAR CASE ASSEMBLY.. Traction motor - Lower
-3	8357105	1	CAP ASSEMBLY.. Grease filler - Gear case (not shown)
-4	8283227	6	SPRING.. Filler cap (not shown)
-5	8326952	2	FILLER.. Lock plate retainer (not shown)
-6	8294467	1	PLATE.. Adapter (not shown)
-7	108659	2	PIN.. Cotter - 5/16 x 2-3/4
-8	8126036	2	STRAP.. Safety - Gear case
-9	8322027	2	BOLT.. Tee head 1-8 x 7-1/2 - Gear case strap
-10	8322026	2	WASHER.. Special - Hardened
-11	8032750	2	NUT.. Hex lock 1-8
-12	103410	2	PIN.. Cotter - 3/16 x 1-3/4
-13	8250267	2	SEAL ASSEMBLY.. Insert - Felt - Gear hub and support bearing
-14	8310818	AR	GASKET.. Cording - Approximately 7-1/2 feet required per gear case half
-15	8366747	AR	COMPOUND.. Silicon rubber - Sold in 12 oz. tube
-16	8407505	1	CLAMP.. Traction motor axle dust guard band and inner gear case seal (not shown)
-17	9560006	1	SEAL.. Inner ring - Plastic - Gear hub and support bearing (not shown)
-18	9560005	1	SEAL.. Outer ring - Plastic - Wheel hub (not shown)

9560077, 53843