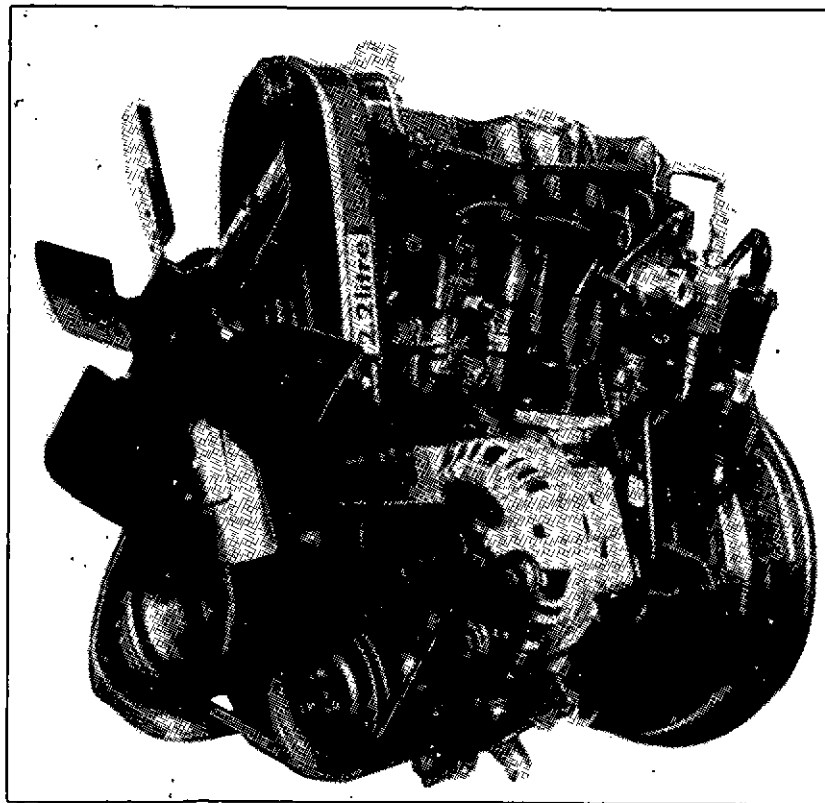
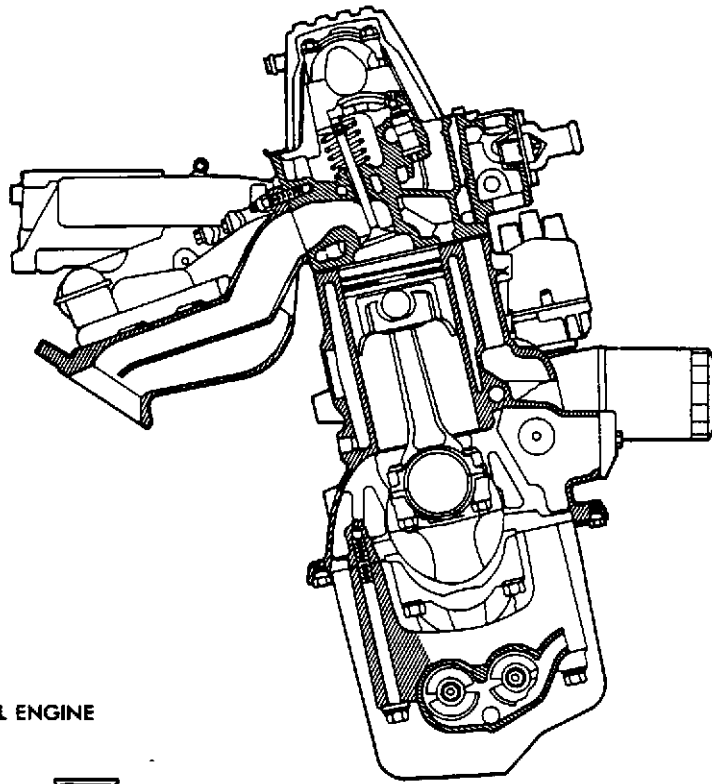


Chrysler 4 Cylinder Industrial Engine

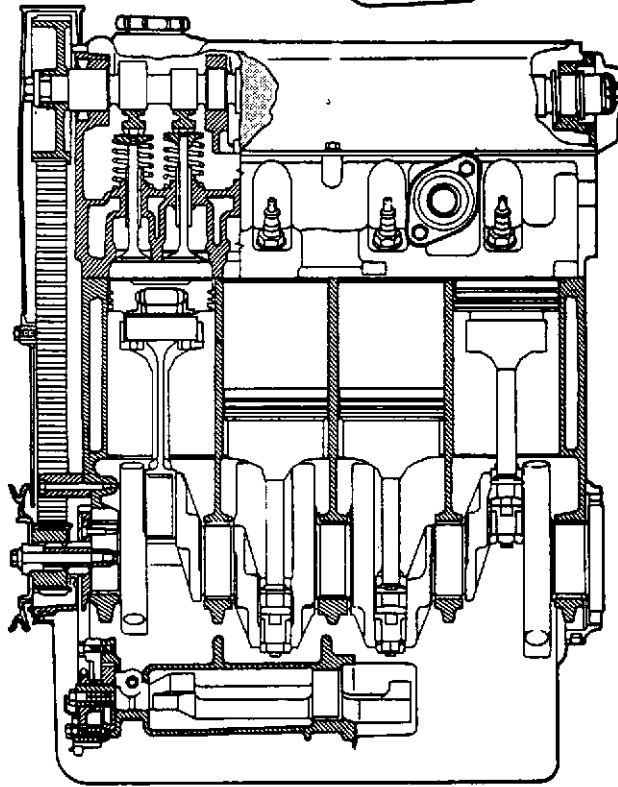
MODELS H135 & H153



Operator's Manual



2.5L ENGINE



RN301

FOREWORD

This manual is presented as a guide for obtaining maximum operating performance from your Chrysler Industrial Engine.

Included are instructions for engine operation and maintenance, an engine system troubleshooting guide for minor repairs, and detailed descriptions of engine construction and specifications for more extensive service.

For optimum engine performance, it is recommended that the owner/operator follows closely the procedures described in this manual and discusses with the Chrysler dealer the environment and conditions in which the engine will be operated. Also, the dealer should be consulted concerning recommendations for optional equipment to be used with the engine.

Members of the nationwide organization of Chrysler Industrial Distributors and Dealers are readily available to provide help and advice to owners/operators for the maintenance of Chrysler Industrial Engines. Chrysler Corporation suggests that all service beyond that described in this manual be performed by authorized Chrysler Industrial Service personnel whenever possible.

If you have any questions, please contact your nearest Chrysler Industrial dealer.

MODIFICATIONS

Slight modifications in the design of Chrysler Industrial Engines may become necessary as dictated by field experience or as desired by the manufacturer to improve the engine; or, changes of material may become necessary due to difficulty in procuring the parts originally specified. If such changes do occur, parts or assemblies will be made interchangeable, if possible, with the original design.

ILLUSTRATIONS

The illustrations in this manual are intended to show the parts and construction of the engine in order to facilitate operation and maintenance. In some instances, the actual appearance of the engine may vary slightly from the illustration. However, all illustrations may be used as aids toward understanding the servicing method or operation of the part depicted.

GENERAL INFORMATION

The 2.2L and 2.5L (135 and 153 C.I.D.) engines are four cylinder overhead camshaft powerplants with cast iron blocks and aluminum cylinder heads. Bore and stroke dimensions for the 2.2L engines are 87.5 mm and 92.0 mm (3.44 × 3.62 in.). The 2.5L engine bore is also 87.5 mm and with unique cylinder block and crankshaft the stroke is increased to 104.0 mm (4.09 in.). The 2.5L engines have in addition a housing installed below the crankshaft. The housing (carrier) contains two counter-rotating balance shafts interconnected by gears and driven at twice engine speed by a roller chain from the crankshaft. The cast nodular iron crankshafts are supported by five 60 mm (2.36 in.) main bearings. Diecast aluminum housings with hydrodynamic seals are attached to the front and rear of the block for crankshaft sealing. No vibration damper is used. A sintered iron timing belt sprocket is mounted on the crankshaft.

Cast aluminum pistons provide a compression ratio of 9.5:1 for the standard 2.2L engine while turbocharged engines use "dished" pistons providing 8.5:1 compression ratio.

2.5L engine compression ratio is 9.0:1. All pistons use pressed in piston pins to attach forged steel connecting rods.

The iron camshaft has five bearing journals. Flanges at the rear journal control camshaft end play. A sintered iron timing belt sprocket is mounted on the cam nose, and a hydrodynamic oil seal is used for oil control at the front of the camshaft. The timing belt also drives an accessory shaft housed in the forward facing side of the block. The accessory shaft in turn drives the fuel pump, (2.2L carbureted engines), oil pump and the distributor.

The aluminum cylinder head features inline valve guide and valve seat inserts. Intake and exhaust ports are located in the rearward-facing side of the head and spark plugs are on the forward facing side. Combustion chambers are "fast-burn design". The valve train with 40.6 mm (1.60 in.) diameter intake valves and 35.4 mm (1.39 in.) diameter exhaust valves employs viton rubber valve stem seals. The engine oil filter is attached to the base located at the left front of the block, toward the front of the vehicle. A mechanical anti-drainback valve incorporated in the filter adaptor keeps the oil from draining out of the filter during shutdown.

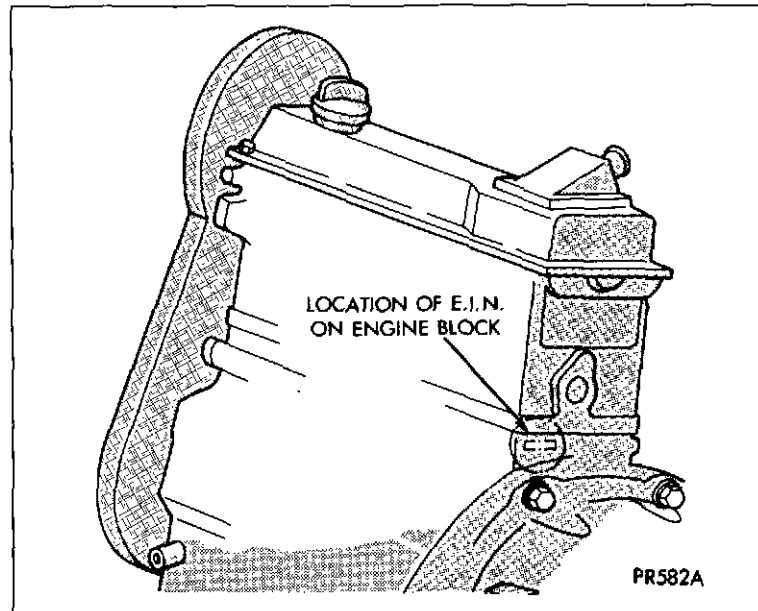


Fig. 1—E.I.N. Location on Engine Block

Engine and Transaxle Identification Numbers

All engine assemblies carry an engine identification number. The E.I.N. is located on the rear face of the engine block, directly under the cylinder head (on the left side of the engine, Fig. 1). The engine also carries an engine serial number which must be referenced when ordering engine replacement parts. This number is located on the rear face of the engine block, directly below the cylinder head (below the E.I.N., Fig. 1).

The transaxle also carries an identification number (the T.I.N.) and serial number for parts replacement reference. The T.I.N. is stamped on a boss that is located on the transaxle housing (Fig. 2). The transaxle serial number for model A-413 manual transaxle is located on the top of the housing, between the timing window and the differential (Fig. 3). For model A-460 and A-565 manual transaxles it is located on a metal tag attached to the front side of the transaxle. On the automatic transaxles, the serial number is located on a pad just above the oil pan at the rear of the transaxle (Fig. 3).

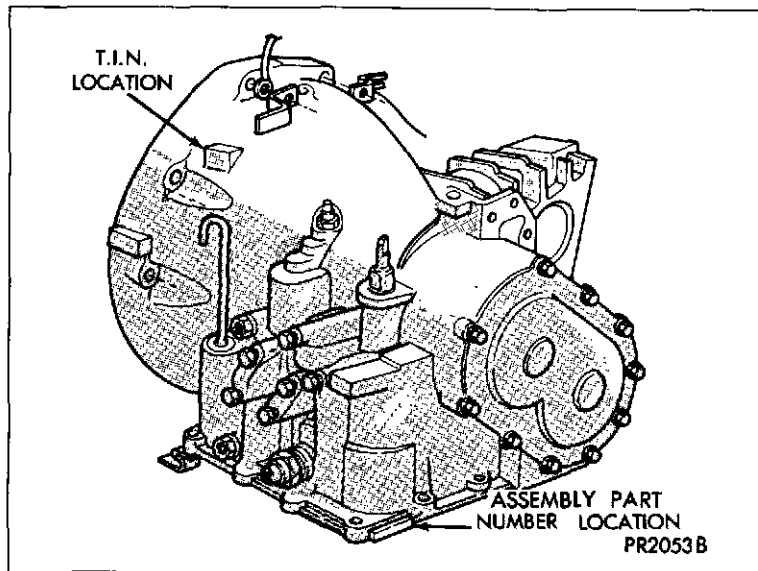


Fig. 2—Location of T.I.N. (on transaxle) and Assembly Part No. Location (Automatic)

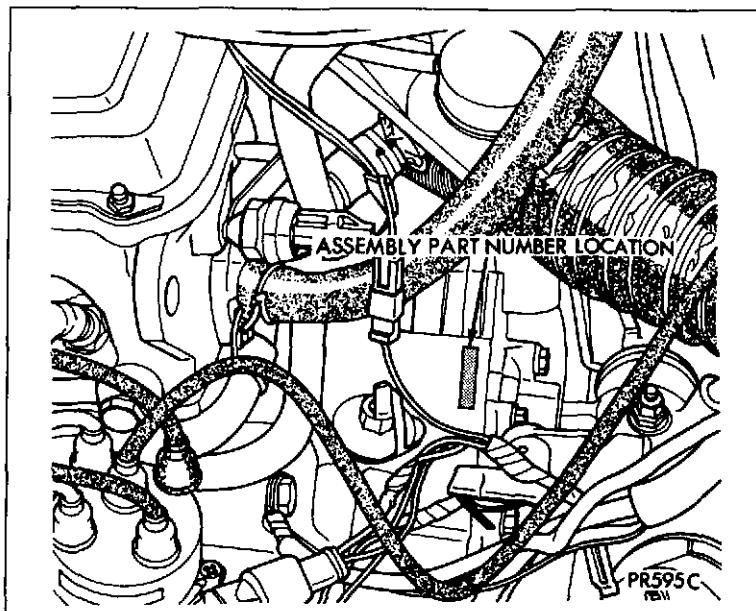


Fig. 3—Location of Assembly Part No. on A-413 Transaxle

Engine Specifications

ENGINE	HIGH COMPRESSION	
	2.2L	2.5L
Type	4 Cylinder O.H.V.	4 Cylinder O.H.V.
Displacement	135 cu. in. — 2.2L	153 cu. in. — 2.5L
Bore	3.455 (87.5 mm)	3.455 (87.5 mm)
Stroke	3.622 (92 mm)	4.09 (104 mm)
Compression Ratio	9.0:1	9.0:1
Gross H.P.	83 @ 4000 rpm	See power curve
Intermittent H.P.	70 @ 3600 rpm	See power curve
Continuous H.P.	60 @ 3600 rpm	See power curve
Net Torque	110 lbs. ft. @ 4000 rpm	See power curve
Firing Order	1 - 3 - 4 - 2	1 - 3 - 4 - 2
Compression Pressure @ 130 rpm		
Cranking Speed		
Wide Open Throttle	130/150 psi	130/150 psi
Max. Variation Between Cylinders	20 psi	20 psi
Oil Pressure		
Operating Oil Pressure @ 2000 rpm	40 psi	40 psi
Minimum Oil Pressure @ Idle rpm	10 psi	10 psi
Crankcase Oil Fill*	4 Quarts	4 Quarts
Valve Adjustment	Hydraulic	Hydraulic
Spark Plug Gap	.035 in. (0.9 mm)	.035 in. (0.9 mm)
Ignition Timing	900 rpm 6° BTC	900 rpm 6° BTC
Fuel	Regular leaded or unleaded gasoline	Regular leaded or unleaded gasoline
Carburetion	1 Bbl. or 2-Single Bbl.	1 Bbl. or 2-Single Bbl.
Ignition System	Electronic	Electronic
Alternator	60 amp, 12V, neg. ground	60 amp, 12V, neg. ground
Basic Engine Weight, Lbs. (KG)	209 (95)	218 (99)

*Add 1 Quart w/Filter Change.

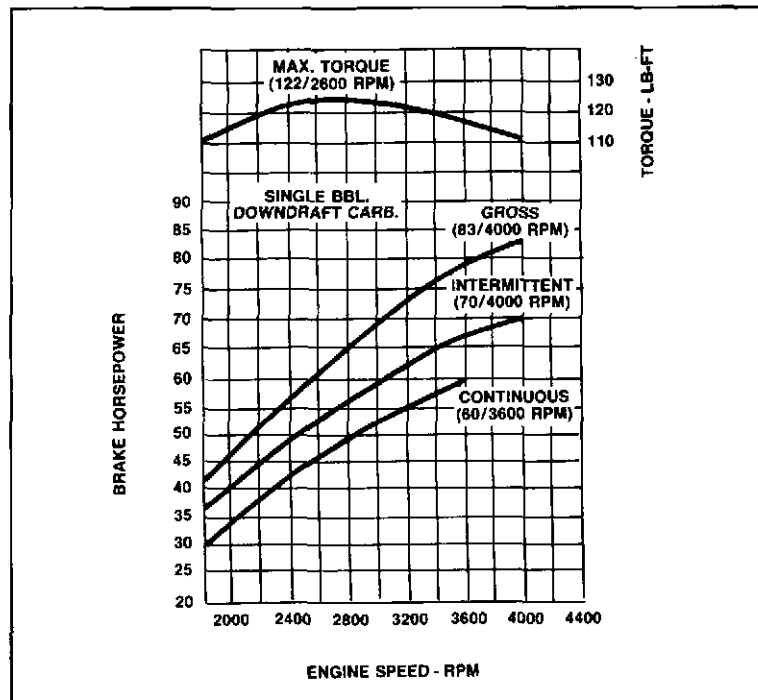
Performance

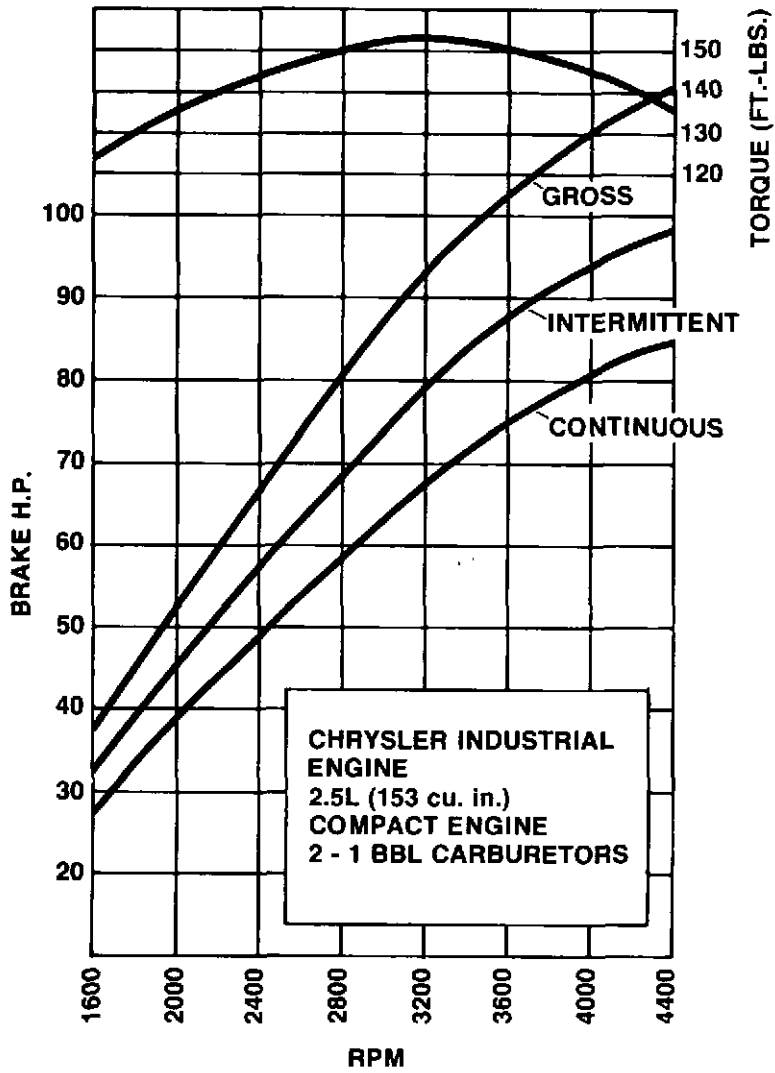
All ratings shown on chart are corrected to 60°F dry air and 29.92 HG (sea level) barometric pressure.

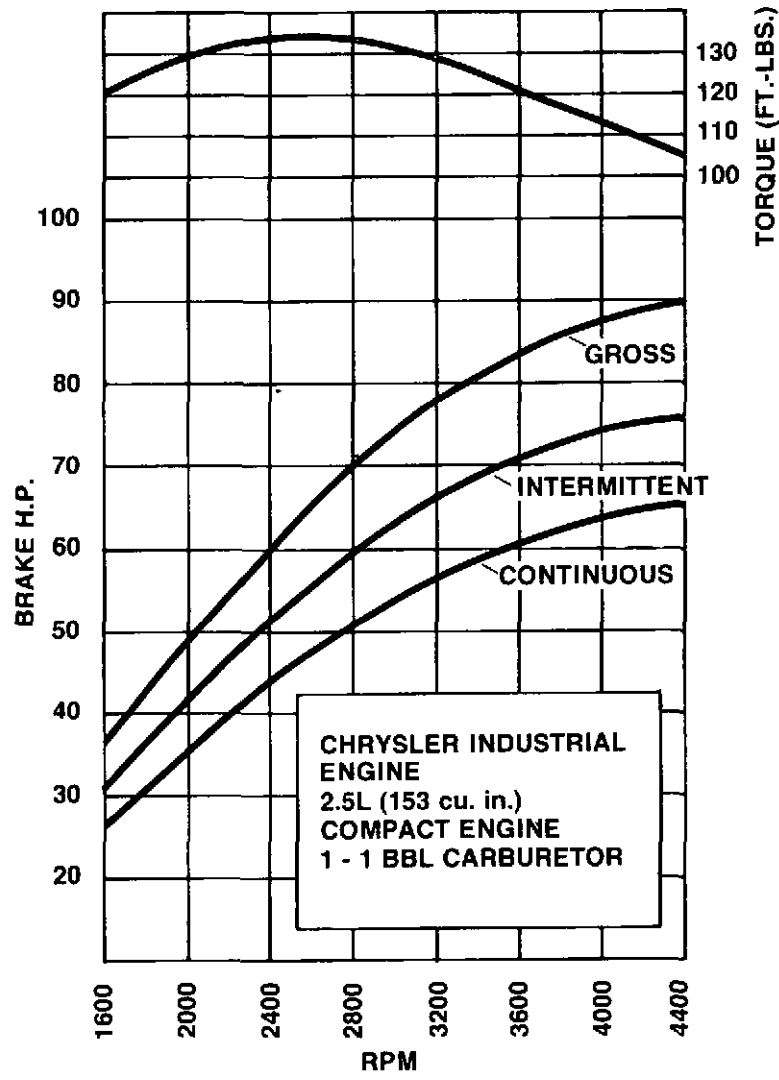
GROSS HORSEPOWER: Rated with non-charging alternator, no air cleaner, no fan, and lab exhaust.

INTERMITTENT HORSEPOWER: Used on applications where engine is operated from idle to full speed and "no load" to "full load" on an intermittent basis.

CONTINUOUS HORSEPOWER: Used on applications where the engine is operated at maximum governed speed and full load for extended periods.

**2.2L**





OPERATION

PRE-OPERATION INSPECTION

Before placing a new or rebuilt engine in service, a thorough inspection should be made for evidence of damaged or loose parts. During this inspection, check the following.

Engine Oil

The crankcase should contain the proper level of clean new SAE engine oil, conforming to the requirements of the API classification "For service SF or SF/CC". This oil should be retained until the regularly scheduled oil change as recommended in the "Lubricating System" section of this manual (page 12).

Cooling System

The cooling system should be filled with a water/anti-freeze or water/rust inhibitor solution (depending on weather conditions — see "Cooling System" section, page 10).

Engine Accessories

All points requiring lubrication should be properly supplied. Battery terminals should be tight and clean. Check for the proper electrolyte level in the battery.

Electrical Connections

All electrical connections should be tight and clean. Check each spark plug for tightness.

STARTING PROCEDURE

Check the oil level daily before operating the engine.

To start:

Put the transmission in NEUTRAL.

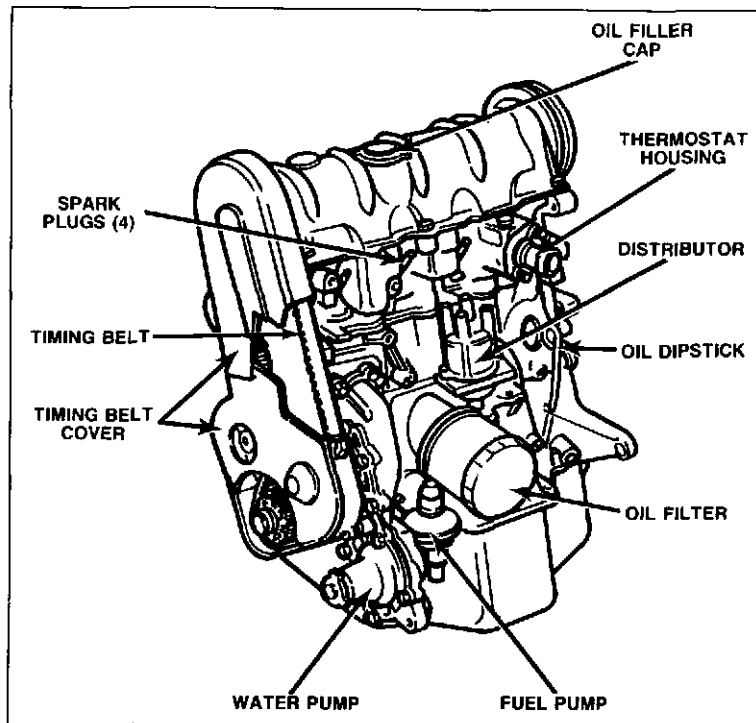
For a Cold Engine: Advance the throttle one third, release, then pull the choke control knob all the way out (do not advance the throttle after the choke is out). Engage the ignition and release when the engine starts.

Caution: Do not keep the starter motor operating more than 2-3 seconds at a time to avoid unnecessary discharge of the battery. If the engine doesn't start, be sure the starter pinion has stopped revolving before engaging the ignition again.

Once the engine has started, push in the choke control knob just enough to prevent stalling. Gradually push the choke all the way in as the engine warms up.

Caution: Avoid unnecessary acceleration during the warm-up period. Keep the engine at idle or up to moderate speed-load conditions until normal operating temperature is indicated on the temperature gauge. This allows the engine oil to reach all parts of the engine requiring lubrication, thus preventing unnecessary damage to these parts and prolonging the life of the engine.

For a Warm Engine: It is unnecessary to pull out the choke when starting an already-warm engine. Advance the throttle half way, release, then engage the ignition.



Typical 4-Cylinder Engine (2.2L Shown)

MAINTENANCE

ENGINE

Periodic Inspection

A general examination of the engine (bolt tightness, leaks, etc.) should be made from time to time (after every 50 hours of operation recommended). During this inspection, check the following.

1. Cylinder head and rocker arm gaskets. Check for blowing or leaking.
2. Engine rubber mountings. Wipe clean of any oil or grease. Check for signs of deterioration or cracking.
3. Inlet and exhaust manifolds. Check all nuts for tightness. Also check the nuts on the studs which secure the exhaust pipe to the exhaust manifold.
4. Carburetor. Check the carburetor flange securing nuts for tightness. Do not overtighten (maximum torque 5 ft. lbs.). Check the mounting of the carburetor air cleaner and tighten if necessary.
5. Accessory drive belts. Check all for tightness. Belt deflection measurements should be taken while applying a 10 lb. load to the belt.

Caution: When adjusting belt tension, leverage must only be applied to the alternator drive end bracket. Leverage applied to the stator or slip ring end bracket will result in serious damage.

6. Throttle controls. Lubricate if necessary.
7. Examine all parts of the engine for oil leaks. Clean all external parts.
8. See that all points requiring lubrication are properly supplied.

COOLING SYSTEM

The cooling system consists of the radiator and hoses, belt-driven fan, thermostat, and water pump.

Periodic Inspection

The following items should be examined regularly (after every 50 hours of operation recommended).

1. Check coolant radiator hoses for signs of deterioration. Replace if necessary. Oil-contaminated hoses should be thoroughly cleaned; if swollen, they must be replaced. Look for signs of chafing on hoses and correct any problems.
2. Clean the exterior of the radiator block.
3. Examine the cylinder block core plugs for signs of water leaks. Repair where necessary. Check also the thermostat housing, water pump, and cylinder heads for leaks.
4. If the radiator requires frequent filling, trace the cause of water loss, making allowance for a certain amount that is normally lost through the overflow pipe (as a result of water expansion).

Draining and Flushing the System

The radiator should be kept full of coolant and the level checked frequently (after every 50 hours of operation recommended). In warm weather, the radiator fluid should be a mixture of water and Mopar Rust Inhibitor; in cold weather, it should be a mixture of water and Mopar 4106784 or Prestone II anti-freeze (a 50/50 concentration; the concentration may be raised to 65% if temperatures below -37°F are expected).

The system should be completely flushed out after every 500 hours of operation. To flush the system, use the following procedure.

Caution: If the cooling system is to be drained immediately after engine operation, remove the filler cap slowly, counter-clockwise, to allow pressure to escape gradually. Do **not** fill the cooling system if the engine is overheated. This may cause the cylinder block or cylinder heads to crack.

1. Remove the radiator filler cap and open both drain taps.
2. Place the end of a water hose into the radiator. Regulate the flow of water into the radiator until it equals the outflow.

Note: When the drain taps are first opened, they may be choked with sediment. Clear them by scraping with a stiff wire.

3. Continue flushing until the outflow is clear of rust or sediment.
4. Close the drain taps and fill the cooling system.

Caution: Do not use hard water. Check with the local utility company for local water contents.

Belt Drives

Proper tension must be maintained on the crankshaft to water pump to alternator belt to prevent belt slippage, and so, prevent engine overheating. Take the belt deflection measurement while applying a 10 lb. load to the belt.

Caution: When adjusting belt tension, leverage must only be applied to the alternator drive end bracket. Leverage applied to the stator or ring end bracket will result in serious damage.

The belt should have a 1/4" deflection at midpoint between the pump and the alternator. If the belt is either too loose or too tight, adjust as follows.

1. Loosen the alternator mounting bracket pivot bolts and the adjusting strap lock screw.
2. Pull outward on the alternator until the belt is under proper tension.
3. Retighten.

Caution: Do not use a pry bar.

Frost Precautions

The cooling system should be drained if the engine is to remain idle for a prolonged period of time in freezing conditions. Drain the system as described previously and then run the engine for a few seconds to disperse any water left in the water pump unit. When the system is to be refilled again before the next engine operation, use lukewarm to cold water (mixed with anti-freeze or rust inhibitor as weather conditions dictate) to avoid cracking the cylinder heads or cylinder block. Do not fill with hot water.

Refilling or Checking of Coolant System

Caution: Caution must be observed when checking coolant level, removing plugs, radiator cap, hoses or refilling radiator to avoid burns from hot coolant or steam.

Initial Fill

1. Remove radiator cap. Remove plug or sensor from top of thermostat water box.
2. Fill with coolant to top of plug hole on thermostat water box. Replace and tighten plug or sensor.
3. Continue filling radiator with coolant to proper level in radiator.
4. Run engine until thermostat opens, indicated by hot upper hose.
5. Observe above caution, stop engine, remove radiator pressure cap and refill with coolant to proper level if necessary.

LUBRICATING SYSTEM

The engine lubricating system consists of the oil pump, full flow oil filter, and oil pan.

Periodic Inspection

The primary function of the lubricating system is to reduce the heavy amount of friction existing between the many moving parts of the engine. Therefore, the lubricating system should be checked regularly.

When servicing the lubricating system, check each of the following.

1. Oil level. This should be checked daily. Allow the engine to sit idle for five minutes or more to allow all oil to drain into the oil sump from the interior of the engine. Remove the dipstick, wipe it clean, then fully reinsert. Remove the dipstick a second time and check the level marks. The oil level should reach the "full" mark.

Caution: The oil level should not go above the "full" mark. Too much oil causes oil aeration and loss of oil pressure.

When the oil level reaches the "add oil" mark, add one quart of oil. Do not operate the engine if the oil falls below this level.

2. Oil pressure. Checking oil pressure will require an oil gauge (the C-3292 Oil Pressure Gauge Assembly is recommended, Fig. 5). With the engine at idle (cold engine), oil pressure should be 310 kPa (45 psi). With the engine at 2000 rpm and the oil temperature at 80°C (176°F), oil pressure should be 345 kPa (50 psi).

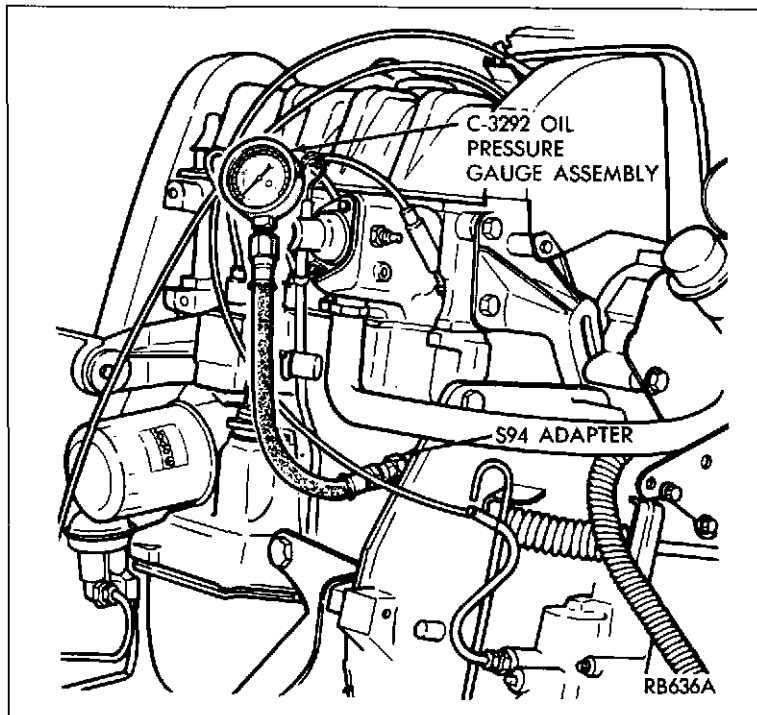


Fig. 5—Checking Oil Pressure

3. Oil filter. The oil filter should be replaced after every 100 hours of operation and more often when the engine is operated under high speed, heavy load, or in dusty conditions. To replace the filter, unscrew counter-clockwise from the base and discard. Wipe clean the filter base on the engine. Install the new filter onto the base. When the filter's rubber gasket makes contact with the filter base, tighten the filter 3/4 to 1 turn more. Run the engine and check for leaks.

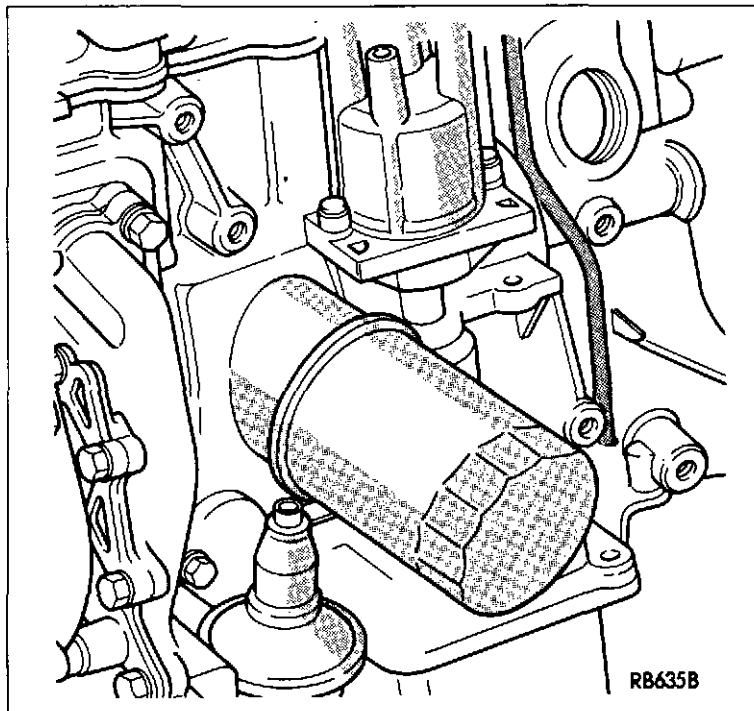


Fig. 6—Engine Oil Filter

4. Oil. The oil should be changed after every 50 hours of operation and more often when the engine is operated under high speed, heavy load, or in dusty conditions. To change the oil, use the following procedure.

- a. Run the engine until it is thoroughly warm (the oil will be less thick and will flow more easily).
- b. Turn off the engine and remove the drain plug at the bottom of the oil pan. Allow the oil to drain into a safe, disposable container.

Caution: Exposure of the skin to used engine oil can be harmful. Wear protective gloves.

- c. Refit the oil pan drain plug and refill the sump with fresh clean oil of the appropriate grade.
- d. Run the engine at idle speed.
- e. Stop the engine after a minute or two and let it stand for five minutes. Check the oil level with the dipstick.

Selection of Oils

For best performance, and to provide maximum protection for the engine under all types of operation, only those lubricants should be selected which meet the following standards.

1. They should conform to the API quality level classification "For service SF or SF/CC".
2. They should have the proper SAE grade number for the expected temperature range (see chart, Fig. 7).

To assure the purchase of properly formulated engine oils, Chrysler recommends the use of Mopar oils or an equivalent that meets Chrysler Material Standard MS-6395.

Lubricants not having both an SAE grade number and the proper API service classification shown on the container should **not** be used.

Low viscosity oils make engine starting easier in cold weather. As shown in the chart (Fig. 7), oils of the SAE 5W-20, 5W-30, or 5W-40 grade number are preferred when minimum temperatures consistently fall below 10°F (-12°C).

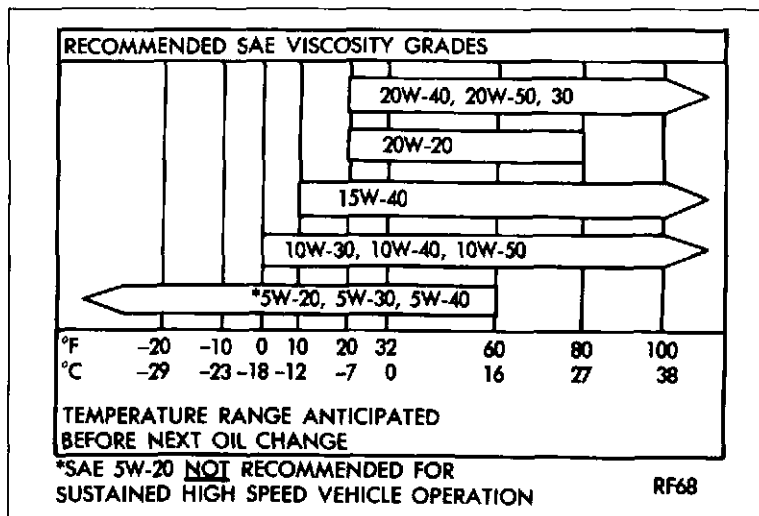


Fig. 7—Recommended Viscosity Grades

Engine Oil Identification Logo

A new logo or symbol has recently been developed to aid the owner/operator in the proper selection of engine oil.

This logo (Fig. 8) is located on the oil container top and is composed of three distinct areas.

1. The upper portion indicates the quality of oil, such as "SF", "SF/CC", or "SF/CD".
2. The center portion, used by most oil marketers, shows the SAE viscosity grade of oil, such as SAE 10W-30.
3. The lower portion reads "Energy Conserving" if applicable to that oil. "Energy Conserving" indicates that the oil offers fuel economy benefits in gasoline engines.

Energy Conserving Engine Oils

There are many engine oils currently available that could increase the fuel economy of your engine. They are marketed as "Energy Conserving", "Fuel Savings", "Fuel Efficient", "Gas Savings", etc. Oils of this type are now identified on the lower portion of the new engine oil identification logo described above.

In addition to selecting the proper API quality classification and SAE viscosity grade, use of energy conserving type engine oil formulations is recommended.

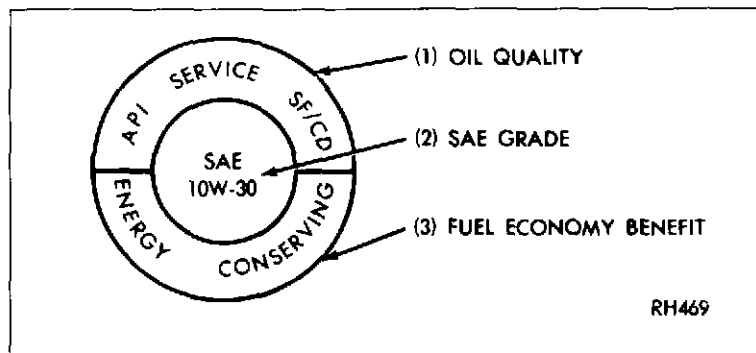


Fig. 8—Oil Container Logo

Oil Consumption

The engine is fitted with chromium plated upper compression rings which increase the life of the cylinder bores. Due to the hardness of these rings, a considerable amount of engine operation time is required before they are fully bedded in. Therefore, a higher quantity of oil may be

consumed during the first 500 hours of engine operation. However, the consumption of a certain amount of engine oil is desirable in modern high performance engines in order to ensure adequate lubrication of the upper part of the cylinder bores and prevent unnecessary wear.

Note: Conversion from gasoline to L.P. fuel should only be made after the break-in period ends. This will allow the proper seating of the piston rings to cylinder walls and will prevent excess oil consumption after the conversion.

Transmission

The transmission contains a separate lubricating system of its own which requires very little service. The transmission fluid should be changed after every 500 hours of engine operation. To change the transmission fluid, use the following procedures.

For Automatic Transaxle Model A-413: Remove the transmission oil pan and allow the transmission to drain completely. Clean the oil pan. Using RTV to form a gasket, install and tighten the oil pan to 165 in. lbs.

Caution: The torque converter is not equipped with a drain plug. No attempt should be made to drain the converter.

Refill the transaxle to the proper level with the appropriate fluid.

For Manual Transaxle Models A-460 (4 Spd.) and A-565 (5 Spd.): Remove the pan cover on the side of the differential and allow the transmission fluid to drain. Clean the magnet and the inside surface of the pan cover with a clean, dry cloth. Using RTV sealant to form a gasket, replace the differential pan cover. Refill the transaxle to the proper level with the appropriate fluid.

Selection of Lubricant

Use only fluids of the type labeled Dexron II Automatic Transmission Fluid. Mopar Dexron II Part Number 4271243 Automatic Transmission Fluid is recommended.

FUEL SYSTEM

The fuel system consists of a fuel pump, fuel lines, fuel filter, carburetor, and carburetor air cleaner. Gasoline may be leaded or unleaded regular, 85 octane or higher.

Periodic Inspection

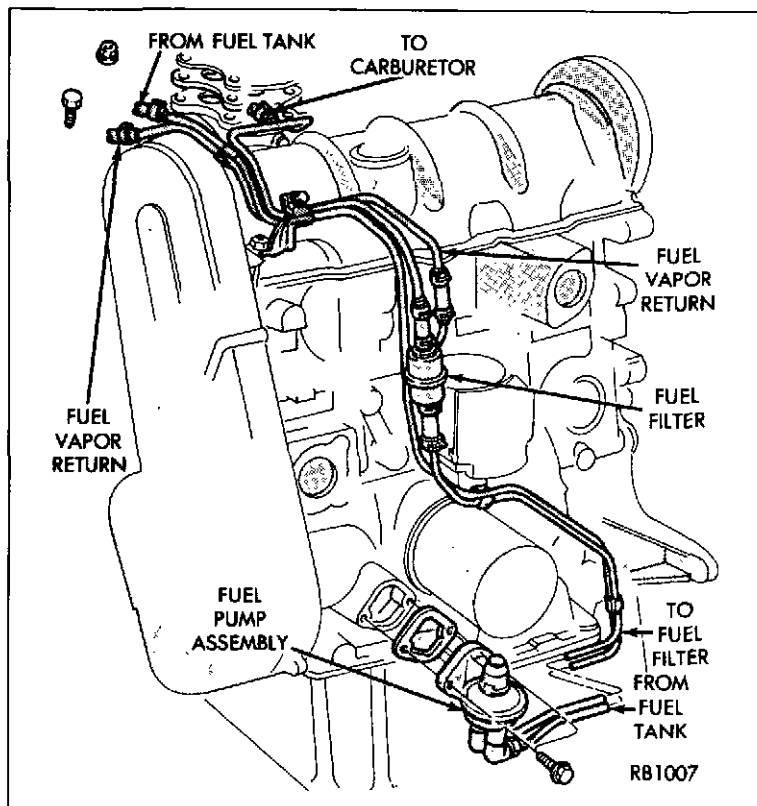
An inspection of the fuel system should be made after every 50 hours of operation. Check the following.

1. Fuel pipe line. Check for signs of chafing, fracture, or other damage. Check pipe unions for tightness.
2. Fuel pump. Check for leaks.
3. Carburetor. Thoroughly clean all metal parts in solvent or Deepclene. Blow out all parts and channels with pressurized air. Inspect for damage, excessive wear, burrs or warpage. Do not clean non-metallic parts in solvent or Deepclene.
4. Carburetor air cleaner. The air cleaner should be cleaned after every 50 hours of operation and replaced after every 500 hours (cleaned and replaced more frequently if operated in dusty conditions).

To Clean: Remove the paper element from the cleaner assembly and gently blow out the dirt with an air hose directed from the inside out. Keep the hose nozzle two inches away from the air cleaner to avoid damage. Do not tap or immerse the element in liquid. Wash the cleaner cover and body with cleaning solvent (such as kerosene) and wipe dry. Replace the paper element, center it, and secure firmly.

To Replace: Remove the retaining screw and washer and lift off the top cover. Lift out the paper filter element and remove the two rubber sealing rings. Wipe out the top cover and bottom plate with a clean cloth to ensure that no foreign matter is allowed to enter the carburetor air intake. The hole in the bottom plate must be clear. Check the condition of the rubber sealing rings and replace if necessary. Place the new paper element in position on the bottom plate, ensuring that the sealing rings are correctly fitted, one on either side of the element. Replace the top cover, aligning the slot with the locating peg fitted to the bottom plate. Fit the retaining screw with its washer.

5. Fuel filter. The fuel filter should be replaced after every 500 hours of operation. To replace, use the following procedure.
 - a. Place some absorbent rags under the filter (it will be full of gasoline when removed).
 - b. With a pair of pliers, expand the clamp on one end of the filter, then slide the clamp down past the point at which the filter pipe extends into the rubber hose. Do the same with the other clamp.
 - c. Gently twist and pull the hoses away from the filter pipes.
 - d. Remove and discard the filter.
 - e. Install a new filter onto the hoses, slide the clamps back into place, then run the engine at idle and check for leaks.



**Fig. 9—Engine Compartment Fuel Line Routing
2.2L Engine**

Fuel Pump

The fuel pump should supply .95 liter (one quart) of fuel in one minute or less at engine idle speed. To test the fuel flow, disconnect the fuel line at the carburetor and, while cranking the engine with the ignition off, discharge the fuel into a suitable container. The amount of gasoline discharged for five pulsations of the pump should be 90 to 100 cubic centimeters (approximately 1/5 pint).

If the fuel pump fails to supply fuel properly to the carburetor, the following tests should be made before replacing it.

1. Pressure test.
 - a. Insert a "T" fitting in the fuel line at the carburetor (Fig. 10).
 - b. Connect a 150 mm (6 inch) piece of "T" fitting and gauge C-3411-A. The hose must not exceed 150 mm (6 inches). A longer hose may collect fuel, and the additional weight of the fuel would result in an inaccurate reading.
 - c. Vent the pump for a few seconds to relieve any air trapped in the fuel chamber. If this is not done, the pump will not operate at full capacity and a low pressure reading will result.
 - d. Connect a tachometer, then start the engine and run at idle. The reading should be 4.5 to 6 psi and should remain constant or return to zero slowly when the engine is stopped. An instant drop to zero indicates a leaky outlet valve. If the pressure is too low, a weak *diaphragm main spring or improper assembly of the diaphragm* may be the cause. If pressure is too high, the main spring may be too strong or the air vent may be plugged.

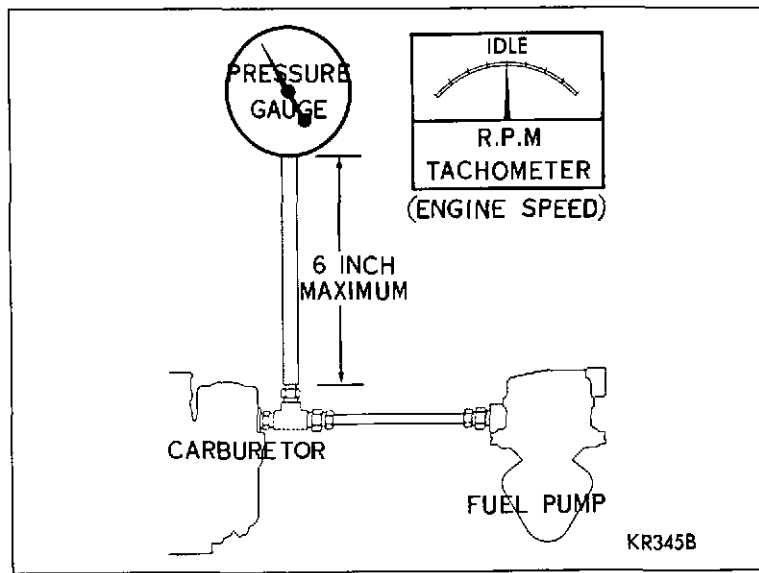
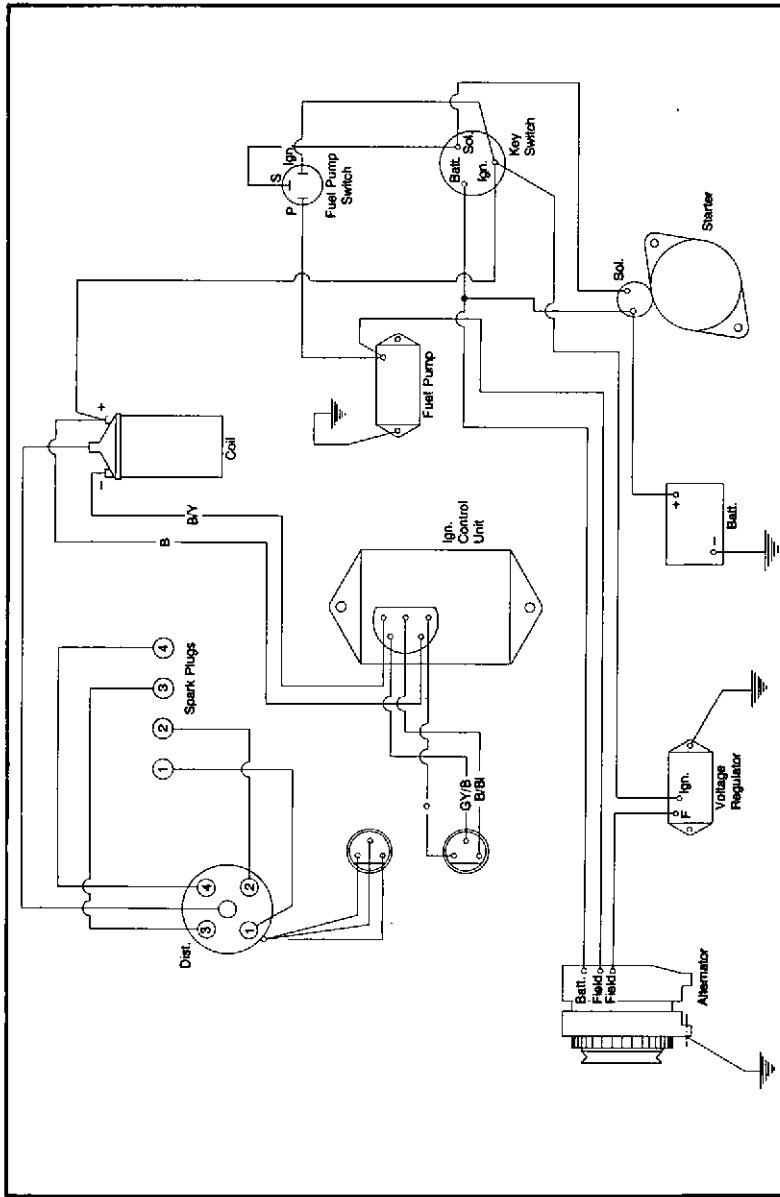


Fig. 10—Pressure Testing Fuel Pump

2. Vacuum test. The vacuum test should be made with the fuel line disconnected from the carburetor. This allows the pump to operate at full capacity. The minimum vacuum gauge reading should be -34 kPa (10 inches of vacuum) at idle.
3. Inlet valve test. To test the inlet valve, connect a vacuum gauge on the inlet fitting while the line is disconnected.
 - a. Start the engine or turn over with the starter motor.
 - b. There should be a noticeable vacuum present without any blowback.
 - c. If blowback is present, the inlet valve is not seating properly and a new pump should be installed.

Fig. 11-Wiring Diagram



ELECTRICAL SYSTEM

The electrical system consists of three component systems:

1. the Ignition System
2. the Charging System
3. the Starting System

Periodic Inspection

Caution: Before making any electrical inspections or tests, the engine compartment should be thoroughly aired out to remove all inflammable fumes.

A general inspection of the electrical system should be made after every 50 hours of operation. Check for the following.

1. All terminals should be clean, tight, and free from damp.
2. Cables should be clean of oil or gas (oil or gas saturation will cause rapid deterioration).
3. Inspect cables for signs of rubbing or vibration.
4. Inspect insulation. Any damage must be corrected immediately.
5. All ground connections such as battery to frame, lamps to frame, etc. should be clean and tight.

Caution: Before removing any electrical unit, disconnect one of the battery terminals to prevent short-circuiting, which could result in burned out wiring and equipment.

IGNITION SYSTEM

The ignition system consists of the distributor, ignition coil, high tension leads, and spark plugs.

Periodic Inspection

The ignition system should be inspected after every 100 hours of operation. Check the following elements.

1. Distributor cap. Remove the distributor cap and inspect the inside for flashover, cracking of the carbon button, cracking of the cap, and burned, worn terminals. If any of these conditions are present, the distributor cap or cables should be replaced.

If the cap is greasy or dirty or has a powder-like substance on the inside, it should be cleaned with a solution of warm water and mild detergent. Scrub with a soft brush, thoroughly rinse, and dry with a clean, soft cloth.

Light scaling of the terminals, caused by the arcing of the spark from the rotor, can be cleaned with a sharp knife. If heavy scaling is present, replace the distributor cap.

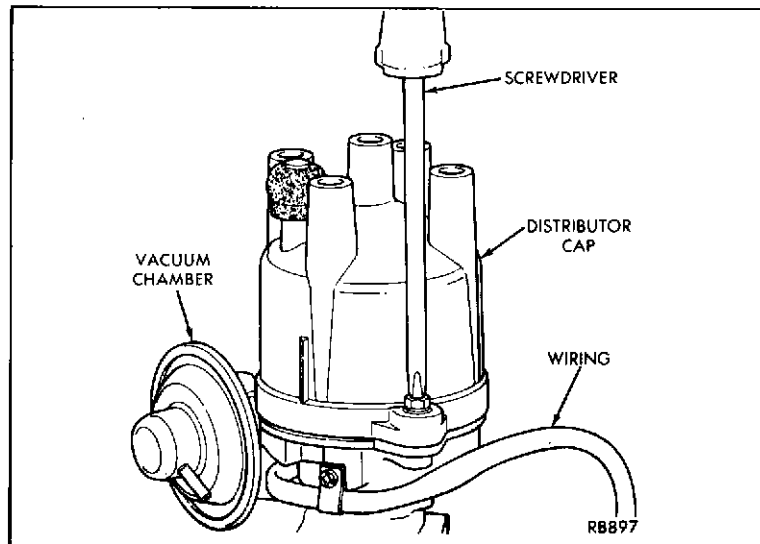


Fig. 12-Distributor Cap Hold-Down Screws

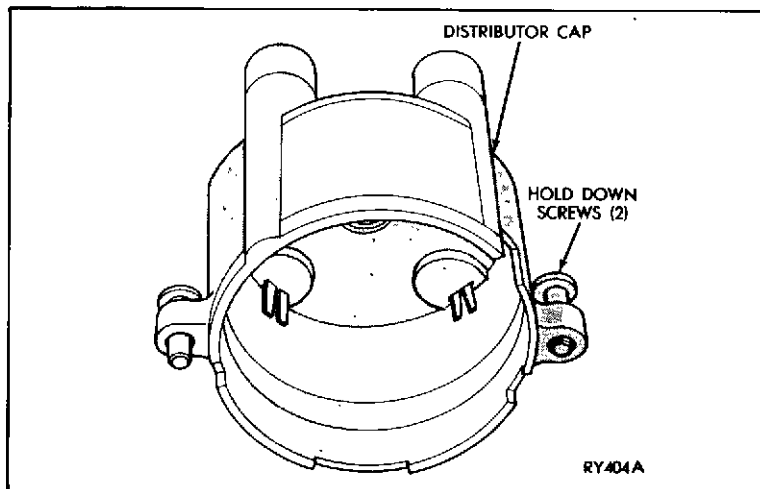


Fig. 13-Distributor Cap

2. Rotor. Inspect the rotor for cracks, excessive burning of the tip, or improper tension of the spring terminal. If any of these conditions are present, the rotor should be replaced.

Light scaling of the tip can be cleaned with a sharp knife. However, if heavy scaling is present, the rotor should be replaced. Be very careful not to bend the rotor blades. Also, scrape the ground strap on the inside surface for a positive ground of shutter blade to shaft.

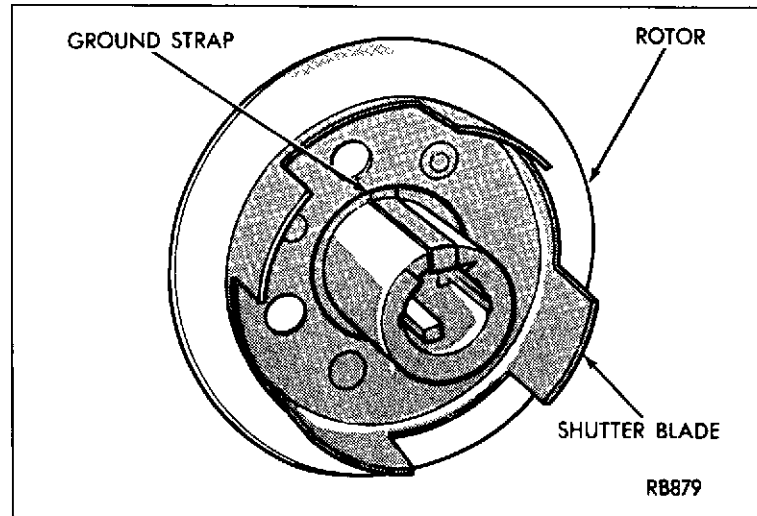


Fig. 14—Hall Effect Rotor

3. Spark plugs.

The spark plugs should be cleaned and adjusted after every 500 hours of operation and replaced after every 1000 hours of operation.

Inspection: Remove the spark plugs (grasp the cable at the cable cap) and check for the following.

- a. Cracked or damaged threads or insulator.
- b. Worn electrodes.
- c. Damaged or worn gasket.
- d. Condition of burned electrode and amount of carbon deposit.

Cleaning: A variety of conditions can dirty the spark plugs and so require spark plug cleaning.

- a. Cold fouling or carbon deposits (Fig. 14). This is a dry, black appearance (fuel carbon) and is caused by a too-rich fuel/air mixture, possibly the result of a faulty choke, clogged air cleaner, improper carburetor idle adjustment, or a dirty carburetor. However, if only one or two plugs in a set are fouled, inspect the valve guide seals for wear or improper installation and check for faulty ignition cables. The condition may also be a result of prolonged engine operation at idle.

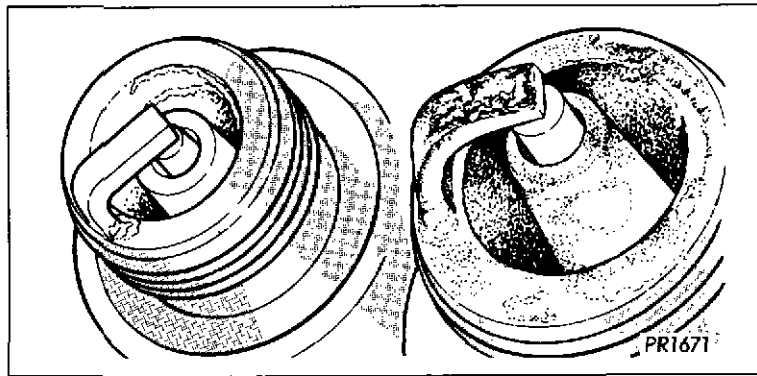


Fig. 15—Normal and Cold Fouling

- b. Wet fouling (Fig. 15). This condition tells you that the plug has drowned in excess oil. In an old engine, worn rings or excessive cylinder wear are probable causes. Remember that break-in fouling of new engines may occur before normal oil control is achieved. In new or recently overhauled jobs, such fouled plugs may be cleaned and reinstalled.

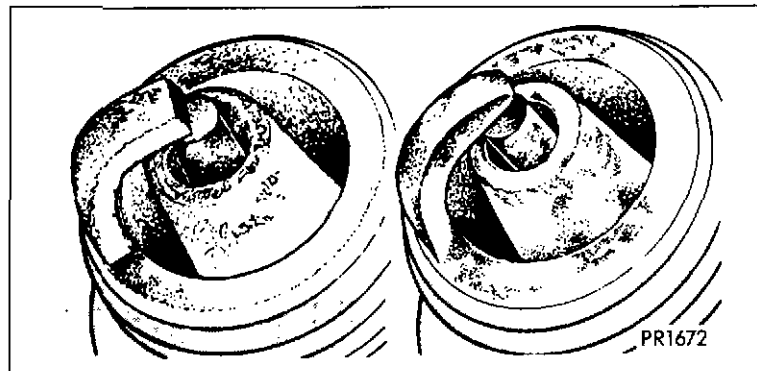


Fig. 16—Wet Fouling and Overheating

- c. Overheating (Fig. 15). This condition is indicated by a white or light gray insulator which appears "blistered". When this condition exists, electrode wear rate will be considerably in excess of 0.025 mm (0.001 in.)/1600 km (1000 miles). Over-advanced ignition timing, detonation, and cooling system stoppages are probable causes.
- d. Oil or ash incrustation (Fig. 16). If one or more plugs are oil or ash incrustated, search for the cause of oil entry into the combustion chamber and repair.
- e. Lead deposits are the result of using leaded gasoline.

Clean the spark plugs by scrubbing with an abrasive cleaner, filing with a spark plug file, or cleaning with a spark plug cleaning device.

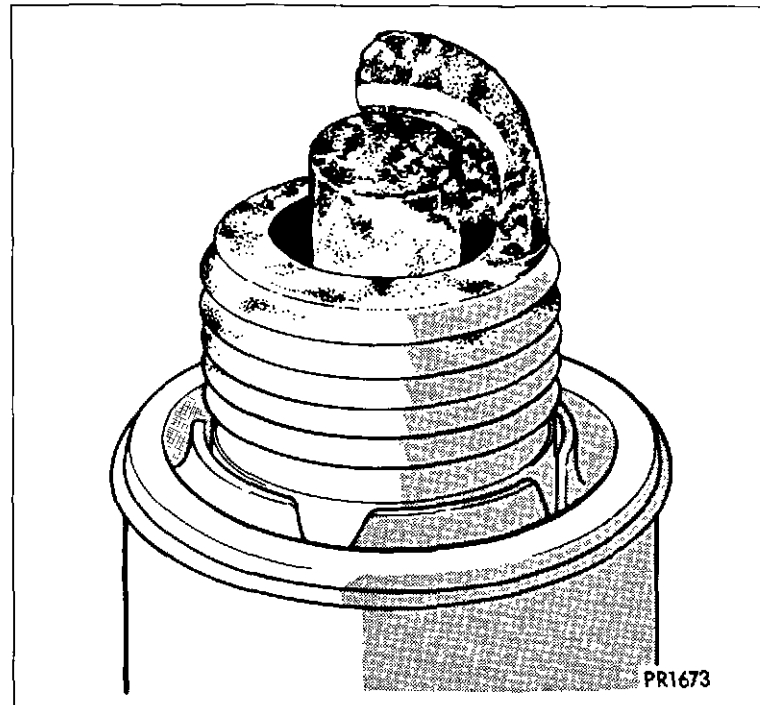


Fig. 17—Oil or Ash Incrusted

Regapping: Check the plug gap with a feeler gauge. If the gap is not within the specified limit, file the center electrode flat and make the gap adjustment by bending the ground (side) electrode. Never bend the center electrode. The gap should be .035 in. (0.9 mm).

Installing: To install the spark plugs, clean the dirt and grit from the spark plug seats. Install the spark plugs and tighten to 27 N-m (20 ft. lbs.). When installing new spark plugs, the following spark plug type is recommended.

Spark Plug Manufacturer — Champion/(Mopar) Chrysler
Champion - RN12YC (P/N 5213693)

Model and Part Number — Mopar - 65 PR (P/N 5213693)

4. Spark plug wires. Check the high tension cable connections for good contact at the coil and distributor cap towers and at the spark plugs. Terminals should be fully seated. The nipples and spark plug covers should be in good condition. Nipples should fit tightly on the coil cap towers and the spark plug covers should fit tightly around

the spark plug insulators (Fig. 17). Loose cable connections will corrode, and thus increase the resistance and permit water to enter the towers, causing ignition malfunction. To maintain proper sealing between the towers and nipples, cable and nipple assemblies should not be removed from the distributor or coil towers unless nipples are damaged or cable testing indicates high resistance or broken insulation.

If Plug wires do not pull from the distributor cap, they must be released from inside.

Clean high tension cables with a cloth moistened with a non-flammable solvent and wipe dry. Check for brittle or cracked insulation.

When testing the secondary cables for punctures and cracks with an oscilloscope, follow the instructions of the equipment manufacturers.

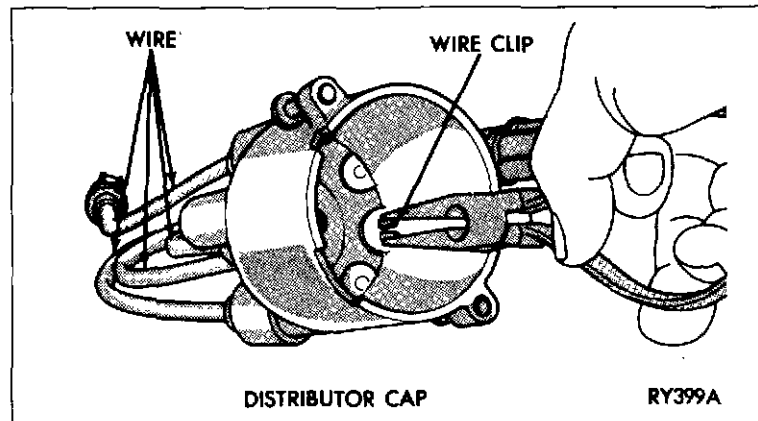


Fig. 18—Removing Spark Plug Wires

5. Ignition coil. Clean the ignition coil and coil terminals and check the exterior for cracks. Replace if necessary. Check for carbon deposits or corrosion in the high tension cable inserting hole. If this is present, the coil must be replaced. Measure the resistance of the primary coil, secondary coil, and external resistor. If the reading is not within the specified resistance, replace the ignition coil.
6. High tension cable.

Caution: When removing the high tension cable, grasp the cable rubber cap.

When inspecting the high tension cable, be careful not to bend it to avoid breaking the conductor. Check the cable terminals. A corroded terminal should be cleaned. A broken or distorted cable should be replaced. Check the resistance of each cable between both ends. If it exceeds the limit (less than $22\ \Omega$), replace the cable.

Ignition Timing

To obtain maximum engine performance, the distributor must be correctly positioned on the engine to give proper ignition timing. To test the ignition timing, use the following procedure.

1. Connect a suitable power timing lamp (Fig. 18) to number one cylinder (refer to the equipment manufacturer's instructions for the correct connecting procedure), or a suitable magnetic timing unit (use a 10° offset when required).

Caution: Do not puncture cables, boots, or nipples with test probes. Always use proper adapters. Puncturing the spark plug cables with a probe will damage the cables. The probe can separate the conductor and cause high resistance. In addition, breaking the rubber insulation may permit secondary current to arc to ground.

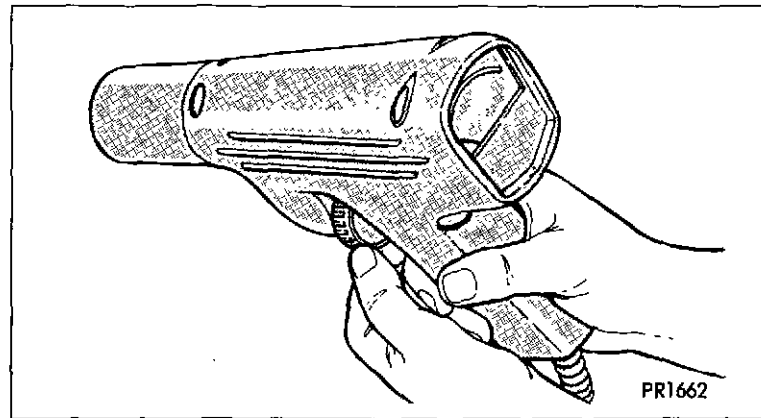


Fig. 19—Adjustable Timing Lamp

2. Connect the red lead of the test tachometer unit to the negative primary terminal of the coil and the black lead to a good ground.
3. Turn the selector switch to the appropriate cylinder position.
4. Start the engine and run until operating temperature is reached.

5. With the engine at normal operating temperature (off fast idle), momentarily open the throttle and release to make sure there is no bind in the linkage and that the idle speed screw is against its stop.
6. Read the engine rpm on the 1000 rpm scale. If the engine rpm is at or below the curb idle rpm, proceed to the next step. If it is higher, turn the idle speed screw until the correct curb idle rpm is reached.
7. Aim the power timing lamp at the front crankshaft pulley (Fig. 19) or read the magnetic timing unit. If flash occurs when the timing mark is before the specified degree mark, timing is advanced. To adjust, turn the distributor housing in the direction of rotor rotation. If flash occurs when the timing mark is after the specified degree mark, timing is retarded. To adjust, turn the distributor housing against the direction of rotor rotation. If timing is within ± 2 degrees of the correct timing, proceed to step 9. If timing is outside the specified tolerance, proceed to the next step.

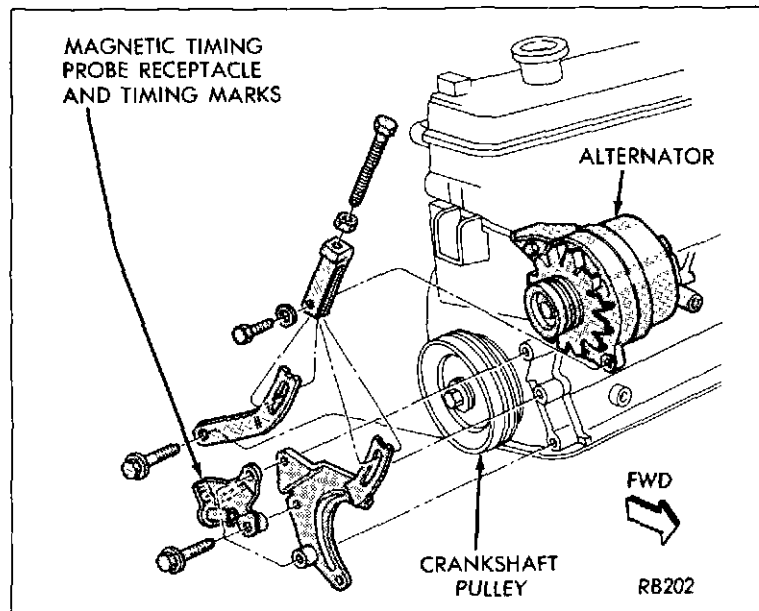


Fig. 20—Magnetic Timing Probe Receptacle

8. Loosen the distributor hold-down arm screw just enough so that the distributor housing can be rotated in its mounting (Fig. 20). Turn the distributor housing until the specified value is reached. Tighten the hold-down arm screw and recheck the timing. When timing is acceptable, recheck the curb idle rpm. If the engine rpm is not at or

below the curb idle rpm, reset the engine rpm and recheck the timing. Repeat the above until both engine rpm and timing rpm are acceptable.

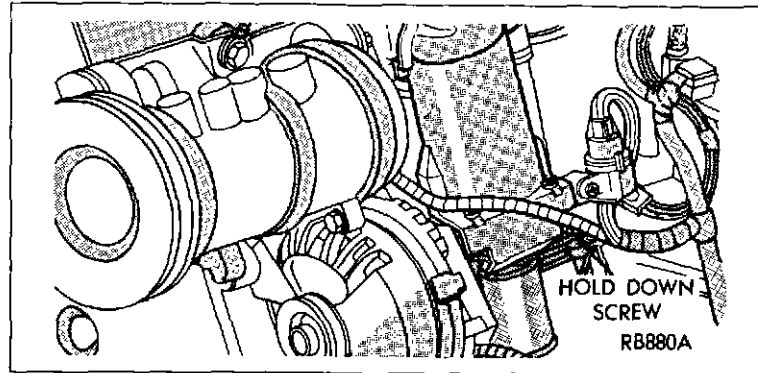


Fig. 21—Distributor Hold Down

9. Unplug and reconnect the vacuum hose to the distributor.
10. If the curb idle speed is not within ± 50 rpm of the correct value, readjust the curb idle rpm. Do **not** reset the timing.
11. Turn the engine off. Remove the timing light or magnetic timing unit and tachometer.

Electronic Ignition Test

If the electronic ignition is suspected of malfunction, the following test may be performed.

Caution: Be sure there are no fuel leaks before performing this test.

1. Remove the high voltage cable (Fig. 21) from the center tower of the distributor and hold the end of the cable at a point 5 to 10 mm (3/16 to 3/8 in.) away from a good engine ground. Crank the engine with the starter and look for a spark at the coil high voltage cable.

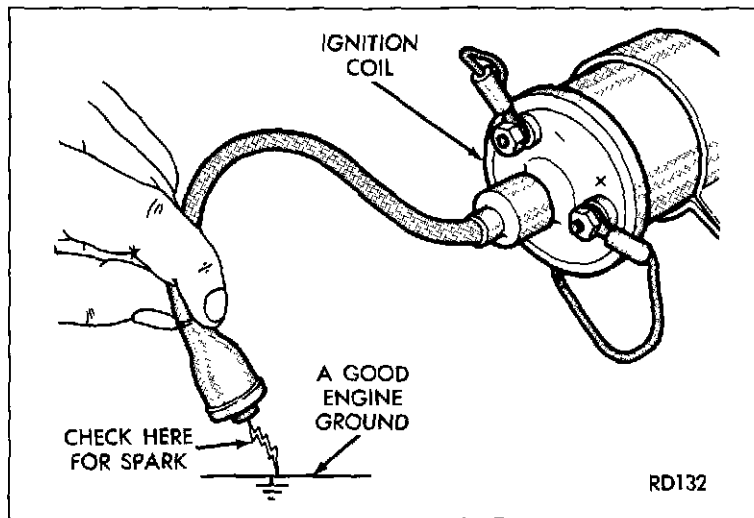


Fig. 22—Checking for Spark

2. If there is a spark at the coil secondary wire, it must be constant and bright blue in color. If it is, continue to crank the engine; and, while slowly moving the coil secondary wire away from the ground, look for arcing at the coil tower. If arcing occurs, replace the coil. If spark is weak or not constant or if there is no spark, proceed to step 3. If spark is good or there is no arcing at the coil tower, the ignition system is producing the necessary high secondary voltage. However, make sure that this voltage is getting to the spark plugs by checking the distributor rotor, cap, spark plug wires, and spark plugs.
3. Turn the ignition switch on and measure the voltage at the negative coil terminal. The voltage should be the same as the battery voltage. If there is no voltage, check for an open circuit in the coil or wiring.
4. With the ignition engaged, use the special jumper wire and momentarily touch the negative (-) terminal of the coil to a ground while holding the coil secondary wire 1/4 inch from a good engine ground. Spark should occur.
5. If no spark occurs, check for voltage at the positive (+) terminal of the coil with the ignition engaged. If proper voltage is obtained, the coil is defective and should be replaced. If proper voltage is not obtained, check the wiring and connections.

CHARGING SYSTEM

The charging system consists of the battery, alternator, and voltage regulator.

Periodic Inspection

1. Battery. The battery is maintenance free. Check leads for tightness.

Note: 1. The battery should never be disconnected while the engine is running.

2. The battery should be disconnected if either electric arc welding or boost charging operations are to be carried out.

3. If it becomes necessary to use a slave battery to aid engine starting, always make sure that the jumper leads are connected positive to positive and negative to negative (or ground).

2. Alternator. The alternator requires very little maintenance. However, occasionally check the following.

a. Check the security of mounting nuts and bolts.

b. Check electrical leads and cables for security and chafing.

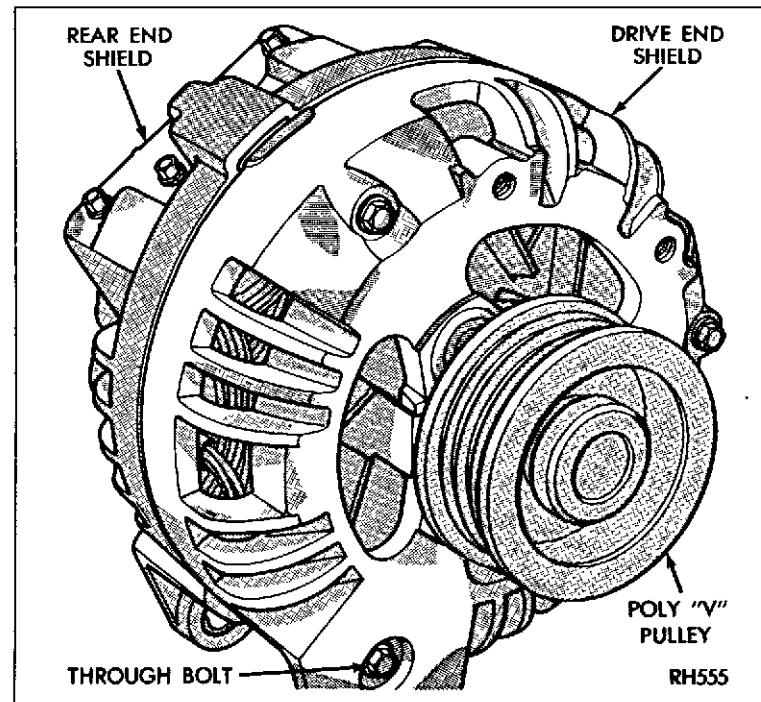


Fig. 23—Alternator Assembly (Front View)

- c. Wipe away any dirt or oil which may collect around the slip ring end cover ventilating apertures.
- d. Check the tension of the drive belt and inspect for any wear (for testing belt tension, see pages 9, 11).

The alternator bearings are permanently lubricated and do not require lubrication.

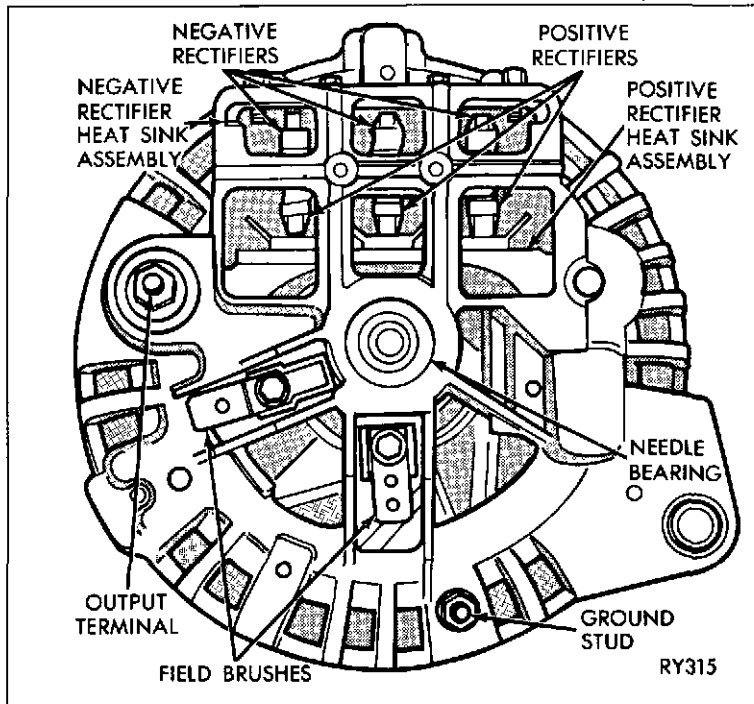


Fig. 24—Alternator Assembly (Rear View)

3. Regulator. The voltage regulator has no moving parts and therefore requires little maintenance. Occasionally check the mounting bolts for tightness.

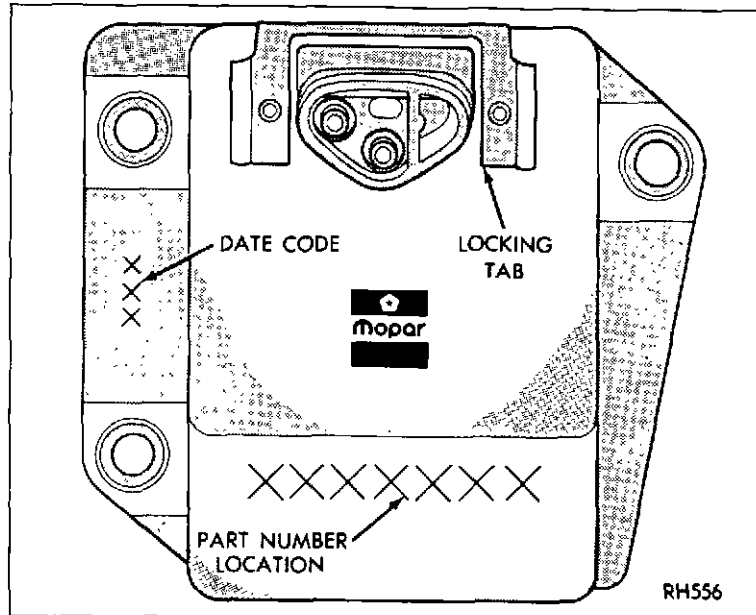


Fig. 25—Voltage Regulator

STARTING SYSTEM

The starting system consists of the starter motor and starter motor solenoid.

Periodic Inspection

The starting system requires little maintenance. Occasionally inspect the starter motor for loose brush holders, worn or corroded brushes, or corrosion on the commutator. To test, disconnect the battery cable at the solenoid switch and touch it firmly to the solenoid starter terminal. The starter motor should operate. If the starter motor fails to operate and a heavy arc occurs when the cable touches the solenoid starter terminal, a mechanical lock-up of the motor or pinion, or a grounded condition in the motor may be the cause. Failure of the starter motor to operate and no arc in the preceding test indicates poor brush contact or an open circuit in the motor winding. Repair or replace the starter motor as required.

STORAGE PREPARATION

When the engine is to be stored or removed from operation for an extended period of time, the following precautions should be taken to prevent rust accumulation, corrosion of bearing and mating surfaces within the engine, and gum formation in the fuel system.

1. Drain the lubrication oil from the engine and refill it with 2-1/2 quarts of rust preventive oil.
2. Clean the engine of dirt and oil accumulation. Touch up any bare surfaces that may rust.
3. Clean off electrical components.
4. Add one quart of special rust preventive oil to each five gallons of gasoline in the fuel tank.
5. Drain the fuel tank and operate the engine until the carburetor runs dry.

Note: The purpose of this operation is to aid in preventing the carburetor from being contaminated with gums that normally form in the gasoline as a result of its prolonged exposure to the oxygen in the air. Failure to take this precaution generally results in carburetor flat spots or other carburetor malfunctioning.

6. Remove the spark plugs and pour two ounces of rust preventive oil into each spark plug opening. Turn the engine over four or five revolutions with the starter motor to distribute the rust preventive oil on the cylinder walls. Install the plugs.
7. Remove the cylinder head covers. Using a clean paint brush, coat the rocker arms, the rocker arm shafts, the valve springs, the push rods, and the valve stems with special rust preventive oil.
8. Drain the cooling system, including both sides of the engine block.
9. Remove the carburetor air cleaner, the oil filler pipe air cleaner, and the outlet ventilator pipe cleaner. Seal the openings with masking or adhesive tape. Also seal the exhaust outlet opening in the exhaust manifold or exhaust pipe.
10. Replace the oil filter.
11. Remove the storage battery and store it in a cool, dry place. See that the battery is fully charged and keep it fully charged during the idle period.
12. Protect the engine with a waterproof cover if it is exposed to the weather.
13. Make periodic inspections to see that the engine is properly stored and that all seals are intact.

14. The rust preventive oil should be drained prior to putting the engine back into operation. The crankcase should then be filled with the recommended engine oil for the operating conditions to be encountered.
15. If the engine is to be stored for several months, repeat item six every 3 months using one ounce of rust preventive oil in each cylinder.

SERVICE NOTES

This manual is not intended as a service repair manual. Its purpose is to provide the owner/operator with those instructions necessary for the efficient maintenance of the engine. If repair work not detailed in this manual becomes necessary, it is strongly recommended that the owner/operator contact a Chrysler dealer who is continually being updated concerning the latest technical developments and repair methods involving the engine.

In order to provide the best possible service, the Chrysler Dealer Organization, located worldwide, forms a link between the owner/operator and the factory. All problems related to the servicing of the engine are dealt with through this organization which is backed by the Chrysler Factory Service Division.

For further information or advice concerning the engine, contact a Chrysler dealer. You may also write or call the following.

Chrysler Corporation
Marine/Industrial Division
P.O. Box 2718
Detroit, MI 48288
(313) 497-9074

Ordering Parts

Orders for parts should be placed with the nearest Authorized Dealer. Authorized Dealers have complete parts information and can, in most cases, promptly supply your parts requirements from their inventory. If you need the location of your nearest Authorized Dealer, contact the Chrysler Corporation Marine/Industrial Division at the above address.

When ordering parts, it is necessary to properly identify the engine. Always give the model, type, and serial number. This information is stamped on the identification plate (located on the rear side of the cylinder head) and should be given in all parts orders or communications. The number stamped on the front end of the cylinder block just in back of the water pump is a manufacturing code and should not be used for the purpose of identification. (See also pages 2-4 for locating the identification numbers.)

TROUBLESHOOTING

A good rule to follow when troubleshooting is to make only one adjustment at a time. Locate the cause of failure or irregular operation by the process of elimination.

ENGINE

Most damage to the engine block itself will probably require the service of a Chrysler Industrial mechanic. However, a common engine problem, "tappet noise", is easily repaired.

Lash Adjuster (Tappet) Noise Diagnosis of Hydraulic Lifters

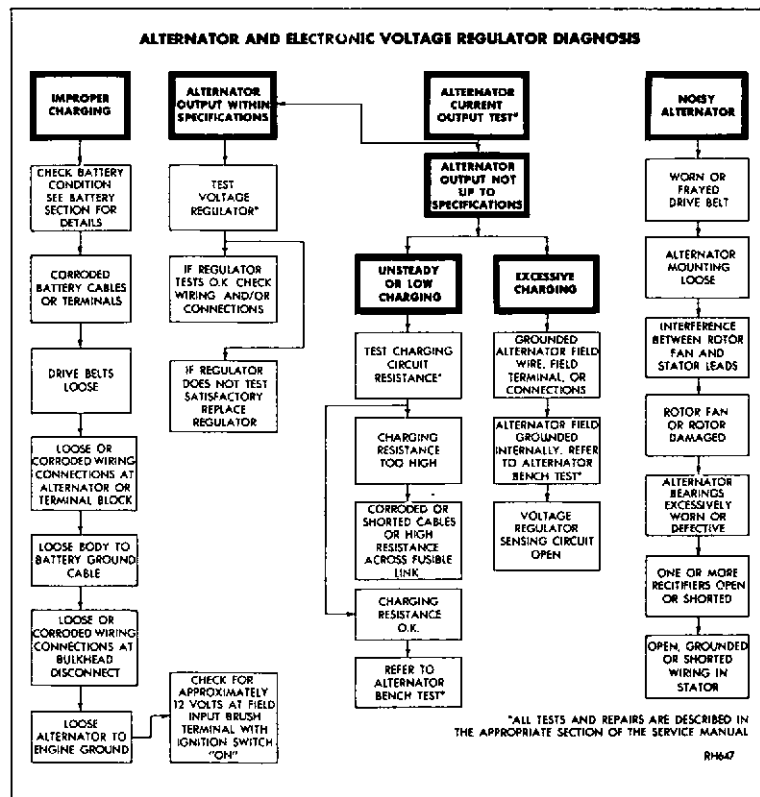
A tappet-like noise may be produced from several items. Check the following.

1. Engine oil level too high or too low. This may cause aerated oil to enter the adjusters and cause them to be "spongy".
2. Insufficient running time after rebuilding the cylinder head. Low speed running up to 1 hour may be required.
3. Low oil pressure.
4. Air ingested into the oil due to broken or cracked oil pump pick up.
5. Worn valve guides.
6. Rocker arm ears contacting valve spring retainer.
7. Rocker arm loose (i.e. adjuster stuck or at maximum extension and still can not contact the rocker arm socket).
8. Faulty lash adjuster.
 - a. Check for sponginess while still installed in the cylinder head. Depress the part of the rocker arm just over the adjuster. Normal adjusters should feel very firm. Spongy adjusters can be depressed to the bottom position easily.
 - b. Remove the suspected lash adjusters and disassemble. Do not interchange parts and make sure that care and cleanliness be exercised in the handling of parts.
 - c. Clean out dirt and varnish with solvent.
 - d. Reassemble with engine oil (do not re-use spring clips).
 - e. Check for sponginess.
 - f. If still spongy, replace with a new adjuster.

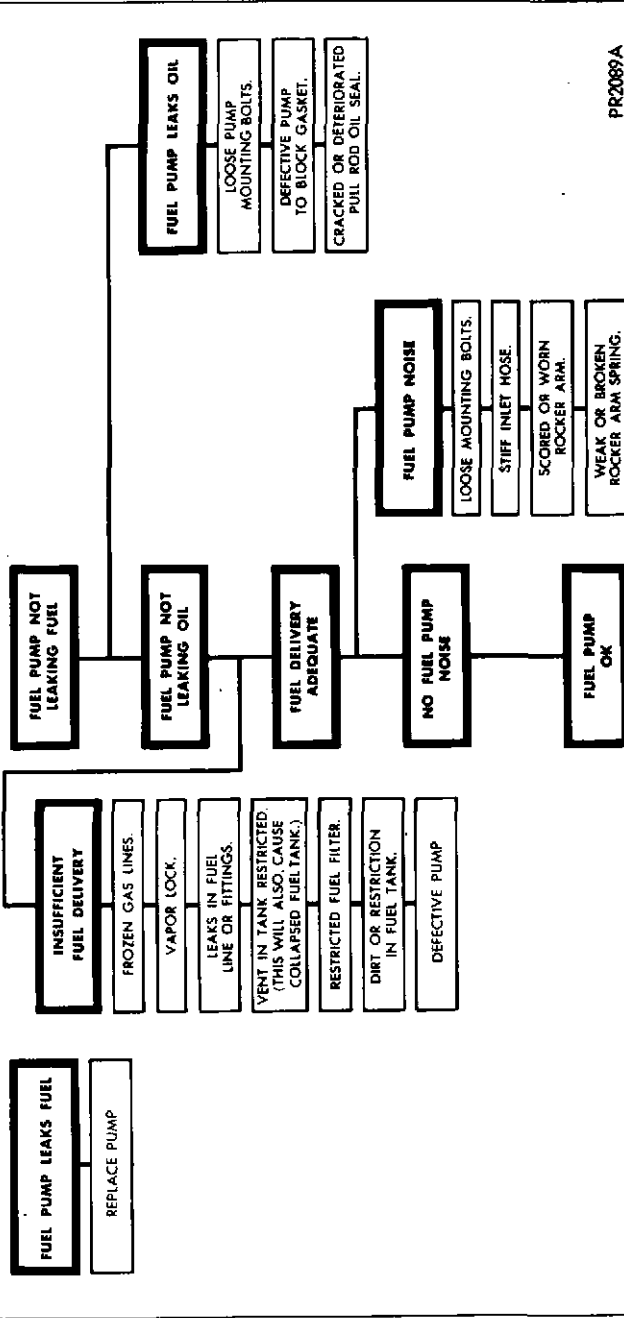
LUBRICATING SYSTEM

With regular maintenance, few lubricating system problems should arise.

1. Low oil pressure. Check for a plugged oil filter. Replace if necessary. Check for oil leaks and repair where necessary.
2. Excessive oil consumption. If this occurs during the break-in period, it is probably a normal condition. If excessive oil consumption persists, check for oil leaks.



FUEL PUMP DIAGNOSIS (MECHANICAL)



PR2089A

STARTING SYSTEM

1. The starter will not turn the engine.
 - a. The battery terminals are loose or corroded. Clean the terminals and clamps or replace if necessary. Tighten the clamps securely. Apply a light film of vaseline to the battery terminals after the clamps are tightened.
 - b. The battery is not fully charged. Check battery specific gravity. Full charge reading is 1.260 +.015 or -.005. If it is under 1.220, the battery needs recharging.
 - c. The flywheel is frozen. Turn the engine flywheel with a suitable flywheel turning tool (freeze-up may be due to improper storage).
 - d. The starter switch is defective. Replace.
 - e. There is an open circuit in the wiring. Test all wiring. Repair or replace as necessary.
 - f. The starter does not operate. Inspect the starter motor for loose brush holders, worn or corroded brushes, or corrosion on the commutator. Repair or replace.
2. The starter turns but the drive pinion does not engage.
 - a. The starter clutch is slipping. Replace the drive.
 - b. There are broken teeth on the flywheel drive gear. Replace the flywheel ring gear (this will probably require the service of a mechanic).
 - c. The armature shaft is rusted, dirty, or dry due to lack of lubrication. Clean and lubricate.
3. The solenoid plunger vibrates back and forth when the starter switch is engaged.
 - a. The battery is low. Recharge or replace the battery.
 - b. There is faulty wiring. Repair.
 - c. Lead or connections are broken inside of the solenoid switch cover. Repair or replace as necessary.
4. The starter operates but will not disengage when the starter switch is released.
 - a. The starter switch is defective. Replace.
 - b. The solenoid is defective. Replace.
5. The starter pinion jams or binds.
 - a. The starter mounting is loose or misaligned. Check to see that the nuts holding the starter on the housing studs or attaching screws are tight. Loose attaching parts will cause misalignment of the starter pinion with the flywheel.
 - b. There are broken or chipped teeth on the flywheel ring gear. Replace the flywheel.

6. The starter will turn the engine but the engine will not start.
 - a. There is dirt and moisture on the ignition wires and distributor cap. Clean the distributor cap and coil. Check for cracks, arcing at the distributor cap contacts, a burned rotor, or corroded terminals. Check that the spark plug and coil cable terminals are fully seated and that the nipples fit tightly on the cap towers and around the cables. Replace any cracked or shorted cables.
 - b. The distributor contact points are dirty or corroded. Clean the points and check for excessive pitting and worn surfaces. If blue oxide is present on the contacts, this is an indication that oil or grease has reached the contact surfaces and the contacts need to be replaced. Remove the rotor and wipe all grease from the surface of the breaker cam. Apply a light film of new Mopar Cam Lubricant, Number 1473595 on the breaker cam only. Keep oil and grease away from the breaker points. Install the contact points. The contact gap should be .014 to .019 inch. Check breaker spring tension. It should be 17 to 20 ounces.
 - c. The spark plugs are fouled. Clean, dry, and regap the spark plugs (see pages 28-31). Adjust the carburetor.
 - d. The condenser is bad. Replace.
 - e. The timing is off. Readjust the timing (see pages 33-35).
 - f. There is dirt or water in the fuel line or carburetor. Flush the fuel system.
 - g. The float level setting is incorrect. Adjust.
 - h. The ignition coil fails.
 - 1) The voltage regulator is set too high. Adjust.
 - 2) The coil is damaged by excessive heat from the engine. Replace the coil and inspect the distributor points.
 - 3) The coil case or tower is cracked or there is a leak at the coil tower. Replace the coil.
 - 4) The coil tower has a carbon track from the tower to the primary terminal. Wipe the tower clean and test the coil.

MECHANICAL GOVERNOR

Oil Level

Clean the body of the governor in the area of the fill plug.

Check the oil level by slowly removing the oil level plug. If oil drips out, the oil level is full. If oil doesn't drip out, slowly add engine oil into the oil fill hole. As soon as it begins dripping out the oil level hole, insert the plug.

Adjustment

Before making any governor adjustments, check the governor belt drive tension with a belt tension gauge. Set the belt to the tension listed in the Specification Section.

The first adjustment is the governor-to-carburetor control rod adjustment. With the control rod connected, manually move the governor throttle lever to the maximum open throttle position. Check that the carburetor throttle shaft lever is set from 1/32 to 1/16 of an inch from its maximum open position stop. If necessary, adjust length of the control rod to obtain the setting.

To perform a high-speed adjustment, attach a tachometer to the engine, then run the engine until it reaches normal operating temperature.

- Loosen the locknut on the high speed stop screw.
- Disengage engine load.
- Slowly pull the throttle control to desired maximum engine speed.
 - Adjust the high speed stop screw on the governor to attain the desired maximum engine speed — do not exceed the recommended maximum rpm.
- Tighten the locknut.

The next adjustment is for spread. Proper governor operation requires a difference between full-load and no load governor speed. Too small an rpm spread between the two speeds will cause governor hunting and surging. Too large a spread will cause the low response. For this governor, normal rpm spread is approximately 250 rpm within the full load speed range of 2000-2800 rpm.

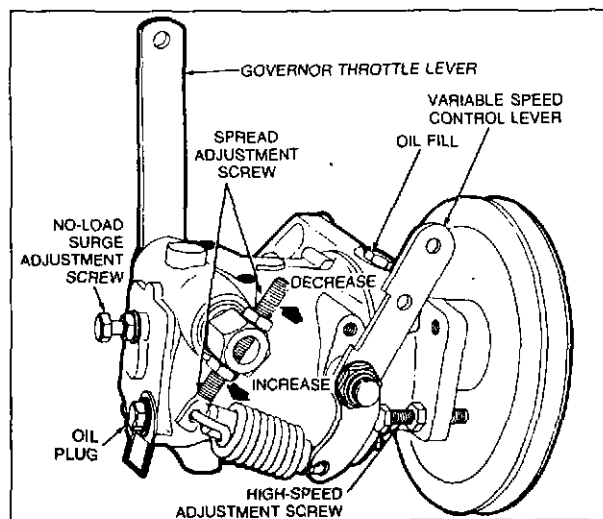
To increase the rpm spread, adjust the screw to move the spring away from the lever hub.

To decrease the rpm spread, adjust the screw to move the spring closer to the lever hub.

The no-load surge adjustment is set at the factory and rarely requires adjustment. If necessary, this adjustment can be used to prevent **hunting and surging at no-load speeds only, provided the rpm spread adjustment is set properly**. Make the adjustment with the tachometer installed. Increase the engine speed with the hand throttle control to 75 rpm lower than the maximum no-load desired control rpm.

Note: At this point if the engine continues to surge, light pressure applied to governor throttle lever will dampen surges). Then loosen the no-load surge adjustment screw locknut and turn the screw inward until the rpm increases to the desired control rpm. Reset high speed adjustment screw and tighten locknuts.

Caution: Do not turn the screw in all the way. It will interfere with proper governor operation and prevent the governor from returning the engine to idle speed.



POWER TAKE-OFF

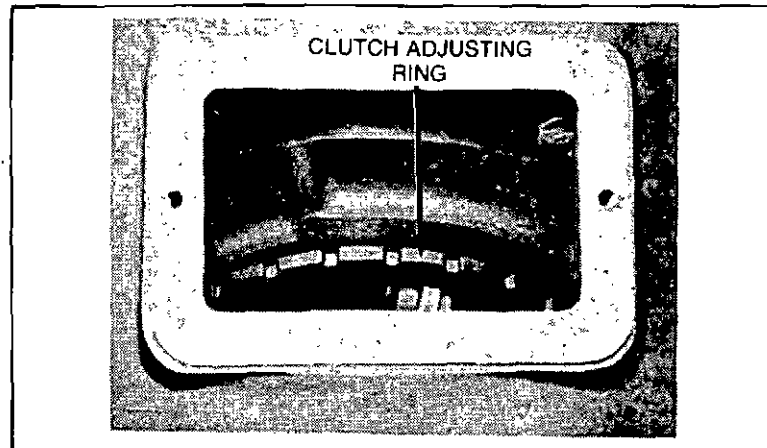
Clutch

A new clutch generally requires several adjustments until the friction surfaces are worn in. Do not let a clutch slip as this will glaze the friction plates and may ruin them.

To adjust the clutch, place the shifter lever in the released position, then remove the patent plate on the top of the housing. Rotate the clutch until the adjusting lock and lock screw can be reached. Remove or disengage the adjustment ring lock. Then turn the adjusting ring. Counterclockwise rotation tightens the adjustment. Turn the adjusting ring until a pressure of 65-80 lbs. is required to engage the clutch. Reinstall the adjustment lock. Lubricate the friction points on the levers and linkage inside the housing with SAE 30 engine oil.

Shaft Bearings

To adjust the shaft bearings, place the shifter lever in the release position, then remove the patent plate on the top of the housing. Loosen the lock plate bolt to free the bearing retainer. Place the end of a long bar into a notch on the bearing retainer and turn it clockwise (facing engine from rear) to remove play from bearings. The bearing retainer should be just tight enough to remove any play from the shaft, yet not so tight as to impose any pre-load on the bearing. Pre-loading the bearing will prevent free turning of the shaft and shorten bearing life. Tighten the lock plate bolt.



POWER TAKE-OFF ADJUSTING RING

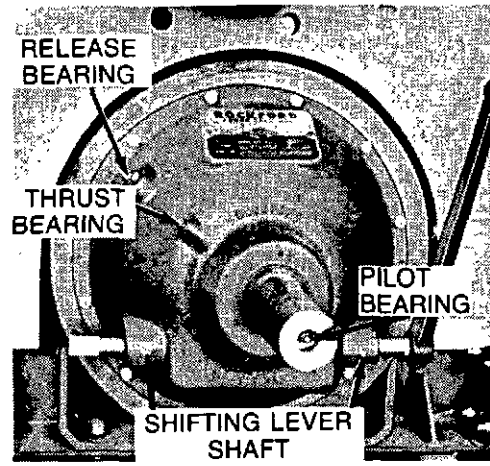
Lubrication

Lubricate the release bearing, thrust bearing, shifting lever bearings, and the pilot bearing. Use a high grade, Lithium Base #2, short fiber grease. Clean the fittings before and after greasing.

The release bearing must be lubricated daily.

Caution: Do not use excessive force when greasing, and do not over-grease. Use grease sparingly. Excessive grease can coat the clutch plates and cause slippage.

If your engine is equipped with a truck-type clutch, lubricate the clutch linkage.



LUBRICATION FITTINGS



P. O. Box 2713, Detroit, Michigan 49238 313/497-9059

81-770-9301