

## TROUBLE SHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	REMEDY
Hard starting or loss of power	<ol style="list-style-type: none"> <li>1. Loose or grounded high tension or breaker point leads</li> <li>2. Improper breaker point gap and timing</li> <li>3. Defective breaker points</li> <li>4. Faulty spark plug or improper gap</li> <li>5. Faulty condenser or coil</li> <li>6. Dirt or gum in fuel line</li> <li>7. Fuel pump faulty</li> <li>8. Dirt in carburetor</li> <li>9. Carburetor improperly adjusted</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and repair leads</li> <li>2. Reset breaker points and timing</li> <li>3. Replace breaker points</li> <li>4. Adjust gap or replace spark plug</li> <li>5. Replace condenser or coil</li> <li>6. Check fuel lines and filters</li> <li>7. Replace fuel pump</li> <li>8. Clean carburetor</li> <li>9. Readjust carburetor</li> </ol>
Overheating	<ol style="list-style-type: none"> <li>1. Insufficient available cool air</li> <li>2. Dirty air intake screen, shroud or cooling fins</li> <li>3. Improper fuel</li> <li>4. Fuel mixture too lean</li> <li>5. Improper ignition timing</li> <li>6. Engine overloaded</li> <li>7. Tight tappet clearance</li> </ol>	<ol style="list-style-type: none"> <li>1. Make sure area in front of flywheel is open</li> <li>2. Clean intake screen, shroud and cooling fins</li> <li>3. Clean and refill tank with proper fuel</li> <li>4. Adjust carburetor</li> <li>5. Reset timing</li> <li>6. Lessen work load</li> <li>7. Adjust tappets</li> </ol>
Backfiring	<ol style="list-style-type: none"> <li>1. Fuel mixture too lean</li> <li>2. Improper timing</li> <li>3. Valve "sticking"</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust carburetor</li> <li>2. Reset timing</li> <li>3. Free up valve</li> </ol>
Skip at high speed	<ol style="list-style-type: none"> <li>1. Spark plug gap too wide</li> <li>2. Improper carburetor setting or lack of fuel</li> <li>3. Wrong type spark plug. Use recommended spark plug</li> <li>4. Improper timing</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust spark plug gap</li> <li>2. Refill tank and adjust carburetor</li> <li>3. Install correct spark plug</li> <li>4. Reset timing</li> </ol>

## ENGINE (Continued)

### TROUBLE SHOOTING GUIDE (Continued)

PROBLEM	PROBABLE CAUSE	REMEDY
Operating erratically	<ol style="list-style-type: none"><li>1. Clogged fuel line</li><li>2. Water in fuel</li><li>3. Faulty choke control</li><li>4. Improper fuel mixture</li><li>5. Loose ignition connections</li><li>6. Air leaks in manifold or carburetor connections</li><li>7. Vent in gas cap plugged</li><li>8. Fuel pump faulty</li></ol>	<ol style="list-style-type: none"><li>1. Clean fuel line</li><li>2. Clean fuel system</li><li>3. Replace choke control</li><li>4. Adjust carburetor</li><li>5. Clean and tighten ignition connections</li><li>6. Tighten manifold and carburetor</li><li>7. Clean gas cap vent</li><li>8. Replace fuel pump</li></ol>
Engine will not idle	<ol style="list-style-type: none"><li>1. Improper carburetor idling adjustment</li><li>2. Carburetor clogged</li><li>3. Spark plug gap set too close</li><li>4. Leaking carburetor or manifold gaskets</li></ol>	<ol style="list-style-type: none"><li>1. Adjust idle speed</li><li>2. Clean carburetor</li><li>3. Adjust spark plug gap</li><li>4. Replace gaskets</li></ol>

## ENGINE – KOHLER

The engine oil level must be maintained in the "safe" operating range at all times. Oil level must be between the "L" (low) and "F" (full) marks on the dipstick. Clean area around dipstick so dirt does not fall into crankcase when dipstick is removed. Check daily and add oil as necessary to maintain proper level – **DO NOT OVERFILL**. Oil level must not exceed the "F" mark. After completely draining oil, reinstall drain plug then remove oil filler cap and refill with 3 quarts (2.8 liter) of oil – check the oil level on the dipstick before adding more – then bring the level up in the safe range. If the oil filter has been changed, add one additional pint (half quart) (0.47 liters) of oil. Select oil weight and type according to the outside temperature. Refer to 1-7.

### OIL FILTER

The filter is mounted on the crankcase of the engine. These are "throw away" cartridge type filter elements. If the cartridge has been overtightened during installation, a strap wrench may have to be used to remove it but usually it can be removed by hand. Use the following procedure to replace:

1. Drain crankcase oil.
2. Place rags or a pan below the cartridge to catch spilled oil. Unscrew the cartridge counter-clockwise and discard.
3. Wipe up any spilled oil, then wipe the adapter clean.
4. Apply grease on oil filter gasket then turn new cartridge (with gasket in place) onto the adapter in clockwise direction – hand tighten only.
5. After replenishing oil and restarting engine, check area around cartridge for signs of oil leakage. Correct leakage if need be by turning cartridge tighter.

Failure to change oil filter elements at the recommended intervals can lead to serious damage to the

engine. An oil filter does a very effective job; however, it must be replaced each 100 hours of operation (every other oil change) under normal conditions or more often if the engine is subject to extremely dirty conditions.

### NOTE

Use only the genuine Kohler oil filter cartridge for replacement.

### AIR SCREEN

Clean flywheel air screen frequently. A dirty air screen and/or engine will cause the engine to overheat and damage the engine.

To clean the flywheel air screen, remove the rubber and steel panels around screen. Replace the panels after the screen has been changed. These panels must remain in place for proper cooling of engine.

### SPARK PLUGS

Every 100 hours remove plugs, check condition and reset at .025 inch (63 mm) or replace plugs if needed. Good operating conditions are indicated if plugs have light coating of gray or tan deposit. A dead white, blistered coating could indicate overheating. A black (carbon) coating may indicate an "over-rich" fuel mixture caused by clogged air cleaner or improper carburetor adjustment. Do not service plugs in poor condition – best results are obtained with new plugs.

### NOTE

Cleaning of spark plugs in cleaning machines that use abrasive grit is not recommended. Spark plugs should be cleaned by scraping or wire brushing and washing with a commercial solvent.

### BREAKER POINTS

Operation is greatly affected by breaker point conditions and adjustment of point gap. If points are burned or badly oxidized, little or no current will pass and as a result the engine may not operate at all, or if

it does run, it is likely to miss particularly at full throttle. This service should be performed by a Authorized Kohler Dealer.

### TIMING

Timing should be performed only by an Authorized Kohler Dealer.

### CYLINDER HEAD SERVICE

After 500 hours of operation have your authorized Kohler Dealer remove the carbon deposits from in the two cylinders.

### NOTE

Under certain operating conditions carbon may build up more rapidly. These build-ups are indicated by heavy deposits of carbon on the spark plug electrodes. When this condition exists 250 hours intervals are recommended.

### VALVE SERVICE

After each 500 operating hours (or sooner if a noisy valve is detached) have your authorized Kohler Dealer service adjust the valves.

### ENGINE REMOVAL

1. Disconnect battery – negative side first.
2. Remove bolt and set screw from drive shaft.
3. Disconnect head light wires, remove hood strap, and front mounting bolts. Remove the hood.
4. Shut off gas at the fuel tank. Disconnect the fuel line.
5. Remove the four bolts holding the platform and remove the gas tank and battery as an assembly.
6. Remove electrical wires, throttle and choke cable from engine.
7. Remove the four engine mounting bolts.
8. Remove PTO belts from engine pulley. (Tip engine forward if necessary).
9. Pull engine forward and up until driveshaft is free of crankshaft.
10. Lift engine out.

Warranty Repair of the Engine must

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## ENGINE REMOVAL AND REINSTALLATION MODEL 2289 & 2288

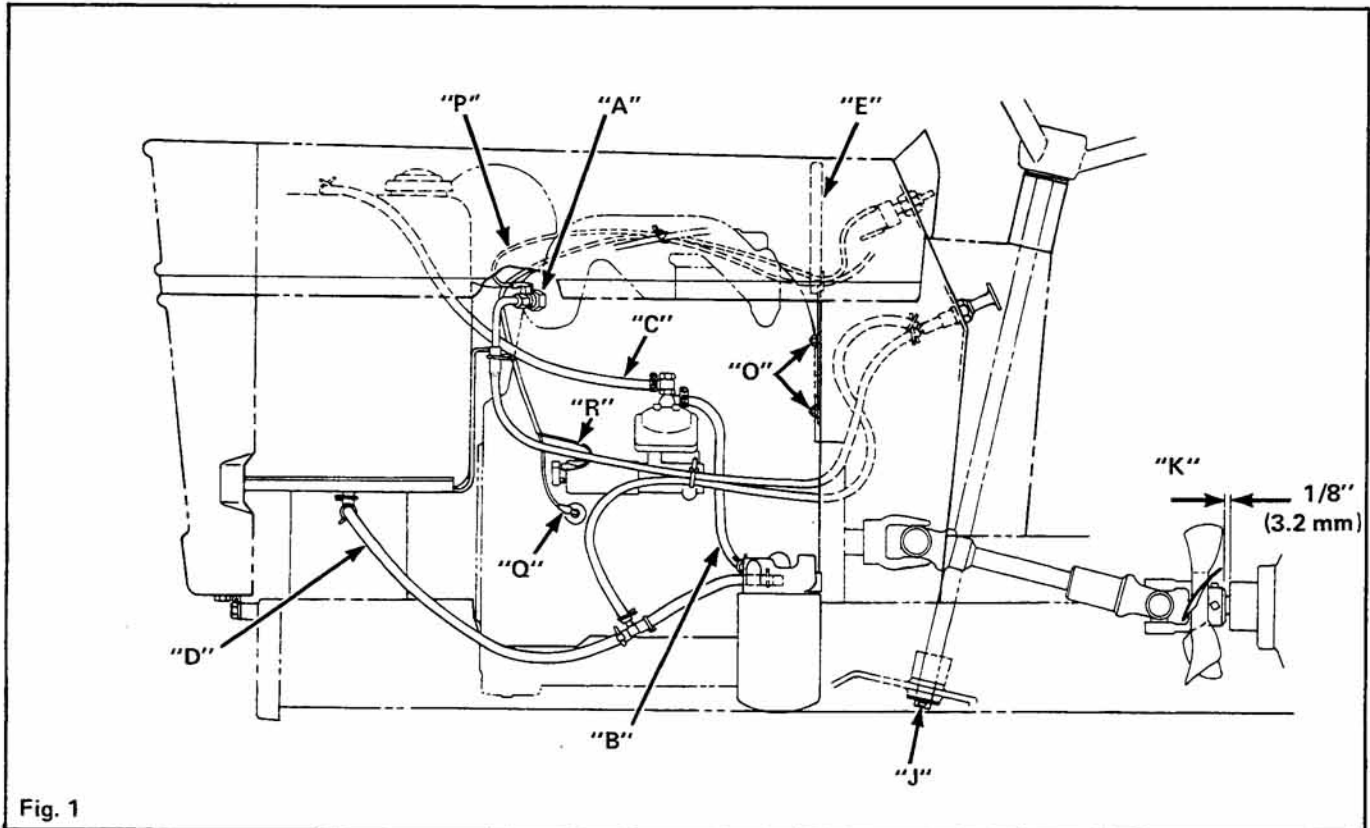


Fig. 1

### REMOVAL

The following parts must be disassembled before the engine can be removed.

1. Battery cables from battery. Negative cable first.
2. Head light harness at grille.
3. Tail light lead.
4. Seat interlock lead.
5. Hood and fender.
6. Battery and fuel tank.
7. Support for battery and fuel tank.
8. Wiring harness and all wires leading to engine.  
Wires from engine to alternator.
9. Primer hose (A) Fig. 1 at engine.
10. Fuel line (B) from engine to filter.  
Vent line (C) from tank to engine.  
Fuel line (D) from tank to filter.
11. Throttle control cable at engine.
12. Rear engine heat shield (E) Fig. 1 from instrument panel.
13. PTO belts from engine.
14. R.H. belt guide (F) Fig. 2 from axle casting.
15. Loosen L.H. wire form belt guide (G) Fig. 2 and pivot down.

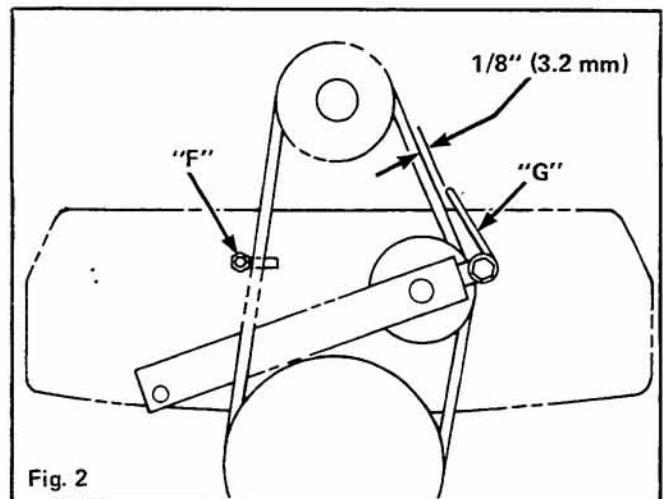


Fig. 2

16. The (4) engine cradle mounting screws.
17. Hydro control rod at hydro.
18. Brake rod (H) Fig. 3 from center shaft.
19. PTO rod (I) Fig. 3 inside instrument panel.

## ENGINE REMOVAL AND REINSTALLATION (CONTINUED)

20. Pin (J) Fig. 1 on bottom of steering shaft.  
Lift shaft out of casting.
21. Instrument panel from frame. (R.H. side is fastened through top of frame and L.H. side is secured with foot pedal mounting screws).
22. Drive shaft (K) Fig. 1 at hydro end.
23. Disconnect control valve from instrument panel by removing the (2) mounting screws through panel.

Instrument panel can not be slid to the rear and engine can be lifted from the frame.

## REINSTALLATION

1. Position engine with drive shaft into frame. Make sure drive shaft is over center cross shaft (L) Fig. 3 of frame.
2. Slide instrument panel back into original position. Make sure steering shaft is inserted in casting.
3. Secure control valve to panel using screws, nuts and lockwashers.
4. Slide rear drive shaft (K) Fig. 1 over front drive shaft and secure to hydro input shaft. End of drive shaft must be approximately 1/8" (3.2 mm) from end of hydro.
5. Secure instrument panel to frame.
6. Reinstall pin (J) Fig. 1 into steering shaft.
7. Reconnect hydro control rod to hydro arm, brake rod (H) Fig. 3 to center cross shaft and PTO rod (I) to PTO hand control.
8. Place round shock tube (M) Fig. 4 over R.H. front engine mount. Insert one flat washer (N) between cradle and rubber mount. Place flat washer on screw and insert (4) screws through cradle and mount. Secure using large flat washer and lock nut.
9. Reinstall PTO belts.
10. Position belt guide (F) Fig. 2 in place and secure using lockwasher and nut. Leg of guide must be behind belts.
11. With PTO lever in the ON position secure wire belt guide (G) to provide approximately 1/8" (3.2 mm) gap between guide and belts.

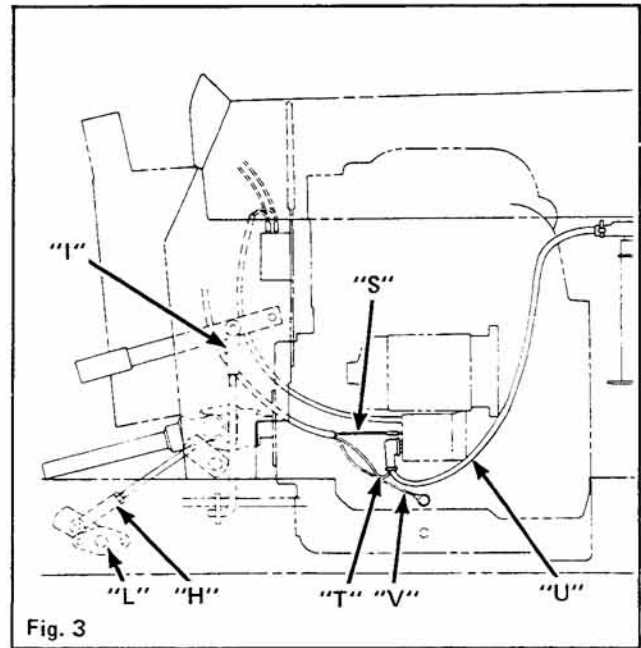


Fig. 3

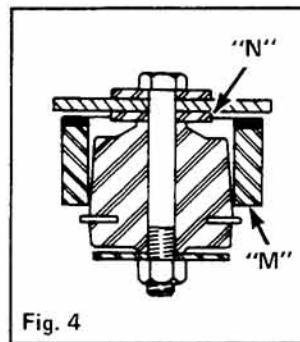


Fig. 4

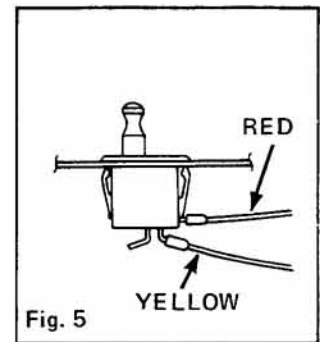


Fig. 5

12. Place star washers over studs (O) Fig. 1 on rear of instrument panel. Insert wiring harness and throttle control through rear engine heat shield. Secure shield on R.H. side using flange nuts. Secure muffler shield and engine shield on L.H. side using flange nuts.
13. Attach throttle cable to engine linkage and secure cable to engine bracket.
14. Install short engine fuel line (B) Fig. 1 to filter manifold.
15. Connect primer hose at engine at point (A).

## ENGINE REMOVAL AND REINSTALLATION (CONTINUED)

16. Connect wiring to engine and regulator as follows:

- A. Single black wire (P) Fig. 1 from engine temp. switch, if equipped, to engine at manifold.
- B. Gray wire from wiring harness to engine oil pressure switch (Q) L.H. side.
- C. Yellow with red stripe from harness to fuel solenoid (R) L.H. side.
- D. Red with yellow stripe to back of starter solenoid (S) Fig. 3 R.H. side.
- E. Red wire (T) of harness and positive red wire of battery (U) to screw terminal on starter.
- F. Secure black lead (V) of harness to R.H. engine cradle with (2) star washers and screw.
- G. Two yellow and one red lead of harness to regulator as shown in Fig. 6.
- H. Red and brown lead of harness to regulator as shown in Fig. 6.

- 17. Reinstall battery and fuel tank support.
- 18. Connect fuel tank to support. Connect fuel line (C) Fig. 1 from tank to L.H. side of engine. Route line under muffler support rod.
- 19. Route fuel line (D) Fig. 1 filter manifold over L.H. front engine mount and secure under fuel tank.
- 20. Reinstall rear fender.
- 21. Reconnect rear light and seat interlock switch. See Fig. 5 for seat switch connection.
- 22. Secure all wires and fuel lines away from muffler and moving parts with tie cables.
- 23. Reinstall hood and lanyard.
- 24. Connect front head light harness.
- 25. Reinstall battery to support.
- 26. Connect RED lead (V) Fig. 3 from starter to POSITIVE post.
- 27. Connect BLACK lead from engine to NEGATIVE post.

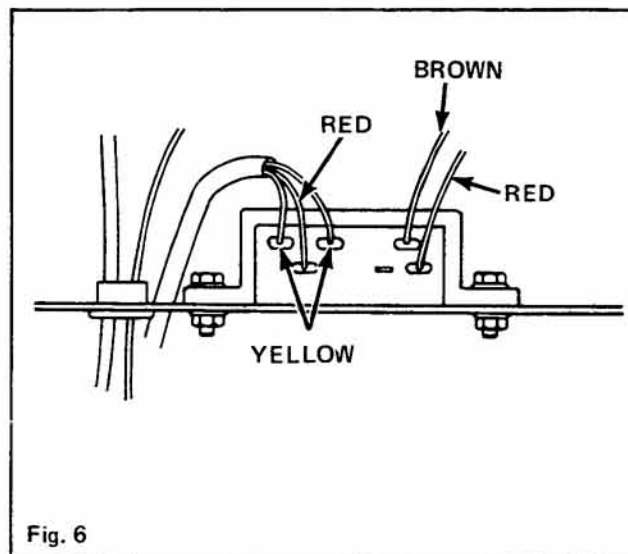


Fig. 6