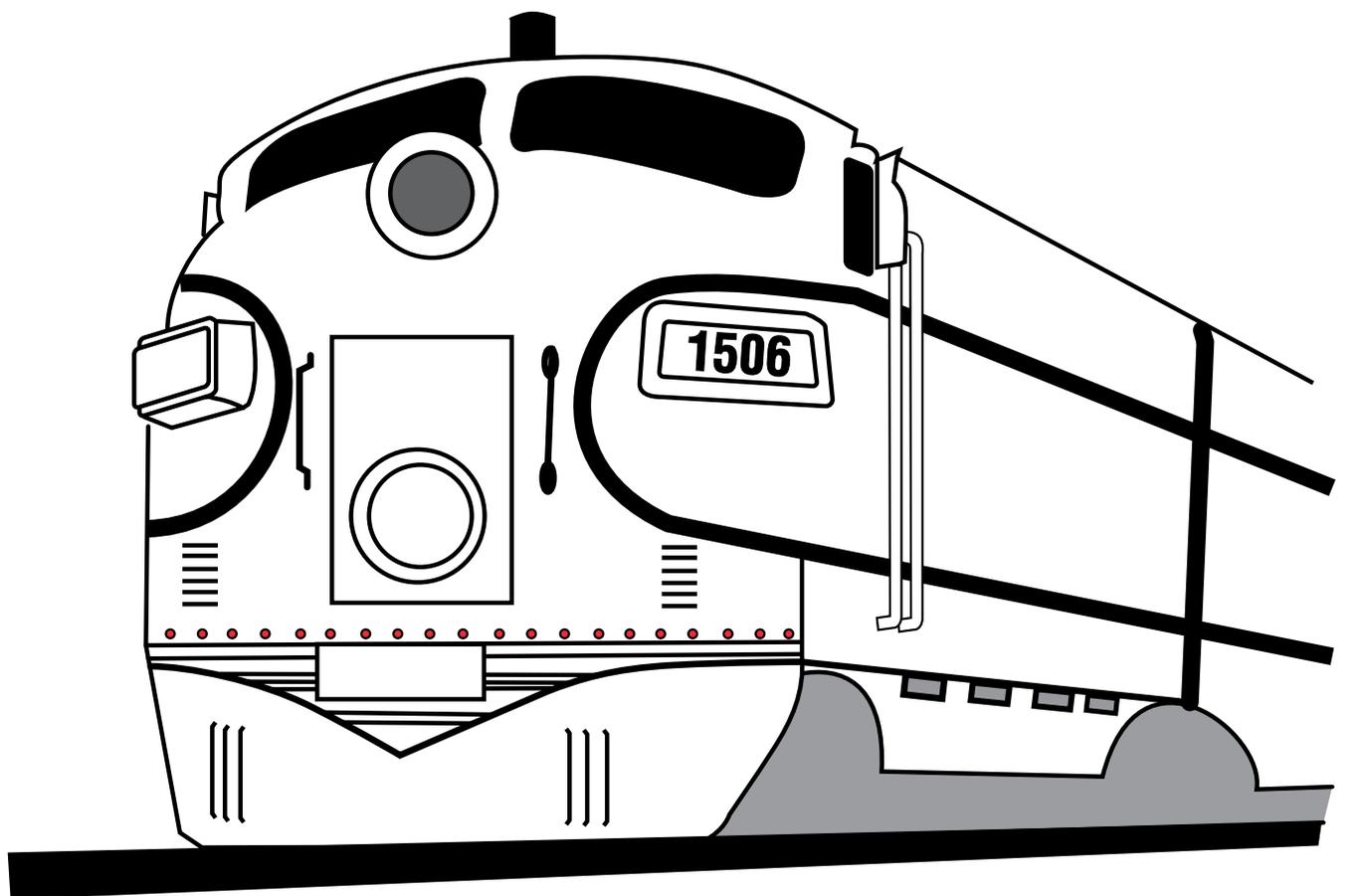


# **LOCOMOTIVE-TYPE SPARK ARRESTERS**





## STANDARDS FOR LOCOMOTIVE-TYPE SPARK ARRESTERS

Locomotive-type spark arresters are tested in accordance with the latest revision of the Association of American Railroads (AAR) Recommended Practice RP-557, "Spark Arresters for Non-turbocharged Diesel Engines Used in Railroad Locomotives," Society of Automotive Engineers (SAE) Recommended Practice J342, "Spark Arrester Test Procedure For Large Size Engines," SAEJ997, "Spark Arrester Test Carbon," and Forest Service Standard 5100-1c, "Spark Arresters for Internal Combustion Engines."

These Standards and procedures establish the minimum performance and maintenance requirements for locomotive-type spark arresters.

EXTERNAL ARRESTERS are those designed to be installed on the locomotive exhaust stack or stacks. They may be inside or outside the engine compartment. SAE J350 or Forest Service Standard 5100-1c test procedures are used for this type arrester.

INTERNAL or MANIFOLD-TYPE ARRESTERS make use of the engine manifold and are installed below the locomotive profile. This type arrester is tested against SAE J342 or ARR Recommended Practice, RP-557.

## LOCOMOTIVE-TYPE SPARK ARRESTER INSPECTION PROCEDURES

1. Look for the locomotive manufacturer's name on the locomotive frame below the cab.

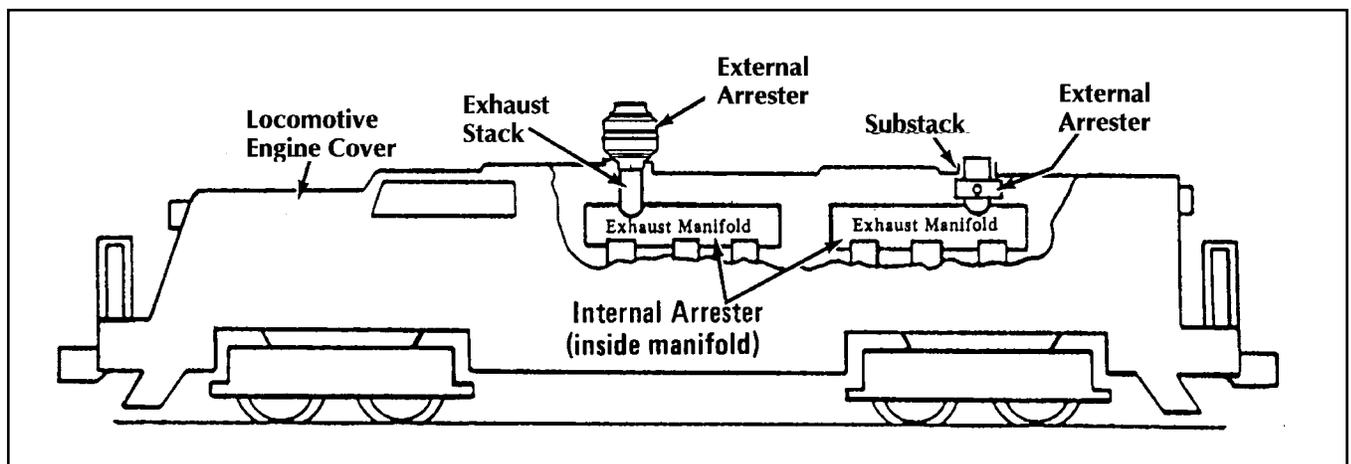
Note:

- Newer General Electric (GE) locomotives are all turbocharged.
- Electro-Motive Division (EMD) locomotives can be both turbo- and nonturbocharged, with and without a muffler.
- You will occasionally inspect an older locomotive of some other brand. The inspection procedures are similar. Determine if it is turbo- or nonturbocharged and if an arrester is needed or not.

2. If it has an arrester, look for the manufacturer's name and model number on the body of the arrester. They must be stamped on the metal body or on an attached metal plate. Internal arresters must be stamped in the metal body or on an attached metal plate affixed to the manifold.

3. If identification is established, then check the "Qualified and Rated" list.

4. If the arrester cannot be identified (i.e., tag missing), determine if the arrester is an internal arrester (manifold type), or an external arrester (generally mounted on the exhaust stack).



**TYPICAL LOCOMOTIVE**  
*Location of Internal and External Spark Arresters*

5. Then turn to the locomotive identification section and check the illustrations for configuration of body type to identify make and model possibilities.

6. Check the “Qualified and Rated” pages to determine if it is qualified.

*(Note: The two most often found are FARR and HAPCO.)*

### Inspection

#### 1. Turbocharged Locomotives

- Inspect for carbon build-up on the eductor tubes and exhaust stack (*no arrester is required*).
- On muffler-equipped locomotives, you will have to remove or have the eductor removed for inspection.

*(Note: The locomotive will have one exhaust stack.)*

#### 2. Nonturbocharged Locomotives

- Inspect for correct application of arrester.
- Arrester properly cleaned and maintained.
- Exhaust system in good order.

*(Note: The locomotive can have up to four exhaust outlets and will require up to four spark arresters).*

#### 3. Steam Powered Locomotives

- Inspect for a screen over the entire exhaust stack that has been maintained in good order. Check your agency rules and regulations.

#### 4. Tools needed for an inspection:

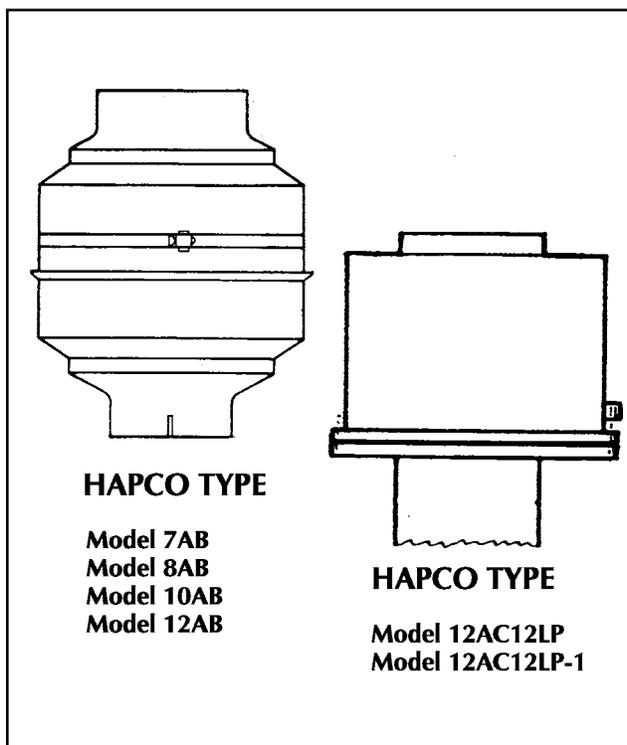
- Miscellaneous hand tools
- Coveralls
- Gloves
- Goggles
- Flashlight
- Mirror
- Carbon particle collection containers.

More detailed instructions are found in the NWCG publication “Railroad Inspection Handbook,” and the

NWCG video, "Spark Arresters and the Prevention of Wildland Fires."

### Identification Key

**EXTERNAL SPARK ARRESTERS** are fitted to the exhaust stack of a conventional locomotive exhaust manifold. They are identified by the manufacturers name and model number.



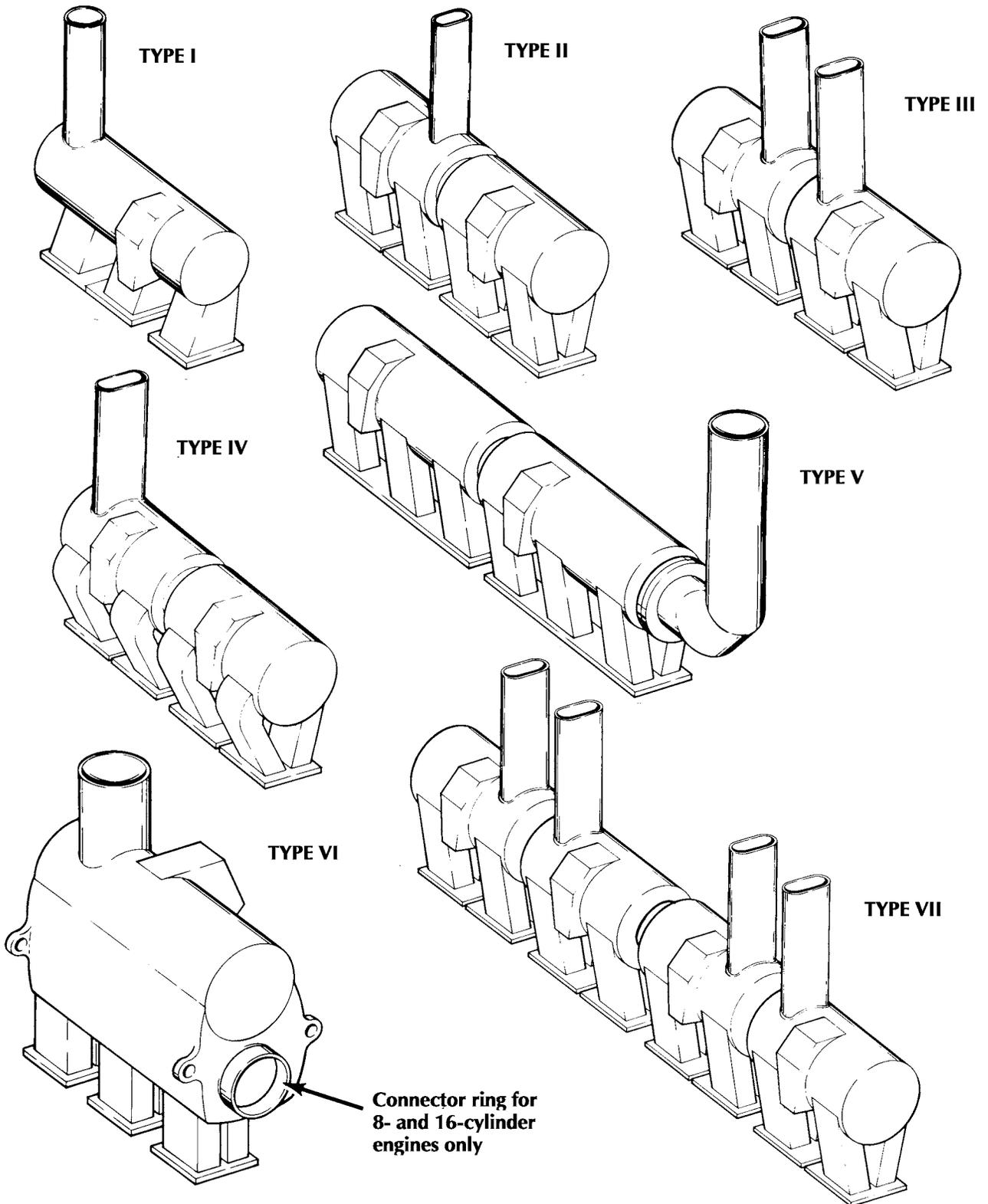
### INTERNAL OR MANIFOLD-TYPE

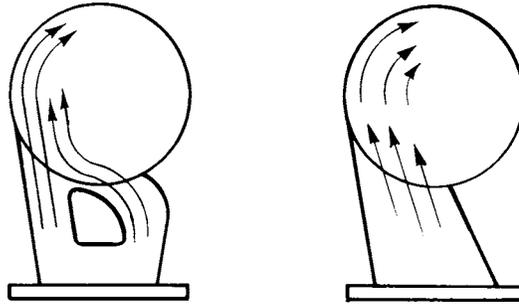
Spark arresters have seven basic body variations referred to as Types I through VII. Each of these body types may use one or more of four leg configurations referred to as A-swirl leg, B-bent leg, C-straight leg, or D-short straight leg. See the following pages for illustrations.

Qualified internal arresters may be redesigned manifolds or they may be originally designed as spark arrester manifolds. They can have any combination of body type and leg configuration as shown on the following pages and as listed on the individual qualification.

The appropriate model number will appear on the spark arrester name plate and correspond to drawing numbers on file at SDTDC.

**LOCOMOTIVE SPARK ARRESTERS** *Internal Spark Arresters—Body Types*

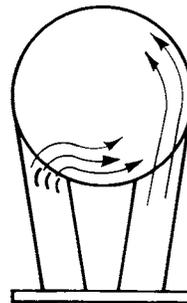




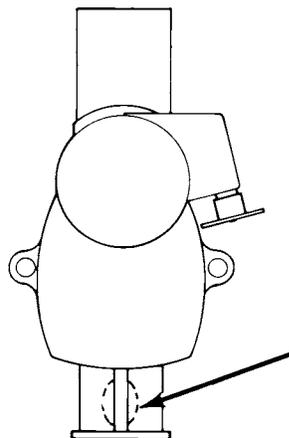
**TYPE A SWIRL**



**TYPE B BENT**



**TYPE C STRAIGHT**



**567 engine only—  
two legs at stack end  
of arrester manifold**

**TYPE D SHORT STRAIGHT**

## 2012 QUALIFIED LIST—LOCOMOTIVE

LINE	MFG	MODEL NUMBER	BODY TYPE	LEG TYPE	REMARKS
1	BUR	GN7	IV	C	Unit consists of two sections combined
2	BUR	GN8	IV	C	Two stacks near center
3	EMD	EMD 32379	II	C	For GP-7 only. Two units, One with exhaust stack and One
4			(with stack)	(with stack)	without exhaust stack make a set.
5	EMD	EMD 32379A	II	C	For GP-7, GP-9,GP-18,GP-28 & GP-38. Two units, One with
6			(w/o stack)		exhaust stack and one with out stack make a set.
7	EMD	EMD 32379AB	II	C	~
8			(w/o stack)		
9	EMD	EMD 32379B	II	C	~
10			(w/o stack)		
11	EMD	EMD 32379SDA	IV	C	For SD-7 & SD-9 with Dynamic brake. Two units, one with
12			(w/o stack)		exhaust stack and one without stack make a set.
13	EMD	EMD 32379SDAB	IV	C	~
14			(w/o stack)		
15	EMD	EMD 44379	II	C	For GP-38, two units , one with exhaust stack and one
16			(with stack)		without stack make a set.
17	EMD	EMD 44379B	II	C	~
18			(w/o stack)		
19	EMD	EMD 8426352	I	A	Two sections form unit for half of 16 cylinder engine. Two
20			(with stack)		stacks at opposite ends.
21	EMD	EMD 8426353	I		~
22			(w/o stack)		
23	EMD	EMD 8426353	I	A	Two sections form unit for half of 16 cylinder engine. Two
24			(w/o stack)		stacks at opposite ends.
25	EMD	EMD 8426353	I	A	Two sections form unit for half of 16 cylinder engine. Two
26			(w/o stack)		stacks at opposite ends.
27	EMD	EMD 8426353	I	A	~
28			(w/o stack)		
29	EMD	EMD 8426353	I	A	~
30			(w/o stack)		
31	EMD	EMD 8426353	I	A	~
32			(w/o stack)		
33	EMD	EMD 8426354	I	A	~
34			(with stack)		

## 2012 QUALIFIED LIST—LOCOMOTIVE

LINE	MFG	MODEL NUMBER	BODY TYPE	LEG TYPE	REMARKS
35	EMD	EMD 8426355	I	A	~
36			(with stack)		
37	EMD	EMD 8426356	I	A	Two sections form unit for half of 12 cylinder engine. Two
38			(with stack)		stacks at opposite ends.
39	EMD	EMD 8426356	I	A	~
40			(with stack)		
41	EMD	EMD 9093983	I	A	Two sections form unit for half of 16 cylinder engine. Two
42			(with stack)		stacks at opposite ends.
43	EMD	EMD 9093984	I	A	Two sections form unit for half of 16 cylinder engine. Two
44			(with stack)		stacks at opposite ends.
45	EMD	EMD 9093984	I	A	~
46			(with stack)		
47	EMD	EMD 9093985	I	A	Two sections form unit for half of 16 cylinder engine. Two
48			(with stack)		stacks at opposite ends.
49	EMD	EMD 9093986	I	A	Two sections form unit for half of 16 cylinder engine. Two
50			(with stack)		stacks at opposite ends.
51	EMD	EMD 9501801C	VI	D	For 16-645 engine-2 spark arrester unit** with 4 leg manifold
52					connector
53	EMD	EMD 9501801C	VI	D	For 8-645 engine-1 spark arrester unit** with two leg
54					manifold connector
55	EMD	EMD 9515814A	VI	D	For 12-645 engine-2 independent spark arrester unit**
56	EMD	EMD 9530989	VI	D	For 12-567A thru 12-567C engines- 2 independent spark
57					arrester units*
58	EMD	EMD 9530989	VI	D	For 6 -567A thru 6-567C engines-1 spark arrester units**.
59	EMD	EMD 9531223	VI	D	For 16-567A thru 16-567D engines - 2 spark arrester units**
60					with 4 leg manifold connector.
61	EMD	EMD 9531223	VI	D	For 8-567A thru 8-567C engines-1 spark arrester unit** with
62					two leg manifold connector.
63	FAR	C-37223***	I	C	Spark arrester has 6 legs
64	FAR	C-37247***	I	C	~
65	FAR	C-42317	II	A	May not be marked FAR #5
66	FAR	C-43888***	III	A	~
67	FAR	C-51994***	II	A	May not be marked FAR #5
68	FAR	C-58151	I	C	one round stack

## 2012 QUALIFIED LIST—LOCOMOTIVE

LINE	MFG	MODEL NUMBER	BODY TYPE	LEG TYPE	REMARKS
69	FAR	C-70899	VII	C	Four oval stacks, manifolds are interconnected.
70	FAR	C-71088***	III & VII	C	Four oval stacks, one at each end and two adjacent stacks in the center, manifolds are interconnected.
71					
72	FAR	C-71372***	VII	C	Four oval stacks, manifolds are interconnected.
73	FAR	C-78327	VII	C	Same as C-70889 with side clean out spark traps.
74	FAR	C-95248***	I	C	Same as C-37223 except with a thicker base plate and side clean-out spark traps, with a removable cover for trap clean out.
75					
76	FAR	C-95248-C	I	C	Same as C-37223 except with a thicker base plate and side clean-out spark traps, with a removable cover for trap clean out.
77					
78	FAR	C-95248-C	I	C	Same as C-37223, with a heavy duty side clean out spark trap.
79	FAR	C-95248-D	I	C	Same as C-37223, with a heavy duty side clean out spark trap.
80	FAR	C-95248-E	I	C	Same as C-37223, with an increased capacity side clean-out trap and a thicker base.
81					
82	FAR	D-111513	III	C	Same as D-69642 with an increased capacity side clean-out trap, a thicker base plate and a removable cover for trap clean out.
83					
84	FAR	D-111513***	III	C	Same as D-69642 with a thicker base plate and removable cover for trap cleanout.
85					
86	FAR	D-111639	III	C	Same as D-69642 with a removable cover for trap cleanout and a reduced distance from the stack centerline to the manifold.
87					
88	FAR	D-111639***	III	C	Same as D-69642 with removable cover for trap clean out and a reduced distance from the stack centerline to the end of the manifold
89					
90					
91	FAR	D-116089	III	C	Same as D-69642 with removable cover for trap cleanout on opposite sides of the manifolds.
92					
93	FAR	D-116089***	III	C	Same as D-69642 with removable cover for trap cleanout on opposite sides of the manifolds.
94					
95	FAR	D-35001***	II	C	~
96	FAR	D-36781***	V	C	~
97	FAR	D-37458***	I	B	~
98	FAR	D-37819***	II	B and C	~
99	FAR	D-38040***	V	B and C	~
100	FAR	D-38100***	IV	C	~
101	FAR	D-38101***	IV	B and C	~
102	FAR	D-38370***	II	C	~

## 2012 QUALIFIED LIST—LOCOMOTIVE

LINE	MFG	MODEL NUMBER	BODY TYPE	LEG TYPE	REMARKS
103	FAR	D-40791***	I	A	~
104	FAR	D-40841***	I	A	~
105	FAR	D-41275***	III	C	~
106	FAR	D-41431***	I	A	End view looks like bentleg (waterpipe opening
107	FAR	D-45312***	II	C	~
108	FAR	D-45313	IV	C	Side cleanout spark traps.
109	FAR	D-46091	II	C	Side cleanout spark traps.
110	FAR	D-46181	IV	C	Side cleanout spark traps.
111	FAR	D-46665***	II	A and C	~
112	FAR	D-47290***	II	C	~
113	FAR	D-47910	II	C	Side cleanout spark traps.
114	FAR	D-48747	II	A and C	Side cleanout spark traps.
115	FAR	D-49209***	I	C	~
116	FAR	D-50318***	II	C	~
117	FAR	D-50590	III	C	Side cleanout spark traps.
118	FAR	D-52151***	II	C	~
119	FAR	D-52179	IV	C	Side cleanout spark traps.
120	FAR	D-52190	II	C	Side cleanout spark traps.
121	FAR	D-52236***	V	C	Four oval stacks, manifolds are not interconnected.
122	FAR	D-52632	III	C	Side cleanout spark traps.
123	FAR	D-53043***	V	C	~
124	FAR	D-53104***	II	C	~
125	FAR	D-53347***	II	C	~
126	FAR	D-53355***	II	B	~
127	FAR	D-53415***	IV	C	p~
128	FAR	D-53934	II	C	Side cleanout spark traps.
129	FAR	D-54500	IV	C	Side or bottom clean out spark traps
130	FAR	D-54501	II	C	Side or bottom clean out spark traps
131	FAR	D-54502	II	C	Side or bottom clean out spark traps
132	FAR	D-54503	IV	C	Side or bottom clean out spark traps
133	FAR	D-54504	II	C	Side or bottom clean out spark traps
134	FAR	D-54505	IV	C	Side or bottom clean out spark traps
135	FAR	D-58438***	IV	C	One round stack
136	FAR	D-59286***	IV	C	One round stack, standard EMD manifold.

## 2012 QUALIFIED LIST—LOCOMOTIVE

LINE	MFG	MODEL NUMBER	BODY TYPE	LEG TYPE	REMARKS
137	FAR	D-62777	II	C	One oval stack, quick opening side clean-out spark trap.
138	FAR	D-62778	IV	C	One oval stack, quick opening side clean-out spark trap.
139	FAR	D-65800***	IV	C	One round stack , manifolds connected by a flex joint connector.
140					
141	FAR	D-66531***	IV	B or C	One oval stack, quick opening side clean-out spark trap
142	FAR	D-66541***	IV	C	One oval stack.
143	FAR	D-69642***	III	C	Two oval stackslocated in the middle, manifolds are not interconnected.
144					
145	FAR	D-71303***	VII	C	Four oval stacks, manifolds are not interconnected.
146	FAR	D-7221***	VII	A	Four oval stacks, manifolds are not interconnected.
147	FAR	D-72222***	II	A	Two rectangular stacks, manifolds are interconnected.
148	FAR	D-72687***	IV	B and C	Same as D-38101 with flex joint in place of band clamp.
149	FAR	D-72698***	III	B and C	Four oval stacks, manifolds are not interconnected.
150	FAR	D-72704***	III	B and C	Four oval stacks, manifolds are not interconnected.
151	FAR	D-73358***	VII	C	Approved as D-71303
152	FAR	D-75318***	III	C	Approved as D-69642
153	FAR	D-78348	V	C	Same as D-530043 with a flex joint and bottom clean-out spark traps.
154					
155	FAR	D-96702	II	C	Same as D-52190 with a side clean-out spark trap a thicker mounting flange base plate and a removable cover for trap cleanout.
156					
157					
158	FAR	D-96702***	II	C	Same as D-52190 with a side clean-out spark trap a thicker mounting flange base plate and a removable cover for trap cleanout
159					
160					
161	FAR	D-99346 ***	III	C	Same as D-69642 with thicker base plate and a reduced distance from centerline of the stack to the end of the manifold.
162					
163					
164	FAR	D-99346***	III	C	Same as D-69642 with a thicker exfor increase thickness of the base plate and a reduced distance from centerline of the stack to the manifold is reduced to 2.89 inch.
165					
166					
167	HAR	HAPCO 10 AB*	External	N/A	Single inlet fits on exhaust stack.
168	HAR	HAPCO 12 AB*	External	N/A	Single inlet fits on exhaust stack.
169	HAR	HAPCO 12			
170		AC12LP*	External	N/A	Single inlet fits on a round or oval exhaust stack.

## 2012 QUALIFIED LIST—LOCOMOTIVE

LINE	MFG	MODEL NUMBER	BODY TYPE	LEG TYPE	REMARKS
171	HAR	HAPCO 12	External	N/A	Single inlet fits on a round or oval exhaust stack.
172		AC12LP-1*		N/A	
173	HAR	HAPCO 7 AB*		N/A	
173	HAR	HAPCO 7 AC 1*		N/A	
174					Single inlet fits on exhaust stack with horizontal or vertical application.
175	HAR	HAPCO 8 AB*	External	N/A	Single inlet fits on exhaust stack.
176	PEN	C-466143-C	II	C	For EMD GP-9, RR class ERS 17.
177	SPR	PT1	III	B	For GP-9 (discontinued model)
178	SPR	PT11	I	B	For SD-9 (discontinued model)
179					
180					
181					

*A description of the terms used in the Locomotive Spark Arrester Update table follows:*

*MFG            Manufacturer*

*FAR            Farr Company—Model 5 Locomotive Spark Arresters; Not all Farr Model 5 exhaust devices are qualified Locomotive Spark Arresters, only the Farr Model 5 model numbers listed on this qualified list.*

*Footnotes—*

*\* = Harco series are external spark arresters designed to be installed on standard locomotive manifold stacks. The back pressure of an external arrester is additive to that of the manifold. Users of external arresters should measure maximum manifold leg backpressure with the arrester installed to make certain it does not exceed the 3 1/2 inches of mercury backpressure limit, specified by the AAR Recommended Practice RP-557, "Spark Arresters For Non-Turbocharged Diesel Engines in Railroad Locomotives."*

*\*\* = Spark arrester has 6 legs.*

*\*\*\* = All have bottom spark trap clean-outs.*

## **2012 LOCOMOTIVE-TYPE SPARK ARRESTERS MANUFACTURERS LIST**

BUR = BURLINGTON NORTHERN, INC., Great Northern Railway

EMD = ELECTRO-MOTIVE DIVISION, General Motors

FAR = HARCO MANUFACTURING COMPANY

PEN = PENN CENTRAL TRANSPORTATION CO.

SPR = SOUTHERN PACIFIC RAILROAD

## HELPFUL HINTS

**REMEMBER:** The **RULE OF THREE** applies to Locomotive arresters, as well as General Purpose arresters. An approved arrester must have all of the following:

1. A manufacturer brand name/trademark.
2. A spark arrester model number.
3. A cleanout.

## SUGGESTIONS

- If it is a turbocharged locomotive, inspect the eductor tubes.
- If the locomotive is muffler equipped, the eductor must be removed for inspection.
- If not turbocharged, then it has to have a spark arrester. There are less than a dozen brands of locomotive spark arresters in common use.

## CHECK LIST

1. Has the locomotive been *BLUE FLAGGED*\* for safety while you conduct the inspection?
2. Make sure everyone who could move the locomotive knows you are conducting an inspection.
3. Always face the locomotive when climbing on or off the equipment.
4. A witness is very helpful when encountering violations.
5. Use a piece of chalk to write the locomotive number on the stack for documentation when taking photographs.

\*Association of American Railroads requirement.