



10340 REGENT CIRCLE ∞ NAPLES, FL 34109
PHONE & FAX 239/593-6944 ∞ CELL 239/404-7524

TEST AND REFURBISH PROCEDURE FOR COMANCHE FUEL TRANSMITTERS

IF YOU ARE EXPERIENCING ERRONEOUS FUEL QUANTITY INDICATIONS IN YOUR COMANCHE THIS MAY BE OF SOME INTEREST AND ASSISTANCE IN THE DIAGNOSIS AND REPAIR OF THE FUEL QUANTITY INDICATING SYSTEM. THIS IS NOT INTENDED TO REPLACE THE METHODS FOUND IN THE SERVICE MANUALS NOR TO RE-HASH THEM; RATHER TO OFFER ADDITIONAL INFORMATION. AND OBVIOUSLY ONE SHOULD REFER PROCEDURALLY TO THE APPROPRIATE MANUAL. YOU DETERMINE IF YOUR CAPABILITIES INCLUDE DOING THIS YOURSELF; THERE ISN'T MUCH MYSTERY INVOLVED ONCE THE SYSTEM IS UNDERSTOOD.

AN ERROR IN FUEL QUANTITY INDICATION CAN BE CAUSED BY AN INCORRECT RESISTANCE VALUE BEING TRANSMITTED TO THE DISPLAY GAUGE UNIT. THERE CAN BE A FEW SOURCES FOR THIS PROBLEM. CHECKING FOR POOR CONNECTIONS SHOULD BE YOUR FIRST LINE OF DIAGNOSIS, SECONDARY WOULD BE A COMPONENT. ONE CAUSE OF INCORRECT RESISTANCE CAN BE FROM CORROSION WHERE WATER HAS LEAKED INTO THE TRANSMITTER AREA FROM POOR SEALING OF AN ACCESS COVER. WATER COLLECTS IN THE DEPRESSION WHERE THE TRANSMITTER UNIT IS MOUNTED – TAKE A LOOK THERE **[SEE PHOTO PAGES]**.

ANOTHER CAUSE IS INTERNAL TO THE TRANSMITTER; A DIRTY RESISTANCE WINDING [NOT OBVIOUS] INSIDE A FUEL TRANSMITTER IS QUITE COMMON AND EASY TO CHECK. THE INTERNALS OF THE TRANSMITTER ARE SIMPLE AND DIAGNOSIS AND REPAIR FAIRLY SIMPLE ONCE DISASSEMBLED. THERE ARE CASES HOWEVER WHERE THE FUEL LEVEL TRANSMITTER HAS REACHED THE END OF ITS LIFE, I.E. THE WIPER BUTTON IS TOO WORN, BROKEN OR MISSING, ANOTHER IS EXCESSIVE HOUSING CORROSION.

BEFORE WE GET INTO THE ACTUAL DISSECTION OF THE TRANSMITTER, TAKE A MOMENT TO CONSIDER OTHER POSSIBLE CULPRITS. ON THE SINGLE MODELS WITH ONE GAUGE DISPLAY UNIT YOU WILL FIND 4 PUSH-BUTTON MOMENTARY SWITCHES AND A ROTARY SELECTOR SWITCH CO-LOCATED WITH THE FUEL TANK SELECTOR. ANY OF THESE ELECTRICAL COMPONENTS MAY HAVE DEVELOPED SOME RESISTANCE WHICH WILL ADD TO THE VALUE FROM THE FUEL LEVEL TRANSMITTER, THE RESULT WILL BE ERRONEOUS FUEL QUANTITY INDICATION. IF YOU HAVE THIS TYPE SYSTEM LET'S PUT IT ON THE DIAGNOSTIC CHECK LIST IN ADDITION TO THE GAUGE, FUEL TRANSMITTERS, AND CONNECTIONS.

I ALSO PROVIDE THE SERVICE TO REPAIR YOUR [ELECTRICAL PORTION, NOT COSMETIC DAMAGE] FUEL VALVE SELECTOR PLATE WHERE THESE FUEL SELECTOR SWITCHES RESIDE. ALSO AVAILABLE SEPARATELY ARE THE SWITCHES, THE WIRING INVOLVED, OR A COMPLETE ASSEMBLY ALL PROPERLY ASSEMBLED WITH FAA-FRIENDLY MS22759 TEFZEL® WIRE, ALL PROPERLY MARKED OF COURSE.

NOW LET'S MOVE ON TO THE WORK-RELATED PORTION. REMOVE THE WING ACCESS COVER FOR THE SUSPECT TRANSMITTER. OBVIOUSLY WE NEED TO HEED ALL SAFETY PRECAUTIONS WHEN WORKING IN THIS AREA. IF NECESSARY DRAIN SUFFICIENT FUEL FROM THE TANK TO AVOID A PROBLEM WHEN THE TRANSMITTER IS REMOVED THEN REMOVE THE TRANSMITTER FROM THE PLATE ASSEMBLY. TO TEST THE TRANSMITTER [SEE SINGLE COMANCHE SERVICE MANUAL SECTION 8-10; SECTION 9-15 FOR TWINS] CONNECT AN OHMMETER BETWEEN THE TERMINAL AND THE HOUSING AND SLOWLY MOVE THE FLOAT ARM FROM THE BOTTOM STOP TO THE TOP STOP. THE OHMMETER INDICATOR SHOULD STEADILY MOVE UP-SCALE, WITHOUT FLUCTUATION, AS THE FLOAT ARM IS MOVED UPWARD. NO "DROP-OUTS" OR "OPENS" ARE ALLOWED. IF IT ISN'T PERFECT, PROCEED WITH THE DISASSEMBLY PHASE WHICH IS NOT COVERED IN THE SERVICE MANUAL, ALTHOUGH THE MAIN SUBJECT OF THIS WRITING.

COMANCHE GEAR



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ONCE YOU HAVE DETERMINED NECESSITY, THE DISASSEMBLY METHOD DEPENDS UPON THE TYPE OF TRANSMITTER YOU ARE INVESTIGATING; MOST EMPLOY THE SOLDERED-RIVET METHOD, SOME A COVER WITH SECURING TABS [400 AUXILIARY]. AFTER DISASSEMBLY YOU SHOULD FIRST EXAMINE THE WIPER BUTTON CONDITION [SEE PHOTO PAGES]. IF EITHER OF THE WIPER COMPONENTS IS NOT SERVICEABLE, YOUR CHOICE IS A REPLACEMENT TRANSMITTER. SEE THE COMANCHE GEAR WEBSITE LINK "ELECTRICAL MISC" WHERE PIPER'S REPLACEMENT PARTS ARE DISCUSSED IN [SERVICE SPARES LETTER 406](#)

IF THE WIPER COMPONENTS PASS INSPECTION THEN USE AN ULTRA-SONIC DEVICE EMPLOYING A PH BASIC SOLUTION [AMMONIA IS PH BASIC] BATH TO CLEAN THE WOUND-RESISTOR ELEMENT. THE ULTRA-SONIC BATH DEVICE IS A HARBOR FREIGHT ITEM; ALTERNATIVELY THEY CAN COMMONLY BE FOUND IN YOUR WIFE'S AREA OF THE BATHROOM. DON'T TELL HER YOU USED IT TO CLEAN YOUR FUEL INJECTORS TOO. REMEMBER THE END RESULT OF APPROXIMATELY 0 TO 30 OHMS IS REQUIRED. THE 400 COMANCHE AUXILIARY TRANSMITTERS ARE 15 OHMS EACH BECAUSE THE AUX TANKS REQUIRE TWO TRANSMITTERS WHICH ARE CONNECTED IN SERIES. BE SURE TO REPEAT THE TEST PROCEDURE AFTER YOU HAVE CLEANED A TRANSMITTER.

TO MECHANICALLY REATTACH THE PIECES OF THE TRANSMITTER TRY USING A COMPRESSION RIVETER FOR THE COPPER RIVETS [I BOUGHT THEM FROM MCMASTER-CARR]. THE RIVETS WILL NEED TO BE ANNEALED PRIOR TO SQUEEZING. IF EVERYTHING IS CLEAN, NO CORROSION, YOU SHOULD BE ABLE TO SOLDER THE RIVETS TO ASSURE A SEAL [FUEL LEAK]. IF YOU'RE NOT INTERESTED IN PURCHASING 100-LOT QUANTITIES, I CAN SUPPLY THE NECESSARY QUANTITY OF EACH REQUIRED PIECE [I MAKE A PROFIT AND REMEMBER ITS NICKEL-DIME STUFF]. THE KIT INCLUDES: 5X SEALING WASHERS, 1X GASKET, 5X SS SCREWS, 2X COPPER RIVETS, 1X BRASS NUT AND WASHER, BRAIDED GROUNDING CONNECTION PIGTAIL[S]. PVC SLEEVING AND NYLON CABLE TIES.

AND IF YOU DON'T LIKE THE CONDITION OF THE WIRING IN THE WING I CAN PROVIDE A FEW FEET EACH OF PROPERLY-MARKED 18 GAUGE MS22759/16 TEFLON® TO SPLICE ONTO THE EXISTING INSIDE THE WING. THE WIRE KIT COMES WITH BUTT CONNECTORS, HEAT SHRINK TUBING, A GROMMET, AND RING AND KNIFE TERMINALS ALREADY CRIMPED.

SUGGESTED LOG BOOK ENTRY

REMOVED THE FUEL LEVEL TRANSMITTER FOR [TANK POSITION] FUEL TANK. CLEANED, ADJUSTED, AND TESTED THE TRANSMITTER. RE-INSTALLED THIS SERVICEABLE UNIT WITH NEW GASKET, SCREWS, AND SEALS. YOU ARE THE JUDGE ON THIS LANGUAGE - PIPER DOESN'T ADDRESS "REPAIR" OF THIS COMPONENT SOME / ALL WORK PERFORMED AND USING METHODS FOUND IN ACCORDANCE WITH THE PIPER COMANCHE SERVICE MANUAL 773-516, 9TH REVISION DATED AUGUST 15, 1998. AN OPERATIONAL CHECK WAS PERFORMED AND FOUND TO BE SATISFACTORY.

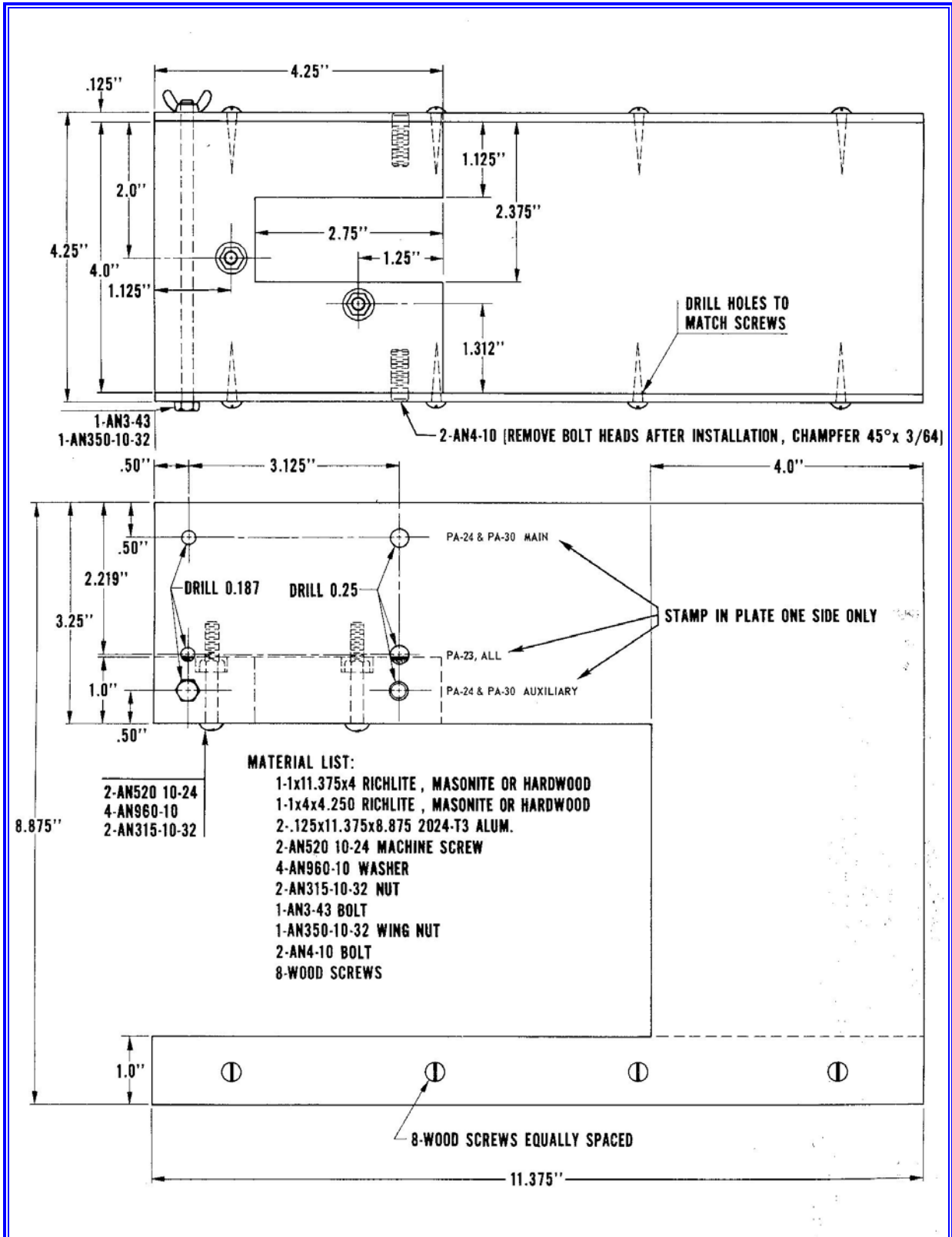
LET'S KEEP 'EM FLYING.

MATT KURKE, A&P
ICS 10288

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COMANCHE FUEL TRANSMITTER CHECKING JIG

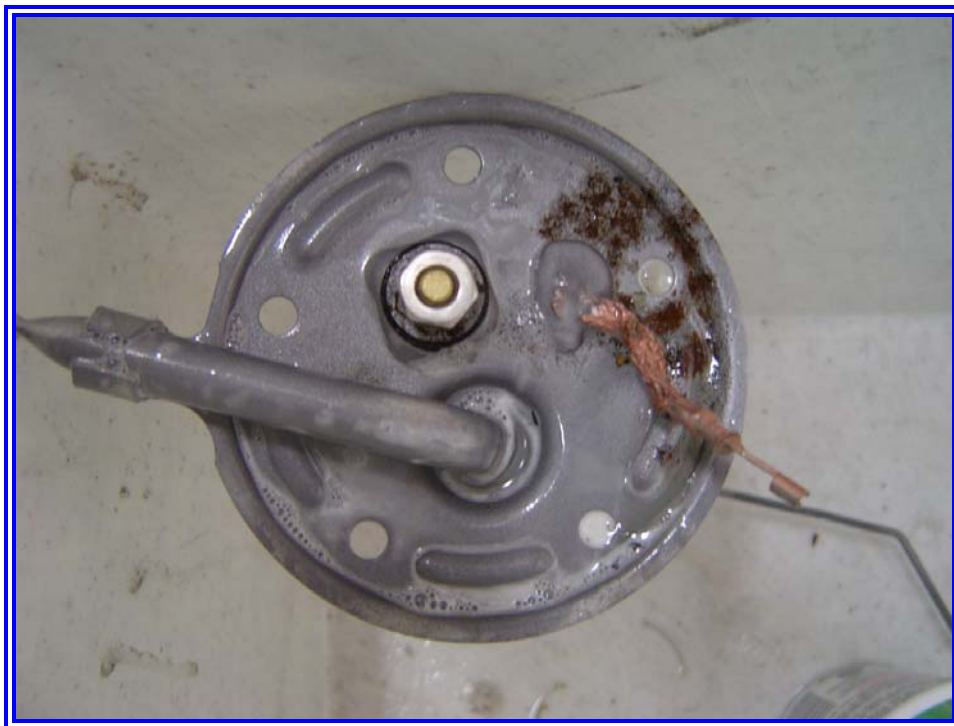
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CORROSION!! THIS MAIN TANK TRANSMITTER DIDN'T SURVIVE



GLASS BEAD BLAST AND ACID USED TO REMOVE CORROSION

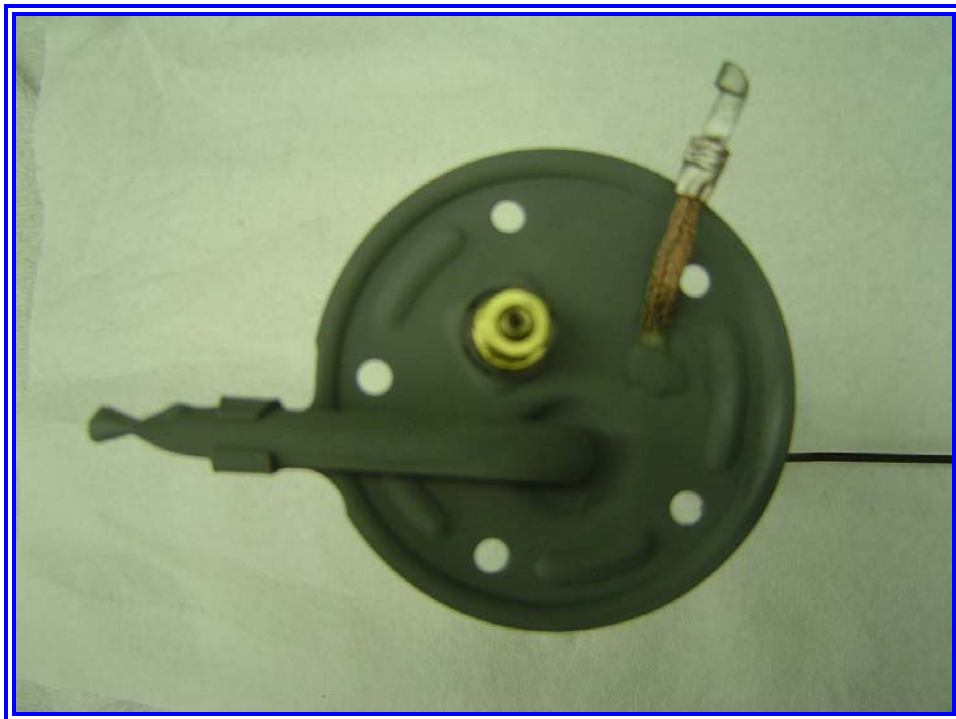
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ZINC CHROMATE PRIMER, AFTER DUPONT® KWIK-PREP METAL
CONDITIONER

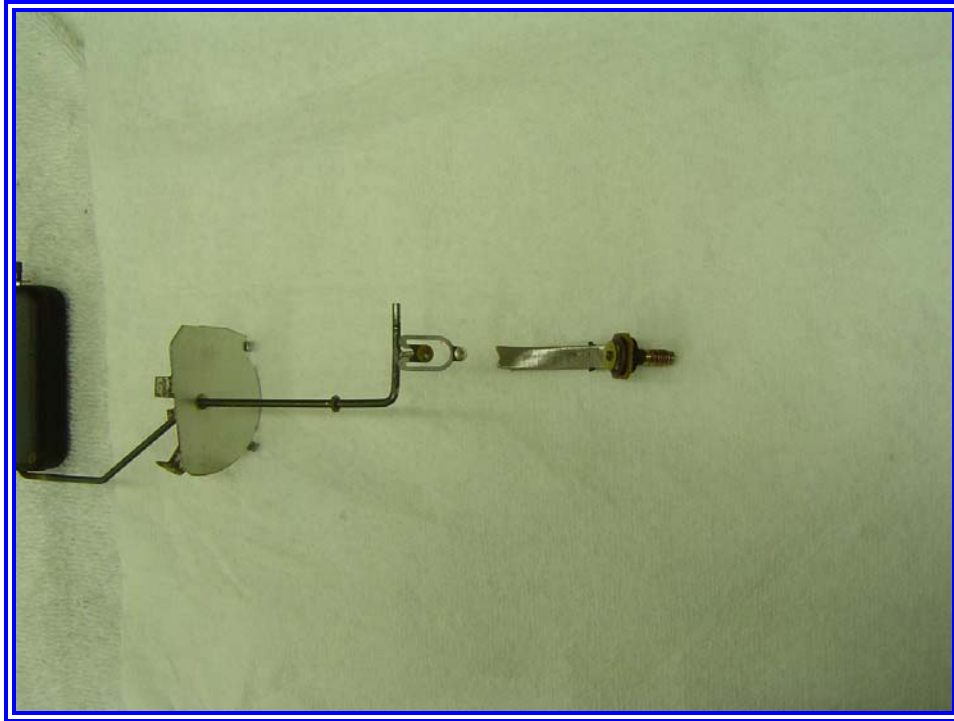


COLD GALVANIZE COMPOUND TOP COAT

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CLEANED WIPER BUTTON AND WIRE-WOUND RESISTOR - 400

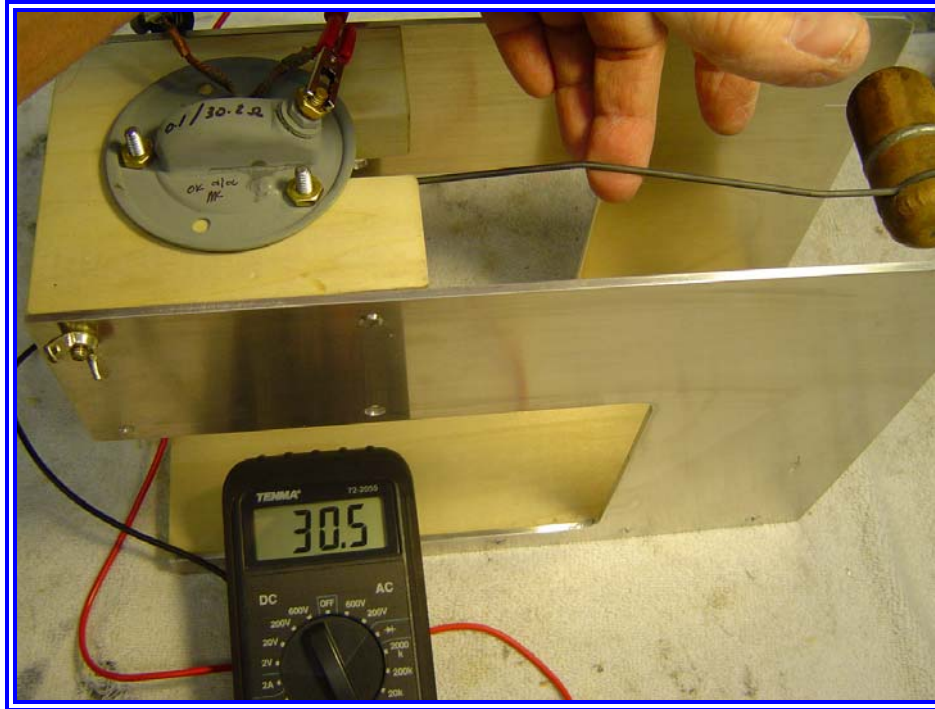


NOTE VERY SMALL WORN SPOT ON WIPER BUTTON, THIS IS OK; A LARGE WORN SPOT WOULD GIVE INACCURATE READINGS

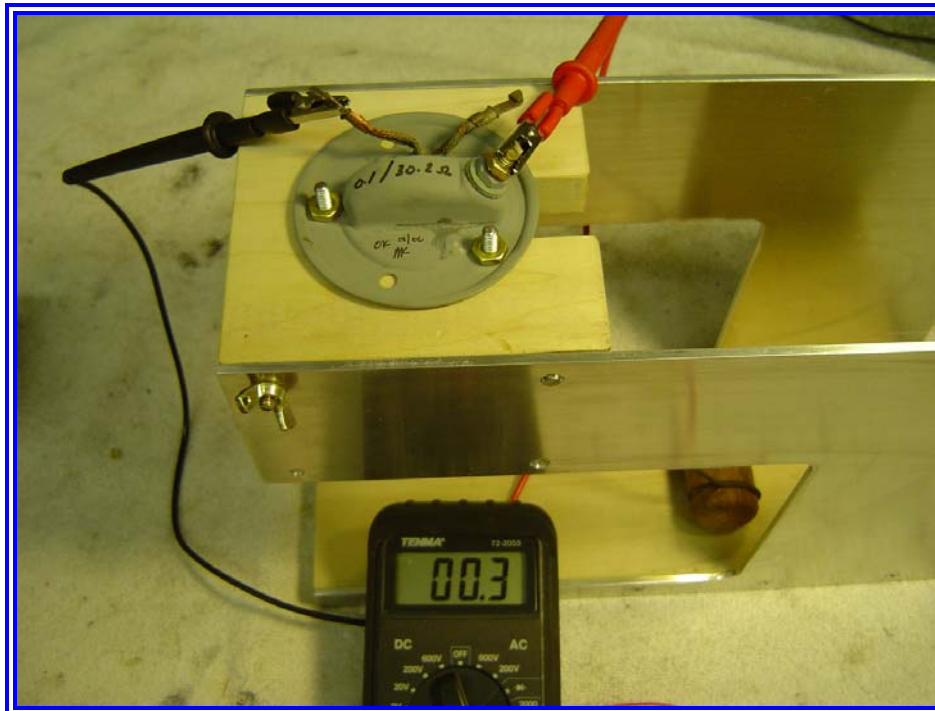
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**FULL RANGE TEST MUST BE 29.6 TO 31.3 OHMS FOR ALL
EXCEPT 14.6 TO 16.3 OHMS FOR THE 400 AUXILIARY
TRANSMITTERS**



EMPTY RANGE TEST MUST BE ZERO TO 0.5 OHMS