

OPERATION AND PARTS MANUAL



Mikasa **SERIES**
MODEL MTR40F
TAMPING RAMMER
(ROBIN EH090D/EH092D GASOLINE ENGINES)

Revision #3 (01/05/12)

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THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.



CALIFORNIA — Proposition 65 Warning

Gasoline engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

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NOTICE

Specification and part number are subject to change without notice.

PARTS ORDERING PROCEDURES

Ordering parts has never been easier! Choose from three easy options:

Effective:
January 1st, 2006



Order via Internet (Dealers Only):

Order parts on-line using Multiquip's SmartEquip website!

- View Parts Diagrams
- Order Parts
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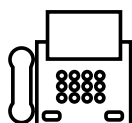
If you have an MQ Account, to obtain a Username and Password, E-mail us at: parts@multiquip.com.

To obtain an MQ Account, contact your District Sales Manager for more information.

Goto www.multiquip.com and click on **Order Parts** to log in and save!

Use the **internet** and qualify for a **5% Discount** on *Standard orders* for all orders which include complete part numbers.*

Note: Discounts Are Subject To Change



Order via Fax (Dealers Only):

All customers are welcome to order parts via Fax.

Domestic (US) Customers dial:
1-800-6-PARTS-7 (800-672-7877)

Fax your order in and qualify for a **2% Discount** on *Standard orders* for all orders which include complete part numbers.*

Note: Discounts Are Subject To Change



Order via Phone: Domestic (US) Dealers Call:
1-800-427-1244

Non-Dealer Customers:

Contact your local Multiquip Dealer for parts or call 800-427-1244 for help in locating a dealer near you.



International Customers should contact their local Multiquip Representatives for Parts Ordering information.

When ordering parts, please supply:

- | | |
|---|--|
| <input type="checkbox"/> Dealer Account Number | <input type="checkbox"/> Specify Preferred Method of Shipment: |
| <input type="checkbox"/> Dealer Name and Address | <input checked="" type="checkbox"/> UPS/Fed Ex <input checked="" type="checkbox"/> DHL |
| <input type="checkbox"/> Shipping Address (if different than billing address) | <input type="checkbox"/> Priority One <input checked="" type="checkbox"/> Truck |
| <input type="checkbox"/> Return Fax Number | <input type="checkbox"/> Ground |
| <input type="checkbox"/> Applicable Model Number | <input type="checkbox"/> Next Day |
| <input type="checkbox"/> Quantity, Part Number and Description of Each Part | <input type="checkbox"/> Second/Third Day |

NOTICE

All orders are treated as *Standard Orders* and will ship the same day if received prior to 3PM PST.

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SAFETY INFORMATION

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.



SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER**, **WARNING**, **CAUTION** or **NOTICE**.

SAFETY SYMBOLS

DANGER

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY**.

WARNING

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY**.







CAUTION

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY**.

NOTICE

Addresses practices not related to personal injury.

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Respiratory hazards
	Accidental starting hazards
	Eye and hearing hazards

SAFETY INFORMATION

GENERAL SAFETY

CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.



- **NEVER** operate this equipment under the influence of drugs or alcohol.



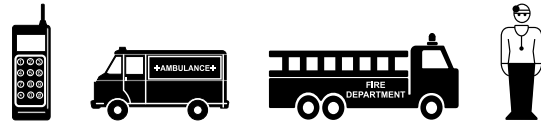
- **ALWAYS** check the equipment for loosened threads or bolts before starting.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- **ALWAYS** know the location of the nearest fire extinguisher.
- **ALWAYS** know the location of the nearest first aid kit.



- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance, doctor and fire department**. This information will be invaluable in the case of an emergency.



RAMMER SAFETY

DANGER

- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death**.



WARNING

- **NEVER** disconnect any **emergency or safety devices**. These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.
- **DO NOT** use this machine on ground that is harder than the machine can handle, or for driving pilings or tamping rock beds. Furthermore, use of the machine on sloping ground, such as the side of an embankment, may make the machine unstable and can cause an accident. It can also result in premature machine wear due to uneven loads on the machine.

Use the machine with confidence for tamping earth and sand, soil, gravel, and asphalt. **DO NOT** use the machine for other types of jobs.

CAUTION

- **NEVER** lubricate components or attempt service on a running machine.

NOTICE

- **ALWAYS** keep the machine in proper running condition.
- Fix damage to machine and replace any broken parts immediately.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.

SAFETY INFORMATION

ENGINE SAFETY

DANGER

- The engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled.
- The engine of this equipment requires an adequate free flow of cooling air. **NEVER** operate this equipment in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.



WARNING

- **DO NOT** place hands or fingers inside engine compartment when engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank and severely scald any persons in the general area of the rammer.



CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.



NOTICE

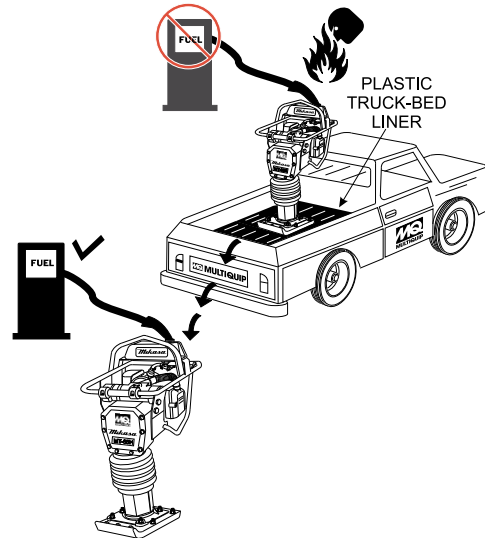
- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable.



FUEL SAFETY

DANGER

- **DO NOT** add fuel to equipment if it is placed inside truck bed with plastic liner. Possibility exists of explosion or fire due to static electricity.



- **DO NOT** start the engine near spilled fuel or combustible fluids. Fuel is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with flammable liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.



TRANSPORTING SAFETY

CAUTION


- NEVER allow any person or animal to stand underneath the equipment while lifting.

NOTICE

- Before lifting, make sure that the equipment parts (hook and vibration insulator) are not damaged and screws are not loose or missing.
- Always make sure crane or lifting device has been properly secured to the lifting bail (hook) of the equipment.
- **ALWAYS** shutdown engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- Use adequate lifting cable (wire or rope) of sufficient strength.
- Use one point suspension hook and lift straight upwards.
- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** tie down equipment during transport by securing the equipment with rope.
- Never allow any person or animal to stand underneath the equipment while lifting.

ENVIRONMENTAL SAFETY

NOTICE

- Dispose of hazardous waste properly. Examples of potentially hazardous waste are used motor oil, fuel and fuel filters. 
- **DO NOT** use food or plastic containers to dispose of hazardous waste.
- **DO NOT** pour waste, oil or fuel directly onto the ground, down a drain or into any water source.

SPECIFICATIONS

Table 1. MTR-40F Rammer Specifications

MODEL	MTR-40F U.S. (metric)
Overall Height	43.7 in. (1,110 mm)
Overall Width	13.8 in. (351 mm)
Overall Length	24.5 in. (622 mm)
Shoe Size	5.9 x 10.6 in. (150 x 270 mm)
Blows/minute	650 ~ 699
Tamping Area	1,453 sq. ft. per hr (135 sq.m per hr)
Impact Force	1,215 lbs./blow (550 kg/blow)
Clutch	Automatic Centrifugal
Travel Speed	30 fpm (9 mpm)
Stroke (Jump Height)	2.2 in. (55 mm)
Operating Weight	101 lbs. (46 kg)

Table 2. Specifications (Engine)

	Model	ROBIN EH090D45050/EH092D45010
Engine	Type	Air-cooled 4 stroke, Single Cylinder, OHV, Horizontal Shaft Gasoline Engine
	Bore X Stroke	2.01 in. X 1.65 in. (51 mm x 42 mm)
	Displacement	5.24 cu. in (86 cm ³)
	Max Output	2.4 H.P./3600 R.P.M. (1.8 kW)
	Fuel	Unleaded Gasoline
	Fuel Tank Capacity	2.1 qts (2.0 liters)
	Lube Oil Capacity	0.79 gal. (0.3 liters)
	Speed Control Method	Centrifugal Fly-weight Type
	Spark Plug	NKG BM6A, BMR6A
	Air Cleaner	Dual Element Type
	Ignition System	Flywheel Magneto (Soild State)
	Starting Method	Recoil Start
	Dimension (L x W x H)	9.1 x 11.6 X 13.0 in. (232 X 295 X 330 mm.)
Dry Net Weight	20.7 lbs. (9.4 Kg.)	

NOTICE

Specifications are general and are subject to change without notice. If exact measurements are required, equipment should be weighed and measured.

Definition of Tamping Rammer

The Mikasa MTR40F Tamping Rammer is a powerful compacting tool capable of applying a tremendous force in consecutive impacts to a soil surface. Its applications include soil compacting for backfilling for gas pipelines, water pipelines and cable installation work.

The impact force of the MTR40F levels and uniformly compacts voids between soil particles to increase dry density.

Circular motion is converted to create impact force. The MTR40F tamping rammer develops a powerful compacting force at the foot of the rammer. To maintain optimum performance, proper operation and service are essential.

Construction of Tamping Rammer

The Mikasa MTR40F is equipped with a Robin air-cooled, four-cycle gasoline engine. Transmission of power takes place by increasing the engine speed to engage the centrifugal clutch.

Rammer Spring Cylinder and Crankcase Bearings

The Mikasa MTR40F uses zerk grease fittings to lubricate the spring cylinder and crankcase bearings. Lubricate these grease fittings as indicated in the maintenance section of this manual.

Controls

Before starting the MTR40F Tamping Rammer, identify and understand the functions of the controls.

CAUTION



Before starting operation check the lifting handle to:

1. Make sure that there is no damage on the bolts.
2. Make sure that there is no crack or breakage on handle.
3. Make sure that there is no fissure on the surface. If there is any abnormality or damage, replace with new one.

For operation:

This handle is to be used to lift up the shoe part of the machine with the body laid down on the ground or truck bed.

1. Use proper lifting techniques to avoid back injury. This handle is for manual lifting only.
2. Do not use this handle as a rammer lift point. Use the lifting point on the top of the machine.
3. Do not move the rammer with the lifting handle and the front rollers more than 16 feet (5 meters).

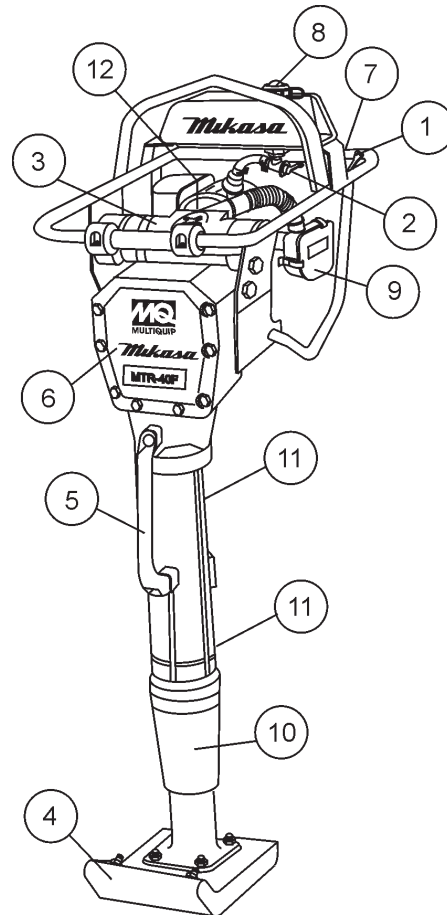


Figure 1. MTR40F Rammer

Figure 1 shows the location of the controls and components for the MTR40F Tamping Rammer. The functions of each control is described below:

1. **Throttle Lever** — Used to adjust engine speed (rpm). Move lever forward (**SLOW**) to reduce engine speed, move lever back toward operator (**FAST**) to increase speed.
2. **Fuel Shut-Off Valve** — Supplies fuel from the fuel tank to the engine. To begin fuel flow move the fuel shut-off valve downward.
3. **Primary Air Cleaner** — Pre-cleans (first stage) dirt and other debris from entering the engine.
4. **Foot** — Laminated wood with tempered steel plate for superior shock absorption.
5. **Grip** — When transporting the rammer, carry it by gripping the handle.
6. **Nameplate** — Displays information regarding the rammer.
7. **Handle** — To operate rammer **GRIP** handle assembly firmly on both sides.

8. **Fuel Tank/Cap** — Remove this cap to add unleaded gasoline to the fuel tank. Make sure cap is tightened securely. **DO NOT** over fill.

WARNING



Add fuel to the tank only when the engine is stopped and has cooled down. In the event of a fuel spill, **DO NOT** attempt to start the engine until the fuel residue has been completely wiped up and the area surrounding the engine is dry.

9. **Engine Air Cleaner** — Prevents dirt (second stage) and other debris from entering the engine.
10. **Dust Sleeve** — Prevents dust and debris from entering into the spring cylinder.
11. **Zerk Fittings** — Lubricates main springs and crankcase bearings.

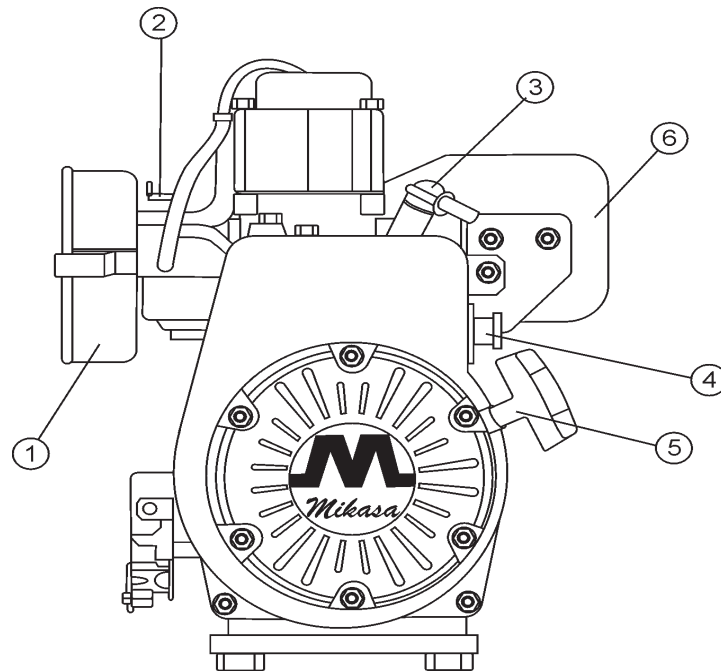


Figure 2. Engine Controls and Components

INITIAL SERVICING

The engine (Figure 2) must be checked for proper lubrication and filled with fuel prior to operation. Refer to the manufacturers Engine manual for instructions & details of operation and servicing.

1. **Secondary Air Cleaner** — Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter cannister to gain access to filter element.
2. **Choke Lever** — Used when starting the engine. Normally used in cold weather conditions. In cold weather turn the choke lever to the fully closed position, in warm weather set choke lever half way or completely open.
3. **Spark Plug** — Provides spark to the ignition system. Set spark plug gap to 0.02 - 0.03 inch (0.6 - 0.7 mm). Clean spark plug once a week.
4. **Engine ON/OFF Switch** — Controls the starting and stopping of the engine. Switch must be in the "ON" position when starting the engine.

NOTICE

Operating the engine without an air filter, with a damaged air filter, or a filter in need of replacement will allow dirt to enter the engine, causing rapid engine wear.

5. **Recoil Starter (pull rope)** — Manual-starting method. Pull the starter grip until resistance is felt, then pull briskly and smoothly.
6. **Muffler** — Used to reduce noise and emissions.

WARNING



Engine components can generate extreme heat. To prevent burns, **DO NOT** touch these areas while the engine is running or immediately after operating. **NEVER** operate the engine with the muffler removed.

7. **Dipstick/Oil Filler Cap** — Remove this cap to determine if the engine oil is low. Add oil through this filler port as recommended in Table 3.
8. **Oil Drain Plug** — Remove this plug to remove oil from the engine's crankcase.

This section is intended to assist the operator with the *inspection* of the **MTR40F Tamping Rammer**. It is extremely important that this section be **read carefully** before attempting to operate the rammer.

DO NOT use your rammer until this section is thoroughly understood.

Inspection

- Check all nuts, bolts fasteners for tightness. Retighten as necessary.
- Clean any dirt from the recoil starter and engine cooling fins. Wipe the entire rammer clean before operating.
- Replace any missing or damaged Safety Operation decals.

CAUTION



DO NOT attempt to operate the Tamping Rammer until the Safety, General Information and Inspection sections of this manual have been **read and thoroughly understood**.

Prior to Operation

1. When transporting the rammer, carry it by the grip handle located on the body (Figure 3).

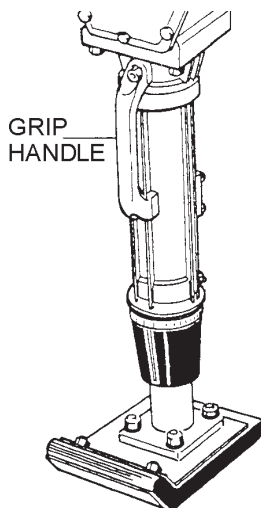


Figure 3. Grip Handle

Main Spring and Crankcase Lubrication

1. There are 2 grease fittings (Figure 18) that require lubrication of the main springs. Lubricate these fittings as outlined in the maintenance section of this manual.
2. There are 2 grease fittings (Figure 19) that require lubrication of the crankcase. Lubricate these fittings as outlined in the maintenance section of this manual.

Fuel

1. This rammer is equipped with a two-cycled gasoline engine. Use only unleaded gasoline. High test ethyl gasoline **is not recommended**.
2. If fuel is low, remove the fuel filler cap (Figure 4) and fill with only **unleaded** gasoline. Motor fuels are **highly flammable** and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the rammer if the engine is **hot!** or **running**.

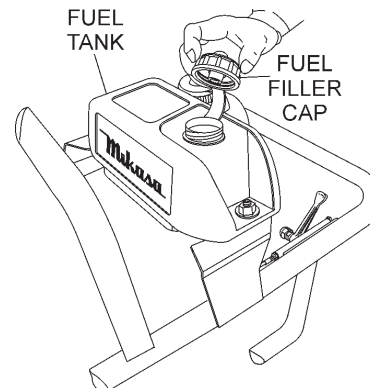


Figure 4. Fuel Tank

Engine Oil Check

1. To check the engine oil level, place the rammer on secure level ground with the engine stopped.
2. Remove the filler cap/dipstick from the engine oil filler hole (Figure 5) and wipe it clean.

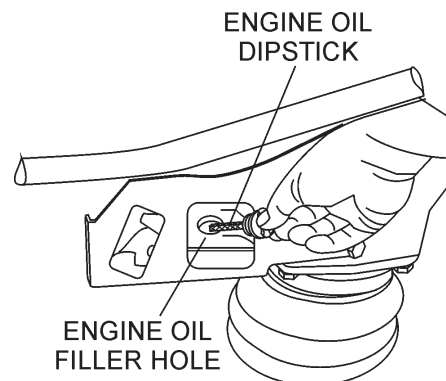


Figure 5. Engine Oil Dipstick

3. Insert and remove the dipstick without screwing it into the filler neck. Check the oil level shown on the dipstick.
4. If the oil level is low (Figure 6), fill to the edge of the oil filler hole with the recommended oil type (Table 3). Maximum oil capacity is .079 gallons (0.3 liters).

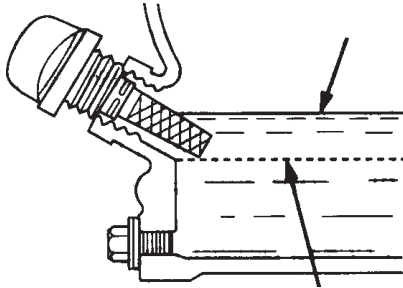


Figure 6. Engine Oil Dipstick (Oil Level)

Table 3 Motor Oil Grade

Season or Temperature	Grade of motor oil (higher than MS class)
Spring, Summer or Autumn +120° F to +15° F	SAE 30
Winter +40° F to +15° F	SAE 30
Below +15° F	SAE 10W-30

Inspection

1. Check all nuts, bolts fasteners for tightness. Retighten as necessary.
2. Clean any dirt from the recoil starter and foot pedestal. Wipe the entire unit clean before operating.
3. Replace any missing or damaged Safety Operation decals.
4. Adjust height of handle. Adjust handle by loosening nuts and moving handle to suit operation. Retighten nuts.

Operation

The following steps outline the procedure for starting the engine:

1. Open the **fuel shut-off valve** by moving the **fuel cock** lever to the **open** position (Figure 7).

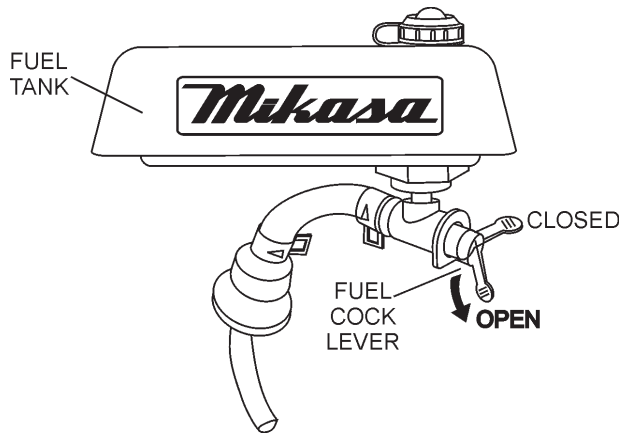


Figure 7. Fuel Shut-Off Valve (Open)

2. Set the engine ON/OFF switch (Figure 8) to the "ON" position (start).

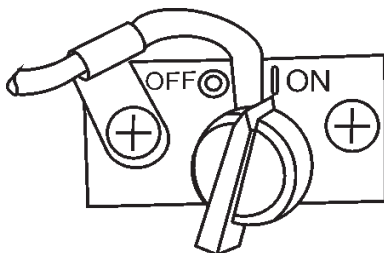


Figure 8. ON/OFF Switch (ON Position)

3. Move the throttle lever to the "IDLE" position (Figure 9).

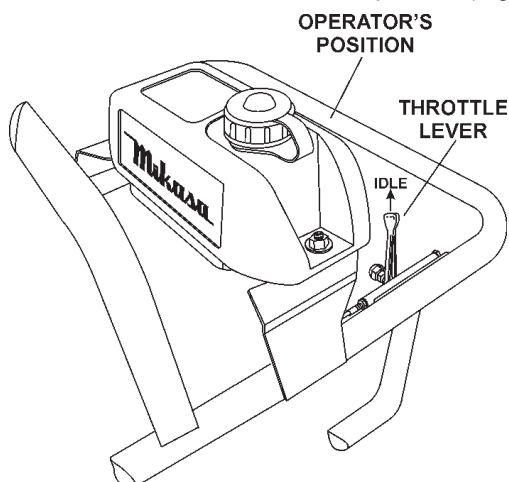


Figure 9. Throttle Lever (Idle)

4. In cold weather, start the unit with choke lever "Fully Closed" (Figure 10). In warm weather or when the engine is warm, the unit can be started with choke halfway or completely open.

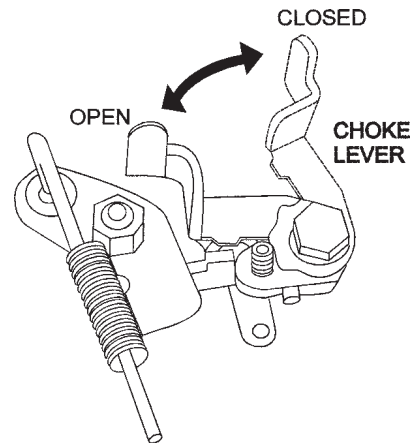


Figure 10. Choke Lever (Closed)

5. Grip the recoil starter (Figure 11) handle and pull it until you feel a slight resistance. Then pull sharply and quickly. Return the recoil starter handle to the starter position before releasing.

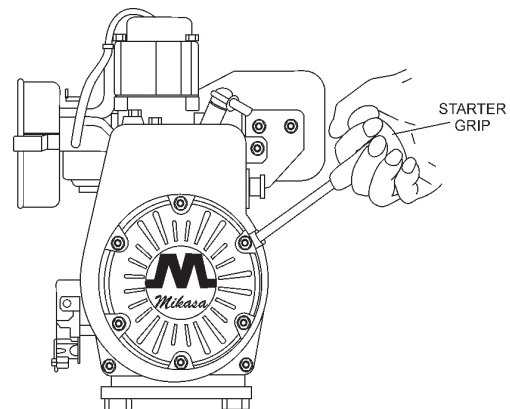


Figure 11. Recoil Starter

6. If engine fails to start, move the choke lever (Figure 10) to the half open position to avoid flooding.
7. Repeat steps 1 through 6.
8. If the engine does not start after repeated attempts, check the spark plug for excess fuel. Clean and replace the spark plug as needed.

Operation

1. To start the rammer tamping action, move the throttle lever (Figure 12) **quickly** from **IDLE** (close) to the **FULL OPEN** position. **DO NOT** move the throttle lever slowly as this may cause damage to the clutch or spring.

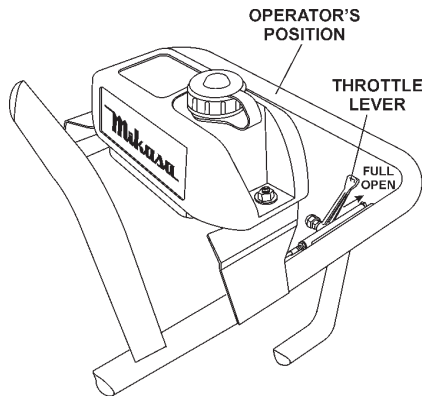


Figure 12. Throttle Lever (Full Open)

CAUTION

Make sure that the throttle lever is moved to the **FULL OPEN** position. Operating the rammer at less than full speeds can result in damage to the clutch springs or foot.

2. The MTR40F tamping rammer is designed to run between 3,800~4,100 rpms. At optimum rpm the foot hits at the rate of 650~695 impacts per minute. Increasing throttle speed past factory set rpm does not increase impacts and may damage unit. The MTR40F is designed to advance while tamping. For faster advance, pull back slightly on the handle so that rear of foot contacts soil first.

Stopping The Engine

Normal Shutdown

1. Move throttle lever quickly from the **FULL OPEN** to **IDLE** position (Figure 13) and run the engine for three minutes at low speed.

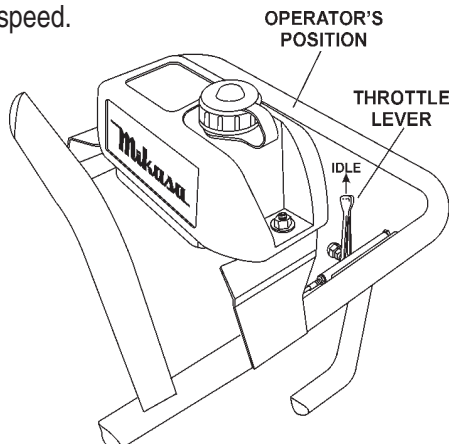


Figure 13. Throttle Lever (Idle)

2. After the engine **cools**, turn the engine **ON/OFF** switch to the **OFF** position (Figure 14).

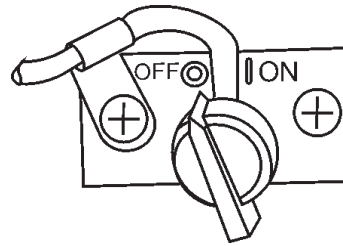


Figure 14. ON/OFF Switch (Off Position)

3. Close the **fuel shut-off valve** (Figure 15) by moving the fuel cock lever to the **CLOSED** position.

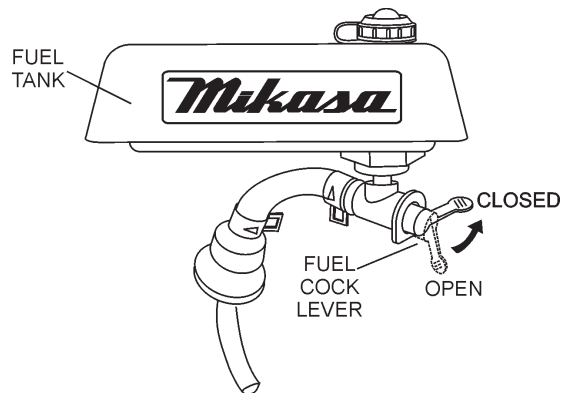


Figure 15. Fuel Shut-Off Valve (Closed Position)

Emergency Showdown

1. Move the throttle lever quickly to the **IDLE** position, and turn the engine **ON/OFF** switch to the **OFF** position. Turn the fuel valve lever to the **CLOSED** position.

Maintenance

Perform the scheduled maintenance procedures as defined by Table 4 and below:

Daily

- Thoroughly remove dirt and oil from the engine compartment and rammer. Clean or replace the air cleaner elements as necessary. Check and retighten all fasteners as necessary. Check the bellows for oil leaks. Repair or replace as needed.

200 - 300 HOURS (Pre-Cleaner)

- Remove the element from the pre-cleaner (Figure 16) at the top of the crankcase (body side) and clean it with cleaning oil (kerosene).

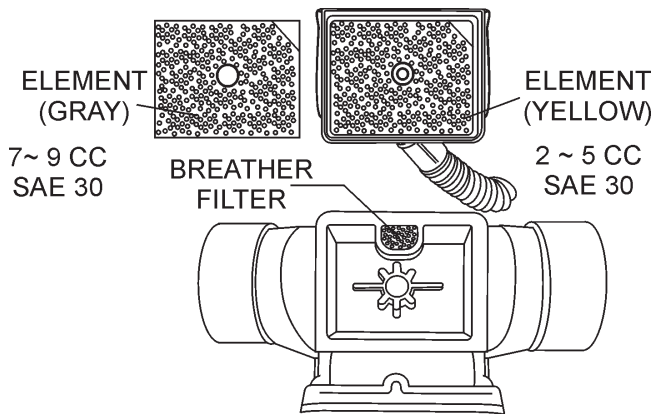


Figure 16. Primary Air Cleaner

- Lubricate the top element (yellow) with 2~5 cc of engine oil SAE-30.
- Lubricate bottom element (gray) with 7~9 cc of engine oil SAE-30 and completely squeeze out the excess oil from the element before installing.

Air Cleaner

- The air cleaner (Figure 17) should be inspected and cleaned on a regular basis at least once a week. Remove element, rinse in soapy water, squeeze and allow to air dry until completely dry before reinstalling.
- Carefully tap the paper filter element (Figure 17) several times on a hard surface until all dirt is removed then reinstall. **NEVER** brush off dirt. Brushing will force dirt into the fibers. Replace the paper filter element if it is excessively dirty.

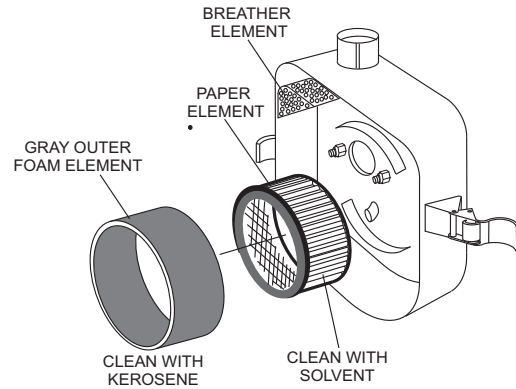


Figure 17. Engine Air Cleaner

Main Springs Lubrication

- The rammer *main springs* (Figure 18) should be lubricated with five shots of grease with a hand grease gun after each eight (8) hours of use.
- Use MQ HIGH TEMPERATURE GREASE, P/N GRS2 or its equivalent.
- Equivalent greases include Shell Darina or Texaco Thermatex, both of which have a bentone base and EP-2 rating.
- If an inferior grease is used, it may become too thick or too thin due to changes in temperature, and improper lubrication could result.

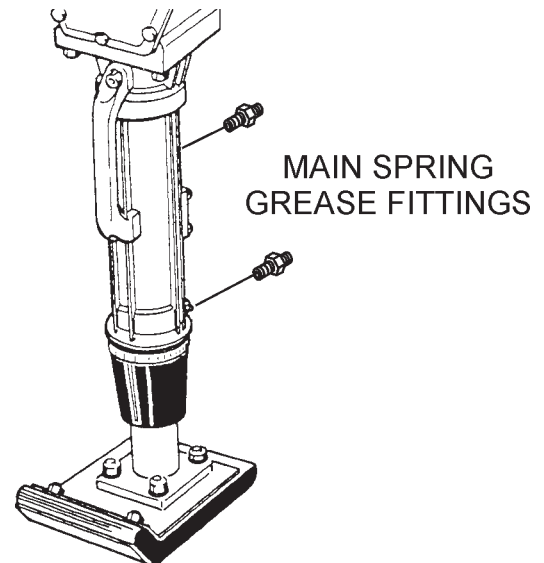


Figure 18. Grease Fittings (Main Springs)

Crankcase Lubrication

- The rammer **crankcase bearings** (Figure 19) should be lubricated with five shots of grease with a hand grease gun after each eight (8) hours of use.
- Use MQ HIGH TEMPERATURE GREASE, P/N GRS2 or its equivalent.

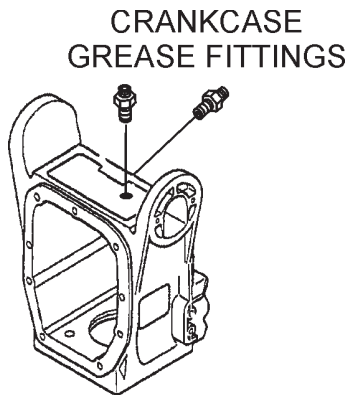


Figure 19. Grease Fittings (Crankcase)

Fuel Lines

- Check the fuel and oil lines regularly for damage and ensure that there are no leaks.
- Replace the fuel lines every two years to maintain the performance and flexibility of the fuel lines.

Cleaning the Rammer

- If using a high pressure spray washer, be careful not to splash water directly on the air cleaner, carburetor, muffler, and fuel cap. Excessive amounts of water may cause severe engine damage.

Spark Plug

- Remove and clean the spark plug (Figure 20), then adjust the spark gap to 0.024 ~0.028 inch (0.6~0.7 mm). This unit has electronic ignition, which requires no adjustments.

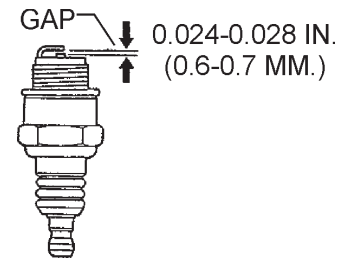


Figure 20. Spark Plug Gap

Long Term Storage

- Drain fuel from fuel tank, fuel line and carburetor.
- Remove spark plug and pour a few drops of motor oil into cylinder. Crank engine 3 to 4 times so that oil reaches all internal parts.
- Clean exterior of rammer with an oil-moistened cloth.
- Store unit covered with plastic sheet in moisture free and dust free location out of direct sunlight.

NOTICE

Refer to manufacturer engine manual for specific servicing instructions.

Perform the scheduled engine maintenance procedures as defined by Table 4 below:

Table 4. Engine Maintenance Schedule							
DESCRIPTION (3)	OPERATION	BEFORE	FIRST MONTH OR 10 HRS.	EVERY 3 MONTHS OR 25 HRS.	EVERY 6 MONTHS OR 50 HRS.	EVERY YEAR OR 100 HRS.	EVERY 2 YEARS OR 200 HRS.
Engine Oil	CHECK	X					
	CHANGE		X				
Air Cleaner	CHECK	X					
	CHANGE			X (1)			
All Nuts & Bolts	Re-tighten If Necessary	X					
Spark Plug	CHECK-CLEAN				X		
	REPLACE						X
Cooling Fins	CHECK				X		
Spark Arrester	CLEAN					X	
Fuel Tank	CLEAN					X	
Fuel Filter	CHECK					X	
Idle Speed	CHECK-ADJUST					X (2)	
Valve Clearance	CHECK-ADJUST						X (2)
Fuel lines	CHECK	Every 2 years (replace if necessary) (2)					

(1) Service more frequently when used in **DUSTY** areas.

(2) These items should be serviced by your servic dealer, unless you have the proper tools and are mechanically proficient. Refer to the ROBIN shop Manual for service procedures

(3) For commercial use, log hours of operation to determine proper maintenance intervals.

TROUBLESHOOTING

TABLE 5. ENGINE TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Difficult to start		
Fuel is available but spark plug will not ignite. (Power available at high tension cable).	Ignition plug being bridge?	Check ignition system.
	Carbon deposit at ignition?	Clean or replace ignition.
	Short circuit due to defective insulators?	Replace insulators.
	Improper spark gap?	Set spark plug gap to the correct gap.
Fuel is available but spark plug will not ignite. (Power NOT available at high tension cable).	Short circuit at stop switch?	Check stop switch circuit. Replace stop switch if defective.
	Ignition coil defective?	Replace ignition coil.
Fuel is available and spark plug ignites (compression normal).	Muffler clogged with carbon deposits?	Clean or replace muffler.
	Mixed fuel quality is inadequate?	Check fuel to oil mixture.
	Fuel in use inadequate (water, dust)?	Flush fuel sytem and replace with fresh fuel.
	Air Cleaner clogged?	Clean or replace air cleaner.
Fuel is available and spark plug ignites (compression low).	Defective cylinder head gasket?	Tighten cylinder head bolts or replace head gasket.
	Cylinder worn?	Replace cylinder.
	Spark plug loose?	Tighen spark plug.
Operation not satisfactory		
Not enough power available (compression normal, no miss-firing).	Air cleaner clogged?	Clean or replace air cleaner.
	Air in fuel line?	Bleed (remove air) from fuel line.
	Fuel level in carbureator float chamber improper?	Adjust carbureator float
	Carbon deposits in cylinder?	Clean or replace cylinder
Not enough power available (compression normal, miss-firing).	Ignition coil defective?	Flush fuel sytem and replace with fresh fuel.
	Ignition plug often shorts?	Replace ignition wires, clean ignition.
	Fuel in use inadequate (water, dust)?	Flush fuel sytem and replace with fresh fuel.
Engine overheats.	Mixed fuel quality is inadequate?	Check fuel to oil mixture.
	Excessive carbon depostion in combustion chamber?	Clean or replace crankcase.
	Exhaust or muffler clogged with carbon.	Clean or replace muffler.
	Spark plug heat value incorrect?	Replace spark plug with correct type spark plug.

TROUBLESHOOTING

TABLE 5. ENGINE TROUBLESHOOTING (continued)

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Operation not satisfactory		
Rotational speed fluctuates.	Governor adjustment improper?	Adjust governor to correct lever.
	Governor spring defective?	Clean or replace ignition.
	Fuel flow erratic?	Check fuel line.
	Air taken in through suction line?	Check suction line.
Recoil starter not working properly.	Dust in rotating part?	Clean recoil starter assembly.
	Spring spring failure?	Replace spiral spring.

TABLE 6. RAMMER TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine rotates but amplitude not uniform or does not strike.	Operating speed of throttle lever is incorrectly set?	Set throttle lever to correct position.
	Clutch slips?	Replace or adjust clutch.
	Spring Failure?	Replace spiral spring.
	Speed of engine improper?	Adjust engine speed to correct operating RPM setting.

EXPLANATION OF CODES IN THE REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

NOTICE

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

SAMPLE PARTS LIST

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	12345	BOLT.....	1	INCLUDES ITEMS W/%
2%		WASHER, 1/4 IN.....		NOT SOLD SEPARATELY
2%	12347	WASHER, 3/8 IN.....	1	MQ-45T ONLY
3	12348	HOSE	A/R	MAKE LOCALLY
4	12349	BEARING	1	S/N 2345B AND ABOVE

NO. Column

Unique Symbols — All items with same unique symbol

(@, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the “Remarks” column.

Duplicate Item Numbers — Duplicate numbers indicate multiple part numbers, which are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.

NOTICE

When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

PART NO. Column

Numbers Used — Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at the time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the “Remarks” Column.

QTY. Column

Numbers Used — Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the “Remarks” Column.

REMARKS Column

Some of the most common notes found in the “Remarks” Column are listed below. Other additional notes needed to describe the item can also be shown.

Assembly/Kit — All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:

“INCLUDES ITEMS W/(unique symbol)”

Serial Number Break — Used to list an effective serial number range where a particular part is used.

Indicated by:

“S/N XXXXX AND BELOW”

“S/N XXXX AND ABOVE”

“S/N XXXX TO S/N XXX”

Specific Model Number Use — Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:

“XXXXX ONLY”

“NOT USED ON XXXX”

“Make/Obtain Locally” — Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

“Not Sold Separately” — Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

SUGGESTED SPARE PARTS

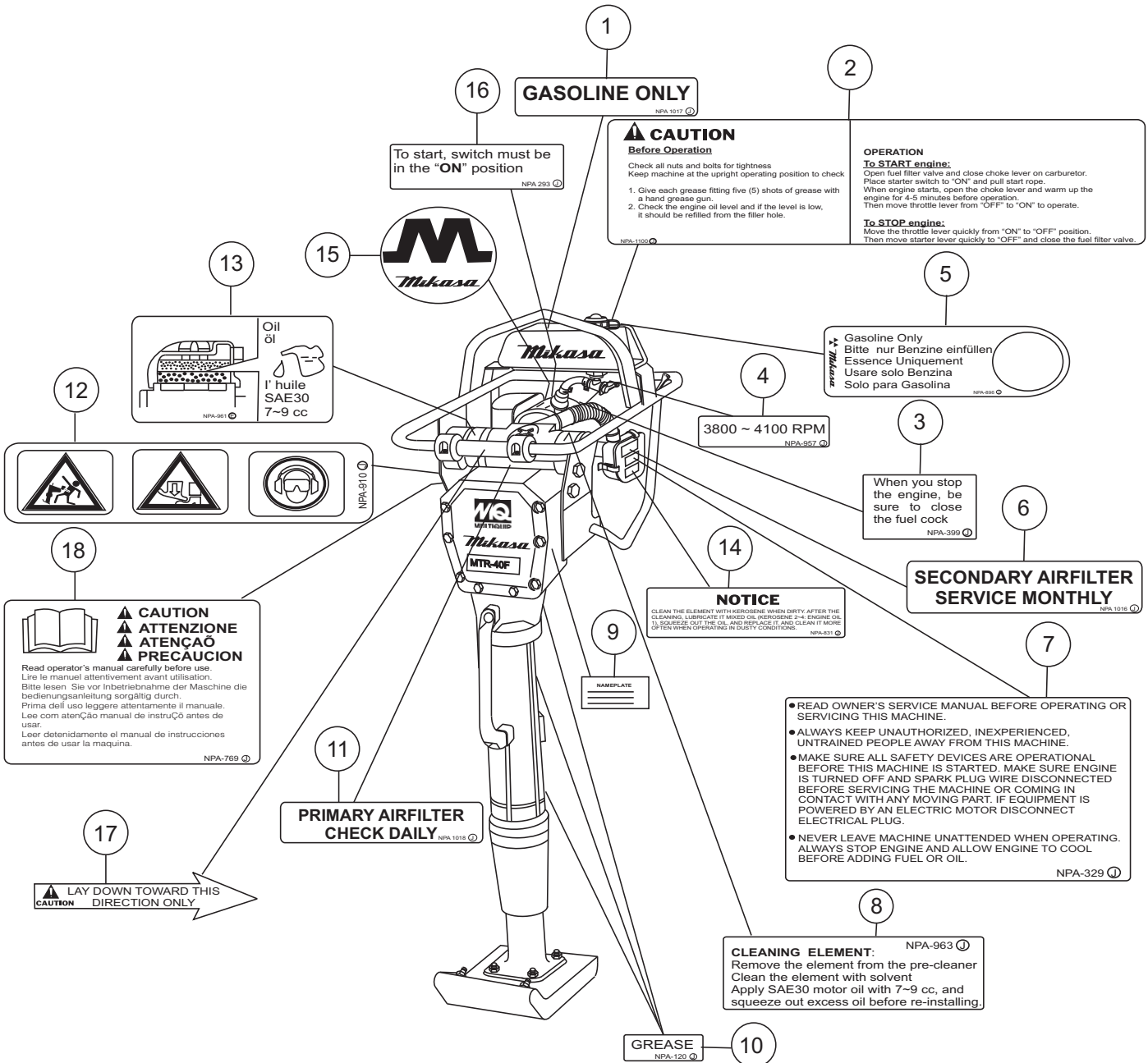
MTR40F RAMMER 3 TO 5 UNITS WITH ROBIN EH-09D45050/EH-092D45010 ENGINES

Qty.	P/N	Description
1	362910060	LEVER, THROTTLE
1	956100040	THROTTLE WIRE
3	362030030	ELEMENT, AIR CLEANER
5	362030020	PACKING, AIR CLEANER
3	362455670	ELEMENT, CRANKCASE
1	361910021	CAP, FUEL TANK W/ STRAP
1	954300720	COCK, FUEL ASSY.
2	301419750	FILTER, IN-LINE FUEL
3	2743260307	ELEMENT, SET ENGINE
1	0660000361	STOP, SWITCH
3	0650140470	SPARK PLUG, NKG
1	362454441	CLUTCH
3	2745011108	STARTER ROPE
1	954404890	FILTER, FUEL TANK (UPPER)
1	954406010	STRAINER, FUEL TANK (LOWER)

NOTICE

Part number on this Suggested Spare Parts List may supersede/replace the P/N shown in the text pages of this book.

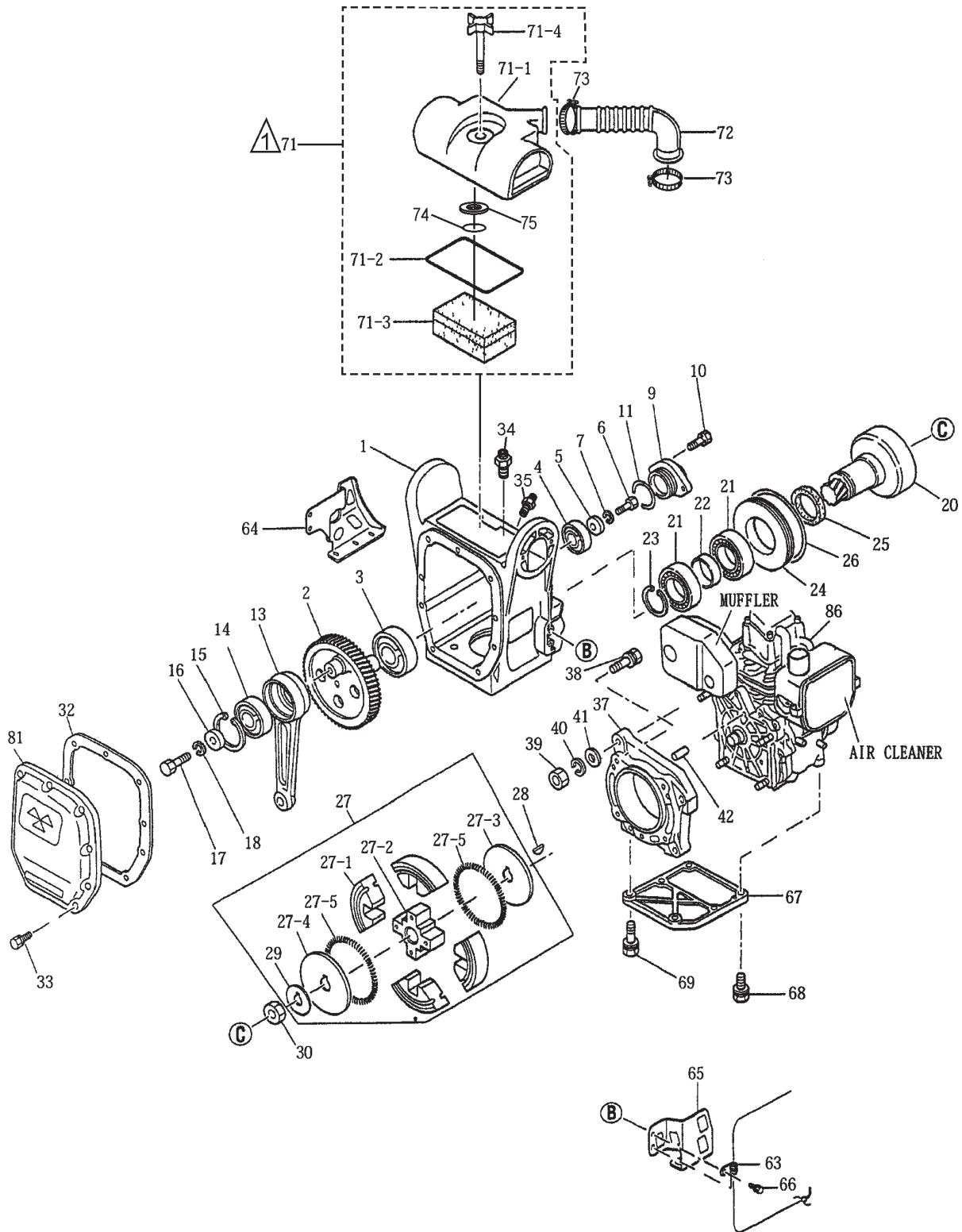
NAMEPLATE AND DECALS



NAMEPLATE AND DECALS

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	NPA1017	DECAL: GASOLINE ONLY	1	
2	NPA1100	DECAL: CAUTION (OPERATION)	1	
3	920203990	DECAL: CAUTION (FUEL COCK)	1	
4	NPA957	DECAL: ENGINE RPM	1	
5	NPA896	DECAL: ELEMENT SET	1	
6	NPA1016	DECAL: SECONDARY AIR FILTER	1	
7	920203290	DECAL: CAUTION	1	
8	920209630	DECAL: CLEANING ELEMENT	1	
9	920209910	PLATE: SERIAL NO.	1 CONTACT MQ PARTS DEPT.
10	920101200	DECAL: GREASE	3	
11	NPA1018	DECAL: PRIMARY AIR FILTER	1	
12	920209100	DECAL: RAMMER BOOT & HEARING	1	
13	920209610	DECAL: DECAL OIL 7-9 CC	1	
14	NPA831	DECAL: CAUTION/OIL INJECT	1	
15	920100240	DECAL: (M-MARK)	1	
16	920202930	DECAL: SWITCH-ON	1	
17	NPA691	DECAL: LAYDOWN	1	
18	NPA769	DECAL: CAUTION	1	

CRANKCASE AND ENGINE ASSY.



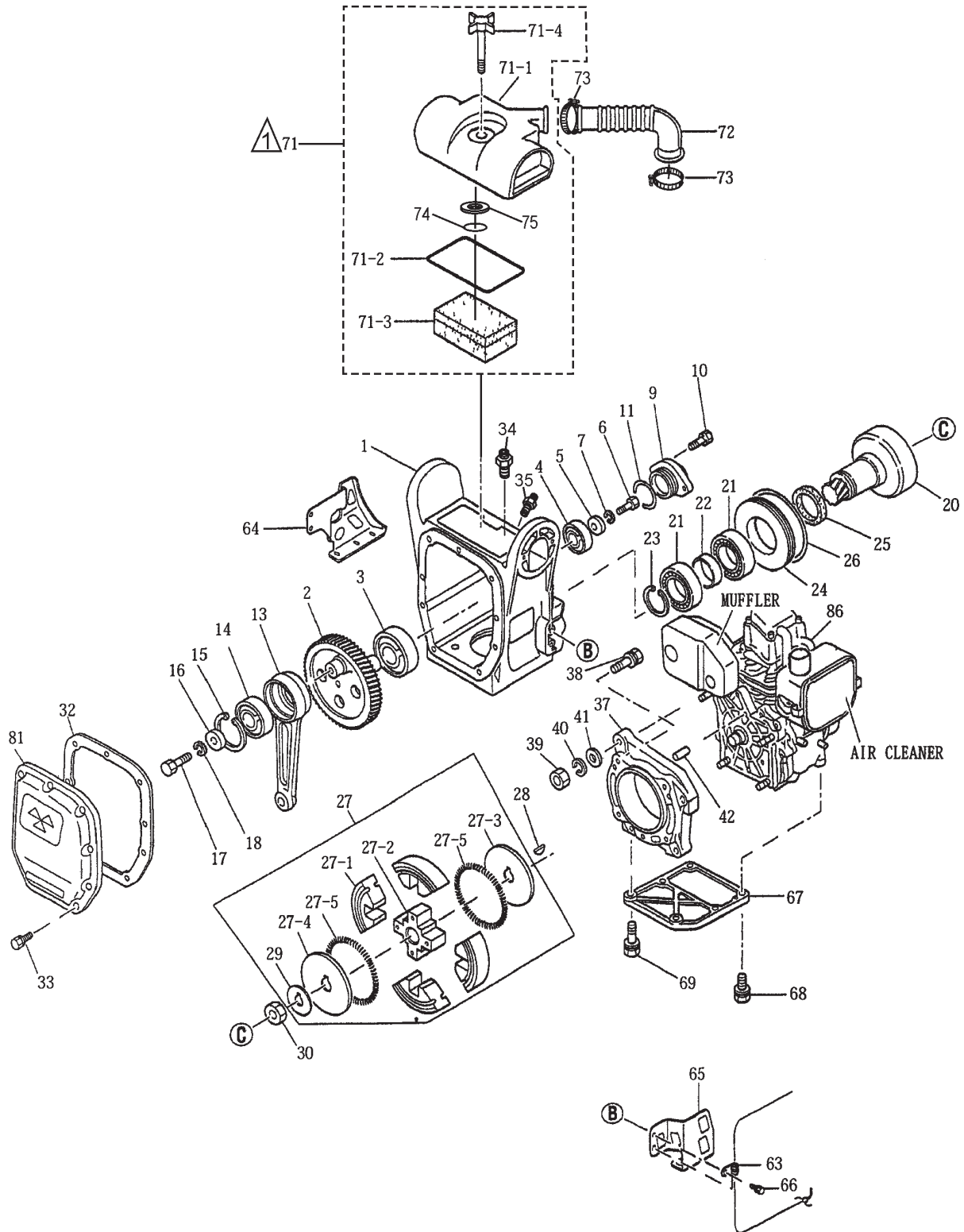
NOTES:

A AIR CLEANER ASSY., INCLUDES ITEMS WITHIN DASHED LINES EXCEPT FOR ITEMS 74 AND 75.

CRANKCASE AND ENGINE ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	305117260	CRANK CASE	1	
2	305343780	CRANK GEAR	1	
3	041006305	BEARING 6305Z	1	
4	041006203	BEARING 6203Z	1	
5	952401450	WASHER 8.5 x 22 x 3	1	
6	001220825	BOLT 8 x 25 T	1	
7	030208200	WASHER, LOCK M8	1	
9	362455660	BEARING COVER	1	
10	002210620	BOLT 6X20 H,SW	2	
11	050100350	O-RING G-35	1	
13	305333090	CONNECTING ROD	1	
14	042006304	BEARING 6304ZZ	1	
15	080100520	STOP RING R-52	1	
16	952400130	WASHER 9304	1	
17	001220825	BOLT 8 x 25 T	1	
18	030208200	WASHER, LOCK M8	1	
20	303010084	PINION	1	
21	042006007	BEARING 6007ZZ	2	
22	351437750	SPACER 35.4-42.7-11	1	
23	080200350	STOP RING S-35	1	
24	351421900	SPACER, CLUTCH DRUM	1	
25	060504010	OIL SEAL VB-40525	1	
26	050300900	O-RING S-90	1	
27	362454441	CLUTCH ASSY. CE120P 1.6T	1	INCLUDES ITEMS W/*
27-1*	943020020	CLUTCH SHOE C812	4	
27-2*	943050050	CLUTCH BOSS C812	1	
27-3*	943060100	CLUTCH GUIDE (A)	1	
27-4*	943060020	CLUTCH GUIDE (B)	1	
27-5*	943030021	CLUTCH SPRING	2	
28	0053204201	WOODRUFF KEY	1	
29*	301010210	LOCK WASHER, CLUTCH	1	
30	0173120010	LOCK NUT	1	
32	362341610	PACKING, FRONT COVER	1	
33	002200620	BOLT 6 x 20 H,SW	9	
34	351010050	GREASE FITTING A-MT6X1	1	
35	351010320	GREASE FITTING B-MT6X1	1	
37	2741500123	ADAPTER FLANGE	1	
38	0011408400	BOLT AND WASHER ASSY.	4	
39	0021808000	NUT	4	
40	0032008000	WASHER, LOCK	4	

CRANKCASE AND ENGINE ASSY.



NOTES:

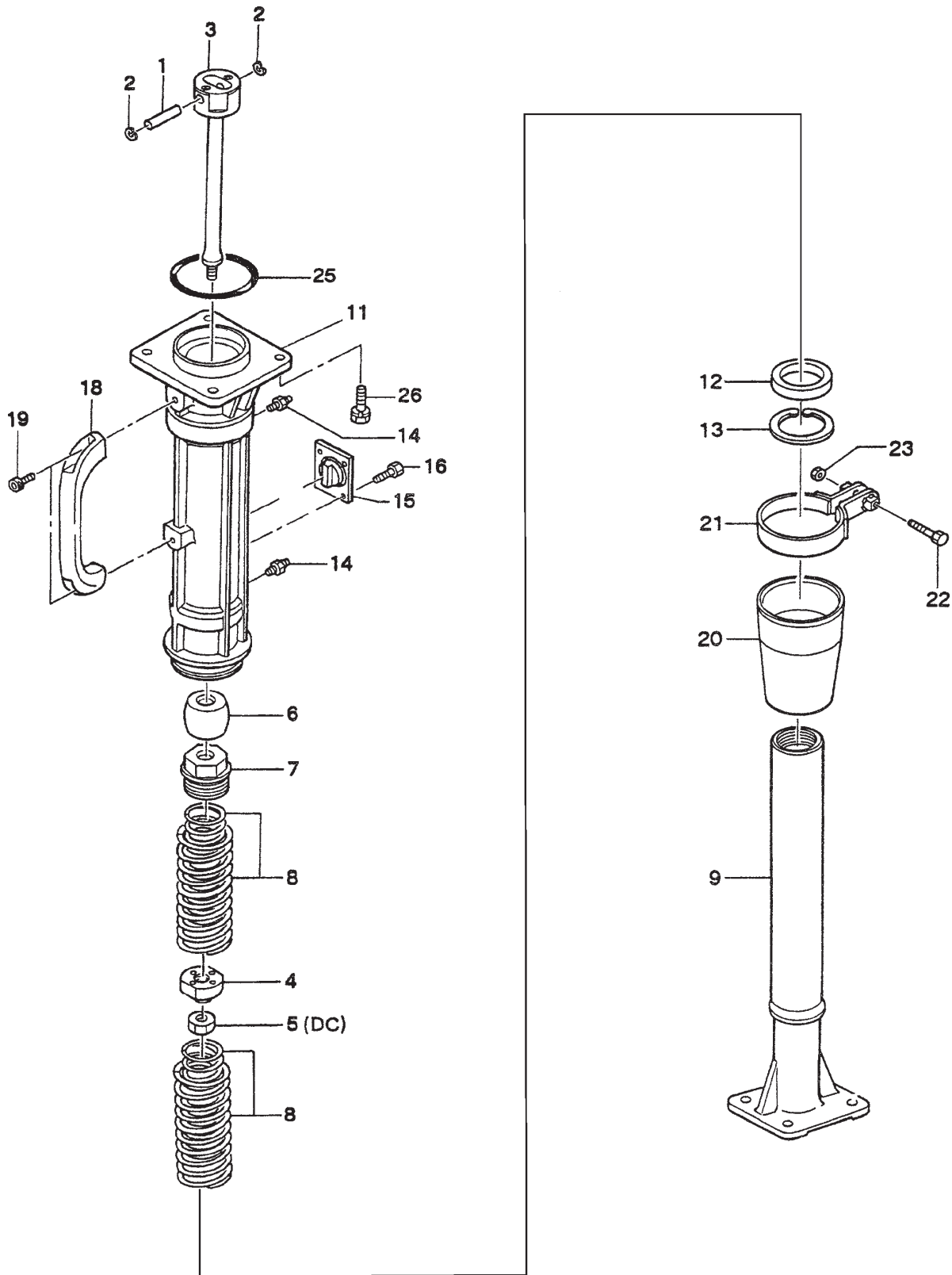
- ▲ AIR CLEANER ASSY., INCLUDES ITEMS WITHIN DASHED LINES EXCEPT FOR ITEMS 74 AND 75.

CRANKCASE AND ENGINE ASSY.

CONTINUED

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
41	0031108000	WASHER	4	
42	0310060020	DOWEL PIN	2	
63	959006120	CLIP (TCP-10509B)	1	
64	362341620	OIL GAUGE PROTECTOR	1	
65	362341630	LINK PROTECTOR	1	
66	002400820	BOLT 8X20 W/FLAT/LOCK WASHER	4	
67	2741600113	STIFFENER	1	
68	0011408250	BOLT AND WASHER	4	
69	0011408300	BOLT AND WASHER ASSY.	2	
71	362116871	AIR CLEANER ASSY.	1 INCLUDES ITEMS W/#
71-1#	362030011	COVER CP, AIR CLEANER	1	
71-2#	362030020	PACKING, AIR CLEANER	1	
71-3#	362030030	ELEMENT CP, AIR CLEANER	1	
71-4#	362030040	BOLT CP, AIR CLEANER	1	
72	353342400	INTAKE PIPE	1	
73	507010110	CLAMP TC-200	2	
74	050300070	O-RING (7)	1	
75	031108160	WASHER, FLAT M8	1	
81	306010020	FRONT COVER	1	
86	911210905	ENGINE ASSY., EH09D		

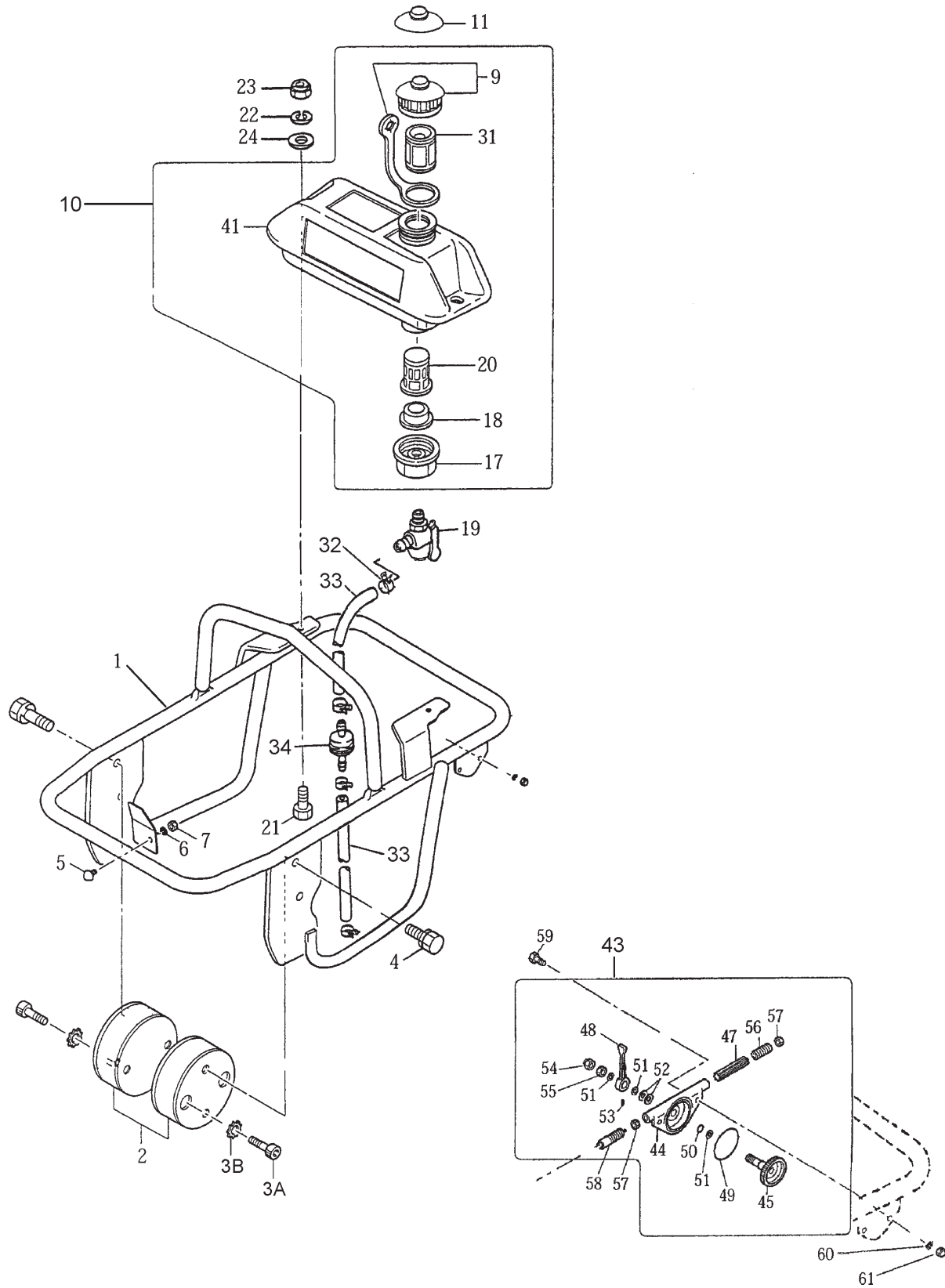
GUIDE CYLINDER ASSY.



GUIDE CYLINDER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	305446380	PISTON PIN	1	
2	080100120	STOP RING R-12	2	
3	305337980	PISTON ROD,M14	1	
4	305451550	PISTON END, M14	1	
6	305446400	STOPPER, UPPER	1	
7	305446410	CYLINDER CAP	1	
8	305446420	MAIN SPRING	2	
9	305212710	SPRING CYLINDER	1	
11	305112730	GUIDE CYLINDER	1	
12	065105010	DUST SEAL DKI-5367811	1	
13	080510680	STOP RING TH-R-68	1	
14	351010050	GREASE FITTING A-MT6x1	2	
15	305446430	STOPPER	1	
16	001220816	BOLT 8x15 H, SW	4	
18	305446440	GRIP	1	
19	001520815	SOCKET HEAD BOLT 8x15 T	2	
20	305446450	DUST SLEEVE	1	
21	305446460	SLEEVE BAND	1	
22	011208030	BOLT 8x30	1	
23	020308060	NUT M8	1	
25	050100800	O-RING G-80	1	
26	002211025	BOLT 10x25 H, SW	4	

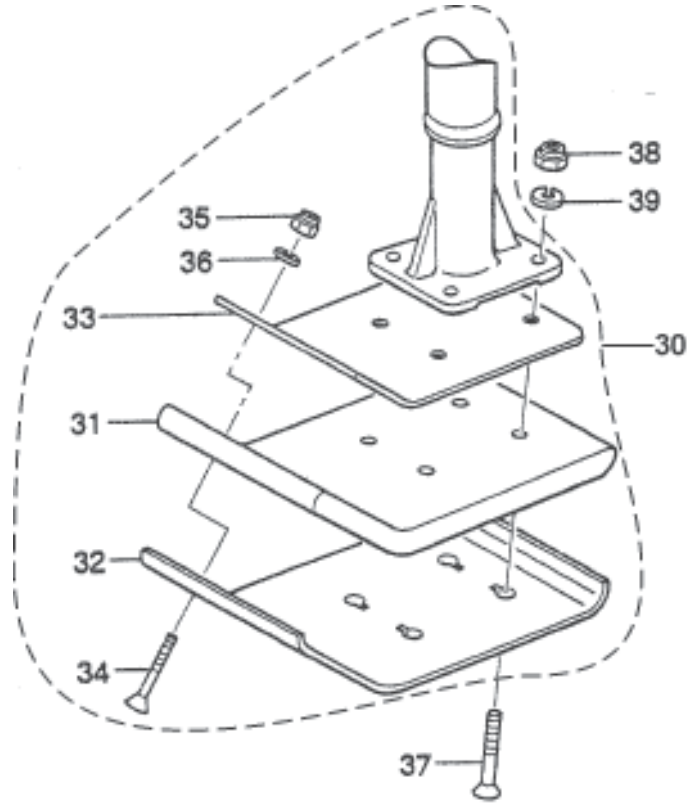
TANK AND HANDLE ASSY.



TANK AND HANDLE ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	306117960	HANDLE	1	
2	351319900	SHOCK ABSORBER	2	
3A	009110007	SOCKET HEAD BOLT 10x20 T	4	
3B	033121009	TOOTHED LOCKWASHER B M10	4	
4	002211020	BOLT 10x20 H, SW	4	
5	939010210	STOPPER RUBBER EH1002	1	
6	030208200	WASHER, LOCK M8	1	
7	020308060	NUT M8	1	
9#	361910021	TANK CAP CP (ORANGE)	1	
10	305910032	FUEL TANK ASSY.	1	INCLUDES ITEMS W/ #
11	361455740	SUB CAP	1	
17#	351437785	HOLDER, COCK	1	
18#	954406020	PACKING, FUEL TANK	1	
19	954300720	FUEL COCK ASSY./CVL-08	1	
20#	954406010	STRAINER (#110)	1	
21	001220830	BOLT 8x30 T	2	
22	030208200	WASHER, LOCK M8	2	
23	022710809	NYLON NUT M8	2	
24	952401450	WASHER 8.5x22x3	2	
31#	954404890	FILTER, TANK	1	
32	954403030	HOSE BAND (8)	4	S/N S-3129 AND BELOW
32	0561080020	HOSE CLAMP	4	S/N S-3130 AND ABOVE
33	351436350	FUEL HOSE, L=150	2	S/N S-3129 AND BELOW
33	0851041790	FUEL HOSE FOR EVP, L=150	2	S/N S-3130 AND ABOVE
34	301419750	FUEL FILTER CP	1	
41#	362116890	F. TANK 2L (GRAY)	1	
43	362910060	THROTTLE LEVER ASSY.	1	INCLUDES ITEMS W/ *
44*	362341550	THROTTLE BODY	1	
45*	362910090	THROTTLE, GEAR CP. W/ BOLT	1	
47*	362455620	SLIDER	1	
48*	362455630	THROTTLE LEVER	1	
49*	050100450	O-RING G-45	1	
50*	050200100	O-RING P-10	1	
51*	031110160	WASHER, FLAT M10	3	
52*	033910070	CONICAL SPRING WASHER	2	
53*	096206006	SOCKET HEAD SCREW 6 x 6	1	
54	022131008	CAP NUT M10	1	
55	020410060	NUT M10, H=6	1	
56*	096208020	SOCKET HEAD SCREW 8 x 20	1	
57*	020408050	NUT M8, H=5	2	
58*	956100040	THROTTLE WIRE 620-710	1	
59	001220620	BOLT 6X20 T	2	
60	030206150	WASHER, LOCK	2	
61	022130605	CAP NUT M6	2	

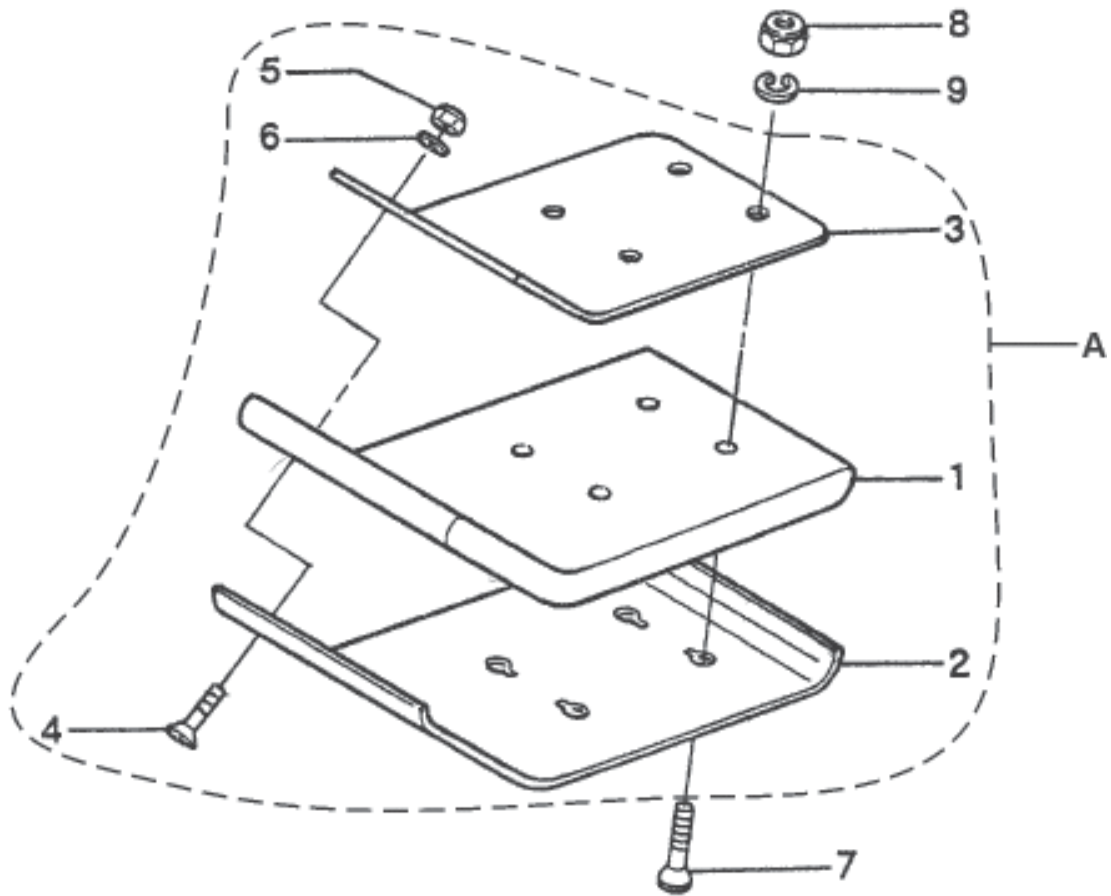
FOOT ASSY. (OPTION)



FOOT ASSY. (OPTION)

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
30	305910010	FOOT ASSY. 150B	1	INCLUDES ITEMS W/*
31*	305333120	FOOT 150B	1	
32*	305333130	METAL SHEET 150B	1	
33*	305446470	FOOT COVER	1	
34*	015110055	SUNK HEAD BOLT 10x50 H	2	
35*	022711012	NYLON NUT M10	2	
36*	030210250	WASHER, LOCK M10	2	
37	015112075	SUNK HEAD BOLT 12x60 H	4	
38	022711214	NYLON NUT M12	4	
39	030212300	WASHER, LOCK M12	4	

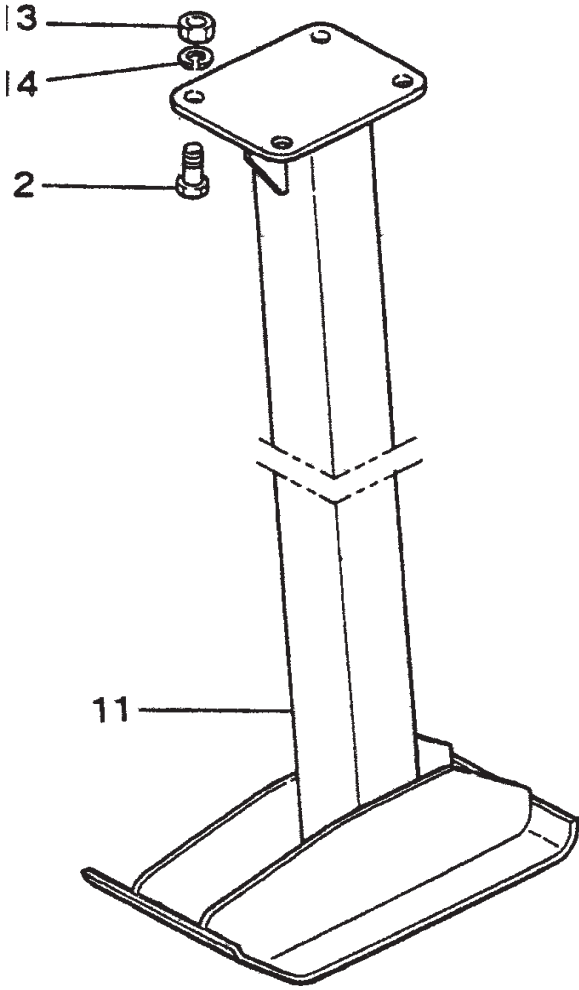
NARROW FOOT ASSY. (OPTION)



NARROW FOOT ASSY. (OPTION)

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	305910020	FOOT ASSY. 200B	1	INCLUDES ITEMS W/*
A	305910040	FOOT ASSY. 100B	1	INCLUDES ITEMS W/#
1*	305333140	FOOT 200B	1	200B
1#	305334930	FOOT 100B	1	100B
2*	305333150	METAL SHEET 200B	1	200B
2#	305334940	METAL SHEET 100B	1	100B
3*	305446470	FOOT COVER	1	200B
3#	305447810	FOOT COVER 96B	1	100B
4*#	001611050	SUNK HEAD BOLT 10x50 H	2	
5*#	022711012	NYLON NUT M10	2	
6*#	030210250	WASHER, LOCKM10	2	
7	001611252	SUNK HEAD BOLT 12x60 H	4	
8	022711214	NYLON NUT M12	4	
9	030212300	WASHER, LOCK M10	4	

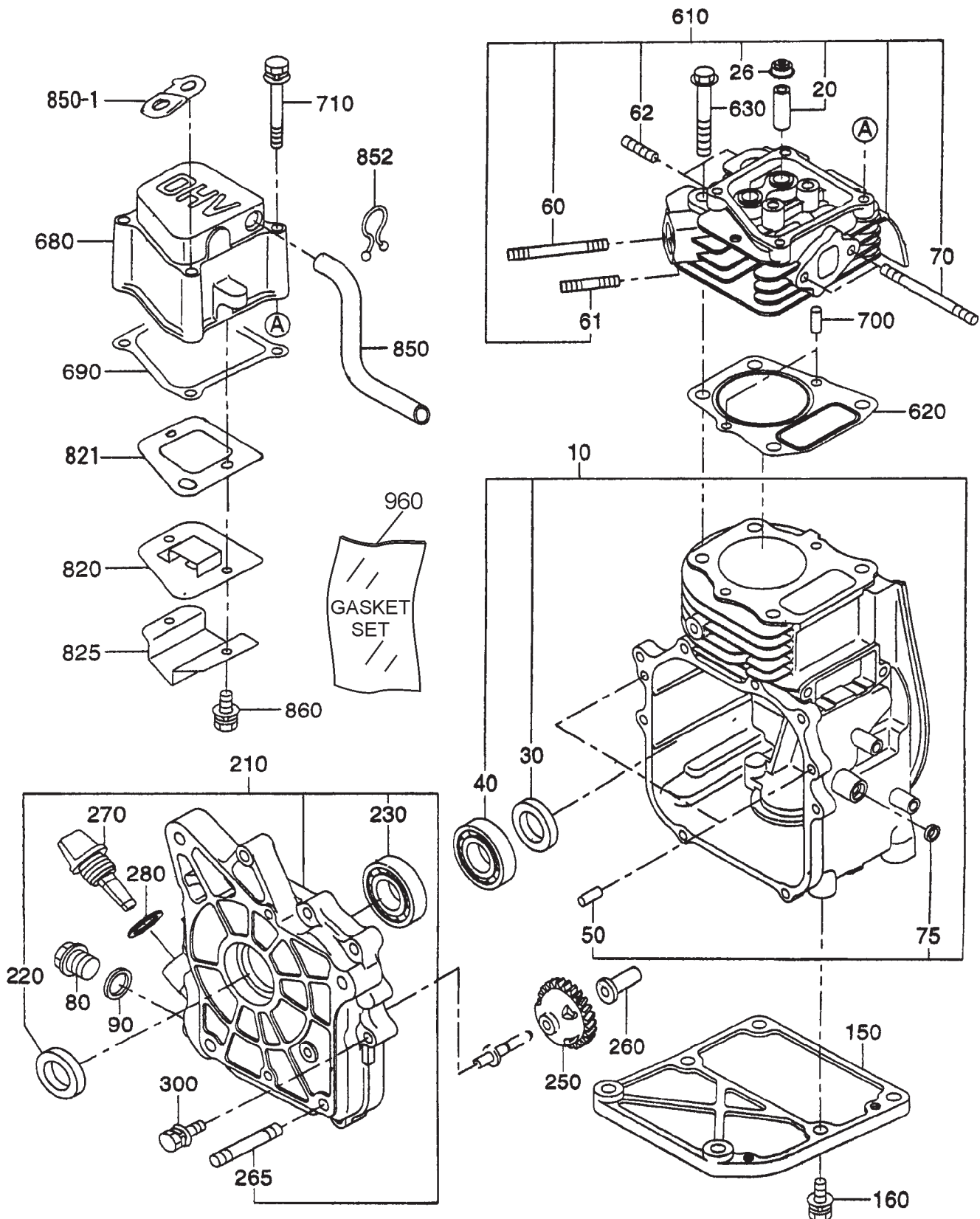
TRENCH SHOE ASSY.



TRENCH SHOE ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
11	305333160	TRENCH SHOE 500H-120B	1	
11	305333170	TRENCH SHOE 800H-120B	1	
11	305334390	TRENCH SHOE 305H-100B	1	
12	001221235	BOLT 12x35 T	4	
13	020312100	NUT M12	4	
14	030212300	WASHER, LOCK M12	4	

ROBIN EH-090D ENGINE — CRANKCASE ASSY.



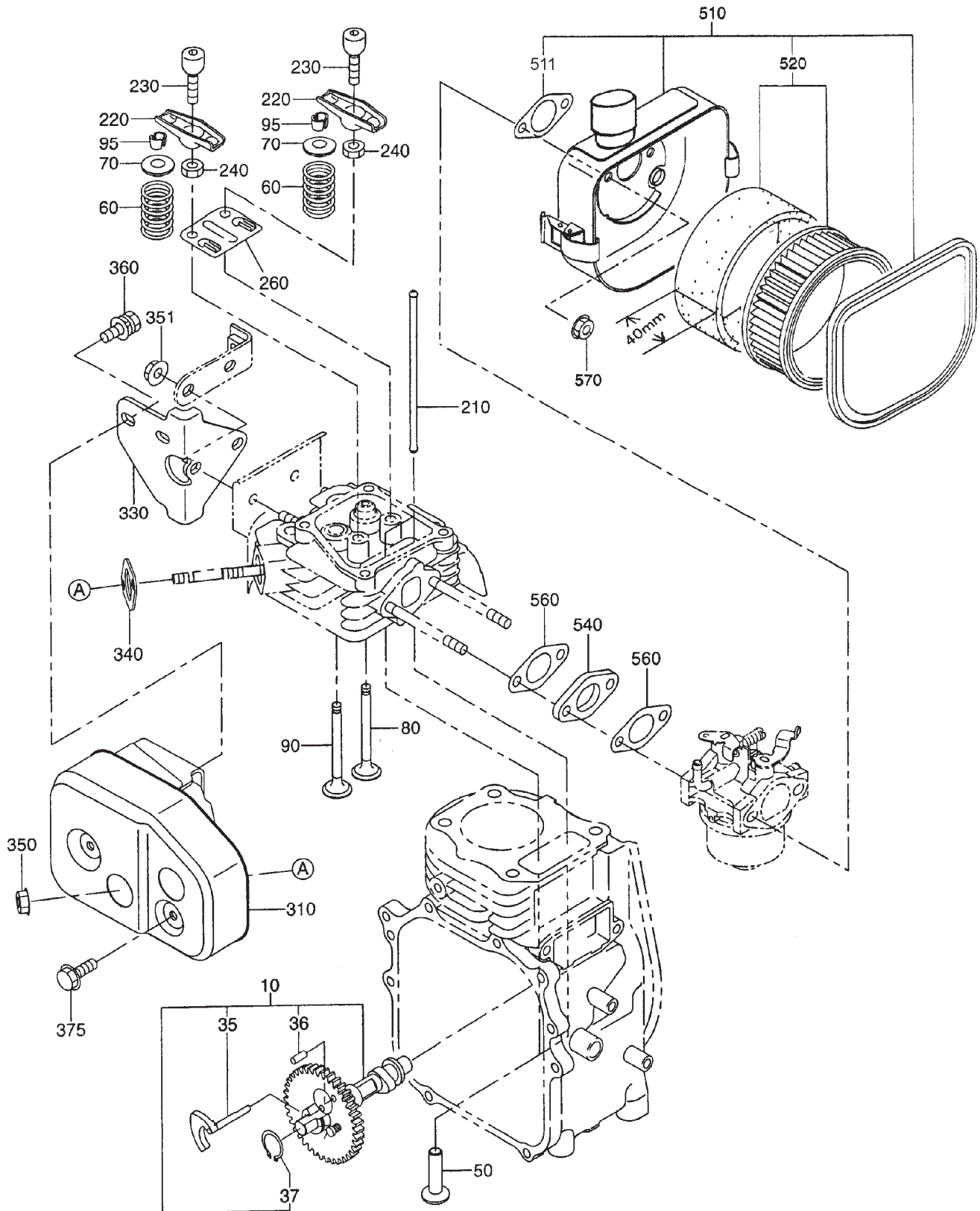
ROBIN EH-090D ENGINE — CRANKCASE ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2741010121	CRANKCASE CP	1	INCLUDES ITEMS W/#
20%	2371420203	VALVE GUIDE	2	
26	2371600801	STEM SEAL CP	1	
30#	0440200070	OIL SEAL 20X32X6	1	
40#	0600200140	BALL BEARING	1	
50#	0310060020	DOWEL PIN	2	
60%	0013906600	STUD	1	
61%	0105060200	STUD	1	
62%	0105060170	STUD	2	
70%	0105060160	STUD	2	
75#	0440060010	OIL SEAL 6X10X2.5	1	
80	0401140030	PLUG	1	
90	0211140020	GASKET	1	
150	2741600113	STIFFENER	1	
160	0011408250	BOLT & WASHER	2	
210	2741100131	MAIN BEARING COVER	1	INCLUDES ITEMS W/*
220*	0440200110	OIL SEAL 20X32X6	1	
230*	0600200140	BALL BEARING	1	
250	2304500301	GOVERNOR GEAR CP	1	
260	2054190103	GOVERNOR SLEEVE	1	
265	0013908500	STUD	4	
270	2306360113	OIL GAUGE	1	
280	0213160020	GASKET	1	
300	0130060200	BOLT & WASHER	9	
610	2741300131	CYLINDER HEAD CP	1	INCLUDES ITEMS W/%
620	2741550103	GASKET, HEAD	1	
630	0110080210	FLANGE BOLT	4	
680	2741550223	ROCKER COVER	1	
690	2741600403	GASKET (ROCKET COVER)	1	
700	0310060020	DOWEL PIN	2	
710	0011406600	BOLT & WASHER ASSY.	4	
727	0566000250	CLAMP	1	
820	2741440101	BREATHER PLATE CP	1	
821	2741620103	GASKET/BREATHER PLATE	1	
825	2741440503	OIL SHELTER PLATE	1	
850	2741610203	BREATHER PIPE	1	
850-1	0566000331	CLAMP, BREATHER, PIPE	1	
852	0569000010	HOSE CLIP	1	
860	0011305100	BOLT & WASHER ASSY.	2	
960	2749900107	GASKET SET	1	

ROBIN EH-090D ENGINE — CRANKSHAFT AND PISTON ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2742010141	CRANKSHAFT CP	1	INCLUDES ITEMS W/#
40	0230200100	SPACER T=0.8	1	
40	0230200110	SPACER T=1.0	1	
40	0230200120	SPACER T=1.2	1	
50	0021812000	NUT	1	
60	0032012000	SPRING WASHER	1	REPLACES 0032012000
70	0053203101	WOODRUFF KEY	1	
75#	0053204201	WOODRUFF KEY	1	
170	0173120010	LOCK NUT	1	
310	2302250120	CONNECTING ROD ASSY.	1	
320	2302300123	CONNECTING ROD BOLT	2	
350	2302330103	PISTON PIN	1	
360	2742340103	PISTON	1	
360	2742340203	PISTON 0.25MM	1	
360	2742340303	PISTON 0.50MM	1	
370	2742350107	PISTON RING SET	1	
370	2742350207	PISTON RING SET 0.25MM	1	
370	2742350307	PISTON RING SET 0.50MM	1	
380	0565110010	CLIP	2	

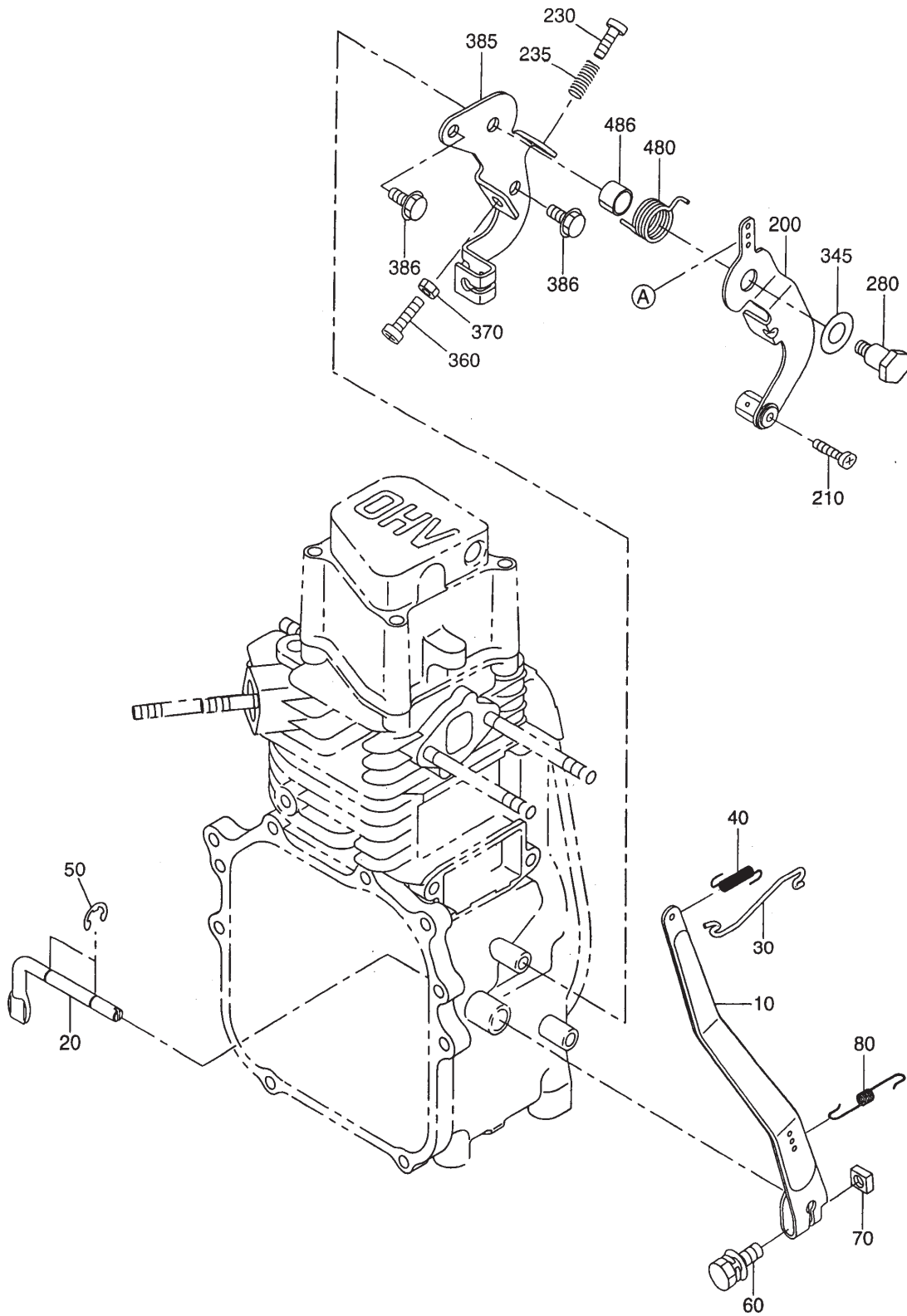
ROBIN EH-090D ENGINE — INTAKE AND EXHAUST ASSY.



ROBIN EH-090D ENGINE — INTAKE AND EXHAUST ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
10	2743170101	CAMSHAFT CP	1	INCLUDES ITEMS W/%
34	2273860123	PIN (SPRING)	1	
35%	2743640103	RELEASE LEVER	1	
36%	0051904100	SPRING PIN	1	
37%	0031517000	SNAP RING	1	
38	2743870103	RETURN SPRING	1	
50	2743330103	TAPPET	2	
60	2743360103	VALVE SPRING	2	
70	2743370103	SPRING RETAINER	2	
80	2743340103	INTAKE VALVE	1	
90	2743350103	EXHAUST VALVE	1	
95	13210KA031	COLLET VALVE	4	
210	2743530103	PUSH ROD	2	
220	2743600103	ROCKER ARM	2	
230	2693580103	BOLT (PIVOT)	2	
240	0170060090	NUT	2	
260	2743650103	GUIDE PLATE	1	
310	2743010211	MUFFLER CP	1	
330	2743700111	BRACKET CP (MUFFLER)	1	
340	2743520101	GASKET CP (EXHAUST)	1	
350	0176060020	SELF LOCK NUT	2	
351	0023806000	FLANGE NUT	2	REPLACES 0023806000
360	0110060010	BOLT AND WASHER ASSY.	2	REPLACES 0011406120
375	0011306120	FLANGE BOLT	2	REPLACES 0110060010
510	2743260400	AIR CLEANER ASSY.	1	INCLUDES ITEMS W/*
510-2*	2303262008	GASKET	1	
520*	2743260307	ELEMENT SET	1	
540	2303290103	INSULATOR	1	
550	2303590103	GASKET (INSULATOR)	1	
560	2303590203	GASKET 2 (INSULATOR)	2	
570	0176060020	SELF LOCK NUT	2	

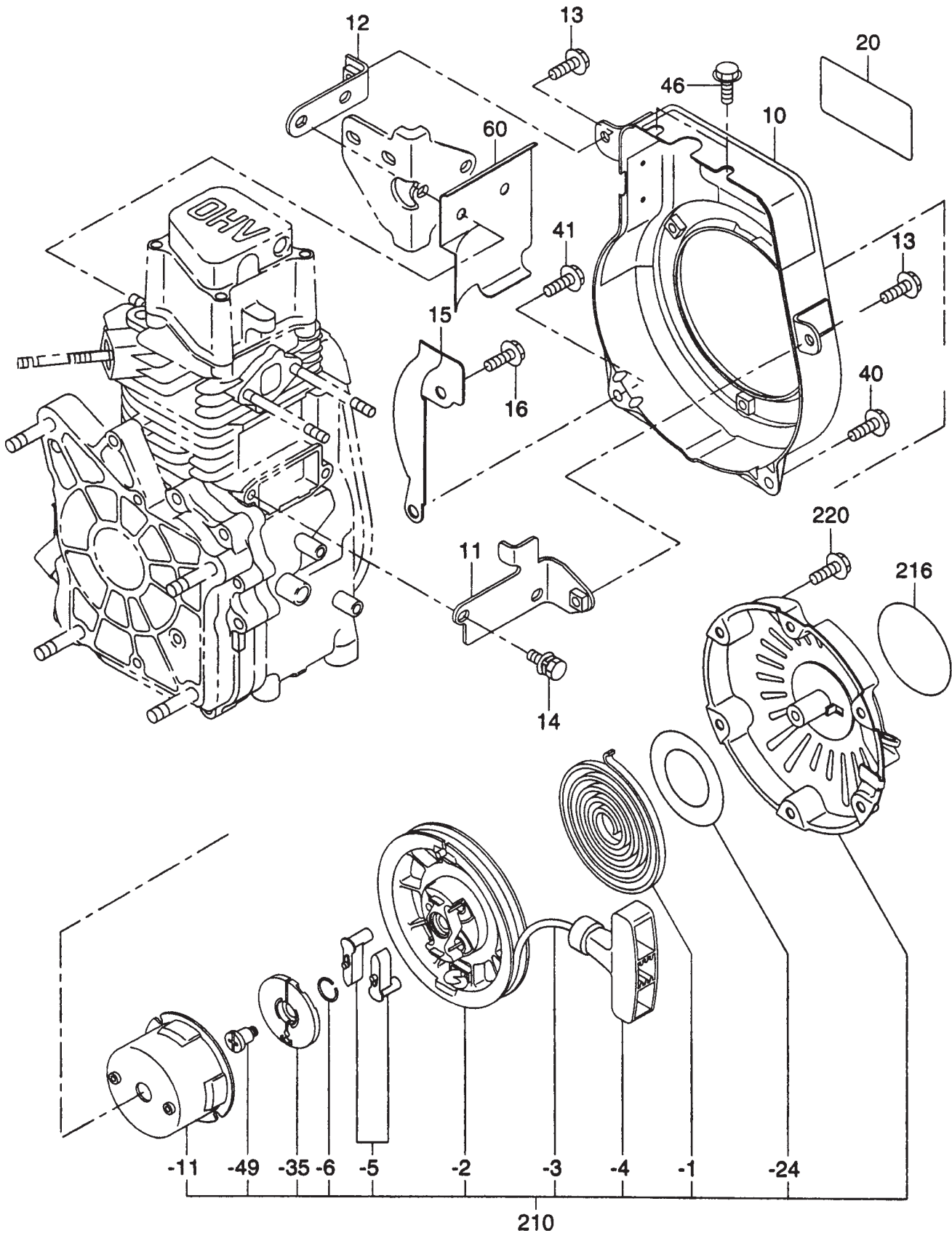
ROBIN EH-090D ENGINE — GOVERNOR ASSY.



ROBIN EH-090D ENGINE — GOVERNOR ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2744230101	GOVERNOR LEVER	1	
20	2304220103	GOVERNOR SHAFT	1	
30	2744270113	GOVERNOR ROD	1	
40	1064280113	ROD SPRING	1	
50	0031305000	CLIP	2	
60	0011406250	BOLT AND WASHER ASSY.	1	
70	0186060020	NUT	1	
80	2744250103	GOVERNOR SPRING	1	
200	2304330210	SPEED CONTROL ASSY.	1	
210	0043104140	SCREW (PAN HEAD)	1	
230	0140040070	SCREW	1	
235	2684500103	CONTROL SPRING	1	
280	2264310301	LINK PIVOT CP	1	
345	0217100020	FRICTION WASHER	1	
360	0043106300	SCREW	1	
370	0022706000	NUT	1	REPLACES 0022706000
385	2744510101	BASE PLATE CP	1	
386	0110060050	FLANGE BOLT	2	REPLACES 0110060010
480	2264500313	RETURN SPRING	1	
486	0230100040	SPACER	1	

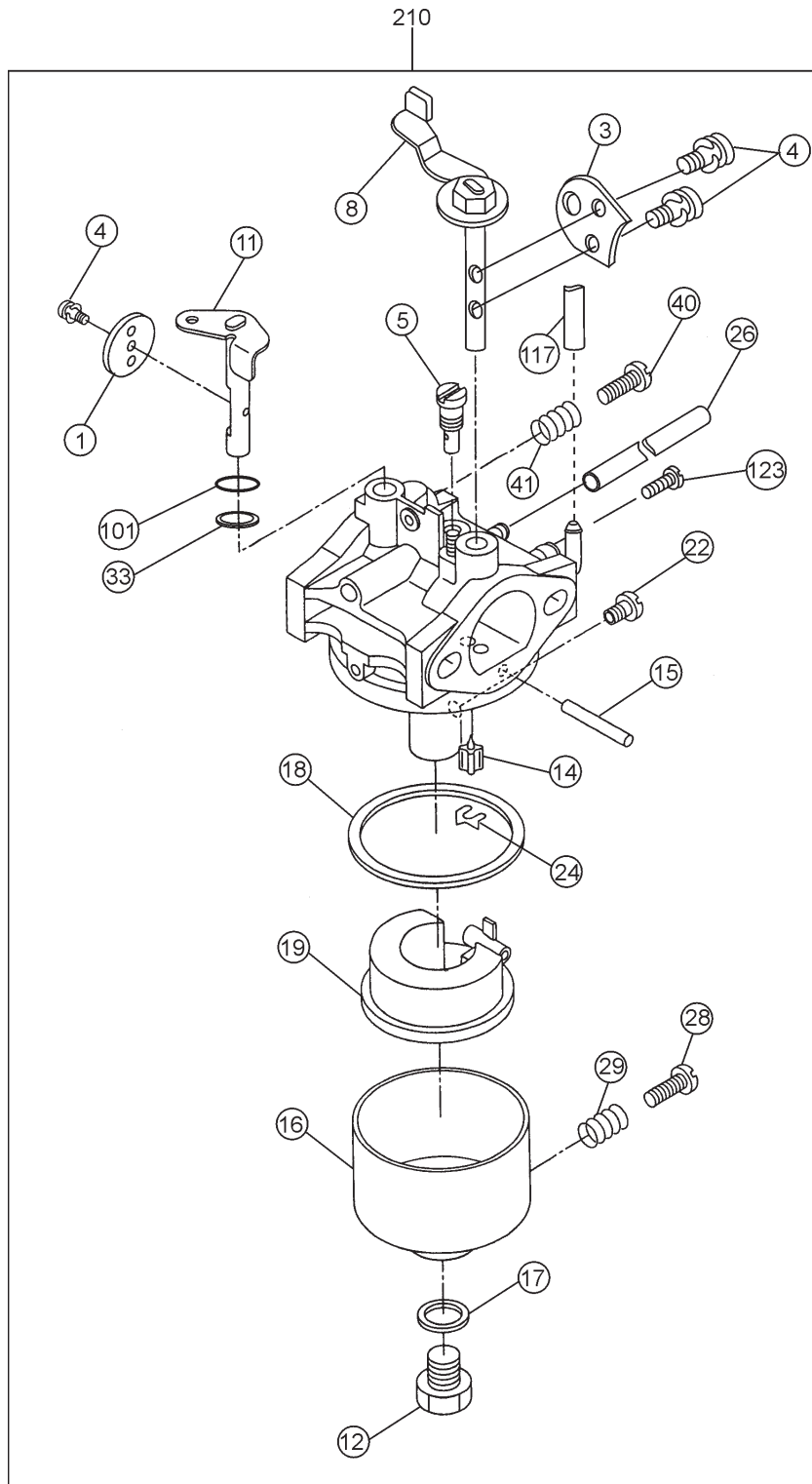
ROBIN EH-090D ENGINE — RECOIL STARTER ASSY.



ROBIN EH-090D ENGINE — RECOIL STARTER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2745120211	BLOWER HOUSING CP	1	
11	2745510121	BLOWER H. BKT. 1 CP	1	
12	2745520101	BLOWER H. BKT. 2 CP	1	
13	0110060020	FLANGE BOLT	2	
14	0011606140	BOLT AND WASHER ASSY.	2	
15	2745500101	BLOWER GUIDE CP	1	
16	0110060050	FLANGE BOLT	1	REPLACES 0110060010
20	2749170103	LABEL (TRADE MARK)	1	
40	0110060050	FLANGE BOLT	1	REPLACES 0110060010
41	0110060020	FLANGE BOLT	1	
46	0110060020	FLANGE BOLT	2	
60	2745260103	CYLINDER BAFFLE	1	
210	2745020120	RECOIL STARTER ASSY.	1	INCLUDES ITEM W/*
210-1*	2745011508	SPIRAL SPRING	1	
210-2*	2745012018	REEL	1	
210-3*	2745011108	STARTER ROPE	1	
210-4*	2615010008	STARTER KNOB	1	
210-5*	2705012508	RATCHET	2	
210-6*	2275013108	FRICTION SPRING	1	
210-11*	2745014508	STARTING PULLEY	1	
210-24*	1315015008	SLIDE PLATE	1	
210-35*	2705026108	RATCHET GUIDE	1	
210-49*	2275015208	SET SCREW	1	
216	2069170103	LABEL (TRADE MARK)	1	
220	0110060020	FLANGE BOLT	3	

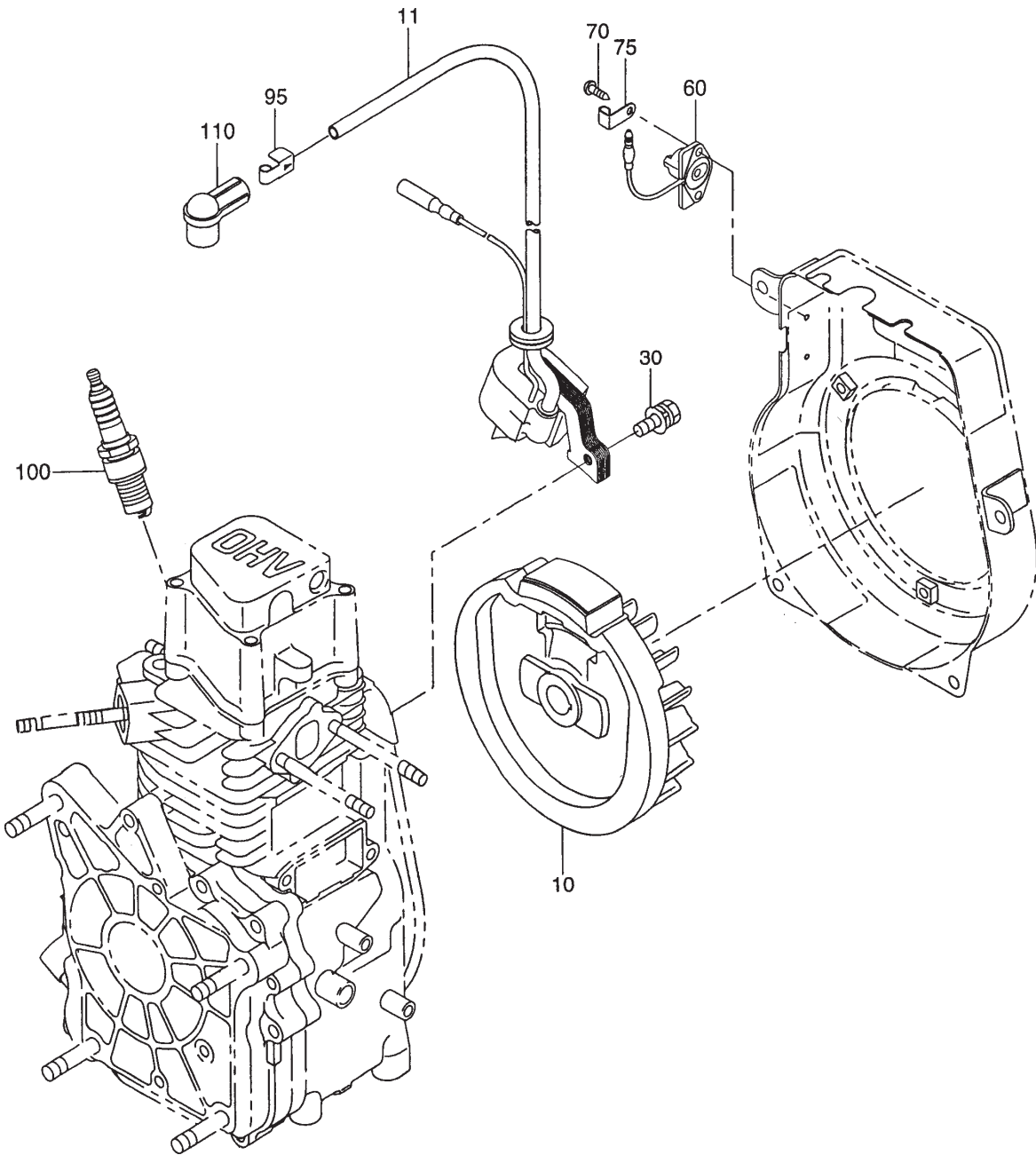
ROBIN EH-090D ENGINE — CARBURETOR ASSY.



ROBIN EH-090D ENGINE — CARBURETOR ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
210	2746230100	CARBURETOR ASSY.	1	INCLUDES ITEMS W/*
-1*	2746253508	THROTTLE VALVE	1	
-3*	2306252508	CHOKE VALVE	1	
-4*	2376245108	SCREW	3	
-5*	2346242108	PILOT JET	1	
-8*	2746252008	SHAFT ASSY. (CHOKE)	1	
-11*	2746253008	SHAFT ASSY. (THROTTLE)	1	
-12*	2246254308	BOLT	1	
-14*	2268250208	NEEDLE VALVE ASSY.	1	
-15*	2146251508	PIN	1	
-16*	2306255308	FLOAT CHAMBER BODY	1	
-17*	2078234508	INSERT WASHER	1	
-18*	2306254008	PACKING	1	
-19*	2306250608	FLOAT ASSY.	1	
-22*	2746240008	MAIN JET	1	
-24*	2266270118	CLIP	1	
-26*	2746235108	HOSE	1	
-28*	2246245008	SCREW	1	
-29*	2106231808	SPRING	1	
-33*	2306258108	SEAL	1	
-40*	1066239308	SCREW	1	
-41*	2066244608	SPRING	1	
-101*	2306258208	PACKING	1	
-117*	2746235008	HOSE	1	
-123*	2276240408	MAIN JET	1	

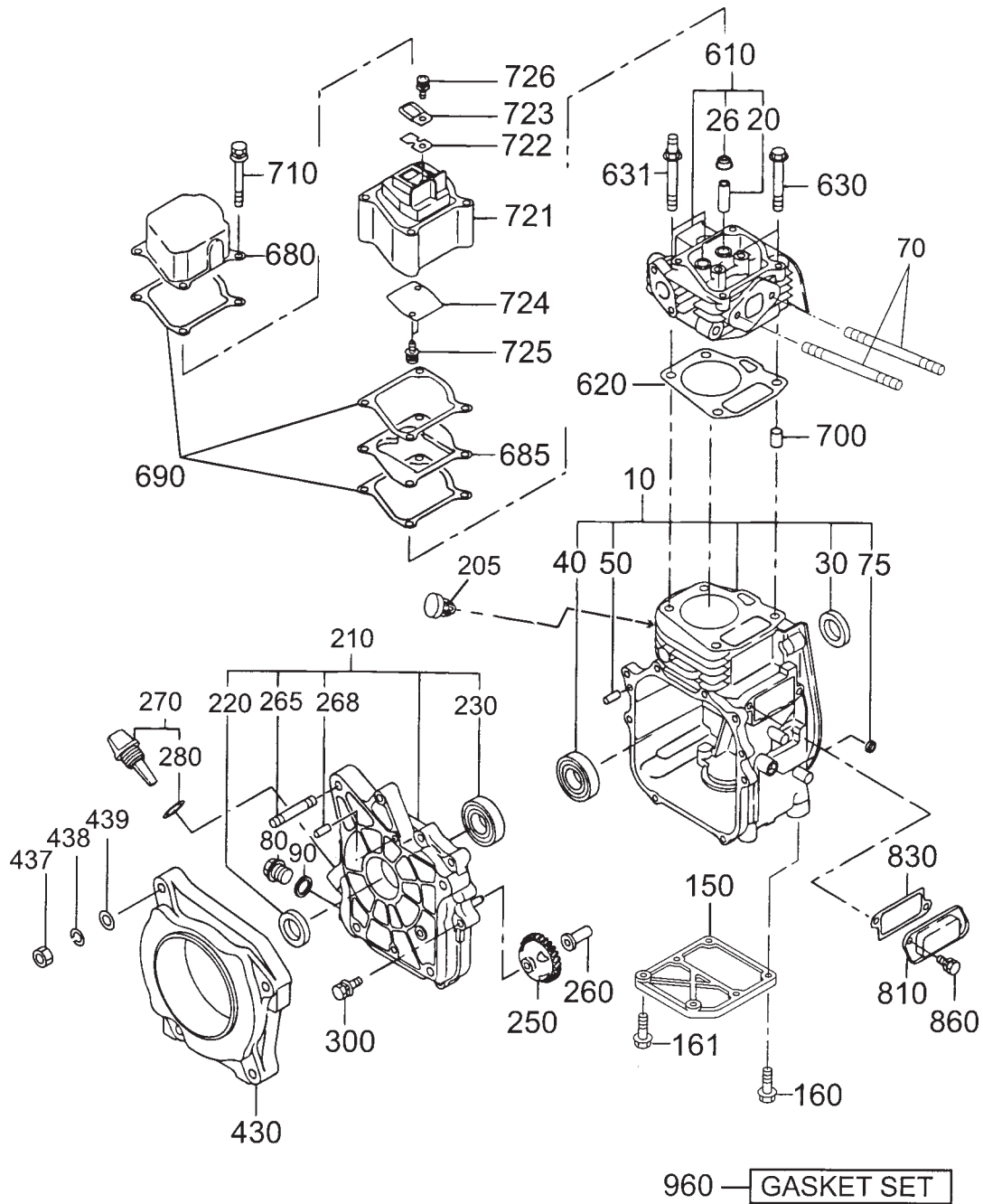
ROBIN EH-090D ENGINE — ELECTRIC DEVICE ASSY.



ROBIN EH-090D ENGINE — ELECTRIC DEVICE ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2307020831	FLYWHEEL CP	1	
11	2747020101	IGNITION COIL CP	1	
30	0011706250	BOLT & WASHER ASSY.	2	
60	0660000361	SWITCH ASSY.	1	
70	0150040090	TAPPING SCREW	2	
75	0566030010	CLAMP	1	
95	0659000010	PLUG TERMINAL	1	
100	0650140470	SPARK PLUG NGK	1	
110	2307510113	SPARK PLUG CAP	1	

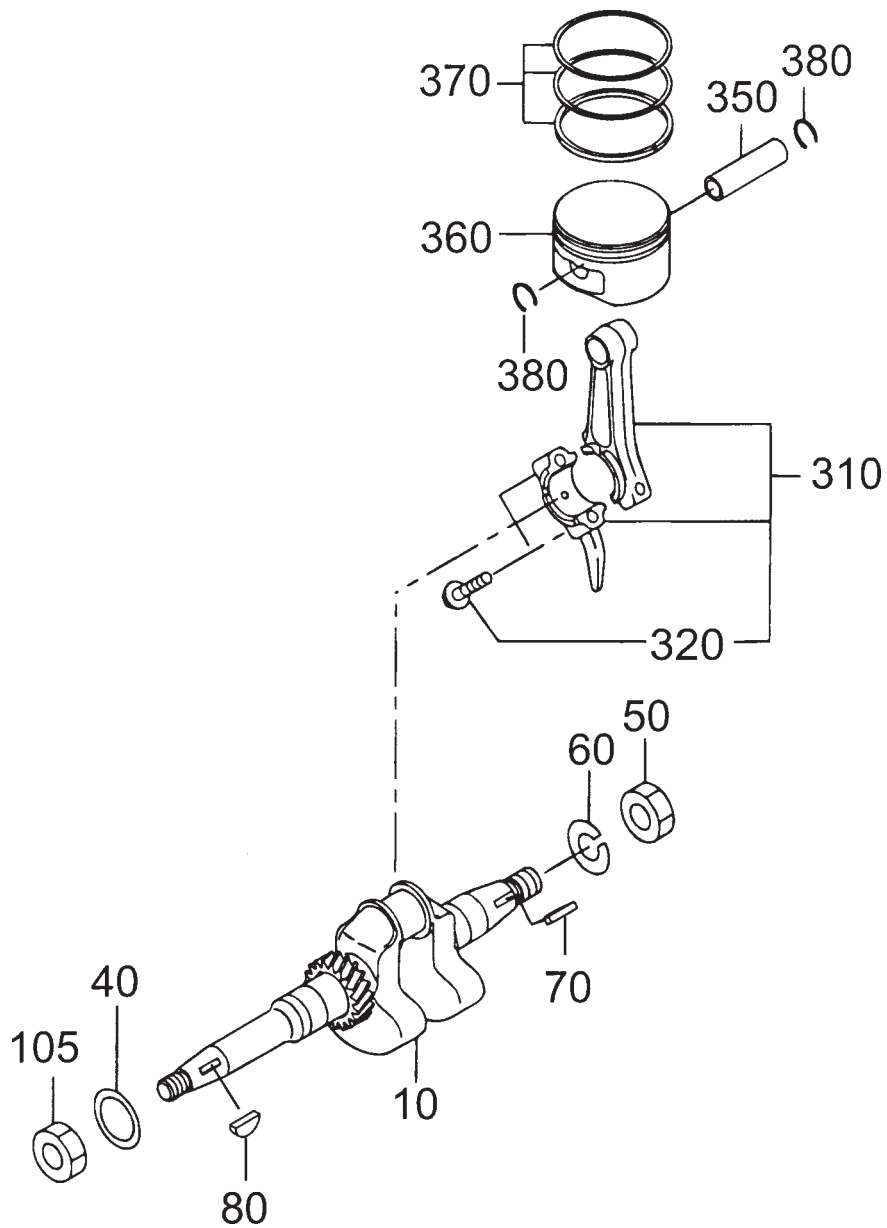
ROBIN EH-092D ENGINE — CRANKCASE ASSY.



ROBIN EH-092D ENGINE — CRANKCASE ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
10	2841010411	CRANKCASE CP	1	INCLUDES ITEMS W/ #
20&	2371420203	VALVE GUIDE	2	
26&	2771601001	STEM SEAL CP	1	
30#	0440200070	OIL SEAL 20X32X6	1	
40#	0600200110	BALL BEARING, 60074C3	1	
50#	0310060020	DOWEL PIN	2	
70	0105060430	STUD	2	
75#	0440060020	OIL SEAL	1	
80	0401140030	PLUG	1	
90	0211140020	GASKET	1	
150	2741600113	STIFFENER	1	
160	0011408250	BOLT & WASHER	4	
161	0011408300	BOLT & WASHER ASSY.	2	
205	0241090060	GROMMET	1	
210	2841100121	MAIN BEARING COVER	1	INCLUDES ITEMS W/ *
220*	0440200110	OIL SEAL 20X32X6	1	
230*	0600200110	BALL BEARING, 6004C3	1	
250	2844500301	GOVERNOR GEAR CP	1	
260	2054190103	GOVERNOR SLEEVE	1	
265*	0013908500	STUD	4	
268*	0310060020	DOWEL PIN	2	
270	2306360101	OIL GAUGE	1	INCLUDES ITEMS W/ %
280%	0213160020	GASKET	1	
300	0130060200	BOLT & WASHER	9	
430	2741500123	ADAPTER FLANGE	1	
437	0021808000	NUT	4	
438	0032008000	SPRING WASHER	4	
439	0031108000	WASHER	4	
610	2841300110	CYLINDER HEAD ASSY.	1	INCLUDES ITEMS W/ &
620	2841500113	GASKET HEAD	1	
630	0110080210	FLANGE BOLT	1	
631	0100080410	BOLT	2	
680	2841550203	ROCKER COVER	1	
685	2841450203	OIL SHELTER PLATE	1	
690	2841600403	GASKET, ROCKER COVER	3	
700	2771501103	PIPE KNOCK	2	
710	0110060400	FLANGE BOLT	4	
721	2841560203	BREATHER PLATE	1	
722	2841600103	LEAF VALVE	1	
723	2841600203	BREATHER PLATE	1	
724	2841450103	OIL SHELTER PLATE	1	
725	0131050020	SCREW & WASHER ASSY.	2	
726	0131050020	SCREW & WASHER ASSY.	1	
810	2841700103	COVER CASE	1	
830	2301600613	GASKET TAPPET COVER NA	1	
860	0011406160	BOLT & WASHER ASSY.	2	
960	2849900117	GASKET SET	1	

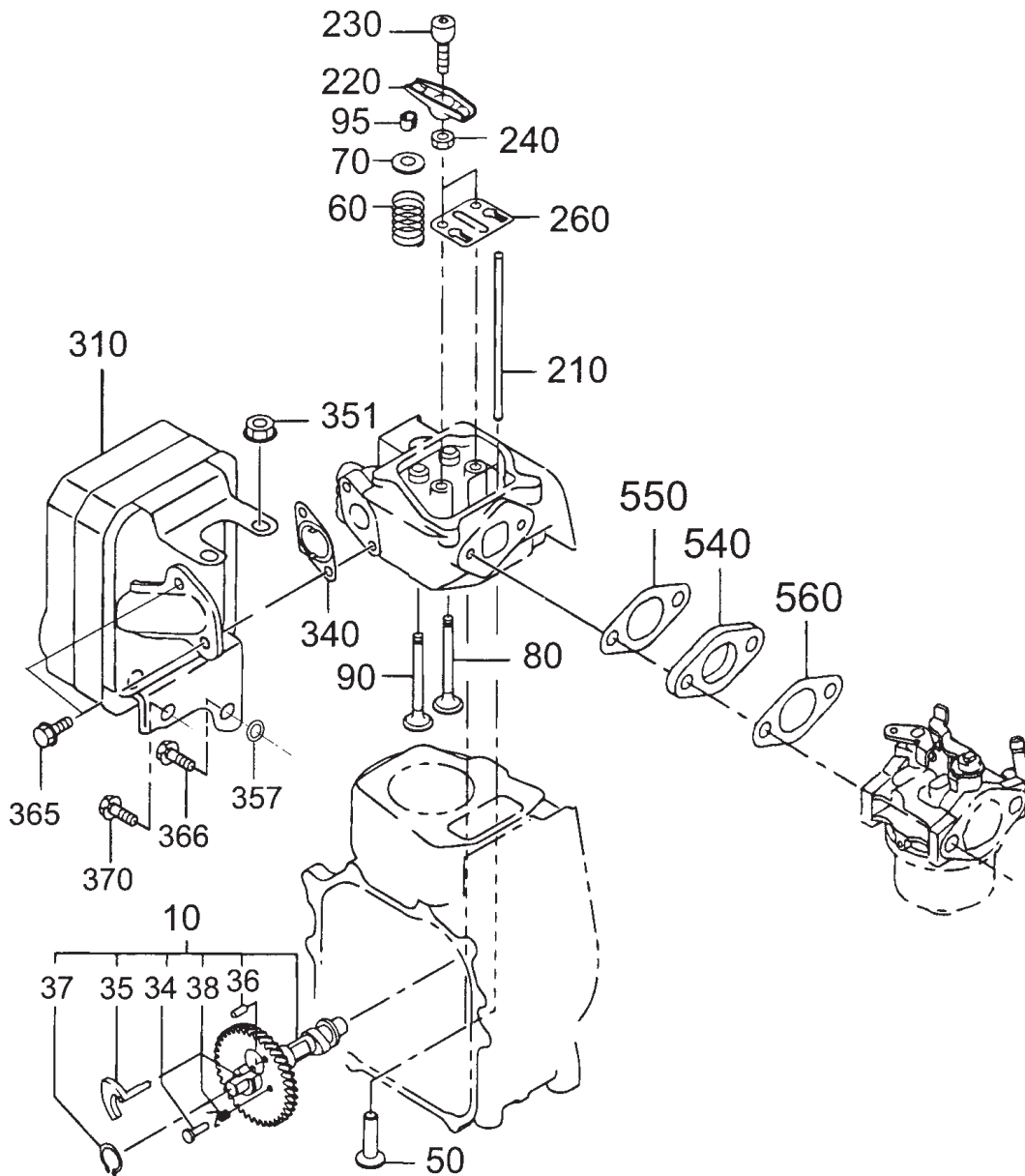
ROBIN EH-092D ENGINE — CRANKSHAFT AND PISTON ASSY.



ROBIN EH-092D ENGINE — CRANKSHAFT AND PISTON ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2842030101	CRANKSHAFT CP	1	
40	0230200100	SPACER T=0.8	1	
41	0230200110	SPACER T=1.0	1	
42	0230200120	SPACER T=1.2	1	
50	0021814000	NUT	1	
60	0032014000	SPRING WASHER	1	REPLACES 0032012000
70	0053203101	WOODRUFF KEY	1	
80	0053204201	WOODRUFF KEY	1	
105	0173120010	LOCK NUT	1	
310	2842250130	CONNECTING ROD ASSY.....	1	INCLUDES ITEMS W/%
320%	2842300103	CONNECTING ROD BOLT	2	
350	2302330103	PISTON PIN	1	
360	28423401H3	PISTON	1	
360	28423402H3	PISTON 0.25MM	1	
360	28423403H3	PISTON 0.50MM	1	
370	2842351107	PISTON RING SET	1	
370	2842351207	PISTON RING SET 0.25MM	1	
370	2842351307	PISTON RING SET 0.50MM	1	
380	0565110010	CLIP	2	

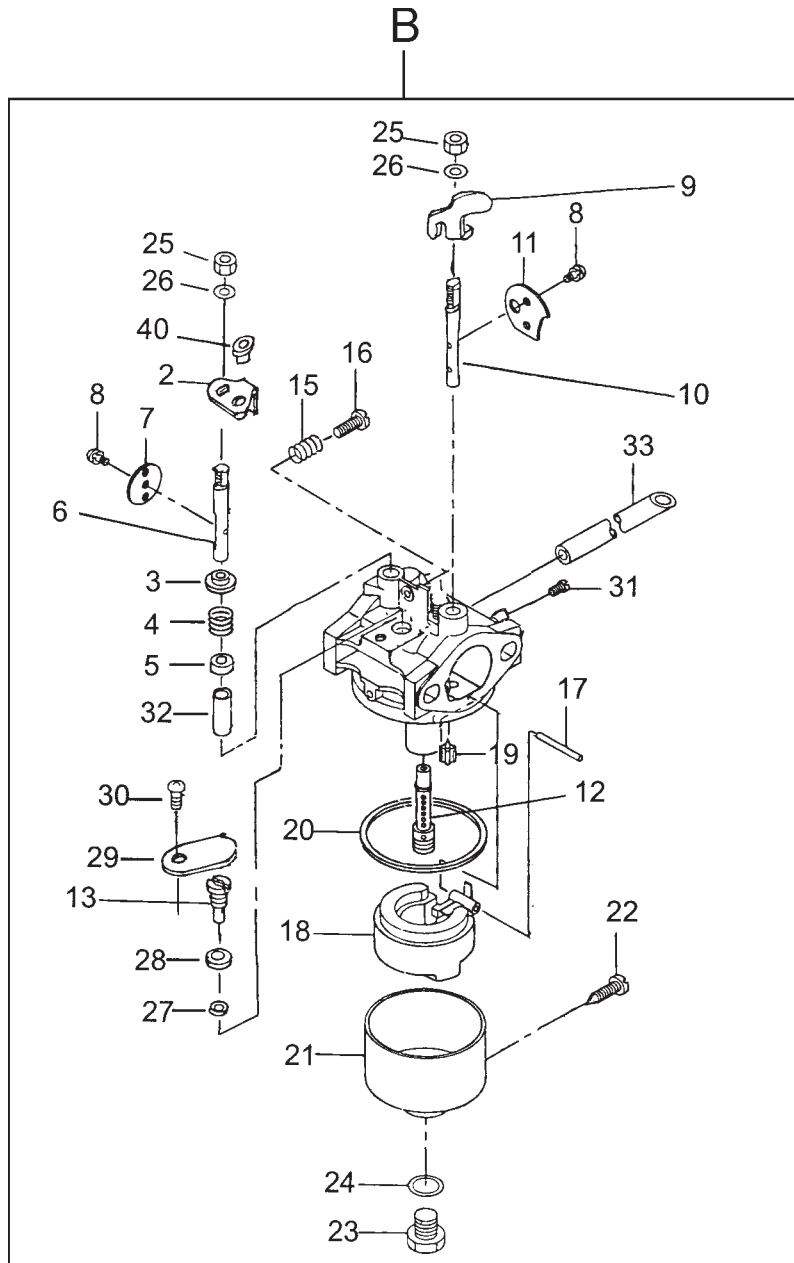
ROBIN EH-092D ENGINE — INTAKE AND EXHAUST ASSY.



ROBIN EH-092D ENGINE — INTAKE AND EXHAUST ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2843170121	CAMSHAFT CP	1	INCLUDES ITEMS W/%
34%	2273860123	PIN (SPRING)	1	
35%	2843640103	RELEASE LEVER	1	
36%	0051904100	SPRING PIN	1	
37%	0031517000	SNAP RING	1	
38%	2743870123	RETURN SPRING	1	
50	2743330103	TAPPET	2	
60	2743360103	VALVE SPRING	2	
70	2743370203	SPRING RETAINER	2	
80	2743340103	INTAKE VALVE	1	
90	2743350103	EXHAUST VALVE	1	
95	13210KA031	COLLET VALVE	4	
210	2743530103	PUSH ROD	2	
220	2743600303	ROCKER ARM	2	
230	2693580103	BOLT (PIVOT)	2	
240	0170060090	NUT	2	
260	2743650103	GUIDE PLATE	1	
310	2843010401	MUFFLER CP	1	
340	2843520103	GASKET (EXHAUST)	1	
351	0023808000	FLANGE NUT	2	
357	0200080170	WASHER	1	
365	0110060460	FLANGE BOLT	2	
366	0011408160	BOLT & WASHER 8X16	1	
370	0130080240	BOLT & WASHER ASSY.	1	
540	1063292103	INSULATOR	1	
550	2843590203	GASKET (INSULATOR)	1	
560	1573500103	GASKET 2 (INSULATOR)	1	
570	0176060030	SELF LOCK NUT	2	

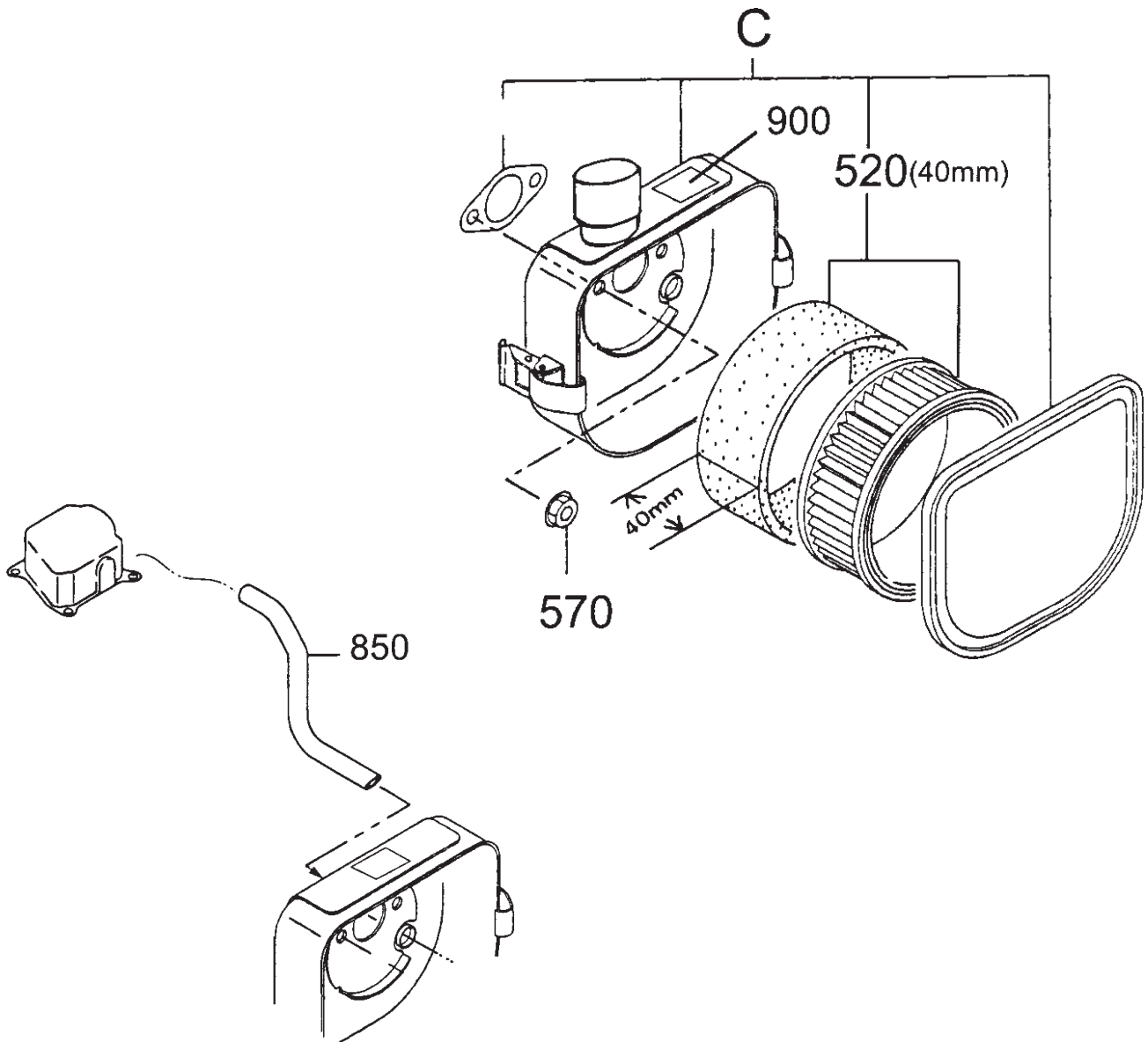
ROBIN EH-092D ENGINE — CARBURETOR ASSY.



ROBIN EH-092D ENGINE — CARBURETOR ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
B	2846233200	CARBURETOR ASSY.	1	INCLUDES ITEMS W/#
2#	2846253908	LEVER SUB ASSY. THROTTLE	1	
3#	2846256008	COLLAR	1	
4#	2846231608	SPRING, THROTTLE	1	
5#	2516255908	BUSH	1	
6#	2846253308	SHAFT, THROTTLE	1	
7#	2846253508	THROTTLE VALVE	1	
8#	2846245508	SCREW	2	
9#	2846252908	LEVER CHOKE	1	
10#	2846252308	SHAFT CHOKE	1	
11#	2846252908	VALVE CHOKE	1	
12#	2846240108	MAIN JET #68	1	
13#	2846242008	SLOW JET	1	
15#	2516244908	SRING	2	
16#	2776258108	SCREW ADJUST	2	
17#	2846251508	PIN, FLOAT LEVER	1	
18#	2846250508	FLOAT ASSY.	1	
19#	2796250008	VALVE NEEDLE	1	
20#	2846254008	GASKET CHAMBER	1	
21#	2846255208	CHAMBER ASSY. FLOAT	1	
22#	2516266108	DRAIN SCREW	1	
23#	2846233508	SCREW	1	
24#	2516235008	GASKET	1	
25#	2846246508	NUT	2	
26#	2846246008	SPRING WASHER	2	
27#	2846245008	O-RING	1	
28#	2846245108	O-RING	1	
29#	2846256308	PLATE	2	
30#	2846245608	SCREW	1	
31#	2846246008	JET	1	
32#	2846243008	COLLAR	1	
33#	2516256508	RUBBER PIPE	1	
40#	2844550103	BUSH, THRO	1	

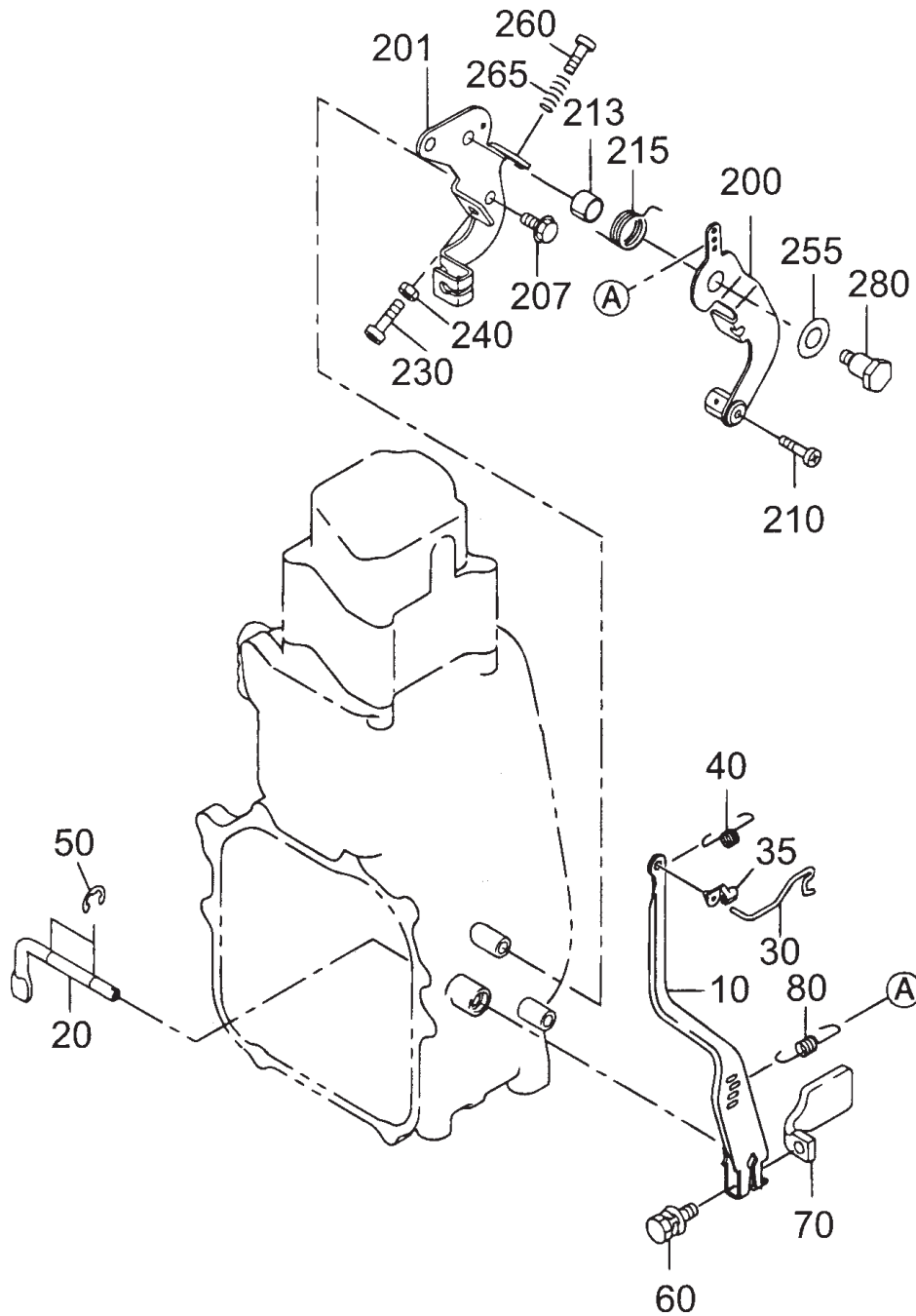
ROBIN EH-092D ENGINE — AIR CLEANER ASSY.



ROBIN EH-092D ENGINE — AIR CLEANER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
C	2843260300	AIR CLEANER ASSY.	1	INCLUDES ITEMS W/#
520#	2743260307	ELEMENT SET/09	1	
570	0176060030	SELF LOCK NUT	2	
850	2841600403	RUBBER PIPE	1	
900#	0732004430	LABEL, CHOKE	1	

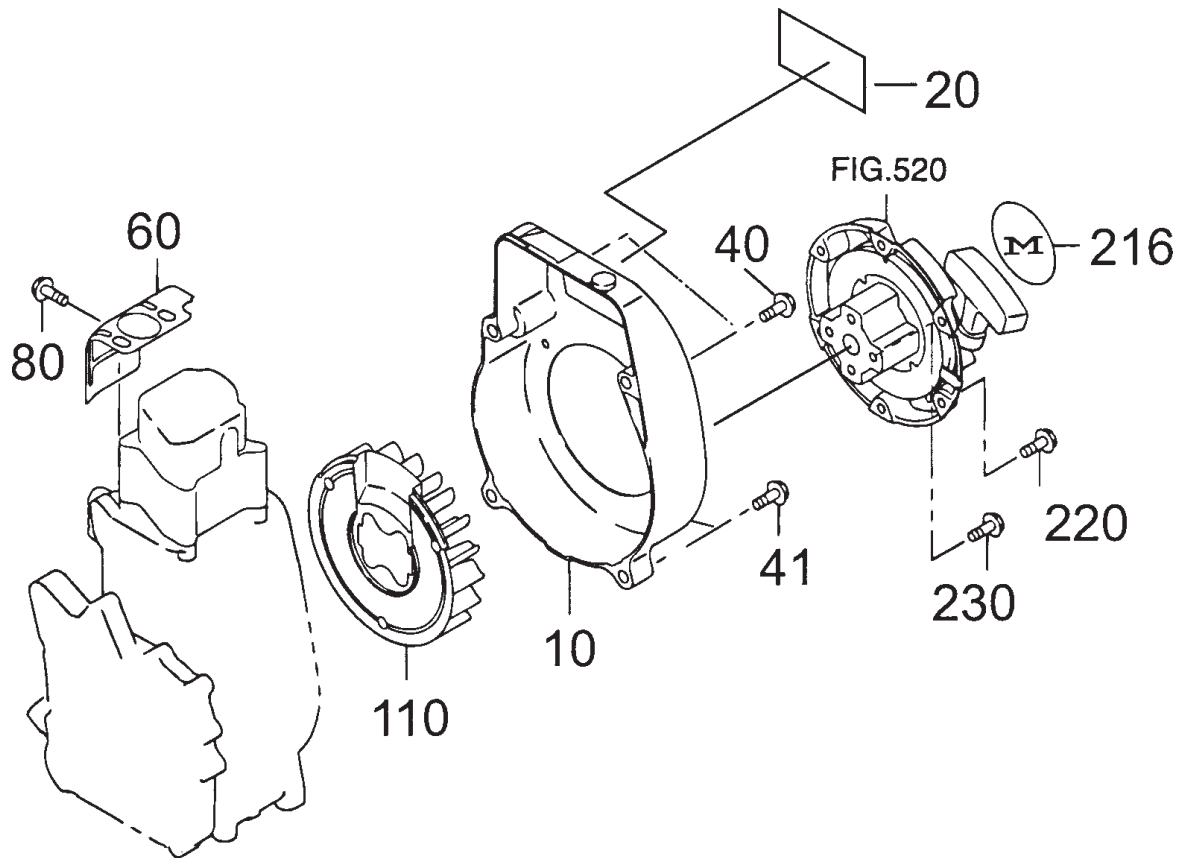
ROBIN EH-092D ENGINE — GOVERNOR, OPERATION ASSY.



ROBIN EH-092D ENGINE — GOVERNOR, OPERATION ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2844230403	GOVERNOR LEVER	1	
20	2304220103	GOVERNOR SHAFT	1	
30	2844270201	GOVERNOR ROD	1	
35	2844560103	LINKAGE BUSHING	1	
40	2844280403	ROD SPRING	1	
50	0031305000	CLIP	2	
60	0011406300	BOLT & WASHER ASSY.	1	
70	2844900201	WEIGHT CP	1	
80	2524250323	GOVERNOR SPRING	1	
200	2304330210	SPEED CONTROL ASSY.	1	
201	2744510101	BASE PLATE	1	
207	0110060010	FLANGE BOLT	2	
210	0043104140	SCREW, PAN HEAD	1	
213	0230100040	SPACER	1	
215	2264500313	RETURN SPRING	1	
230	0043106300	SCREW	1	
240	0022706000	NUT	1	
255	0217100020	FRICTION WASHER	1	
260	0140040070	SCREW	1	
265	2684500113	CONTROL SPRING	1	
280	2264310301	LINK PIVOT	1	

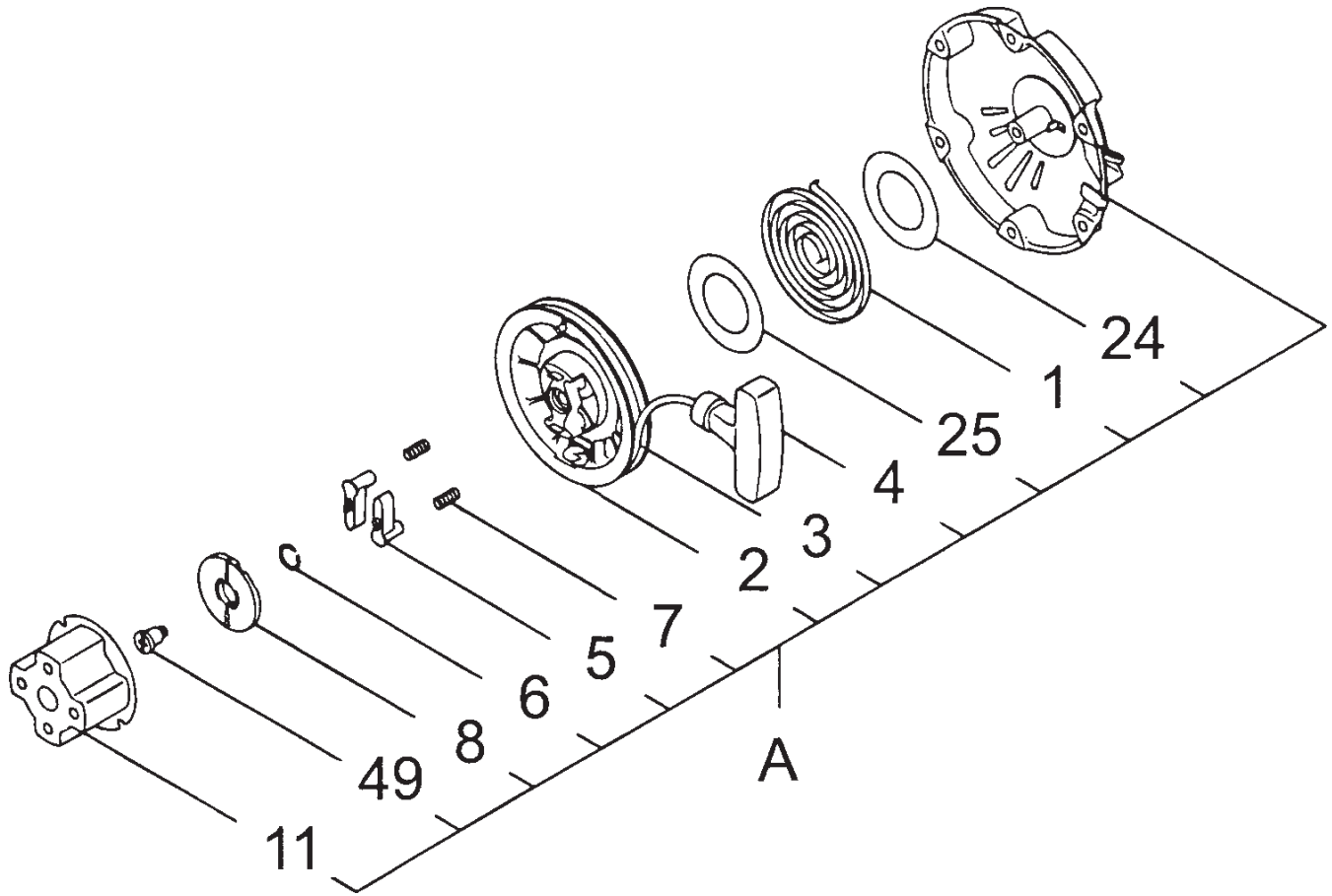
ROBIN EH-092D ENGINE — BLOWER HOUSING ASSY.



ROBIN EH-092D ENGINE — BLOWER HOUSING ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2845110213	BLOWER HOUSING CP	1	
20	2849510203	LABEL	1	
40	0010408350	FLANGE BOLT	1	
41	0010408200	FLANGE BOLT	1	
60	2845260123	CYLINDER BAFFLE	1	
80	0110060010	FLANGE BOLT	2	
110	2845410103	COOLING BLOWER	1	
216	920100240	DECAL, M-MARK	1	
220	0110060010	FLANGE BOLT	3	
230	0110060020	FLANGE BOLT	4	

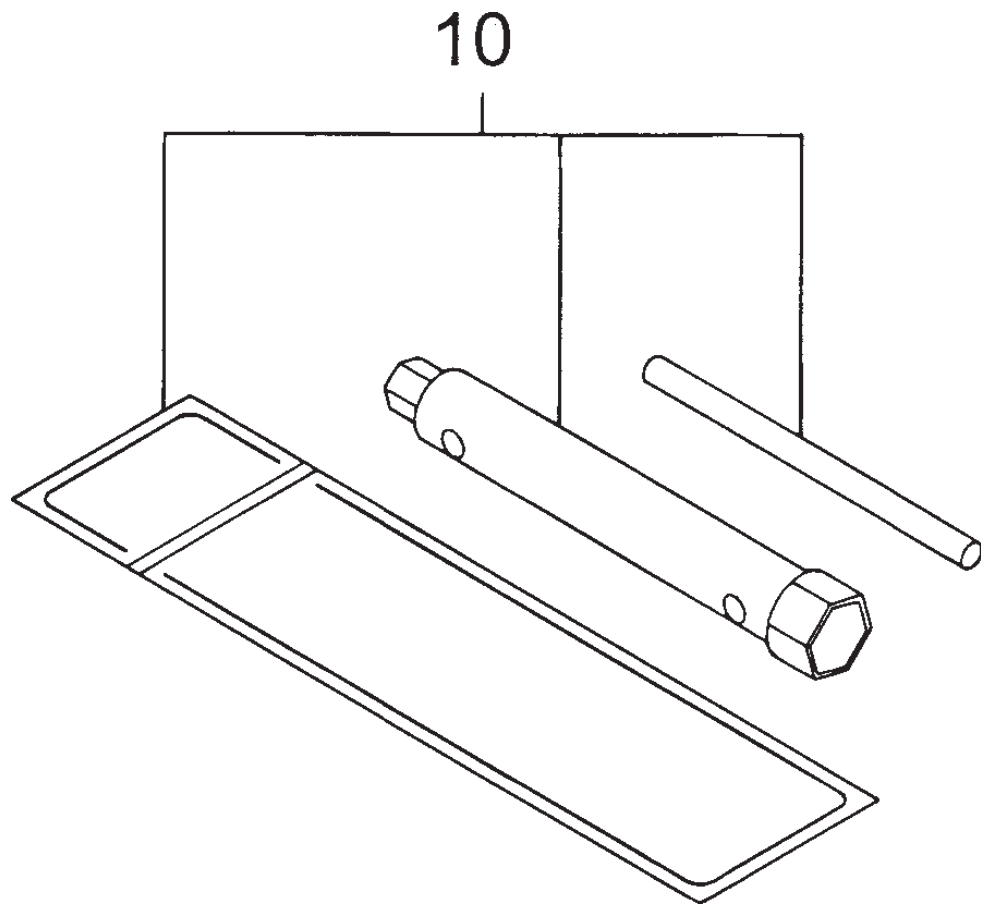
ROBIN EH-092D ENGINE — RECOIL STARTER ASSY.



ROBIN EH-092D ENGINE — RECOIL STARTER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
A	2845021120	RECOIL STARTER ASSY.	1	INCLUDES ITEM W/*
1*	2745011508	SPIRAL SPRING	1	
2*	2745012018	REEL	1	
3*	2745011208	STARTER ROPE	1	
4*	2615010008	STARTER KNOB	1	
5*	2705012508	RATCHET	2	
6*	2745013108	FRICTION SPRING	1	
7*	2275013508	RETURN SPRING	2	
8*	2705026108	RATCHET GUIDE	1	
11*	2845014508	STARTING PULLEY	1	
24*	2745015208	SLIDE PLATE, B	1	
25*	1315015008	SLIDE PLATE	1	
49*	2275015208	SET SCREW	1	

ROBIN EH-092D ENGINE — ACCESSORIES ASSY.



ROBIN EH-092D ENGINE — ACCESSORIES ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	2269030710	ACCESSORY TOOL KIT	1	

TERMS AND CONDITIONS OF SALE — PARTS

PAYMENT TERMS

Terms of payment for parts are net 30 days.

FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

MINIMUM ORDER

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the current parts price list.
 - b. The list must be typed or computer generated.
 - c. The list must state the reason(s) for the return.
 - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
 - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.

5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
 - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
 - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
 - c. Any line item with an extended dealer net price of less than \$5.00.
 - d. Special order items.
 - e. Electrical components.
 - f. Paint, chemicals, and lubricants.
 - g. Decals and paper products.
 - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

LIMITATIONS OF SELLER'S LIABILITY

Multiquip shall not be liable hereunder for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

Effective: February 22, 2006

OPERATION AND PARTS MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON-HAND WHEN CALLING

UNITED STATES

Multiquip Corporate Office

18910 Wilmington Ave.
Carson, CA 90746
Contact: mq@multiquip.com

Tel. (800) 421-1244
Fax (800) 537-3927

MQ Parts Department

800-427-1244
310-537-3700

Fax: 800-672-7877
Fax: 310-637-3284

Service Department

800-421-1244
310-537-3700

Fax: 310-537-4259

Warranty Department

800-421-1244
310-537-3700

Fax: 310-943-2249

Technical Assistance

800-478-1244

Fax: 310-943-2238

MEXICO

MQ Cipsa

Carr. Fed. Mexico-Puebla KM 126.5
Momoxpan, Cholula, Puebla 72760 Mexico
Contact: pmastretta@cipsa.com.mx

Tel: (52) 222-225-9900
Fax: (52) 222-285-0420

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Multiquip

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Tel: (450) 625-2244
Tel: (877) 963-4411
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This manual MUST accompany the equipment at all times. This manual is considered a permanent part of the equipment and should remain with the unit if resold.

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