DELPHI

P. O. Box 431   Warren, Ohio 44486

ENGINEERING SPECIFICATION NO.   **M3382**

TITLE   **CABLE, EXPANDED DUTY FUSIBLE LINK – 150 DEG. C RATED**

1.   GENERAL: This specification covers heavy wall, insulated cable. It is intended for use as a fusible link at a nominal system voltage of 50 volts or less in surface vehicles.

2.   MANUFACTURE:

    2.1   Conductors - The conductors shall be constructed of bare copper wire (Ref. ASTM B-3).
        2.1.1   See Table I for sizes and dimensions.
        2.1.2   Splices - Splices are permitted in the individual strands and the conductor as a whole provided that they do not increase the conductor diameter or decrease the break strength of the conductor by more than 20%. Maximum weld length is 7mm.

    2.2   Insulation - The insulation shall be homogeneous in character and rated for 150°C continuous operating temperature.
        2.2.1   See Table II for sizes and dimensions.

3.   PROPERTIES:
    3.1   Conductors

        3.1.1   0.35mm^2 through 8mm^2 shall be constructed from annealed copper strands (Ref. ASTM B-3).
    3.2   Insulation
        3.2.1   The cable shall meet the requirements of SAE J-1128 Type HTS and SAE J-156.
        3.2.2   Physical Properties - The cable shall be tested in accordance with SAE J-1128 Type HTS.
            3.2.2.1   Original*

                              Tensile   5.0 MPA
                              Elongation   150%
            3.2.2. 2   After 168 Hours at 180°C
                              Tensile (% of original test value)   80%
                              Elongation (% of original test value) 50%

*Cable may be conditioned at 180°C for 24 hours to obtain tensile and elongation values followed by 168 hours at 180°C for aged physicals.

        3.2.3   Minimum Abrasion Resistance - The cable shall be tested in accordance with SAE J-1128 Type HTS. See Table II.
        3.2.4   Minimum Wall – The minimum wall shall be measured in accordance with SAE J-1128. See Table II for requirements.
        3.2.5   Strip Force – A minimum force of 10N for .35mm^2 and .5mm^2 and 20 N for .8mm^2 and larger shall be required to remove a 50mm section of insulation.
    3.3   Color – The color of the finished cable shall be as specified by the code number.

    3.4   Legend -   Example: 1 SQ. mm Fusible Link …
                          Frequency: Minimum of 6 times per 305mm
                          Color: White legend on black or gray insulation
                                         Black legend on rust or blue insulation

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Date	Change Notice	Change
11/11/08	305107	Clerical Corrections in Sections 3.2.1 & 3.2.3
03/01/13	CN102759	Editorial Corrections p. 2, 3

4.   **DIMENSIONS**:

    4.1   Table I

Wire Size (mm^2)	No. of Strands	Min. Avg Strand Size (mm)	Lay Max (mm)	Nom. O.D. (mm)	Max. Res. At 20°C (mΩ/m)	Copper Weight (lbs/1000 ft)
0.35	7	0.248	19	0.75	51.0	2.04
0.5	19	0.191	30	0.96	31.9	3.09
0.8	16	0.248	40	1.15	22.4	4.61
1	19	0.275	40	1.38	15.4	6.81
2	19	0.353	40	1.78	9.28	11.26
3	19	0.443	40	2.23	5.91	17.70
5	19	0.559	55	2.81	3.72	28.25
8	37	0.500	45	3.38	2.41	44.28

    4.2   Table II

Wire Size (mm^2)	Min. Strip Force (N)	Minimum Wall (mm)	Finished Cable OD (mm) (Avg 5 readings)		Finished Cable OD (mm) (1 reading)	
			MIN	MAX	MIN	MAX
0.35	10	.64	2.49	2.65	2.44	2.70
0.5	10	.63	2.69	2.85	2.64	2.90
0.8	20	.66	2.98	3.14	2.93	3.19
1	20	.72	3.36	3.52	3.31	3.57
2	20	.74	3.81	3.97	3.76	4.02
3	20	.83	4.53	4.69	4.48	4.74
5	20	.86	5.18	5.34	5.13	5.39
8	20	.91	5.80	6.06	5.73	6.13

5.   PACKAGING: Unless otherwise specified on the purchase order, all wire sizes shall be supplied on reels.

6.   MARKING: Each reel shall be marked as shown:
          Name of Manufacturer
          Net Weight of Material - Footage
          Lot Number
          M3382- Code Number

7.   FACTORY ACCEPTANCE: Material as supplied under this specification shall comply with processing and physical requirements so required by Delphi.

8.   CERTIFICATION AND TESTING: Delphi may request at any time and receive from the supplier samples of the insulating compound for testing at Delphi. Physical property test data developed by the supplier to assure conformance to this specification will be subject to recall on demand by Delphi.

9.   IN-PROCESS TEST: All cable shall be spark tested at 3500 volts at time of extrusion.

10.   REJECTION: All material which does not conform to the above requirements shall be rejected.

11.   MATERIAL CHANGE: The supplier must notify the Cable Engineer at Delphi, in writing and obtain written approval prior to making any change in the basic formulation, composition and/or manufacturing process of this material originally approved and supplied under this specification.

12.   RESTRICTED AND REPORTABLE MATERIALS: All materials supplied to this specification must comply with Delphi Corporation specification 10949001 "Substances of Concern and Recycled Content".

13.   CODE SHEET:

Size (mm^2)	0.35	0.5	0.8	1	2	3	5	8
Replaces (GA.)	22	20	18	16	14	12	10	8
SOLID COLORS								
BLACK				401				801
BLUE			302			602		
GRAY		205			505			
ORANGE (RUST)	109						709	
RED								812
**WHITE								808

**Restricted Use Only