Name: _____ Date:_____

Activity Sheet 11

Use addition and subtraction to determine part condition

Objective: Upon completion of this activity sheet you should be able to use addition and subtraction to determine part condition.

NATEF mathematics-related academic skills covered in this activity sheet:

•   Determine the proper sequence of arithmetic operations that are needed to arrive at a solution that can be compared to other specifications when comparing system measurements or tolerances to the manufacturer's specifications.
•   Add two or more whole numbers, fractions, or decimals to determine the component conformance of multiple measurements with the manufacturer's specifications.
•   Subtract whole numbers, fractions, or decimals to arrive at a difference for comparison with the manufacturer's specifications.
•   Determine the irrelevant and/or missing data needed to solve a problem.

This activity sheet also covers, wholly or partially, the following NATEF language arts skills:

•   Adapt a reading strategy for all written materials, e.g. customers notes, service manuals, shop manuals, technical bulletins, etc., relevant to problem identification, diagnosis, solution, and repair.

This activity sheet also covers, wholly or partially, the following NATEF science skills:

•   Convert measurements taken using the English or metric system to specifications stated in terms of either system.

Tools and Materials: Pen or pencil

Procedure:
1.   After a metal door panel has been straightened, some parts have a thickness of .035 inch. The manufacturer's specification calls for .045 thickness, with a tolerance of plus or minus .005 inch. Is the thickness of the straightened metal within specifications? Yes __ No __

   If the above answer is no, is the metal too thin or too thick?

   By how much?   _____ _

2.   One inch equals 25.4 millimeters (mm). Knowing this, convert the inch readings in the above problem (Problem 1) to mm.

   Manufacturer's specifications for thickness _____

   Manufacturer's specifications for tolerance _____

Difference between actual thickness and manufacturer's specifications _____

Activity Sheet 11 (page 2)

Use addition and subtraction to determine part condition

3. The gap between a door and the front fender is $^1/_8$ inch at the top, and ¼ inch at the bottom. The manufacturer's specifications call for a gap of $^3/_{16}$ inch, ± $^1/_{16}$ with no more than $^1/_8$ inch variation between top and bottom. Is the gap within specifications? Yes __ No __

    If the above answer is no, should the top of the door be moved in, or the

    bottom moved out? _____ By how much? _____ _

4. Which of the following decimal inch measurements corresponds most closely to $^1/_{16}$ inch? (Circle the correct answer.)

a. .0625 inch   b .125 inch

c. .625 inch   d. 1.25 inch

5. Convert the following inch readings to millimeters.

a. 1" _____   b. 5" _____   c. 7" _____   d. 8 ½ " _____

6. Convert the following millimeter readings to inches.

a. 50.8mm _____   c. 482.6 mm _____

b. 177.8mm _____   d.203.2mm _____

a. 75 + 25 = _____   b.   . 5 + 10 = _____

c. 7 + 8 = _____   d. .15 + 15 = _____

e. .77 + .23 = _____   f.   6 + .4 = _____

g.   .025 + 1 + .750 + .0001 = _____

h. 1/3 + 2/3 + 3 = _____

8. Manufacturer's specifications call for a hood to fender gap of 4 mm, ± 1 mm. Study the gap figures listed below and circle the gaps that are within specifications.

          2 mm   3 mm   4 mm   5 mm   6 mm   7 mm

_____

Activity successfully completed. Yes _____ No ___

Grade (if applicable) _____ _