California Vocational Agriculture Curriculum Guidelines Instructional Unit

USING THE OPERATOR'S MANUAL

TABLE OF CONTENTS

Introduction to Agriculture	
Agricultural Production	01.01
Agricultural Supplies/Services	01.02
Agricultural Mechanics	01.03
Agricultural Products/Processing	01.04
Ornamental Horticulture	01.05
Renewable Resources/ Rural Recreation	01.06
Forestry	01.07

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USING THE OPERATOR'S MANUAL

Unit Goal

The goal of this unit is to provide the student with the knowledge needed to correctly read and interpret service and operator's manuals.

Unit Performance Objectives

The student will be able to:

1. Identify the equipment that is to be serviced or repaired and locate the proper service or operator's manual.
2. Using the index, determine the main sections and their page numbers.
3. Using the proper manual, determine the location of various parts or systems and locate adjustment points for adjusting the equipment.
4. Identify proper names of these parts and systems.
5. Order repair or replacement parts by proper name.
6. Determine when service is due.

Teaching Outline

I. Determining the Proper Manual to Use

A. Location of model or equipment number (see manual for location)

B. Obtaining proper service manual from files

C. Determining why it is essential to use correct service manual

II. Using the Proper Manual

A. Locate by page number from the index section the following:

1. Preventive maintenance guide

2. Specifications

3. Lubrication guide

B. Using the charts, sketches and pictures, determine where parts and systems are located

1. Types of lines used on sketches and charts and what they mean (colored lines for systems, etc.)

2. Abbreviations, symbols, etc. found on charts or sketches and what they mean

3. Proper names for parts (useful in ordering new parts)

C. Locating specifications for making adjustments - by use of index and table of contents

1. Specifications and tolerances for tune-up

2. Abbreviations used in specification tables

D. Care and handling of the manual

1. Store in proper place after each use

2. Use care in turning pages and make effort to keep pages clean

	Suggested Learning Activities	Suggested Resource Materials
I.A. 1.	For equipment being worked on, have students obtain proper service manual, or use correct sections of service manuals.	1. Technical Publications Inc. 1014 Wyanotte Street Kansas City, Missouri. Massey Ferguson, Ford.
2.	Have students note the main sections of manual from table of contents and/or index.	2. Service and assembly operator's manuals and charts. Massey Ferguson, Ford International Harvester, John Deere.
3.	Have students determine items and information of the following nature: a. Correct spark plug settings (if applicable) b. Clutch or brake pedal "free play." c. The lubrication intervals for equipment being worked on. (daily, 50 hrs., 100 hrs., 250 hrs., 500 hrs., 2000 hrs.) d. Electrical system maintenance procedure. e. Correct oil weights and capacities for above 32° F. operation.	3. Manufacturer's Service manuals Sample manual descriptions TM's 1, 2, 3, 4, 5
4.	Have students prepare a list of parts and supplies necessary to conduct a 200 hr. service.	3. Manufacturer's or service manuals

Student Evaluation (Practical)

1. Check student while at work to determine if he is correctly using service, operator, or assembly manuals.

2. Provide students with a question/specification sheet which would ask for information of the type listed below:

   a. Valve lash
   b. Names of instruments to be observed prior to and during operation (TM - 5, 5a)
   c. Maximum and minimum wheel spacing
   d. Fuel capacity
   e. Crankcase capacity
   f. Names of four (if applicable) hydraulic controls
   g. Pre-operation items that must be checked before operation or starting
   h. Lubrication and maintenance schedule times

3. Ask student to demonstrate or point out four things that must be checked if engine cranks but fails to start.

4. Ask student to properly describe a part to be selected by you that will make use of the manual for preparation of the description. (Note: This is to prepare the students for the time when they must order a part at the parts counter.)

5. Ask student to properly demonstrate hitching and unhitching procedures (if applicable) using operator's manual.

Student Evaluation

1. List five time intervals for proper servicing as indicated in operator's manuals.

   a. _____ d. _____

   b. _____ e. _____

   c. _____

2. Where should the operator's manual be kept? Why?

3. List the ways in which the operator's manual can help you at the equipment dealer's parts counter.

   a.

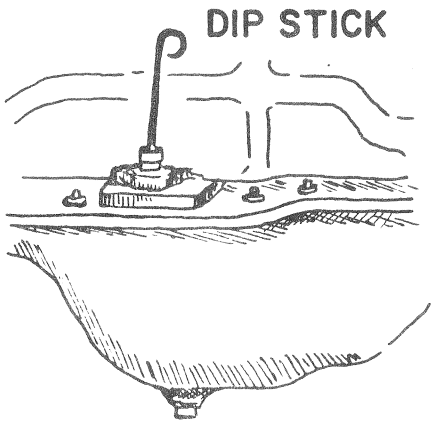
   b.

   c.

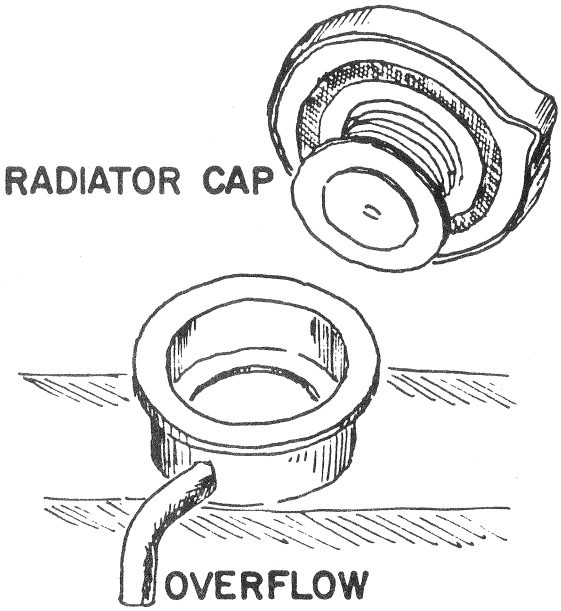
4. Where would you first look to find what is contained in the manual?

5. Where should you look in the operator's manual for help when the engine fails to start?

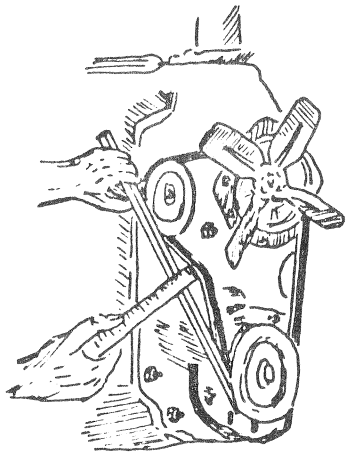
WHERE TO CHECK AFTER FIRST TEN HOURS



CRANKCASE OIL LEVEL MAINTAINED

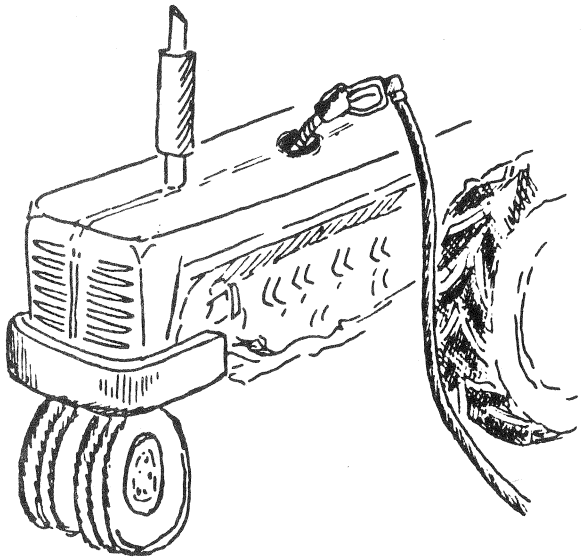


RADIATOR LIQUID LEVEL MAINTAINED

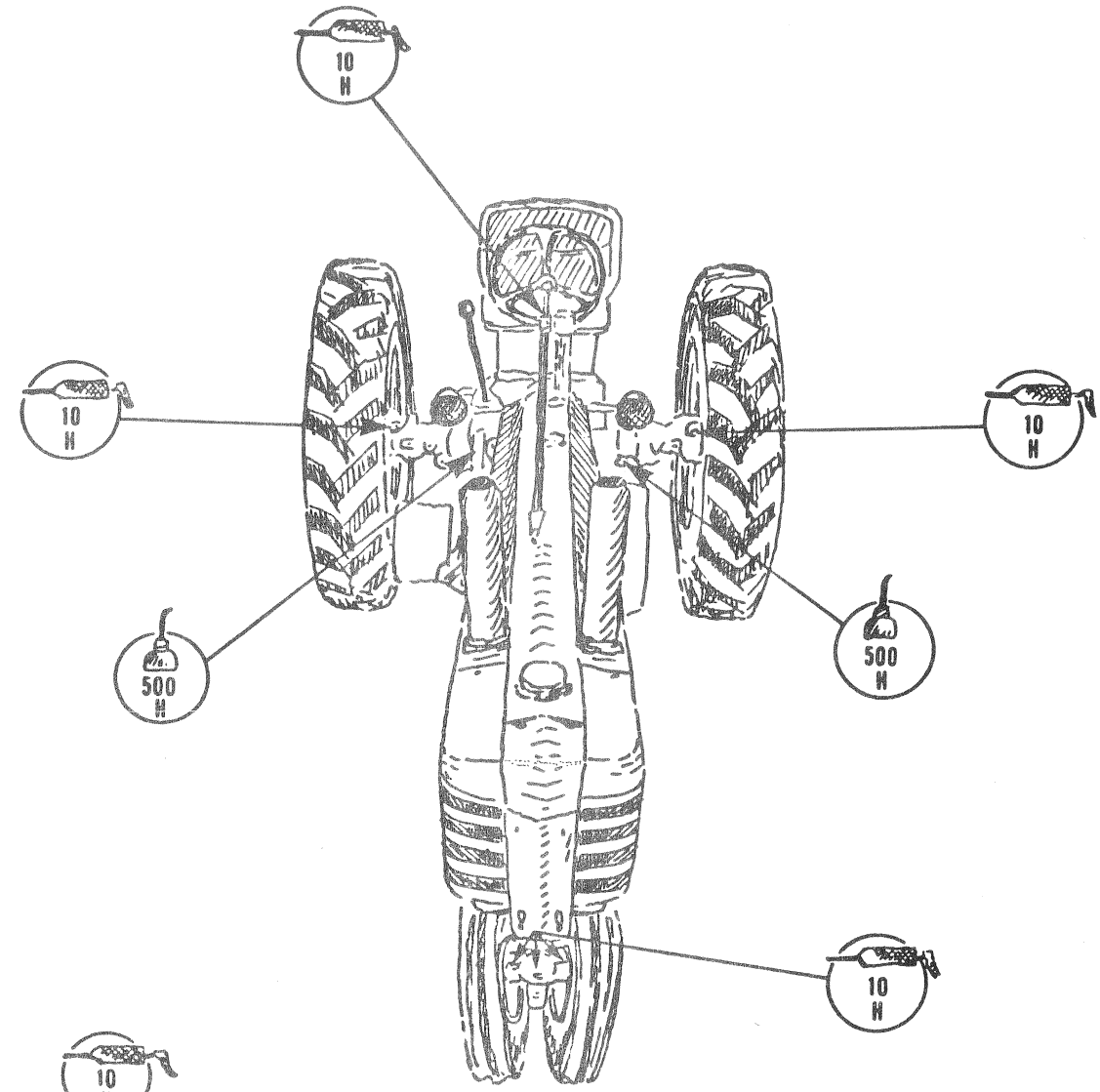


BELT TENSION

GASOLINE TANK FILLED AT END OF DAY



LUBRICATION ACCORDING TO HOUR USE



SYMBOLS

10 H — GREASE EVERY 10 HOURS OF OPERATION

500 H — OIL EVERY 500 HOURS OF OPERATION

Vocational Instructional Services

SAMPLE KEY

TM-2A

FOR 10 HOUR SERVICING AS MAY BE DESCRIBED IN SERVICE MANUAL

After each succeeding 10 hours of operation:

a. Check the crankcase oil level.

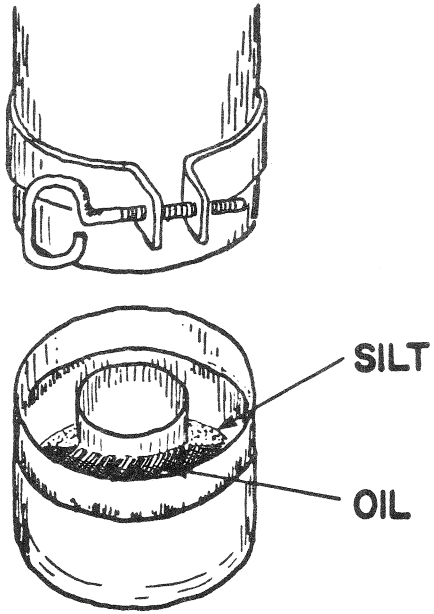
b. Check the water level in the radiator. If the coolant is low, fill to about two inches below the neck.

c. Check the fuel level in the tank. Full tanks collect less moisture than empty tanks.

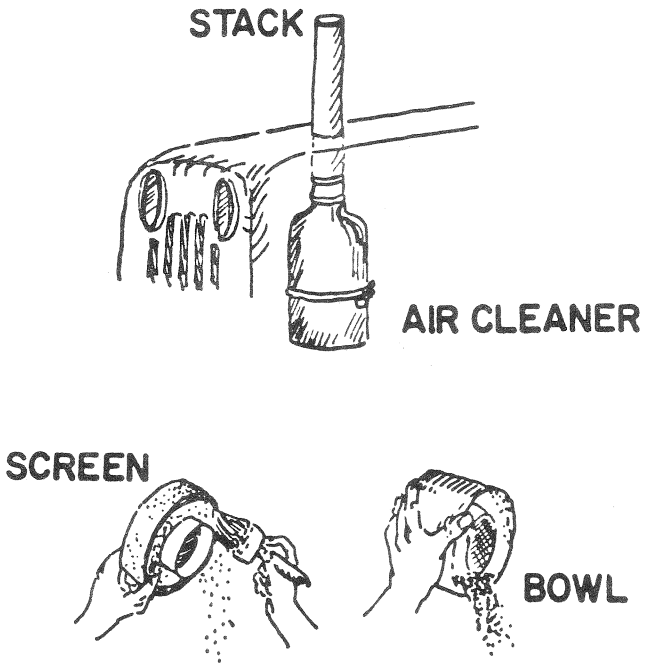
d. Lubricate fittings that require lubrication (steering, brake and clutch pedals, etc.)

e. Check tractor for broken and worn parts, loose nuts, and bent brackets.

CHECK FILTERS

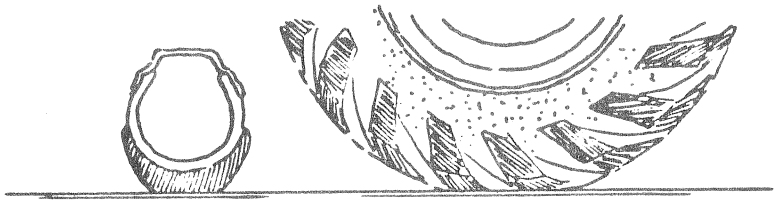


OIL-TYPE AIR FILTER

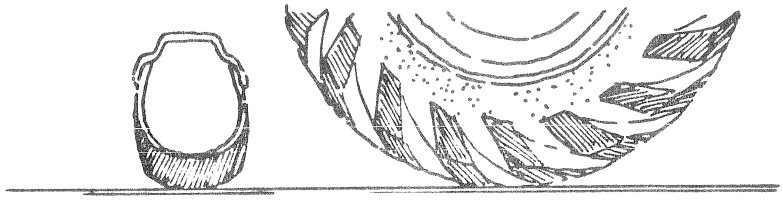


DRY-TYPE AIR FILTER

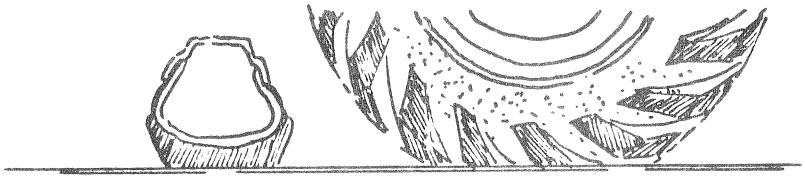
TIRE CHECK



PROPERLY INFLATED TIRE



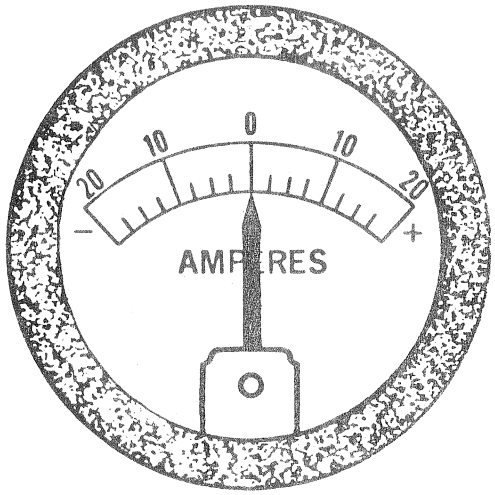
OVER INFLATED TIRE



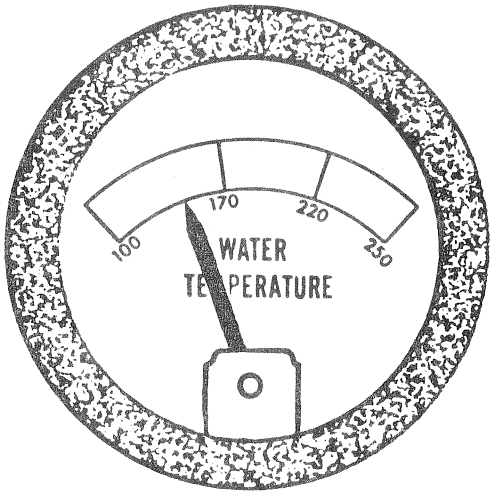
UNDER INFLATED TIRE

Check the pressure in the tires. The change in weight of tractor equipment will make it necessary to change the air pressure.

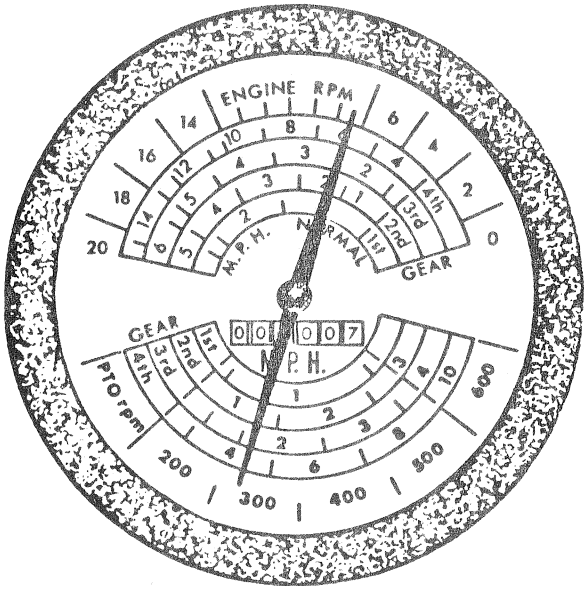
GAUGES TO AID IN OPERATION



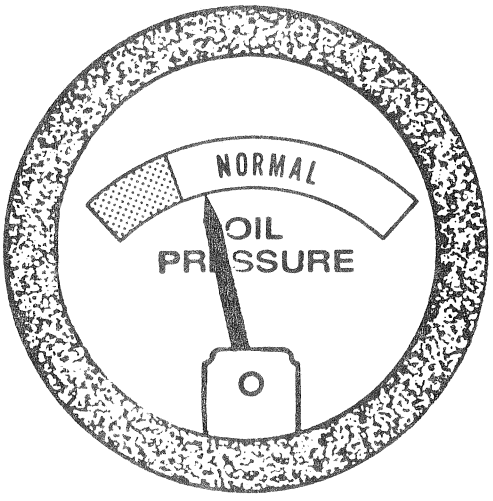
AMPERES GAUGE



WATER TEMPERATURE GAUGE



MILES PER HOUR AND
HOUR USE GAUGE



OIL PRESSURE GAUGE

GAUGE FUNCTIONS TM-5A

a. Heat Indicator - indicates the temperature of the liquid in the cooling system.

b. Oil Gauge - indicates the oil pressure which is regulated by the circulation of the oil.

c. Ammeter - points out any trouble in the circuits. It gives the amount of current flowing from the battery.

d. Hour Meter - indicates hours of operation for servicing and maintenance purposes. May be combined with a speedometer and tachometer.

General References

Allis-Chalmers Tractor Co., Milwaukee, Wisconsin 53208

Caterpillar Tractor Co., East Peoria, Ill. 61611

Ford Motor Co., Tractor and Implement Division
2500 East Maple Road, Birmingham, Michigan 48012

International Harvester
401 North Michigan Ave., Chicago, Illinois 60611

J.I. Case Co., Racine, Wisconsin 53400

John Deere Service Publications
Dept. F. John Deere Road, Moline, Illinois, 61265

Massey Ferguson Co., Des Moines, Iowa 50315

Minneapolis-Moline, Hopkins, Minnesota 55343

Oliver Corp. Chicago, Ill. 60606

Technical Publications, Inc.
1014 Wyanotte Street, Kansas City, Missouri 6405

Tractor Maintenance-Principals & Procedures
AAVIM Engineering Center, Athens, Ga. 30601

White Farm Equip Co., Oak Brook, Ill. 60521