



Introduction

Introducing the 2009 Sea-Doo® iControl Advanced training work book. This training is a comprehensive interactive training tool, as well as a valuable service information reference tool.

Long after the workbook training is complete you can use the interactive shop manual to help you in the diagnosis and repair of Sea-Doo® Watercraft.

This Interactive Shop manual is interlinked (hyperlinked*) with service publications, video clips, Power Point shows and selected internet web links.

Identifying colors in the Interactive Shop Manual will identify "hyperlinks*" to service procedures or additional information helpful to complete the repair. Simply clicking on the word will automatically open the file or bring you to a different section of the shop manual.

Blue (Blue Underlined) = service procedures or information contained elsewhere in the shop manual

Red (Red Box – Yellow highlighted) = video clip of procedure

Green (Green Box – Yellow highlighted) = power point show

Violet (Violet Box – Yellow highlighted) = Internet web link

How to use this work book

PRINT THE WORK BOOK (color is preferred but not necessary)

Fill in the answers in the paper copy, as you will need the completed workbook for reference when taking the test on B.R.P.T.I.

Work book prompts

The following reference will inform you that the information required to answer the questions will be in which certain section and or subsection of the shop manual.

Refer to Section 00 Subsection 00 the SECTION or SUBSECTION NAME in the shop manual and complete the following:

The following prompts inform you where to click in the SHOP MANUAL.

- From the Shop Manual BOOKMARKS click on Shop Manual Hyper Link to: A certain section
- Click on the Shop Manual Hyper link to: Video Clip (video clip)
- Click on the Shop Manual Hyper link to: Website (<https://www.bossweb.brp.com>)
- Click on the Shop Manual Hyper link to: Power Point Show (PPS)

→ This will be a question that needs to be answered?

- Possible answer
- Possible answer

When the workbook is complete, go on-line and take the B.R.P.T.I. website test.

NOTICE The shop manual is one of the most valuable tools you have to assist in repair of the vehicle. Unfortunately, it is sometimes overlooked as being such a valuable reference tool. It is highly recommended that during the course of this training ensure to thoroughly read the theory and procedures contained in each section of the shop manual and not just answer the questions in this workbook.

* **Hy-per-link (noun)** = A word, symbol, image, or other element in a hypertext document that links to another element in the same document, in another hypertext document or a different file.



Refer to Section 01 Subsection 01 the MAINTENANCE SCHEDULE in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS click on Shop Manual Hyper link to: 01 01 Maintenance schedule

→ When should the "fuel system leak" test be performed?

- Every 10 Hours
- Every 50 Hours or 3 months
- Every 100 Hours or 1 year
- Every 200 Hours or 2 years

→ What should be done with the iBR friction sleeves every 100 Hours or 1 year.

- They should be inspected.
- They should be lubricated.
- They should be replaced.
- They should be adjusted.

→ Click on BLUE Shop Manual Hyper link in the Maintenance Schedule to: iBR friction sleeves

→ Where are the iBR friction sleeves located and how many are there?

- There are four, two one each outside of the VTS trim ring.
- There are six, stacked in order, at the base of the iBR motor.
- There are two, one on each side of the steering cable ball joint.
- There are two, one on each inside of the iBR gate pivot point.

Refer to Section 01 Subsection 04 the SPECIAL PROCEDURES in the shop manual and complete the following:

Special precautions should be taken when towing a Sea-Doo watercraft in water.

→ What is the maximum towing speed of the watercraft?

- Maximum recommended towing speed is _____ km/h (____MPH).

→ Complete the following Concerning the Boil Out Procedure.

- Connect the vehicle to B.U.D.S. to monitor the coolant temperature. It must exceed _____°C (____°F) in order for the water boil out.
- Run the engine for ____ minutes at _____ RPM.
- Install a LARGE HOSE PINCHER to the _____ line going to the oil _____.
- Continue to run the engine at _____ RPM for ____more minutes (____ minutes total run time).

Refer to Section 02 Subsection 01 ENGINE REMOVAL AND INSTALLATION in the shop manual and complete the following:

→ From the Shop Manual Table of Contents Click on Hyper link to: 02 01 Engine Removal and Installation – Procedures – Engine Removal

→ Click on the Shop Manual Hyper link to: Engine Removal (video clip)

→ The Drive shaft is turned counterclockwise to remove it from the PTO sealing ring.

- TRUE
- FALSE



→ How many turns does it take to remove the driveshaft from the PTO sealing ring?

- 4
- 6
- 8
- 10
- 12

- From the Shop Manual BOOKMARKS Click on Hyper link to: Procedures – Engine Alignment
- Click on the Shop Manual Hyper link to: Engine Alignment (video clip)

→ Two marks need to be placed on the engine alignment shaft. How far from the tip of the alignment shaft adapter do the marks need to be placed on the shaft?

- _____ mm (_____ in) and at _____ mm (_____ in)

→ The engine is properly aligned when both marks on the shaft are clearly visible at the alignment shaft support end.

- TRUE
- FALSE

Refer to Section 02 Subsection 02 AIR INTAKE SYSTEM in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: 02-02 Air intake system – Procedures – Air intake silencer
- Click on the Shop Manual Hyper link to: Air silencer removal (video clip) and Air silencer installation

→ Which statement is correct concerning the removal and installation of the intake air silencer?

- The groove on the supercharger air intake hose is installed into the base of the air intake silencer.
- The supercharger air intake hose is lightly lubricated with engine oil before it is installed.
- The air intake retaining straps are cut off on removal and replaced on installation.
- All of these answers are correct

Refer to Section 02 Subsection 03 INTAKE MANIFOLD in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: 02-03 Intake Manifold– Procedures – Intake Manifold Removal
- Click on the Shop Manual Hyper link to: Air silencer removal (video clip) and Air silencer installation (video clip)

→ What is the part number for the FUEL HOSE DISCONNECT TOOL used to separate the fuel hose from the fuel rail?

- 529 036 127
- 529 036 037
- 529 036 045
- 529 036 039

→ The ECM is left on the intake manifold during the intake manifold removal procedure.

- TRUE
- FALSE



Refer to Section 02 Subsection 04 SUPERCHARGER in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-04 Supercharger – Inspection

→ Fill in the blanks for the supercharger slip clutch specifications.

SLIPPING MOMENT (NEW SUPERCHARGER)
___ N•m to ___ N•m (___ lbf•in to ___ lbf•in)

SLIPPING MOMENT (BREAK-IN SUPERCHARGER)
___ N•m to ___ N•m (___ lbf•in to ___ lbf•in)

→ There is a supplemental video clip for both supercharger removal and supercharger installation.

- TRUE
- FALSE

Refer to Section 02 Subsection 05 INTERCOOLER in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-05 Intercooler – Procedures – Intercooler leak test

→ When the intercooler is leak tested the intercooler is sealed and pressurized. What is the pressure and for how much time is it tested.

- _____ kPa (____PSI) for a period of _____ Minutes

Refer to Section 02 Subsection 06 EXHAUST SYSTEM in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-06 Exhaust System – Procedures – Resonator

→ Click on the Shop Manual Hyper link to: Resonator removal (video clip)

→ Which statement is correct concerning the removal and installation of the resonator according to the video clip?

- The engine must be removed to replace the resonator.
- The resonator is removed and reinstalled through the starboard side storage compartment hole.
- The resonator can be removed but not reinstalled through the right side storage compartment hole.
- None of these statements are correct.

Refer to Section 02 Subsection 07 PTO HOUSING AND MAGNETO in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-07 PTO Housing and Magneto – Procedures – Stator

→ During the stator output voltage test a 6 PIN MAGNETO HARNESS ADAPTER is installed, the engine is run @ 2500 RPM and the minimum output voltage is 50 VAC.

- TRUE
- FALSE



Refer to Section 02 Subsection 08 LUBRICATION SYSTEM in the shop manual and complete the following:

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-08 Lubrication System – Maintenance – Engine oil

➔ What engine oil has been thoroughly tested to be free of any additives that could impair the functionality of the supercharger clutch?

- XPS _____ grade oil (PN 293 600 _____)

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-08 Lubrication System – Inspection – Engine Oil Pressure

➔ What is the minimum engine oil pressure with the engine at idle @ 80°C (176°F)?

- Min. _____ kPa (_____ PSI)

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-08 Lubrication System – Procedures – Blow by Valve

➔ Where is the TOPS switch located?

- On the _____

➔ Complete the following chart for testing the Blow – by valve output voltage

TOPS SWITCH CONNECTOR	BLOW-BY VALVE POSITION	VOLTAGE
Pin 1 and Pin 2	Normal position	Approximately _____ Vdc
Pin1and Pin 2	Upside down	Approximately _____ Vdc
Pin 2 and Pin 3	Normal position or upside down	Approximately _____ Vdc

Refer to Section 02 Subsection 09 COOLING SYSTEM in the shop manual and complete the following:

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-09 Cooling System

➔ At what engine temperature does the monitoring beeper indicate an engine overheat on a supercharger equipped vessel?

- _____ °C (_____ °F)

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 02-09 Cooling System – Procedures - Clamps

➔ Click on the Shop Manual Hyper link to: Clamp Replacement (Video clip)

➔ Which side of the OETIKER PLIERS is used to crimp a new clamp tight?

- The front
- The side with the gap
- Either side will work



Refer to Section 02 Subsection 10 CYLINDER HEAD in the shop manual and complete the following:

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 02 10 Cylinder Head

➔ Complete the following chart comparing the percentage of cylinder leakage to engine condition.

LEAKAGE PERCENTAGE	ENGINE CONDITION
Up to ____%	Excellent condition
____% to ____%	Good condition
____% to ____%	Fair condition; engine will run and performance might be down in some cases
____% and higher	Poor condition, diagnose and repair engine

Refer to Section 02 Subsection 11 CYLINDER BLOCK in the shop manual and complete the following:

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 02 11 Cylinder Block

➔ What is the maximum service limit for piston to cylinder wall clearance?

- 0._____ mm (._____ in)

➔ What is the recommended method for applying loctite® 5910 to the crankcase halves?

- A caulk gun with the tip trimmed to apply a 3mm (1/8in) bead.
- A soft rubber roller and a Plexiglas plate.
- A plastic spatula to smooth the application.
- A clean hand towel and a finger.

Refer to Section 03 Subsection 01 ENGINE MANAGEMENT SYSTEM in the shop manual and complete the following:

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 03 01 Engine Management System

➔ There are 7 main systems in interaction with the engine management system. List those 7 systems.

1. _____
2. _____ system
3. _____ system
4. _____ system
5. _____ (____-_____)
6. _____ system (_____ (____-_____ system))
7. _____ system

Refer to Section 03 Subsection 02 iCONTROL SYSTEM in the shop manual and complete the following:

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 03 02 iCONTROL SYSTEM

➔ Click on the Shop Manual Hyper link to: iCONTROL

➔ Click on the Shop Manual Hyper link to: iTC (INTELLIGENT THROTTLE CONTROL)

➔ Click on the Shop Manual Hyper link to: iBR (INTELLIGENT BRAKE AND REVERSE)

➔ Click on the Shop Manual Hyper link to: iS (INTELLIGENT SUSPENSION)



→ Fill in the blanks to define iTC (Intelligent Throttle control).

- The iTC is an _____ throttle control system that includes a _____ throttle control located on the _____ side of _____ and a throttle _____ (_____) located on the throttle _____.

→ Fill in the blanks to define iBR (Intelligent Brake and Reverse).

- The iBR is a _____ and _____ system that is used to avoid _____, gradually _____ or _____ the watercraft by _____ a _____ that reverts the _____ at the outlet of the _____ nozzle.

→ Fill in the blanks to define iS (Intelligent Suspension).

- The intelligent suspension is a _____ system of one _____ and one _____ installed in the lower _____ to _____ the riders from _____ water.

Refer to Section 03 Subsection 03 COMMUNICATION TOOLS AND B.U.D.S. SOFTWARE in the shop manual and complete the following:

→ [From the Shop Manual BOOKMARKS Click on Hyper link to: 03 03 Communication Tools and B.U.D.S. soft ware](#)

→ What component is NEVER used when connecting the MPI-2 to the iControl watercraft?

- The _____ interface.

→ What protocol is selected to read the data from an iControl equipped watercraft?

- DESS
- Kw 2000
- KW2000 (500 K)
- 947 DI

→ [From the Shop Manual BOOKMARKS Click on Hyper link to: 03 03 Communication Tools and B.U.D.S. soft ware – Procedures – B.U.D.S. Software](#)

→ [Click on the Shop Manual Hyper link to: BOSSWeb \(https://www.bossweb.brp.com\)](https://www.bossweb.brp.com)

→ What is the latest version of B.U.D.S. currently on BOSSWeb?

- Version 2.3. _____ is the latest version

Refer to Section 03 Subsection 04 MONITORING SYSTEM AND FAULT CODES in the shop manual and complete the following:

→ [From the Shop Manual BOOKMARKS Click on Hyper link to: 03 04 Monitoring System and Fault Codes – Fault Codes](#)

→ There are 4 types of fault codes used on the vehicle, list the fault code types.

- "B" = _____
- "C" = _____
- "P" = _____
- "U" = _____



→ There are 4 modules that stores the fault codes, list the four modules that can store codes.

- _____
- _____
- _____
- _____

→ From the Shop Manual BOOKMARKS Click on Hyper link to: [03 04 Monitoring System and Fault Codes – Specific Fault Codes](#)

→ Which statement is correct concerning specific fault codes C2221, C2222, C2233, U16A2 and U401?

- Installed part is not appropriate for the vehicle.
- The engine will crank but will not start.
- Any of these faults should be immediately reported to the technical service department for assistance in diagnosis and repair procedures.
- These faults may occasionally appear as occurred. Normal operation is not affected.

→ A specific fault code U0300 has been set. Which statement is correct concerning this specific fault code?

- All of these answers are correct.
- Incorrect ECM or information center for the engine.
- Installed part is not appropriate for the vehicle.
- The engine will crank but will not start.

→ A specific fault code P0563 has been set, indicating "Battery voltage too high". At what voltage is the code set and what is the maximum charging voltage? (Hint—click on the [CHARGING SYSTEM](#) hyperlink on the specific fault code description.)

- Code P0563 stes @ _____ Vdc.
- Maximum output voltage is _____ ± _____ Vdc @ _____ RPM.

Refer to Section 04 Subsection 01 INTELLIGENT THROTTLE CONTROL (iTC) in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: [04 01 Intelligent Throttle Control \(iTC\)](#)

→ Fill in the blanks to describe iTC (Intelligent Throttle control) and its primary components.

- The iTC is often referred to as a " _____ " system.
- The throttle lever operates the _____ sensor (_____). It is a _____ sensor. The redundancy is used for security purposes.
- The throttle _____ (_____) is a _____ motor on the throttle body that _____ the throttle plate via a _____. _____ (_____) is used to control the motor.
- In the throttle body, there is a _____ throttle _____ sensor (_____). The redundancy is used for _____ purposes. The _____ is a _____ that supplies the ECM the actual _____ of the throttle _____.



➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 01 Intelligent Throttle Control (ITC) – Procedures – Throttle Accelerator Sensor - TAS

➔ What is the part number for the DIAGNOSTIC HARNESS that connects to the harness in between moving and the fixed decks?

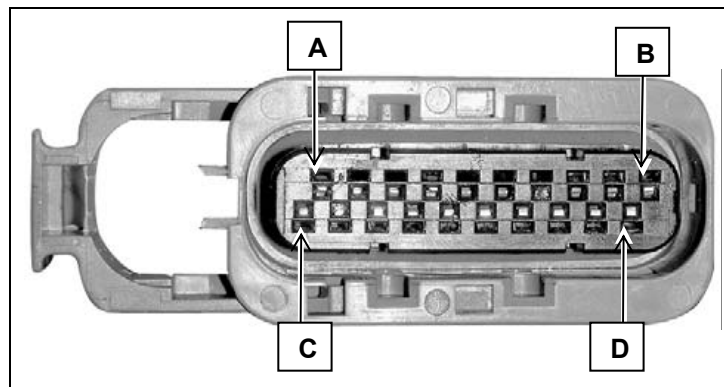
- P/N 529 035 868
- P/N 529 035 721
- P/N 529 035 417
- P/N 529 035 179

➔ You are about to perform the TAS Voltage Test. The DIAGNOSTIC HARNESS has been connected to the Vessel. Fill in the specifications and pin numbers for both the 12 pin and 8 pin connectors?

8-PIN CONNECTOR		IDLE POSITION	WIDE OPEN POSITION
PIN		VOLTAGE (Vdc)	
___	7	___ - ___	
7	___	___ - ___	___ - ___

12-PIN CONNECTOR		IDLE POSITION	WIDE OPEN POSITION
PIN		VOLTAGE (Vdc)	
___	11	4.9 -5.1	
11	___	0.4 - 0.6	2.9 - 3.1

➔ Fill in the correct terminal number for the following picture of the GAUGE CONNECTOR PIN-OUT ?



- A = ___
- B = ___
- C = ___
- D = ___



Refer to Section 04 Subsection 02 ELECTRONIC FUEL INJECTION (EFI) in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: [04 02 Electronic Fuel Injection \(EFI\) – System Description](#)

→ The electronic fuel injection system (EFI) on this engine is based on the open-loop Bosch ME-Motronic system.

- TRUE
- FALSE

→ Fill in the blanks to describe electronic fuel injection system.

- The _____ – _____ uses an electronically _____ _____ valve. There is no _____ control valve (_____). Also, this system introduces _____ functions.

→ From the Shop Manual BOOKMARKS Click on Hyper link to: [04 02 Electronic Fuel Injection \(EFI\) – Adjustment – Closed Throttle Reset](#)

→ Which statement is **INCORRECT** concerning the CLOSED THROTTLE RESET?

- The reset should be performed if the throttle body is replaced.
- The reset should be performed if the ECM is replaced.
- The reset just requires clicking on reset in BUDS with the ECM activated.
- If throttle valve was not within the allowed range while resetting the Closed Throttle, a fault code would be set when the engine is started.
- It is absolutely necessary to click on the Write button in B.U.D.S. after the throttle reset.
- All of these answers are INCORRECT.
- None of these answers are INCORRECT.

→ From the Shop Manual BOOKMARKS Click on Hyper link to: [04 02 Electronic Fuel Injection \(EFI\) – Procedures – Engine Control Module \(ECM\) – ECM Power supply troubleshooting](#)

→ Which of the following is a quick indication that ECM is not powered (assuming the observed component is working)?

- Information center does not turn on.
- Fuel pump does not turn on for approximately 5 seconds.
- Throttle actuator does not initialize.
- All of these answers are correct.

→ From the Shop Manual BOOKMARKS Click on Hyper link to: [04 02 Electronic Fuel Injection \(EFI\) – Procedures – Engine Control Module \(ECM\) – ECM Replacement](#)

→ When installing a new ECM, data must be entered and a reset is required. How many possible methods are to transfer/enter data to the new ECM?

- 1
- 2
- 3
- 4
- 5



➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 02 Electronic Fuel Injection (EFI) – Procedures – Throttle Body – Throttle Actuator Operating Positions

➔ Fill in the blanks concerning the different Throttle Actuator operating positions?

ECM	ENGINE	THROTTLE BODY
OFF	Stopped	Throttle actuator: Off. Throttle plate: _____ position, maintained opened at approximately _____° (1). This is also the _____ position.
ON	Not started	Throttle actuator: On. Throttle plate: Moves from the _____ position to approximately _____°. It then moves back to the _____ position. This is the _____ where the _____ position, actuator _____ to overcome the return springs and the motor _____ are monitored. If any of these parameter are out of range, a _____ is initiated.
ON	Started. Normal operation at idle	Throttle actuator: On. Throttle plate: Moves from the _____ position to _____ position (approximately _____ - _____°) according to ECM injection and ignition maps. Throttle plate is _____ and _____ as necessary to control the _____ speed.
ON	Started. Normal operation at various RPM	Throttle actuator: On. Throttle plate: _____ and _____ according to ECM torque management priorities.
(1) Degree values are given from the fully _____ position.		

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 02 Electronic Fuel Injection (EFI) – Procedures – Throttle Body – Throttle Body Inspection

➔ What happens to the throttle plate when observing it when the ECM is activated and the engine is not Started?

- It should quickly move from the rest position to a partially open position (approximately 14°). It will then move back to the rest position.
- It should slowly move from the rest position to the fully closed position (approximately 3°). It will then move back to the rest position.
- It should quickly move from the rest position to a partially open position (approximately 14°). It will then move to the fully closed position (approximately 3°) and then move back to the rest position.
- It should slowly move from the rest position to a fully closed position (approximately 3°). It will then move to the partially open position (approximately 14°) and then move back to the rest position.
- None of these answers are correct.



- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 02 Electronic Fuel Injection (EFI) – Procedures – TPS (Throttle Position Sensor) – TPS resistance test
- ➔ Click on the Shop Manual Hyper link to: TPS Resistance Test (Video clip)

➔ What is the correct order to check a fault code, according to the TPS resistance test video clip? (Place a number next to the statement in the correct order.

- ____ Perform the test according to the shop manual.
- ____ Check the code in B.U.D.S.
- ____ Check and understand the circuit in the schematic.
- ____ Check the shop manual testing procedure.

➔ During the TPS resistance check the throttle plate has to be pushed and held in the fully open position. Fill in the specifications on the chart for the fully open position.

ECM ADAPTER		FULLY CLOSED THROTTLE PLATE (1)		FULLY OPEN THROTTLE PLATE	
		RESISTANCE (Ω)			
PIN		MIN.	MAX.	MIN.	MAX.
A-A2	A-K4	875	1625	_____	_____
A-A2	A-K3	954	1934	_____	_____
A-A2	A-F3	254	634	_____	_____
A-K3	A-K4	228	585	_____	_____
A-K3	A-F3	1385	2315	_____	_____
A-K4	A-F3	980	1983	_____	_____

(1) To obtain the fully closed position, it is necessary to push against throttle plate in throttle body with your hand and hold it in this position for the measurement.

- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 02 Electronic Fuel Injection (EFI) – Procedures – Coolant Temperature Sensor – CTS resistance test

➔ What should be the resistance of the CTS (Coolant Temperature Sensor) @ 80°C (176°F)?

- Nominal = _____ Low = _____ High = _____

Refer to Section 04 Subsection 03 FUEL TANK AND FUEL PUMP in the shop manual and complete the following:

- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 03 Fuel Tank and Fuel Pump – Fuel system diagnosis flow chart

➔ What is the correct fuel pressure for a supercharged – intercooled model watercraft?

- _____ kPa (_____ PSI)



- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 03 Fuel Tank and Fuel Pump – Inspection – Fuel Tank Leak Test
- ➔ Click on the Shop Manual Hyper link to: Fuel Tank Leak Test (Video clip)

➔ Complete the following based on the shop manual and video clip.

- The fuel tank is pressurized to _____ kPa (_____ PSI) and must hold that pressure for _____ minutes.
- A _____ and a _____ valve can be installed to use _____ for quick pressure build-up when the fuel tank is not full.

- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 03 Fuel Tank and Fuel Pump – Inspection – Fuel Pump Pressure Test
- ➔ Click on the Shop Manual Hyper link to: Fuel Pump Pressure Test (Video clip)

➔ The moving deck must be removed to perform the fuel pressure test.

- TRUE
- FALSE

➔ The fuel pressure must be relieved with B.U.D.S. prior to performing the fuel pressure test. After starting B.U.D.S. What screen tabs are depressed to reach the fuel pressure relief function? [Hint—click on the FUEL PUMP hyperlink](#)

- Monitoring then ECM tabs
- Monitoring then Activation tab
- Activation then ECM tabs
- None of these are correct

- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 03 Fuel Tank and Fuel Pump – Procedures – Fuel Pump
- ➔ Click on the Shop Manual Hyper link to: Fuel Pump Removal (Video clip)

➔ The moving deck must be removed to replace the fuel pump.

- TRUE
- FALSE

- ➔ Click on the Shop Manual Hyper link to: Fuel Pump Installation (Video clip)

➔ What must be done before finally tightening the fuel pump retaining nut?

- Lubricate the nut with BRP synthetic grease.
- Lubricate the nut with BRP lube.
- Align the index mark and arrow.
- Position the fuel outlet line to the rear of the watercraft.

- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 04 03 Fuel Tank and Fuel Pump – Procedures – Fuel Tank
- ➔ Click on the Shop Manual Hyper link to: Fuel Tank Removal (Video clip)



→ Which component does **NOT** have to be removed in order to remove the fuel tank?

- Suspension base
- Fuel pump
- Engine
- Jet pump
- Resonator
- All of these have to be removed

Refer to Section 05 Subsection 01 CONTROLLER AREA NETWORK (CAN) in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 01 CONTROLLER AREA NETWORK \(CAN\)](#)
- Click on the Shop Manual Hyper link to: [SYSTEM DESCRIPTION \(PPS\)](#)

→ Complete the following from the CAN PPS.

- Consider the CAN wires as a _____ where the "modules" are continually "_____ " with each other "_____ ". So they can all stay updated on all the latest "_____ " and take action as necessary.

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 01 CONTROLLER AREA NETWORK \(CAN\) – Troubleshooting](#)

→ How many modules will be active in B.U.D.S. if CAN communication with the iBR MODULE is lost?

- 1
- 2
- 3
- 4
- 5

→ How many modules will be active in B.U.D.S. if CAN communication with the DEPTH SOUNDER is lost?

- 1
- 2
- 3
- 4
- 5

Refer to Section 05 Subsection 02 POWER DISTRIBUTION in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 02 Power Distribution – Power Distribution](#)
- Click on the Shop Manual Hyper link to: [POWER DISTRIBUTION \(PPS\)](#)

→ Complete the following from the CAN PPS (Power Point Show) and the wiring diagram.

Note: It is highly recommended to print the electrical wiring diagram and while viewing the show, trace the individual circuits as they play with a RED, GREEN, VIOLET or LIGHT BLUE marker as indicated.

→ The BUS bar in fuse box one (FB1) has constant battery power at all times?

- TRUE
- FALSE



- What terminal of the ECM does power enter when the start stop switch is pushed?
- B-H2
 - B-D1
 - A-K4
 - A-D4
 - None of these terminals
- The ECM activates the main relay by sending a ground to Fuse Box 2 (FB2). What terminal does the ground enter fuse box 2 to activate the main relay?
- B10
 - D2
 - C5
 - E4
 - A12
 - None of these terminals
- What is the amperage and what is the fuse number of the fuse that protects the iBR main power?
- Fuse number _____ Rated @ _____ Amperes
- What component COULD STILL be activated if the bottom BUS bar in Fuse box 1 (FB1) (in the schematic) was missing?
- ECM
 - Gauge
 - iBR module
 - iS module
 - None of these could still be activated
 - All of these could still be activated
- What does 5 amp fuse number 11 in Fuse box 1 (FB1) protect?
- ECM activation
 - Gauge activation
 - iBR module activation
 - iS module activation

Refer to Section 05 Subsection 03 IGNITION SYSTEM in the shop manual and complete the following:

→ [From the Shop Manual BOOKMARKS Click on Hyper link to: 05 03 Ignition System – Procedures – Ignition Coils](#)

- What should be done prior to installing the ignition coils into the engine?
- Perform the ignition coil electrical stress test.
 - Apply LOCTITE 5150 to the spark plug contact area.
 - Apply DOW CORNING 111 under and on the seal contact area.
 - All of these answers are correct.



Refer to Section 05 Subsection 04 CHARGING SYSTEM in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 04 Charging System – Procedures – Battery](#)
- Click on the Shop Manual Hyper link to: [Battery Removal \(Video clip\)](#)

→ When installing the Battery Vent and Check Valve, ensure to position the check valve with black side connected to the vent line and the ORANGE side inserted into the grommet protruding through the hull.

- TRUE
- FALSE

Refer to Section 05 Subsection 06 DIGITALLY ENCODED SECURITY SYSTEM (D.E.S.S.) in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 06 DIGITALLY ENCODED SECURITY SYSTEM \(D.E.S.S.\) – Procedures – Setting Maximum Speed for Learning and Rental Keys](#)

→ What would the maximum watercraft speed be in key setting number 3, when setting a learning key maximum Speed?

- _____ km/h (_____ MPH)

Refer to Section 05 Subsection 07 GAUGE in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 07 Gauge - Troubleshooting](#)

→ Complete the following based on the shop manual?

- IMPORTANT: When B.U.D.S. is being used, the _____ will stop _____ with B.U.D.S. approximately _____ minutes after the _____ button was pressed. Therefore, operations with B.U.D.S. will be _____. To _____ the _____, briefly press the _____ button. Do not hold the _____ button to avoid engine starting.

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 07 Gauge – Procedures – Information center overview](#)

→ Complete the following based on the shop manual Information Center Overview?

- The gauge itself is an _____. Both the _____ and _____ handlebar _____ send _____ signals to the gauge. The gauge _____ the signals from the switches and _____ the signals into the appropriate _____ (_____). The _____ information is then sent out of the gauge through the _____ bus to the appropriate _____ so that it can _____ the specific _____.

- From the Shop Manual BOOKMARKS Click on Hyper link to: [05 07 Gauge – Procedures – Gauge description](#)

→ What does it indicate if the small indicator light on the gauge that looks like a small wrench illuminates?

- Limp Home Mode
- Fault Code
- Maintenance reminder
- All of these answers are correct.



➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 05 07 Gauge – Procedures – Setting language and units of measurement

➔ How is the Language and Units of Measurement set?

- With B.U.D.S
- By clicking on the MODE, SET and GAUGE UP/DOWN BUTTONS in the proper sequence.
- Both of these answers are correct.

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 05 07 Gauge – Procedures – Information Center Input Voltage Test (at Gauge Connector)

➔ Fill in the specifications as indicated.

INPUT VOLTAGE TEST AT GAUGE CONNECTOR		
PROBE		VOLTAGE
Pin__ (____)	Pin __ (____)	_____
Pin __ (____)	Battery ground	

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 05 07 Gauge – Procedures – Information Center Removal

➔ Click on the Shop Manual Hyper link to: Information Center Removal (Video clip)

➔ Click on the Shop Manual Hyper link to: Information Center Installation (Video clip)

➔ To remove the gauge cover, pry the cover with a screwdriver from the back of the cover.

- TRUE
- FALSE

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 05 07 Gauge – Procedures – Information Center Replacement

➔ Complete the following based on shop manual information.

- NOTICE** Before replacing the information center, it is very important to _____ the "approximate time left to Supercharger _____" in B.U.D.S. (on the _____ page), and to advise the _____ when the watercraft needs to be brought in for _____. The new information center will start counting the "supercharger time to _____ due hours" from zero as the hours are calculated and stored in the _____ (old _____), not in the _____. The SUPERCHARGER _____ REQUIRED indicators will then come on past the real _____ due hours. Indicated engine hours in new _____ will be correct as they are calculated in the _____.

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 05 07 Gauge – Procedures – Mode/Set and Up/Down Arrow Buttons

➔ Click on the Shop Manual Hyper link to: Mode/Set and Up/Down Arrow Buttons (PPS)

➔ How many diodes are in series on one side of the diode switch?

- 2
- 3
- 4
- 5
- 6



→ How much voltage does each diode "consume" when tested?

_____ Volts DC

→ How many diodes are BY PASSED when the UP button is pushed and what is the voltage reading on the multi-meter?

_____ Diodes _____ Volts DC

→ How many diodes are BY PASSED when the DOWN button is pushed and what is the voltage reading on the multi-meter?

_____ Diodes _____ Volts DC

→ Fill in the specifications as indicated.

MODE/SET SWITCH TEST			
SWITCH POSITION	FLUKE 115	GAUGE CONNECTOR	VOLTAGE
Switch released	Red lead Black lead	Pin 17 Pin 18	Approx. ____Vdc
	Black lead Red lead	Pin 17 Pin 18	OL
MODE depressed	Red lead Black lead	Pin 17 Pin 18	Approx. ____Vdc
	Black lead Red lead	Pin 17 Pin 18	OL
SET depressed	Black lead Red lead	Pin 17 Pin 18	Approx. ____Vdc
	Black lead Red lead	Pin 17 Pin 18	OL

UP/DOWN ARROW SWITCH TEST			
SWITCH POSITION	FLUKE 115	GAUGE CONNECTOR	VOLTAGE
Switch released	Red lead Black lead	Pin ____ Pin 18	Approx. ____Vdc
	Black lead Red lead	Pin ____ Pin 18	OL
UP depressed	Red lead Black lead	Pin ____ Pin 18	Approx. ____ Vdc
	Black lead Red lead	Pin ____ Pin 18	OL
DOWN depressed	Red lead Black lead	Pin ____ Pin 18	Approx. ____Vdc
	Black lead Red lead	Pin ____ Pin 18	OL



- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 05 07 Gauge – Procedures – Depth Sounder
- ➔ Click on the Shop Manual Hyper link to: Depth Sounder Removal (Video clip)

➔ Where is the Depth sounder located?

- Next to the iBR motor
- Under the supercharger housing
- Under the battery
- Next to the iS hydraulic pump

➔ What could be the problem if -----(ft or m) is displayed on the gauge?

- The watercraft is not in the water
- There is air between gel pad and depth sounder
- The Depth sounder is defective
- All of these could be the problem
- None of these could be the problem

Refer to Section 06 Subsection 01 STEERING AND O.T.A.S. in the shop manual and complete the following:

- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 06 01 Steering and O.T.A.S – System Description (O.T.A.S.)

➔ The O.T.A.S. (Off-Throttle Assisted Steering) provides additional maneuverability in off-throttle situations Which of the following must be achieved in order for the O.T.A.S. system to be activated?

- The engine speed must be above 4000 RPM for at least 1.5 second (approximately).
- The throttle lever must be released completely.
- The steering must be fully turned within approximately 4 seconds after throttle release.
- All of these must be achieved in order for O.T.A.S. to be activated

- ➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 06 01 Steering and O.T.A.S – Procedures – Steering Cover

- ➔ Click on the Shop Manual Hyper link to: Steering Cover Removal (Video clip)
- ➔ Click on the Shop Manual Hyper link to: Steering Cover Installation (Video clip)

➔ When removing the steering cover, how many tabs have to be released at the rear or base of the steering cover?

- 2
- 3
- 4
- 5

➔ To install the steering cover the foam pad and steering cover are installed as an assembly.

- TRUE
- FALSE



➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 06 01 Steering and O.T.A.S – Procedures – O.T.A.S switch

➔ To replace the O.T.A.S switch the steering column support has to be removed.

- TRUE
- FALSE

Refer to Section 06 Subsection 02 iBR and VTS in the shop manual and complete the following:

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 06 02 iBR and VTS – System Description (iBR)

➔ Complete the following based on shop manual information.

- The iBR gate will move when commanded by the iBR lever only if the _____ is _____. For maintenance purposes, the _____ _____ function available through the _____ can be used to electrically move the _____ to the desired position.

➔ To permit easy access to the jet pump, nozzle, iBR gate, and various linkages for inspection, maintenance, cleaning or removal of debris, the iBR system provides for an iBR override function which, is accessible through the information center. When iBR override is activated, it allows the user to electrically move the iBR gate and nozzle through its full range of motion using the VTS control button.

The iBR override is activated by pressing the MODE, SET, UP/DOWN and VTS buttons in the proper sequence.

- TRUE
- FALSE

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 06 02 iBR and VTS – Procedures – iBR LEVER SENSOR (BRLS)

➔ The iBR lever sensor (BRLS) is tested after installing the DIAGNOSTIC HARNESS in the 6 and 12 pin connectors in the steering harness. Fill in the specifications as indicated.

6-PIN CONNECTOR OF DIAGNOSTIC HARNESS		iBR LEVER RELEASED	iBR LEVER PULLED IN
PIN		VOLTAGE (Vdc)	
4	___	___ - 5.1	
5	___	___ - ___	1.4 -1.6

12-PIN CONNECTOR OF DIAGNOSTIC HARNESS		iBR LEVER RELEASED	iBR LEVER PULLED IN
PIN		VOLTAGE (Vdc)	
___	4	4.9 - ___	
___	4	0.4 -0.6	___ - ___

➔ From the Shop Manual BOOKMARKS Click on Hyper link to: 06 02 iBR and VTS – iBR Actuator

➔ Click on the Shop Manual Hyper link to: iBR Actuator Installation (Video clip)

➔ The iBR spacer washer is installed on the iBR shaft immediately after it is slipped into position.

- TRUE
- FALSE



→ What is the maximum amount of amperage allowed while using B.U.D.S. to observe iBR motor current draw?

- + 10 AMP
- + 15 AMP
- + 20 AMP
- + 25 AMP
- + 30 AMP

Refer to Section 06 Subsection 03 JET PUMP in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: 06 03 JET PUMP – Procedures – Jet pump Housing
- Click on the Shop Manual Hyper link to: Jet Pump Housing Removal (Video clip)
- Click on the Shop Manual Hyper link to: Jet Pump Housing Installation (Video clip)

→ How long do you have to wait after activating the iBR override function before beginning to work in the iBR gate area?

- 2 minutes
- 3 minutes
- 4 minutes
- 5 minutes

→ What is used to lubricate the Drive shaft spines before installation of the jet pump?

- XPS synthetic grease
- BRP lube
- Engine oil
- None of these answers

Refer to Section 06 Subsection 04 DRIVE SHAFT in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: 06 03 DRIVE SHAFT – Procedures – Drive Shaft
- Click on the Shop Manual Hyper link to: Drive Shaft Removal (Video clip)
- Click on the Shop Manual Hyper link to: Drive Shaft Removal (Video clip)

→ In which direction is the driveshaft turned in order to disengage it from the floating ring?

- Clockwise
- Counterclockwise

→ How many complete turns are required to disengage the driveshaft from the floating ring?

- 4
- 6
- 8
- 10

→ During driveshaft removal and installation the spark plugs are removed so the crankshaft can be turned over.

- TRUE
- FALSE



Refer to Section 07 Subsection 01 SUSPENSION (iS) in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 01 Suspension (is) – General

→ Complete the following based on shop manual information.

- An _____ is mounted underneath _____ to control the _____ and therefore the suspension height.
- The iS module controls the _____ motor of the _____ to adjust the _____ height. It also sets the _____ height according to the active mode of operation and input signals.

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 01 Suspension (is) – Procedures - Springs

→ Click on the Shop Manual Hyper link to: Spring removal (Video clip)

→ The spring should not be replaced if rust is present on the first ¼ of the coil.

- TRUE
- FALSE

→ What is the maximum the curve can be when checking the shape of the long spring?

- ____ mm (____ in)

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 01 Suspension (is) – Procedures – Suspension Position Sensor

→ You are checking the suspension position sensor voltage with the 6 pin magneto harness adapter attached to the iS module. You are connected to the WH an BK/YL wires. What is the approximate reading obtained if the suspension is at 75 % in B.U.D.S.?

- _____ Vdc

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 01 Suspension (is) – Procedures – iS module

→ Complete the following based on shop manual information.

- The iS module communicates via _____ with the _____. The iS module receives information from the _____ and a comparison is made with the input from the _____. If the suspension is not in the proper position, the iS module will then _____ an _____ signal to the hydraulic pump to either raise or lower the suspension to pre-programmed positions.

→ The iS Button is a momentary contact switch and tested with an ohmmeter.

- TRUE
- FALSE



→ What is the maximum amount of amperage allowed while using B.U.D.S. to observe iS hydraulic pump motor current draw?

- + 10 AMP
- + 15 AMP
- + 20 AMP
- + 25 AMP
- + 30 AMP

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 01 Suspension (is) – Procedures – Lateral Support

→ Click on the Shop Manual Hyper link to: Lateral Support (Video clip)

→ The video clip shows how easily the lateral support is inserted through the bellows after it is lubricated.

- TRUE
- FALSE

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 01 Suspension (is) – Procedures – Suspension Base

→ Click on the Shop Manual Hyper link to: Suspension Base Removal (Video clip)

→ Where is the hidden HIN number located in the vessel.

- _____

Refer to Section 07 Subsection 02 BODY in the shop manual and complete the following:

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 02 BODY – Procedures – Boarding Platform

→ Click on the Shop Manual Hyper link to: Boarding Platform Removal (Video clip)

→ The port storage bucket must be removed to remove the Boarding Platform

- TRUE
- False

→ From the Shop Manual BOOKMARKS Click on Hyper link to: 07 02 BODY – Procedures – Moving Deck

→ Click on the Shop Manual Hyper link to: Moving Deck Removal for Servicing Watercraft (Video clip)

→ Click on the Shop Manual Hyper link to: Moving Deck Installation (Video clip)

→ What must be done prior to removing the moving deck?

- Mark the position of the center suspension
- Mark the position of the lateral arm supports
- Mark the position of the boarding platform
- Mark the position of the rear suspension arm brackets
- All of these must be done



→ Number in order the steps for installing the moving deck.

- ____ Install the rear suspension arm bolts
- ____ Raise the seat
- ____ Install the alignment pins into the top suspension plate
- ____ Install the lateral arm bolts
- ____ Install the top suspension plate bolts

Refer to Section 07 Subsection 03 HULL in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: 07 03 HULL
- Click on the Shop Manual Hyper link to: HULL

→ List the three words that the 3 in S³ hull stands for.

- _____
- _____
- _____

→ The S³ has a step in the Hull after the intake to reduce drag.

- TRUE
- FALSE

Refer to Section 09 Subsection 02 CONNECTOR INFORMATION in the shop manual and complete the following:

- From the Shop Manual BOOKMARKS Click on Hyper link to: 09 02 CONNECTOR INFORMATION – Procedures – ECM connector (Molex)
- Click on the Shop Manual Hyper link to: ECM Connector (Molex)

→ What is the part number for the 2.25 ECM TERMINAL REMOVER.

- 529 036 ____

→ <https://www.bossweb.brp.com>

→ Go to BRPTI and take the online test.

- GOOD LUCK ON THE TEST**