ELECTRO-MOTIVE

M.I.9636

MAINTENANCE INSTRUCTION

MODERNIZATION RECOMMENDATION
LOCOMOTIVE WINTERIZATION

PURPOSE: To provide instructions for applying winterization equipment on locomotives.

APPLICATION: All 30, 35, 38, 39, 40, 45, 38-2, 40-2, 39-2, 45-2 locomotives.

REFERENCES: The following application drawings are required:

LOCOMOTIVE MODEL	DRAWING NUMBER	DRAWING DESCRIPTION
GP-30 (Non-Dynamic Brake)	8404236	Winterization Duct
	8404705 (Rev. B)	Shutter and baffle Applic.
	8404245	Inertial Separator Structure Alt.
	8404519	Temp. Switch Appl.
	8404349	Switch Application
	8404130	Relay Application
	WS-16635	Wiring Diagram
GP-30 (Dynamic Brake)	Reference Drawings are same as above although some application details may not be correct.	
	8438193	Dynamic Brake Cable Alt.
GP-35/SD35 (Non-Dynamic Brake)	8405997	Winterization Duct
	8406418 (Rev. A)	Shutter Appl.
	8406488	Baffle Appl.
	8406236	Inertial Separator Structure Alt.
	8404519	Temp. Switch Appl.
	8404349	Switch Application
	8404130	Relay Application
	WS-16745	Wiring Diagram
GP35/SD35 (Dynamic Brake)	Reference Drawings are same as above although some application details may not be correct.	
	8438193	Dynamic Brake Cable Alt.
GP-39/SD39 GP-40/SD-40 SD45 (Non-Dynamic Brake)	8406179	Winterization Duct
	8406418 (Rev. A)	Shutter Appl.
	8406489	Baffle Appl.
	8406236	Inertial Separator Structure Alt.
	8404519	Temp. Switch Appl.
	8404349	Switch Appl.
	8404130	Relay Appl.
	WS-16745	Wiring Diagram

GP39/SD39 GP40/SD40/SD45 (Dynamic Brake)	Reference Drawings are same as above although some application details may not be correct.	
	8438193	Dynamic Brake Cable Alt.
	9090177	Dynamic Brake Hatch Struct. Alt.
GP-38-2 (Non-Dynamic Brake)	9507771	Shutter and Partition Appl.
	9508148	Grille and Cover Appl.
	9507772	Duct Appl.
	9507777	Tube Asm.
	9507776	Tube Asm.
	9508383	Solenoid Valve Appl.
	9508378	Inertial Filt. Compartment Alt.
	9508361	Underframe Alt.
	9507934	Air Brake Piping Underframe Alt.
	9608283	Physical Schem. and Wiring Diagram
	9508251	Temp. Switch Appl.
	8467325	Relay Appl.
	9508397	Frame Alt.
	8488385	Switch
	9508358	Solenoid Valve Conduit Appl.
GP-38-2 (Dynamic Brakes)	Reference Drawings are same as above although some application details may not be correct.	
	9090177	Dynamic Brake Hatch Struct. Alt.
GP38 (Non-Dynamic Brake and Dynamic Brake)	Reference Drawings are a combination of GP40 Drawings and GP38-2 Drawings. Some application details depicted may not be correct.	
GP39-2/SD39-2 GP49-2/SD40-2 SD45-2 (Non-Dynamic Brake)	8467325	Ralay Appl.
	8476985	Elect. Cabinet Alt.
	8404148	Switch Asm.
	8425175	Hatch Alt.
	9091564	Inertial Separator Structure Alt.
	8467617	Shutter Appl.
	8423975	Fan Hatch Eq.
	8426973	Winterization Duct Appl.
	8467604	Temp. Switch Appl.
	8467759	Magnet Vlv. Ppg. Appl.
	8467773	Magnet Vlv. Conduit Appl.
	8467282	Baffl. Appl.
	8468709	Phys. Schematic And Wiring List.
GP39-2/SD39-2 GP40-2/SD40-2 SD45-2 (Dynamic Brake)	8467325	Relay Appl.
	9089928	Elect. Cabinet Alt.
	8404148	Switch Asm.
	9089929	Inertial Filter
	8406236	Inertial Separator Structure Alt.
	8423975	Fan Hatch Equip.
	9090085	Winterization Duct Appl.
	8467617	Shutter Appl.
	9090115	Temp. Switch Appl.
	9090008	Magnet Vlv. Ppg. Appl.
	9089990	Magnet Vlv. Conduit Appl.
	9090304	Baffle Appl.
	8468709	Phys. Schematic and Wiring List
	9090177	Dynamic Brake Hatch Struct. Alt.
	8438143	Dynamic Brake Cable Alt.

DISCUSSION:

Several railroads have had problems operating locomotives in the winter because of snow entering the air intake filters. Conditions such as moisture grounds in electrical components or engine air filter plugging are encountered when snow is drawn into the inertial filter compartment, through the filters, and into the traction motor and generator blowers. These effects are increased in snow plowing operations.

To alleviate such snow problems, E.M.D. has developed a "Winterization System". It will supply heated air from the cooling system radiators to the engine room via a roof mounted duct, Fig. 1. A set of temperature controlled shutters mounted between the engineroom and the inertial filter compartment as shown in Fig. 2 allows this air to mix with the air being drawn into the inertial filters, as shown in Fig. 3. This serves to melt the snow before it can cause any problems. The system should maintain an air temperature into the blowers of about 50° F above the ambient temperature.

The winterization shutters are controlled by an automatic temperature sensing switch set so the shutters will open at 35° F and close at 45° F. This switch can be wired to alter the cooling fan operating sequence, but this feature is not required. A "snow operation" switch mounted on the engine control panel activates or deactivates the winterization system.

Reference drawings for locomotive modifications have been listed in this recommendation to serve as guidelines or starting points for system application. In some cases, due to features on specific locomotives, details shown in the drawings may be inapplicable. Some alteration of drawings may be required to fit various locomotives. The degree of rework necessary to accommodate this system is a customer decision. E.M.D. Representatives are available for assistance if it is desired.

NOTE

Since the shutter seal is dependent on the linkage force, the actuating linkage should be installed as shown in shutter application drawings.

NEW MATERIAL REQUIRED AND COST:

This is dependent on actual work done on locomotives and hence, because of customer discretion, new material and ultimate cost will vary.

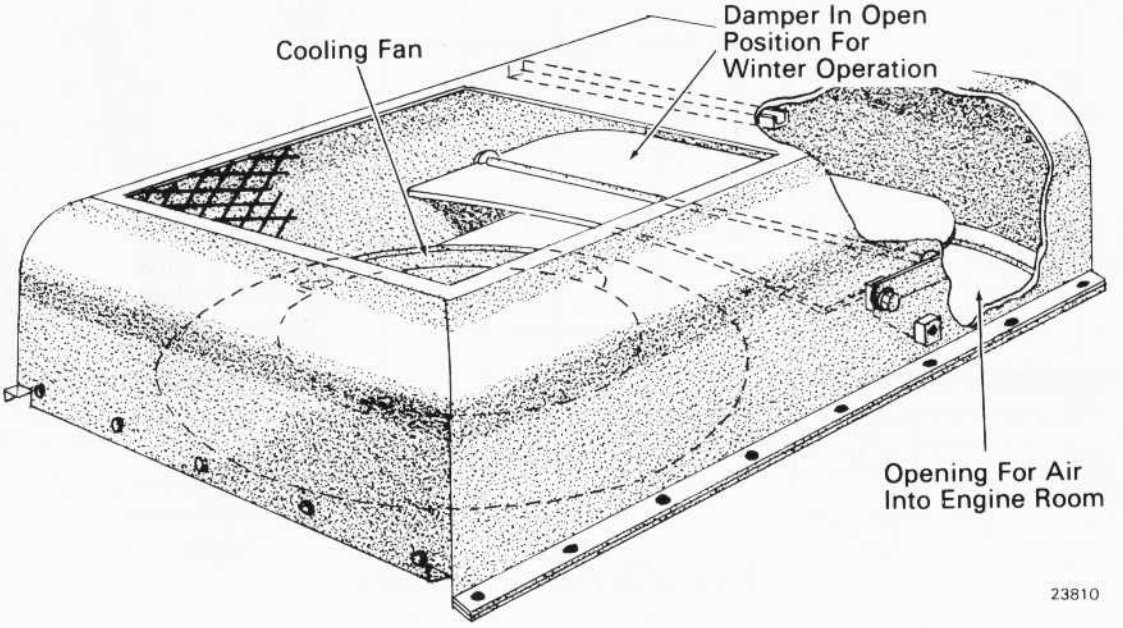
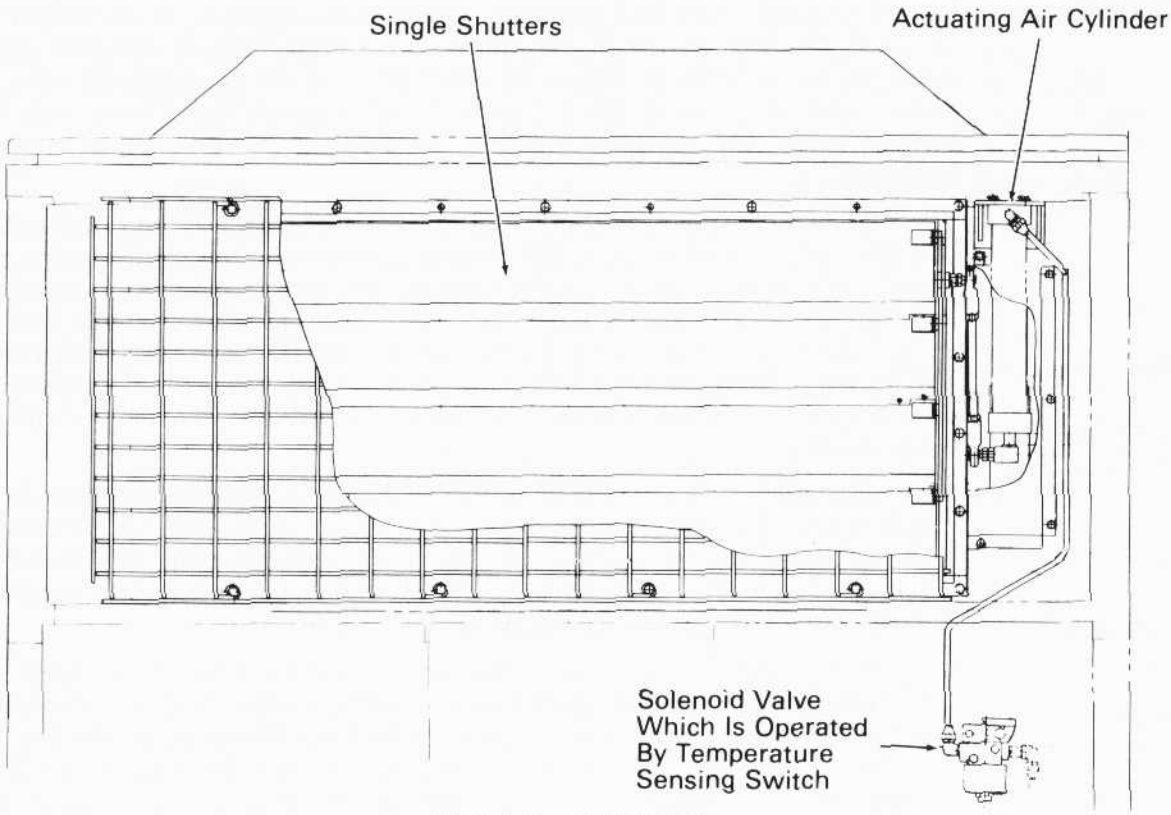
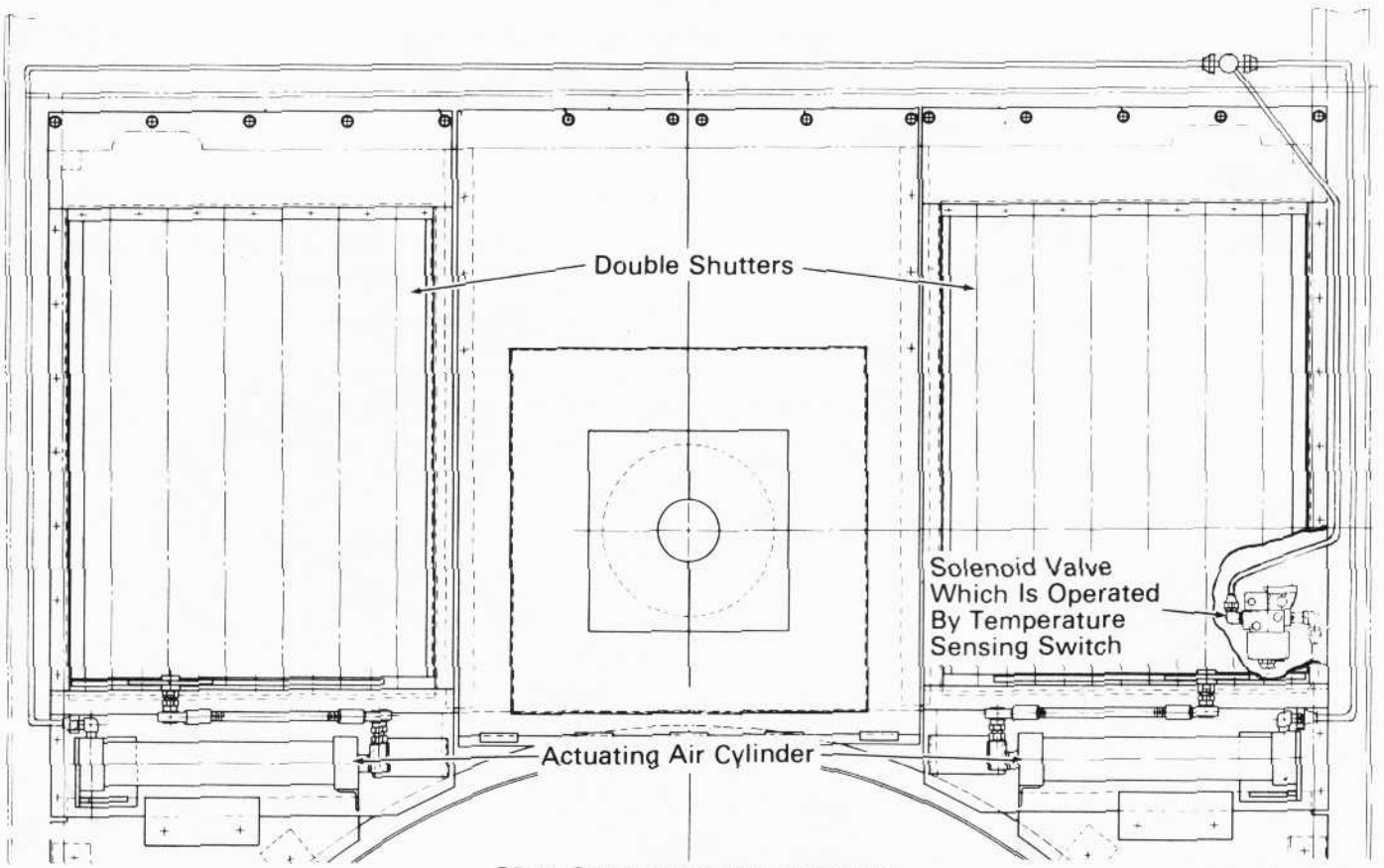


Fig.1 -Winterization Roof Duct



ALL TURBOCHARGED



SD & GP38-2 (ROOTS BLOWER)

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Fig.2 - Shutters At Engine Room And Filter Compartment Partition

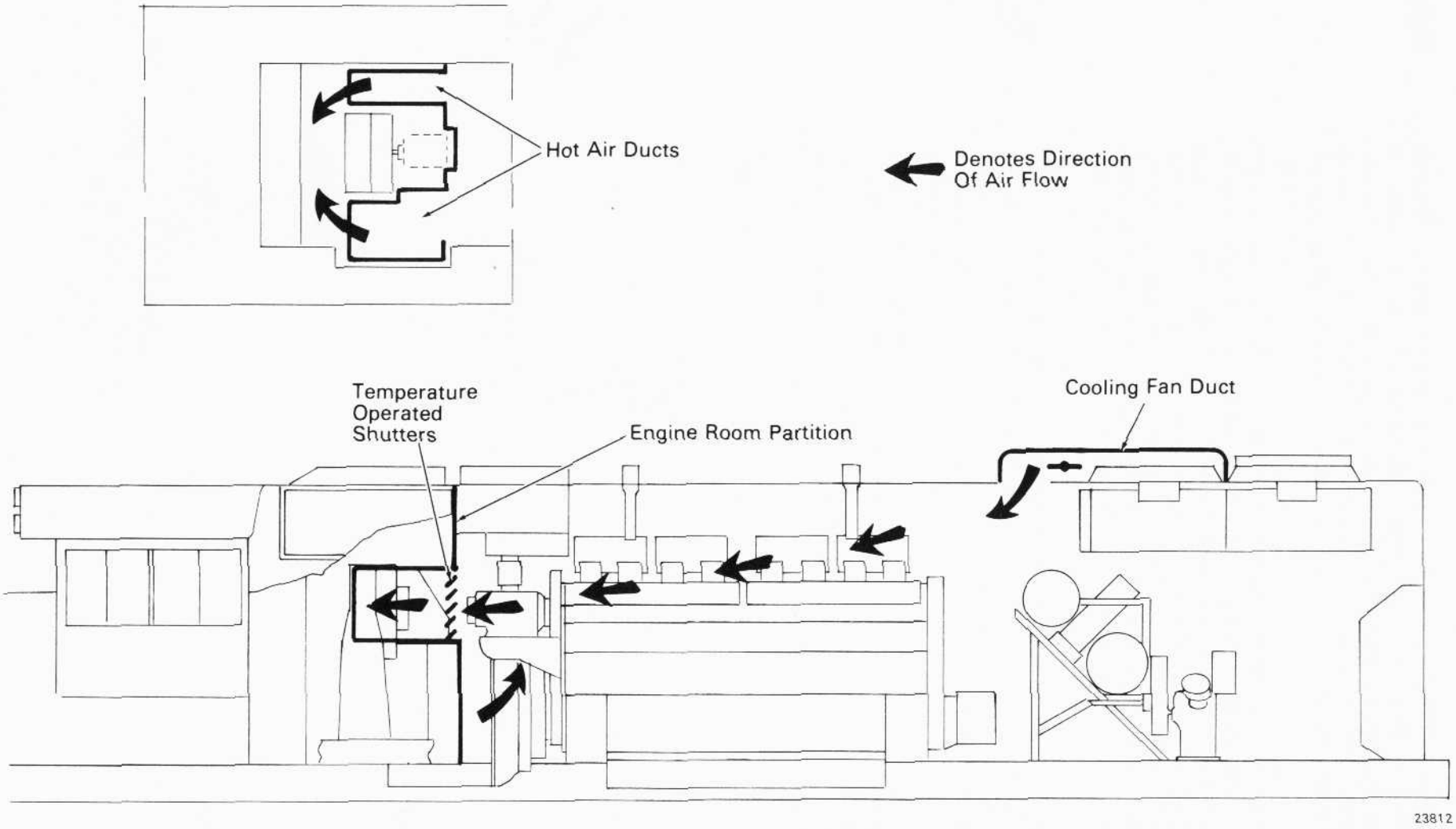

Fig.3 - Typical Winterization System