



GM Locomotive Group

MODERNIZATION RECOMMENDATION M.I. 9678

SPACED WEDGE OF TRACTION MOTOR ARMATURES

(DE-L) February 1990

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Document Number MM001010

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PURPOSE:

To provide instructions for applying spaced wedges to all EMD locomotive traction motors for improved cooling of armature coil insulation.

APPLICATION:

All EMD locomotive traction motor models D-27 through D-87B.

REFERENCES:

Figures 1, 2, and 3, plus data sheet of this Modernization Recommendation.

DISCUSSION:

The D-87B spaced wedge traction motor armature was developed for improved armature cooling.

Staggering or spacing the wedges invites cooling air to brush over the coil insulation which cools and dissipates the heat from the armature much more rapidly. Because of the higher ratings of the D-87B motor, the insulation system becomes hotter and requires better cooling to prolong the life of the motor. This same type wedging system used on D-77 and D-87 armatures can result in improved insulation system life for them as well.

Armature temperature rise can be reduced from three (3) to eight (8) degrees C., depending on load point on the new design space wedges. The thermal life of insulation typically increases by a factor of two (2) for a temperature reduction of about fifteen (15) degrees C. in the region of continuous operation.

This new design improvement is particularly worthwhile since no extra material or labor costs are incurred. It should, therefore, be considered as an important step toward improving the quality and longevity of the insulation system and life of the motor.

NEW MATERIAL REQUIRED:

<u>Quantity</u>	<u>Part No.</u>	<u>Description</u>
280	9556138	Slot Wedge
A. R.	8129831	Filler Strip (0.010")
A. R.	8129833	Filler Strip (0.015")

PROCEDURE FOR APPLICATION OF SPACED WEDGES

1. DEPTH OF COIL SLOT

Check depth of coil slot. Depth from top of core to top of coil must be a minimum of 0.230".

2. MARKING ARMATURE CORES

Mark armature core for wedging by using templates shown in Figure 1 on page 3 and Figure 2 on page 4. These marks are used to locate the wedges in even rows around the core and should be made with chalk, felt marker, or any marking method which doesn't raise burrs or chips on the armature core.

Figure 1 on page 3 marker is used to mark from end of core to stop of first inserted wedge (7-1/8").

Figure 2 on page 4 marker is used to mark from end of core to stop of second inserted wedge (2-9/16").

NOTE

These markers can be easily constructed by referencing figure 1 and figure 2 drawings.

3. PROCESS FOR DRIVING WEDGES

Drive three (3) or four (4) wedges in commutator end area to determine filler strip thickness for proper tightness of wedges. Wedges which stress and move laminations are too tight. Wedges which sound and feel loose when tapped are too loose. Apply a filler strip, dip wedge in varnish, and start wedge in core slot. Dip wedge in same type varnish used to impregnate the armature.

NOTE

Care must be taken to avoid varnish dripping from wedges onto "V" ring and commutator. Keeping varnish cup on pinion end side of armature reduces this risk.

Where looseness appears during driving, remove wedge immediately and apply thicker filler strip. Two (2) thicknesses of strips are available; 0.010" (#8129831) and 0.015" (#8129833).

If wedges become damaged, if possible, drive the next wedge before removal of the damaged one. This results in removing and replacing damaged wedges after good adjacent wedges are in position.

4. METHODS FOR DRIVING WEDGES

The objective during wedging is to distribute all the forces equally over the entire core surface. Uneven forces can bend the lamination fingers causing wedges in one slot to be tighter than in other slots. Many methods can be used to distribute the forces. One acceptable method is to drive a wedge in every other slot over the full circumference, which requires eight (8) rotations to complete an armature. Another method is to fill a given area of a few slots, working the commutator end by sections until completely wedged, then doing the pinion end in the same manner for a total of two (2) revolutions. In any case, wedges will be driven into every other slot in any sequence so that without

exception, no two (2) successive wedges will be driven into adjacent slots, one immediately after the other. Two operators may work on the same armature at the same time by working on opposite ends in similar patterns of wedge application.

5. **TRIMMING**

Trim excess filler strips from beyond ends of outer wedges and from between wedges. Save those trimmings of adequate length for reuse on other armatures.

NOTE

Reference winding drawing Figure 3 on page 5, which shows application and location of the four (4) 2.812" wedges in each slot. Spacing between each wedge is 1-3/4 inches.

Reference data sheet on page 6 for information on part numbers and material requirements to wind and/ or wedge an armature.

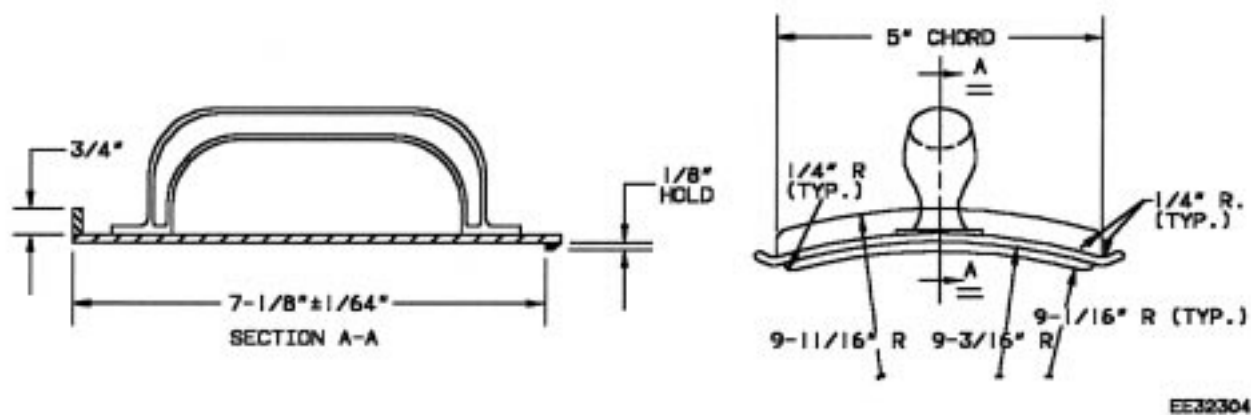
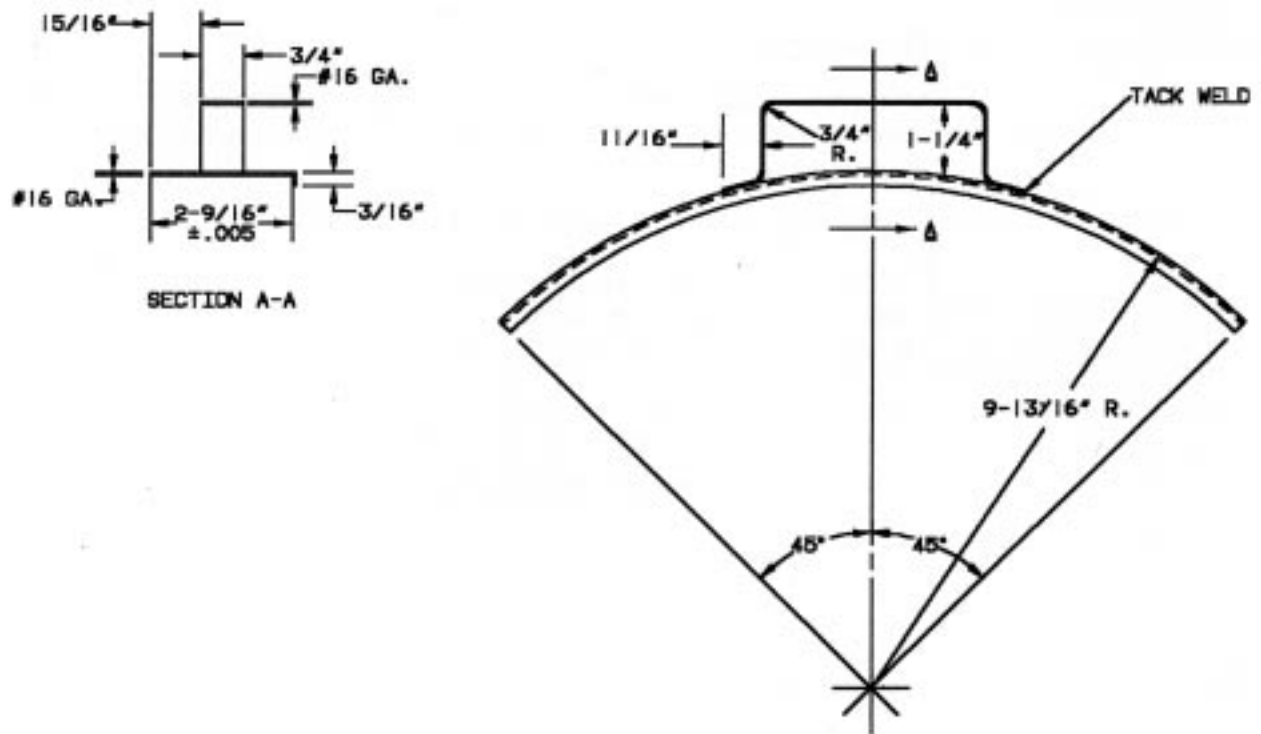


Figure 1. Armature Core Template (7-1/8")



EE32305

Figure 2. Armature Core Template (2-9/16")

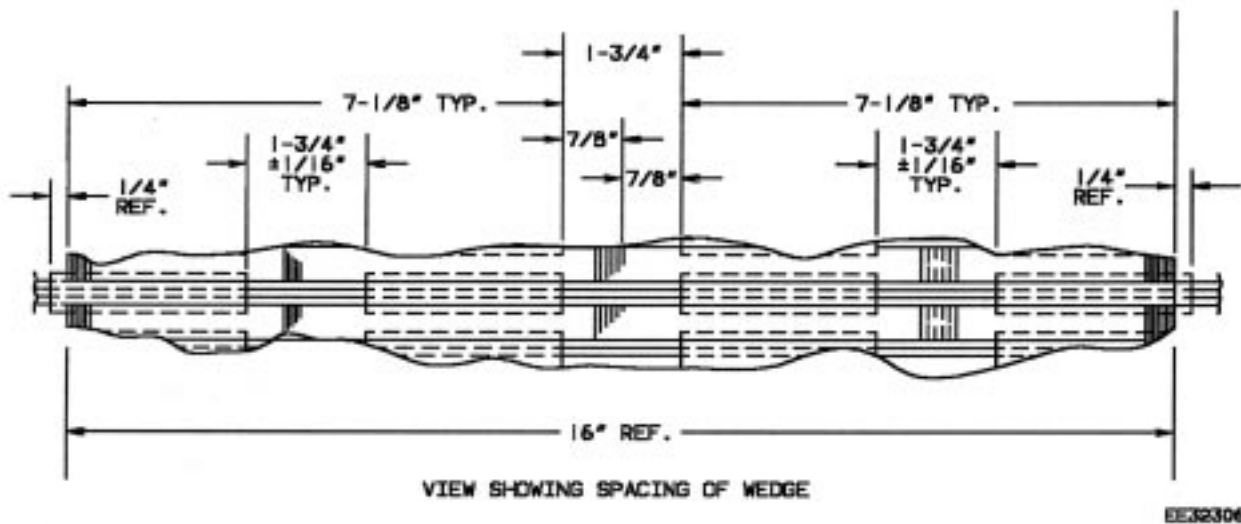


Figure 3. Application/ Location Of Wedges In Armature Slots

DATA SHEET

PART NO./ QTY.

WEDGE (2-13/16" long)	9556138
NUMBER OF WEDGES PER SLOTS	4
TOTAL SLOTS PER ARMATURE	70
TOTAL WEDGES REQUIRED PER ARMATURE	280
FILLER STRIPS (0.010")	8129831
FILLER STRIPS (0.015")	8129833
ARMATURE REWIND KITS (INCLUDES WEDGES & FILLER STRIPS)	
A) D-77	9522138
B) D-87/ D-87B	9524499