



M.I. 9682

GM Locomotive Group

MODERNIZATION RECOMMENDATION

REPLACEMENT OF "JUMBO" WINDSHIELD WIPER MOTORS

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PURPOSE:

To provide instructions for installation of replacement HP100 wiper motors and control valves in place of former "Jumbo" motors and controls. The HP100 motors have been found to be more reliable, quieter, have a longer service life, and are a cost savings. The new motors also have an automatic parking feature which eliminates the need for a handle on the motor.

APPLICATION:

All GP and SD 40, 50, and 60 series locomotive models equipped with "Jumbo" windshield wiper motors.

REFERENCES:

The following is a list of locomotive cab application drawings which will be affected by this upgrade, and a reference drawing of a typical HP100 wiper motor application in a similar locomotive cab.

Windshield wiper application (Jumbo)	9321431
Cab inner trim application	9509253
Cab roof assembly	9320075
 Windshield wiper application (HP100)	 40036385

Note: Copies of the above referenced application drawings are available (at no charge) from EMD Service Department. Requests should be addressed as follows:

**ELECTRO-MOTIVE DIVISION
GENERAL MOTORS CORPORATION
9301 W. 55th Street
La Grange, IL. 60525**

and marked to the ATTENTION OF:

Technical Publications Dept. 0704

DISCUSSION:

I. JUMBO MOTOR ASSEMBLY REPLACEMENT

The following parts are required in order to undertake the "Jumbo" to HP100 upgrade. All of these parts are available in a conversion kit which can be ordered under P/ No. 40041036.

Table 1. REPLACEMENT PARTS		
EMD P/ NO.	DESCRIPTION	QUANTITY
40036186	angle	4
40036812	wiper motor	1
40030273	wiper motor	2
40030274	wiper motor	2
10591018	plate asm.	1
10591019	plate asm.	1
8243073	outer bearing asm.	6
40036816	tube asm. - A2	1
40036818	tube asm. - B2	1
40036820	tube asm. - C2	1
40036822	tube asm. - D2	1
40036826	tube asm. - E4	1
171720	screw	4
132277	screw	10
8160443	elbow	1
272131	nut	1
9332004	grommet	4
9537580	hose asm.	2
8168449	clamp	5
118748	connection	3
40028128	adapter	2
40036824	tube asm. - E2	1
40040566	shaft & bearing asm.	1
40033758	label	2

Note: The following steps are necessary to replace the "Jumbo" wiper motors with the HP100 motor assemblies using the parts referenced above:

II. MODIFICATIONS TO P/ NO. 9509253 - (Cab Inner Trim Application)

Remove the following items from the cab inner trim and save for reapplication later:

- item #1 P/ No. 9320970 - sheet
- item #2 P/ No. 9320971 - sheet
- item #3 P/ No. 9320972 - sheet
- item #6 P/ No. 8461158 - insulation (qty. 4)
- item #7 P/ No. 8461160 - insulation (qty. 4)
- item #14 P/ No. 9320974 - insulation (qty. 2)
- item #16 P/ No. 9320976 - insulation
- item #17 P/ No. 9320977 - insulation (qty. 2)

After the HP100 wiper application is completed, reapply the above items. Some of these pieces will need to be trimmed to accommodate the new larger wiper control valve plate assembly.

III. MODIFICATION TO P/ NO. 9320075 - (Cab Roof Assembly)

Remove the following items from the cab roof assembly:

- item #18 P/ No. 9319960 - angle
- item #19 P/ No. 9319959 - angle (qty. 4)
- item #28 P/ No. 9327747 - angle

Item #19 will be replaced with P/ No. 40036186 - angle. When locating the new angle in position, maintain the 12.75 inch dimension per **section A-A**. The new angles will extend between items #7 (channel) on both sides of the roof.

IV. MODIFICATION TO P/ NO. 9321431 - (Windshield Wiper Application)

The parts that need to be removed are shown on this drawing. For application of the new parts, reference the HP100 application, P/ No. 40036385 - windshield wiper application.

Note: For steps 1 thru 3, removal and replacement of the wiper motors, retain the following items (from P/ No. 9321431):

- item #20 P/ No. 120380 - washers
- item #55 P/ No. 118748 - connector
- item #58 P/ No. 40028128 - adapter

For mounting the motors, use P/ No. 132277 - screw, along with P/ No. 120380 - washer, 2 of each per motor. For mounting details, reference P/ No. 40036385 - wiper application items #42 and #44.

Some additional connectors and the adapters are required for the new motor application. There should be a total of 6 connectors and 4 adapters, which includes the retained items plus some additional items ordered for the new application. For application of these items, reference P/ No. 40036385 items #45 and #46.

1. Remove item #2 P/ No. 9506600 - wiper motor, and replace with P/ No. 40036812 - wiper motor.
2. Remove item #52 P/ No. 9506602 - wiper motor, and replace with P/ No. 40030273 - wiper motor (qty. 2).
3. Remove item #1 P/ No.9506601 - wiper motor, and replace with P/ No. 40030274 - wiper motor.
4. Remove item #9 P/ No. 8128523 - outer bearing assembly, and replace with P/ No. 8243073 (qty. 6).

Note: For steps 5 and 6, removal and replacement of the control valve mounting plate assembly, retain the mounting screws P/ No. 171720. The Jumbo application had a total of 20 mounting screws, 10 per plate (see item #17 of P/ No. 9321431). Since the new plate assembly is larger, 4 additional screws are required, 2 per plate assembly. For application of these screws, reference item #39 of P/ No. 40036385.

5. Remove item #35 P/ No. 9505698 - plate assembly, and replace with P/ No. 10591018 - plate assembly.
6. Remove items #47 P/ No. 9505699 - plate assembly, and replace with P/ No. 10591019 - plate assembly.

Note: When applying the additional lines that are called out in steps 7 and 8, several new items are required.

- An additional elbow P/ No. 8160443 is required. For application, reference item #49 of P/ No. 40036385. The elbow is located at the front windshield wiper motor air line.
- Also, at the front windshield motor, an additional nut P/ No. 272131 is required. For application, reference item #50 of P/ No. 40036385.
- When applying the additional air lines to all four (4) side motors, 4 more grommets P/ No. 9332004 are needed. For application, reference item #33 of P/ No. 40036385.
- Both new motors applied to the cab doors will need another hose assembly applied, P/ No. 9537580. For application, reference item #32 of P/ No. 40036385.
- Clamps P/ No. 8168449 will be applied to secure the tubing. A total of five (5) are required. For application of these clamps, reference item #36 of P/ No. 40036385.

7. Apply P/ No.'s 40036816, 40036818, 40036820, 40036822, and 40036826 as per reference drawing P/ No. 40036385 (items #21, #23, #25, #27, & #31).
8. Remove item #7 P/ No. 9088064 shaft and bearing assembly, and replace with P/ No. 40040566 shaft and bearing assembly.
9. Apply label P/ No. 40033758 to the control valve mounting plate.