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Hamilton Jet Unit Owner's Manual

SERIES

770

(WITH FLANGED COUPLING)

Warranty

The Company warrants each new Hamilton product to be free from defects in materials and workmanship under normal use and service, its obligations under this Warranty being limited to make good at its factory or at the factory of any subsidiary or branch of the Company the product or any part or parts thereof which shall be returned to it with transportation charges prepaid and which its examination shall disclose to its satisfaction to have been defective provided that the product or such part or parts thereof shall be so returned to it not later than 12 months from the date of the original purchase from the Company or its authorised agents. No allowance shall be granted for any repairs or alterations made by the purchaser or his or its agent without the written consent of the Company. This Warranty is expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on its part, including any liability under the Sale of Goods Act, 1908, and no other person or agent or dealer is authorised to give any other condition or warranty or to assume for the Company any other liability in connection with the sale of its products whether new or second-hand. Any obligation on the part of the Company under this Warranty does not apply to any Hamilton product which may have been repaired or altered in any way outside the factory of the Company or to damages caused in the opinion of the Company by overloading, misuse, mis-application, improper storage, abnormal wear and tear due to exposure to the elements, negligence, accident, or whilst being operated in any way other than in accordance with the operating and maintenance instructions of the Company nor does it apply to repairs made necessary by the use of parts or accessories not recommended by the Company. There is no liability on the part of the Company with respect to any items incorporated in any Hamilton product when such items have been manufactured by others and are warranted by their respective manufacturers in favour of the purchaser or when they are supplied by the Company on special order. The Company shall not be liable for any consequential loss or damage resulting directly or indirectly from any defect in the product the subject of this agreement. No liability on the part of the Company with respect to this Warranty shall extend to second-hand and reconditioned goods and the Warranty does not cover the cost of labour involved in the replacement of defective parts. No liability on the part of the Company with respect to this Warranty shall exist unless the registration card supplied by the Company is completed in every detail and returned to the Company within seven (7) days of the product being delivered to the customer.

C.W.F. HAMILTON & CO. LTD.

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1 Introduction

This manual contains important information regarding the operation, care and maintenance of your Hamilton 770 Series Jet Unit. Its new features include a single deflector for light, positive steering, a removeable inspection cover to allow easy access for removing any debris which may find its way into the intake and a new 2 position nozzle which allows a trim change for a boat. In order to obtain the maximum benefit from your jet unit, we suggest that you familiarise yourself with the contents of this manual and follow the recommendations laid down.

All information, illustrations and specifications contained in this manual are based on the latest production information available at the time of publication. The right is reserved to make changes at any time without notice, so always quote both model and serial numbers in any correspondence regarding your jet unit.

We would like you to obtain the utmost performance and satisfaction from your 770 Jet Unit, so if you intend to install it into a boat yourself, we strongly recommend that you obtain 770 Series "Workshop Manual" from your Hamilton Jet Dealer. The information includes the selection and matching of a suitable hull, engine, coupling and control system, installation etc.

2 Scope of Use

The 770 Series Marine Jets are designed for the efficient propulsion of small and medium sized high speed (over 20 knots) planing craft, and to be driven by conventional gasoline inboard engines. If used as recommended, they will give brisk acceleration, excellent power for water-skiing, and economical load-carrying for family, sporting and utility purposes of all descriptions.

These units can be used on heavier and larger boats, displacement craft, and a variety of special purpose vessels, with approximately equal efficiency to a direct-drive propeller. However, at these low speeds, efficiency is reduced. If the units are to be used outside their design range, the manufacturers should be consulted for guidance.

IMPORTANT

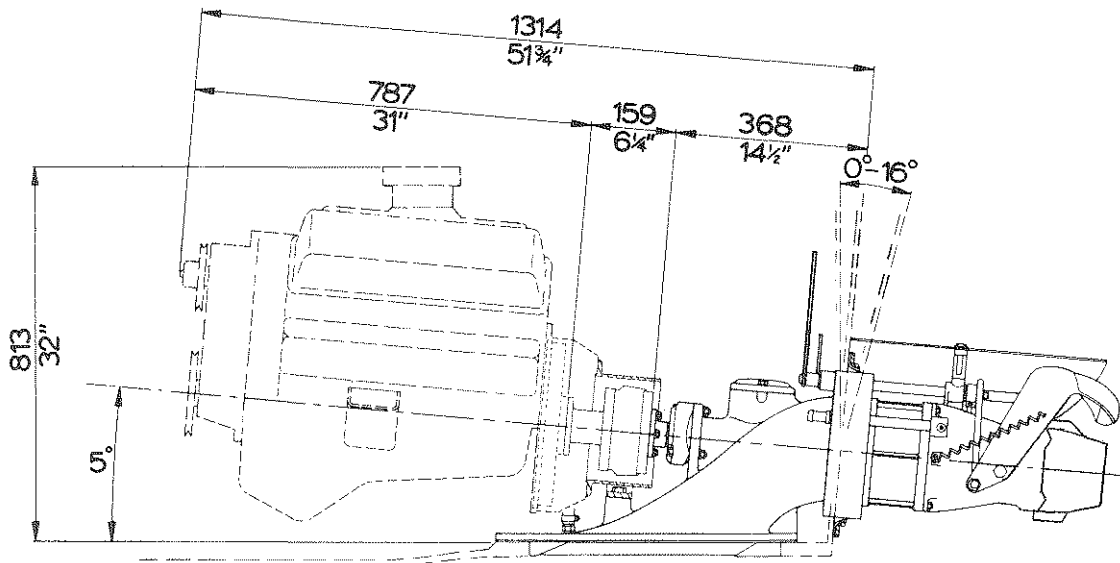
Generally, therefore, it is recommended that they be confined to the lighter, fast class of craft usually trailered (or slipped) when not in use. The units are built from lightweight materials for high performance. They can be used freely in the sea but to avoid problems with fouling and excessive corrosion, it is recommended that they are slipped or trailered when not in use.

3 Specification

MODEL	771	772	773
No. of stages	1	2	3
Impeller Diameter	190mm 7½"	190mm 7½"	190mm 7½"
Nozzle Numbers (std)	No 103	No 88	No 74
Nozzle Options	No 88	No 74	No 88
Engine Size	1—3.3 litres 60—200 C.I.D.	3—5.7 litres 180—350 C.I.D.	4—8 litres 250—500 C.I.D.
Horsepower Range	50—130	100—240	130—400
Maximum R.P.M. (Normal)	5000	5000	5000
Drive Coupling flange for: Hardy Spicer or Hamilton "Close Kit"	1300 Series	1300 Series	1300 Series (773 unit with coarse impeller option uses 1400 series)
Jet Unit Weight	45 kg 100 lb	55 kg 120 lb	59 kg 130 lb
Boat Size	3.7—6m 12'—20'	4.3—7m 14'—23'	4.9—8m 16'—26'
Unladen Boat Weight (Maximum)	800 kg 1750 lb	1200 kg 2650 lb	1600 kg 3500 lb
Rotation	Left Hand	Left Hand	Left Hand
Impeller Options	Fine Standard Coarse	Standard Coarse	Standard Coarse

NOTE: Only use high H.P. and high R.P.M. (over 4500 r.p.m.) on light high performance pleasure craft. Use lower R.P.M., and move up one stage for heavier craft and commercial operation. For heavy duty and commercial work requiring over 250 H.P. refer to the Technical Manual. Standard nozzles are fitted unless options are requested. Standard pitch impellers are fitted unless optional fine or coarse impeller options are requested.

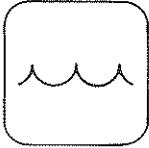
Typical Assembly



Typical assembly showing 302c.i.d. Ford V-8, close coupling and Hamilton 772 jet unit

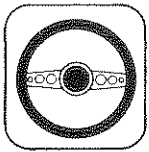
5 Pre-Start Check

Although most of the settings are done at the factory, the following points should be checked after the unit has been installed in the boat. It is also advisable to go through all the checks listed in the Owner's Manual of the engine you are using.



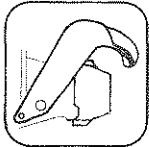
LEAKS

With boat well laden at the back, check for leakage at the transom seal and intake joint. Well prepared surfaces and proper use of sealing cement provide leak proof joints.



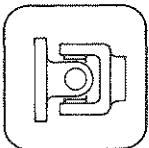
STEERING

The steering wheel should have no undue slack. If it has, check that the steering wires are taut, and adjust if necessary.



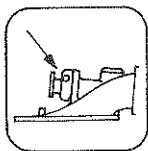
REVERSE BUCKET

Make sure that the reverse bucket operates freely.



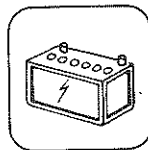
DRIVE SHAFT

The drive shaft universals and sliding splines should be greased springly. If a rubber close coupling system is used, check the bolts for tightness. (See Section 7—Maintenance).



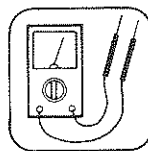
BEARING

The thrust bearing should be greased with a water repellent, Lithium based grease, using an ordinary grease gun on the nipple provided. **DO NOT OVERGREASE.** (See Section 7—Maintenance).



ELECTRICAL AUXILIARIES

Batteries, radio transmitters, or other electrical equipment should **NOT** be earthed to the Jet Unit. It is safer to use an independent grounding plate which is electrically isolated from both the Jet casing and from the engine.



INSULATION

The rotating parts of the Jet units are electrically insulated from the aluminium casing to prevent electrolytic corrosion in sea water. Insulation is by tufnol washers, insulating film on the front bearing housing, and rubber in the rear bearing.

When a new boat is being fitted out, it is most important that the insulation should not be short-circuited by external fittings such as control links, fuel lines, steering cables or engine mountings which could provide an electrical circuit from the rotating shaft, through the engine, and back to the aluminium Jet casing. The use of rubber couplings insulates the engine from the jet shaft.

To check the insulation, use an ohm-meter or a bulb and battery (3-12 volt) between the casing and the mainshaft of the Jet Unit while it is out of the water and the engine is stationary. The resistance under these conditions should not be less than 1000 ohms (or, if you are using a bulb it should not light). A rear bearing, damp with sea water, may show a slightly lower resistance, but a metallic short circuit, which is dangerous, usually shows a very low resistance (under 10 ohms) and a test light will glow.

If there is a short circuit, find the cause and remove it.

To test the Jet Unit alone, remove the coupling shaft and repeat the test, revolving the shaft slowly by hand.

Operation

LOADING

Do not carry more weight aboard than is absolutely necessary. Remember, a high speed planing hull is very sensitive to weight.

STARTING OFF & STOPPING

Find a suitable place to launch the boat. Drive the trailer back enough to submerge the jet intake into the water. (If there is a proper launching ramp then there is nothing to worry about but if you are launching at a lake shore or river bed, make sure that you can drive the trailer out with the boat on it).

Start the engine, engage reverse and open throttle slowly to get the boat in the water. If you are in shallow water with a shingle bed, do not open full throttle to take off as this will suck the shingle into the unit damaging the impeller blades.

With the engine idling, or with small throttle opening, manoeuvre into deep water. Now open throttle fully until the craft is planing clear and then ease the throttle back to economical cruising revolutions (generally 75% of Max.), and maintain planing speed. Avoid driving in the 10-15 m.p.h. range as at these speeds, the draught and drag are at maximum.

STEERING

Try your steering and make sure you get the feel of it. Steering is achieved by deflecting the jet, so the engine must always be running to get any steering. The larger the throttle opening, the greater the steering effect.

NEVER—repeat **NEVER** stop the engine when approaching a mooring, rapid or any situation when steering would be required. With the engine stopped, there will be **NO** steering available.

REVERSING

Reverse thrust is obtained by directing the jet stream forward under the boat hull. Once again, reverse is only available when the engine is running. The boat can be brought to a stop from speed by engaging reverse with throttle closed and then opening the throttle slowly. **FULL THROTTLE OPENING** could be dangerous in this condition, as instant reverse thrust is obtained.

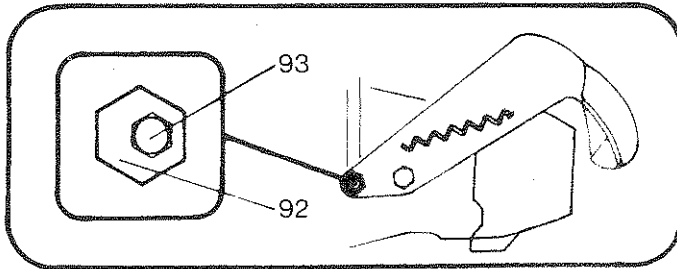
It is possible to creep forward or backward by moving the reverse lever towards forward or reverse. It is also possible to steer the boat in reverse and neutral. It must be noticed that the steering in reverse is opposite to that of car steering, a feature that can be used to advantage when manoeuvring. An easy way to remember is that "the bow goes in the same direction as the steering wheel is turned" or "whichever way the wheel is turned—the bow will go the same way".

It is also possible to rotate the boat when neutral is engaged.

These manoeuvres need some practice but with experience they will enable you to handle the boat in extremely difficult conditions which would prove almost impossible in a conventional propeller driven boat.

After the boat is launched, the neutral position should be checked as follows:—

- (a) Select the neutral position on the reverse lever.
- (b) Run the boat at a fast idle in open water with no current or wind, with the steering straight ahead.
- (c) If the boat moves forward, rotate the adjusting sleeves to lower the reverse bucket a little.
- (d) If the boat moves astern, rotate the adjusting sleeves to raise the bucket.



- (a) Loosen bolt (93)
- (b) Rotate both adjusting sleeves (92) to raise or lower the reverse bucket.

Important: Take care that the eccentric sleeves are set in identical positions on either side.

- (c) Hold adjusting sleeve in position and tighten bolt.

BLOCKED INTAKE SCREEN

During operation in debris laden water, the intake screen of the jet unit might get clogged. Floating sticks, weeds and leaves are the worst offenders. The effect is falling off in thrust and speed, and in extreme cases, increased noise from the jet unit. Close the throttle momentarily and switch off the engine for a few seconds. In most cases it will fall from the screen bars. If this fails, stop the engine and remove the blockage manually with the rake provided, or by removing the inspection cover to gain access to the intake.

CAUTION: Before removing the cover, make sure that it is above the water-line and if not, shift ballast to the bow of the boat.

In shallow waters over shingle beds, full throttle sucks in the shingle and blocks the screen. Once again, the engine should be stopped for a short time to drop off the shingle. However, this problem will not be encountered while running at a reasonable speed over shallows or weeds.

Two types of intake screens are available:—

(a) Solid bar screen for stony conditions, and where the bottom may be encountered frequently.

(b) Free-finger "comb" intake screens for weedy conditions. **NOTE:** This screen should not be used if a stony bottom is to be encountered, as stones can pass the flexible bars and can seriously damage the interior of the unit.

BLOCKED WATER DELIVERY TUBE

Lack of cooling water flow is sometimes caused by a blocked water delivery tube, and can often be noticed by the increase in exhaust noise even before it shows on the temperature gauge. Switch off the engine and clear debris from water delivery tubes (58).

Maintenance

This unit has been designed to require the absolute minimum of maintenance. The main moving parts which may require occasional attention are described below. Routine checks and lubrication at regular intervals will ensure a long trouble-free life.

THRUST BEARING

This is a special high thrust capacity duplex ball bearing with separate grease seals. The bearing should be lubricated after every 30 hours' use with a water repellant Lithium based grease (Shell Alvania 3 or equivalent).

REAR BEARING

This is a water lubricated, Cutless rubber bearing. It requires no attention. **DO NOT RUN THE UNIT OUT OF WATER** as this will damage the bearing. Because there will be no cooling water, the engine could also be damaged.

DRIVE SHAFT & UNIVERSAL

Grease the joints and splines sparingly after every 30 hours' use, as for Thrust Bearing. Do not overgrease. (Rubber coupling, if used, will need no attention other than periodic inspection and a check on the condition of rubber and the tightness of the bolts).

REVERSE & STEERING MECHANISMS

Occasionally check all bolts for tightness. Make sure the cotter pins are tight when reassembled.

ROMET SHAFT SEAL

This is a carbon face seal with a bronze counterface and needs no attention. If a leak appears below the bearing housing, this is an indication of a cracked or chipped carbon face. Replace it with another seal. For details see Service Information, Section 8.

TRANSOM SEAL

Occasionally inspect the rubber to check that it is sealing effectively and is in sound condition.

SALT WATER OPERATION

This unit is designed for high speed planing craft where light weight is important. Therefore aluminium alloy components have been used. Use freely in the sea, but the boat should be trailered or slipped and flushed with fresh water or given a short run in fresh water before extended storage.

If it is used extensively in salt water, it is recommended that all casings and seals be inspected regularly. Occasionally dismantle and inspect all internal and external surfaces for corrosion. Rubber seals should be replaced where required. Protective spray on machinery, fittings, wirings, instruments, etc is recommended.

STORAGE

Always clean down the whole boat, and wash inside and out with fresh water (and detergent if desired). Hose out interior of jet unit through the intake and the nozzle. Allow to dry completely, and spray with a suitable corrosion protection liquid. Oil and lubricate all moving parts, including the steering gear and deflector pins and pivots. Keep well aired in storage to avoid condensation.

CORROSION PROTECTION

For salt water operation, the protective sacrificial ZINC ANODE (67) is provided. Check constantly the condition of the anode and replace when approximately half original size.

NOZZLE TRIM

NOZZLE DOWN (standard position)—tips jet stream downwards. This gives best all round boat performance.

NOZZLE UP—tips jetstream up. This gives maximum boat speed. To assemble with nozzle up—remove the cotter pin (79) from the steering crank (84), pushing the steering shaft forward to remove the crank. Remove the nozzle (68) and steering deflector (90) assembly by removing 4 nuts (63).

Remove the split pins (89) and pivot pins (88) to separate nozzle and deflector. Turn the nozzle upside down and reassemble into steering deflector. Reverse above procedure to reassemble unit.

The adjustment of the reverse bucket now has to be altered by refitting the two bolts (93) into the alternative holes in the reverse yoke (91).

WARNING—with the nozzle up the jetstream may cause annoyance to other boats nearby. The up position is not recommended for water skiing.



Service Information

THRUST BEARING, GREASE SEAL & CARBON SEAL: REMOVAL

Undo the two nuts and remove the inspection cover (9) to withdraw split pin (54) inside the intake. Unfasten the rear end of the drive shaft (in some cases where short couplings are used it may be necessary to remove the drive shaft completely or shift the engine). Remove the self locking nut and washer (43 and 44). The coupling (45) will now slide off, freeing the key (46). Undo the three nuts and bolts (22 and 24) and carefully remove the bearing housing (31) with the bearing inside. One half of the bearing race will probably stay on the shaft. Remove this and keep with the bearing. **DO NOT EXCHANGE THE BEARING INNER RACE HALVES. KEEP THE BEARING CLEAN.** Remember with this type of thrust bearing, even a new one will have considerable slack. Therefore, excessive noise, obvious water damage or wear on the inner races and balls should be the only reason to replace the bearing. The bearing is locked tight inside the housing for insulation purposes and if it needs replacing it can be bought as a unit from the factory or your Hamilton dealer.

To remove the grease seals continue by removing the O-ring (36), locating ring (37) and the bearing spacer (39). Check the bearing spacer and coupling for wear caused by the seals (30 and 38). Check the seals in the bearing housing and locating ring for wear and replace if necessary.

A worn or damaged carbon seal is indicated by water leakage from the hole beneath the bearing housing. To remove the carbon seal continue by removing the shaft slinger (50). The seal face (51) and carbon seal assembly (53) can now be removed by reaching into the intake and pushing them off the shaft. If the seal face is difficult to remove, two bolts (22) may be screwed into the tapped holes in the seal face to allow it to be pulled out. Inspect the sealing faces carefully and if they are scored or chipped they should be replaced. The seal can be bought from the factory or dealer as a unit.

ASSEMBLY

Assembly is the reverse of removal. Oil or grease the shaft surface before sliding the carbon seal assembly on the shaft with spring retainer, spring, flat washer, O-ring, carbon seal in that order. When replacing the bearing housing some difficulty may be experienced with one inner race half, which may need to be pushed on with the coupling. Tighten the coupling self locking nut to 70-80 lb. ft. torque. Refit the split pin and inspection cover. Check that the shaft turns freely and then refit drive shaft. Regrease the bearing with Lithium based water repellent grease.

IMPELLER: REMOVAL

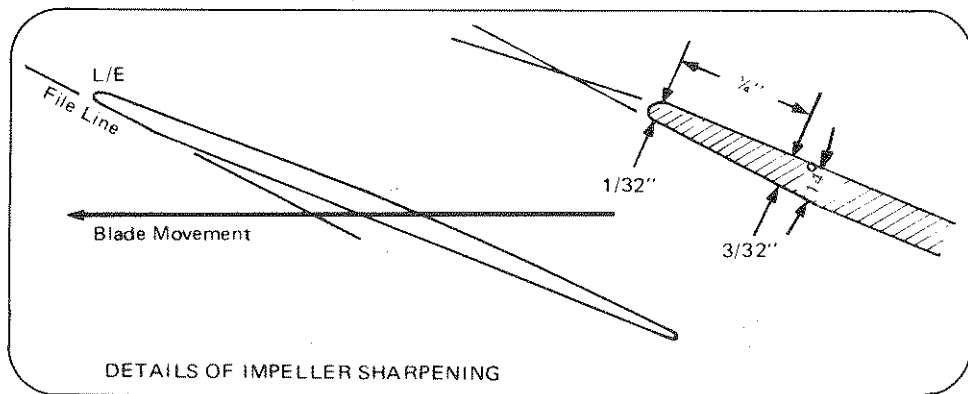
Remove the two nuts and bolts (111 and 109). Then remove bolt (107), splash guard (113), and support (106). Remove bucket spring (86). Remove nuts and cotter pins (79) from the reverse and steering cranks (77 and 84) and remove both cranks by pushing the shafts forward slightly. Remove the six stud nuts (13) and withdraw the tailpipe (62). The two water delivery tubes (58) will now be free and care should be taken of the four O-rings (61). Prevent the mainshaft from rotating and undo the mainshaft nut (49) and remove washer (44), bearing sleeve (42), impeller (41), and key (48). (For two or three stage units, continue with stator casing (59) next bearing sleeve, impeller and key etc.) Take care not to damage the large O-ring in the tailpipe and stator casing recesses. Blunt leading edges on impellers can reduce performance considerably, so the edges should be kept reasonably sharp, but take care to sharpen only as shown in the diagram. Tip clearance of impeller blades should not be more than .060" (about 1-16") for best performance.

ASSEMBLY

IMPORTANT. Clean all traces of grease from the bearing sleeves. It is often helpful to dust the sleeve with French Chalk to act as a lubricant for the bearings during assembly. When the sleeve measures about $.007''$ under $1\frac{1}{2}''$ diameter by micrometer, replacement is advised. The cutless rubber bearing should be replaced if wear is apparent on the fluted surfaces by eye, and the new sleeve is excessively slack. Make sure all parts are clean, and grease all mating surfaces. Fit keys in keyways in shaft, and slide impellers over shaft and key. Slide on bearing sleeves and when tightening the nut, ensure that the washer is central, otherwise it can prevent the tailpipe from fitting on.

Tightening torque for the mainshaft nut is 70 lb.ft.

Note:—The steering crank cotter pin is fitted from right to left (nut on the left side), the reverse crank cotter pin from left to right (nut on right), looking forward.

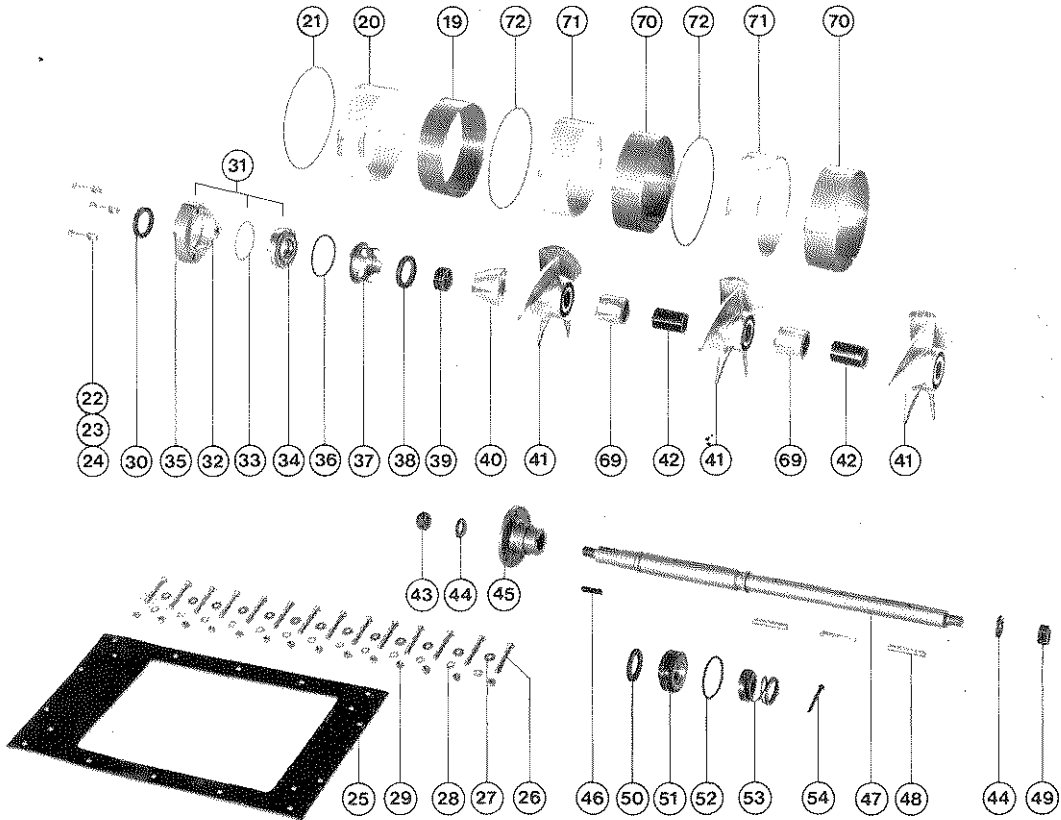


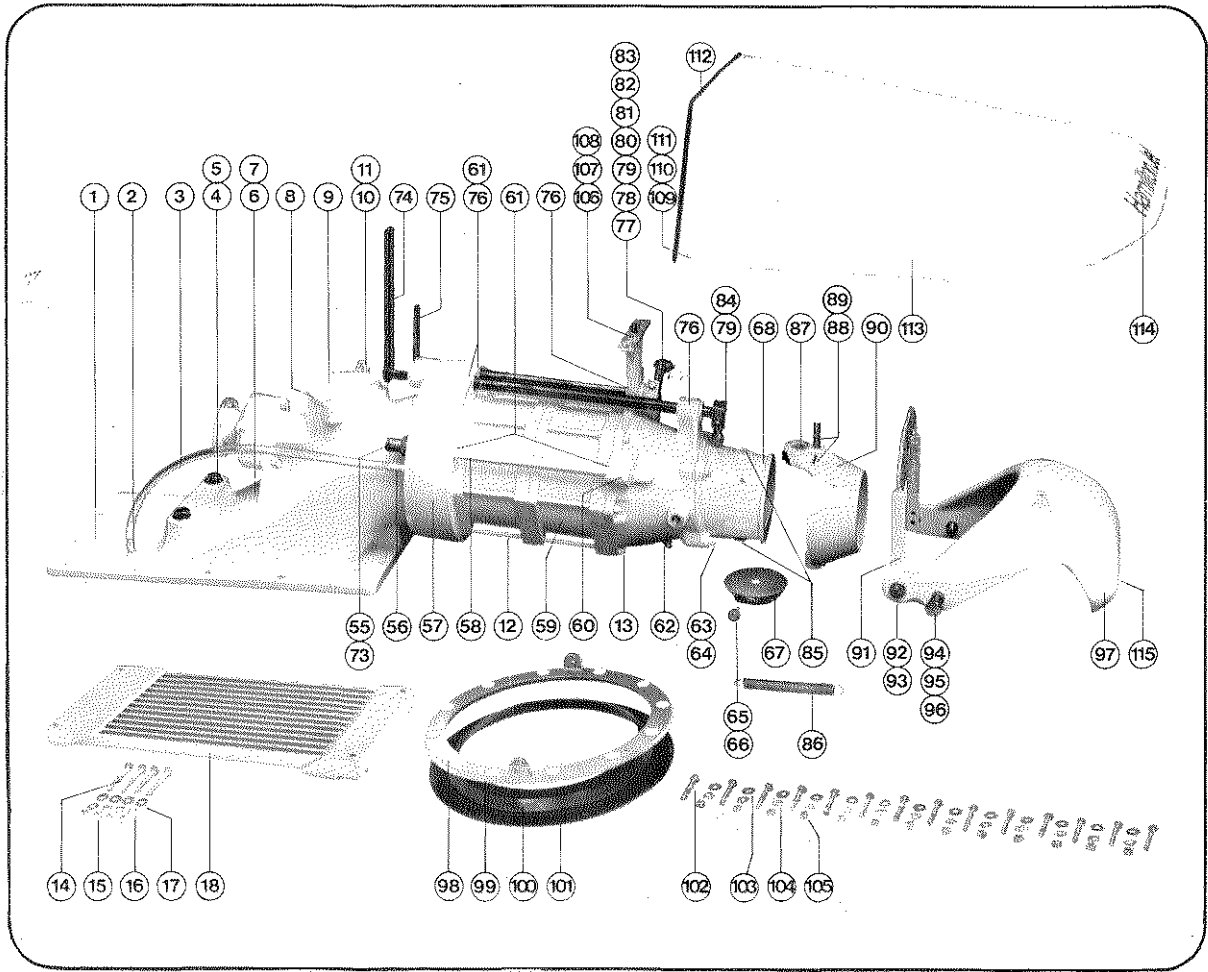
GENERAL

If you dismantle the unit, it is generally worthwhile examining the seals, bearings, grease seals and impeller at the same time. A complete check just before the start of the season usually pays dividends in terms of assured reliability and peak performance.



Parts List





Intake Assembly

		771		772		773	
Item	Description	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.
1	Intake Housing	102319	1	102319	1	102319	1
2	Male hose connector	63370	1	63370	1	63370	1
3	Hose	63373	1	63373	1	63373	1
4	Bolt	JP 154	2	JP 154	2	JP 154	2
5	Washer	JP 406	2	JP 406	2	JP 406	2
6	Name plate	63097	1	63097	1	63097	1
7	Patent plate	63135	1	63135	1	63135	1
8	'O' ring	JP 598	1	JP 598	1	JP 598	1
9	Inspection cover	102320	1	102320	1	102320	1
10	Inspection cover stud	102321	2	102321	2	102321	2
11	Lock Nut	JP 383	2	JP 383	2	JP 383	2
12	Intake tailpipe stud	102323	6	102324	6	102325	6
13	Nut	JP 362	6	JP 362	6	JP 362	6
14	Bolt	JP 117	4	JP 117	4	JP 117	4
15	Nut	JP 362	4	JP 362	4	JP 362	4
16	Washer	JP 402	4	JP 402	4	JP 402	4
17	Fibre washer	61213	4	61213	4	61213	4
18	Intake screen *	103113	1	103113	1	103113	1
19	Wear ring	JE 144	1	JE 185	1	JE 185	1
20	Wear ring insulator	JE 147	1	JE 147	1	JE 147	1
21	'O' ring	JP 575	1	JP 575	1	JP 575	1
22	Bolt	JP 128	3	JP 129	3	JP 129	3
23	Flat washer	JP 403	3	JP 403	3	JP 403	3
24	Nut	JP 363	3	JP 363	3	JP 363	3
25	Intake screen gasket	103149	1	103149	1	103149	1
26	M/C screw	JP 321	14	JP 321	14	JP 321	14
27	Washer	JP 402	14	JP 402	14	JP 402	14
28	Fibre washer	61213	14	61213	14	61213	14
29	Nut	JP 362	14	JP 362	14	JP 362	14
	*Optional Free Finger Intake Screen for weed	JE 292	1	JE 292	1	JE 292	1

Shaft and Bearing Housing Assembly

		771		772		773	
Item	Description	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.
30	Oil seal	61180	1	61316	1	61316	1
31	Bearing Assembly	JE 217SY	1	JH 210SY	1	JH 210SY	1
	Consists of:—						
	32—Housing	JE 212	1	JH 205	1	JH 205	1
	33—Tufnol washer	JE 216	1	JH 209	1	JH 209	1
	34—Bearing	JP 850	1	JP 851	1	JP 851	1
35	Grease nipple	JP 700	1	JP 700	1	JP 700	1
36	'O' ring	JP 565	1	JP 568	1	JP 568	1
37	Locating ring	JE 298	1	JH 252	1	JH 252	1
38	Oil seal	61180	1	61315	1	61315	1
39	Bearing spacer	JE 205	1	JH 204	1	JH 204	1
40	Thrust collar/fairing	JE 219	1	JH 107	1	JH 107	1
41	Impeller (standard)*	80609	1	JH 106	2	JH 106	3
42	Bearing sleeve	JE 122	1	JH 159	2	JH 159	2
43	Self locking nut	JP 470	1	JP 471	1	JP 471	1
44	Washer	JP 408	2	JH 117	2	JH117	2
45	Coupling	JE 244	1	JH 110	1	JH 110	1
46	Key (coupling)	JE 121	1	JH 132	1	JH 132	1
47	Shaft	JE 220	1	JH 213	1	JH 211	1
48	Key (impeller)	JE 121	1	JH 239	2	JH 239	3
49	Nut	JP 472	1	JP 472	1	JP 472	1
50	Shaft slinger	JE 290	1	JH 251	1	JH 251	1
51	Seal face	JE 295	1	JH 250	1	JH 250	1
52	'O' ring	JP 566	1	JP 566	1	JP 566	1
53	Seal	61317	1	61318	1	61318	1
54	Split pin	JP 515	1	JP 527	1	JP 527	1
	*Optional Impellers						
	Fine pitch	JE 104	1	—		—	
	Coarse pitch	80620	1	103348	2	103348	3

Booster Assembly

		771		772		773	
Item	Description	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.
55	Water off take	JP 703	1	JP 703	1	JP 703	1
56	Male hose connector	63370	1	63370	1	63370	1
57	Seal plate	102603	1	102603	1	102603	1
58	Water delivery tube	102332	2	102333	2	102334	2
59	Stator	—	—	102326	1	102326	2
60	Screen spring	JE 309	2	JE 309	2	JE 309	2
61	'O' ring	JP 552	2+4	JP 552	2+4	JP 552	2+4
62	Tailpipe†	103153	1	103153	1	103153	1
63	Nut	JP 362	4	JP 362	4	JP 362	4
64	Stud (tailpipe to nozzle)	103250	4	103250	4	103250	4
65	Bolt	—	1	—	1	—	1
66	Washer	—	1	—	1	—	1
67	Anode†	102185-4	1	102185-4	1	102185-4	1
68	Nozzle (standard)*	103159-103	1	103159-088	1	103159-074	1
69	Bearing (cutless)	JH 160	1	JH 160	2	JH 160	3
70	Wear ring	—	—	JE 185	1	JE 185	2
71	Wear ring insulator	—	—	JE 147	1	JE 147	2
72	'O' ring	—	—	JP 575	1	JP 575	2
73	Plug	JP 675	1	JP 675	1	JP 675	1
	*Optional Nozzles						
	Smaller	103159-088	1	103159-074	1	—	
	Larger	—	—	—	—	103159-088	1
	† Tailpipe 103358 and Anode 103359 (with 2 Bolts, 2 washers and 2nuts) replaced tailpipe 103153 and anode 102185-4 from Serial no. 8103 onwards. 103153 now obsolete — replace with 103358 and 103359.						

Control Assembly

		771		772		773	
Item	Description	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.
74	Steering shaft assembly	103224	1	103223	1	103222	1
75	Reverse shaft assembly	103230	1	103229	1	103228	1
76	Bush (control shaft)	JE 248	1+1	JE 248	1+1	JE 248	1+1
77	Reverse crank assembly	103177	SY 1	103177	SY 1	103177	SY 1
	Consists of:						
	78—Reverse crank	103178	1	103178	1	103178	1
	79—Cotter pin assembly:	103171	SY 1	103171	SY 1	103171	SY 1
	—Flat washer JP 412						
	—Nut JP 362						
	—Cotter pin 103170						
	—Spring washer JP 412						
	80—Pivot pin	102874	1	102874	1	102874	1
	81—Split pin	JP 504	1	JP 504	1	JP 504	1
	82—Roller	102876	1	102876	1	102876	1
	83—Washer	63368	2	63368	2	63368	2
84	Steering crank	103169	1	103169	1	103169	1
85	Deflector bush	103164	2	103164	2	103164	2
86	Spring	102364	1	102364	1	102364	1
87	Crank bush (deflector)	103266	1	103266	1	103266	1
88	Deflector pivot pin	103165	2	103165	2	103165	2
89	Split pin	JP 515	2	JP 515	2	JP 515	2
90	Deflector	103163	1	103163	1	103163	1
91	Reverse yoke	103175	1	103175	1	103175	1
92	Yoke eccentric bush	103176	2	103176	2	103176	2
93	Screw	JP 224	2	JP 224	2	JP 224	2
94	Bucket pivot sleeve	103181	2	103181	2	103181	2
95	Bolt	JP 155	2	JP 155	2	JP 155	2
96	Flat washer	JP 406	2	JP 406	2	JP 406	2
97	Reverse bucket	103174	1	103174	1	103174	1

Transom Seal Assembly

		771		772		773	
Item	Description	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.
98	Insulating bush	JE 262	12	JE 262	12	JE 262	12
99	Transom plate	102331	1	102331	1	102331	1
100	Transom seal	102330	1	102330	1	102330	1
101	Seal spring	102336	1	102336	1	102336	1
102	M/C Screw	JP 323	12	JP 323	12	JP 323	12
103	Flat washer	JP 402	12	JP 402	12	JP 402	12
104	Fibre washer	61213	12	61213	12	61213	12
105	Nut	JP 362	12	JP 362	12	JP 362	12
106	Splash guard support	103182	1	103182	1	103182	1
107	Bolt	JP 132	1	JP 132	1	JP 132	1
108	Flat washer	JP 403	1	JP 403	1	JP 403	1

Miscellaneous Parts

		771		772		773	
Item	Description	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.
109	Bolt	JP 113	2	JP 113	2	JP 113	2
110	Flat washer	JP 402	2	JP 402	2	JP 402	2
111	Lock nut	JP 382	2	JP 382	2	JP 382	2
112	Sealing strip	102543	1	102543	1	102543	1
113	Splash guard	102977	1	102978	1	102979	1
114	Hamilton jet sticker (transom)	63349	1	63349	1	63349	1
115	770 jet sticker	63383	1	63383	1	63383	1
116	Foil sticker*	63234	2	63234	2	63234	2
117	Screen rake*	J 656 SY	1	J 656 SY	1	J 656 SY	1
	* Not illustrated						