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150-190, T90
2310, 2510 & 2712
Compact Tractors

Service Manual

9-77981

Reprinted

CASE

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CASE 150, 190 AND T90 COMPACT TRACTOR

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THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

M171B

If Safety Decals on this machine use the words **Danger, Warning or Caution,** which are defined as follows:

- **DANGER:** Indicates an immediate hazardous situation which if not avoided, will result in death or serious injury. The color associated with Danger is RED.
- **WARNING:** Indicates an potentially hazardous situation which if not avoided, will result in serious injury. The color associated with Warning is ORANGE.
- **CAUTION:** Indicates an potentially hazardous situation which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

If Safety Decals on this machine are ISO two panel Pictorial, decals are defined as follows:

- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as  and  if used, are RED.

WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH. BEFORE USING THIS MACHINE, MAKE CERTAIN THAT EVERY OPERATOR:

- Is instructed in safe and proper use of the machine.
- Reads and understands the Manual(s) pertaining to the machine.
- Reads and understands ALL Safety Decals on the machine.
- Clears the area of other persons.
- Learns and practices safe use of machine controls in a safe, clear area before operating this machine on a job site.

It is your responsibility to observe pertinent laws and regulations and follow Case Corporation instructions on machine operation and maintenance.

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K241 engine

K241 ENGINE SPECIFICATIONS

Type ---------- Kohler, 1 Cylinder, 4 Stroke Cycle Air Cooled, "L" Head Engine
Bore ---------- 3.250 Inches
Stroke ---------- 2.880 Inches
Piston Displacement ---------- 23.9 Cubic Inches
Compression Ratio ---------- 6 to 1
Max. Comp. at Cranking Speed (Engine at Operating Temperature)---------- 110 to 120 PSI at Sea Level
Crankcase Vacuum(Engine Running)--- 5 to 10 Inches Vacuum at Sea Level
Ignition ---------- 12 Volt Coil, Breaker Point

CYLINDER BORE

Diameter of Cylinder Bore Std. A, B ---------- 3.2505-3.2545 Inches
.010 Oversize A, B + 10 ---------- 3.2605-3.2615 Inches
.020 Oversize A, B + 20 3.2705-3.2715 Inches
.030 Oversize A, B + 30 ---------- 3.2805-3.2815 Inches
Cylinder Bore Must Be Bored or Honed Oversize If Taper or Out of Round Exceeds ---------- .005 Inches

PISTON AND PISTON PIN

Diameter of Std. Piston at Bottom of Skirt ------- 3.2470-3.2480 Inches
Diameter of Std. Piston at Top of Skirt ---------- 3.2425-3.2535 Inches (Measured Just Below Oil Ring)
Diameter of Std. Piston at Top ---------- 3.218-3.220 Inches
Piston Pin ---------- Full Floating Type, Retained In Place With Two Retainer Rings.
Piston Pin Bore in Piston Std. ---------- .8595-.8596 Inches
Piston Pin Diameter Std. ---------- .8591-.8593 Inches
.005 Oversize ---------- .8641-.8643 Inches
Piston Pin Length ---------- 2.738-2.753 Inches
Piston Pin Fit in Piston (Select Fit) ---------- .0000-.0003 Inches
Piston Pin Fit in Connecting Rod ---------- .0003-.0008 Inches

PISTON RINGS

Rings Per Piston ---------- (2 Compression-1 Oil)
1st(Top)Compression-Chrome, Taper Face. Relief Indicates Top Side
Side Clearance ---------- .002-.004 Inches
Width ---------- .093-.094 Inches
2nd Compression-Chrome, Relief Indicates Bottom Side
Side Clearance ---------- .0015-.0035 Inches
Width ---------- .093-.094 Inches
3rd Oil Ring ---------- Cast W/Expander
Side Clearance ---------- .001-.003 Inches
Width ---------- .1860-.1870 Inches
Ring End Gap - When Installed in Bore ---------- .010-.020 Inches
Replacement Ring Width
1st. Comp. ---------- .0925-.0935 Inches
2nd. Comp. ---------- .0665-.0675 Inches
2nd. Comp. Rail ---------- .0235-.0245 Inches
3rd. Oil Rail ---------- .0235-.0245 Inches
3rd Oil Ring ---------- .134-.135 Inches

CONNECTING RODS

Connecting Rod Length from Center of Pin Hole To Center of Bearing Journal ---------- 5.560-5.562 Inches
Piston Pin Hole Diameter in Rod ---------- .8596-.8599 Inches
Inside Diameter of Rod Journal, Std. ---------- 1.5005-1.5010 Inches
Undersize ---------- 1.4905-1.4910 Inches
Connecting Rod to Crank Journal Clearance --------- .0005-.0015 Inches
Connecting Rod to Crank End Play Clearance --------- .007-.016 Inches

CRANKSHAFT AND BEARINGS

Type Main Bearings ---------- Ball Bearings
Crankshaft Rod Journal ---------- 1.4995-1.5000 Inches
Crankshaft Rod Journal Width ---------- 1.079-1.084 Inches
Crankshaft End Play ---------- .003-.020 Inches
Measured at Bearing Plate and Shim to Proper End Play

CAMSHAFT

Camshaft End Play ---------- .005-.010 Inches
Camshaft Pin Diameter ---------- .4980-.4985 Inches
Camshaft Inside Diameter ---------- .4995-.5015 Inches
Camshaft Pin to Camshaft Clearance ---------- .001-.0035 Inches
Camshaft Pin to Breaker Cam Clearance ---------- .001-.0025 Inches

VALVE LIFTERS

Valve Lifter Outside Diameter in Block ---------- .6232-.6237 Inches
Valve Lifter Bore in Block ---------- .6245-.6255 Inches
Valve Lifter to Block Clearance ---------- .0008-.0023 Inches

VALVES

Intake Valve Tappet Clearance (Cold) ---------- .008-.010 Inches
Exhaust Valve Tappet Clearance (Cold) ---------- .017-.020 Inches
Angle of Valve Face - Intake and Exhaust ---------- 44 Degrees
Valve Length - Intake and Exhaust ---------- 4.572-4.582 Inches
Max. Valve Face Runout - Intake ---------- .0015 Inches
Max. Valve Face Runout - Exhaust ---------- .003 Inches
Valve Head Diameter - Intake ---------- 1.370-1.380 Inches
Valve Head Diameter - Exhaust ---------- 1.120-1.130 Inches
Valve Stem Diameter - Intake ---------- .3105-.3110 Inches
Valve Stem Diameter - Exhaust ---------- .3090-.3095 Inches
Intake Valve Stem to Guide Clearance ---------- .001-.0025 Inches
Exhaust Valve Stem to Guide Clearance ---------- .0025-.004 Inches

VALVE SEATS

Seat Angle - Intake and Exhaust ---------- 45 Degrees
Max. Seat Runout - Intake and Exhaust ---------- .002 Inches
Seat Width - Intake ---------- .037-.045 Inches
Seat Width - Exhaust ---------- .031-.062 Inches
Exhaust Seat Insert ---------- Replaceable
Outside Diameter of Exhaust Insert ---------- 1.2535-1.2545 Inches
Exhaust Insert Height ---------- .219-.221 Inches

VALVE GUIDES

Valve Guide Length ---------- 2.125 Inches
Valve Guide Outside Diameter ---------- .6260-.6265 Inches
Valve Guide to Block (Press Fit) ---------- .0005-.002 Inches
Valve Guide Inside Diameter - Before Installing ----- .307-.308 Inches
Ream Valve Guides After Installing to ---------- .312-.313 Inches

VALVE SPRINGS

Spring Free Length ---------- 1.793 Inches
Spring Pressure When Comp. to 1.469 In. (Valve Closed)--27 to 31 Lbs.
Spring Pressure When Comp. to 1.165 In. (Valve Open) --- 54 to 62 lbs.

GOVERNOR

Governor Stub Shaft Outside Diameter ---------- .3735-.3740 Inches
Governor Gear Bore for Stub Shaft ---------- .3745-.3755 Inches
Stub Shaft to Governor Gear Clearance ---------- .0005-.002 Inches
Governor Spring Free Length With 2 Lbs. Pre-Load -------2.62 Inches
Governor Spring Extended to 2.88 Inches ---------- 5.5 to 6.5 Pounds

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Spark Plug

A spark plug that has been worn out by normal service can be identified by a light brown to grayish tan dry deposit. It indicates a balanced ignition and combustion system and the plug was of the proper heat range.

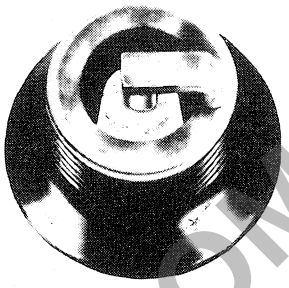


Figure F-25

NOTE

If a highly leaded fuel is used, a white powdery or yellow glazed deposit will appear. These deposits should be cleaned off regularly.

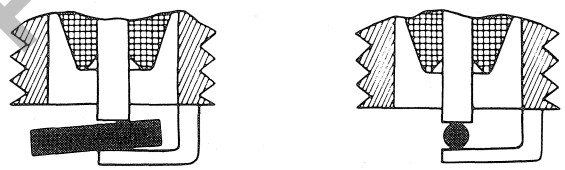
Cleaning and Gapping Spark Plug

Use an abrasive type cleaning machine (if available) to remove the deposits on the plug, after this has been done, wire brush the threads.

File the electrode sparking areas to obtain bright flat parallel surfaces. The plug should be washed in a good cleaning solvent and blown dry with air pressure. Reset the gap between the electrodes to .025 inch.

Set the gap by bending the ground or outside electrode, never try to bend the center electrode as the insulator will crack.

Use a round type feeler gauge to measure the gap as a flat type feeler gauge will give a false reading, Figure F-26.



FLAT FEELER GAUGE CAN GIVE FALSE READING

ROUND FEELER GAUGE WILL GIVE A MORE ACCURATE READING

Figure F-26

Installing the Spark Plug

Make sure the cylinder head threads and the gasket seat is clean. Always install a new gasket whenever a spark plug has been removed and reinstalled. Use a thin wall deep socket type spark plug wrench (13/16") and torque to 27 foot pounds. If a torque wrench is not used, tighten the plug until the plug, gasket and head make contact and then give it 3/4 of a turn which will compress the gasket properly. Install spark plug wire.

NOTE: The J I Case Company reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

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Series

Engines

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C. ENGINE MISSES UNDER LOAD

Cause	Remedy
Spark plug fouled.	Clean and regap spark plug.
Spark plug porcelain cracked.	Replace spark plug.
Improper spark plug gap.	Regap spark plug.
Pitted magneto breaker points.	Clean and dress breaker points. Replace badly pitted breaker points. (par. 8-A-3).
Magneto breaker arm sluggish.	Clean and lubricate breaker point rod and arm. Check for spring tension.
Faulty condenser.	Check condenser on a tester (par. 8-B-4); replace if defective.
Improper carburetor adjustment.	Adjust carburetor (par. 2-B-1).
Improper valve clearance.	Adjust valve clearance (par. 6-A-1 and 6-A-4).
Weak valve spring.	Replace valve spring (par. 6-A-3).

D. ENGINE LACKS POWER

Cause	Remedy
Choke partially closed.	Open choke.
Improper carburetor adjustment.	Adjust carburetor (par. 2-B-1).
Magneto improperly timed.	Time engine (par. 8-A-3).
Loss of compression.	Check compression (par. 9-D-1) and make necessary repairs.
Lack of lubrication.	Fill crankcase to the proper level.
Air cleaner restricted.	Clean air cleaner (par. 2-A-1 or 2-A-2).
Valves leaking.	Grind valves.
Valve timing inaccurate.	Check timing marks on camshaft and crankshaft gear (par. 6-B-2).
Carburetor dirty or damaged.	Clean and repair carburetor. See Carburetor Chapter II.
Ignition system malfunction.	Check and repair system. See Ignition Chapter 8.

E. ENGINE OVERHEATS

Cause	Remedy
Engine improperly timed.	Time engine (par. 8-A-3).
Carburetor improperly adjusted (lean).	Adjust carburetor (par. 2-B-1).
Air flow obstructed.	Remove any obstructions from air passages in shrouds. (par. 1-A-4).

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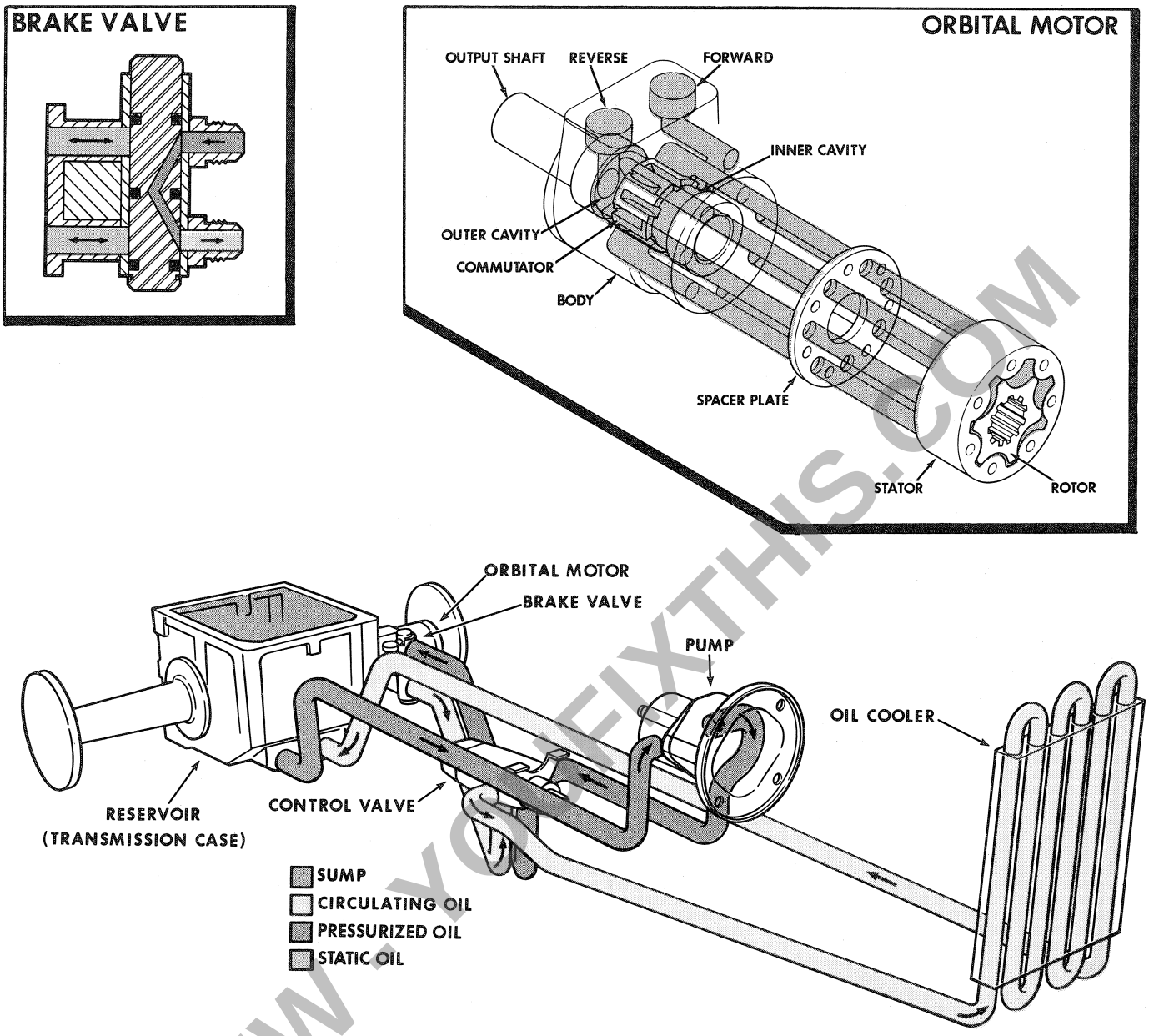


Figure A-4

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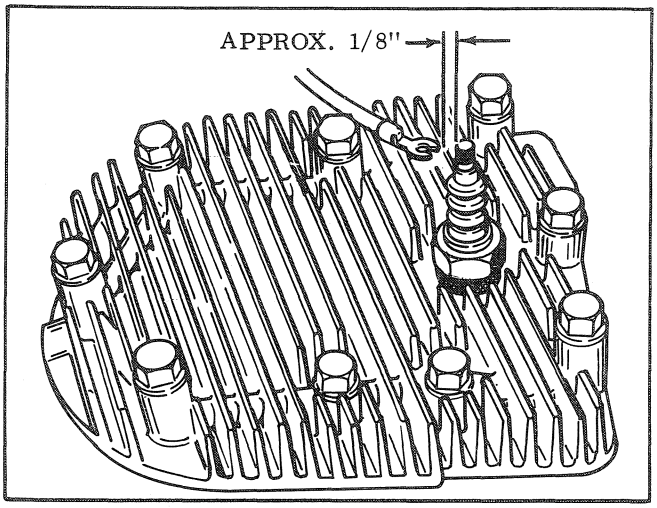


Figure 8-A-1

8-A-1 Check the ignition by removing the high tension lead from the spark plug. Hold the terminal of the high tension lead approximately 1/8" from the spark plug. (Figure 8-A-1) Crank the engine over rapidly. If a spark jumps the 1/4" gap the ignition is serviceable. Remove the spark plug and check, replace if carboned, damaged. Check and set electrode gap at .030. Examine spark plug gasket and replace if damaged or compressed beyond serviceability. Torque spark plug when replacing.

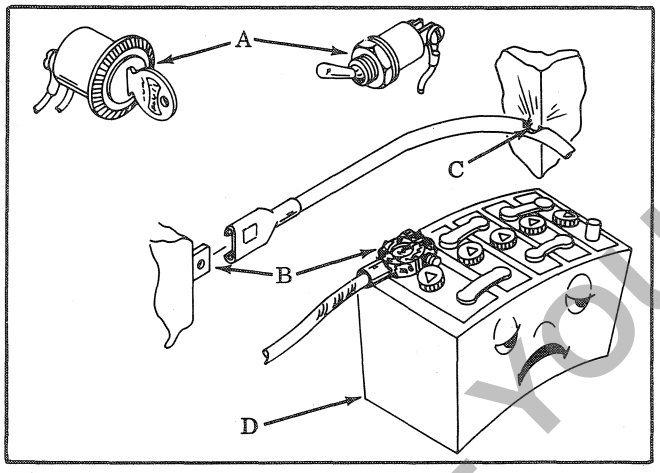


Figure 8-A-2

8-A-2 Ignition failure is, at times, caused by other than ignition parts. See Figure 8-A-2 for examples of external causes of ignition failure. Such items as shorting at grounding devices (A), switches (B), loose, corroded, and disconnected terminals (C) frayed and grounded wires (D) weak or dead batteries.

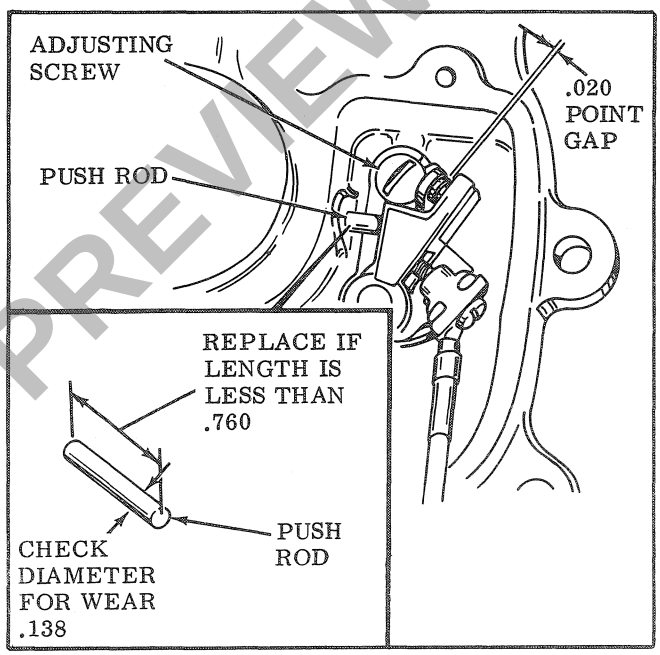


Figure 8-A-3

8-A-3 Procedure for installing points for magneto and battery ignition.

1. Replace push rod. Pull out through point box.
2. Install and align points using the Tecumseh point aligning tool.
3. Adjust point gap by rotating engine to extend the push rod as far out as possible. Push rod will then be on the highest portion of the cam lobe. With rod in this fully extended position, carefully adjust point gap to .020 using the correct thickness (feeler) gauge. Secure locking screw that holds the stationary point. Recheck point gap and correct if necessary.
4. Clean oil and finger prints off contact points by passing a clean, lint free, paper between the closed contacts. THIS IS IMPORTANT!
5. Ignition timing is provided for by the correct point gap setting and by the automatic spark advance mechanism.

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