

Free Motion Headform Position Kits, TE-110-6G & TE-110-6G-ADJ

Technical Product Sheet

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Overview

The Free Motion Headform Positioning Kit was developed to be used as an aiming tool for the accelerator units used to launch the Free Motion Headform (FMH) in compliance with FMVSS 201 – “Occupant protection in interior impact”¹. The original version of the TE-110 was introduced to the market in 2000 and various subsequent models were produced to accommodate different accelerator stroke lengths and adjustability.

In 2008, Humanetics received a request to improve the shape relationship between the TE-110 clear plastic head and the FMH. These enhancements led to the release of the current TE-110-6G and the TE-110-ADJ-6G.

Description

TE-110-6G: The standard positioning kit consists of a clear plastic head mounted on an extruded aluminum beam of a length equal to the accelerator stroke. The forehead is scribed with a target pattern following the requirements of FMVSS 201. A digital protractor is mounted to the underside of the aluminum beam and a line laser is mounted on top. There is a bubble level for cross axis angle zeroing. The beam is mounted to a back plate simulating the FMH back plate with a ¼ inch (6.35 mm) diameter pin to interface with a hole in the accelerator rod for positioning.

TE-110-ADJ-6G: The adjustable positioning unit features an additional laser pointing forward. It is mounted on a slide allowing vertical and horizontal motion. A second bubble level is included. The target area on the face of the head is marked with a 12.5 mm square grid. Holes are drilled at 20 of the grid intersections to allow the forward laser beam to exit. The length of the beam may be adjusted for different strokes utilizing the slides on the sides of the beam.

Method of Use

TE-110-6G: The positioning kit is attached to the front of the accelerator and is held in place by magnets. The extruded beam simulates the stroke. The vertical laser is switched on and is used to align the unit with respect to the centerline of the vehicle. The head is aimed at the target in the car which must appear inside the scribed target area on the face of the clear plastic head. The test technician looks through the side or back of the head to make the alignment. The lateral impact angle is adjusted and indicated by the protractor. The accelerator is fixed in position allowing for at least 25 mm of free flight for the head. The kit is then replaced by the FMH to conduct the regulated test.

TE-110-ADJ-6G: The positioning kit is mounted the same as the TE-110-6G. With this unit both lasers are switched on. The vertical laser is switched on and is used to align the unit with respect to the centerline of the vehicle. The horizontal laser beam is adjusted to shine through a selected hole in the front of the head and the spot is aligned with the desired target in the vehicle. The rest of the procedure is the same as above.

Application

TE-110-6G is primarily for GM applications and the TE-110-ADJ-6G is primarily for other applications. The length of the adjustable unit may be fixed. The beam length may be set at stroke, plus free flight (~25 mm), if the clear head is to be put into contact with the target inside the car. It may be set shorter for non-contact aiming. The inclusion or exclusion of the free flight length is not as important if the accelerator unit can be retracted a calculated amount between aiming and final set up for the test.

Specifications

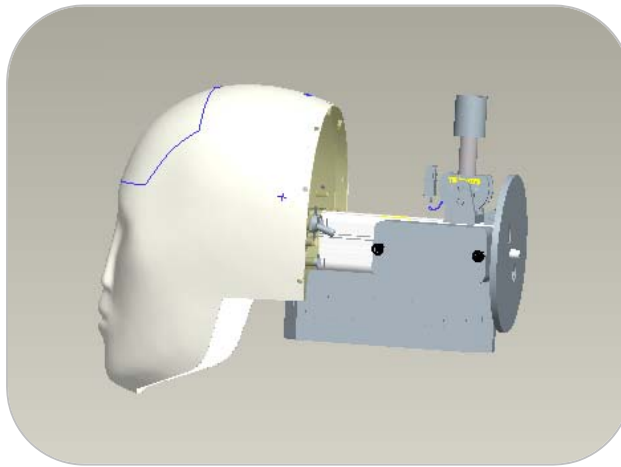
	TE-110-6G	TE-110-ADJ-6G
Headform	Clear plastic. Thickness ~1.5 mm, profile matches FMH on front and sides within 2.5 mm	Clear plastic. Thickness ~1.5 mm, profile matches FMH on front and sides within 2.5 mm
Headform Target	Outline per FMVSS 201.	Outline per FMVSS 201 with 12.5 mm square grid pattern in target.
Laser Targeting Holes		20 holes for laser transmission at grid intersections (plus hole @ "O" below.
Head Reference Holes	Forward @ point "O" per FMVSS 201. Top @ ½-20 hole location. Sides @ intersection of horizontal and vertical planes through the first two holes.	
Vertical Laser	Color: Red. Output less than 1 mw. ² Line laser cap for transverse linear output	
Vertical Laser Mounting	Forward angle adjustment-continuous w 30 deg detents, lockable to secure forward tilt angle. Line laser cap is lockable to secure transverse angle of output lin.	
Horizontal Laser		Color: Red. Output ≤1 mw. ² Spot laser beam.
Horizontal Laser Mounting		Vertical and lateral traverse mounting to allow laser beam to exit through hole selected in front target on face.
Laser Power	6 VDC-four AA cells in series-included. Manual power switch.	
Digital Protractor	Pro-360 reads ±90° in .1° increments. Power 9 VDC-battery included.	
Bubble Level	1 at top back for cross level	1 at top back & 1 at bottom front for cross level.
Beam Length-back of head to front of back plate³	133 mm	229-330 mm
Back plate to face @ CG length³	292 mm	388-489
Head width³	79 mm	
Head Height-chin to crown³	114 mm	
Acceptances	Headform shape & target location accepted by GMPG. Mechanical design & features accepted.	Headform shape & target location accepted by GMPG.

TE-110 Positioning Kit Modifications to 6G and ADJ-6G configurations

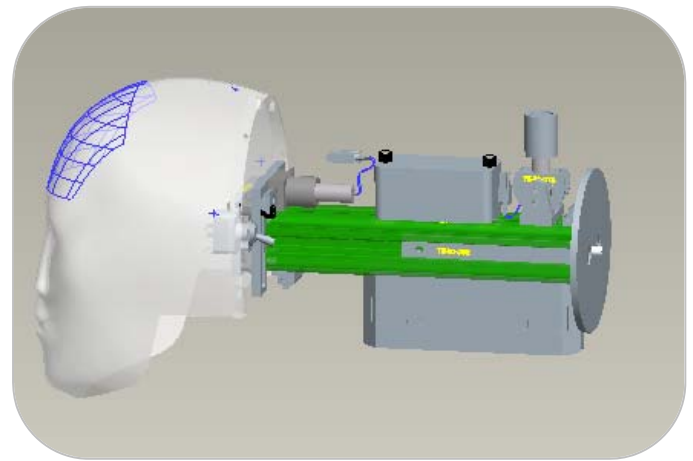
- Headform shape developed from average data supplied by industry FMH inventory
- Headform made symmetrical left side to right side.
- Head back thickness increased for durability, angled at back to improve mating interface to head form.
- Screw inserts and machine screws added for improved assembly.
- Reduced variation to Headform in crown area at top of target.
- Face target and grid pattern is machine marked for accuracy and not molded into Headform.
- Overall length reduced to ~290 mm for non-adjustable unit.
- Clear Plastic Headform and complete assembly units serialized for quality control.
- Laser power system upgraded with separate battery holder and commercial electrical contacts. Batteries not inside beam and do not slide out if back plate is removed or retracted.
- Vertical laser fitted with locking collar to fix angle of line laser output. Fitted with lockable trunnion to set angle continuously or with 30 degree detents.

Notes

1. US Code of Federal Regulations Title 49 Transportation Part 571.201.
2. Class II Laser to comply with ECE safety regulations.
3. Dimensions rounded to nearest millimeter.



TE-110-6G Free Motion Headform Positioning Kit 6G



TE-110-6G Free Motion Headform Positioning Kit ADJ-6G



TE-110 Device in use



Free Motion Headform in use