

SEA²⁰⁰⁰®

Sport Boats



SHOP MANUAL

**SPEEDSTER
CHALLENGER 1800
CHALLENGER 2000
X-20**



2 1 9 1 0 0 1 6 2

Shop Manual

SPEEDSTER
CHALLENGER 1800
CHALLENGER 2000
X-20

BOMBARDIER
RECREATIONAL PRODUCTS



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SAFETY NOTICE

SAFETY NOTICE

This manual was primarily published to be used by sport boat mechanic technicians trained by the manufacturer who are already familiar with all service and maintenance procedures relating to Bombardier made Sea-Doo sport boats. Mechanic technicians should intent to continuous training courses given by Bombardier Training Dept.

Please note that the instructions will apply only if proper hand tools and special service tools are used.

It is understood that this manual may be translated into local language upon certain conditions and furthermore agreed that in the event of any discrepancy among the two versions, the English version shall prevail.

The content depicts parts and/or procedures applicable to the particular product at time of writing. *Service and Warranty Bulletins* may be published to update the content of this manual. Make sure to read and understand these.

The use of Bombardier parts is most strongly recommended when considering replacement of any component. Dealer and/or distributor assistance should be sought in case of doubt.

Torque wrench tightening specifications must be strictly adhered to. Locking devices (ex.: locking tab, self-locking fasteners, etc.) must be installed or replaced with new ones. If the efficiency of a locking device is impaired, it must be renewed.

This manual emphasizes particular information denoted by the wording and symbols:

WARNING

Identifies an instruction which, if not followed, could cause serious personal injury including possibility of death.

CAUTION: Denotes an instruction which, if not followed, could severely damage boat components.

NOTE: Indicates supplementary information needed to fully complete an instruction.

Although the mere reading of such information does not eliminate the hazard, your understanding of the information will promote its correct use. Always use common shop safety practice.

Bombardier Inc. disclaims liability for all damages and/or injuries resulting from the improper use of the contents. We strongly recommend that any services be carried out and/or verified by a highly skilled professional technician. It is understood that certain modifications may render use of the boat illegal under existing federal, provincial and state regulations.

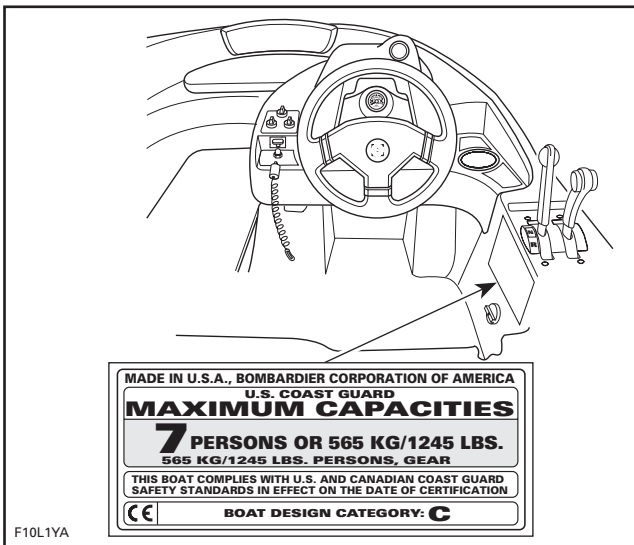
INTRODUCTION

This *Shop Manual* covers the following BOMBARDIER made SEA-DOO® Sport Boat:

- Speedster
- Challenger 1800
- Challenger 2000
- X 20

MAXIMUM BOAT CAPACITY

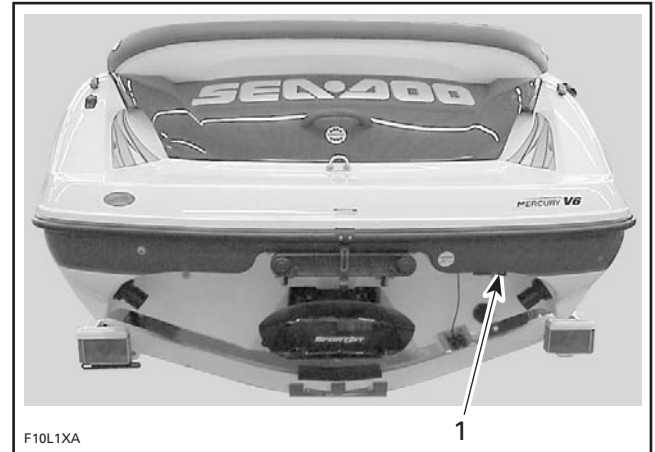
Depending on model, the Sport boat maximum capacity label can be found on RH or LH side of operator position.



TYPICAL

HULL IDENTIFICATION NUMBER (H.I.N.)

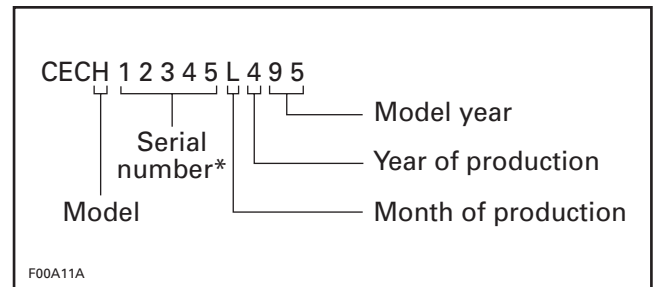
The Hull Identification Number (H.I.N.) is located at right hand rear side of hull.



TYPICAL

1. Hull Identification Number (H.I.N.)

Refer to the next illustration for a description of the serial number.



*A letter may also be used as a digit.

CEC indicates that boats are manufactured in USA.

INTRODUCTION

ENGINE IDENTIFICATION NUMBER (E.I.N.)

Refer to *Mercury Marine (M2) Jet Drive Operator's Guide*.

ARRANGEMENT OF THIS MANUAL

The manual is divided into 9 major sections:

01 Service Tools and Products

02 Maintenance

03 Engine

04 Fuel System

05 Electrical

06 Steering System

07 Hull/Deck

08 Technical Data

09 Wiring Diagram

Each section may be divided in various subsections, and again, each subsection may have one or more divisions.

TYPICAL PAGE

Section 03 ENGINE
Subsection 04 (MAGNETO SYSTEM)

MAGNETO SYSTEM
717 Engine

12, 11, 13, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1

5 N•m (44 lbf•in)
9 N•m (80 lbf•in)
6 N•m (53 lbf•in)
6 N•m (53 lbf•in)
6 N•m (53 lbf•in)
6 N•m (53 lbf•in)
145 N•m (107 lbf•ft)
9 N•m (80 lbf•in)

Loctite 242
Loctite 242
Loctite 242
Loctite 242
Loctite 648
Anti-seize lubricant

F04A09S

03-04-1

Page heading indicates section and subsection detailed.

Subsection title indicates beginning of the subsection.

Italic sub-title above exploded view indicate pertaining models.

Drop represents a liquid product to be applied to a surface. In this case Loctite 242 to screw threads.

Bold face number indicates special procedure concerning this part.

Illustration number for publishing process.

Tightening torque nearby fastener. In this case, nut must be torqued to 145 N•m (107 lbf•ft).

CAUTION: Pay attention to torque specifications. Some of these are in lbf•in instead of lbf•ft. Use appropriate torque wrench.

Exploded view assists you in identifying parts and related positions.

Dotted box contains parts of a particular model or an exploded view.

Page numbering system:
03: ENGINE section
04: MAGNETO SYSTEM subsection
1: First page of this subsection

F04A09S

INTRODUCTION

TYPICAL PAGE

Sub-title indicates a particular procedure for the named part.

Section 06 FUEL SYSTEM Subsection 03 (CARBURETORS)

CARBURETOR REMOVAL

To remove carburetors from engine, proceed as follows:
 Remove air vent tube support.
 Unlock retaining slides holding air intake silencer base.
 Remove air intake silencer base from watercraft.
 Remove screws holding flame arrester base support to cylinder head cover.
 Unscrew base retaining screws then remove base from carburetors and move to front of watercraft.
 Turn the valve to OFF position.

NOTE: For fuel line removal, use pliers (P/N 295 000 054).

Disconnect pulse line from fuel pump.
 Disconnect fuel supply line from fuel pump.
 Disconnect fuel return line.
 Disconnect oil injection pump cable, throttle cable and choke cable.

Challenger Model Only

Remove screws and lock washers retaining carburetors.
 Remove carburetors from intake manifold.

All Others Models

Remove 4 bolts and lock washers from rotary valve cover then move carburetors and rotary valve cover on top of engine.

NOTE: When removing rotary valve cover, pay attention that the rotary valve stay in place, otherwise it must be timed.

Remove carburetors from intake manifold.
 Disconnect fuel bypass line between carburetors (twin carburetors).
 Remove carburetor(s) from rotary valve cover.

DISASSEMBLY AND INSPECTION

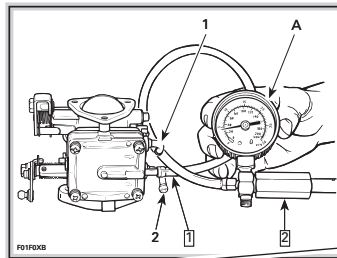
Inspect parts for corrosion damage (shaft, butterfly, spring, etc., check valve housing, etc.).

Diaphragm

Pump Diaphragm Leak Test

Using a suitable pump gauge tester, perform the following test proceeding as follows:

- Install pump gauge tester (P/N 295 000 083) on pulse nipple.
- Pump tester until it reaches 28 kPa (4 PSI).



TYPICAL
 Step 1. Install pump gauge tester to pulse nipple.
 Step 2. Pump tester until it reaches the desired pressure.
 1. Fuel outlet nipple
 2. Fuel inlet nipple
 A. 28 kPa (4 PSI)

Diaphragm no. 3 must stand pressure for 10 seconds. pressure drops, replace diaphragm.

Title indicates main procedure to be carried-out.

Service tool to be used to perform a certain procedure.

Italic bold face setting indicates a particular procedure concerning a model.

Italic bold face setting in this case indicates that particular procedure for Challenger is finished, so from this point, all others models are concerned.

Sub-sub-title indicates a particular testing, adjustment or repair procedure.

Illustration always follows text it is pertained to.

"TYPICAL" caption indicates a general view which does not represent full detail.

Numbers in a frame are used to give a sequence to be performed for above illustration.

Number: following part name refers to exploded view at beginning of subsection.

Letters are used for any measures for above illustration.

Numbers are used for description of components for above illustration.

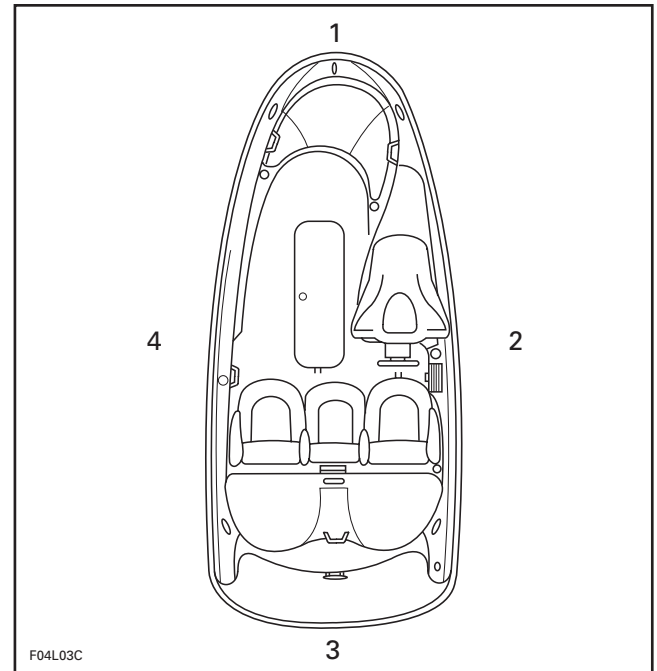
06-03-4

LIST OF ABBREVIATIONS USED IN THIS MANUAL

AC	Alternative Current
Ass'y	Assembly
CDI	Capacitor Discharge Ignition
DC	Direct Current
E.I.N	Engine Identification Number
H.I.N.	Hull Identification Number
HP	Horsepower
LH	Left Hand side (port)
MAG	Magneto
N.A.	Not Applicable
P/N	Part Number
PTO	Power Take Off
RFI	Radio-Frequency Interference
RH	Right Hand side (starboard)
RPM	Revolution Per Minute
SAE	Society of Automotive Engineering
T.I.G.	Tungsten Inert Gas
Vac	Volt, Alternative Current
Vdc	Volt, Direct Current

GENERAL INFORMATION

In the marine industry, PORT, STARBOARD, BOW and STERN are used to refer to LEFT, RIGHT, FRONT and REAR respectively. They always refer to the operator's position sitting in boat.



1. BOW (front)
2. STARBOARD (RH)
3. STERN (rear)
4. PORT (LH)

The information and component/system descriptions contained in this manual are correct at time of publication. Bombardier Motor Corporation of America (B.M.C.A.) however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on products previously manufactured.

Because of our ongoing commitment to product quality and innovation, Bombardier Inc. reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring obligation.

This *Shop Manual* uses technical terms which may be different from the ones of the *Parts Catalogs*.

When ordering parts always refer to the specific model *Parts Catalogs*.

INTRODUCTION

ILLUSTRATIONS AND PROCEDURES

The illustrations in this document show the typical construction of the different assemblies and, in all cases, may not reproduce the full detail or exact shape of the parts shown. However, they represent parts which have the same or a similar function.

CAUTION: These boats are designed with parts dimensioned in both the metric and the imperial systems. When replacing fasteners, make sure to use only those recommended by Bombardier. Mismatched or incorrect fasteners could cause damage to the boat or possible personal injury.

As many of the procedures in this manual are interrelated, we suggest, that before undertaking any task, you read and thoroughly understand the entire section or subsection in which the procedure is contained.

A number of procedures throughout the book require the use of special tools. Before commencing any procedure, be sure that you have on hand all the tools required, or approved equivalents.

Technical Publications
Bombardier Inc.
Valcourt (Quebec), Canada

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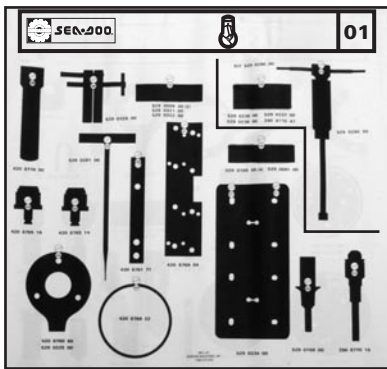
SERVICE PRODUCTS	01-03-1
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SERVICE TOOLS

This is a list of tools to properly service Sea-Doo Sport boats. The list includes both the mandatory tools and the optional tools that are ordered separately. Service products are not part of any kit and must all be ordered separately. If you need to replace or add to your tool inventory these items can be ordered through the regular parts channel. Refer to Mercury Marine service department for M² Jet Drive service tools list.

MANDATORY SERVICE TOOLS

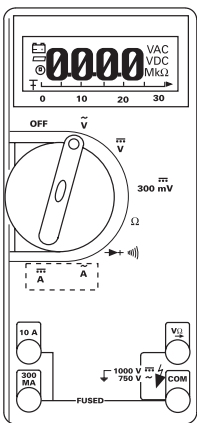
Tool board
P/N 295 500 608



F00A0S4

APPLICATION
Workshop.

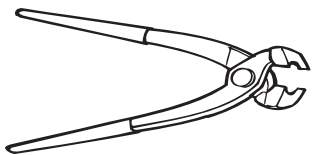
Digital multimeter
P/N 529 035 868



F01B374

APPLICATION
Electrical tests.

Pliers
P/N 295 000 070
Oetiker 1099



F01D174

APPLICATION
Removal or installation of non-reusable Oetiker clamps on fuel system.

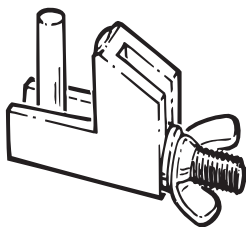
Pump gauge tester
P/N 529 021 800
Engine leak tester kit
P/N 295 500 352



F01B2Q5

APPLICATION
Fuel system pressurization.

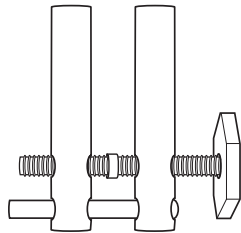
Hose pincher
P/N 295 000 076



A01B214

APPLICATION
Fuel, oil and cooling hoses pinching.

Hose pincher
P/N 529 032 500
TYPICAL



F01B234

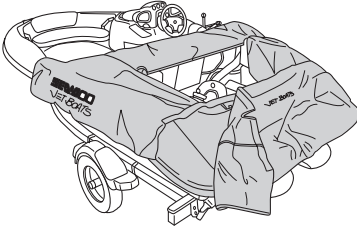
APPLICATION
Fuel, oil and cooling hoses pinching.

Section 01 SERVICE TOOLS AND PRODUCTS

Subsection 02 (SERVICE TOOLS)

RECOMMENDED SERVICE TOOLS

Protective mat
P/N 295 000 129

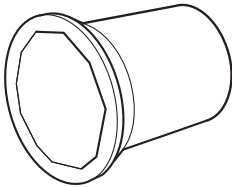


F04L1V4

APPLICATION

Hull and seat protection.

Exhaust outlet tool
P/N 295 000 132

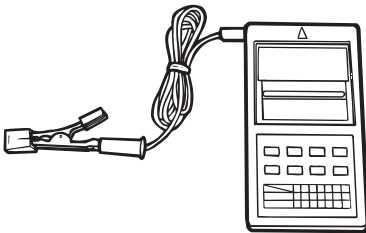


F01B2A4

APPLICATION

Exhaust nut removal on transom.

Digital/induction type tachometer
P/N 529 014 500

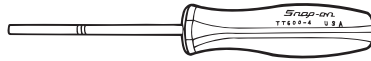


F01B1G4

APPLICATION

RPM checks.

Terminal remover
Not sold by Bombardier
Snap-on
TT 600-4



F01B1J4

APPLICATION

Terminal removal from Packard connector housing used on neutral switch, bow light, etc.

Lighted adjustable mirror
Not sold by Bombardier

Snap-on
50101



F01B114

APPLICATION

Repair under restraint access.

Lift kit

14 foot: P/N 295 000 160

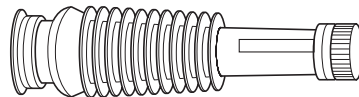
16 foot: P/N 295 100 085

18 foot: P/N 295 100 045

APPLICATION

Boat handling.

Flexible spout (oil)
P/N 414 837 300

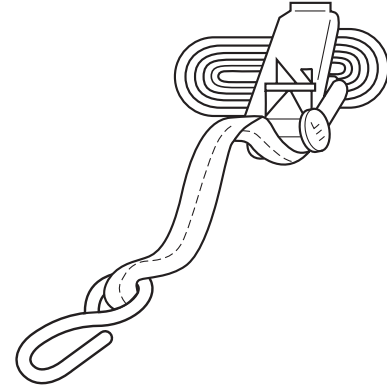


F04B044

APPLICATION

Oil reservoir filling.

Tie-down with ratchet
3.60 m (12 ft) long
P/N 295 100 104



F04B054

APPLICATION

Secure boat to trailer.

Tie-down
P/N 295 100 088



F00I014

APPLICATION

Secure boat to trailer.

SERVICE PRODUCTS

Loctite is a trademark of Loctite™ Corporation.

Dow Corning® is a trademark of Dow Corning® Corporation.

Medium strength threadlocker
P/N 293 800 060

Loctite 243 (blue)
(10 mL)



F00A004

APPLICATION

Battery base, radio retaining nuts, mirror nut, engine cover hinge screws, etc.

Retaining compound
P/N 413 703 100

Loctite® RC/609 (green)
(10 mL)



A00B2S4

APPLICATION

Used for retaining bushings, bearings in slightly worn housing or on shaft.

Dielectric grease
P/N 293 550 004

Dow Corning
(150 g)



F01B164

APPLICATION

On all electric connections, connector housings, etc.

Deoxit contact lubricant

P/N 293 550 015

DeoxIT D5
(200 mL)



F00B0X4

APPLICATION

Remove oxidation from connector pins.

High strength threadlocker
P/N 293 800 005

Loctite 271 (red)
(10 mL)



A00B2U4

APPLICATION

Fasteners and studs up to 1 in diameter.

Loctite primer
P/N 293 800 041

Loctite
Primer N



A00B3N4

APPLICATION

To prepare mating surfaces before applying paste gasket, retaining compound or threadlockers.

Section 01 SERVICE TOOLS AND PRODUCTS

Subsection 03 (SERVICE PRODUCTS)

Anti-seize lubricant
P/N 293 800 023

Loctite anti-seize
lubricant
12 oz (454 g)



F01B174

Adhesive activator
P/N 293 530 036

(250 mL)



F01B124

Parts cleaner
P/N 413 711 809

(320 g)



A00B4X4

BOMBARDIER LUBE
P/N 293 600 016

(12 x 14 oz)



F01B0S4

APPLICATION

Decal replacement.

Sea-Doo cleaner

P/N 293 110 001 (400 g)

P/N 293 110 002 (4 L)



F01B2J4

APPLICATION

Any greasy surfaces.

NOTE: This product replaces Loctite Safety solvent (P/N 413 708 200).

Clear silicone sealant
P/N 293 800 033

Adseal 4511
(clear)



F01B1S4

APPLICATION

Exhaust outlet, water bypass fitting, scupper valve, etc.

Loctite Super Bonder
P/N 413 705 800

Loctite 414



F09P074

APPLICATION

Seat trim, radio trim, steering logo, etc.

Section 01 SERVICE TOOLS AND PRODUCTS

Subsection 03 (SERVICE PRODUCTS)

Vinyl and Plastic Cleaner
P/N 413 711 200

Threadlocker
P/N 293 800 040

Loctite 425



F09P084

APPLICATION

Small plastic fasteners, ignition key switch nut, buzzer nut, etc.

Threadlocker
Not sold by Bombardier
Loctite 220

APPLICATION

Steering helm screws and low-speed cable adjustment screws.

Loctite adhesive
P/N 293 530 028

Loctite 330
(300 mL)

APPLICATION

Hull identification number plate.

Loctite instant adhesive
P/N 413 708 300

Loctite 454 (gel)

APPLICATION

Jet drive gasket and wind deflector.

Sealant adhesive
P/N 293 800 086

Loctite 5150
(29647)



A00B5S4

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<hr/>	
STORAGE.....	02-04-1

PERIODIC INSPECTION CHART

DESCRIPTION		FREQUENCY				
		FIRST 10 HOURS	EVERY 25 HOURS	EVERY 50 HOURS	EVERY 100 HOURS OR PRE-SEASON	TO BE PERFORMED BY
GENERAL	Fire extinguisher condition/mounting ④	✓			✓ ②	O
	Lubrication/corrosion protection	①		✓	✓	O
ENGINE	Exhaust system fasteners/hoses ④	✓		✓	✓	D
COOLING SYSTEM	Flushing		✓ ③			O
	Hose condition and fasteners	✓		✓	✓	D
FUEL SYSTEM	Throttle cable adjustments				✓	D
	Throttle/choke cables, inspection/lubrication ④	①	✓		✓	D
	Fuel filter and lines inspection ④	✓	✓		✓	D
	Fuel filter replacement				✓	D
	Fastener tightening (fuel lines)	✓		✓		D
	Fuel tank straps	✓				O
	Fuel tank Filling				✓ ②	O
LUBRICATION SYSTEM	Oil lines inspection	✓	✓			D
	Oil reservoir straps	✓			✓	O
	Oil reservoir filling				✓ ②	O
ELECTRICAL SYSTEM	Main battery cut-off switch ④	✓	✓		✓	D
	Lights condition/operation	✓	✓		✓ ②	D
	Bilge blower and bilge pump inspection	✓	✓		✓ ②	D
	Electrical connections (ignition system, electrical box(es), starting system, etc.)	✓	✓		✓	D
	Safety lanyard cap/switch	✓			✓ ②	D
	Monitoring beeper	✓		✓	✓	D
	Battery tightness	✓		✓	✓ ②	D
	Battery charging				✓	D
	Sacrificial aluminum anode			✓		O
STEERING SYSTEM	Inspection and cable adjustment	✓		✓	✓	D
LOW-SPEED STEERING SYSTEM	Inspection and throttle cable adjustment	✓		✓	✓	D
PROPULSION SYSTEM	Shifter system/cable adjustment	✓			✓	D
HULL AND BODY	Hull condition	✓			✓ ②	O
	Storage compartment cover locks lubrication	①		✓		O
	Deck drains/scupper valve cleaning	✓	✓		✓ ②	O

NOTE: Some items are included in the PRE-OPERATION CHECKS and not necessarily repeated in this chart. Refer to *M² Jet Drive Operator's Guide* for engine and jet pump checks.

D: Dealer

O: Operator

① Every 10 hours in salt water use.

② Daily checked.

③ Daily flushing in salt water or foul water use.

④ Safety item covered in the annual safety inspection (owner's expenses).

FLUSHING AND LUBRICATION

GENERAL

Flushing the cooling system with fresh water is essential to neutralize corroding effects of salt or other chemical products present in water. It will help to clear sand, salt, shells or other particles in engine.

Flushing should be performed when the boat is not expected to be used further the same day or when the boat is stored for any extended time.

CAUTION: Failure to flush cooling system, when necessary, will severely damage engine.

PROCEDURE

Refer to *M² Jet Drive Service Manual* for complete procedure.

STORAGE

Fuel System

Fuel stabilizer should be added in fuel tank to prevent fuel deterioration and carburetor (if so equipped) gumming. Follow manufacturer's instructions for proper use.

WARNING

Fuel is flammable and explosive under certain conditions. Always work in a well-ventilated area. Do not smoke or allow open flames or sparks in the vicinity. Always wipe off any fuel spillage from the boat.

Refer to *M² Jet Drive Service Manuals* for complete procedure.

Boat Cleaning

Clean the bilge with hot water and mild detergent or with bilge cleaner. Rinse thoroughly. Unscrew drain plug and lift front end of boat to completely drain bilge. Replace plug after draining. If any repairs are needed to the body or to the hull, touch up paint and Gelcoat® repair kits are available. Replace damaged labels/decals.

Wash the body and the trailer with soap and water solution (only use mild detergent). Rinse thoroughly with fresh water. Remove marine organisms from the hull. Apply a nonabrasive wax.

CAUTION: Never clean apparent fiberglass and plastic parts with strong detergent, degreasing agent, paint thinner, acetone, etc.

Stains may be removed from seats, fiberglass and convenience center top surfaces with Knight's Spray-Nine* from Korkay System Ltd or the equivalent.

Battery

For battery removal, cleaning and storage, refer to BATTERY.

Anticorrosion Treatment

Remove any residual water in the engine compartment.

Spray BOMBARDIER LUBE lubricant (P/N 293 600 016) over all metallic components except engine and jet pump in engine compartment.

NOTE: Refer to *M² Jet Drive Service Manuals* for engine and jet pump components corrosion treatment.

Lubricate the throttle cable with BOMBARDIER LUBE lubricant.

Finalizing Storage

The engine storage cover should be left opened during storage (disconnect gas shocks from cover to prevent full opening). Remove storage tray. Place it on deck. This will avoid engine compartment condensation and possible corrosion.

If the boat is to be stored outside, cover with a vented opaque tarpaulin to prevent UV rays and grime from affecting the plastic components or boat finish as well as to prevent dust accumulation.

Unscrew the drain plugs during storage. Lift the boat so that the bow is higher than the stern to allow draining of the bilge. Safely block it in this position.

CAUTION: The boat must never be left in water for storage. Never leave the boat stored in direct sunlight. UV radiation will dull finishes. Make sure to turn OFF bilge pump and blower.

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aservicemanualpdf@yahoo.com