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EO 20-105BA-2A

LIST OF REVISIONS

ROYAL CANADIAN AIR FORCE



DESCRIPTION AND MAINTENANCE INSTRUCTIONS

TUBES PITOT STATIC MODEL 852 (TYPE MA-1) AND MODEL 855E

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DESCRIPTION AND MAINTENANCE
 INSTRUCTIONS
 TUBES PITOT STATIC MODEL 855
 (TYPE MA-1) AND MODEL 855E

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TUBES PITOT STATIC MODEL 852 (TYPE MA-1) AND MODEL 855E

GENERAL

1 This EO is published to provide the basic description and field maintenance instructions for pitot static tubes Model 852 (type MA-1) used on CF101 Aircraft, and Model 855E used on CF104 Aircraft. Both models are manufactured by Rosemount Engineering Company, Minneapolis, Minnesota.

DESCRIPTION

MODEL 852 (TYPE MA-1)

2 This model which is used on RCAF CF101 B and F aircraft, is a de-iced pitot static tube, electrically heated, and capable of measuring total and static pressure at air-speeds up to Mach 3. For details of external construction refer to Figure 1.

MODEL 855E

3 This model which is used on RCAF CF104 and CF104D aircraft, is a de-iced pitot static tube, aerodynamically compensated, electrically heated, and capable of accurately measuring total and static pressure at air-speeds up to Mach 3. For details of external construction refer to Figure 2.

LEADING PARTICULARS

4 The leading particulars are:

Mach Number	0 to Mach 3
Angle of Attack	Up to 25°
Temperature Range	-65°C to +540°C (-85°F to +1004°F)
De-icing Time	Less than 1-1/2 minutes.
Power Requirements:	115 volts 400 cycles single phase
Voltage Breakdown	Greater than 150 volts RMS AC after 4 hours at 80,000 feet
Heater Outputs	For Model 852, 190 watts after 5 minutes at room temperature For model 855E, 210 watts after 5 minutes at room temperature

MAINTENANCE INSTRUCTIONS MODELS 852 AND 855E

PRE-INSTALLATION CHECK

5 Prior to installation on an aircraft, pitot-static tubes shall be inspected for signs of damage, leakage between the pressure and static chambers, and for freedom from obstruction of the pitot and static holes. Apply power to the heater element and ensure that the heater is functioning. For heater checks it is only necessary to ensure that the tube commences to warm up when power is applied.

ROUTINE CHECK

6 Installed pitot heads shall be checked periodically at intervals specified in the applicable aircraft -7 and -7A EOs. These checks shall ensure that the:

- (a) Pitot hole is unobstructed, with peeling of the silver insert not exceeding 25% of the periphery. Gauging shall be carried out in accordance with instructions as detailed in Figure 7 of this EO.
- (b) Static holes are unobstructed, that they are free of all burrs, and no damage exists on the tube surface in the vicinity of these holes.

CAUTION

On no account should the static holes be cleared with a hard or pointed tool. A pointed tool may pierce the inner tube thereby causing a leak between the chambers. Use of a hard tool increases the possibility of burring the edge of the hole. Slightly out of round holes are of little consequence, but a burred edge will produce erroneous static pressure readings.

- (c) Heater commences to warm up when power is applied.

CAUTION

Do not operate the heater while the aircraft is on the ground for longer than is necessary to complete this check.

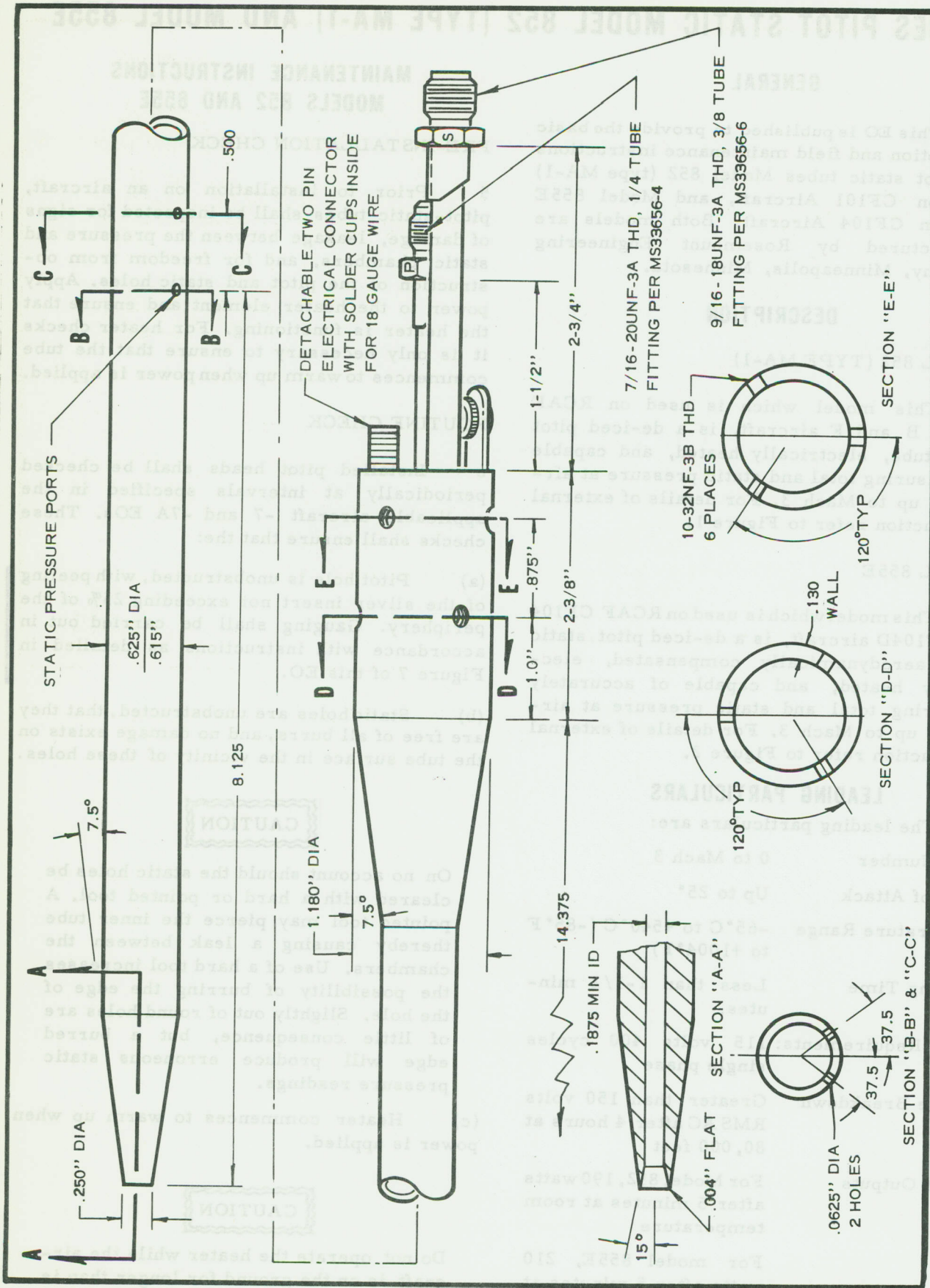


Figure 1 Pitot-Static Tube Model 852 (Type MA-1)

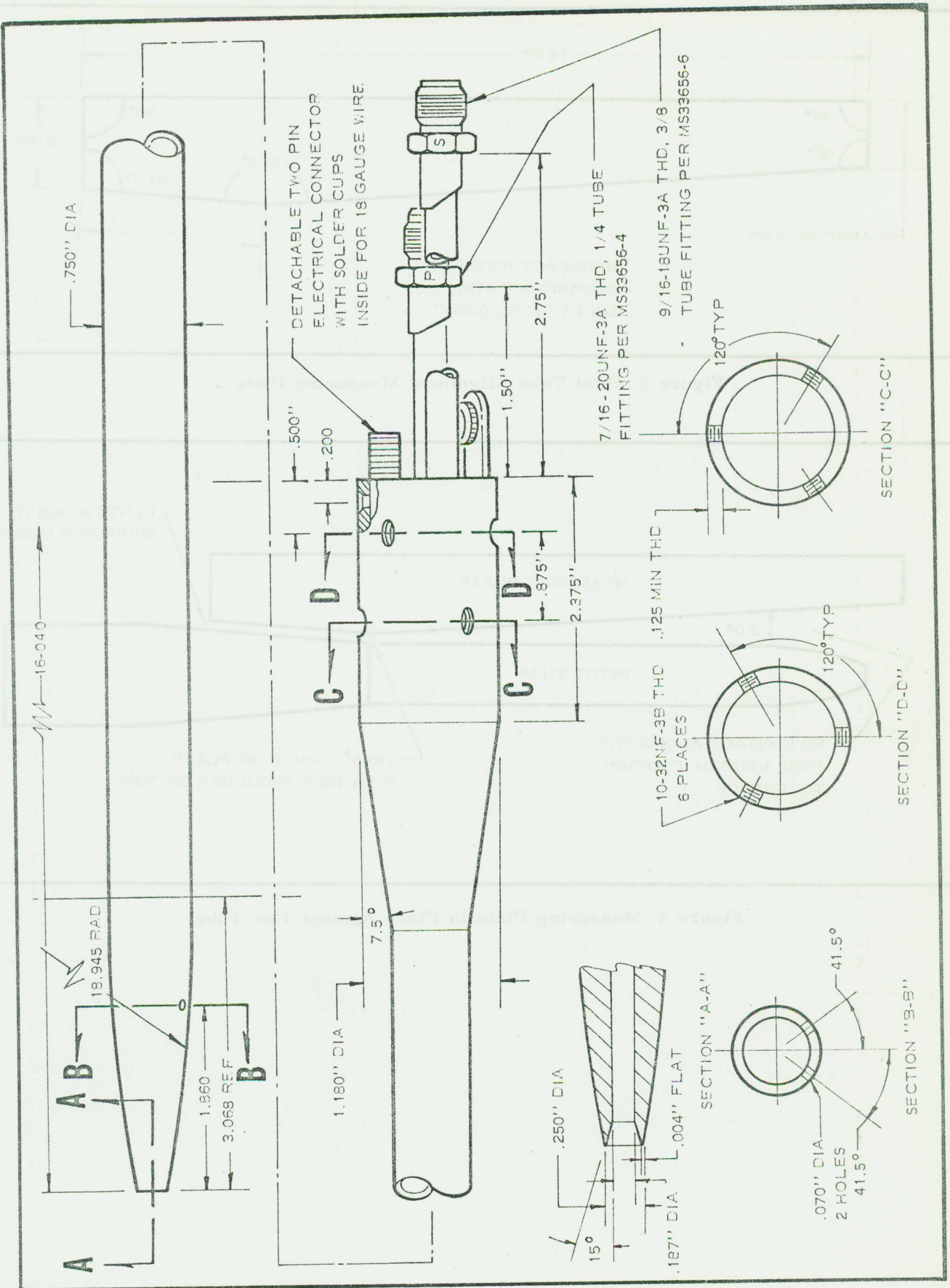


Figure 2 Pitot-Static Tube Model 855E

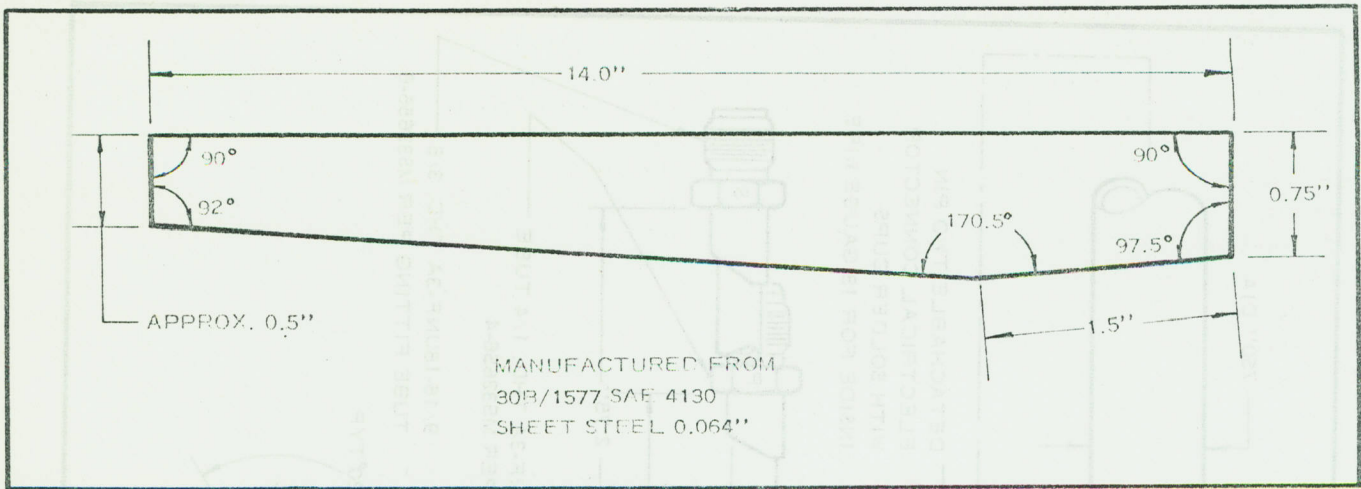


Figure 3 Pitot Tube Alignment Measuring Plate

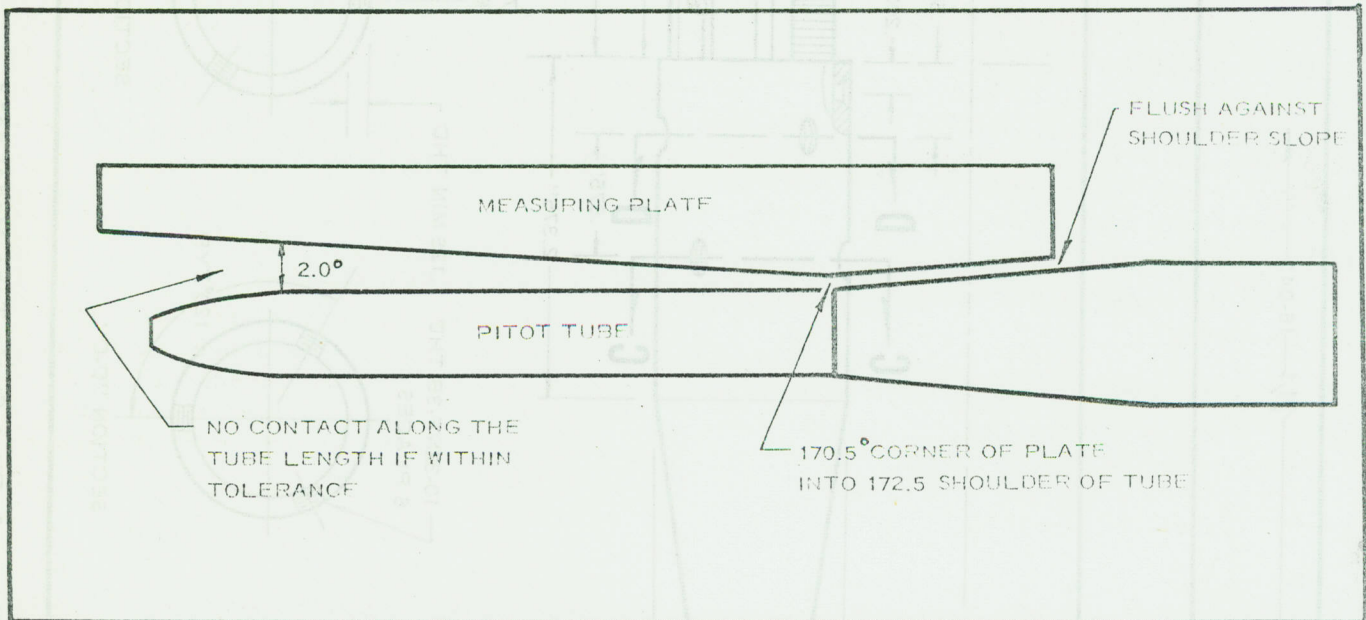


Figure 4 Measuring Plate In Place Against The Tube

(d) Tube is straight to within 2 degrees of its fore and aft alignment axis. Tubes which are suspected of having bends exceeding this tolerance may be checked while still installed by using a locally manufactured measuring plate such as is suggested in Figures 3 and 4. To check alignment, place the measuring plate flush against the shoulder slope of the tube so that the 170.5 degree corner of the plate fits into the angle of the pitot tube neck. If the tube straightness is within tolerance there will be no contact along the tube length.

NOTE

The check must be made along the top, bottom, and each side of the pitot tube.

**REPAIR INSTRUCTIONS
MODELS 852 AND 855E**

7 Because of their welded construction tubes with internal faults cannot be repaired, therefore tubes which have defective heaters and those with internal leaks, must be discarded.

8 The following faults can be rectified by user sections.

(a) BENT TUBE - Tubes which are bent beyond their tolerance can be straightened provided the

- (1) Tube is not rippled.
- (2) Bend is not at the static holes.
- (3) Tube wall is not kinked or collapsed.

Straightening is accomplished by gripping the mounting base in the jaws of a lathe or vice and straightening the tube by pressure of the hands only. Ensure the jaws of the lathe or vice are padded to prevent damage to the mounting head.

(b) BURRED STATIC ORIFICE - These burrs may be removed by rubbing with a fine grade paper abrasive. Small burrs may be removed while the pitot tube is installed. For larger burrs the tube should be removed from the aircraft and slowly rotated in a lathe with the paper abrasive pressed over the affected area. Do not remove more of the wall thickness than is necessary to remove the burr. On completion, clean away the dust which may have formed around the static holes, and ensure that there are no dents in the tube surface immediately forward of the static holes.

(c) PITOT HOLE OUT OF ROUND - See Figures 1 and 2. The entrance of the pitot hole is tapered with a wall slope of 15 degrees. Provided the hole is not collapsed, tubes which are visually out-of-round can be rounded to an acceptable configuration by using a locally manufactured tool such as is suggested in Figures 5 and 6. With the tip of the tool inserted in the hole, rotate the tool, at the same time gently pressing it into the tube until the hole is rounded.

CAUTION

Do not rock the tool in the hole, and avoid using more pressure than is necessary to achieve roundness. Such actions will cause bellling of the tube tip, and disturb the pressure pattern over the static holes.

(d) LEADING EDGE DENTED OR NICKED - Damage to the leading edge of the pitot hole can be repaired by flush filing to the extent that the leading edge thickness does not exceed .010 inch. To prevent any adverse effect on the static pressure measurement no significant change should be made to the taper angle at the tube tip.

9 On completion of repairs carry out a pre-installation check as per paragraph 5.

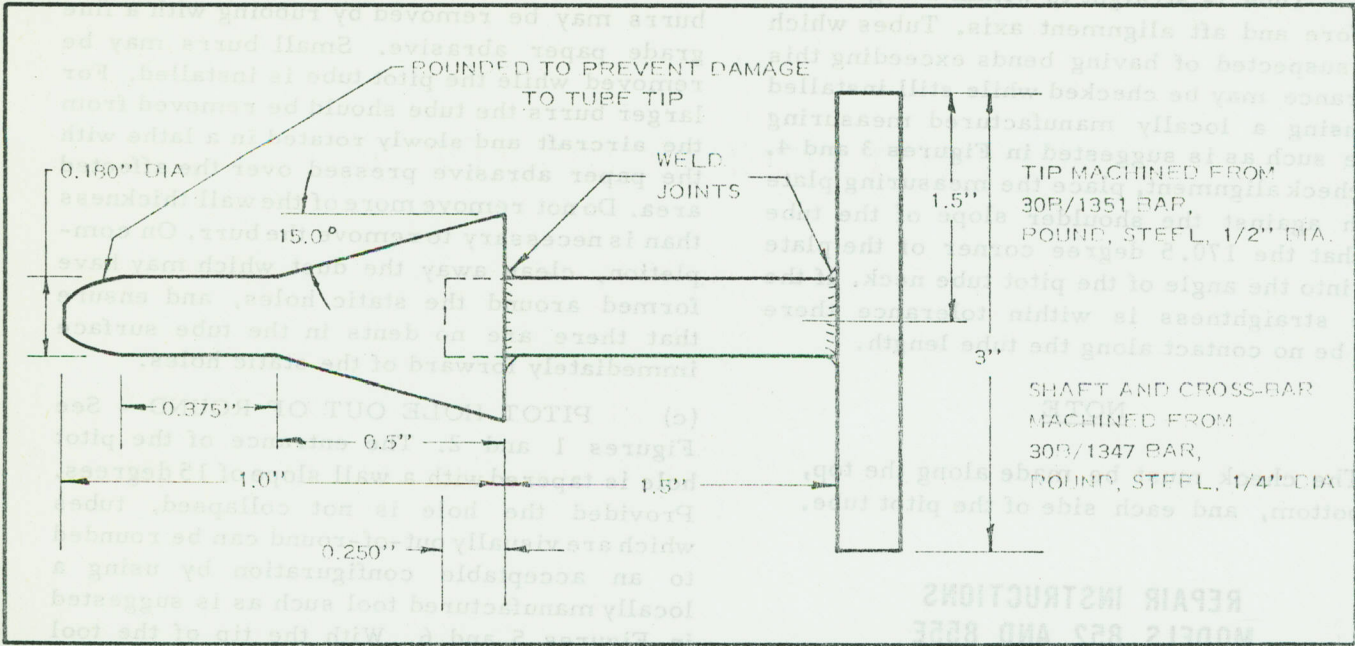


Figure 5 Tip Rounding Tool

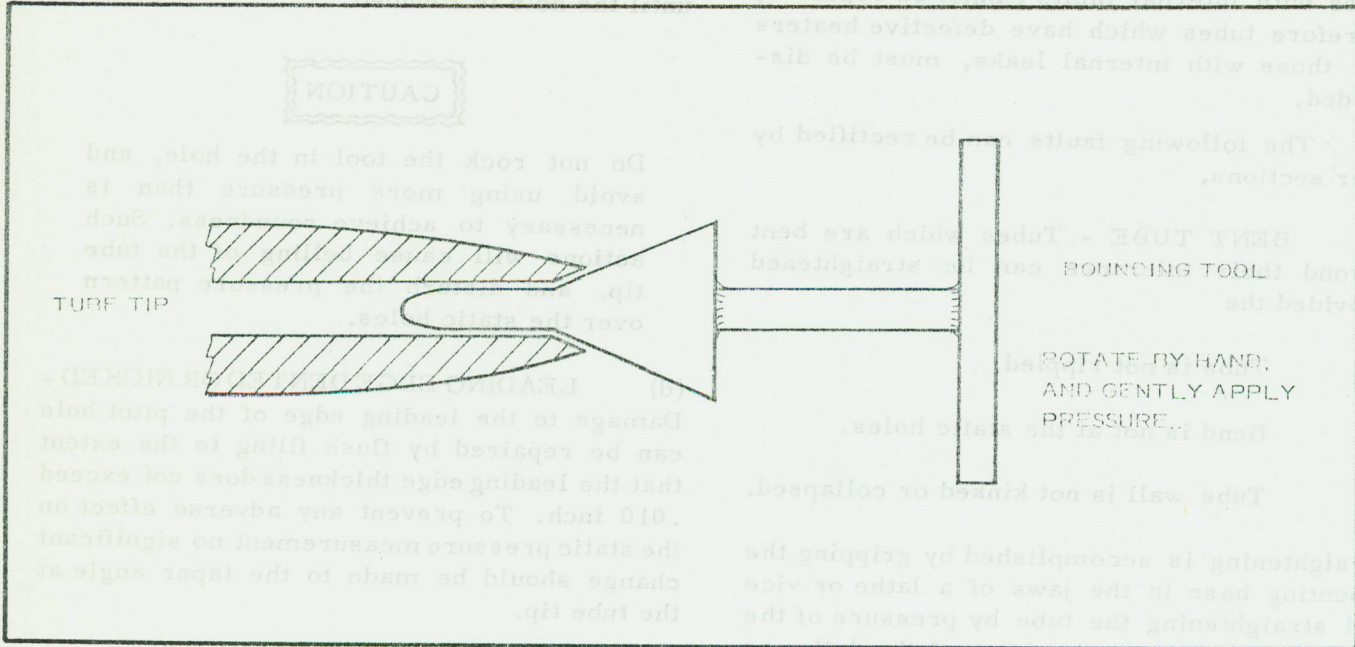


Figure 6 Tool Inserted In Tube Tip

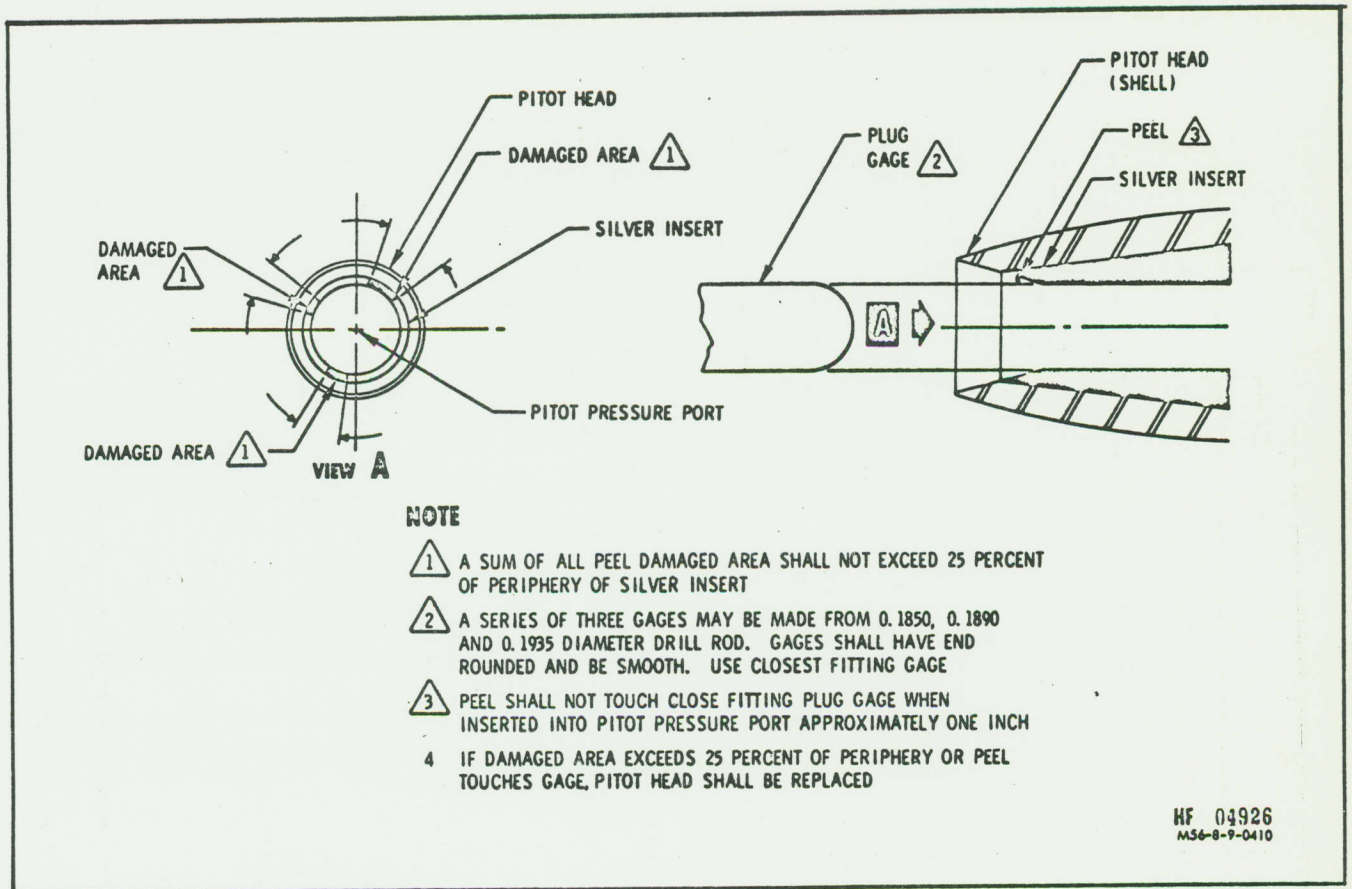
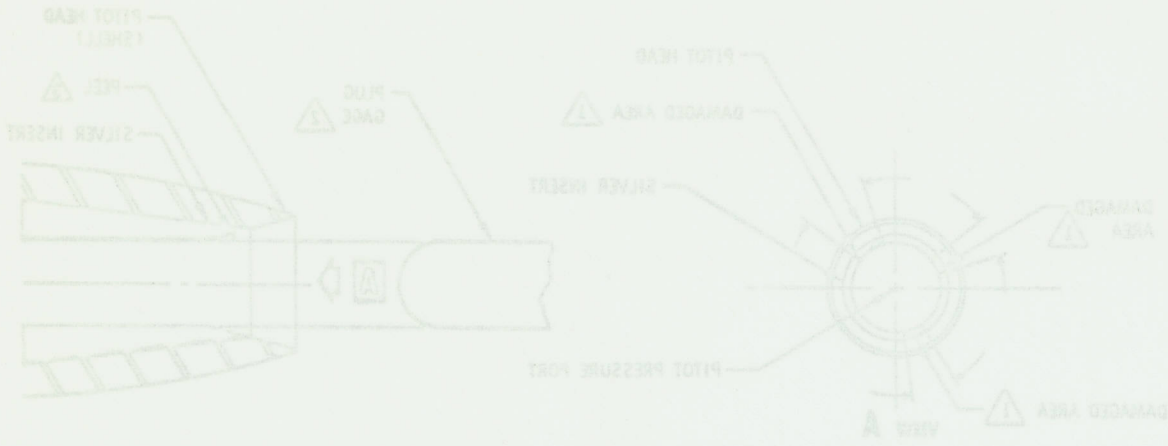


Figure 7 Pitot Head Silver Insert Damage Tolerance



NOTE

- ▲ IF DAMAGED AREA EXCEEDS 25 PERCENT OF PERIPHERY OR PEE, THICKNESS GAGE PITOT HEAD SHALL BE REPLACED
- ▲ PEE SHALL NOT TOUCH CLOSE FITTING PLUG GAGE WHEN INSERTED INTO PITOT PRESSURE PORT APPROXIMATELY ONE HIGH BOUNDED AND BE SMOOTH. USE CLOSEST FITTING GAGE AND A 1/16" DIAMETER DRILL HOLE. GAGES SHALL HAVE END A SERIES OF THREE GAGES MAY BE MADE FROM A 1/8" & 1/16" OF PERIPHERY OR SILVER INSERT
- ▲ A SUM OF ALL PEE DAMAGED AREA SHALL NOT EXCEED 25 PERCENT

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Figure 7 Pitot Head Silver Insert Damage Tolerance

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