



Dec.7, 2021 (Updated 1/5/24 – changes since original are in red)

Subject: Change to SAE/USCAR-21, Rev 4 (Letter #3)

Changes have been made to the USCAR-21 specification. Table 4.4.5 showing the pull force requirements for core crimps has added a row for low-strength coax cable. These changes takes effect today and are applicable to USCAR-21 Revision 4. Comments and questions can be sent to EWCAP@uscar.org.

Situation:

Table 4.4.5 does not list a value for the inner conductor of coax cable, but this cable is being tested and a value is needed.


Resolution:

1) On the next page is an update to Table 4.4.5 adding criteria for inner conductors of coax cable.


2) An update has been made to Paragraph 1 of Section 1 (for the scope of USCAR-21) as shown below to include coax.

This specification was developed for use with stranded automotive copper wire **and stranded/ solid center conductor coax cable**. Only where specifically mentioned are other constructions or other core materials (aluminum, clad, steel core, etc.) applicable. This specification does not apply to wire types not mentioned, ~~such as coaxial cable crimps.~~

TABLE 4.4.5A AND TABLE 4.4.5B - PULL-OUT FORCE REQUIREMENT (IN MM AND GAUGE SIZES)



ISO ^(a) (mm ²)	\bar{X} -3s Pull-out Force (N)
Coax inner strand 0.13 thru 0.35	60% of center conductor tensile strength ^(d)
0.13 ^(b)	50
0.22	50
0.35	50
0.50	75
0.75	90
1	120
1.5	150
2	180
2.5	210
3	240
4	265
5	290
6	320
8	350
10	450
>10	600 ^(c)



Wire Gauge ^(a)	SAE Size in mm ^{2(a)}	\bar{X} -3s Pull-out Force (N)
Coax inner strand 26 thru 22	0.13 to 0.35	60% of center conductor tensile strength ^(d)
26 ^(b)	0.13	50
24	0.22	50
22	0.35	50
20	0.50	75
18	0.80	90
16	1	120
14	2	180
12	3	240
10	5	290
8	8	350
-	>10	600 ^(c)

^(a) Refer to SAE J1127/J1128 and ISO 19642-3 if not familiar with wire sizes.

^(b) 0.13mm² (26 AWG) and smaller require special handling and controls not covered in this document.

^(c) The requirement on >10mm² is to meet minimum value only. No pull-to-failure or \bar{X} -3s calculation is required.

^(d) Use tensile strength as provided by coax cable manufacturer when calculating the criteria. If not available, criteria per ISO 19642-3 for the applicable wire size may be used. Center conductor 60% criteria applies only if the outer cable jacket is locked to the connector body using a ferrule or similar device. (All known mini coax connector designs have this type of design and the 60% criteria applies.) If cable is not locked to connector housing, values in table for 0.13 thru 0.35 coax shall be used.