OPERATION GUIDE

WISCONSIN
Engine Model
W2-1250

TELEDYNE
TOTAL POWER

INTRODUCTION

USE FOR W2-1230 & W2-1235 ALSO

The **W2-1250** is a two cylinder, four cycle, Vee type, air cooled gasoline engine of the most advanced design, and is readily and efficiently adaptable to a great variety of customer requirements. This typical **Wisconsin** heavy-duty engine has full pressure lubrication with a full-flow type oil filter, and is capable of operating at a 30° angle in any direction.

COOLING is accomplished by a flow of air circulated around the cylinders and heads of the engine from a combination fan-flywheel encased in a metal shroud. The air is divided and directed by ducts and baffle plates to insure uniform cooling of all parts.

IMPORTANT

Never operate an engine with any part of the shrouding removed — this will retard air cooling and cause the engine to overheat.

Keep the air intake screen, and the cylinder and head fins free from dirt and chaff. Improper circulation of cooling air will cause engine to overheat and become damaged in a very short time.

BATTERY IGNITION (12 volt) distributor with automatic advance is furnished as standard equipment, and can be supported by an efficient **30 amp Flywheel Alternator** and unified Rectifier Regulator module, or a lower output 10 amp Flywheel Alternator.

ROTATION of the crankshaft is clockwise when viewing the flywheel or starting end of the engine. This gives counterclockwise rotation when viewing the power take-off end of the crankshaft. With a **Take-off Shaft** optionally available at flywheel end, full engine power can be taken from either end of crankshaft.

SPECIFICATIONS

Bore ..... **3.75 in. (95.25 mm)**

Stroke ..... **3.40 in. (86.36 mm)**

Piston Displacement ..... **75 cu. in. (1230 cc)**

BATTERY IGNITION (12 volt) .....
Distributor with automatic advance

BEARINGS, crankshaft main .....
Sleeve Type
1000 lb. thrust capacity
1000 lb. belt load

COMPRESSION RATIO 6.8:1

ROTATION .... Counterclockwise at T.O. end

CONNECTING ROD ..... Forged Steel
Automotive Shell Bearings

CRANKSHAFT ..... Ductile Iron

CYLINDER DESIGN ..... L-head

GEAR TRAIN ..... Helical Gears

STARTING MOTOR with Folo-Thru Bendix

VALVE GUIDES ..... Replaceable

VALVES and SEAT INSERTS .....
Hardened Exhaust
Exhaust Valve Rotators
Replaceable Inse

SAFETY PRECAUTIONS

Careless use of the engine causes a high percentage of accidents. Avoid serious injury by being alert, use common sense and be safety minded. Observe the following precautions and carefully enforce them when operating your ***Wisconsin Engine.*** Read operating instructions thoroughly — Know how to stop the engine in case of emergency.

⚠ This symbol indicates important safety messages throughout this operators guide — ***Read Them Carefully.***

- Engine should be operated only by qualified persons.
- Do not 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 can cause serious illness and possible death.
- Keep exhaust connection tight and components in good condition; noise from a faulty exhaust system can also be harmful.
- Exhaust system parts get very hot — avoid touching these parts until engine has stopped and has sufficiently cooled.
- Never refuel a hot or running engine. Do not smoke while filling fuel tank or servicing fuel system.
- Always refuel slowly to avoid spillage.
- Make sure all fuel lines and connections are tight and in good condition.
- Handle batteries carefully; battery acid will burn skin and can cause blindness if it contacts the eyes.
- Avoid sparks near battery. Gas given off by battery is explosive.
- Keep engine and surrounding area clean and clear of trash.
- When starting engine, maintain a safe distance from moving parts of equipment. Be sure all rotating parts are secure and in good condition.
- Do not start engine with clutch engaged.
- Never run engine with governor linkage disconnected, or operate at speeds in excess of 3600 R.P.M. load.
- Never make adjustments on machinery while it is connected to the engine, without first disconnecting the ignition cables from the spark plugs. Turning the machinery over by hand during adjusting or cleaning might start the engine and machinery with it, causing serious injury to the operator.
- Never run engine while safety switches are disconnected, or protective screening is removed from unit.
- Do not leave engine running while lubricating, making adjustments or repairs unless specifically recommended.
- Never leave engine unattended while it is running.
- Keep hands, feet and clothing away from all moving parts.
- Mount a fire extinguisher close to the engine. Maintain extinguisher properly and be familiar with its use.
- Precaution is the best insurance against accidents.

STARTING and OPERATING INSTRUCTIONS

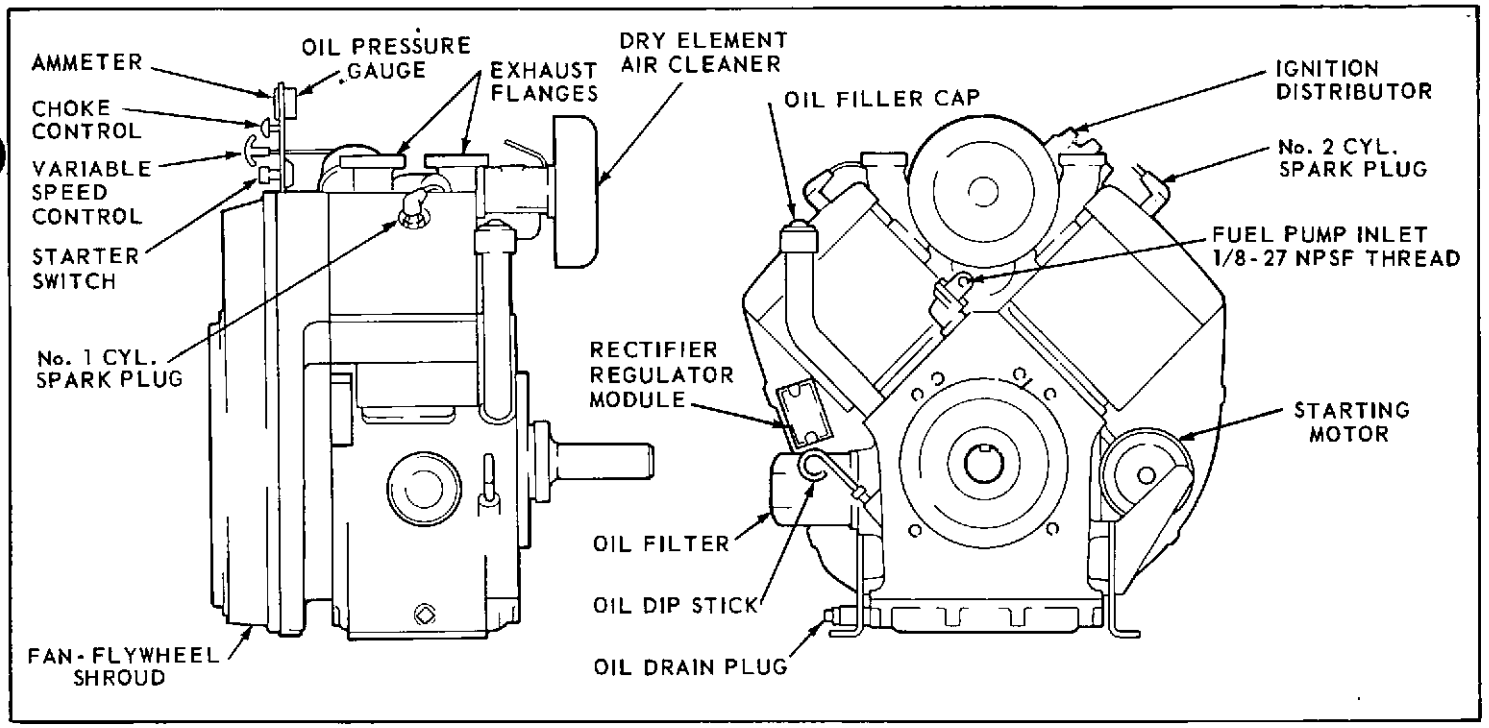


Fig. 1, REFERENCE VIEWS

IMPORTANT

Engine is shipped without oil. Fill Crankcase to proper level, and add oil to Clutch or Reduction gear units and Oil Bath Air Cleaner if furnished. Refer to Lubrication paragraphs, Oil Chart, and Air Cleaner Maintenance.

NEW ENGINE BREAK-IN

Proper **break-in** will lead to trouble-free operation and increased engine life. The factory test given to a new engine is not sufficient to establish the polished bearing surfaces which are so necessary for good performance and long engine life. There is no quickway 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 as follows:

1/2 hour	1000-1200 rpm	No load
1 hour	50% rated rpm	25% load
1 hour	75% rated rpm	50% load
1 hour	100% rated rpm	75% load
5 minutes	Low idle	No load

For **break-in** of new engines, use same oil as recommended in oil chart.

BEFORE STARTING ENGINE

1. **FUEL**

Fill fuel tank with a reputable well known brand of **Regular Grade** gasoline. **Leaded** gasoline is preferred with an *Anti-knock Index of **87 minimum.** Unleaded regular gasoline may be used, although shorter valve life may be experienced.
Note: *minimum Motor octane number must be 82.

Caution: Refuel slowly to avoid spillage. Do not smoke when filling tank.

Be sure that vent hole in fuel tank cap is clean and free of any obstruction.

2. **LUBRICATION**

Fill crankcase base with the proper grade of engine oil as specified in **"Grade Of Oil"** chart. Fill through the oil filler tube opening to the level indicated by the **Full Mark** on **Dipstick.** Approximately 3-1/2 quarts are required in a new engine — 4 quarts with oil and filter change.

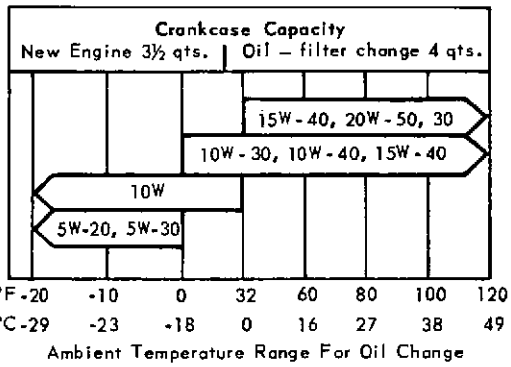
IMPORTANT

Do not overfill crankcase. **Do not** allow oil level to go below **Add** mark on dip stick.

Check oil level every 8 hours. One quart of oil is required to raise the oil level from **Add** to **Full** mark on dip stick.

Change oil every **100 hours** under normal operating conditions. In extreme dusty and extensive idling conditions, change oil at 50 hour intervals.

RECOMMENDED SAE VISCOSITY GRADES
Use Oil Designation as Service SE or SF



Ambient Temperature Range For Oil Change

If engine is used at near maximum performance, it is recommended that a single-viscosity oil of SE Quality be used either grade SAE 30 or SAE 10W.

Proven synthetic oils give superior service in air cooled gasoline engines and can be used, but the recommended oil change interval remains at 100 hours.

3. **CLUTCH-GEAR RED. LUBRICATION**

With reference to Fig. 2 and Fig. 3, fill clutch and gear reduction units to the height of the oil level plug opening — Use same grade oil as used in engine crankcase. Add sufficient oil between changes to keep oil up to the level plug opening.

Change Oil in Clutch and Reduction Units at least every 500 hours of operation.

NOTE: Automotive Dry Plate Clutch and Clutch Reduction assemblies should be lubricated per instructions on inspection plate on clutch housing.

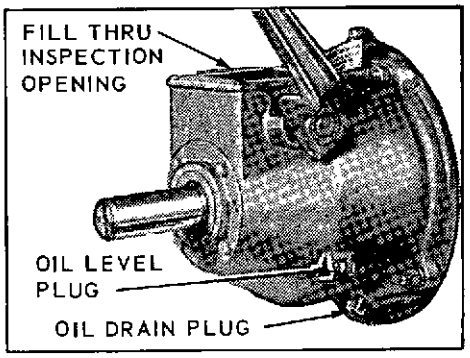


Fig. 2, CLUTCH LUBRICATION

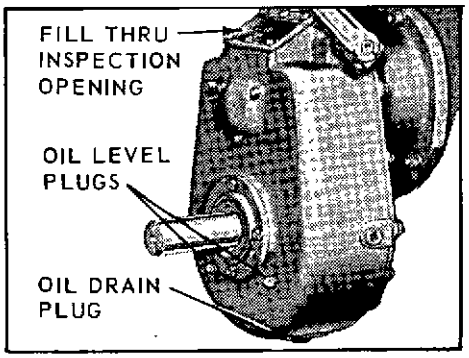


Fig. 3, CLUTCH RED. LUBRICATION

ELECTRICAL SYSTEM

12 Volt Battery Ignition Distributor, Coil and heavy duty Starting Motor are standard equipment. Options include: 10 amp or 30 amp Flywheel Alternator, Instrument Panel, Solenoid Starting, High-Temperature Safety Switch and electric Fuel Pump.

Battery is not furnished by Teledyne Wisconsin Motor.

ALTERNATOR

The **12 volt - 30 amp** Flywheel Alternator system consists of a **Magnetic Rotor, Stator** and **Rectifier-Regulator** module. No adjustments are required. The alternator is wired into the electrical circuit as illustrated in Fig. 4.

IMPORTANT

This is a **Negative Ground** system. Charging components will be damaged if grounded wrong in connecting or jumping batteries.

Caution: Handle battery carefully to prevent acid burns. Avoid sparks near battery — gas given off by battery is explosive.

PRECAUTIONS to be exercised in the use of Alternators:

1. **Do not** reverse battery connections. Negative battery terminal must be grounded. Reverse polarity will damage rectifier-regulator.
2. Connect booster batteries — positive to positive and negative to negative.
3. **Do not** ground any wires from stator or module which terminate at connectors.
4. **Do not** operate engine with battery disconnected from system.
5. Disconnect at least one battery lead if a battery charger is used.

STARTING

Caution: Maintain a safe distance from moving parts of equipment. Know how to stop the engine quickly in case of emergency.

Caution: Do not operate engine in a closed building unless it is properly ventilated.

STARTING PROCEDURE, Fig. 5

1. Check crankcase oil level and gasoline supply. Open fuel shut-off valve in fuel strainer or tank.
2. Disengage clutch, if furnished.
3. Pull variable speed control **"T"** handle out about half-way and lock in place. With a two speed (idle control) start in full load position — idle after engine starts.
4. Close choke by pulling choke button to extreme out position.
5. Pull out ignition switch button, tag reads **"To Stop Push In."**
6. Depress starter switch to start engine.

IMPORTANT

Do not crank engine for more than 30 seconds at a time. If engine fails to start, wait about 2 minutes between cranking periods to prevent starter from over-heating.

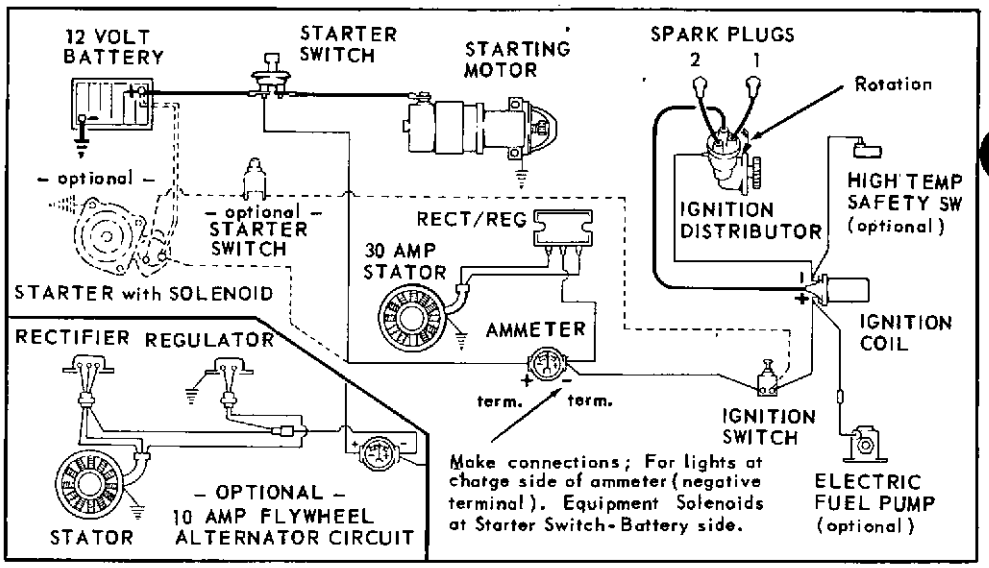


Fig. 4, ELECTRICAL SYSTEM with FLYWHEEL ALTERNATOR

7. After engine starts, push choke button in as required for smooth running.

   Less choking is necessary in warm weather or when engine is warm, than when cold. Should flooding occur, open choke fully and continue cranking.

WARM-UP

After engine starts, allow it to warm up a few minutes before applying load. **Do not race or gun engine** to hurry WARM-UP. The proper oil film on various surfaces of the pistons, cylinders, bearings, etc., cannot be established until the oil has warmed up and become sufficiently fluid.

TO STOP ENGINE

Depress ignition switch button, tag reads **"To Stop Push In."**

If engine has been running hard and is hot, do not stop it abruptly from full load. Cool the engine by removing the load and allowing the engine to run idle (1000 to 1200 R.P.M.), for 3 to 5 minutes.

OIL PRESSURE

Oil pressure is controlled by a non-adjustable relief valve mounted in the crankcase below the oil pump. With engine oil hot, gauge pressure will be from 30 to 50 P.S.I. at engine speeds of 1600 to 3600 r.p.m. If pressure falls below 15 P.S.I., refer to **"Trouble Shooting"** for possible causes.

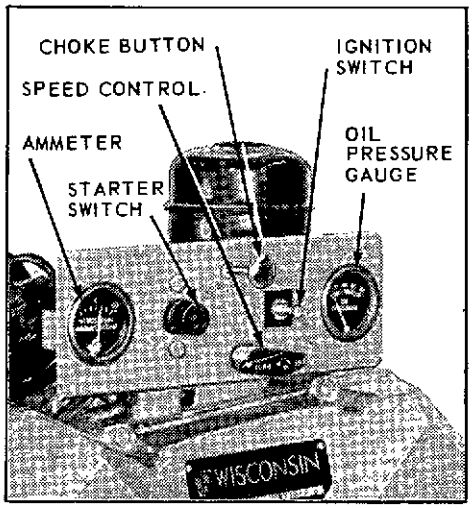


Fig. 5, CONTROL PANEL

MAINTENANCE

AIR CLEANERS

The air cleaner is an essential accessory, filtering the air entering the carburetor and preventing abrasive dirt from entering the engine and wearing out valves and piston rings in a very short time.

The air cleaner must be serviced frequently, depending on the dust conditions in which the engine is operated. Check connections for leaks or breaks and replace all broken or damaged hose clamps on remote or side mounted air cleaners.

Excessive smoke or loss of power are good indications that the air cleaner requires attention.

DRY TYPE AIR CLEANER, Fig. 6

The dry element air cleaner mounted directly to the carburetor is Standard equipment on this model engine. **Do not** oil element, and **Do not** use gasoline or kerosene for cleaning.

Service Daily; or twice a day if engine is operating in very dusty conditions. Remove element and shake out the accumulated dust and dirt. Wipe out dirt from inside cover and from housing.

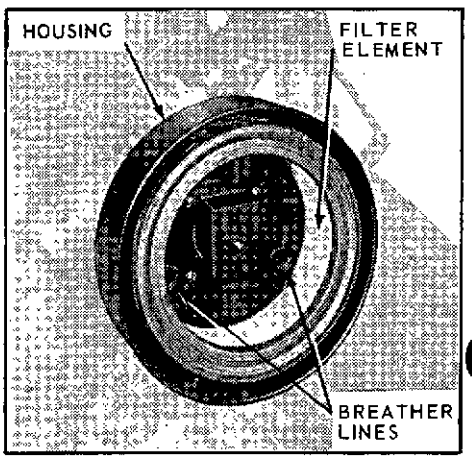


Fig. 6, DRY ELEMENT AIR CLEANER

Once Each Week; The filtering cartridge should be taken out and rinsed under a faucet with cold water, then wash by repeated dippings 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.

After five washings or one year of service, which ever comes first, replace the cartridge element. New filter elements are available from all Teledyne Wisconsin Motor Distributors and Service Centers.

HEAVY DUTY AIR CLEANERS, Fig. 7

Dry Element or Oil Bath heavy duty type air cleaners are optionally used, and are mounted either to the side of the engine, or to the equipment structure.

DRY TYPE HEAVY DUTY AIR CLEANER

Service Daily; squeeze rubber dust unloader once or twice a day to check for possible obstruction. If engine is operating in very dusty conditions, remove cartridge and shake out the accumulated dust and dirt.

Wipe out dirt from inside housing and bowl, after removing baffle and dumping out dust.

Once Each Week; The filtering cartridge should be taken out and rinsed under a faucet with cold water, then wash by repeated dippings 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 re-installing. In cold weather, protect element from freezing until dry.

Do Not Use Gasoline, Kerosene or Solvent For Cleaning — Do Not Oil Element.

After ten washings or one year of service, which ever comes first, replace cartridge element — available from your nearest Teledyne Wisconsin Motor Distributor or Service Center.

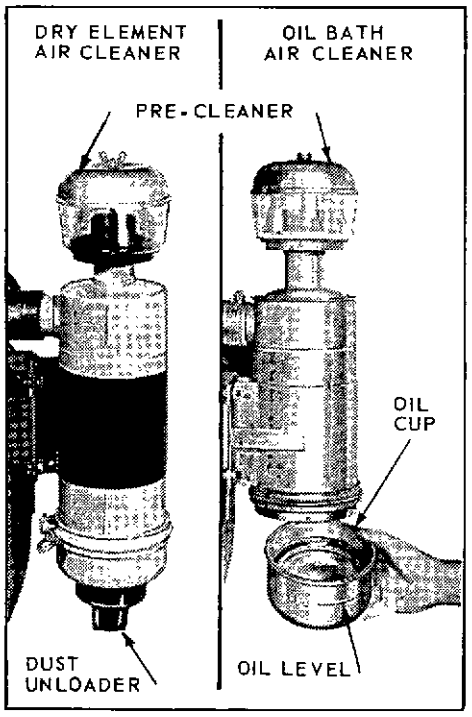


Fig. 7, HEAVY DUTY AIR CLEANERS

OIL BATH HEAVY DUTY AIR CLEANER

Service Daily; or twice a day if engine is operating in very dusty conditions. **Once each week;** in comparatively clean conditions.

Remove oil cup from bottom of air cleaner and clean thoroughly. Add the same grade of oil, as used in the engine crankcase, to the **Level Line** indicated on the oil cup.

IMPORTANT

Operating the engine under dusty conditions without oil in the air cleaner or with dirty oil, may wear out cylinders, pistons, rings and bearings in just a few days time.

Once a Year; or oftener if conditions are severe, the air cleaner should be removed from the engine and the element, which is not removable, should be washed in a solvent to clean out accumulated dust and dirt.

PRE-CLEANER

The optionally furnished collector type pre-cleaner, mounted to the top of the air cleaner as illustrated in Fig. 7, removes the larger dirt and dust particles before the air reaches the main air cleaner.

Clean bowl regularly of accumulated dust and dirt. **Do not put oil or water in pre-cleaner, this must be kept dry.**

CRANKCASE BREATHER, Fig. 8

The crankcase is ventilated by means of a closed breather system, controlled by **reed type breather valves.** The breather valve is an integral part of each of the two valve chamber inspection covers.

Oil and fuel vapors **(blow-by)** in the crankcase are released through the breather valves to the air cleaner, carburetor and intake manifold, where it is mixed with fresh fuel vapor and burned in the combustion chamber.

IMPORTANT

It is necessary that the breather valves be kept clean and operable, and the breather lines free of obstruction.

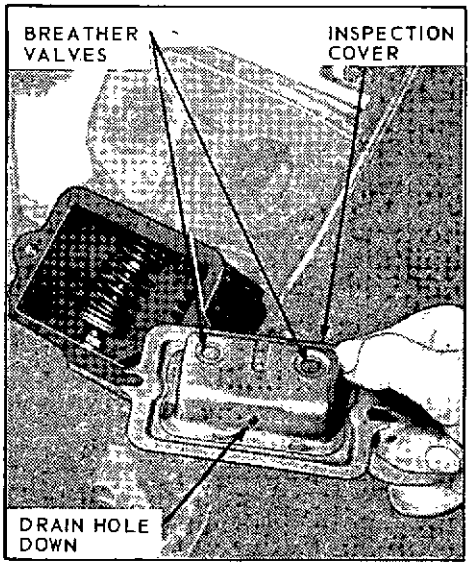


Fig. 8, CRANKCASE BREATHER

The operation of the breather valves is also important in maintaining a partial vacuum in the crankcase to prevent oil leaks at seal and gasket surfaces.

Every 100 Hours; Inspect breather lines.

Every 250 Hours; Remove inspection covers and clean breather valves with a solvent.

Caution: Do not use gasoline, naptha, or benzine. They are highly flammable.

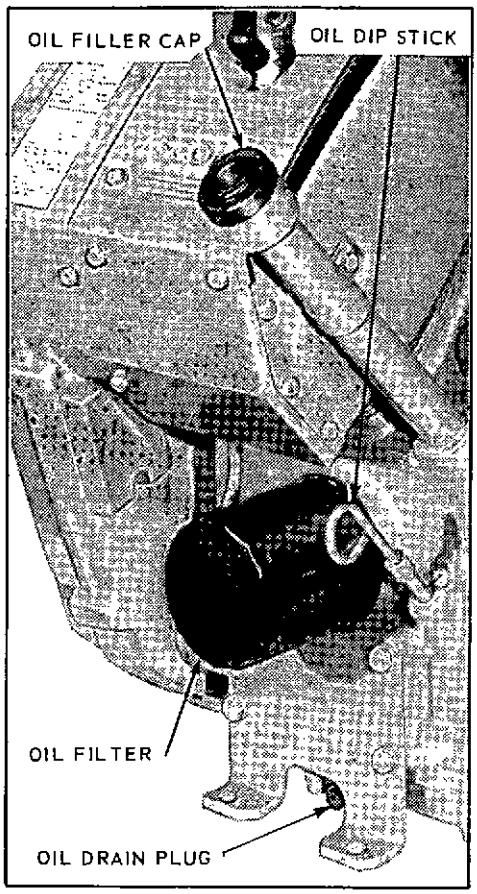


Fig. 9, LUBRICATION

CRANKCASE OIL, Fig. 9

Check Oil Level Every 8 Hours. One quart of oil is required to raise the oil level from **Add** to **Full** mark on dipstick.

Change Oil Every 100 Hours under normal operating conditions. In extreme dusty and extensive idling conditions, change oil at 50 hour intervals. Remove drain plug and allow oil to drain into a suitable container. Drain oil while engine is hot — it will flow more freely.

Caution: Wear gloves when removing drain plug from a hot engine.

Crankcase capacity	3-1/2 Quarts
With Oil Filter Change	4 Quarts

IMPORTANT

Do not overfill crankcase. **Do not** allow oil level to go below **Add** mark on dipstick.

Refer to **Recommended Grades of Oil** chart, page 1, for classification and grade of oil to be used.

OIL FILTER, Fig. 9

Under ordinary conditions all of the engine oil is circulated through a **full-flow Micro-Fine** oil filter. But, when the filter element becomes extremely dirty, the oil by-passes the filter material through a relief valve within the oil filter. As a result, there is no variation in oil pressure to indicate that the oil filter is clogged and requires replacement. Because clean oil is so essential for the friction free operation of all bearing surfaces, it is very important that the oil filter be changed at the recommended interval.

Every 100 hours of operation, or at every oil change, replace oil filter.

For replacement, use only a Wisconsin **Micro-Fine** oil filter, specifically designed for this model engine.

When reassembling new filter, add a film of oil to the face of the base gasket. Turn filter to a snug fit, then 1/2 turn more — **Do not over-tighten.**

FUEL FILTER, Fig. 10

It is very important that the fuel be filtered to prevent sediment, dirt and water from entering the carburetor and causing trouble or even complete stoppage of the engine. A glass bowl fuel filter should be connected into the fuel system between the tank and fuel pump, see Fig. 10.

Inspect glass filter bowl daily, and clean if dirt or water are visible. To remove sediment bowl, loosen nut below glass bowl and swing bail to one side. Twist bowl as it is being removed to prevent gasket from sticking to bowl and breaking. Clean screen and bowl thoroughly — replace gasket if it is damaged or hardened.

IGNITION DISTRIBUTOR, Fig. 13

Check for faulty and loose fitting wires, and for cracks in distributor cover.

Every 250 Hours: apply 1 drop of light engine oil (10W), to the breaker arm pivot.

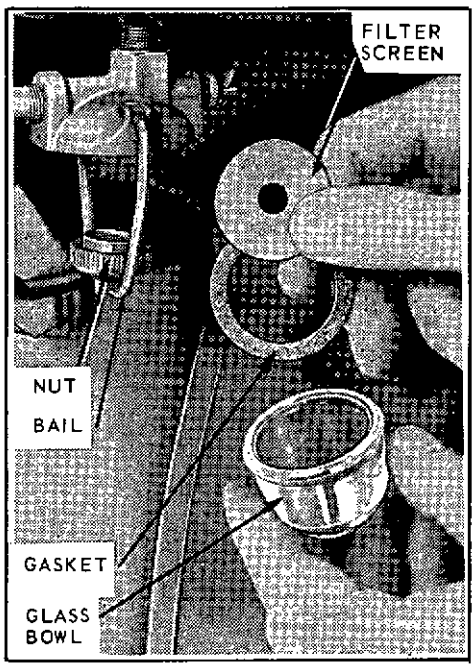


Fig. 10, FUEL FILTER

Every 250 Hours; add a small amount of high melting point grease to the breaker arm rubbing block.

Avoid Excessive Lubrication. Oil on the contact points will cause them to burn.

SPARK PLUGS, Fig. 11

Incorrect gap, fouled or worn spark plug electrodes, will have an adverse affect on engine operation.

Every 250 Hours: remove spark plugs — clean, regap or replace if necessary.

Spark plug gap - 0.035 inch (Standard)
- 0.030 inch (Resistor plug)

Replacement plugs must be of the correct heat range, like Champion No. N6 (Wisconsin YD369, Standard), or RN6 (YD369A, Resistor plug). Thread size is 14 mm. In reassembly tighten spark plugs **18** to **22 foot pounds torque (dry)**.

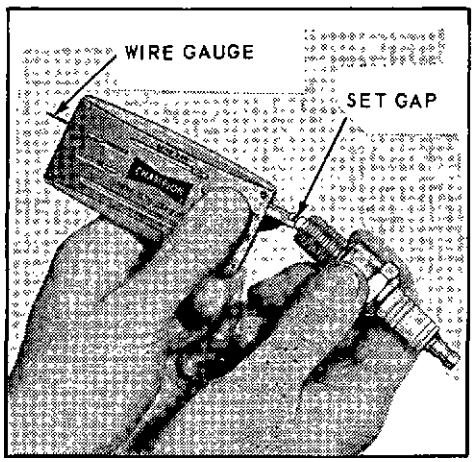


Fig. 11, SPARK PLUG

STARTING MOTOR, Fig. 12

No maintenance is required other than keeping the outside of the starting motor clean, and periodic inspection for insecure mounting and loose or corroded cable connections.

In extreme dust and dirt conditions it may be necessary to occasionally remove the started from the engine and clean the Bendix by brushing with Kerosene. **Do not oil Bendix** drive — if necessary lubricate with powdered graphite.

KEEP ENGINE CLEAN, Fig. 12

This engine is cooled by blasts of air which must be allowed to circulate all around the cylinders *and cylinder heads to properly cool the engine* and thereby keep it in good running condition. If **dust, dirt or chaff is allowed to collect in the cylinder shrouding or in the V between the cylinders,** it will retard the flow of air and cause the engine to overheat. Keep **flywheel screen** clean, so as not to restrict the intake of cooling air.

IMPORTANT

Do not operate engine with damaged or badly dented shrouding.

Do not operate engine with any part of the shrouding removed.

Do not allow warm air to recirculate back through the cooling system.

ADJUSTMENTS

CARBURETOR, Fig. 18.

The carburetor **Main Metering Jet** is of the fixed type and therefore no adjustment is necessary

The correct amount of throttle plate opening for the proper low idle speed is obtained by means of the **Throttle Stop Screw.** However, this is set at

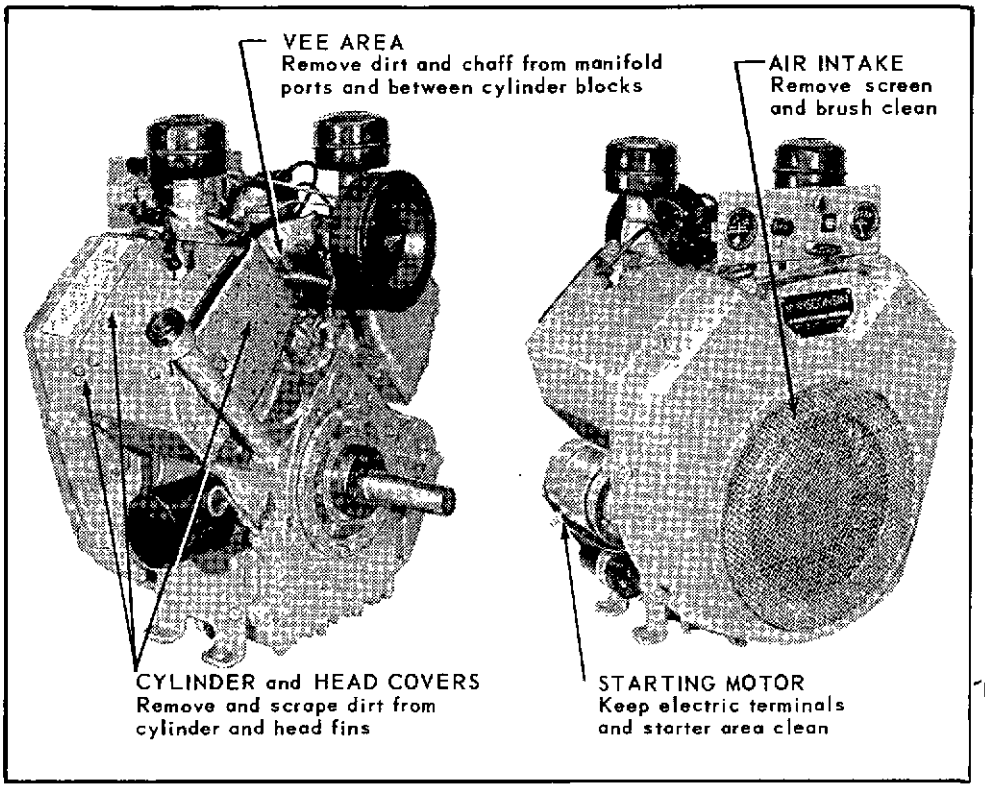


Fig. 12, KEEP ENGINE CLEAN

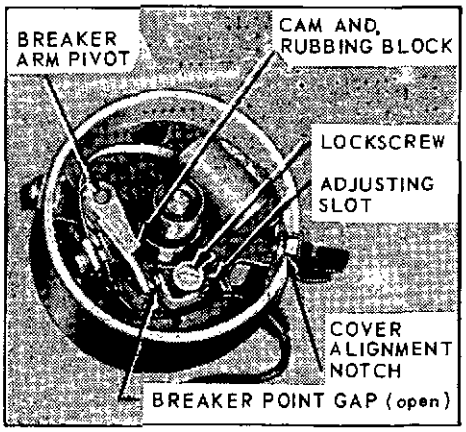


Fig. 13, DISTRIBUTOR BREAKER POINTS

the factory so that no immediate adjustment is necessary. The **Idle Adjustment** is for smooth low speed operation and this adjustment, if necessary, must be made with the engine running at idle speed (throttle valve closed). Initial setting is approximately **1 turn open.**

NO ADJUSTMENT REQUIRED ON SOLID STATE IGN
BREAKER POINT ADJUSTMENT, Fig. 13
BREAKER POINT GAP – .020 IN.

To readjust point gap, turn engine over slowly until the distributor breaker arm **Rubbing Block** is on a high point of the **Cam.** Loosen the stationary contact **Lockscrew** slightly and place a feeler gauge between the points. Insert the end of a screwdriver into to the **Adjusting Slot** on the breaker plate. Open or close the points by moving the point bracket until a slight drag is felt when sliding the feeler gauge from between the points. Tighten lockscrew and recheck point gap.

Points that are badly pitted or worn should be replaced and properly adjusted.

VALVE TAPPET ADJUSTMENT, Fig. 14

With the tappets in their **lowest position** (valves completely closed) and **engine cold,** the clearance between valve stem and tappet adjusting screw should be:

Intake - .007 Inch Exhaust - .020 inch

The **intake valve** is to the **left** in the cylinder block, facing the valve chamber opening. The **exhaust valve** is to the **right.** Place a feeler gauge of proper clearance thickness between valve stem and tappet screw. Adjust clearance by means of two 1/2 - 7/16 inch tappet wrenches.

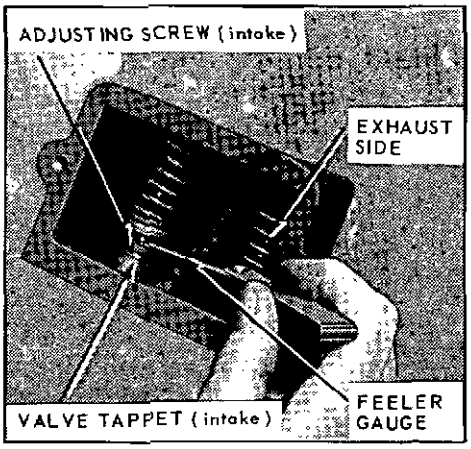


Fig. 14, VALVE TAPPET ADJUSTMENT

TIMING

FIRING ORDER

The firing interval (crankshaft degrees), between No. 1 cylinder and No. 2 is 270° — from No. 2 cylinder to No. 1, 450°.

The **No. 1 cylinder** is on the **Right Hand Side,** when viewed from flywheel end of engine. No. 2 cylinder is on the left hand side, nearest to the flywheel.

DISTRIBUTOR

The distributor is of the mechanical advance type and it is driven off an engine speed governor shaft through a pair of 2:1 ratio gears. Thus, the distributor operates at **one-half** engine speed in a **clockwise direction,** when viewed from above.

SPARK ADVANCE

The running spark advance is 6° before Top Dead Center (T.D.C.) at 1800 r.p.m., with the distributor **fully advanced** to **22°** before T.D.C. at **3400 r.p.m.** Engines are properly adjusted at the factory for accurate timing and peak dependable performance for the complete operating range of speeds from 1600 through 3600 r.p.m. Future timing can be checked and adjusted in the following manner:

TIMING MARKS

Two timing slots are provided on the right hand side of the front face of flywheel shroud:

1. **For timing variable high speed engines to 22° at 3400 r.p.m.,** refer to Fig. 15 which illustrates 25°, 22°, 19° and T.D.C. timing marks. A **cast arrow** identifies the **"I" marked** flywheel vane that is visible through the opening at the 22° mark.
2. **For fixed speed engines,** particularly those operating at **1800 r.p.m.,** refer to Fig. 16 which illustrates 9°, 6°, 3° and T.D.C. timing marks. The **cast arrow** identifies the **"I" marked** flywheel vane that is visible through the opening at the **6° mark.**

NOTE: Read **Important Note** with reference to Fig. 18 on page 6, for adjusting engine speed to 1800 r.p.m. for 6° advance timing.

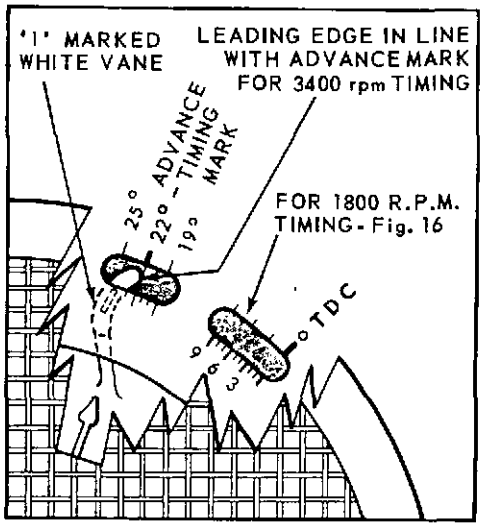


Fig. 15, SPARK ADVANCE VARIABLE HIGH SPEED

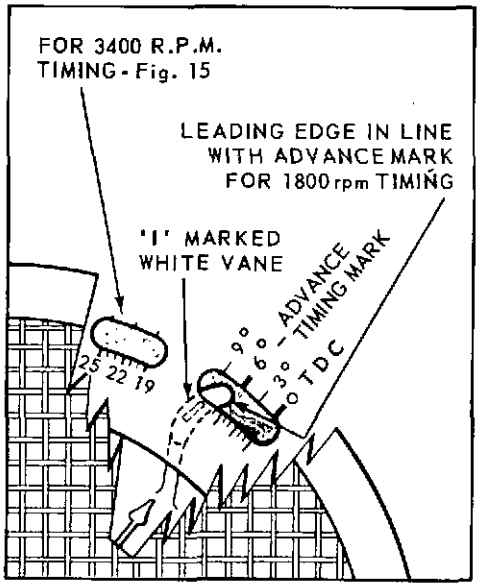


Fig. 16, SPARK ADVANCE FIXED LOW SPEED

TIMING CHECK AND ADJUSTMENT

IMPORTANT

It is necessary that the distributor breaker point gap be **.020 inch,** because any change in gap opening will affect the ignition advance. Check and adjust if necessary, per Distributor Breaker Point Adjustment paragraphs, before timing.

A **slotted opening** is provided on the rim of the flywheel screen so that timing can be checked without removing the screen.

Caution: Do not operate engine with screen removed from front face of shroud.

NOTE: Paint the **"I" marked** flywheel vane **white,** so that it will be clearly visible for checking with a **Timing Light.**

1. With reference to Fig. 17, insert a small screwdriver into the No. 1 terminal tower on the distributor cap, making contact with the spark plug wire terminal. Connect the red terminal clip, from a conventional automotive type **Timing Light,** to the metal portion of the screwdriver. One of the other two timing light wires is connected to the battery, and the other to the ground.

2. With reference to Fig. 15 and the engine operating at **3400 r.p.m.,** allow the flash from the timing light to illuminate the **"I" whitened** flywheel vane. At the time of the flash the **leading edge** of the vane should line up with the **22° Timing Mark** on the flywheel shroud.

2a. For fixed **low speed** applications, operate the engine at **1800 r.p.m.** and allow the flash from the timing light to illuminate the **"I" whitened** flywheel vane. At the time of the flash the leading edge of the vane should line up with the **6° Timing Mark** on flywheel shroud, as illustrated in Fig. 16.

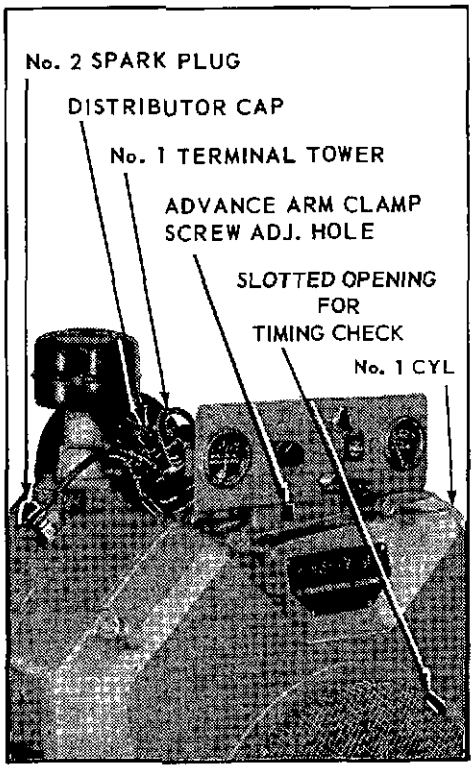


Fig. 17

3. If timing is incorrect, loosen the advance arm **clamp screw** at the base of the distributor. A screwdriver clearance hole is provided in the flywheel shroud as shown in Fig. 17.

   With the engine again running at timing speed turn the distributor body **very slightly** clockwise or counterclockwise as required, until white vane and **Timing Mark** do match up. Securely tighten clamp screw when satisfactory timing is accomplished.

IMPORANT

On fixed low speed applications timing should be adjusted to 6° before T.D.C. at 1800 r.p.m.

For engines where the governor is set to operate at low **fixed speed** other than 1800 r.p.m., a tachometer will have to be used, and the speed set at 1800 r.p.m. in the following manner, and with reference to **Fig. 18.**

1. Run engine at idle speed, **1000 r.p.m.**
2. Turn **Stop Screw** on carburetor throttle lever clockwise until engine speed reaches **1800 r.p.m.**
3. Proceed to check and adjust timing starting with paragraph 2a, page 5.
4. After timing is accomplished, turn stop screw on carburetor throttle lever counterclockwise until original idle speed of **1000 r.p.m.** is obtained.

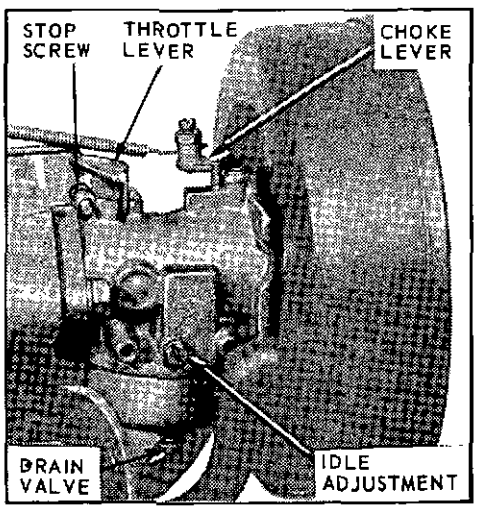


Fig. 18, CARBURETOR ADJUSTMENT

CLUTCH ADJUSTMENT

The clutch is an optional accessory furnished either as a power take-off unit, or a clutch reduction assembly.

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).

CLUTCH, Fig. 19

Turn engine over until clutch **adjustment lock** is visible through the inspection opening. Loosen **adjustment lockscrew** one full turn. Keep clutch from turning by securing the crankshaft at flywheel end. Then, by means of a screwdriver, turn **adjusting ring** one notch at a time in a clockwise direction, until a very firm pressure (100 foot pounds torque) is required to snap the clutch into engaged position by means of the clutch shifter lever. Securely tighten adjustment lockscrew.

CLUTCH REDUCTION, Fig. 20

The clutch in the clutch reduction unit is the same as used in the power take-off unit and is adjusted through **two pipe tap openings;** one for the **adjustment lockscrew** and the other for turning the **adjusting ring.** There are **four adjusting plugs** in the housing to provide a means of adjusting the clutch regardless of what position the unit is mounted in.

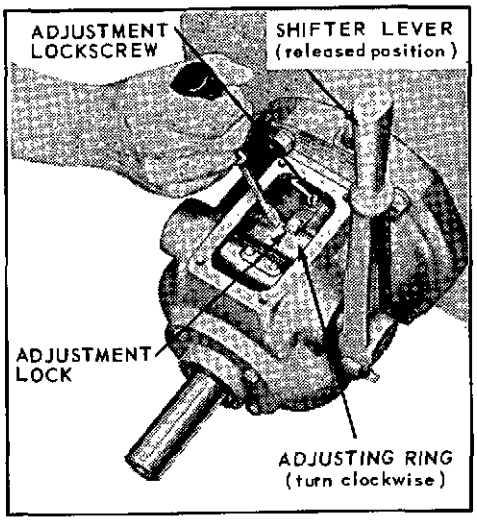


Fig. 19, CLUTCH ADJUSTMENT

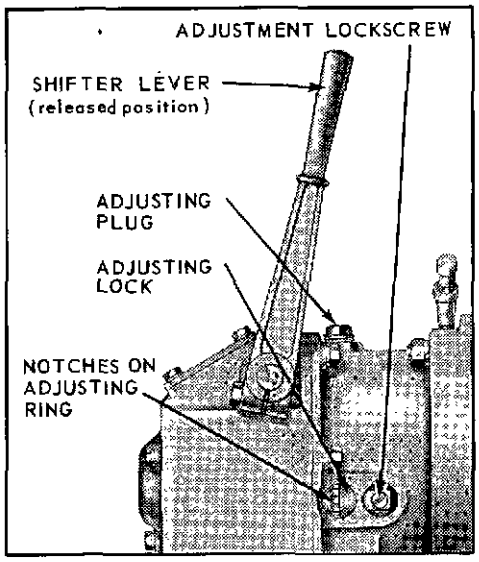


Fig. 20, CLUTCH REDUCTION ADJUSTMENT

Automotive Type Clutch *should be adjusted per* instructions on inspection plate attached to the clutch housing.

TROUBLE SHOOTING

The three prime requisites essential to starting and maintaining satisfactory operation of internal combustion 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 in starting, **causes** are listed under the three main headings of:

Fuel Mixture, Compression, and **Ignition.**

FUEL MIXTURE

No fuel in tank or fuel valve closed.

Plugged vent hole in fuel tank cap.

Fuel line clogged.

Fuel pump diaphragm worn or punctured.

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.

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

COMPRESSION

Cylinders dry due to engine having been out of use. Pour one fluid ounce of crankcase oil through spark plug holes.

Loose or broken spark plug. A hissing noise will be heard in cranking 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.

Valve stuck open. Piston rings stuck or worn.

Valves adjusted with insufficient clearance.

IGNITION

Test for spark by removing spark plugs 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 spark plug, distributor or coil.

Broken or frayed ignition wires.

Spark plug insulator broken.

Spark plugs wet or dirty.

Spark plug gap incorrect.

Condensation on spark plug electrodes.

Breaker point gap incorrect.

Breaker points pitted or fused.

Breaker arm sticking.

Condenser leaking or grounded.

Spark timing wrong.

Weak battery. Faulty ignition coil.

ENGINE MISSES

Spark plug gap incorrect.

Worn, leaking or loose ignition cables.

Weak spark. See "Ignition" test for spark.

Loose connections at ignition cables.

Breaker points pitted or worn.

Water in gasoline. Sticky valves.

Poor compression. See "Compression."

ENGINE STOPS

Fuel tank empty.

Water, dirt or gum in gasoline.

Gasoline vaporized in fuel lines, due to excessive heat around engine (Vapor Lock).

Vapor lock in fuel lines due to using winter gas (too volatile) in hot weather.

Air vent hole in fuel tank cap plugged.

Ignition troubles. See "Ignition."

OVERHEATING

Crankcase oil supply low.

Ignition timing wrong.

Low grade of gasoline.

Engine overloaded.

Restricted cooling air circulation.

Part of air shroud removed from engine.

Dirt between cooling fins.

Intake screen clogged with dirt.

Restricted exhaust.

ENGINE SURGES OR GALLOPS

Carburetor flooded.

Governor spring hooked into wrong hole.

Governor rod incorrectly adjusted.

ENGINE KNOCKS

Poor grade gasoline or of low octane rating.

Operating under heavy load at low speed.

Loose or burnt out rod bearings.

Spark advanced too far.

Worn or loose piston pin.

Carbon or lead deposits in cylinder head.

BACKFIRES THROUGH CARBURETOR

Water or dirt gasoline.

Engine cold.

Poor grade of gasoline.

Sticky inlet valves.

Overheated valves.

Spark plug heat range incorrect (too hot).

Hot carbon particles in engine.

HIGH OIL PRESSURE

Oil pressure gauge defective.

Oil too heavy.

Faulty relief valve.

Clogged pressure line.

LOW or NO OIL PRESSURE

Oil pressure gauge defective.

Clogged oil lines or leaky connections.

Crankcase oil supply low.

Faulty relief valve.

Faulty oil pump.

Oil pump intake screen clogged.

Oil too thin (diluted or wrong grade).

Worn rod or crankshaft bearings.

For Your Record

MODEL	
SPEC NO.	
SERIAL NO.	

Copy the above from the Engine Name Plate. The Model, Spec No. and Serial No. must be given when requesting specific engine information and when ordering Service Replacement Parts.

Individual REPAIR and SERVICE PARTS CATALOGS available from all Wisconsin Distributors.

ENGINE MAINTENANCE SCHEDULE	Daily	*Weekly or 50 hrs.	100 hrs.	250 hrs.
CHECK OIL LEVEL. Add to full mark — Do not overfill.	●			
CHECK AIR CLEANER. Shake out accumulated dirt from dry element.	●			
CLEAN AIR INTAKE SCREEN. Clean cooling fins if necessary.	●			
CLEAN AIR FILTER ELEMENT. Replacement Element LO 194 A		●		
CHANGE CRANKCASE OIL. Use grade and classification of oil recommended. In adverse conditions change oil every 50 hours of operation.			●	
REPLACE OIL FILTER every oil change. Replacement Filter RV 51			●	
INSPECT CRANKCASE BREATHER SYSTEM. Clean if necessary.			●	
DISTRIBUTOR. Apply 1 drop of light oil (10W) to breaker arm pivot.				●
INSPECT SPARK PLUGS and BREAKER POINTS. Replace if necessary and regap. (Spark Plugs .035 inch Std. — .030 inch Resistor Plug). (Breaker gap .020 inch)				●
INSPECT FUEL FILTER. Clean filter screen or strainer in fuel tank.				●
INSPECT COOLING SYSTEM. Remove shrouding and scrape off dirt from between fins, around cylinder, head and from shrouding.				●
INSPECT STARTING MOTOR. Check for loose mounting and cable connections.				●

ENGINE STORAGE

To protect the cylinders, pistons, rings and valves and keep them from rusting and sticking, a half-and-half mixture of kerosene and good "gasoline engine" oil (the same kind of oil as used in the crankcase of the engine), should be injected into the ***pipe tap*** opening on the ***intake manifold*** while the engine is warm and running at moderate speed. About a quarter of a pint is necessary, or enough so that a heavy bluish smoke will appear at the exhaust. The ignition switch should then be shut off and the engine stopped. This fogging operation will leave a coating of oil on the above mentioned parts, protecting them from the atmosphere.

Drain crankcase oil while engine is warm. Drain fuel lines, carburetor, fuel pump and tank, to prevent lead and gum sediment from interfering with future operation.

Caution: Gasoline fumes from gradual evaporation is a dangerous fire hazard.

The outside of the engine, including the cooling fins on the cylinder block 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 starting the engine, after the storage period, remove crankcase drain plug so that any condensation which may have collected may be drained, before new crankcase oil is added. It is advisable to remove the engine oil pan and scrub off all sediment which may have collected there. Use a new gasket when reassembling the oil pan.

Use new spark plugs at the beginning of the operating interval, 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.

SERVICE AND PARTS

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TELEX: 462-1058 (ITT)
CALL TOLL FREE 1-800-932-2858

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Rue Joseph Deflandre, 13
B4920 Chaudfontaine (Liege)
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