



GETTING THE MOST OUT OF YOUR TRACTORS

Farm Machinery Fact Sheet FM-14

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Now, more than ever, you need to operate your tractors efficiently. Any time you can accomplish more work with less time and less fuel, it is good business to do so.

Engine tune-up is probably the most important preventative maintenance that can be performed on a machine. However, most operators make the mistake of performing tune-up only when the engine is not running satisfactorily. This is often a costly error because, at this point, the engine may be worn or damaged until it requires major repair or overhaul. This can be very costly to the operator.

What is engine tune-up?

Tune-up is the process of making checks and minor adjustments to improve the operation of the machine.

When should an engine be tuned?

Regularly. The intervals for tune-up may vary from 500 to 1000 hours each spring and fall depending upon the operating conditions. But, regularity is the key to tuning the engine so that major problems are prevented.

A badly worn engine cannot be tuned up. This is why the engine should first be checked on a dynamometer to see if:

1. a tune-up will restore it, or
2. a major overhaul is needed.

A dynamometer test will give you:

1. engine speed according to manufacturer's recommendation
2. checking valves, spark plugs, and compression
3. checking ignition timing
4. adjusting the carburetor
5. check timing and pump settings on a diesel
6. check PTO clutch
7. checking clean air supply
8. check blowing from crankcase to determine condition of rings

9. reading the maximum horsepower on the dynamometer. (Do not expect engines to give the same results as the Nebraska test, for these are run under only the most ideal conditions.)
10. After performing a tune-up, run the tractor again to see the change in performance.

ENGINE TUNE-UP CHART

The following chart gives you the steps necessary to tune your engine. Check off each step that applies to your engine and make the necessary replacement of parts or adjustments as needed. Make sure you understand the function and purpose of this chart.

Step No. & Operation

1. Air Intake and Exhaust System

- Clean out precleaner.
- Remove and clean air cleaner.
- Inspect exhaust system and muffler.
- Check crankcase ventilating system for restrictions.
- Check intake manifold for leaks.
- Check air intake for leaks or restrictions.
- Check air induction hoses and clamps for leaks and breaks.
- Check radiator for air bubbles or oil indicating compression or oil leakage.
- Check cylinder head gasket for external leaks.
- Retighten cylinder head cap screws.
- Adjust valve tappet clearance.
- Check engine compression.

2. Ignition System (Spark-Ignition Engines)

- Spark plugs - Clean and adjust gap.
- Check spark plug wires.
- Distributor - Check the following items:
 - Cap and rotor
 - Breaker points
 - Breaker point gap
 - Cam lubrication
 - Distributor timing

3. Fuel Systems

- Check fuel lines for leaks or restrictions.
- Clean fuel pump sediment bowl.
- Clean fuel strainer or filter.
- Check radiator for LP-Gas leaking from converter into cooling system.
- Drain sediment from gasoline or diesel fuel tank.
- Bleed diesel fuel system.

4. Lubricating System

- Check operation of pressure gauge or light.

- _____ Drain and refill crankcase.
- _____ Replace oil filter.

5. Cooling System

- _____ Check water pump for leaks and excessive shaft endplay.
- _____ Inspect radiator hoses and clamps.
- _____ Clean and flush cooling system.
- _____ Test the thermostat operation.
- _____ Check radiator for leaks.
- _____ Check condition of fan belt.

6. Electrical System

- _____ Check battery.
- _____ Clean battery, cables and terminals.
- _____ Tighten battery cables and battery hold-down clamps.
- _____ Coat battery posts and cable clamps with petroleum jelly.
- _____ Check specific gravity of electrolyte & add water to proper level.
- _____ Check generator or alternator.
- _____ Check belt tension.

7. Clutch Pedal Free Travel

- _____ Check free travel at clutch pedal.

8. Check R.P.M.

9. Check color of exhaust smoke under light load.

10. Check color of exhaust smoke under heavy load.

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