# PARTS AND OPERATION MANUAL

WHITEMAN

# Bullfloat — HAL 150 & 300



Revision #2 (03/12/01)

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# ⚠ WARNING ⚠

**CALIFORNIA — Proposition 65 Warning**

Engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks.
- Cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: ALWAYS work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

# HERE'S HOW TO GET HELP

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

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*800-427-1244 or 310-537-3700*
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***SERVICE DEPARTMENT/TECHNICAL ASSISTANCE***
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***NOTE: Specification and part number are subject to change without notice.***

- **Dealer account number**
- **Dealer name and address**
- **Shipping address (if different than billing address)**
- **Return fax number**
- **Applicable model number**
- **Quantity, part number and description of each part**
- **Specify preferred method of shipment:**
  - UPS Ground
  - UPS Second Day or Third Day*
  - UPS Next Day*
  - Federal Express Priority One (please provide us with your Federal Express account number)*
  - Airborne Express*
  - Truck or parcel post

**Normally shipped the same day the order is received, if prior to 2PM west coast time.*

# Earn Extra Discounts when you order by FAX!

All parts orders which include complete part numbers and are received by fax qualify for the following extra discounts:

| Number of line items ordered | Additional Discount |
|---|---|
| 1-9 items | 3% |
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**Extra Fax Discount for Domestic USA Dealers Only**

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*For faxed orders only*

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No other allowances on freight shipped by any other carrier.

**Common nuts, bolts and washers (all items under $1.00 list price) do not count towards the 10+ line items.

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**Fax order discount and UPS special programs revised June 1, 1995**

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# EXPLANATION OF CODE IN REMARK COLUMN

How to read the marks and remarks used in this parts book.

**Section 1: Items Found In the "Remarks" Column**

Serial Numbers-Where indicated, this indicates a serial number range (inclusive) where a particular part is used.

Model Number-Where indicated, this shows that the corresponding part is utilized only with this specific model number or model number variant.

**Section 2: Items Found In the "Items Number" Column**

All parts with same symbol in the number column:

*, #, +, %, or ■, belong to the same assembly or kit.

Note: If more than one of the same reference number is listed, the last one listed indicates newest (or latest) part available.

***NOTE: The contents of this parts catalog are subject to change without notice.***

The Bullfloat models HAL 150/300 have been developed and tested in accordance with strict International Safety Standards.

This section contains general advice.

Regular maintenance of the Bullfloat **promotes** safe operation.

- When in doubt and/or when you are operating the Bullfloat for the first time, always read the necessary instructions in this manual.
- Wear safety shoes with extra protection (steel caps and anti-slip soles).
- Place the wires between the electrical source and the work area in such a way that they can not be damaged or your co-workers cannot trip over them.
- Do not leave any tools or parts laying around on the work floor, as this can cause accidents.
- Watch where you are going; the ground can be slippery.
- Take care that you do not injure yourself on objects, such as scaffolding and reinforcement materials, which can be found directly or indirectly in the working area.
- Pay attention to your own safety and that of your fellow workers.
- Be careful when lifting and carrying the Bullfloat. Do not bend forwards when picking up the apparatus, but bend your knees. Ensure that the working area is within your reach, so that you do not have to bend forward.
- Ensure that you are qualified (familiar with the contents of this manual) to operate and carry out light maintenance work to the Bullfloat.
- Check that the electrical source complies with the local regulations.
- Use grounded extension cords, when it is necessary to use extension cords.
- Use an electrical source which is provided with a ground leakage switch between the electrical mains and the Bullfloat.
- Ensure that the wall socket and possible connections between the extension cords are protected against dampness.
- Do not pull the plug out of the wall socket or extension cords by it's cord, use the plug.

**The following safety-aspects specifically apply to those Whiteman products which are equipped with a gas-engine.**

- **Do not use the Bullfloat with a gas-engine indoors or in poorly ventilated places, such as pits etc.**
- Make sure that there is sufficient ventilation in spaces which are surrounded by walls. Never inhale exhaust gases, they can damage your health and that of your fellow workers.
- Wear working-gloves, safety glasses and protective clothing during refueling.
- Make sure that there is sufficient ventilation during refueling.
- Refuel only after the engine has cooled off sufficiently.

Refueling of fuel, while the engine is hot, might lead to a very dangerous situation including an explosion and fire.

- **It is strictly forbidden to refuel:**
  - in the direct vicinity of a open fire or other flammable materials,
  - in explosion endangered places.

- To avoid getting an electric shock, do not touch the high-tension cable or spark plug cap while the engine is running.

**General Safety Instructions**

- When operating the Bullfloat wear ear protection, safety glasses, a safety helmet, gloves which do not conduct electricity and protective clothing.
- Ensure that all symbols on the Bullfloat — can always be clearly read.
- Regularly check the Bullfloat's connections.
- When cleaning the Bullfloat, ensure that no water or cleaning detergents, under high pressure, get into the motor housing or plug connections.
- When the Bullfloat is not being used for long periods of time, then it must be store in a dry and clean area.

**Important Safety Checks for the electrical Bullfloat**

- Check the feeder cable and extension cords outer casing before you connect the Bullfloat to the electrical mains.

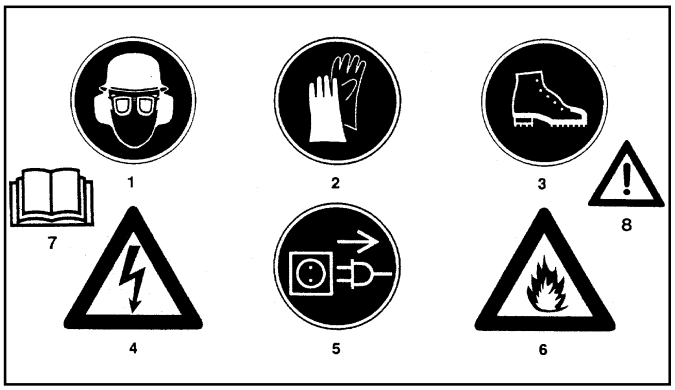
- Check the feeder cable's attachment on the bullfloat, before you connect the Bullfloat to the electrical mains. The cable must be correctly attached to the Bullfloat.
- Ensure that the feeder cable does not graze past any sharp objects.

- The use of extension cords are permitted, if they are completely watertight.

- Switch the Bullfloat "off" when the electrical power cuts off. This prevents the Bullfloat from starting suddenly when the electrical power comes on again.

- Check the feeder cable and extension cord's attachments regularly. When the Bullfloat is in operation, the plugs can loosen due to the vibrations.
- Disconnect the electrical supply to the Bullfloat, before you start to clean or service the Bullfloat.
- Connect the Bullfloat to an alternating voltage source of 115VAC, which is provided with a ground switch, with a frequency of 60 Hz.
- Check that the ventilation openings in the motor housing are free from dirt and moisture.
- Regularly check the connections of the feeder cable to the switch.

## Explanation of the utilized safety symbols.




1. Safety glasses, safety helmet and ear protection compulsory.
2. Gloves compulsory.
3. Safety shoes with extra protection compulsory.
4. Dangerous electrical voltage.
5. Before opening the motor housing remove the plug.
6. Inflammable material.
7. Pls. read the operation-instructions
8. Careful, danger!

**Tip:** Ask the manufacturer for clarification, if you have any questions about any of these safety instructions.

| | HAL (115VAC) | HAL (2 stroke gas-engine) |
|---|---|---|
| **Voltage** | 115VAC<br>1 Phase/60Hz | — |
| **Capacity** | 350 W | 520 W |
| **Revolutions** | 12000 r/min | 12000 r/min |
| **Centrifugal force Mass** | 1800 N (405 lbs.) | 1800 N (405 lbs.) |
| | 1 m (11Kg) (24.3 lbs.) | 1 m (11Kg) (24.3 lbs.) |
| | 1, 5 m (13Kg) (28.6 lbs.) | 1, 5 m (13Kg) (28.6 lbs.) |
| | 2 m (15Kg) (33.1 lbs.) | 2 m (15Kg) (33.1 lbs.) |
| | 2, 5 m (17Kg) (37.5 lbs.) | 2, 5 m (17Kg) (37.5 lbs.) |
| | 3 m (19Kg) (41.9 lbs.) | 3 m (19Kg) (41.9 lbs.) |
| **Fuel** | — | 2-stroke (mixture) |
| **Mixture** | — | 1 : 25 |
| **Sealing** | IP 54, splash proof | IP 54, splash proof |
| **Insulation** | Class II<br>Double Insulated | — |
| **Motor protection** | Impact and shock proof | — |
| **Design** | Portable | Portable |
| **Dimensions drive-unit** | | |
| **Length** | 180 mm (7.1 in.) | 150 mm (5.9 in.) |
| **Width** | 150 mm (5.9 in.) | 200 mm (7.9 in.) |
| **Height** | 140 mm (5.5 in.) | 220 mm (8.7 in.) |

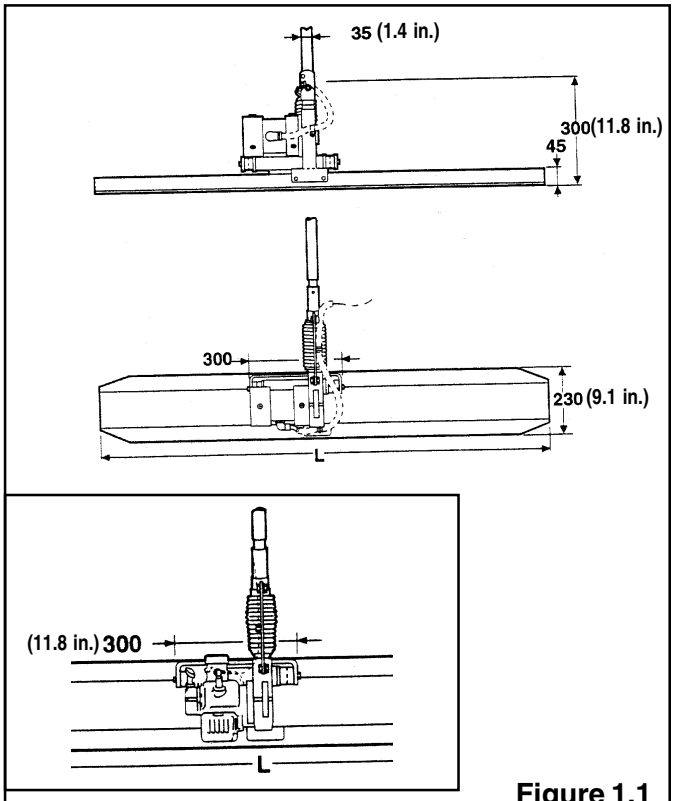
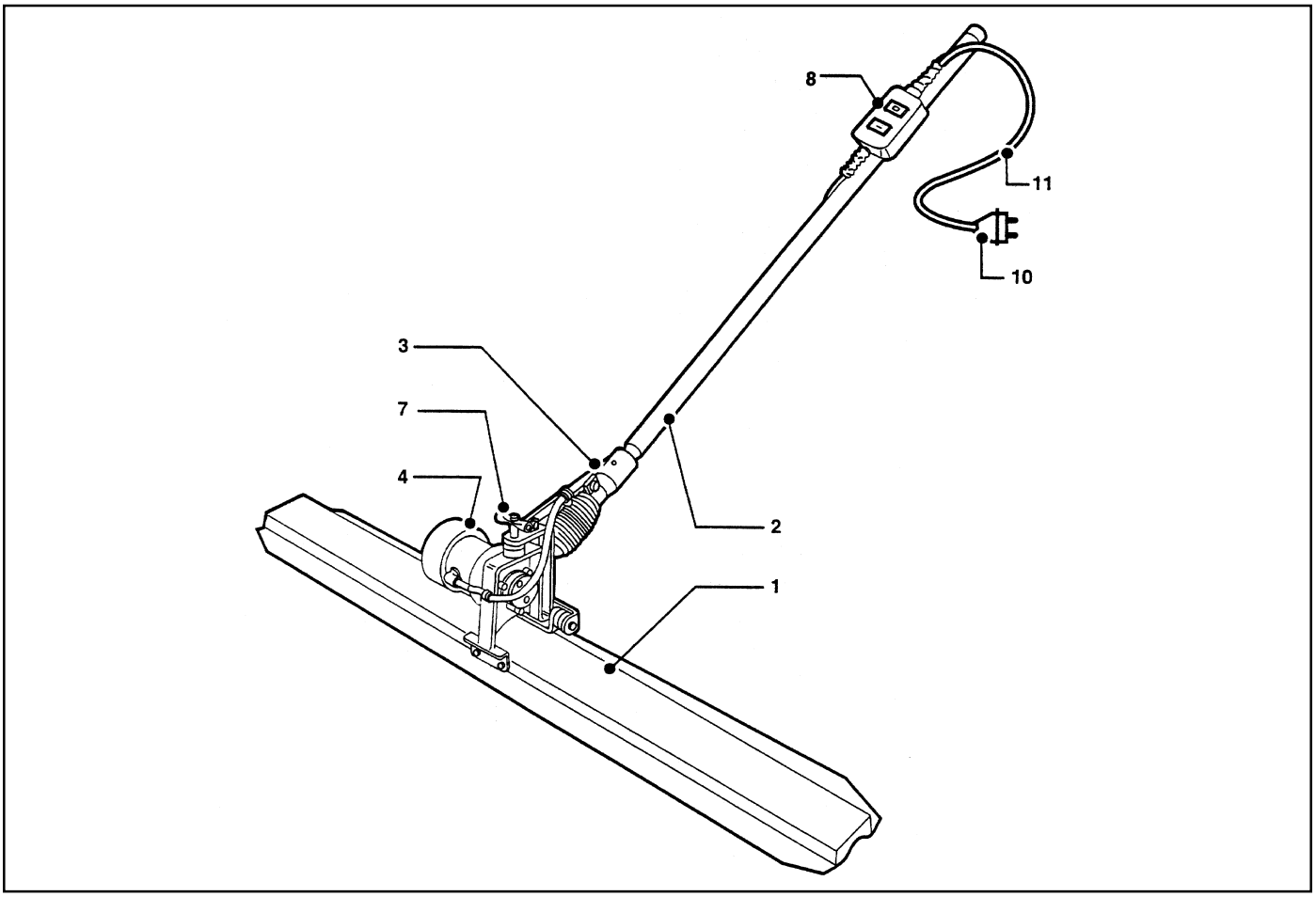
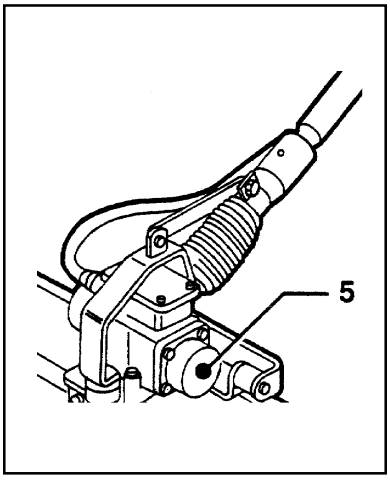
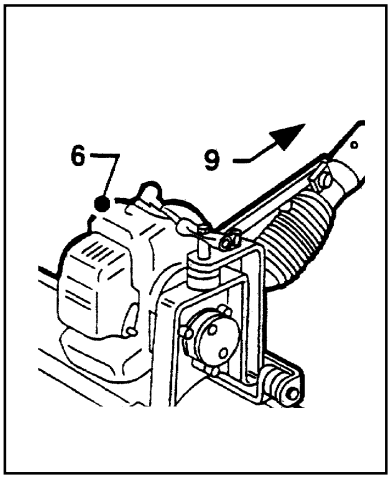



**Figure 1.1**
**Dimensions in mm. of the HAL 150 & 300**



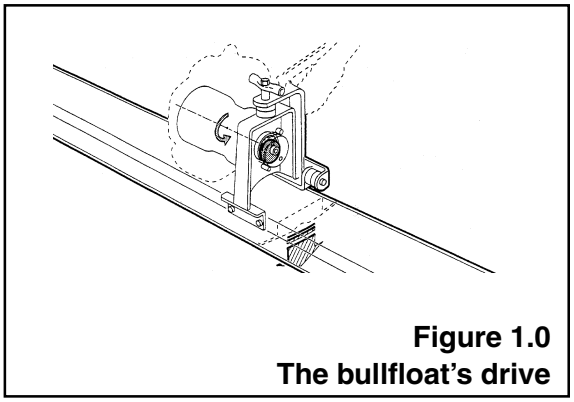



**Figure 1.0**
**The bullfloat's drive**

1. Aluminium profile
2. Operating handle
3. Pitch control
4. Drive-unit 115 VAC
5. Vibratory Unit
6. Gas engine
7. Grip
8. ON/OFF-switch
9. Gas throttle
10. Plug
11. Cable

**What is a Bullfloat?**

A Bullfloat is an apparatus with a vibrating alloy blade that smooths and compacts the top layer of freshly poured concrete, without the need for guiding rails.

Before the Bullfloat is brought into action, the concrete should be distributed and compacted by means of a vibrator.

The vibrator is used in combination with a laser, in order to adjust and control the height of the concrete floor.

The Bullfloat consists of an operating handle, an electrical or gas-engine vibrating-unit and an aluminium blade, available in 5 lengths: 1m, 1.5m, 2m, 2.5m, and 3m.

The switch is located on the operating handle with which the electrical vibrating-unit is switched 'ON' and 'OFF'. The gas-engine vibrating-unit is operated by means of a gas throttle also located on the operating handle.

**Operation**

The drive-unit of the Bullfloat is started by turning the knob of the electric-speed-regulator to the 'ON' position (electrical), or by pulling the recoil-starter of the gas-engine.

An excentric part is set in motion by the drive-shaft of the motor. This rotating motion sets the aluminium blade in vibration. The vibrating motion of the blade smooths and compacts the surface of the concrete.

**This section describes the operation of the HAL 150 & 300 Bullfloats.**

**Tip:** For the location and description of the Bullfloat's parts, which are mentioned in the text, refer to the illustration figure (page. 9): What is a Bullfloat.

## How to assemble the HAL 150 & 300 Bullfloats.

When delivered the Bullfloat is not ready for use. You only have to carry out the following procedures to assemble them:

1. Connect the switch (an electronic speed regulator, or a gas throttle), to the operating handle by means of the bracket and the butterfly nut. Now lock the bracket by tightning the butterfly nut. (Fig. No. 2.0)
2. Stick the operating handle into the shaft of the motor unit frame. Make sure that the operating handle is locked properly.

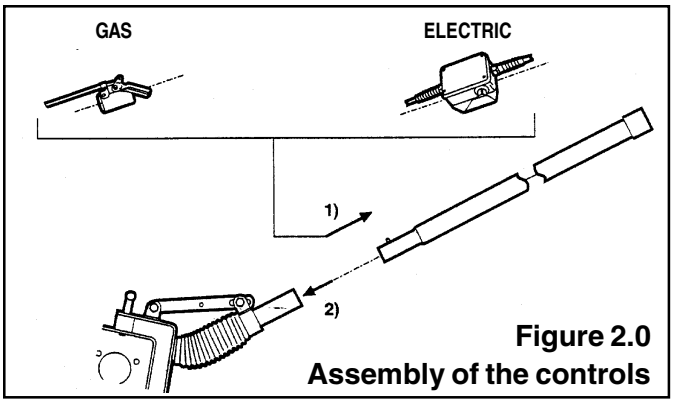



**Figure 2.0**
**Assembly of the controls**

**How to adjust the trowel blade angle.**

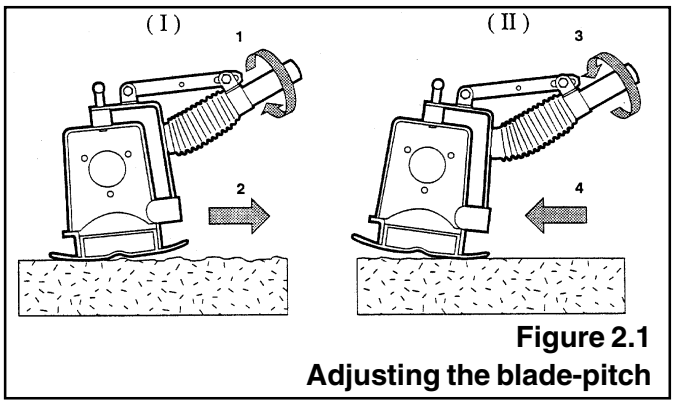



**Figure 2.1**
**Adjusting the blade-pitch**

**Use position** (I), when smoothing freshly poured concrete. (Fig. No. 2.1)

**Use position** (II), in the event you want to smooth the same lane once again. (Fig. No. 2.1)

## Operation and use of the Bullfloat

This section describes how to operate and use the Bullfloat. In the text are numbers in brackets. These numbers are position numbers and they correspond to the numbers in the parts list of the corresponding figures.

**Careful: Read the safety instructions before you switch on the apparatus.**

**Careful:** Prevent the **Bullfloat, from sinking** into the concrete. After the motor has been switched on, immediately move the Bullfloat backwards.

**Tip:** Before the Bullfloat is brought into action, first compact the freshly poured concrete floor with a poker-vibrator while at the same time adjust the height of the floor by means of a laser device.

**Tip:** Pour concrete lanes of approx. 3 ft. wide and approx. 15 ft. long. You can finish this surface in one pass without any problem.

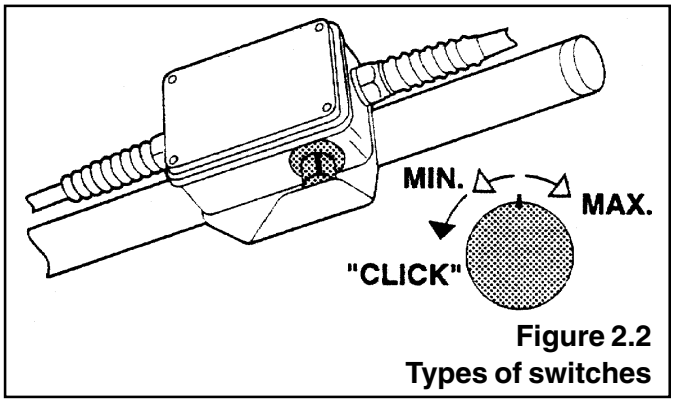



**Figure 2.2**
**Types of switches**

**Tip:** When using a low slump concrete, move the Bullfloat slowly across the surface of the concrete. When using a high slump concrete, move the Bullfloat faster across the surface of the concrete.

## Operation of the Electric Bullfloat

1. Check that the Bullfloat is properly assembled and that the switch is in the 'OFF' position.
2. Put the plug of the drive-unit's feeder cable in the wall socket.
3. Place the Bullfloat in the direct vicinity of where you are going to smooth the surface of the concrete-floor.
4. Place the Bullfloat on the surface of the freshly poured concrete, and turn the speed regulator slowly to the required revolutions.
5. Adjust the trowel blade angle.(read paragraph 2, on page 11)
6. Now start to smooth the surface of the concrete floor by moving the Bullfloat backwards in a slow but steady motion.
7. After having finished one lane of concrete, switch off the Bullfloat immediately, by turning the speed regulator's knob to the position 'Minimal'. You will hear a "CLICK". (Fig. 2.2, on page 11)

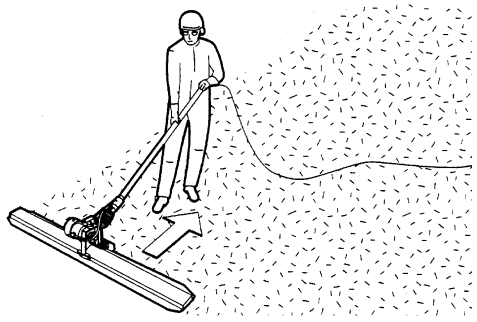


**Figure 2.3**
**Work situation during smoothing and compacting of the concrete floor.**

***Tip:*** *If the processed concrete-surface is* not smooth *or level enough, repeat the procedures 5*,6,7 and 8.

8. Pull the plug of the feeder cable out of the wall socket.
9. After use, place the Bullfloat on a dry and stable surface.

## Operation of the Gas Bullfloat

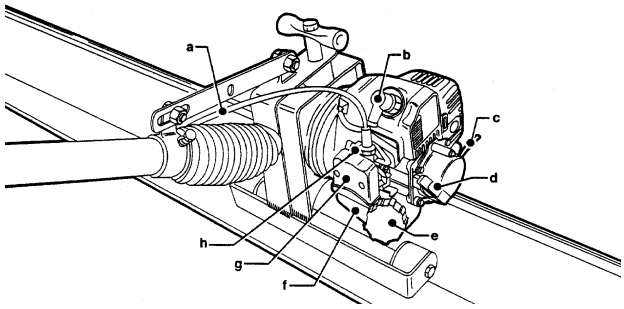



**Figure 2.4**
**Components of the gas-engine**

**a.** Throttle cable
**b.** Spark plug
**c.** Overflow pipe
**d.** Starter rope
**e.** Fuel cap and fuel filter
**f.** Fuel tank
**g.** Air filter
**h.** Carburetor

## Starting Procedure

1. Check that the Bullfloat is properly assembled, and the fuel tank is filled.
2. Place the Bullfloat in the direct vicinity of where your are going to smooth the surface of the concrete.
3. Adjust the throttle-lever (**1**) to the idle-position.(Fig 2.5)

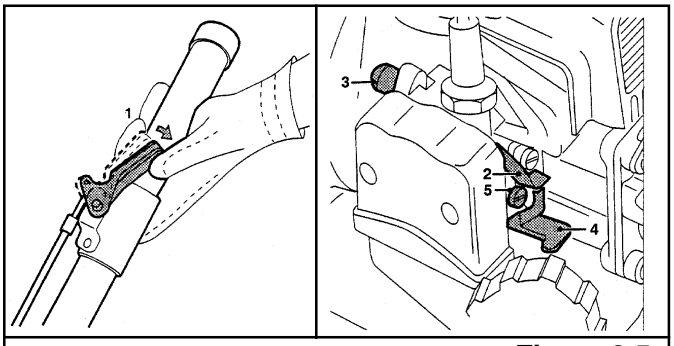



**Figure 2.5**
**Idle position of the throttle-handle and components of the carburator**

4. Put the choke-lever (**2**) in the upper position.(Fig 2.5)
5. Push simultaneously the black priming pump (**3**) and the tickler lever (**4**) (Fig 2.5) until fuel comes out of the overflow pipe (**c**). (Fig 2.4)

***Careful! :*** *When pushing the tickler lever (**4**) half way down, the fuel will flow directly into the engine and will* create *starting problems.* ***Be* sure *to push the tickler lever fully down.***

***Careful! :*** *Never change the adjustment of the main jet screw on the carburetor* (**5**).(Fig 2.5)

6. Open the throttle-handle half way.
7. Give the starter rope (**6**) (Fig 2.6) a rapid vigorous pull until the engine fires.

***WARNING:*** Do not pull the starter rope all the way. The rope might break. Use 3/4 of the starter rope's length.

8. If you have executed the starting procedure in the correct way, the engine will run after approx. 2 pulls of the starter rope.
9. Allow the engine to run for approx. 10 seconds. Push the choke lever (2) (Fig 2.5) slowly down. The period of time depends on the ambient temperature.
10. After allowing a three-minute warming-up period set the throttle handle to the desired engine speed. The Bullfloat is now ready for use.

## Smoothing concrete

11. Adjust the right trowel blade angle. (read paragraph 2, page 11)
12. Smooth the freshly poured concrete.

**Tip:** Repeat procedure **12** in the event the treated surface is not smooth or level enough.

13. Switch "off" the Bullfloat after you have finished the concrete lane:

    — Put the throttle lever (**1**) in the idle position. (Fig 2.5)

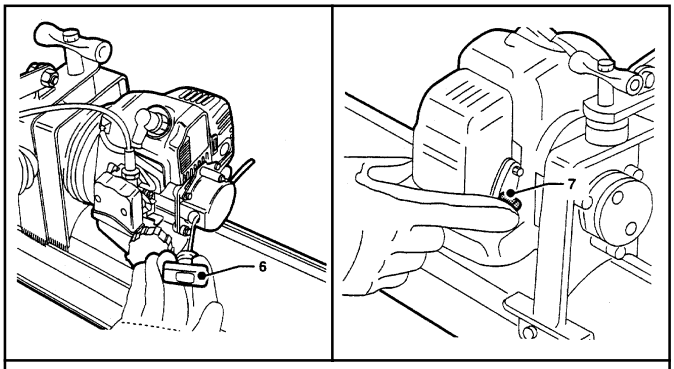



**Figure 2.6**
**Location of the starter rope and the stop button**

    — Press the black stop-button (**7**) for a couple of seconds until the engine stops. (Fig 2.6)

14. If you do not expect to use the engine for a long period of time, drain the fuel tank of fuel and let the engine run at idle speed until the fuel in the carburetor is used and the engine stops.
15. After use, place the Bullfloat on a dry and clean surface.

***WARNING!*** *Make sure to refill the fuel tank before you run out of fuel during operation. Do not let the engine run until all the fuel is used. This might cause starting problems. The average operation time is approx. 45 min. (per tank).*

**Problem: The Bullfloat does not vibrate in the ON position.**

**Cause:** Fault in the electrical connections of the feeder cable.

**Solution:** Check the electrical connections to the Bullfloat, switch, plug and feeder cable for breakage.

Replace the faulty part(s).

**Problem: The Bullfloat does not get into the required number of revolutions.**

**Cause:** Voltage drop, due to the feeder cable being too long.

**Solution:** Move the electrical source closer to the working area. Be certain you have the correct wire gauge size for the distance and amp draw.

**Problem: The electrical motor rotates irregularly and makes a lot of noise.**

**Cause:**

1. The bearings are worn out, and/or
2. an electrical defect in the stator, and/or
3. a break in the feeder cable.

**Solution:**

1. Replace the bearings, and/or
2. replace the stator, and/or
3. repair or replace the feeder cable.

**Problem: The connected and running Bullfloat rotates irregularly and does not get into the required revolutions.**

**Cause:** Insufficient current supply.

**Solution:**

Electrical supply via electrical mains; check the plug connections for defects.

**Problem: The electrical motor runs irregularly.**

**Cause:** The carbon brushes are worn out.

**Solution:** Replace the carbon brushes. (Replace every 6-12 months).

**Problem: Gas engine does not start.**

**Cause:** There is no, or too little, fuel in the fuel tank. The starting procedure was not carried out in the correct way.

**Solution:** Fill the fuel tank or repeat the starting procedure.

**Problem: The engine starts but runs irregularly.**

**Cause:** The spark plug, the fuel filter or the air filter are dirty.

**Solution:** Clean or replace the spark plug, the fuel filter or the air filter. See paragraph 4-4 on the next page.

**Problem: The engine runs in idle position but stops when increasing the revolutions.**

**Cause:** The choke lever has not been pushed down completely, after the starting procedure.

**Solution:** Repeat the starting procedure. (Do not prime again). See Section 3, 4 & 5 on page 13.

**Problem: Engine smokes excessively.**

**Cause:**

1. Choke lever has not been pushed down all the way.
2. The carburetor is worn out.
3. The engine is worn out.
4. Wrong mixture. (Possibly to much oil)

**Solution:**

1. Check the position of the choke lever.
2. Replace the worn out parts of the carburetor, (please consult your dealer or the manufacturer).
3. Replace the gas engine.
4. Replace the mixture for the right mixture with the correct proportion: 1 part 2-stroke oil to 25 parts of normal gasoline (1: 25).

## Maintenance

Although the Bullfloat has few moving parts, regular maintenance promotes a long and trouble-free life.

**Warning:** Never use a high pressure cleaner to clean a Bullfloat with an electrical or gas drive unit.

## Lubricating the blade pitch control

Lubricate the blade pitch control, after long periods of storage, or at least twice a year, by using a hand grease gun. (Fig. 4.0)

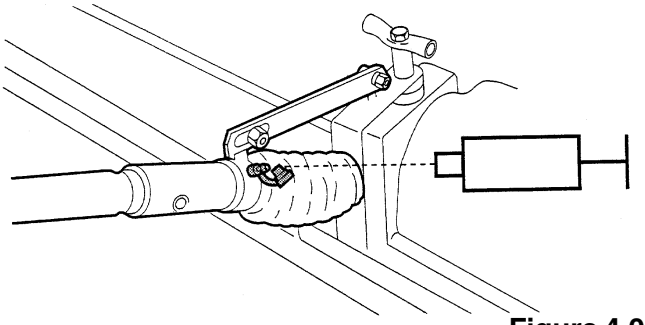


**Figure 4.0**
**Lubricating the blade pitch control**

### 4.3 Cleaning and servicing of the electrical drive unit.

**Warning:** Cut off the electrical supply to the Bullfloat before carrying out any maintenance activities to the Bullfloat.

In order to achieve a maximum cooling effect the ventilation slots of the electrical drive unit must stay free from dirt and grease. Check them at the end of each working day.

If necessary, clean the motor with a brush or a damp cloth.

### 4.4 Cleaning and servicing of the gas engine. (refer also to engine manual)

## Daily maintenance

— In order to achieve a maximum cooling effect the ventilation openings must stay free from dirt or grease. Check them at the end of each working day.
If necessary, clean them with a brush or a damp cloth.

— For a proper functioning of the carburetor's control mechanism, it is necessary to check the carburetor for concrete or dirt, each time after use. If necessary clean the control mechanism with a brush or a damp cloth.

## Maintenance after 20 hours of operation

— How to clean the fuel filter.

(Removal Procedure)

1. Remove the fuel tank cap.
2. Pull out the black rubber tube from the fuel tank. At the end of the tube is the felt-weight assembly. Remove the felt and the felt-weight from the tube and wash out both parts in clean fuel.

3. Insert the felt and the felt-weight into the fuel tank again.

How to clean the air filter.

1. Unscrew the black filter cap from the carburator.
2. Take out the filter element.
3. Wash out the filter element in clean fuel and wring out the filter element.
4. Re-install the filter and the black filter cap.

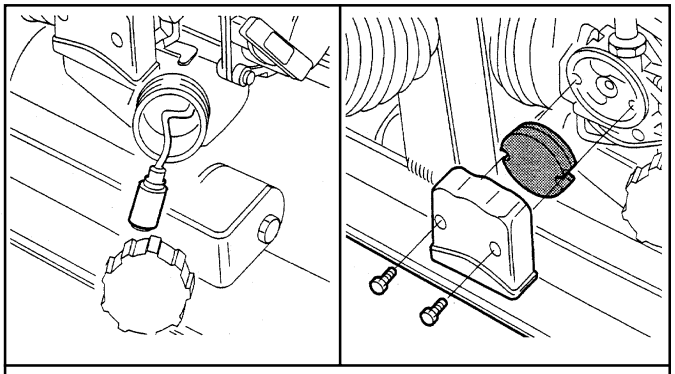


**Figure 4.1**
**Location of the fuel and air filters**

***WARNING!:*** *When the engine operates in dusty conditions, clean the air filter each day or after each 10 hours of operation.*

## Maintenance after 50 hours of operation

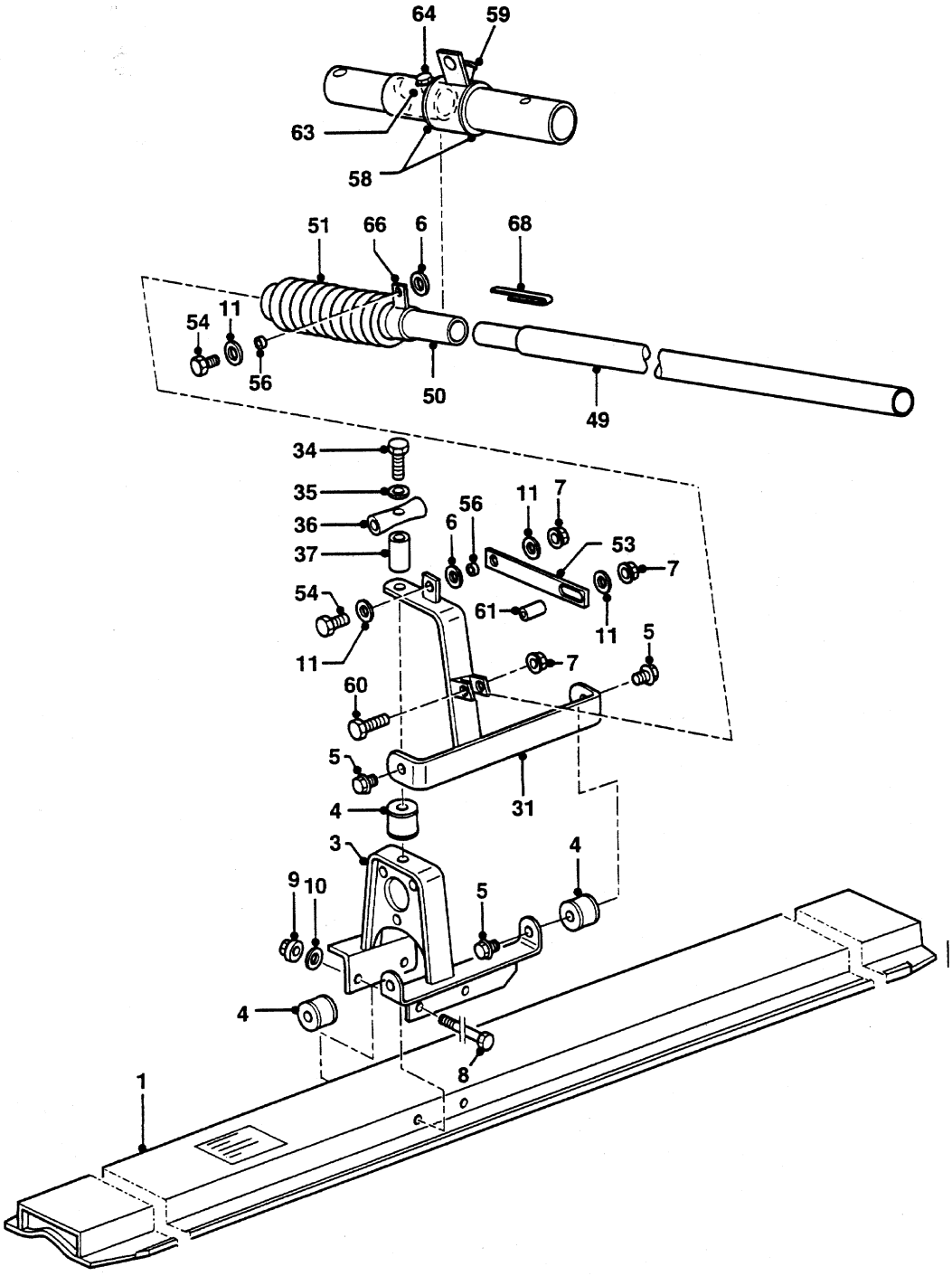
- Cleaning of the piston.
  Remove the carbon from the upper side of the piston, from the exhaust-ports in the cylinder, from the combustion chamber and from the exhaust.

- Cleaning of the spark plug.
  Clean off carbon deposits on the spark plug electrode using a plug cleaner or wire brush.
  Check electrode gap. If necessary adjust it to between: 0.6 to 0.7 mm.

## Longtime storage

1. Remove the spark plug and pour 3 to 5 cc of new engine oil into the plug-hole.

   Pull the recoil starter several times and reinstall the spark plug.
2. Slowly pull the recoil starter until resistance is felt. The piston is in its compression stroke.
3. Clean the engine thoroughly with an oiled cloth.
4. Store the engine in a clean and dry place.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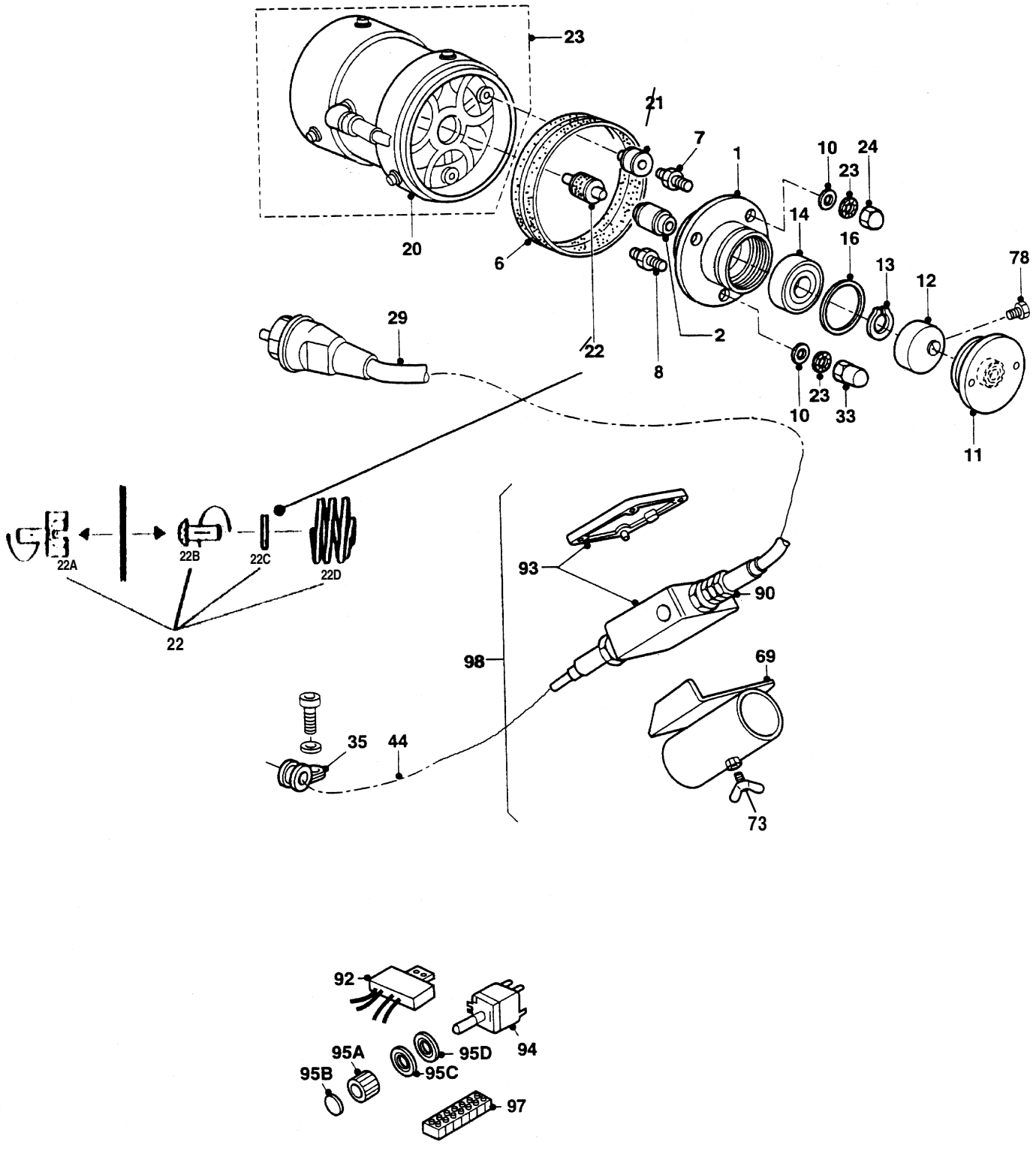
# HAL 150 AND 300 FRAME

HAL 150 & 300 type E, ER and B frame

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 1 | BF230010 | BLADE, ALUM. 1.0 m — 3 ft. | 1 | |
| | BF230015 | BLADE, ALUM. 1.5 m — 5 ft. | 1 | |
| | BF230020 | BLADE, ALUM. 2.0 m — 6½ ft. | 1 | |
| | BF230025 | BLADE, ALUM. 2.5 m — 8 ft. | 1 | |
| | BF230030 | BLADE, ALUM. 3.0 m — 10 ft. | 1 | |
| 3 | BF23003 | MOTOR ASSEMBLY BRACKET | 1 | |
| 4 | BF0060 | RUBBER BUFFER | 3 | |
| 5 | BF0124 | BOLT M8 X 10 | 5 | |
| 6 | BF0173 | UNDULATED RING | 2 | |
| 7 | BF0093 | NUT M10 | 3 | |
| 8 | BF0115 | BOLT M8 X 150 | 2 | |
| 9 | BF0107 | NUT M8 | 2 | |
| 10 | BF0172 | RETAINING RING | 2 | |
| 11 | BF0156 | WASHER M 10 | 4 | |
| 31 | BF230031 | ASSEMBLY BRACKET | 1 | |
| 34 | BF0140 | BOLT | 1 | |
| 35 | BF0212 | RETAINING RING | 1 | |
| 36 | BF23036 | GRIP | 1 | |
| 37 | BF23037 | SPACER | 1 | |
| 49 | BF2348 | OPERATING HANDLE 150 CM | 3 | |
| 50 | BF2350 | PITCH CONTROL | 1 | |
| 51 | BF23051 | RUBBER SLEEVE | 1 | |
| 53 | BF23053 | ADJUSTABLE STRIP | 1 | |
| 54 | BF0131 | BOLT M10 X 25 | 2 | |
| 56 | BF23056 | SPACER 4,2 mm | 2 | |
| 58 | BF0203 | LOCK-RING | 2 | |
| 59 | BF23059 | LUBRICATING NIPPLE & CAP | 1 | |
| 60 | BF0133 | BOLT M10 X 50 | 1 | |
| 61 | BF23061 | SPACER 32 mm | 1 | |
| 63 | BF23063 | BRASS NUT M8 | 1 | |
| 64 | BF0125 | BOLT M8 | 1 | |
| 66 | BF23066 | PLASTIC CLAMP | 1 | |
| 68 | BF23068 | LOCKING CLIP | 1 | |

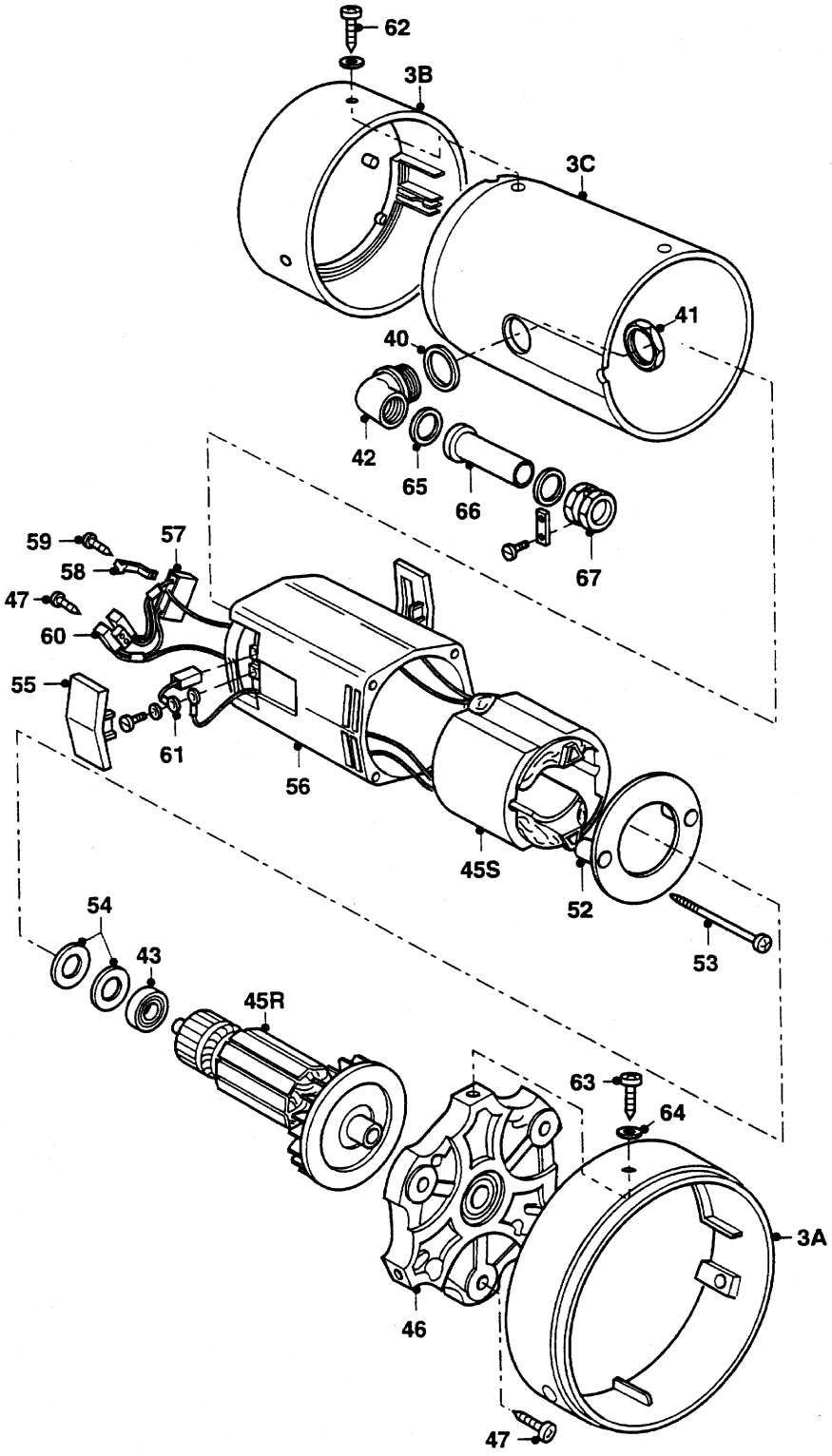
# HAL 150 AND 300 ELECTRIC DRIVE-UNIT AND SWITCH



# HAL 150 AND 300 ELECTRIC DRIVE-UNIT AND SWITCH

HAL 150 & 300 type-E-,ER drive-unit and switch

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 1 | BF2301 N | EXCENTER-HOUSING | 1 | |
| 2 | BF2302N | EXCENTER-SHAFT | 1 | |
| 6 | BF2306B | RUBBERSEAL | 1 | |
| 7 | BF2307 | ADAPTOR - BOLT (SHORT) | 2 | |
| 8 | BF2308 | ADAPTOR - BOLT (LARGE) | 1 | |
| 10 | BF0155 | WASHER | 3 | |
| 11 | BF2311N | COVER&BEARING, EXCENTER | 1 | |
| 12 | BF231213 | EXCENTER 1.0 - 1.5 m. | 1 | |
| | BF231217 | EXCENTER 2.0 - 2.5 m. | 1 | |
| 13 | BF0201 | LOCKRING | 1 | |
| 14 | BF2314 | EXCENTER-BEARING | 1 | |
| 16 | BF2316 | O-RING | 1 | |
| 20 | BF2320 | DRIVE-UNIT | 1 | |
| 21 | BF0051 | RUBBERBUFFER | 3 | |
| 22 | BF2325 | COUPLING- SET | 1 | INCLS. ALL ITEMS W/* |
| 22A* | BF2323 | CATCH, DRIVESHAFT | 1 | |
| 22B* | BF0273 | SCREW | 1 | |
| 22C* | BF0154 | WASHER | 1 | |
| 22D* | BF2322 | SPRING | 1 | |
| 23 | BF0172 | RETAINING RING M8 | 3 | |
| 24 | BF0088 | CAPNUT | 2 | |
| 29 | BF0017 | CABLE 2 X1,5 mm2 + PLUG 220V | 10 | |
| 33 | BF0086 | CAPNUT (HIGH) | 1 | |
| 35 | BF2335 | CABLE-CLAMP | 1 | |
| 44 | BF0004 | CABLE | 1 | |
| 69 | BF2369ER | SWITCH ASSEMBLY BRACKET (ER) | 1 | |
| 73 | BF0325 | WING-SCREW | 1 | |
| 74 | BF23074 | SWITCH COMPLETE | 1 | |
| 78 | BF0122 | SCREW | 1 | |
| 90 | BF0420 | PACKING BOX | 2 | |
| 91 | BF0421 | NUT | 2 | |
| 92 | BF2392 | SPEED-REGULATOR (ONLY) | 1 | |
| 93 | BF2393 | SWFTCH-BOX (SPEED-REGULATOR) | 1 | |
| 94 | BF2394 | POTENTIOMETER & SWITCH | 1 | |
| 95A | BF2395A | KNOB (POTENTIOMETER) | 1 | |
| 95B | BF2395B | KNOB-CAP | 1 | |
| 95C | BF2395C | FIGURE DIAL | 1 | |
| 95D | BF2395D | STATOR | 1 | |
| 97 | BF2397 | TERMINAL-BLOC | 1 | |
| 98 | BF2398 | SPEED-REGULATOR COMPL. (INCL. BRACKET) | 1 | |
| 99 | BF2399 | SPEED-REGULATOR COMPL. (EXCL. BRACKET) | 1 | |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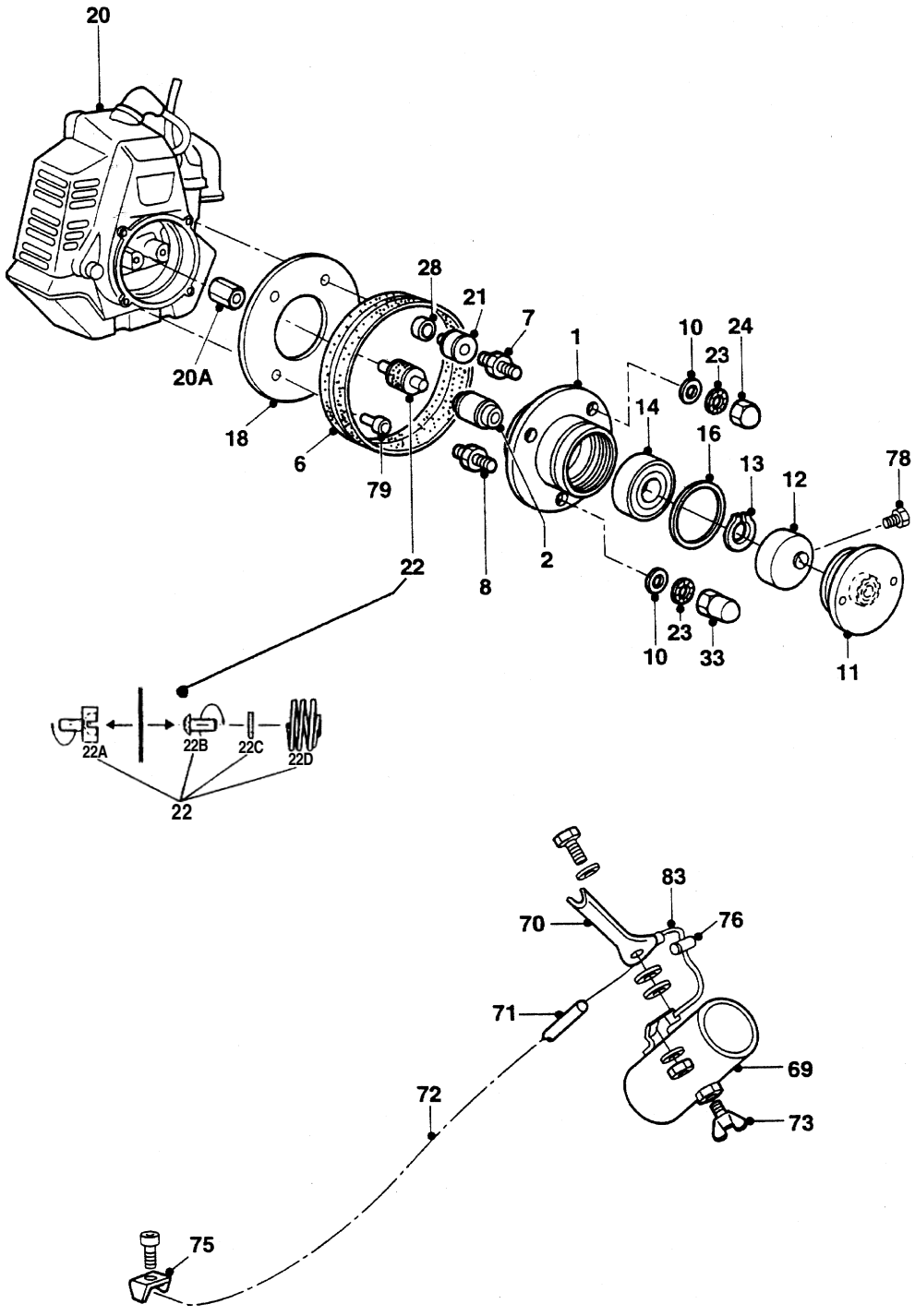
# HAL 150 AND 300 ELETRIC DRIVE-UNIT COMPONENTS

HAL 150 & 300 type- E, ER drive-unit

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 3A | BF2303A | VENTILATION RING (SMALL) | 1 | |
| 3B | BF2303B | VENTILATION RING (LARGE) | 1 | |
| 3C | BF2303C | VENTILATION HOUSING | 1 | |
| 40 | BF0428 | RUBBERING | 1 | |
| 41 | BF0421 | PLASTIC NUT | 1 | |
| 42 | BF0430 | PACKING BOX | 1 | |
| 43 | BF1101220240 | REAR-BEARING | 1 | |
| 45S | BF2345S | STATOR | 1 | |
| 45R | BF2345R | ROTOR | 1 | |
| 46 | BF2346 | FRONT SHIELD | 1 | |
| 47 | BF0249 | SELF TAPPING SCREW | 5 | |
| 52 | BF1101220170 | VENTILATOR-COVER | 1 | |
| 53 | BF1101220200 | SCREW | 2 | |
| 54 | BF1101220250 | SPRING SOURCER | 2 | |
| 55 | BF1101220220 | BRUSH-COVER | 2 | |
| 56 | BF1101220180 | MOTOR-HOUSING | 1 | |
| 57 | BF2357 | CAPACITOR | 1 | |
| 58 | BF2358 | CAPACITOR-CLAMP | 1 | |
| 59 | BF0248 | SELF TAPPING SCREW | 3 | |
| 60 | BF2360 | TERMINAL-BLOC | 1 | |
| 61 | BF1101220230' | SET OF BRUSHES | 1 | |
| 62 | BF0230 | SELF TAPPING SCREW | 3 | |
| 63 | BF0231 | SELF TAPPING SCREW | 3 | |
| 64 | BF0154 | WASHER | 3 | |
| 65 | BF0417 | PRESSING RING | 2 | |
| 66 | BF0415 | CABLE-SLEEVE | 1 | |
| 67 | BF0416 | CABLE-PACKING-BOX | 1 | |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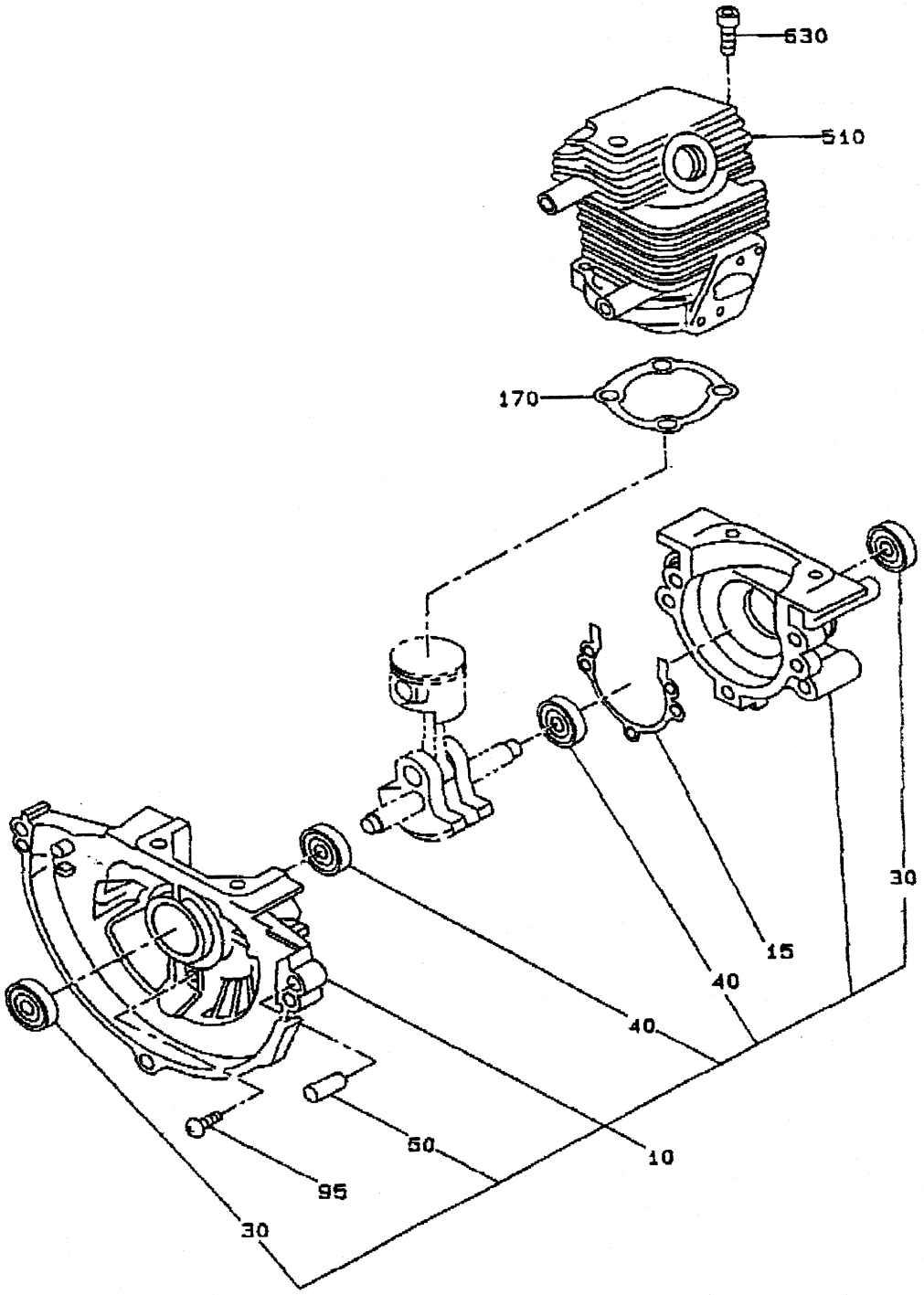
# HAL 150 AND 300 GAS DRIVE-UNIT AND GAS THROTTLE

HAL 150 & 300 type- B drive-unit and gasthrottle

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 1 | BF2301 N | EXCENTER-HOUSING | 1 | |
| 2 | BF2302N | EXCENTER-SHAFT | 1 | |
| 6 | BF2306 B | SEAL, RUBBER | 1 | |
| 7 | BF2307 | ADAPTOR-BOLT (SHORT) | 2 | |
| 8 | BF2308 | ADAPTOR-BOLT (LARGE) | 1 | |
| 10 | BF0155 | WASHER | 3 | |
| 11 | BF2311N | COVER&BEARING (EXCENTER HS.) | 1 | |
| 12 | BF231213 | EXCENTER 1.0 - 1.5 m. | 1 | |
| | BF231217 | EXCENTER 2.0 - 2.5 m. | 1 | |
| 13 | BF0201 | LOCK RING | 1 | |
| 14 | BF2314 | EXCENTER-BEARING | 1 | |
| 16 | BF2316 | O-RING | 1 | |
| 18 | BF2318N | ENGINE BRACKET | 1 | |
| 20 | BF2302666020 | GAS ENGINE, KAWASKI | 1 | |
| 20A | BF2320A | ENGINE ADAPTOR | 1 | |
| 21 | BF0055 | RUBBER BUFFER | 3 | |
| 22 | BF2325 | COUPLING - SET | 1 | INCLS. ALL ITEMS W/* |
| 22A* | BF2323 | CATCH, DRIVESHAFT | 1 | |
| 22B* | BF0273 | SCREW | 1 | |
| 22C* | BF0154 | WASHER | 1 | |
| 22D* | BF2322 | SPRING | 1 | |
| 23 | BF0172 | RETAINING RING M8 | 3 | |
| 24 | BF0088 | CAPNUT | 2 | |
| 28 | BF2328 | SPACER | 3 | |
| 33 | BF0086 | CAPNUT (HIGH) | 1 | |
| 69 | BF2369B | LEVER, GAS & BRACKET | 1 | |
| 70 | BF2302666700 | LEVER, GAS (ONLY) | 1 | |
| 71 | BF2371 | THROTTLE-CABLE (OUTER) | 1 | |
| 72 | BF2372 | THROTTLE-CABLE (INNER) | 1 | |
| 73 | BF0325 | WING-SCREW | 1 | |
| 75 | BF2375 | ASSEMBLY-BRACKET | 1 | |
| 76 | BF2376 | THROTTLE-CABLE STOPPER | 1 | |
| 78 | BF0122 | SCREW | 1 | |
| 79 | BF0123 | NUT | 4 | |
| 83 | BF2383 | SPRING | 1 | |
| 84 | BF2384 | DRIVE-SHAFT ASSY | 1 | |
| | BF23510 | UNIT ASSY (ENGINE & COMPONENTS), KAWASAKI | 1 | |
| | KWAAIR | ELEMENT, AIR FILTER KAWASAKI ENGINE | 1 | |
| | 0650140460 | SPARK PLUG, KAWASAKI ENGINE | 1 | |

**NOTE:** For the balance of the Kawaski Engine Parts, call your local Kawaski Engine distributor refering to engine model TGO 18D-CA 51
For the Robin Engine spare parts, refer to the engine section of this book.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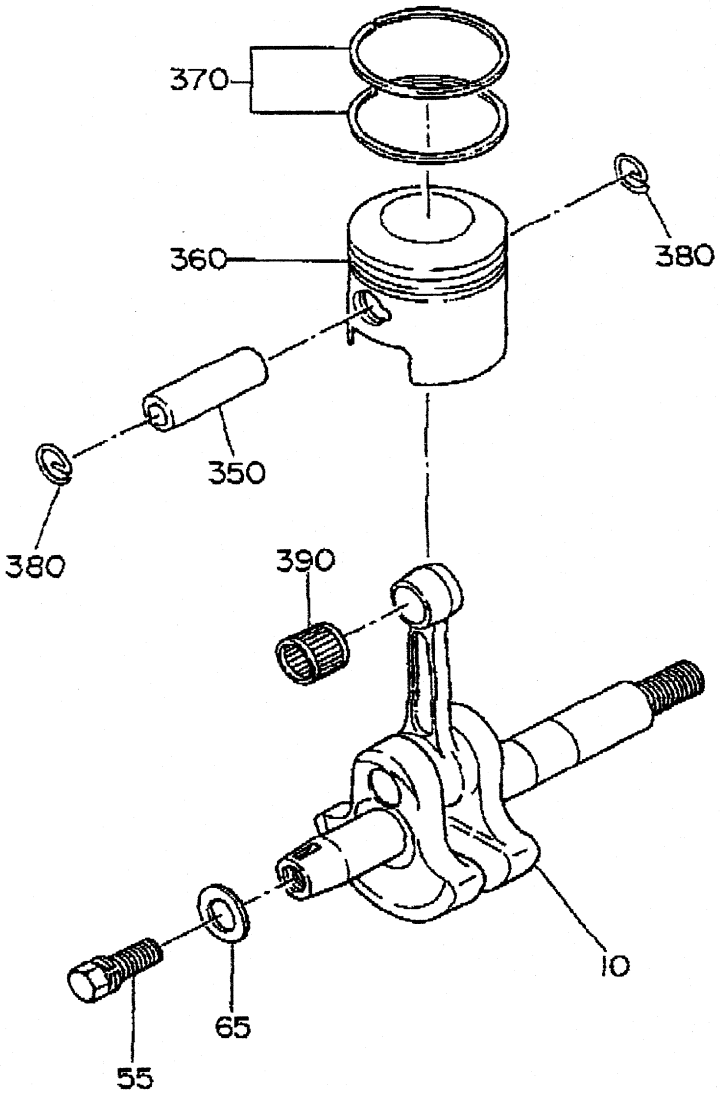
# ROBIN EC0250G6004 — CRANKCASE & CYLINDER

CRANKCASE & CYLINER

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 10 | 525100300 | CRANKCASE ASSY | 1 | INCLS. ITEMS W/* |
| 15 | 5231502202 | GASKET | 1 | |
| 30* | 0440129970 | OIL SEAL | 2 | |
| 40* | 0600129920 | BALL BEARING | 2 | |
| 95 | 0140059520 | SCREW | 3 | |
| 170 | 5231502304 | GASKET | 1 | |
| 510 | 5251500200 | CYLINDER | 1 | |
| 630 | 0119059730 | SOCKET HEAD BOLT | 2 | |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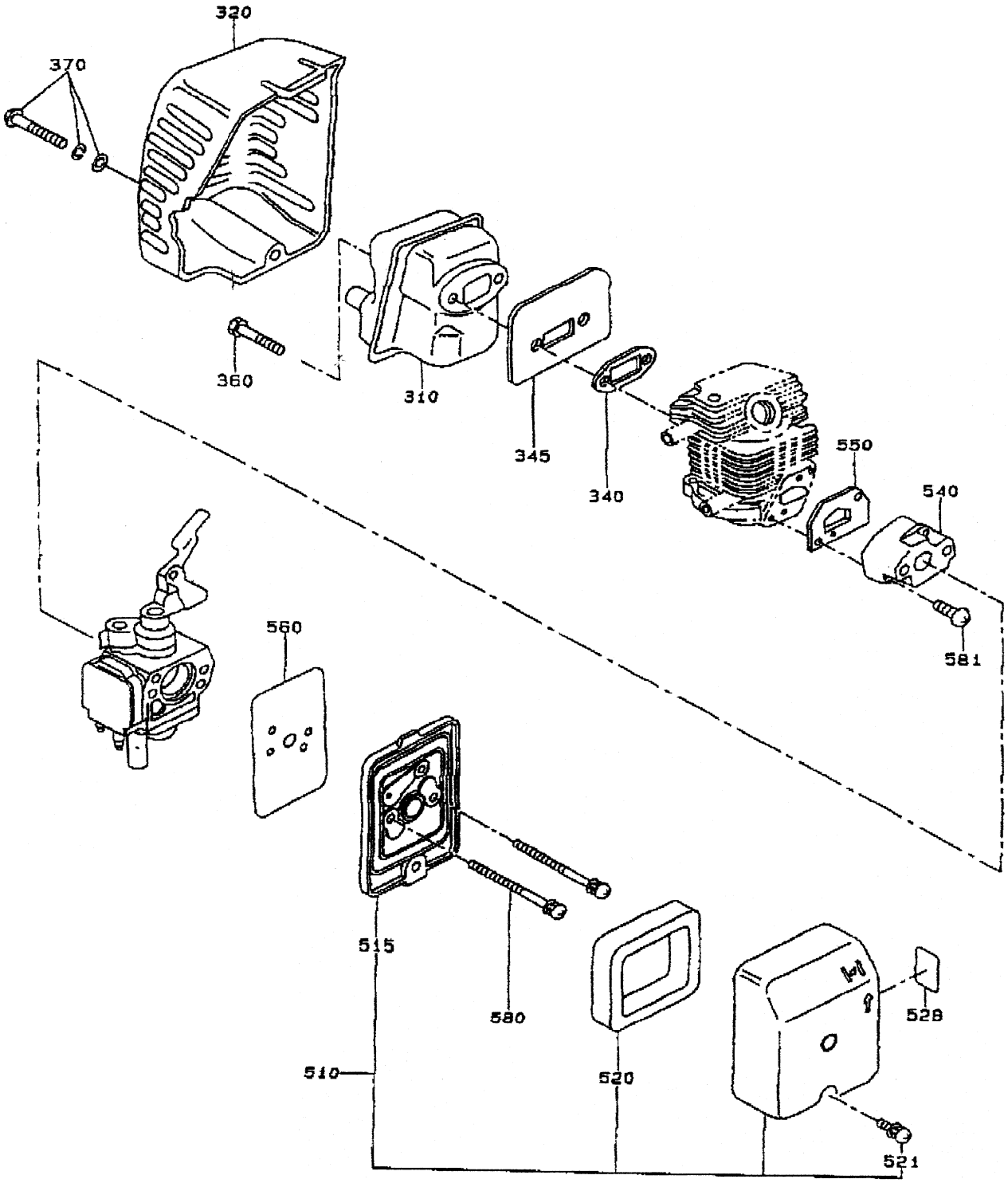
# ROBIN EC0250G6004 — CRANKSHAFT & PISTON

CRANKCASE & PISTON

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 10 | 5252001001 | CRANKSHAFT | 1 | |
| 55 | 0011306160 | BOLT & WASHER ASSY | 1 | |
| 65 | 0031206000 | WASHER | 1 | |
| 350 | 5232502600 | PISTON PIN | 1 | |
| 360 | 5232501902 | PISTON | 1 | |
| 370 | 5242500701 | PISTON RING | 1 | |
| 380 | 0565089970 | CLIP | 2 | |
| 390 | 0610089990 | NEEDLE BEARINGS | 1 | |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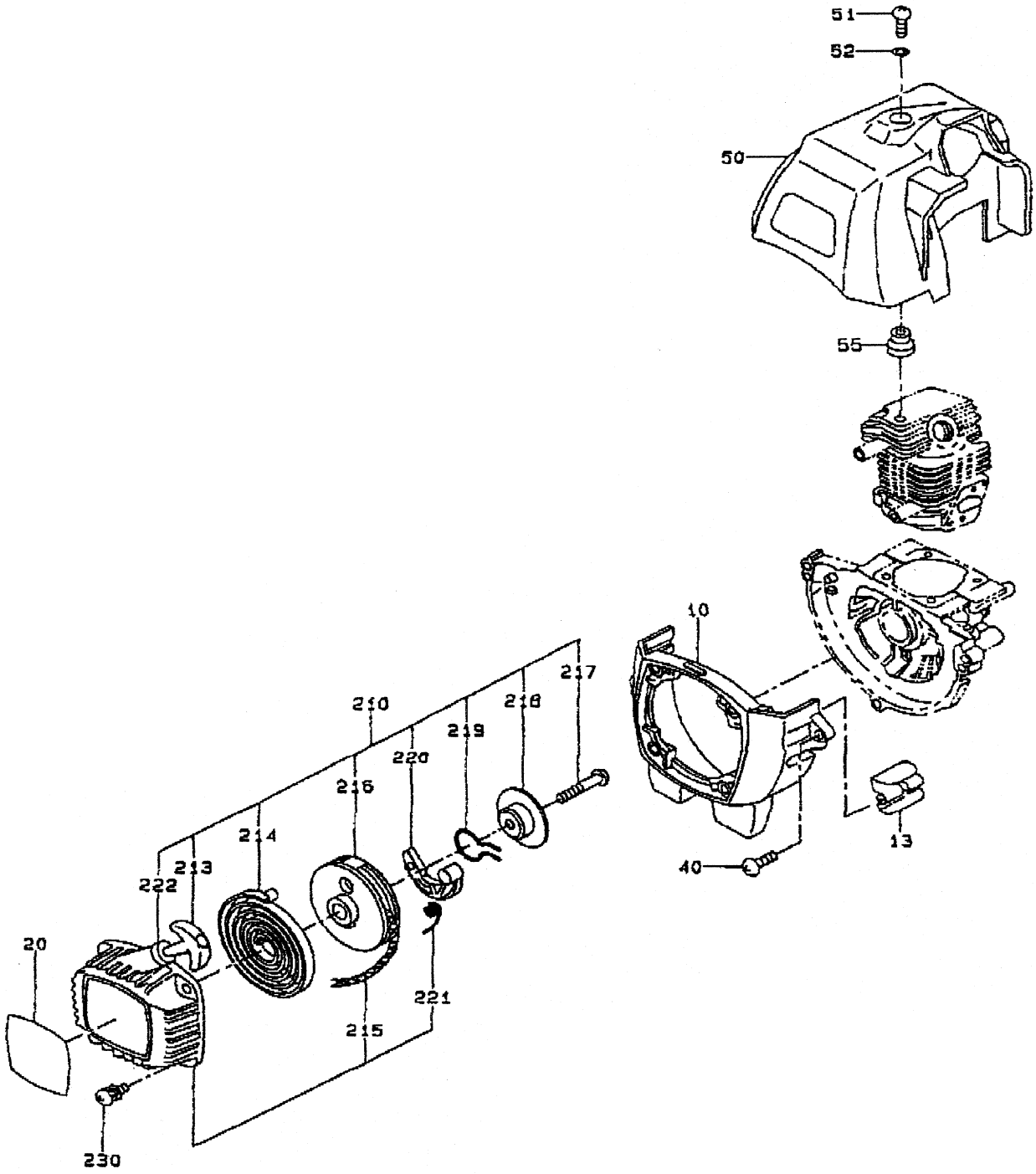
# ROBIN EC0250G6004 — MUFFLER, AIR CLEANER

MUFFLER, AIR CLEANER

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 310 | 5253015000 | MUFFLER | 1 | |
| 320 | 5253500000 | MUFFLER COVER | 1 | |
| 340 | 5233504302 | GASKET | 1 | |
| 345 | 5253500101 | GASKET | 1 | |
| 360 | 0119059660 | SOCKET HEAD BOLT | 2 | |
| 370 | 0043705160 | SCREW ASSY | 1 | |
| 510 | 5203004030 | AIR CLEANER ASSY | 1 | INCLS. ITEMS W/* |
| 515* | 5253004010 | CLEANER BODY ASSY | 1 | |
| 520* | 5203004010 | ELEMENT, AIR CLEANER | 1 | |
| 540 | 5233014000 | INSULATOR CAP | 1 | |
| 550 | 5253500200 | GASKET | 1 | |
| 560 | 5103502800 | GASKET | 1 | |
| 562 | 5256501200 | GASKET | 1 | |
| 563 | 5256501100 | O'RING | 1 | |
| 580 | 0043305650 | SCREW ASSY | 2 | |
| 581 | 0140059500 | SCREW ASSY | 2 | |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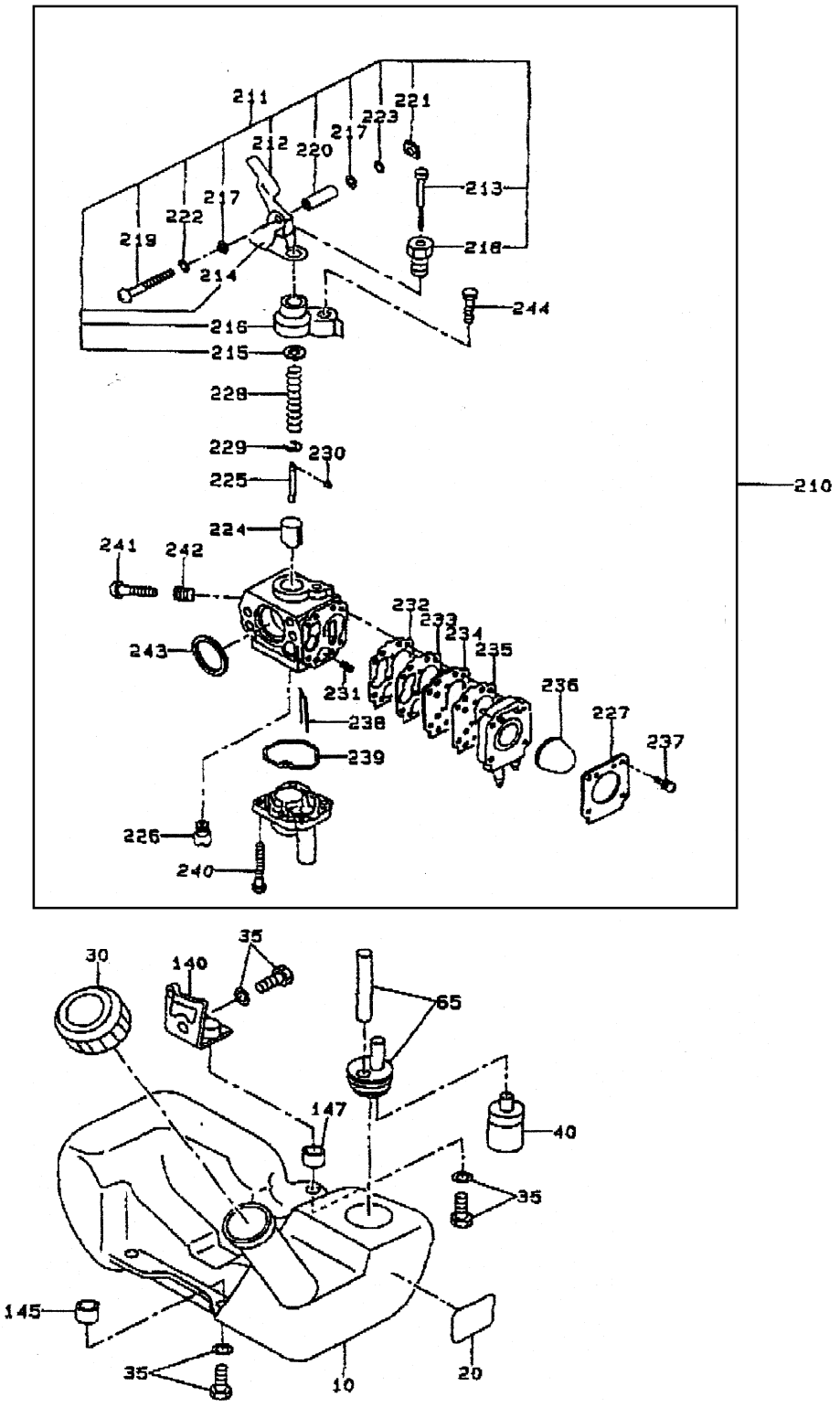
# ROBIN EC0250G6004 — RECOIL STARTER & HOUSING

RECOIL STARTER & HOUSING

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 10 | 5255500001 | BLOWER HOUSING | 1 | |
| 13 | 5215500300 | BUFFLE PLATE | 1 | |
| 20 | 5259500000 | DECAL | 1 | |
| 40 | 0043505160 | SCREW AND WASHER ASSY | 3 | |
| 50 | 5255500401 | CYLINDER COVER | 1 | |
| 51 | 0140059490 | SCREW | 1 | |
| 52 | 0200070010 | WASHER | 1 | |
| 55 | 5503503001 | SPACER | 1 | |
| 210 | 5255001000 | RECOIL STARTER ASSY | 1 | INCLS. ITEMS W/* |
| 213* | 5225004020 | STARTER KNOB | 1 | |
| 214* | 5025001020 | SPIRAL SPRING | 1 | |
| 215* | 5235024022 | STARTER ROPE | 1 | |
| 216* | 5025001010 | REEL | 1 | |
| 217* | 5255001020 | SET SCREW | 1 | |
| 218* | 5215002040 | FRICTION PLATE | 1 | |
| 219* | 5105015050 | FRICTION SPRING | 1 | |
| 220* | 5105015020 | RATCHET | 1 | |
| 221* | 5105015060 | RETURN SPRING | 1 | |
| 222* | 5255001040 | DAMPER | 1 | |
| 230 | 0140059480 | SCREW | 1 | |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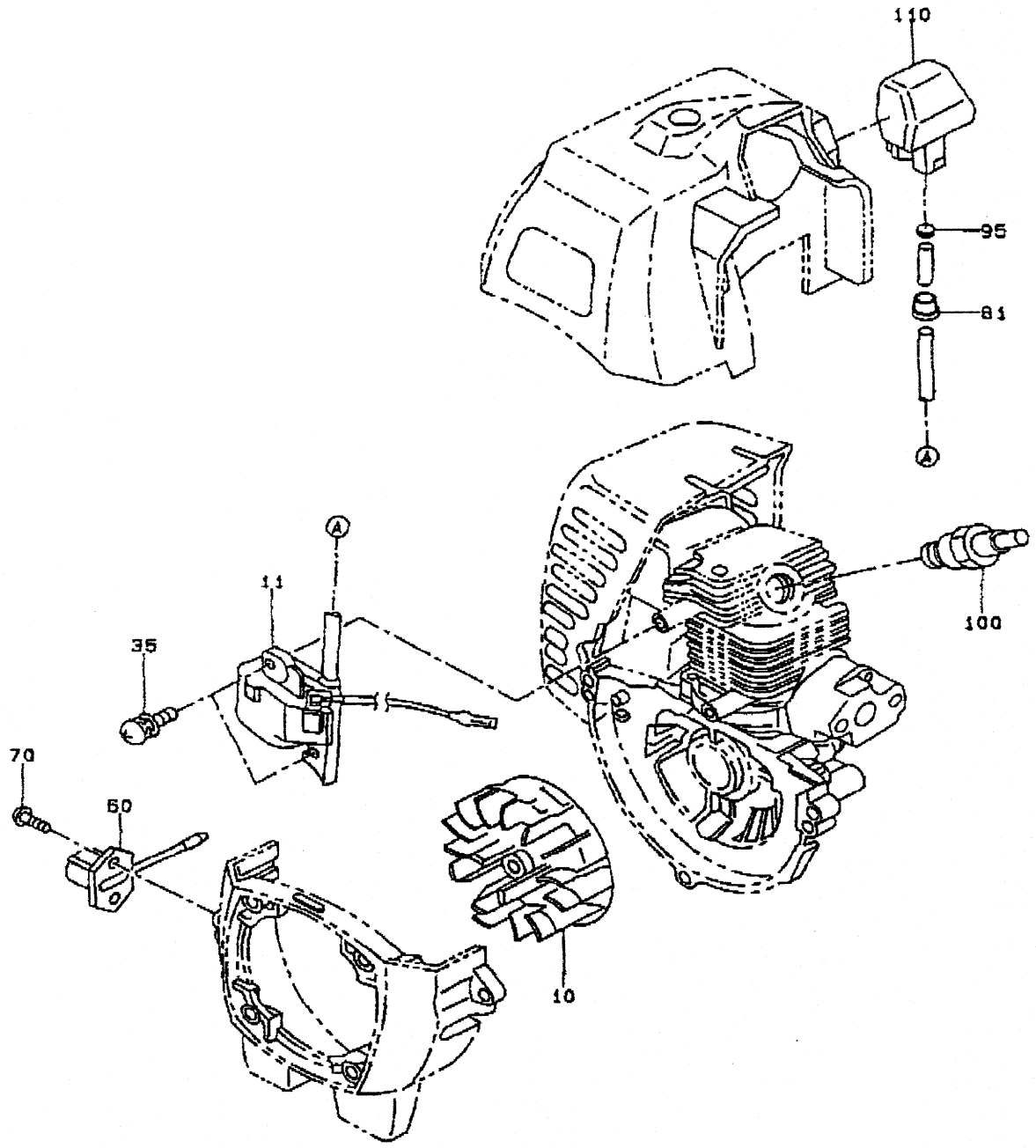
# ROBIN EC0250G6004 — CARBURETOR & FUEL TANK

FUEL TANK, CARBURETOR

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 10 | 5256500502 | FUEL TANK | 1 | |
| 20 | 5259503500 | LABEL, MODEL | 1 | |
| 30 | 5216004003 | CAP | 1 | |
| 35 | 0043705160 | SCREW ASSY | 4 | |
| 40 | 5236503900 | FILTER | 1 | |
| 65 | 5256012001 | TUBE ASSY | 1 | |
| 140 | 5256002000 | PLATE | 1 | |
| 145 | 0230059970 | SPACER | 2 | |
| 147 | 0230059950 | SPACER | 1 | |
| 210 | 5256007000 | CARBURETOR ASSY | 1 | INCLS. ITEMS W/* |
| 227* | 5236046050 | SPACER | 1 | |
| 232* | 5246001030 | COVER | 1 | |
| 233* | 5246001040 | DIAPHRAGM | 1 | |
| 234* | 5316005250 | DIAPHRAGM ASSY | 1 | |
| 235* | 5236046040 | GASKET | 1 | |
| 236* | 5246001150 | PUMP | 1 | |
| 237* | 5236046010 | SCREW | 4 | |
| 246* | 5256007010 | BODY ASSY | 1 | |
| 247* | 5016004010 | SCREEN | 1 | |
| 253* | 5236046060 | BODY ASSY | 1 | |
| 254* | 5316005120 | RING | 1 | |
| 255* | 5236018040 | SWIVEL | 1 | |
| 256* | 5206008030 | SCREW | 2 | |
| 350* | 5256500100 | CABLE BRACKET | 1 | |
| 355* | 5216008010 | ADJUSTER SCREW | 1 | |
| 357* | 5316005150 | NUT | 1 | |
| 360* | 5219500000 | HOLDER | 1 | |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COIL & SPARK PLUG

| NO. | PART NO. | PART NAME | QTY. | REMARKS |
|---|---|---|---|---|
| 10 | 5257001010 | FLYWHEEL | 1 | |
| 11 | 5257001020 | IGNITION COIL | 1 | |
| 35 | 0140049920 | SCREW | 2 | |
| 60 | 0660000371 | SWITCH ASSY | 1 | |
| 70 | 0043304100 | SCREW & WASHER ASSY | 2 | |
| 81 | 5257500300 | GROMMET | 1 | |
| 95 | 0654009931 | SPRING, PLUG CAP | 1 | |
| 100 | 0650149721 | SPARK PLUG | 1 | |
| 110 | 5237503301 | SPARK PLUG CAP | 1 | |

# TERMS AND CONDITIONS OF SALE — PARTS

**PAYMENT TERMS**

Terms of payment for parts are net 10 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 Muiltiquip part numbers clearly marked.
6. The following items are not returnable:
    a. Obsolete parts. (If an item is listed in the parts price book 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 5 working days from notification, pending instructions. If a reply is not received within 5 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 $20.00 to $50.00 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 here under 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 not authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. A part 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.

# NOTE PAGE

# PARTS AND OPERATION MANUAL

## HERE'S HOW TO GET HELP

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

***PARTS DEPARTMENT***
*800-427-1244 or 310-537-3700*
*FAX: 800-672-7877 or 310-637-3284*

***SERVICE DEPARTMENT/TECHNICAL ASSISTANCE***
*800-478-1244 or 310-537-3700*
*FAX: 310- 537-4259*

***WARRANTY DEPARTMENT***
*888-661-4279, or 310-661-4279*
*FAX: 310- 537-1173*

***MAIN***
*800-421-1244 or 310-537-3700*
*FAX: 310-537-3927*

MULTIQUIP

**MULTIQUIP INC.**
POST OFFICE BOX 6254
CARSON, CA 90749
310-537-3700 • 800-421-1244
FAX:310-537-3927
E-MAIL: mq@multiquip.com
WWW: multiquip.com

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