



TECHNICAL INFORMATION

HAMILTON 773R RACING JET UNIT

GENERAL DESCRIPTION

This unit has been developed expressly for very high performance racing craft used for relatively short periods. It will absorb effectively the maximum output of the large block V8 normal aspirated and turbocharged racing engines currently available. It is recommended for any engines capable of more than about 300 h.p. and is designed to run in the 5000 - 6000 r.p.m. region.

The unit should have a reasonable life without attention, exceeding that of the engine driving it, but it is recommended that it be dismantled, inspected, crack-checked, and rebuilt, with great care and attention every few races, or at the same time as the engine.

They are hand-built by Factory experts experienced in their use, and have a number of special features as listed below:-

MAINSHAFT: High strength 56 tonne 431 stainless steel, with involute splined drive and special radiused impeller thrust shoulder (and matching fairing) to reduce stress concentration points.

COUPLING: Forged manganese bronze drive flange with matching involute spline, designed to use the 1410 series Hardy Spicer drive shaft for high torques.

IMPELLERS: Fitted with three high grade Hamilton stainless steel impellers. Hand fitted keys, and very close (.005" - .007") tip clearances to reduce slip and tip losses.

THRUST BEARING: A heavy duty 40mm Duplex bearing replaces the usual 35mm bearing, giving a considerable increase in thrust capacity, and bearing life under racing conditions.

CUTLESS BEARINGS: The aft lubricated rubber bearings and their shaft sleeves are selected to give closest possible running clearances.

LUBRICATION: The thrust bearing is lubricated from a light oil reservoir surrounding the bearing itself. The oil passages ensure a steady circulation of oil



TECHNICAL INFORMATION

through the bearing, and a large oil capacity is provided for safety.

COOLING:

To ensure adequate dissipation of the heat generated by the thrust bearing at sustained high powers, a cold water jacket is arranged, being fed water from the engine cooling water line through a restrictor, and to waste out through a transom fitting.

AIR BLEED:

The air bleed hose into the intake is employed to assist the unit to run sweetly, but since it allows a small thrust loss to occur, it is sealed off for racing purposes.

TIE BOLTS:

The six tie-bolts holding the whole unit together are increased in size to $\frac{3}{8}$ " diameter for extra strength at the very high racing pressures generated. Torque up to 50 ft. lbs. Intake, stators, and tailpipe have their corresponding holes opened up to suit the heavier bolts.

NOZZLE:

The 3 stage "073" (about 73 sq. cms. area or equivalent to 4" diameter) nozzle is normally the correct nozzle for almost all applications. Larger will cause excessive take-off slip and lower the jet velocity, and smaller nozzles may cause throttling and lower the efficiency. Fit nozzle in the up-turned position for increased trim angle, lower wetted area, and best top speed. The 073 nozzle gives 5° of tilt up and down, instead of the 3° of the standard 074 nozzle.

INTAKE:

The standard intake has been found to be as good as any, but great care must be taken during installation to avoid steps, bumps, projections, or any other impediment to the smooth flow of the water into the intake. This aspect is most important.

INTAKE SCREEN: The standard intake screen is usual, but some owners may wish to use the optional special racing screen (extra cost) which provides the following features:

- (a) Forward block reduced in size to improve water approach at front end.
- (b) Less bars, with tapered inside edge to improve water flow through the screen.

- (c) Rounded cutwater brought well forward to reduce screen area should be best for high speeds.

Note: The reduced intake area may be more efficient, as the standard opening calculates too large for high speed work. It may also improve handling on some hulls that experience high speed steering problems.

STATORS:

Standard Hamilton aluminium stators are quite satisfactory for the highest powers currently used. Stator vane breakage will only occur if stones are pumped through the unit.

ENGINE MATCHING/PITCH: The unit will be supplied with one of three pitches as shown in the POWER CURVE graph. The extreme "Turbo-pitch" is used for turbocharged 454 C.I.D. Chevrolet engines and equivalent, and will hold maximum revolutions in the 5300 - 5600 r.p.m. region. In this set up the impellers are increasing pitch from the front to the back, the steepest pitch impeller being the last one, near the tailpipe. Note: with Turbo-pitch, the front of the aft stator vanes is machined back to clear the central impeller trailing edges, and a wide single stage (JE 144) wear-ring fitted to fully cover the third impeller. Always refit Turbopitch impellers in the correct order, but other setups, being equal pitch, can be interchanged for position.

INSTALLATION: Follow the instructions for the standard unit as set out in the 770 Workshop Manual. We suggest that the 12" diameter transom hole in the hull be relieved a little around the top half, and the transom ring fitted on the high side to match. This may avoid unit damage if the boat bottom is deflected upwards by a rock at high speed. If this hole is snug, the unit can be distorted and seizure can occur.

Also some owners may wish to double bolt the intake to the hull bottom for extra strength and security. A particularly good practice is to install two extra holding down bolts at the intake rear flange - a particularly high pressure area to avoid possible extrusion of the intake gasket at this point.

Twin springs on the reverse bucket can make doubly sure that the reverse bucket never falls into the jetstream at the wrong moment.



TECHNICAL INFORMATION

- MAINTENANCE:
1. Keep thrust bearing oil reservoir topped up with a good grade of mineral oil. For example: Shell "Turbo 46". If not available Tellus 46 or SAE 20 motor oil.
 2. Do not run jet unit out of water for more than about 5 seconds to clear out engine after a race. The rubber bearings and the plastic seal face can be easily damaged if run dry.
 3. Check over all nuts and bolts frequently, especially on steering gear. Oil all moving parts before each race to reduce friction and avoid binding.
 4. We recommend that the unit be dismantled and closely inspected for damage, cracks, and wear about every 10 hours of racing, or immediately, if stones have been pumped. Check bearings for signs of wear, make sure cutless bearings and matching sleeves are sound and free of excess clearance. Most important check impellers for tip clearance, sharp leading edges, and cavitation burns, (usually caused by too large a nozzle or racing with partially blocked intake screen).
 5. Take particular care when reassembling to ensure the unit turns freely by hand. Match mark the stators, and re-assemble in the same position. The side holes have less clearance to act as dowels. Some scraping of the impeller tips is normal on new units, or after reassembly due to the very close blade tip clearances, but it should never be too hard to turn easily by hand. If the unit is assembled on the bench, check again after bolting down into the boat.

WARRANTY: The Hamilton Racing unit has been built as best we know how, and will give good and reliable service with common sense and proper care and attention. However, due to the widely varying conditions and treatment of racing units, and the very high powers applied too many factors are outside the control of the Factory, and our normal Warranty does not apply.

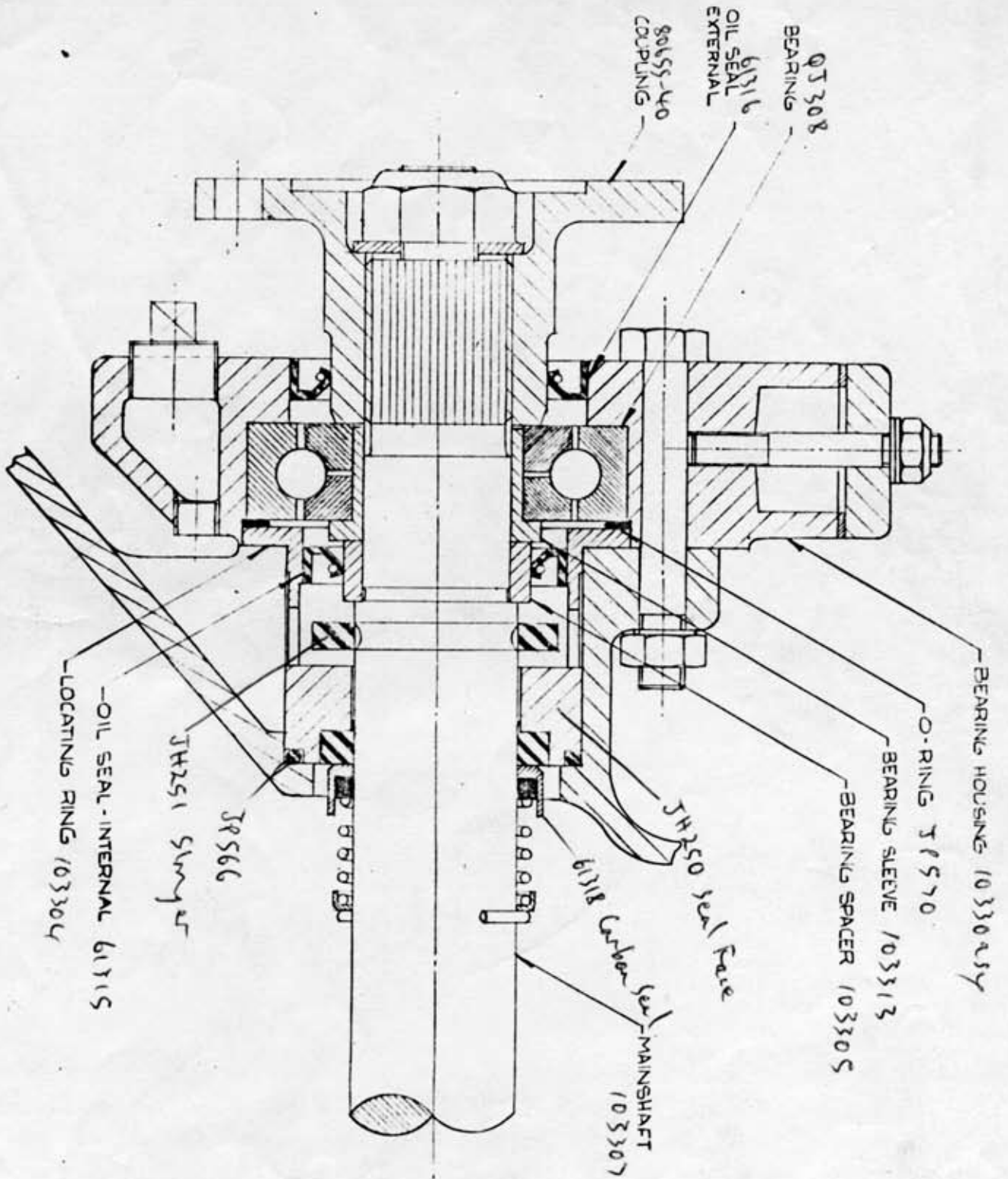
CHANGES: We reserve the right to make changes and improvements to the unit or its specification at any time without notice or responsibility to previous owners. Jet propulsion is an evolving science in our time.



TECHNICAL INFORMATION

773R SPECIAL PARTS LIST

<u>DESCRIPTION</u>	<u>QTY</u>	<u>PART NO.</u>	<u>REMARKS</u>
Intake	1	103301	$\frac{3}{8}$ " tiebolt holes
Stator	2	103299	$\frac{3}{8}$ " tiebolt holes
Tailpipe	1	103302	$\frac{3}{8}$ " tiebolt holes
Sealing ring	1	103300	$\frac{3}{8}$ " tiebolt holes
Heavy tiebolts	6	103298	$\frac{3}{8}$ " tiebolts
Nuts for above	6	JP 363	$\frac{3}{8}$ " UNC
Bearing assembly	1	103309	40mm bearing and rectangular housing, with water and oil jackets
Locating ring	1	103304	Larger for 40mm bearing
O-ring	1	JP 571	$3\frac{3}{8}$ " x $3\frac{7}{8}$ " x $\frac{1}{8}$ " M.S.
Bearing Spacer	1	103305	
Mainshaft	1	103307	Involute splined end
Coupling	1	80655-40	Matches above
Impeller key	3	103303	
Fairing	1	103306	Radius thrust shoulder
Nozzle	1	103159-073	5° tilt capacity
Impellers	3	JM 1134	S.S. standard pitch
or Impellers	3	JM 1135	S.S. coarse pitch
or Impeller set	1	-	Turbopitch
Racing Intake Screen	1	80703A	(Optional at extra cost)



QT308
BEARING

OIL SEAL
EXTERNAL
61316

6055-40
COUPLING

BEARING HOUSING 103302

O-RING T1570

BEARING SLEEVE 103313

BEARING SPACER 103305

JH250 seal face

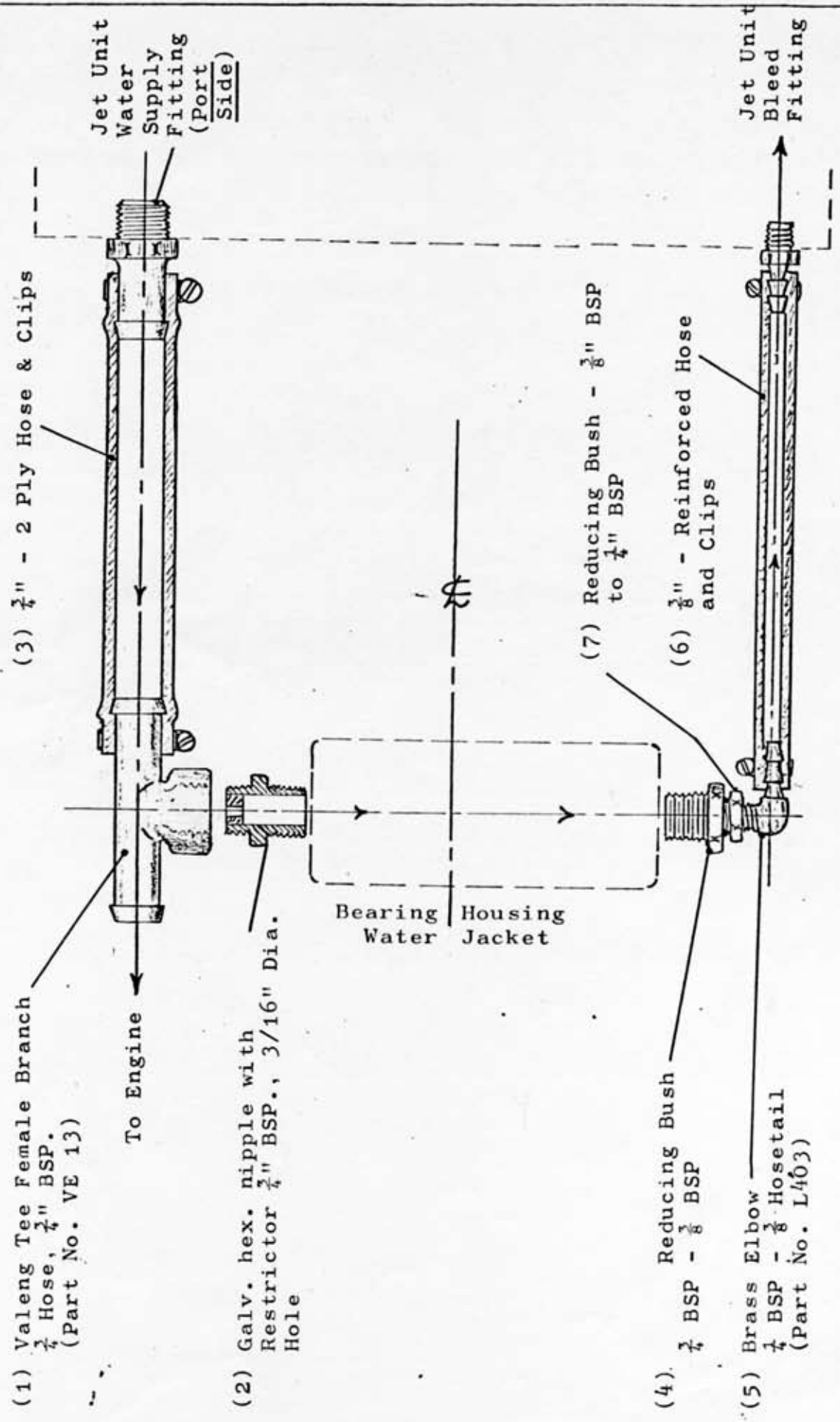
6118 Carbon Seal
- MAINSHAFT
103307

JH251 spacer

JH251 spacer

OIL SEAL - INTERNAL 61715

LOCATING RING 103304



All 073 (4") Nozzle

