



PowerPro Gasoline Engines

Form L-1511
(6/08)

Operation, Repair, and Parts Manual



Hypro Model Number 2549-0042 (1/2" shaft), **2549-0043** (5/8" shaft)

2.5 HP Gasoline Engine with Low Oil Sensor

Engine Type	4 Stroke, Single Cylinder
Displacement (Bore x Stroke)	97cm ³ (52mm x 45mm)
Idle Speed	2000 rpm
Max. Output	2.5 HP @ 3600 rpm
Max. Torque	2.96 ft. lbs. @ 3000 rpm
.....	4.0 Nm @ 3000 rpm

Note:

Unit is not shipped with oil. Please add oil to engine prior to operating.

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WARNING

A warning is used to alert the user to the fact that hazardous operating and maintenance procedures may result in injury or death of personnel if not strictly observed.

CAUTION

A caution is used to alert the user to the fact that hazardous operating and maintenance procedures may result in damage to or destruction of equipment if not strictly observed.

NOTE

A note is used to give helpful information.

Although the engine conforms to the safety requirement of EN1679-1, the user must notice the possible danger when they install the engine with other terminal products because the different installing purposes may result in new danger to the engine and its driving product. So, all users must be responsible to take action for assuring the safety.

SAFETY PRECAUTIONS

WARNING

Before operating the engine, be sure to read and familiarize yourself with the manual carefully, otherwise injury to personnel or damage to equipment may occur.

1. Always make a pre-operation inspection before you start the engine. You may prevent an accident or equipment damage.
2. To prevent fire hazards and to provide adequate ventilation, keep the engine 1 meter (3.3 feet) away from buildings and other equipment during operation. Do not place flammable objects close to the engine.
3. Children and pets must be kept away from the area of operation due to a possibility of burns from hot engine components or injury from any equipment the engine may be used to operate.
4. Know how to stop the engine quickly and understand the operation of all controls. Never permit anyone to operate the engine without proper instructions.
5. Do not place flammable objects such as gasoline, lighter, etc. close to the engine while it's running.
6. Refuel in a well ventilated area with the engine stopped.
7. Do not overfill the fuel tank. There should be no fuel in the filler neck.
8. After refueling, make sure that the filler cap is closed securely.
9. If any fuel is spilled, clean it up completely and make sure the area is dry before starting the engine.
10. Do not smoke or allow flames or sparks in the area where gasoline is stored or where the fuel tank is refueled.
11. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide (CO) gas that can cause loss of consciousness and lead to death.
12. Locate the engine on a firm working platform without a slant exceeding 20 degrees to avoid fuel from spilling out.
13. Do not place any objects on the engine.
14. The exhaust muffler is very hot during running the engine even after the engine stops. Never touch it, or you may get burns. Transport or store the engine after cooling it down entirely.

PARTS DESCRIPTION

The main parts of the engine are located as follows (Fig.1).

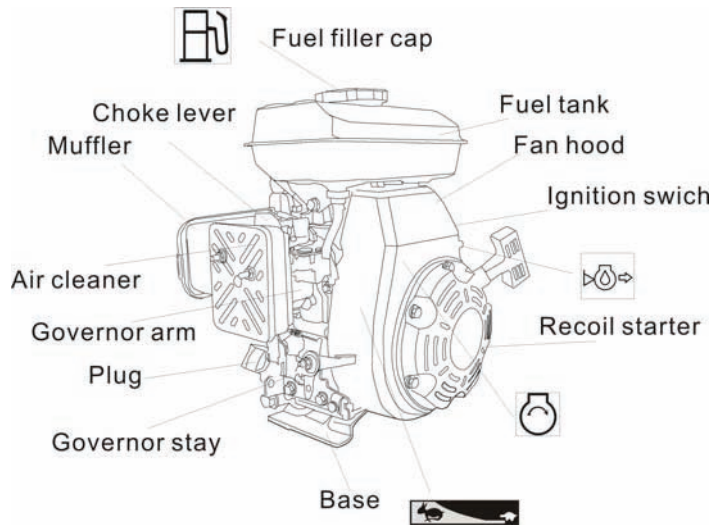


Fig. 1

PRE-OPERATION INSPECTION

I. ENGINE OIL

CAUTION

- Please add engine oil to engine prior to starting.
- Engine oil is a key factor in deciding the engine's performance. Do not use engine oil with additives or 2-stroke gasoline engine oil as they do not have enough lubrication, which may shorten the engine's service life.
- Check the engine with it stopped on level ground.

SAE10W-30 (Fig. 2) is recommended for general, all temperature use. As viscosity varies with regions and temperatures, the lubricant has to be selected in accordance with our recommendation. If single viscosity engine oil is to be used instead, its viscosity corresponding to average temperature of the region must be considered.

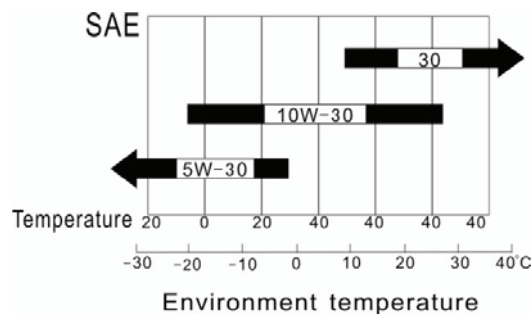


Fig. 2

Check Figure 3

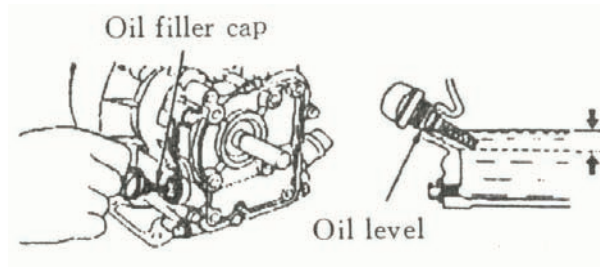


Fig. 3

1. Ensure that the engine is stopped on level ground.
2. Remove the dipstick and clean it.
3. Reinsert the dipstick into the oil filler without screwing in, and check oil level.
4. If the oil level is too low, add the recommended engine oil to the oil filler neck.
5. Reinstall the dipstick.

CAUTION

⚠ Operating engine with insufficient oil may damage the engine severely.

II . AIR CLEANER

Check the filter element for dirt, and remove if any present.

CAUTION

⚠ Never run the engine without an air cleaner, or severe wear of the engine may occur.

III . FUEL AND FUEL TANK (Fig.4)

1. Fuel

These engines are certified to operate on unleaded gasoline. Using unleaded gasoline will decrease the possibility of producing carbon deposit and prolong the engine's service life.

Never use an oil gasoline mixture or dirty gasoline. Avoid getting dirt, dust or water in the fuel tank.

2. Fuel Tank

Fuel tank capacity: 1.4 liters/1.5 quarts

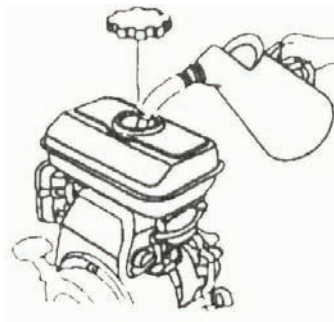


Fig. 4

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions.
- Refuel in a well-ventilated area with the engine stopped. Do not smoke and allow flames or sparks in the area where gasoline is stored or where the fuel tank is refueled.
- Do not overfill the tank (there should be no fuel in the filler neck). After refueling, make sure the fuel tank cap is set back securely.
- Be careful not to spill fuel when refueling. Spilled fuel or fuel vapor may ignite. If any fuel is spilled, make sure the area is dry enough before starting the engine.
- Avoid repeated or prolonged contact with skin or breathing of fuel vapor.
- Keep out of reach of children.

STARTING THE ENGINE

1. Push the fuel cock to ON position (Fig.5).

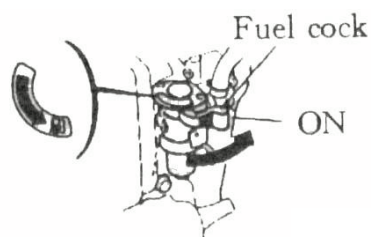


Fig. 5

2. Push the choke lever to the CLOSE position (Fig. 6).

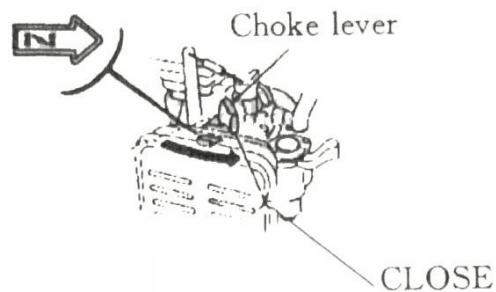


Fig. 6

⚠ NOTE

Do not choke if the engine is warm or the air temperature is high.

3. Move down the throttle lever slightly to the FAST position (Fig. 7).
4. Start the engine (Fig. 8).
 - a) Push the engine switch to the ON position.
 - b) Slightly pull the starting rope handle up until feeling anti-action, and then make a rapid pull.

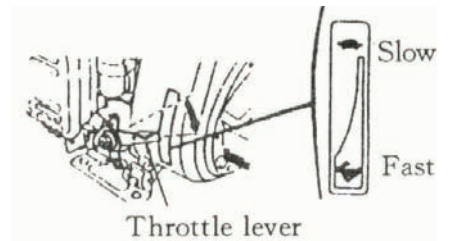


Fig. 7

⚠ CAUTION

Return the starting rope handle gently to prevent damage to the starter.

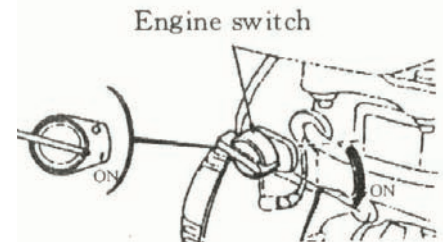


Fig. 8

5. Gradually move the choke lever to the OPEN position. Warm up the engine until it runs smoothly (Fig. 9).
6. Set the throttle lever in proper position to ensure the engine runs at required velocity (Fig. 10).

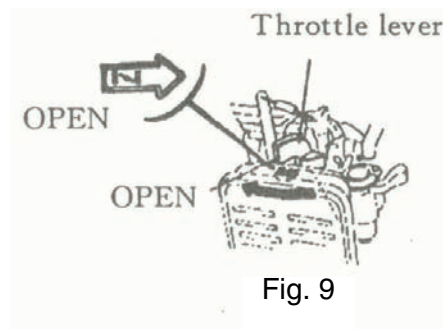


Fig. 9

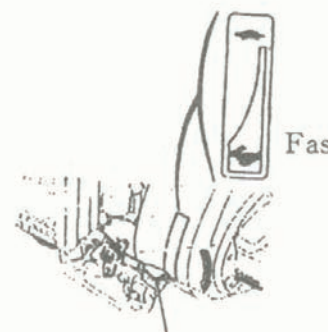


Fig. 10

Operating on Highlands

On highlands, the standard carburetor air/fuel mixture is relatively too rich so the engine performance may be impaired while the fuel consumption may increase.

High altitude performance can be improved by installing a smaller diameter main fuel jet in the carburetor and readjusting the idle needle screw and the idle adjust screw. If you always operate the engine at altitudes higher than 1830 meters/6000 feet above sea level, ask your dealer to adjust the carburetor.

The engine power will decrease approximately 3.5% for every 305 meters or 1000 feet increase in altitude, even when the proper main jet of carburetor is used. The affect of altitude on power will be greater than this if no carburetor modification is conducted.

⚠ CAUTION

The engine equipped with the main jet applicable to highlands may be damaged seriously in areas below specified altitude, because its mixture ratio is too lean; output drops and the engine overheats for operation in low altitude area. In this case, ask your dealer to recover the engine to its normal technical status.

STOPPING THE ENGINE

In an emergency, push the engine switch to “OFF” to stall the engine. Stop it normally in the following sequence:

1. Push the throttle lever up to the SLOW position (Fig. 11).

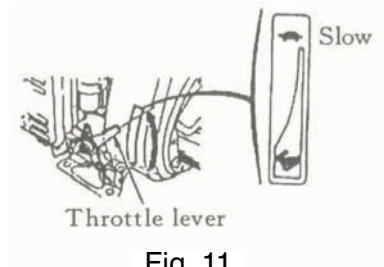


Fig. 11

2. Push the engine switch to the OFF position (Fig. 12).

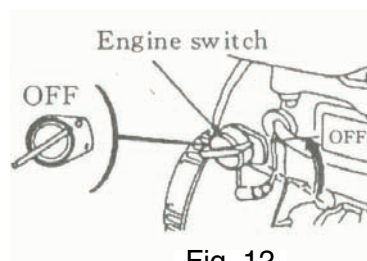


Fig. 12

3. Set the fuel cock to the OFF position (Fig. 13).

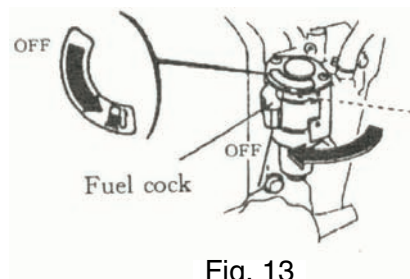


Fig. 13

MAINTENANCE

WARNING

Shut off the engine before performing any maintenance.

To prevent accidental start-up, turn OFF the engine switch and disconnect the spark plug cap. The engine should be serviced by your dealer unless the owner has proper tools and service data and feels mechanically qualified.

I. MAINTENANCE SCHEDULE

Periodic inspection and adjustment of the engine is essential if high level performance is to be maintained. Regular maintenance will also ensure a long service life. The required service intervals and the kind of maintenance to be performed are described in the table in the chart below.

Maintenance Schedule

Frequency		Each time	First month or 20 hrs	Each season or 50 hrs	Every 6 months or 100 hrs	Each year or 300 hrs
Item						
Engine oil	Check oil level	√				
	Replace		√		√	
Air cleaner	Check	√				
	Clean					
Deposit cup	Clean			√ ^①	√	
Spark plug	Check/Clean				√	
Valve clearance	Clean					√ ^②
Combustion chamber	Clean					√ ^②
Fuel tank & fuel filter	Clean					√ ^②
Fuel supply line	Clean	Every two years (do a replacement if necessary) ^②				

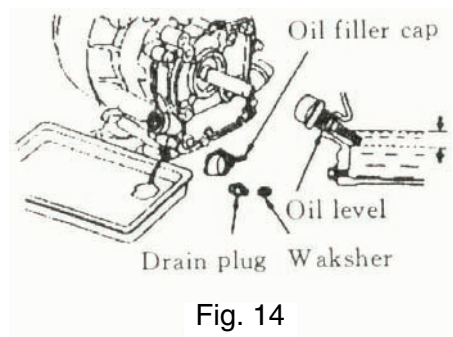
CAUTION

Use only genuine parts manufactured by the company or equivalents in quality; otherwise damage to equipment may occur.

NOTES

- ① The item should be serviced more often than in the schedule if used in dusty circumstances.
- ② Service should be done by your dealer unless you are specially trained and well equipped with tools.

II. REPLACEMENT OF ENGINE OIL (Fig. 14).



A still hot engine is helpful to drain out the engine oil in the crankcase rapidly and entirely.

- a) Turn off the oil filler cap and drain plug to drain engine oil thoroughly.
- b) Reinstall the drain plug and screw in securely.
- c) Fill the specified engine, and check the oil level.
- d) Reinstall the oil filler cap.

Engine oil capacity: 1 pint or 0.45L/1 pint

⚠ CAUTION

Do not contact engine oil repeatedly for long time, otherwise, it may cause skin cancer. Wash your hands with soap and water immediately after handling oil.

⚠ NOTE

Do not dump oil containers or discarded engine oil into rubbish boxes or onto the ground. For the sake of environmental protection, we suggest you take in discarded engine oil in a closed container to the local recycling station.

III. SERVICE OF AIR CLEANER

A dirty air cleaner may block enough air flowing into the carburetor. To prevent the carburetor from producing trouble, please service the air cleaner periodically. If operating the engine in an extremely dusty area, the job should be done more often.

⚠ WARNING

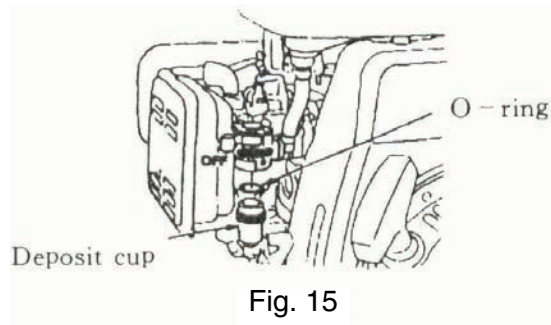
Never clean the air cleaner core in gasoline or low flash-point detergents, or explosion may occur.

⚠ CAUTION

Never run the engine without an air cleaner, or air with dirt and dust may enter the engine and speed the engine's wear.

1. Unscrew two nuts M5 and remove the air cleaner cover; take out the element.
2. Wash the element in a nonflammable or high flash point solvent and dry it thoroughly.
3. Soak the element in clean engine oil until it becomes saturated, and then squeeze out the excess oil.
4. Install the removed parts in the reverse order of removal.

IV. WASHING OF DEPOSIT CUP (Fig. 15)



Set the fuel cock at “OFF”. Remove the deposit cup and O-ring. Wash them in nonflammable or high flash point cleansing solvents, and then dry them. Lastly, carry out reinstallation. Set the fuel cock to “ON” and check for leaks.

⚠ WARNING

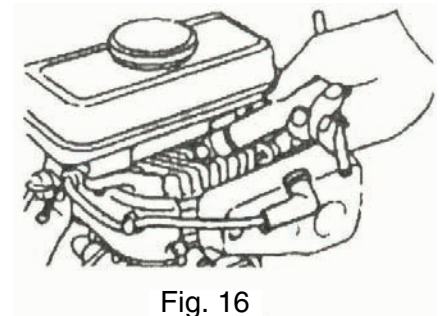
Gasoline is extremely flammable and explosive in certain conditions. Keep cigarette, sparks and open flames away. After reinstalling the deposit cup, check it for leakage, and make sure the area around the engine is dry.

V. SPARK PLUG

Recommended spark plug: 6RTF, BM4A, BMR4A (NGK)

Proper spark plug clearance ensures the engine’s normal running and prevents deposits around the spark plug.

1. Remove the spark plug by means of spark plug wrench (Fig. 16).



⚠ WARNING

Be careful not to touch the muffler and the spark plug during or just after running the engine.

2. Visually inspect the spark plug. Clean the spark plug with a steel brush. If the insulator is cracked or chipped, or if there is apparent wear, replace the spark plug with a new one.
3. Measure the spark plug clearance with a feeler. The clearance should be .024”-.028” or 0.6~0.7mm / .024”-.028” (Fig. 17). If adjustment is necessary, bend the side electrode carefully.

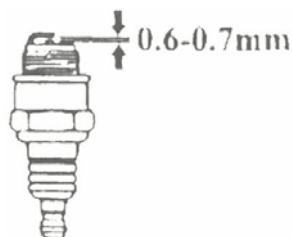


Fig. 17

4. Check to see if the spark plug gasket is in good condition. If not, replace with a new one. Screw on the spark plug by hand to the bottom first to prevent cross-threading (Fig. 18).

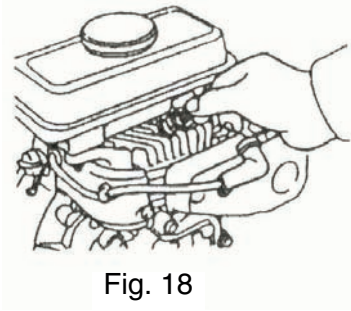


Fig. 18

5. After the spark plug is seated, tighten it up by a spark plug wrench to compress the gasket.

▲ NOTE

If a new spark plug is used, twist 1/2 more turns after impacting the gasket. If reinstalling the original one, just twist 1/8-1/4 more turns.

▲ CAUTION

The spark plug must be tightened securely, or it may become very hot and damage the engine. Only use recommended spark plug or the equivalent. Incorrect heat range of the spark plug may damage the engine.

CONTROL STEEL WIRE OF THROTTLE

(OPTION)

The hole in the throttle is used for mounting control steel wires. Fig. 19 shows how to mount a stiff steel wire. If necessary, you may unscrew the damping nut on the throttle lever slightly when controlling the throttle valve by a remote-controlled steel wire.

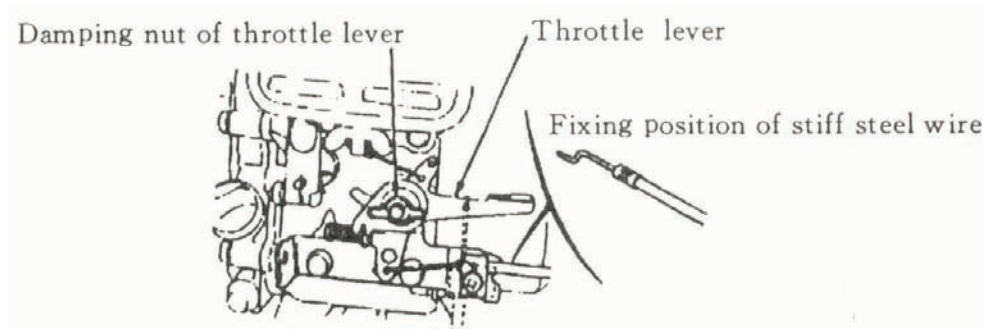


Fig. 19

TRANSPORT AND STORAGE

I. TRANSPORT

Transport with the fuel cock turned off. Transport or store the engine when it is cool to avoid getting burns or fire.

CAUTION

To avoid spilling fuel, do not incline the engine. Spilled fuel or fuel vapor may ignite to cause fire.

II. STORAGE

Before storing the engine for an extended period:

1. Be sure the storage area is free of excessive humidity and dust.
2. Drain the fuel as follows:

WARNING

Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in the area.

- a) Set the fuel cock to the OFF position; remove the deposit cup and clean it.
 - b) Set the fuel cock to the ON position, and drain the fuel into the container.
 - c) Install the deposit cup to the original position.
 - d) Loosen the carburetor drain screw to drain the fuel into the container.
3. Change the engine oil.
 4. Remove the spark plug and pour about a tablespoon of clean engine oil into the cylinder. Crank the engine several revolutions to scatter the oil evenly inside the cylinder, then reinstall the spark plug.
 5. Pull the starter rope slowly until resistance is felt, thus closing the valve. Such operation prevents getting of dust and protects the cylinder well from rusting.
 6. Cover the engine to keep out dust.

TROUBLESHOOTING

When the engine will not start with the recoil starter:

1. Is the engine switch in the ON position?
2. Is there enough engine oil?
3. Is the fuel cock in the ON position?
4. Is there fuel in the fuel tank?
5. Is gasoline reaching the carburetor?
To check, loosen the carburetor drain screw and set the cock to the ON position (Fig. 20).

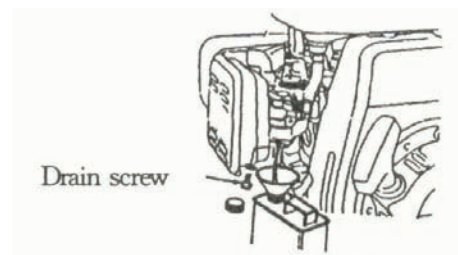


Fig. 20

WARNING

If any fuel is spilled, make sure that the area is dry before checking the spark plug or starting the engine. Spilled fuel or fuel vapor may ignite to cause fire.

6. Is there a spark from the spark plug?

- a) Disconnect the spark plug cap. Clean any dirt from around the spark plug base, then remove the spark plug.
- b) Install the cap onto the spark plug.
- c) Grounding the side electrode to the engine body, pull the recoil starter to see if sparks jump across the gap.
- d) If you do not get spark, contact your dealer or Hypro directly for further assistance.

SPECIFICATIONS

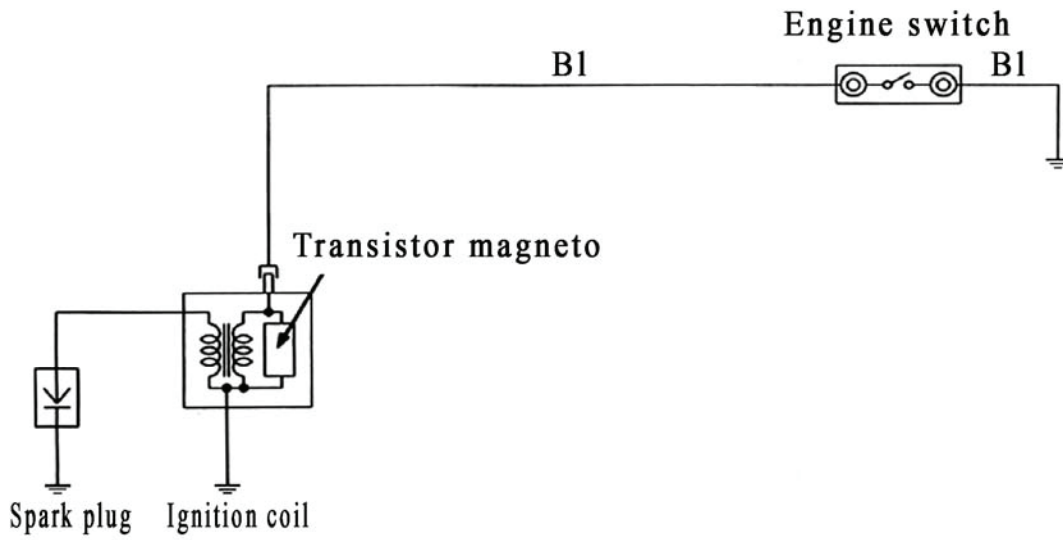
Gasoline Engine

Type	Single cylinder, 4-stroke
Displacement	97cm ³
Bore x Stroke	52mm x 45mm
Rated power	2.5 hp @ 3600 rpm
Rated max. torque	2.37 ft. lbs. @ 3000 rpm
Fuel consumption	≤445g/kW.h
Cooling system	Forced air
Ignition system	Non-contact transistor magneto
PTO shaft rotation	Counterclockwise
Length	289mm/11.38"
Width	270mm/10.63"
Height	345mm/13.52"
Dry weight	8.7kg or 19.8 lbs.

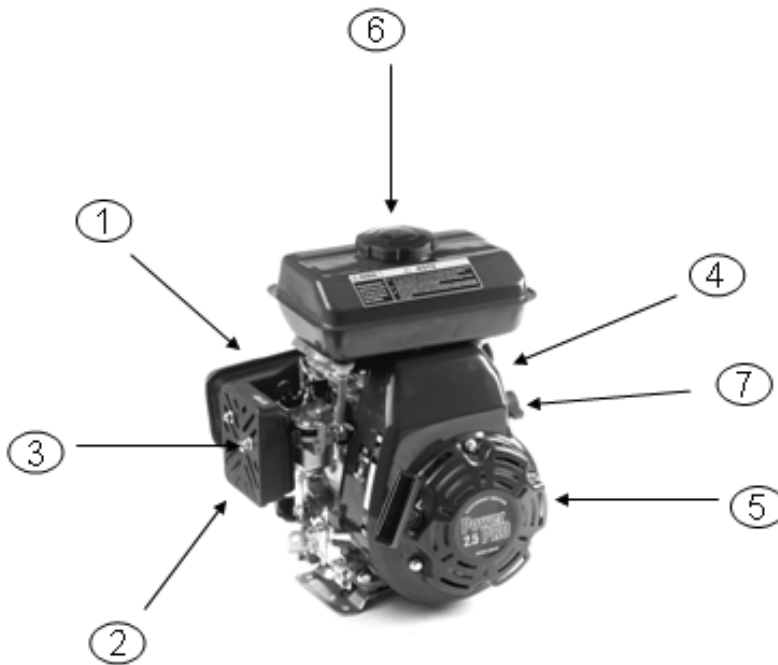
NOTE

Specifications may vary according to the types and are subject to change without notice.

ELECTRICAL DIAGRAM



PARTS BREAKDOWN



Ref. No.	Description	Part Number
1	Muffler	2545-0023
2	Air Cleaner Cover	2545-0024
3	Air Cleaner Element	2545-0025
4	Fan Cover	2545-0026
5	Recoil Assembly	2545-0027
6	Fuel Cap	2545-0028
7	ON/OFF switch	2545-0029

Limited Warranty on PowerPro Gasoline Engines

Hypro warrants to the original purchaser of its PowerPro gasoline engine to be free from defects in material and workmanship under normal use for the period of one (1) year from the date of purchase. This warranty does not cover freight damage, normal wear and tear, or damage caused by misapplication, lack of routine maintenance, negligence, alterations, or repair that affects the performance or reliability of the engine (see limitations and exclusions listed below). The repair or replacement of any part or parts under this Limited Warranty shall not extend the terms of the warranty beyond the original warrantable period.

THIS WARRANTY IS EXCLUSIVE. HYPRO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Hypro's obligation under this warranty is, at Hypro's option, to either repair or replace free of charge, any part, or parts of the engine upon return of the entire product to the Hypro factory in accordance with the return procedures set forth below. **THIS IS THE EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.**

LIMITATIONS AND EXCLUSIONS: This Limited Warranty shall not apply to:

1. Bent or broken crankshaft or damage caused by vibration related to a bent or broken crankshaft. Also, damage caused by loose engine mounting bolts or improper or imbalanced accessories.
2. Repairs required because of prolonged storage including damage caused by old or contaminated fuel in the fuel tank, fuel lines or carburetor, sticky valves or corrosion and rust of engine parts.
3. Repair required due to overheating. Common causes of overheating are clogged or damaged flywheel, fan, inlet air passages, cooling fins or air shrouds.
4. Damaged or broken parts caused by low oil levels or dirty or improper grade of motor oil.
5. Engine tune-ups and normal maintenance services including, but not limited to, fuel and lubricating oil, valve adjustments and normal replacement of service items.
6. Dirt or grit related wear caused by improper air cleaner maintenance. The damages include but not limited to worn pistons, piston rings, cylinders, valves, valve guides, carburetors and other internal components.
7. Engines that have been serviced or repaired with parts or components not manufactured or approved by Hypro.
8. Engines that have been serviced by someone other than Hypro or its dealerships.
9. Instances when normal use has worn out the component or a engine without any signs of breakage or defects.

IN NO EVENT SHALL HYPRO BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER FOR BREACH OF ANY WARRANTY, FOR NEGLIGENCE, ON THE BASIS OF STRICT LIABILITY, OR OTHERWISE.

Return Procedures

All engines must be flushed of any flammable liquids before being shipped* to Hypro for service or warranty consideration.

For technical or application assistance, call the **Hypro Technical/Application number: 1-800-PowerPro (800-769-3777).**

To obtain service, warranty assistance, or a Return Merchandise Authorization number, call the Hypro Service and Warranty number: 1-800-468-3428; or call the Hypro Service and Warranty FAX: (651) 766-6618.

Be prepared to give Hypro full details of the problem, including the following information:

1. Model number, date and the company from whom you purchased your PowerPro engine.
2. Approximate number of hours on the engine.
3. In what application the engine is currently being used.
4. Maintenance that has been done on the engine prior to failure.

Hypro may request additional information to help determine the cause of failure. **Contact the factory to receive a return material authorization number (RMA) before sending the product. The customer is responsible for all transportation charges related to warranty work. If found warrantable, returned product(s) will be sent back to the customer at Hypro's expense. Non-warrantable items will be evaluated and an estimate of repair will be sent to the customer.**

Please send products back prepaid to:

HYPRO
Attention: Service Department
375 Fifth Avenue NW
New Brighton, Minnesota 55112

* Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous materials being shipped. Failure to do so may result in a substantial fine and/or prison term. Check with your shipping company for specific instructions.

