Component Number 1: Crankshaft

**Directions: True/False Questions**

1. This crankshaft is for an 8-cylinder engine.
2. Oil galleys to the second crank pin journal are clear.
3. There are four main bearing journals on this crankshaft.
4. The third crankpin journal shows galling from heat or lack of lubrication.
5. Plasti-gauge was applied to crankpin journal #3, torqued, then bearings and rod caps were removed. Tolerance for the clearance between the crankshaft journal and bearing surface is .002-.003. This journal is within specifications.

Component Number 2: Hydraulic Cylinder

**Directions: True/False Questions**

1. This cylinder is designed to exert force in one direction.
2. The cylinder is displayed fully extended and has a “stroke” of 11 ¼”.
3. Ram is free of dents or abrasions.
4. Ram is not bent.
5. Cylinder is suitable for continued service.

Component Number 3: Tractor Tire

**Directions: True/False Questions:**

1. This tire is designed to be mounted in either direction.
2. This tire is six-ply and engineered to carry a maximum load of 2310 lbs. if inflated to 50 psi.
3. Tire is safe for use on highway vehicles if inflated to less than 50 psi.
4. Ballast of the tractor can be modified by adding a mixture of calcium chloride and water to the tires.
5. The tread pattern of this tire would make it suitable for tractor operation on golf courses, ball fields, or other turfs.

Component Number 4: Hydraulic Hoses

**Directions: True/False statements**

1. Hydraulic hoses are commonly color-coded to aid in reassembly.
2. The hose marked with red tape is a ¼” flex hose with both male and female hose ends.
3. Maximum pressure for the hose marked with yellow tape is 3500 psi.
4. Fiber skirt are installed on some flexible hydraulic hoses to protect the operator in the event of a hose failure.
5. Hose marked with yellow tape is suitable for continued service.

Component Number 5: PTO items

**Directions: True/False Statements**

1. This PTO shaft is intended for operation at 540 rpm.
2. This PTO switch is designed to operate the PTO shaft when pulled out.
3. Switch shows continuity from NC pole to ComB pole when the switch is pulled.
4. This would be considered a “normally open” switch.
5. Switch is suitable for continued service.

Component Number 6: Grease gun and lubricants – ***Please do not pump the grease gun.***

**Directions: True/False statements**

1. Cartridge of the grease gun at this station is empty.
2. Items B and D are suitable for packing wheel bearings.
3. Comparing items C and F, oil F has the lower viscosity.
4. Both fluids A and E are suitable for use in tractor hydraulic systems.
5. Oil “C” gets thinner as it warms up.

Component Number 7: Engine coolant

**Directions: True/False statements**

1. Coolant sample “A” shows signs of particulate contamination.
2. Coolant sample “A” shows signs of fuel/lubricant contamination.
3. Hydrometer test of sample “B” indicates freezing protection to -10⁰.
4. Hydrometer test sample “B” indicates freezing protection to 128oC if used with a 15 psi pressure cap.
5. Both samples are suitable for continued use assuming freezing protection to -10oF is required.

Component Number 8: Electrical Components

**Directions: Multiple Choice Questions**

1. Identify the relay
	1. Item A
	2. Item B
	3. Item C
	4. Item D
2. Identify the limit switch
3. Item A
4. Item B
5. Item C
6. Item D
7. Identify the PTO switch
8. Item A
9. Item B
10. Item C
11. Item D
12. Identify the solenoid
13. Item A
14. Item B
15. Item C
16. Item D

**Directions: True/False Statements**

1. Item “D” is a normally closed switch

Component Number 9: Air Filters

**Directions: True/False Statements**

1. Filters A, B, and, D are single stage filters.
2. Filter B shows dust and particulate contamination.
3. Filter A is suitable for continued service.
4. Filter D is suitable for continued service.
5. All four of these filters can be used in air intake systems with a pre-cleaner.

Component Number 10: Water pump

**Directions: True/False Statements**

1. Freeze plug on this pump appears functional.
2. Pump is designed to be installed without a paper or fiber gasket.
3. Impeller damage is evident.
4. Bearing damage is evident.
5. Water pump is suitable for continued service.

Component Number 11: Electrical Components

**Directions: True/False statements**

1. Item “A” is and internally regulated alternator.
2. Both items “A” and “B” are rated for service on either 6 or 12 volt electrical systems.
3. Item. “A” could be operated on the same tractor with Item “C”.
4. Bearings in Item “A” show excessive wear.
5. Gears on the starter motor show excessive wear.

Component Number 12: Bearings

**Directions: True/False statements**

1. Items “C” and “F” are tapered roller bearings.
2. Items “A” and “E” are plain bearings.
3. Items “D” and “G” are sealed bearings.
4. Items “G” and “F” could be classified as throw-out bearings.
5. Reference numbers on bearings can be used to identify suitable substitute bearings of the same size form different manufactures.

Component Number 13: Starter Motor

**Directions: Multiple Choice Questions**

1. Starter motor appears to have a \_\_\_\_\_\_\_\_ rotor/armature.
2. Squirrel cage
3. Wound
4. Bar
5. Gear
6. Starter motor part labeled “A” is referred to as the \_\_\_\_\_\_\_\_.
7. Motor/armature
8. Commutator
9. Brush
10. Field coil

**Directions: True/False statements**

1. Starter motor appears to have continuity between the rotor/armature and the main shaft.
2. Brushes appear to be in usable condition.
3. Starter motor field coils appear to be burned.

Component Number 14: Top link Bar

**Directions: True/False statements**

1. Top link bar appears to be usable to both Cat 2 and Cat 3 tractors.
2. Top link locking mechanism appears to be functioning.
3. Top link attachment points are noticeable out of round.
4. Top link has grease fittings for maintenance purposes.
5. Top link should be returned to service.

Component Number 15: Solenoid

**Directions: True/False statements**

1. Solenoid is to be used with 12-volt current.
2. Solenoid has excessive amp draw during running operation.
3. Solenoid ground wire has continuity to case.
4. Solenoid start wire has continuity to case.
5. Solenoid should be returned to service.

**Specification:**

* 12.25 oz. pull capacity
* Running power = .25 – 3 amps
* Starting power = 21 – 26 amps
* Black: Chassis ground
* White: Start operation
* Red: Running operation
* All wire insulated from core.

Component Number 16: Various hydraulic pumps

**Directions: Multiple Choice Questions**

1. This pump is a \_\_\_\_\_\_\_ type pump
	1. Piston
	2. Gear
	3. Vane
2. Pump would be able to be used in a \_\_\_\_\_\_\_ hydraulic system.
3. Open centered
4. Closed centered
5. Looped
6. All of the above
7. Pump inlet appears to use a \_\_\_\_\_\_\_type filter
8. O- ring
9. Pipe
10. Flare
11. Banjo

**Directions: True/False statements**

1. Pump to rotor distance exceeds maximum specification.
2. Pump should be returned to service.

**Specification:**

* Rotor out of round < .0015
* Rotor to vane clearance < .0005
* Rotor to housing < .015

Component Number 17: Air Conditioner

**Directions: Multiple Choice Questions**

1. Blower uses a \_\_\_\_\_\_\_ type fan.
2. Axial
3. Blade
4. Centrifugal
5. Direct

**Directions: True/False statements**

1. Low speed operation amps within tolerance.
2. Fan bearings should be replaced.
3. Fan shows neglected cabin air filter maintenance.
4. Fan should be returned to service.

**Specifications:**

* Running power usage
* Low speed 4.6 amps
* Medium speed 5.0 amps
* High speed 6.7 amps

Component Number 18: Oil Pressure Sending Unit

**Directions: True/False statements**

1. Oil pressure sending unit is usually open type switched.
2. Oil pressure sending unit will illuminate the warning light during start up.
3. One should check sending unit for fault, before checking engine oil.
4. Oil pressure sending unit should use a yellow and black wire combination.
5. Oil pressure sending unit is usable for service.

Component Number 19: Piston

**Directions: True/False statements**

1. Bottom ring is a oil control ring.
2. Top ring land/groove is within tolerance.
3. Piston pin boss is machined for a snap-ring.
4. Piston skirt shows signs of scoring.
5. Piston should be returned to service.

Component Number 20: Key switch

**Directions: True/False statements**

1. Switch shows continuity between start and ignition when in cranking position.
2. Switch shows continuity between battery and ignition when in cranking position
3. Key switch should be mounted in a 1” diameter hole.
4. Key switch is a surface mount switch.
5. Key switch has provisions to accept #1 wire.