



**STARTING and  
OPERATING INSTRUCTIONS**

ISSUE MM-309-A

**W I S C O N S I N**

*Air-Cooled Engines*

**Single Cylinder – Four Cycle**

**MODELS**

**S-7D, S-8D, TRA-10D, TRA-12D**

**S-10D, S-12D, S-14D**

**WORLD'S LARGEST BUILDERS OF HEAVY DUTY AIR COOLED ENGINES**

# NEW ENGINE Instructions

READ THOROUGHLY BEFORE STARTING ENGINE.

## 1. LUBRICATION – Operating without oil will ruin engine.

### IMPORTANT

There is **NO OIL** in this unit.  
Fill crankcase to proper oil level, also clutch or gear box if either accessory is furnished.

Refer to *GRADE OF OIL* chart and fill with proper oil *before* starting engine.

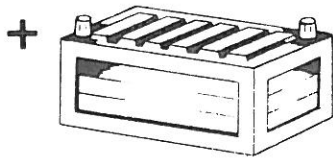
## 2. AIR CLEANER Must be cleaned regularly – very frequently in dusty and dry grass conditions. *Damage will result from operating with dirty air cleaner.*

Dry element type, standard equipment on Models TRA-12D and S-14D.

Oil bath type requires same grade oil as used in crankcase. Maintain oil level or dirt will be drawn in and damage engine.

## 3. FUEL – USE 'REGULAR' GRADE GASOLINE. Engines built to operate on FUEL OIL, KEROSENE, L.P.G. or NATURAL GAS are so identified in the model designation. Refer to 'FUEL' paragraphs of instructions. Buy fresh fuel. Do not use *out-of-season* gasoline.

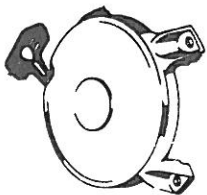
## 4. NEGATIVE GROUND CIRCUIT, if engine is electrically equipped with BATTERY IGNITION, MOTOR-GENERATOR or FLYWHEEL ALTERNATOR.



**GROUND ENGINE TO NEGATIVE TERMINAL ON BATTERY.**

*CAUTION:* Be absolutely sure of proper connection or damage to coil, points and regulator will result.

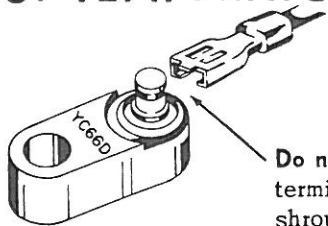
## 5. REWIND STARTER – OPTIONAL STARTING EQUIPMENT.



### INSTRUCTIONS FOR STARTING

Pull engine over against compression. Let rope rewind into starter slowly. Pull firmly and rapidly to start engine. (Repeat procedure if necessary).  
**DO NOT DROP ROPE ASSEMBLY**, hold on to handle while rewinding.  
*Rope may rewind improperly and jam assembly.*

## 6. TEMPERATURE SAFETY SWITCH



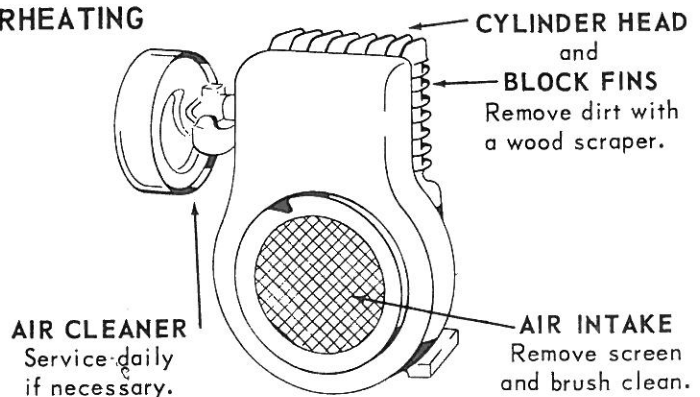
Do not disconnect wire or allow terminal to touch head fins or shrouding.

Optional accessory mounted to cylinder head bolt near spark plug – **TO PROTECT ENGINE AGAINST OVERHEATING**. If engine is equipped with this switch and stops, check first to see if engine is overheated. Other conditions may have caused engine to stop. Clean air cleaner, air intake screen, fins and check oil level, spark plugs and wiring. Let engine cool at least 10 minutes before re-starting.

## KEEP ENGINE CLEAN

External dirt restricts cooling and internal dirt causes wear – the result will be costly repairs.

### PREVENT OVERHEATING



# ENGINE MODELS

## S-7D, S-8D, TRA-10D, TRA-12D, S-10D, S-12D, S-14D

### OPERATING NEW ENGINE

Breaking-in a new engine, in the proper manner, will greatly increase its life and result in trouble-free operation. The factory test given is not sufficient to establish the polished bearing surfaces, which are so necessary for reliable performance and long life of an engine. There is no quick way to force the establishment of good bearing surfaces, and these can only be obtained by running a new engine carefully and under reduced speeds and loads for a short period of time.

Run the engine for an hour without load, at 1600 to 1800 R.P.M. The speed should then be increased gradually to engine operating speed, still without load, for an additional two hours. If at all possible, operate the engine at light loads for a period totaling about eight hours, before maximum load is applied.

The various bearing surfaces in a new engine have not been glazed, as they will be with continued operation, and it is in this period of "running in", that special care must be exercised, otherwise the highly desired glaze will never be obtained. A new bearing surface that has once been damaged by carelessness will be ruined forever.

### SPECIFICATIONS and HORSEPOWER

MODEL	S-7D	S-8D	TRA-10D	TRA-12D	S-10D	S-12D	S-14D
Bore-inches	3	3-1/8	3-1/8	3-1/2	3-1/4	3-1/2	3-3/4
Stroke-inches	2-5/8	2-5/8	2-7/8	2-7/8	3	3	3
Displ. cu. in.	18.6	20.2	22.05	27.66	24.9	28.9	33.1
R.P.M.	HORSEPOWER						
2000	4.5	5.0	5.4	7.3	6.6	8.1	8.2
2200	5.0	5.6	6.1	8.0	7.3	9.0	9.1
2400	5.5	6.1	6.8	8.8	8.2	9.8	10.0
2600	6.0	6.6	7.6	9.6	8.7	10.5	10.8
2800	6.4	7.0	8.3	10.2	9.4	10.9	11.6
3000	6.7	7.4	8.8	10.8	9.7	11.6	12.4
3200	6.9	7.7	9.4	11.3	10.2	11.9	13.1
3400	7.1	8.0	9.7	11.7	10.4	12.2	13.7
3600	7.25	8.25	10.1	12.0	10.5	12.5	14.1

Horsepower specified in the accompanying chart is for an atmospheric temperature of 60° Fahrenheit at sea level and at a Barometric pressure of 29.92 inches of mercury.

The friction in new engines cannot be reduced to the ultimate minimum during the regular block test, but engines are guaranteed to develop at least 85% of maximum power when shipped from the factory. Power will increase, as friction is reduced, after a few days of operation. The engine will develop at least 95% of power when friction is reduced to a minimum. For continuous operation, allow 20% of horsepower, as a safety factor.

**CAUTION:** OIL AND FUEL HAVE BEEN DRAINED FROM THIS ENGINE FOR SHIPPING AND STORAGE PURPOSES. PREPARE ENGINE AS FOLLOWS, BEFORE STARTING.

### LUBRICATION

THERE IS NO OIL IN THIS UNIT. Fill crankcase, clutch and gear box (if these accessories are furnished), to level marks indicated, with oil classified as Service MS and per viscosity grades in oil chart.

### GRADE OF OIL CHART

SEASON or TEMPERATURE	GRADE OF OIL			
Spring, Summer or Autumn + 120°F to + 40°F	SAE 30			
Winter + 40°F to + 15°F + 15°F to 0°F Below Zero	SAE 20-20W SAE 10W SAE 5W-20			
Use oils classified as Service SD or MS				
Engine Model	Crankcase Capacity	Clutch Unit	Reduction Unit	Cl. Red. Unit
S-7D, S-8D TRA-10D, TRA-12D	1 QT.	½ Pt.	1 Pt.	-
S-10D, S-12D, S-14D	2 Qts.	1 Pt.	2/3 Pt.	1 Pt.

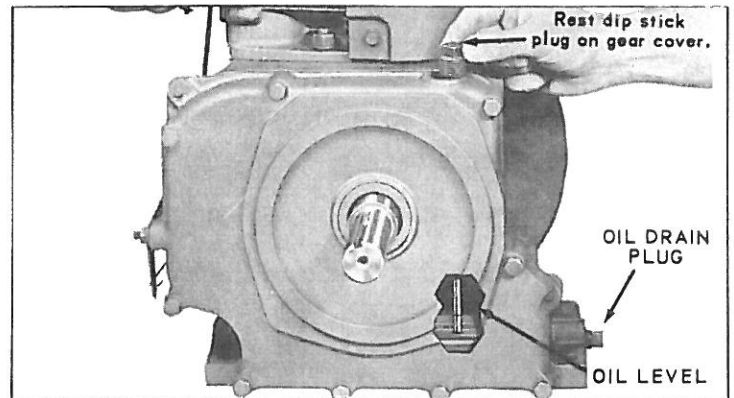


Fig. 1, CHECKING CRANKCASE OIL LEVEL

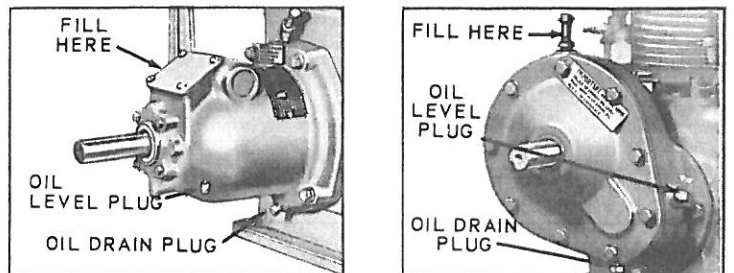


Fig. 2, USE SAME GRADE OIL IN THESE UNITS AS USED IN CRANKCASE - CHANGE EVERY 500 HOURS OF OPERATION

Fill crankcase thru dip stick plug opening, Fig. 3, Ref. 1, to level mark indicated in Fig. 1. Refer to GRADE OF OIL CHART for capacity.

The oil level is indicated by a groove on the dip stick, as shown in Fig. 1. Check oil level by resting bottom of plug at the top of oil filler opening on gear cover. (Do not thread in place to check oil).

For run-in of new engines, use same oil as recommended in GRADE OF OIL CHART.

Check crankcase oil level every 8 hours, change oil every 50 hours of operation.

### AIR CLEANER

Add oil to level line indicated on bowl of OIL BATH AIR CLEANER, Fig. 3, Ref. 3. Use same grade oil as used in crankcase. **Caution:** Maintain oil level or dirt will be drawn in and damage engine.

DRY ELEMENT AIR CLEANER, Fig. 3, Ref. 3A available in place of oil bath cleaner - do not oil element - do not use gasoline, kerosene or solvent for cleaning. For detailed cleaning instructions, see 'AIR CLEANER', Page 5.

Carry spare element (dry type cleaner), in a dust-proof container for quick replacement in field. Clean dirty element later.

### FUEL

Regular grade gasoline.

OIL BURNING engine has letter 'O' suffixed to model designation - use 35 minimum octane fuel oil.

L.P.G. BURNING engine has letter 'G' added to model designation - use propane HD5.

NATURAL GAS burning engines require a B.T.U. content of at least 1000.

### IGNITION

SOLID STATE IGNITION furnished on model TRA-12D and available on model S-14D. Refer to Page 5.

### MAGNETO

A flywheel magneto consisting of three component parts; flywheel, stator plate with coil, and breaker assembly, provide the high tension spark for ignition, on all engine models illustrated below.

### BATTERY IGNITION - 12 Volt Neg. Ground

Engines furnished with battery ignition, instead of the standard magneto ignition system use a conventional 12 volt coil to produce the ignition spark.

### STARTING

#### STARTING PROCEDURE

- Check crankcase oil level and gasoline supply. Open fuel shut-off valve. OIL BURNING engines must be started on gasoline and run for 2 or 3 minutes before switching to oil. Special instructions are enclosed for starting L.P.G. and NATURAL GAS burning engines.
- The MAIN JET ADJUSTMENT on carburetor is made when engine is tested at the factory. See 'CARBURETOR - ADJUSTMENT' paragraphs if readjustment is required.
- Disengage clutch, if furnished.
- Set throttle about 1/2 open if variable speed governor control is furnished. With a fixed speed governor, spring will hold throttle open for starting.
- Pull out ignition switch, on engines equipped with solid state or battery ignition and with motor-generator. Magneto ignition breaker box switch is always in the on position for starting.
- Close choke on carburetor by pushing choke lever down, on all models except TRA-12D (turn lever counter-clockwise two notches), and crank engine over

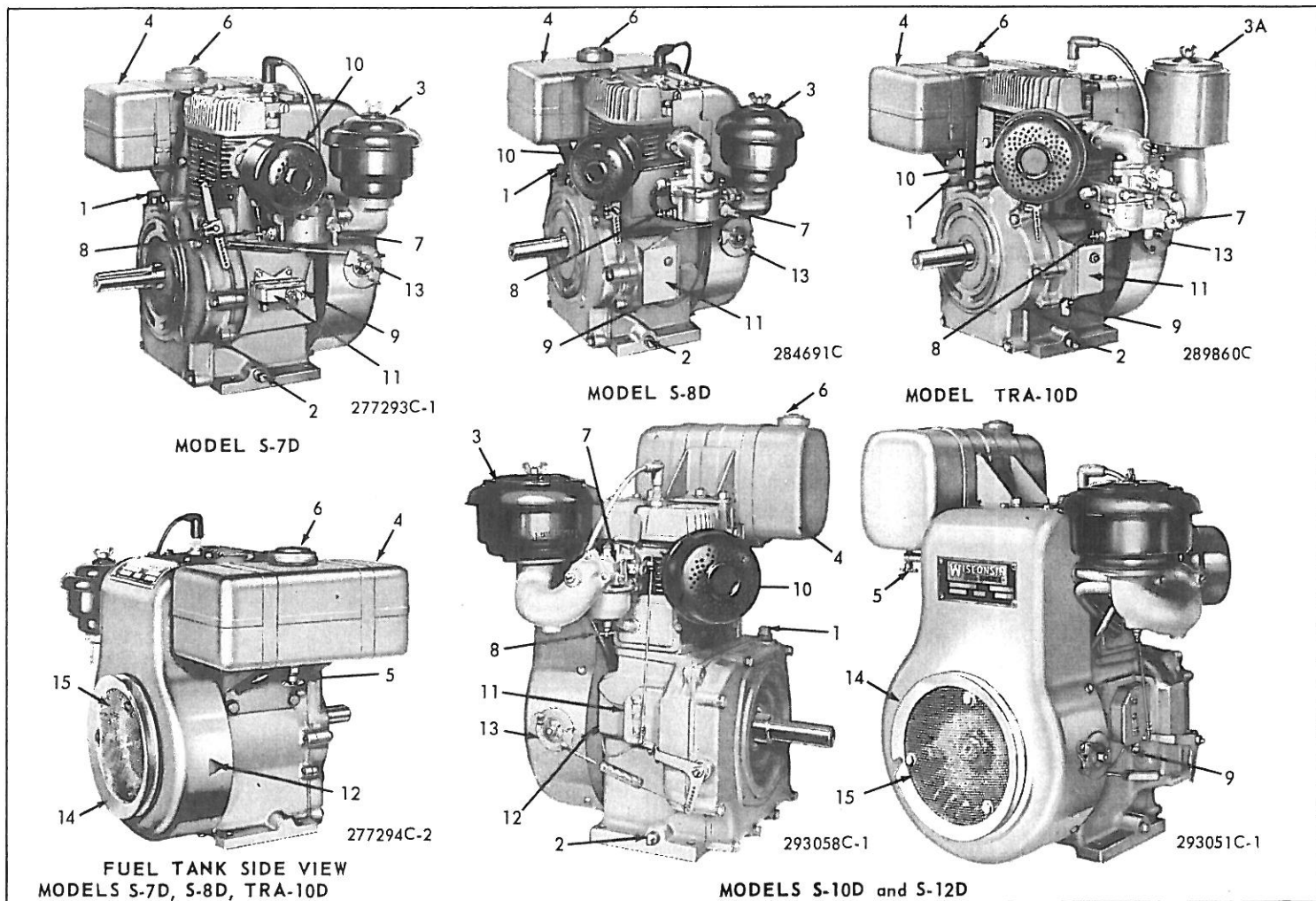


Fig. 3, ENGINE REFERENCE VIEWS

- |                             |                                      |                                   |                               |
|-----------------------------|--------------------------------------|-----------------------------------|-------------------------------|
| 1. Oil Filler and Dip Stick | 4. Fuel Tank                         | 8. Carburetor Main Jet Adjustment | 12. Pointer for Timing Mark   |
| 2. Oil Drain Plug           | 5. Fuel Shut-off Valve with Strainer | 9. Stop Switch                    | 13. Variable Speed Control    |
| 3. Air Cleaner (oil bath)   | 6. Air Vent Hole (keep free of dirt) | 10. Muffler                       | 14. Rope or Motor-Gen. Sheave |
| 3A. Air Cleaner (dry type)  | 7. Carburetor Choke Lever            | 11. Breaker Point Box             | 15. Keep Screen Free of Dirt  |

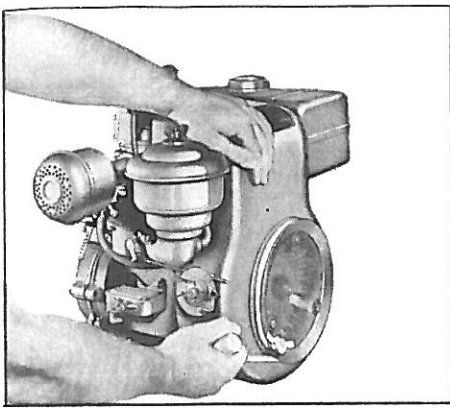


Fig. 4

slowly one complete turn. Open choke half-way, turn engine over to compression stroke and then back off 1/2 turn. Wind rope fully on sheave and PULL BRISKLY to turn crankshaft over. See Fig. 4.

With STARTING MOTOR, pull out ignition switch, (tag reads 'TO STOP PUSH IN'), and depress starter button.

- g. After engine starts OPEN CHOKE FULLY. Less choking is necessary in warm weather or when engine is warm, than when cold. Should flooding occur, open choke fully and continue cranking.

If all conditions are right, engine will start promptly in one or two attempts. After engine starts, allow it to warm up a few minutes before applying load. Do not race or gun engine to hurry WARM-UP, as the proper oil film on various surfaces of the piston, cylinder, bearings, etc., cannot be established until the oil has warmed up and become sufficiently fluid.

#### TO STOP ENGINE

The breaker box on the side of the crankcase has a magneto ground switch for stopping the engine. DEPRESS AND HOLD DOWN UNTIL ENGINE STOPS. See Fig. 3, Ref. 9. Engines with motor-generator, breakerless or battery ignition have an ignition switch; TO STOP PUSH IN.

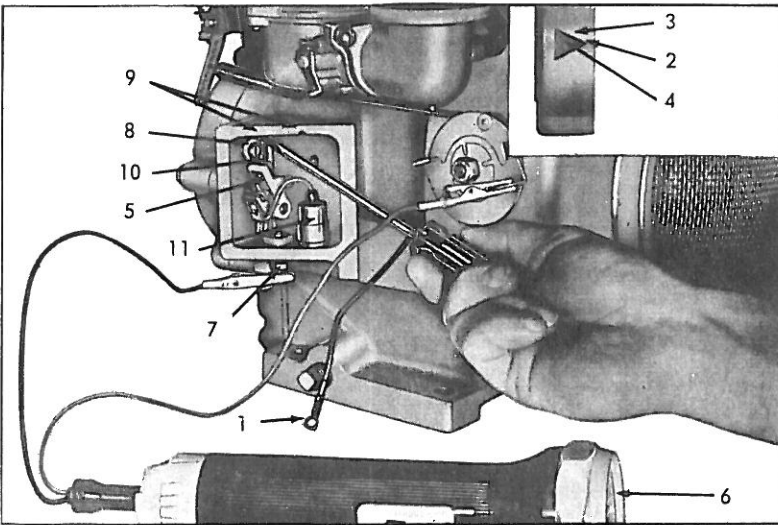
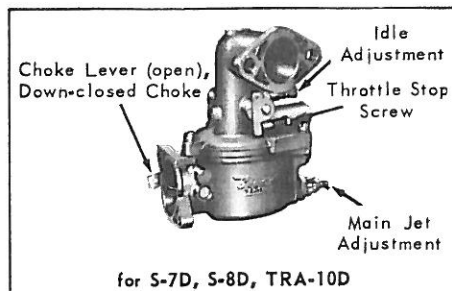
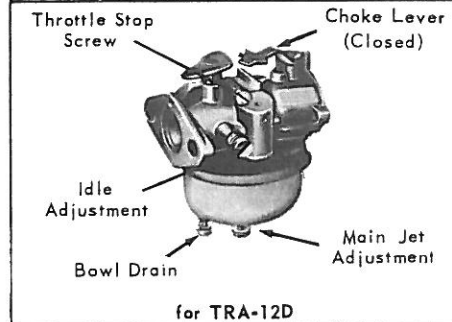


Fig. 6, TIMING FOR MODELS S-7D, S-8D, TRA-10D

- |                            |                    |                  |  |               |                    |
|----------------------------|--------------------|------------------|--|---------------|--------------------|
| 1. Coil Primary Wire       | 3. Pointer Opening | 5. Breaker Arm   | 7. Timing Light (light out when points are open) | 8. Lockscrew  | 10. Breaker Points |
| 2. Timing Mark on Flywheel | 4. Timing Pointer  | 6. Terminal Stud | 9. Adjusting Slot                                | 11. Condenser |                    |



for S-7D, S-8D, TRA-10D



for TRA-12D

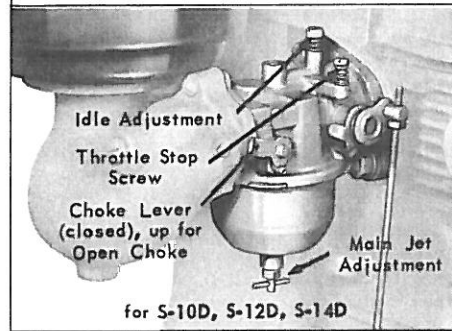


Fig. 5, CARBURETOR ADJUSTMENTS

If engine has been running hard and is hot, do not stop it abruptly from full load. Remove the load and allow the engine to run idle (1000 to 1200 R.P.M.), for 3 to 5 minutes. Air circulation from the flywheel will reduce the temperature of the engine much faster and minimize valve warping.

#### CARBURETOR - ADJUSTMENT, Fig. 5

The carburetor MAIN JET ADJUSTMENT needle valve should be opened approximately 2 full turns from its seat for Models

S-7D, S-8D, - 2 1/4 turns for Models S-10D, S-12D, S-14D and 1 1/4 turns for TRA-12D. After the engine is started and warmed up, adjust the needle valve for best operation under full load, if possible. In cold weather, starting may be facilitated by opening the needle valve slightly more, then readjusted to normal running position after engine is started.

The correct amount of throttle plate opening for the proper lowidle speed is obtained by means of the THROTTLE STOP SCREW. However, this is set at the factory so that no further adjustment is necessary. The IDLE ADJUSTMENT is for smooth low speed operation and this adjustment, if necessary, must be made with the carburetor throttle lever closed. Initial setting is approximately 1 1/2 turns.

#### TIMING

Refer to Page 5 for solid state (breakerless ignition) timing as furnished on Model TRA-12D and optional on Model S-14D.

The fixed RUNNING SPARK ADVANCE for Model S-7D is 15°, and for Models S-8D, TRA-10D, S-10D, S-12D, S-14D it is 18°. The advance is regulated by the breaker point opening and reasonably accurate timing is obtained by setting the breaker point gap to .020 inch, (.023 for S-10D, S-12D, S-14D). However, STATIC TIMING with a CONTINUITY LIGHT, as illustrated in Fig's. 6 and 7, is most accurate and advisable. The timing light is Wisconsin Motor part number DF-81-S1.

A TIMING HOLE and POINTER are located on the right hand side of the flywheel shroud, to visibly check the ADVANCE TIMING MARK on outer rim of flywheel.

#### STATIC TIMING PROCEDURE, Fig's. 6, 7

- a. Disconnect coil PRIMARY WIRE at bottom of breaker box. Remove breaker box cover.
- b. TIMING MARK on FLYWHEEL can be observed thru the POINTER OPENING on right hand side of flywheel shroud.

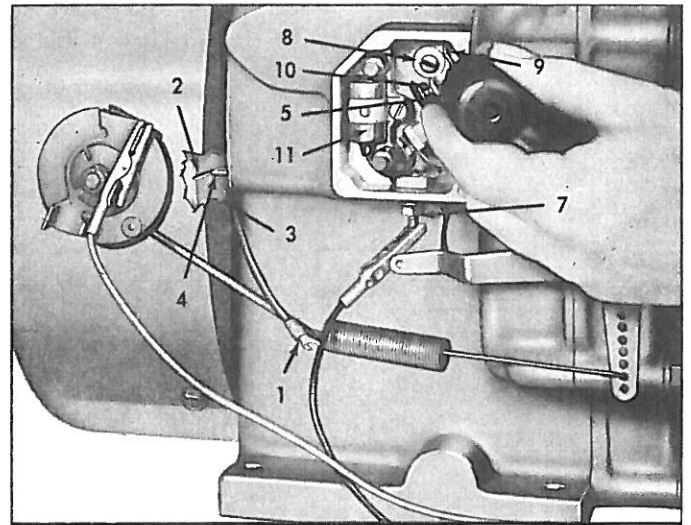


Fig. 7, STATIC TIMING FOR MODELS S-10D, S-12D, S-14D

Since breaker arm operates at half engine speed, it is necessary to line up FLYWHEEL TIMING MARK with POINTER, while engine is on COMPRESSION STROKE. The compression stroke can be determined by turning starter sheave in a clockwise direction and watch for breaker arm movement by push pin.

- c. Connect one lead wire of the TIMING LIGHT DF-81-S1 to ground and the other to the TERMINAL STUD at bottom of breaker box. (With points closed, the timing light will be on).
- d. Slightly loosen LOCKSCREW on contact support plate (just enough so that plate can be moved).
- e. Insert a screw driver into support plate ADJUSTING SLOT and close points so that light is ON, then turn screw driver slowly in the opposite direction until the LIGHT JUST GOES OUT. Retain points in this position and securely tighten lock screw.
- f. As a final check; turn flywheel counter-clockwise until timing light is ON. Then, slowly rotate flywheel clockwise, and stop immediately when LIGHT GOES OUT. At this point, MARK ON FLYWHEEL should be in line with timing POINTER.
- g. Assemble coil primary wire to terminal stud and mount breaker box cover.

## ELECTRICAL EQUIPMENT

Special-Furnished When Specified

### MOTOR-GENERATOR, Fig's. 8, 9

The combination MOTOR-GENERATOR functions as a cranking motor when the STARTING SWITCH is closed. When the switch is open and the engine is in operation the unit will function as a generator. The generator output and circuit voltage for the various battery and operating requirements are controlled by a CURRENT-VOLTAGE REGULATOR mounted to the generator.

The total electrical output of this 12 VOLT combination motor-generator is 10 AMPS., for Models S-7D, S-8D, TRA-10D and 12

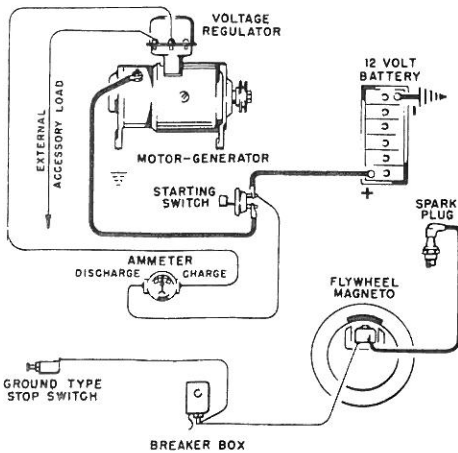


Fig. 8  
WIRING DIAGRAM (with Magneto Ignition)

AMPS. for Models S-10D, S-12D, S-14D. A maximum continuous load of 5 amps. can be taken off the 'L' terminal of the current-voltage regulator, for operating lights, etc.

THE AMMETER IN THIS CIRCUIT INDICATES ONLY THE CURRENT GOING INTO THE BATTERY TO KEEP IT CHARGED AND DOES NOT INDICATE THE TOTAL GENERATOR OUTPUT.

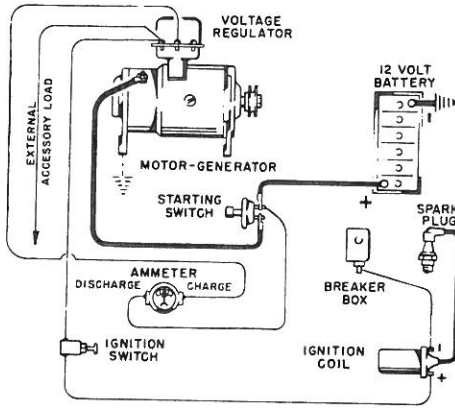


Fig. 9  
WIRING DIAGRAM (with Battery Ignition)

Inspect the brushes for wear, approximately every 200 hours of operation. If they are worn to less than half their original length, they should be replaced.

Bearings are pre-lubricated, therefore no external oiling is required.

### SPARK PLUG, Fig. 10

The spark plug gap should be 0.030 of an inch, and plug should be kept clean both inside and out. Check spark plug gap with a wire type gauge and regap as shown.

Use a new spark plug at the beginning of a new season. Replacement plug must be of the correct heat range, like Champion No. D-16J, AC No. C86 commercial or equal. Thread size is 18mm.

Use a new gasket when mounting either old or new plug and thoroughly clean threads in cylinder head. Tighten spark plug 28 to 30 FOOT POUNDS TORQUE. If torque wrench is not available, tighten plug until it begins to seat on the gasket, then turn 1/2 to 3/4 of a turn more.

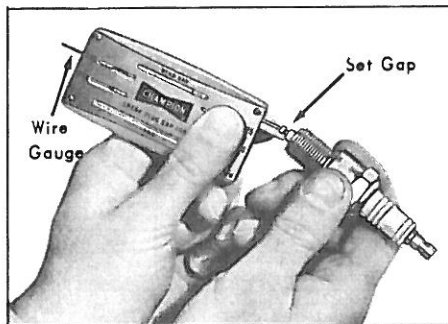


Fig. 10

## CLUTCH ADJUSTMENT

If the clutch begins to slip, it should be readjusted to prevent it from becoming overheated and damaged. First, remove inspection plate to expose the adjusting ring. Release clutch by pushing shifter lever forward (toward engine). Refer to name plate on clutch housing to identify whether it is a TWIN DISC or ROCKFORD CLUTCH, for proper adjustment procedure.

### TWIN DISC CLUTCH, Fig. 11

Turn take-off shaft by hand until SET SCREW in the ADJUSTING RING is on top. Loosen set screw, and then with a drift punch turn ring, in a clockwise direction 1/4 turn at a time. The take-off shaft must be held in a stationary position. After each movement of the ring, engage clutch with the lever. When properly adjusted the clutch will engage with a slight snap.

### ROCKFORD CLUTCH, Fig. 12

Turn engine over by means of the rope starter sheave until clutch ADJUSTMENT LOCK is visible thru the inspection opening. Loosen ADJUSTMENT LOCKSCREW, thru PIPE PLUG HOLE behind inspection opening, one full turn. Keep clutch from turning by holding rope starter sheave firmly in place. Then, by means of a screw driver, turn ADJUSTING RING one notch at a time in a clockwise direction, until a very firm pressure is felt when engaging the clutch with shifter lever, as the clutch snaps into engaged position. Securely tighten ADJUSTMENT LOCKSCREW.

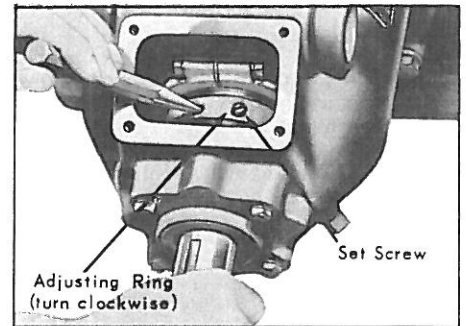


Fig. 11  
TWIN DISC CLUTCH ADJUSTMENT

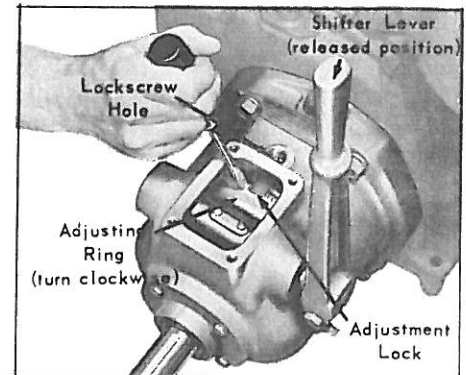


Fig. 12  
ROCKFORD CLUTCH ADJUSTMENT

# INSTRUCTIONS

## Pertinent to Models TRA-12D, S-14D and Solid State Ignition

**AIR CLEANER - DRY TYPE, Fig. 14, Ref. 3**

**SERVICE DAILY**, if engine is operating in very dusty and dry grass conditions. **Extensive damage can result** from operating with dirty air cleaner. Remove cartridge and shake out the accumulated dirt (do not tap or strike element - it may become damaged). Wipe out dirt from inside cover.

**ONCE EACH WEEK**; the filtering cartridge should be taken out and rinsed under a faucet with cold water, then wash by repeated dipping for several minutes in a solution of lukewarm water and a mild, **NON-SUDSING** detergent. Rinse in cold water from the inside out, and allow to dry overnight before installing in air cleaner. In cold weather, protect element from freezing until dry.

**DO NOT USE GASOLINE, KEROSENE OR SOLVENT - DO NOT OIL ELEMENT.** The paper element will be materially affected by their use.

After five washings or one year of service, replace cartridge. New cartridges are available at all **WISCONSIN MOTOR** service centers.

### STARTING

Follow starting procedures instructions on page 2, warm-up and stopping on page 3.

### IGNITION

**SOLID STATE, Fig. 13**

The breakerless - solid state ignition system is standard equipment for Model TRA-12D, and optional in place of flywheel magneto for Model S-14D.

No timing adjustment or breaker point setting is necessary. All solid state components are neatly molded into the stator which is mounted to the flywheel end bearing plate. The only mechanically moving part is the magnetic rotor, a component part of the flywheel.

### IGNITION TIMING - SOLID STATE

The accuracy of the spark advance timing can be checked in the conventional method

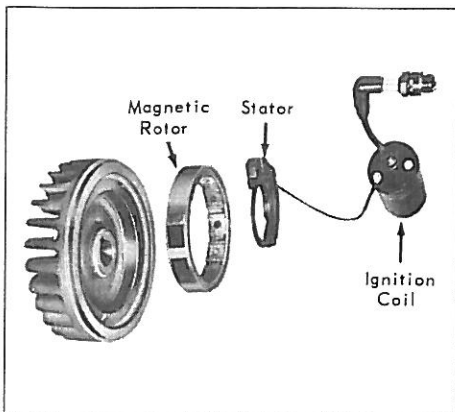


Fig. 13

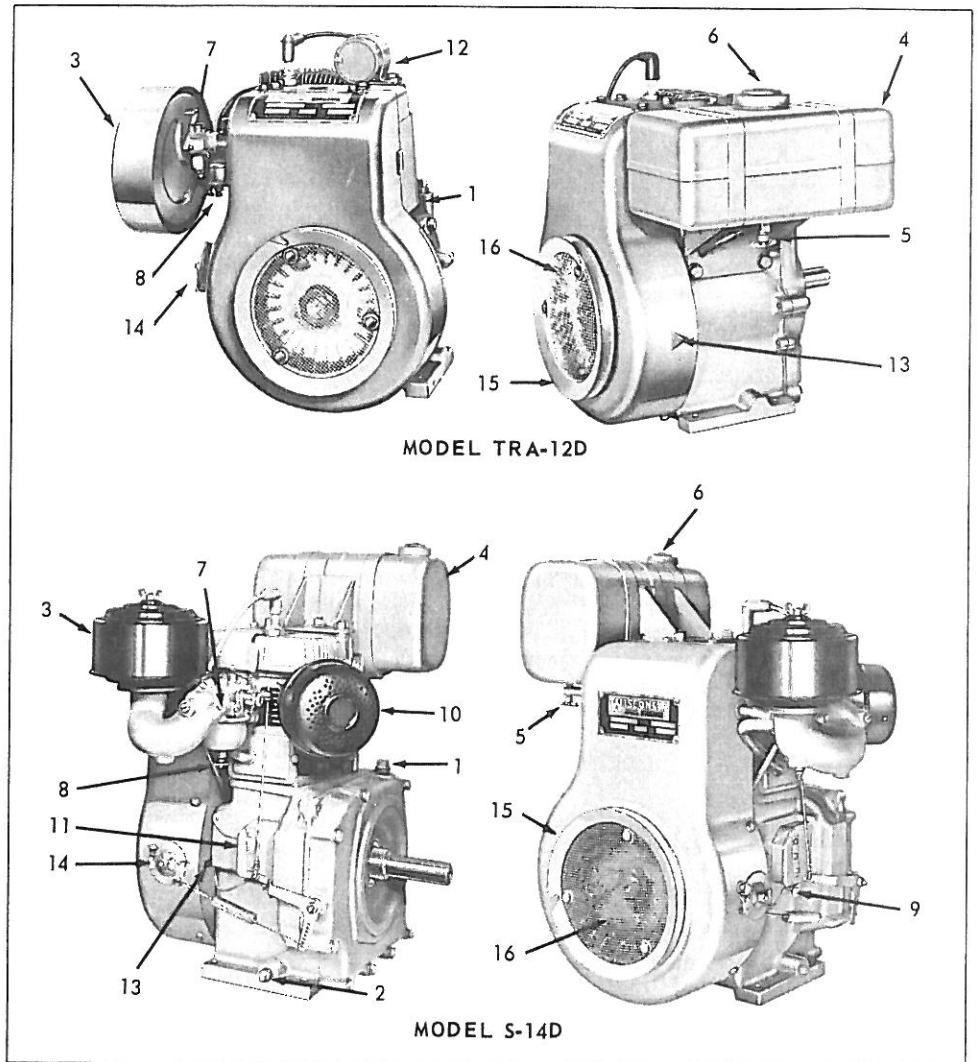


Fig. 14, ENGINE REFERENCE VIEWS

- |   |   |
|---|---|
| 1. Oil Filler and Dip Stick   | 9. Stop or Ignition Switch  |
| 2. Oil Drain Plug   | 10. Muffler   |
| 3. Air Cleaner (dry type)   | 11. Breaker Point Box   |
| 4. Fuel Tank  | 12. Ignition Coil   |
| 5. Fuel Shut-off Valve with Strainer                                    | 13. Pointer for Timing Mark   |
| 6. Air Vent Hole (keep open - atmospheric pressure maintains fuel flow) | 14. Variable Speed Control  |
| 7. Carburetor Choke Lever   | 15. Rope or Motor-Gen. Sheave   |
| 8. Carburetor Main Jet Adjustment                                       | 16. Keep Screen, Cylinder block and Head fins free of dirt (prevents overheating) |

with a neon timing lamp. However, the timing cannot be changed, since it is electronically controlled by a trigger coil molded into the stator plate.

The spark is retarded at  $10^{\circ}$  to  $12^{\circ}$  before T.D.C. for starting, and automatically advances as engine speed increases. The running spark advance (2500 R.P.M. and over) is  $20^{\circ}$ .

**Model TRA-12D:** The flywheel is marked with a groove to indicate the  $20^{\circ}$  running spark advance. With engine operating at 2500 R.P.M. or over, the timing mark (groove) on rim of flywheel will appear in line with timing pointer. Fig. 6, Ref. 2, 4.

**Model S-14D:** The timing groove on the rim of the flywheel, Fig. 7, Ref. 2, is marked for the  $18^{\circ}$  magneto and battery ignition advance, and timing can be checked to this mark for solid state ignition while engine is running at 1000 R.P.M. When checking the  $20^{\circ}$  running spark advance, at 2500 R.P.M. or over, the timing mark (groove) will appear about  $1/8$  inch above the timing pointer.

### FLYWHEEL MAGNETO

This is the standard ignition system for Model S-14D and is identified by the breaker box on the right hand side of the crankcase, Fig. 14, Ref. 11. Refer to page 3 for Timing.

## BATTERY IGNITION – 12 Volt Neg. Ground

Also optionally available on Model S-14D. In addition to breakerpoint box, an ignition coil is mounted to the cylinder head. The combination motor-generator Fig. 9, or flywheel alternator Fig. 16, can be used for battery ignition system.

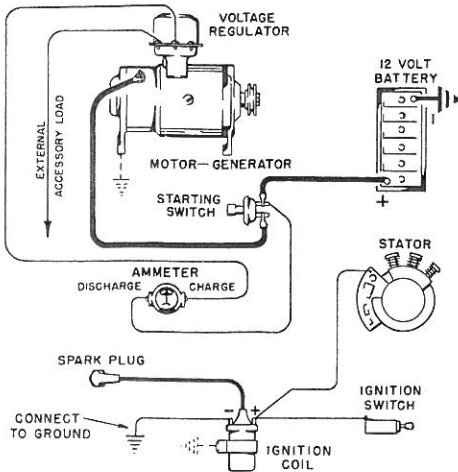


Fig. 15, WIRING DIAGRAM  
Motor-Generator and Solid State Ignition

Engines equipped with motor-generator and breakerless (solid state) ignition are wired in accordance with diagram, Fig. 15. Refer to page 4 for motor-generator operating and maintenance instructions.

## FLYWHEEL ALTERNATOR

12 Volt – 10 Amp NEGATIVE GROUND Alternator, consisting of a flywheel with Magnetic Rotor, Stator and Rectifier-Regulator module, is optional equipment on models S-10D, S-12D, S-14D.

The flywheel alternator is of the permanent magnet type and has no brushes, commutator or belts and requires no adjustments.

**PRECAUTIONS** to be exercised in the use of a flywheel alternator:

1. Do not reverse battery connections. This is a negative ground system only.
2. Connect booster batteries – positive to positive and negative to negative.
3. Do not polarize the alternator.
4. Do not ground any wires from stator or module which terminate at connector.
5. Do not operate engine with battery disconnected from system.

6. Disconnect at least one battery lead if a fast battery charger is used.
7. Never use a fast battery charger to boost battery output.

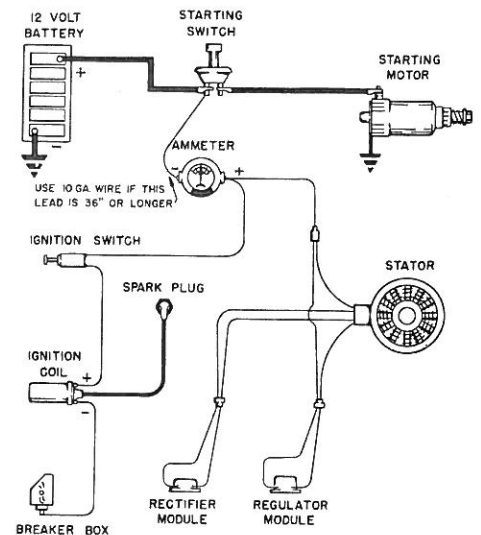


Fig. 16, WIRING DIAGRAM  
Flywheel Alternator and Battery Ignition  
for Models S-10D, S-12D, S-14D

# TROUBLE SHOOTING

The three prime requisites essential to starting and maintaining satisfactory operation of gasoline engines are:

1. A proper fuel mixture in the cylinder.
2. Good compression in the cylinder.
3. Good spark, properly timed, to ignite the mixture.

If all three of these conditions do not exist the engine cannot be started.

As a guide to locating some of the difficulties which might arise, the following causes are listed under the three headings: Fuel Mixture, Compression, and Ignition. If it appears that the troubles are mechanical and replacement parts are required, contact your nearest 'Wisconsin' authorized service center. Factory trained mechanics will save you time and money, by repairing your engine in the shortest way possible.

## STARTING DIFFICULTIES

### FUEL MIXTURE

No fuel in tank or fuel valve closed.

Plugged vent hole in fuel tank cap.

Fuel line clogged.

Carburetor not choked sufficiently, especially if engine is cold.

Water, dirt, or gum in gasoline interfering with free flow of fuel to carburetor.

Poor grade, stale or out-of-season gasoline.

Carburetor flooded, caused by too much choking especially if engine is hot.

Dirt or gum holding float needle valve in carburetor open. This condition would be indicated if fuel continues to drip from carburetor with engine standing idle.

Excessive flooding will require the spark plug be removed, dried off, and the engine turned over several times, with the choke open, to blow excess fuel out through the plug hole.

Carburetor out of adjustment. Restricted (dirty) air cleaner.

### COMPRESSION

Cylinder dry due to engine having been out of use for some time. Pour one fluid ounce of crankcase oil through spark plug hole.

Loose or broken spark plug. A hissing noise will be heard in cranking engine due to escaping gas mixture on compression stroke.

Damaged cylinder head gasket or loose cylinder head. This will likewise cause hissing noise on compression stroke.

### IGNITION

Test for spark by removing spark plug and observe spark at plug gap while turning engine over. No spark or weak spark may be attributed to the following:

Ignition wires loose or disconnected at magneto coil, spark plug, breaker box or ignition coil.

Broken or frayed ignition wires.

Spark plug cable wet or oil soaked.

Spark plug insulator broken.

Spark plug wet or dirty.

Spark plug point gap wrong.

Condensation on spark plug electrodes.

Breaker points pitted or fused.

Breaker arm sticking.

Condenser leaking or grounded.

Oil in breaker box.

Spark timing wrong.

Weak battery.

Faulty ignition coil.

Defective stator (breakerless ignition system).

## OVERHEATING

Crankcase oil supply low.

Ignition spark timed wrong

Low grade of gasoline.

Engine overloaded.

Restricted cooling air circulation.

Part of air shroud removed from engine.

Dirt between cooling fins of cylinder block and head.

Air intake screen clogged with dirt.



# Safety Precautions

Always refuel slowly to avoid spillage.

Never fill fuel tank while engine is running or hot. Avoid the possibility of spilled fuel causing a fire.

Never operate engine in a closed building unless the exhaust is piped outside. This exhaust contains carbon monoxide, a poisonous, odorless and invisible gas, which if breathed causes serious illness and possible death.

Never make adjustments on machinery while it is connected to the engine, without first removing the ignition cables from the spark plug. Turning over the machinery by hand during adjusting or cleaning might start the engine, and machinery with it, causing serious injury to the operator.

Precaution is the best insurance against an accident.

## Engine Storage

To protect the cylinder, piston, rings and valves, and keep them from rusting and sticking, a half and half mixture of kerosene and good gas engine oil, (the same grade as used in the engine crankcase) should be injected into the carburetor air intake while the engine is warm and running at moderate speed. About an eighth of a pint is necessary, or enough so that a heavy bluish smoke will appear at the exhaust. This fogging operation will leave a coating of oil on the above mentioned parts, protecting them from the atmosphere. After the engine has stopped, turn engine over slowly by means of the rope starter sheave, until flywheel key or take-off shaft key-way is up, or in the 12 o'clock position and on compression stroke. Both valves will then be closed and the piston will be on top in the cylinder bore. This will minimize rusting of the cylinder bore and help in retaining the oil fog previously injected into the engine.

Drain crankcase oil while engine is warm.

Drain tank, fuel lines and carburetor of all gasoline, to prevent accumulation of lead and gum deposits in the small passages of the carburetor.

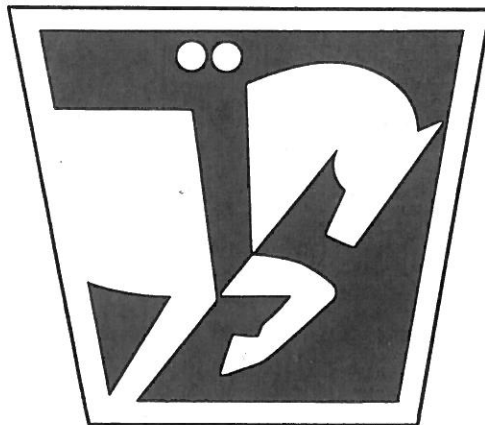
The air cleaner should be thoroughly cleaned (remove oil from oil bath type). Air cleaner and exhaust openings should be taped or otherwise sealed off for the duration of the storage period.

The outside of the engine, including the cooling fins on the cylinder and head, should be thoroughly cleaned of all dirt and other deposits. All exposed unpainted metal parts should be coated with grease or heavy oil.

Before adding new crankcase oil the following season, drain base of condensation which may have accumulated during the storage period.

Use a new spark plug at the beginning of the next season, especially if the engine has given considerable service.

*It is highly recommended that machines be stored inside a building through the winter. If this is not possible, the engine should be protected from snow and ice by a proper covering.*



 **TELEDYNE WISCONSIN MOTOR**

MILWAUKEE, WISCONSIN 53246

# ENGINE WARRANTY

TELEDYNE WISCONSIN MOTOR, hereinafter referred to as "Manufacturer", warrants each new Wisconsin engine sold by the Manufacturer to be free from defects in material and workmanship, under normal use and service, for a period of one (1) year after the date of delivery to the original retail purchaser, and Manufacturer will, at its option, replace or repair, at one of the Manufacturer's factories, or at a point designated by the Manufacturer, any part or parts which shall appear to the satisfaction of the Manufacturer upon inspection at such point, to have been defective in material or workmanship. This Warranty does not obligate the Manufacturer to bear any transportation charges in connection with the replacement or repair of defective parts.

This Warranty shall not apply to any engine which shall have been installed or operated in a manner not recommended by the Manufacturer; nor to any engine which shall have been repaired, altered, neglected or used in any way which, in the Manufacturer's opinion, adversely affects its performance; nor to any engine in which parts not manufactured by the Manufacturer, or supplied by the Manufacturer or by one of Manufacturer's Distributors or approved Service Centers, have been used; nor to any accessories installed on the engine, where the accessory manufacturer has its own warranty; nor to normal maintenance services or replacement of normal service items.

Manufacturer reserves the right to modify, alter, and improve any engine or parts without incurring any obligation to replace any engine or parts previously sold with such modified, altered or improved engine or part.

THIS WARRANTY, AND THE MANUFACTURER'S OBLIGATION HEREUNDER, IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, and all other obligations or liabilities, including special or consequential damages or contingent liabilities arising out of the failure of any engine or part to operate properly. No person is authorized to give any other warranty or to assume any additional obligation on the Manufacturer's behalf unless made in writing and signed by an officer of the Manufacturer.

THIS MANUAL IS FOR MY WISCONSIN MODEL..... ENGINE

SPEC. No..... SERIAL No.....

THE ABOVE INFORMATION, WHICH WILL BE FOUND ON THE NAME PLATE ATTACHED TO THE AIR SHROUD OF THE ENGINE, SHOULD BE FILLED IN. YOUR PROMPT ATTENTION TO THIS MATTER WILL MAKE IT CONVENIENT FOR YOU IN THE FUTURE, AS THIS INFORMATION MUST BE GIVEN WHEN ORDERING SERVICE REPLACEMENT PARTS.

\* For Your Own Record, Do Not Cut Out and Return to Factory.