Specification's on the Engine

LEARNING AREA: Read, Listen & View
EDUCATIONAL LEVEL: High School
CONTENT STANDARD: Technical Reading

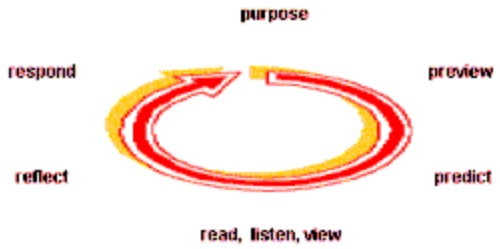
STANDARD:

A. A student shall demonstrate the ability to read and apply technical information from varied English documents or electronic media by applying information from technical reading, listening, or viewing selections in the following two applications, operate, maintain or repair from a technical manual. Analyze a situation based on technical information.

B. From the selected applications in item A, a student shall:

1. identify and select relevant information for completing the applications;
2. interpret specialized vocabulary
3. interpret information found in charts, graphs, tables, and other visual graphic representation of data;
4. apply step by step procedures

LARGE PROCESSES/CONCEPTS:



ASSESSMENT TASK:

DESCRIPTION:

Students will learn specialized vocabulary and apply it to the process of measuring various engine components, as compared to the specification manuals.

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PRODUCTS/EVIDENCE OF LEARNING:

Upon the completion of this activity the student should be able to find information pertaining to the specifications of engine components through the use of a variety of precision measuring equipment such as, but not limited to, micrometers, veneer calipers, dial bore gauges and feeler gauges. The student will be able to compare the specifications they measured, with the ones in the service manual to determine whether or not the component is acceptable to be reused.

OVERVIEW:

An engine will assist the student in comparing his/her specifications of the engine that he/she is working on with the engines in the service manual. It is generally hard to keep track of the specifications, therefore a simple worksheet that the student can fill in while measuring will assist him/her in comparing their specifications with the service manual. The following are examples of worksheets that will assist the student.

BLOCK PREPARATION, PISTON FITTING, AND PISTON RING WORKSHEET

1. Measure the main bearing bores: **a.** _____ **b.** _____ **c.** _____ **d.** _____ **e.** _____ **f.** _____

Manufacture specification _____
Align bore or hone as necessary - **OK** _____ **NOT OK** _____

2. Measure the cylinders for out-of-round and taper:

	#1	**#2**	**#3**	**#4**	**#5**	**#6**	**#7**	**#8**
out-of-round								
taper								

Manufactures specifications for out-of-round _____
Manufactures specifications for taper _____
Bore or hone cylinders as necessary **- OK** _____ **NOT OK** _____

3. Measure flatness of the block deck _____

Manufactures specification **OK**_____ **NOT OK**_____

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4. With a micrometer, measure the piston skirt diameter.

Manufactures specification _____

Actual = **Piston #1**_____ **Piston #5** _____

Piston #2 _____ **Piston #6** _____

Piston #3_____ **Piston #7** _____

Piston #4 _____ **Piston #8**_____

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5. With a telescoping gauge and micrometer measure the smallest diameter of the cylinder.

Cylinder #1_____ **Cylinder #5**_____

Cylinder #2 _____ **Cylinder #6** _____

Cylinder #3 _____ **Cylinder #7** _____

Cylinder #4 _____ **Cylinder #8** _____

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6. Select the largest diameter piston and using the thickness gauge, fit the piston to the largest diameter cylinder. Continue selecting pistons and fit each to the cylinder that results in the best fit with the correct clearance (usually between 0.002 and 0.003 in).

7. Match the cylinder number in the top of the selected piston for each cylinder.

Cylinder #1 uses piston # _____ **Cylinder #5 uses piston #**_____

Cylinder #2 uses piston # _____ **Cylinder #6 uses piston #**_____

Cylinder #3 uses piston # _____ **Cylinder #7 uses piston #** _____

Cylinder #4 uses piston # _____ **Cylinder #8 uses piston #**_____

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8. Double check piston rings for correct size and type.

	SIZE	TYPE
Top ring	_____	_____
2nd compressing ring	_____	_____
Oil control ring	_____	_____

9. Install each ring into the designated cylinder by inverting the piston and pushing each ring into the lower quarter of the cylinder. Measure the piston ring gap: (should be about 0.004 in. for each inch of bore)

	SPECIFICATION	ACTUAL	OK	NOT OK
Top ring	_____	_____	____	_____
2nd compressing ring	_____	_____	____	_____
Oil control ring	_____	_____	____	_____

10. Install the piston rings on the pistons.

11. Measure the piston ring side clearance: (usually about 0.001-0.003 in.)

	SPECIFICATION	ACTUAL	OK	NOT OK
Top ring	_____	_____	___	_____
2nd compressing ring	_____	_____	___	_____
Oil control ring	_____	_____	___	_____

CHECK LIST:

STUDENT	TEACHER	
_____	_____	Appropriate and accurate technical vocabulary is used correctly.
_____	_____	All necessary and accurate information from technical manuals and resources is selected and applied.
_____	_____	Information from technical manuals on charts and tables is accessed and used accurately.
_____	_____	Multiple sources of information are accessed to acquire information, when necessary.

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