



## GE Aviation

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### Approval of GE inspection Technologies Video Borescopes for Borescope Inspections of GE Aviation & CFM Commercial Engines

In order for a borescope inspection device to be considered approved for use in inspecting Commercial GE Aviation Engines, the equipment must meet certain optical performance criteria relative to the devices ability to resolve a specified test pattern at a specified viewing distance. For many of the GE Aviation commercial aircraft engines, the Engine Maintenance Manual (EMM) requires that the BoreScope Inspection equipment (BSI) must meet the optical resolution requirements called out in the GE Commercial Engine Standard Practices Manual SPM 70-32-84, Borescope Systems. This approval letter describes video borescope products which meet SPM 70-32-84 Revision 105 Dated 04/01/2016.

GE Inspection Technologies (GEIT) has tested their video borescopes to the GE Aviation SPM 70-32-84 Revision 105 Dated 04/01/2016 for Borescope Systems. GE Aviation Commercial Aircraft Engines accepts the integrity of the optical resolution test data performed by GEIT. Based on this test data, specific probe diameters and optical tip adapters of the XLG3, XL Go, XL Go+, XL Vu, XL Vu+, XL VuB, and MViQ video borescopes are approved for the inspection of all GE Aviation and CFM Commercial Engines, including the GE90, CF34, CF6, CFM56, LEAP-1A, LEAP-1B, LEAP-1C, GP7200, GENx, CT7, and Passport 20 engines.

Please refer to page 2 of this document, the GEIT document titled " GEIT Video Borescope Compliance to GE Aviation SPM 70-32-84" for the current list of approved GEIT VideoProbes.

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**GEIT Video Borescope Compliance to GE Aviation SPM 70-32-84**

GE Aviation has developed a document which defines performance specifications for borescope equipment intended to be used to perform internal BoreScope Inspections (BSI) on certain GE Aviation commercial aircraft engines. This GE Aviation document is referenced in certain Engine Maintenance Manuals (EMMs), and is titled "GE Commercial Engine Standard Practices Manual, SPM 70-32-84, Borescope Systems". As of the publication date of this GEIT Compliance Letter, the latest revision level of SPM 70-32-84 is Revision 105 Dated 04/01/2016.

Specification SPM 70-32-84 requires that borescope equipment meet certain minimum optical performance requirements as defined in tables included in the spec in order to be considered compliant with the specification and ultimately be listed as "Approved" BSI devices. SPM 70-32-84 now contains two borescope optical performance tables, one which defines borescope optical performance for smaller engines (less than 20" (508mm) diameter), and one for larger engines (greater than 20" (508mm) diameter). Note that in order for a BSI kit to comply with the optical performance specifications tables in SPM 70-32-84, optical tip adapters may be required to be included in the BSI kits.

GEIT has tested the optical performance of various GEIT VideoProbe models. Testing was performed by GE Inspection Technologies Engineering department personnel, with all test data recorded and stored in engineering test reports. GE Inspection Technologies is an ISO 9001 registered company.

Video Borescope Test Environment

- Test Target: Edmund Industrial Optics USAF 1951 Test Target
- Illumination: All testing performed with illumination provided only by the video borescope

The specific model type and diameter of each product which meets or exceed the optical resolution specifications contained in SPM 70-32-84 are listed in the Table I below:

Compliance*	VideoProbe Product Family	VideoProbe Model	VideoProbe Diameters
Complies with SPM 70-32-84 Table 103 optical performance table for small engines	Mentor Visual iQ	Inspect, Analyze, & Touch	3.9mm, 4.0mm, 6.1mm, 6.2mm, 8.4mm
	XLG3	XLG3	3.9mm, 5.0mm, 6.1mm, 6.2mm, 8.4mm
	XL Go	XL Go, XL Go+	3.9mm, 5.0mm, 6.1mm, 6.2mm, 8.4mm
	XL Vu	XL Vu, XL Vu+, XL VuB	3.9mm, 6.1mm, 8.4mm
	XL Lv	XL Lv	3.9mm, 6.1mm, 8.4mm
Complies with SPM 70-32-84 Table 104 optical performance table for larger engines	Mentor Visual iQ	Inspect, Analyze, & Touch	4.0mm, 6.1mm, 6.2mm, 8.4mm
	XLG3	XLG3	5.0mm, 6.1mm, 6.2mm, 8.4mm
	XL Go	XL Go, XL Go+	5.0mm, 6.1mm, 6.2mm, 8.4mm
	XL Vu	XL Vu, XL Vu+, XL VuB	6.1mm, 8.4mm
	XL Lv	XL Lv	6.1mm, 8.4mm

**Table I**  
**Summary of GEIT VideoProbes which meet SPM 70-32-84 Revision 105 Dated 04/01/2016**  
**( \* Refer to Table II for specific optical tips required for compliance )**



In order to meet both the near / far; as well as forward / side viewing optical resolution requirements contained in SPM 70-32-84, optical tip adapters must be used with the GEIT video borescopes. Table II below describes the minimum set of optical tips which are required for each probe diameter in order to meet SPM 70-32-84's optical performance specifications. There are many additional optical tip adapters available for the MVIQ, XLG3, XL Go, XL Vu and XL Lv video borescopes which greatly exceed the minimum specifications at either the near or far specification points, and the combination of these tips will meet the set of near and far viewing point minimum resolution specifications.

Probe Diameter	Minimally Required Tips	
	Forward View Tips	Side-View Tips
3.9mm	PXT480FG (Headguard) PXT490FN (Orange)	PXT480SG (Brown) PXT490SN (Red)
4.0mm	T4080FF (Headguard) T40155FN (Black)	T40120SF (Blue)
5.0mm	PXT550FF (Headguard) PXT5100FG (Black)	PXT580SG (Green) PXT580SN (Red)
6.1mm MVIQ	T6150FF (Headguard) XLG3T61120FG (Black)	XLG3T61120SG (Blue)
6.1mm XLG3, XL Go, XL Lv, XL Vu	XLG3T6150FF (Headguard) XLG3T61120FG (Black)	XLG3T61120SG (Blue)
6.2mm	PXT6240FF (Headguard) PXT62120FN (Black)	PXT62120SN (Blue)
8.4mm	XLG3T8440FF (Headguard) XLG3T84120FN (Black) XLG3T8480FG (Yellow)	XLG3T84120SN (Blue)

**Table II**  
**GEIT VideoProbe Optical Tips Required for SPM 70-32-84 Revision 105 Dated 04/01/2016 Compliance**

**Specification Compliance Statement**

The GE Inspection Technologies products listed in Table I of this document meet or exceed the specifications contained in GE Commercial Engine Standard Practices Manual SPM 70-32-84 Revision 105 Dated 04/01/2016 when used with the optical tips listed in Table II of this document.

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