INCREMENTAL CHANGE Release Notification Date: 08/09/2023

SPM 70-32-88 WHITE LIGHT INSPECTION BY USING A DIGITAL VIEWING SYSTEM

DISCLAIMER

The Incremental Changes published by GE Aviation are considered Instructions for Continued Airworthiness. These Incremental Changes, along with the current Manual revision and published Temporary Revisions, constitute the latest Instructions for Continued Airworthiness.

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HIGHLIGHTS

HIGHLIGHT REFERENCE	DESCRIPTION OF CHANGE
sk70-32-88-220-001	Technical Change: Added new standard practice inspection.

TASK 70-32-88-200-801

1. General.
   - A. This visual inspection document establishes the minimum requirements for visual inspection to be used on parts that have many operational and/or handling defects by using white light digital viewing system.
   - B. Operational and/or handling defects can be seen by using white light digital viewing system.
   - C. Refer to TASK 70-32-11-220-011, White Light Inspection for general requirements and instructions on white light inspection process.
   - D. Refer to TASK 70-31-08-200-801, Visual Inspection Requirements of Rotating Parts for visual inspection requirements of rotating parts.
2. Equipment.

   CAUTION: PERSONNEL PERFORMING THIS INSPECTION MUST RECEIVE PRACTICAL TRAINING IN THE USE OF THIS PROCEDURE AND MUST DEMONSTRATE PROFICIENCY IN USE AND CONTROL OF THE INSPECTION EQUIPMENT AND INSPECTION OF HARDWARE.

   - A. A digital viewing system must be used.
3. Procedure.

Subtask 70-32-88-220-001

- A. The digital viewing system used for visual white light inspection must meet the following requirements:

Subtask 70-32-88-220-002

- (1) Direct and/or reflected white light source must be able to provide adequate viewing of the inspection surface and controlled by qualification package.

Subtask 70-32-88-220-003

- (2) Inspectable Image Region must be established for each inspection. The Inspectable Image Region is defined as the region of image where all requirements are met.

Subtask 70-32-88-220-004

(3) The Inspectable Image Region must be clearly defined and visible to the operator either through cropping or defined boundaries unless the whole image qualifies as an Inspectable Image Region. No interpretation of indications is permitted outside of this region.

Subtask 70-32-88-220-005

(4) The image must be free from artifact or distortion that would affect interpretation and evaluation in the Inspectable Image Region. This must be documented in the qualification package.

Subtask 70-32-88-220-006

(5) An image of approved reference target(s) must be taken during equipment qualification and must be comparable in daily check as follows.
- (a) Intensity level and uniformity
- (b) Artifact
- (c) Displacement or movement of features
- (d) Dimension of features
- (e) Sharpness
- (f) Contrast
- (g) Color (if applicable)
- (h) Depth of field

Subtask 70-32-88-220-007

(6) The viewing device recommended line-of-sight angle should be within 45 degrees of a line perpendicular to the inspection surface (refer to Figure 1). When it is possible, it is always recommended to use perpendicular line of sight for viewing device. It is recommended to use a front surface mirror for inspecting areas not visible by direct line of sight.

Subtask 70-32-88-220-008

(7) The image resolution must be measured using the USAF 1951 resolution target. The system must be able to resolve Group 2 and Element 4 (refer to Figure 2) perpendicular to the inspection surface. Images of a USAF 1951 resolution target taken in the center and edges of the Inspectable Image Region must be archived. This must be performed at a working distance and also at the minimum and maximum distances (also known as near plane and far plane) at which the equipment was qualified.
- (a) Prior to first use.
- (b) Annually.
- (c) Any time repairs have been completed.
- (d) Any time image quality is suspected of deterioration.

Subtask 70-32-88-220-009

(8) In meeting the performance specification for resolution, not only must the specified element be observed, but also individual lines must be clearly resolved (i.e., the lines and spaces must form a distinct pattern with clearly defined edges).

Subtask 70-32-88-220-010

(9) Inspect 100 percent of the part surface (internal and external) except as noted in the qualification package. To account for variation in part location and acquisition device position, adjacent Inspectable Image Regions must overlap by a minimum of 10 percent.

Subtask 70-32-88-220-011

(10) Control of each axis of motion used for viewing system must be provided to maintain a known, and fixed viewing distance as well as measurable scan indexing.

Subtask 70-32-88-220-012

CAUTION: USE OF AUTO SETTINGS SUCH AS GAIN, EXPOSURE, WHITE BALANCE, ETC. REQUIRES DEMONSTRATION THAT THE AUTO MODE AND ITS PARAMETERS ARE PROPERLY SUITED FOR THIS SPECIFIC CONTROL PROCEDURE.

(11) Each mechanical axis used for viewing system and turntable must be checked semi-annually or whenever a component of the system has been repaired or replaced to ensure that travel accuracy and repeatability are maintained in half of the overlap defined by Subtask 70-32-88-220-010 (paragraph 3.A.(9)). Inspection facilities must generate a quality maintenance plan.

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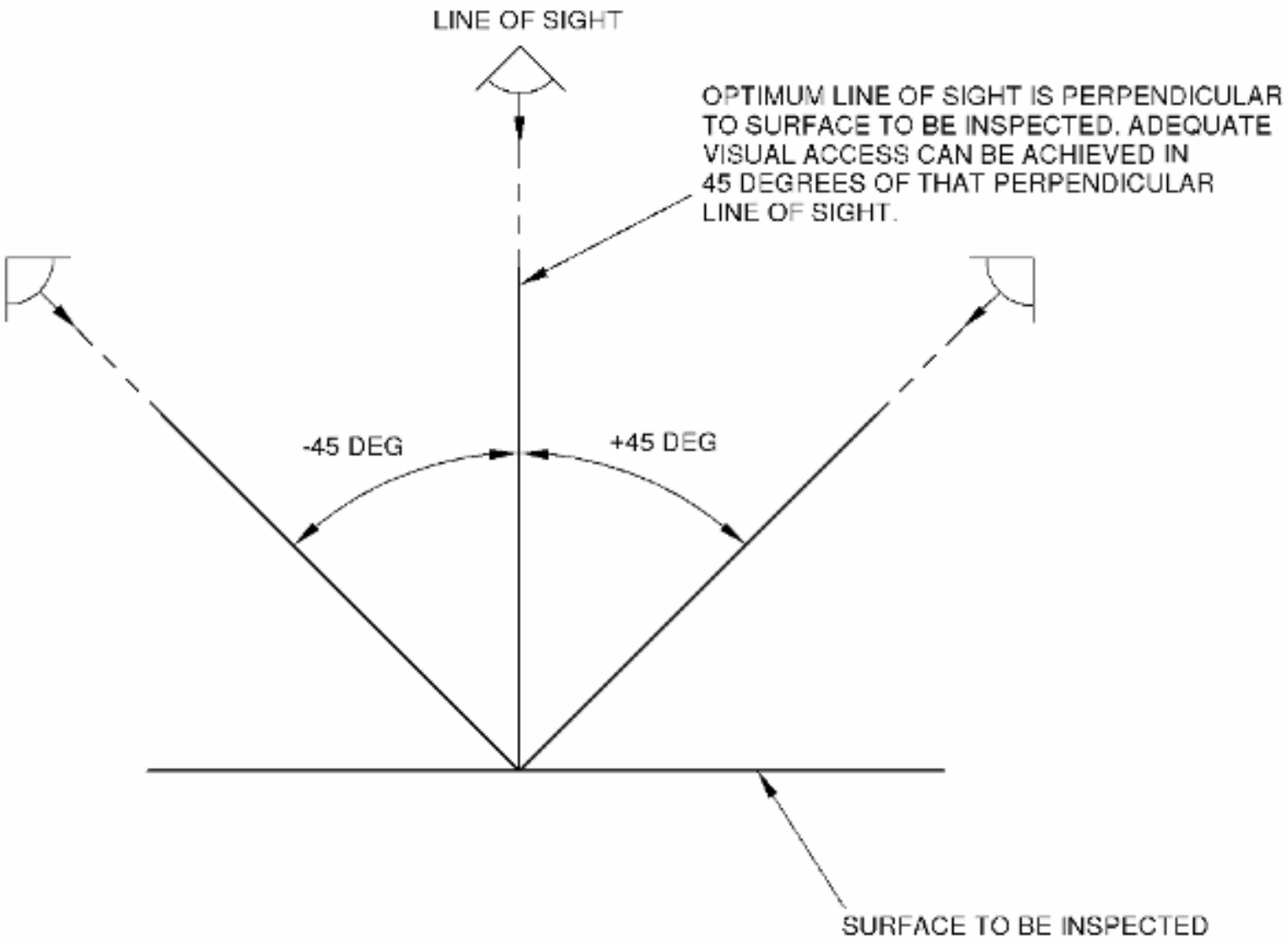

Figure 1 Optimum Viewing Angle

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	GROUP NUMBERS											
ELEMENT	-2	-1	0	1	2	3	4	5	6	7	8	9
1	0.250	0.500	1.00	2.00	4.00	8.00	16.00	32.0	64.0	128.0	256.0	512.0
2	0.281	0.561	1.12	2.24	4.49	8.98	17.96	35.9	71.8	143.7	287.4	574.7
3	0.315	0.630	1.26	2.52	5.04	10.08	20.16	40.3	80.6	161.3	322.5	645.1
4	0.354	0.707	1.41	2.83	5.66	11.31	22.63	45.3	90.5	181.0	362.0	724.1
5	0.397	0.794	1.59	3.17	6.35	12.70	25.40	50.8	101.6	203.2	406.4	812.7
6	0.445	0.891	1.78	3.56	7.13	14.25	28.51	57.0	114.0	228.1	456.1	912.3

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Figure 2 Table-1: USAF 1951 Resolving Power Test Resolution

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