

# REMOVAL AND INSTALLATION

## GENERAL

Engine removal is necessary to repair BOTTOM END.

## ENGINE REMOVAL

Use the VCK (Vehicle Communication Kit) (P/N 529 035 981) and release the fuel pressure in the fuel system. Refer to ENGINE MANAGEMENT section.

In order to remove engine from watercraft proceed as follows.

First, disconnect battery cables from battery.

### **⚠ WARNING**

Always disconnect battery cables exactly in the specified order, **BLACK** negative cable first then the **RED** positive battery cable last.

## Electrical Connections

It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

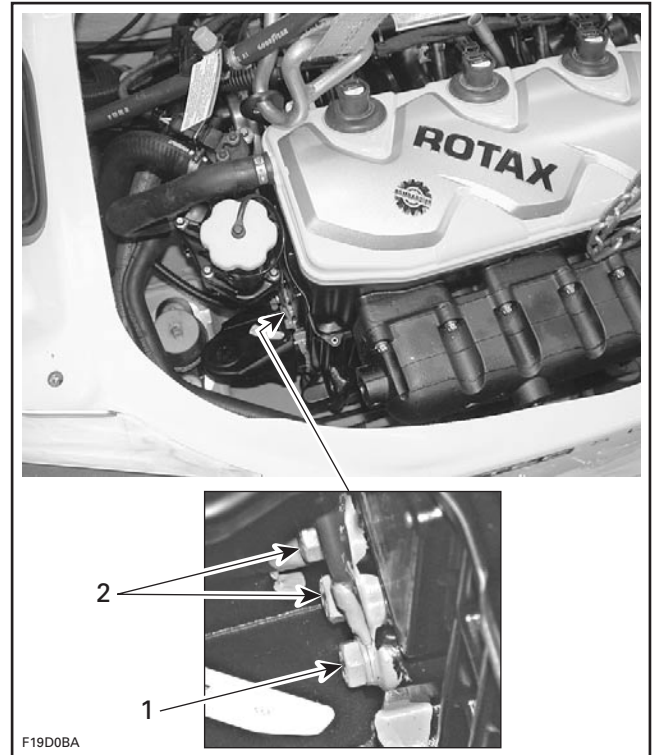
Disconnect magneto wiring harness.

Disconnect ground battery cable from engine.

### **RXP 4-TEC Models**

Disconnect ground wires from engine.

### **All Models**



1. Battery ground
2. Engine grounds

### **GTX 4-TEC Series**

Disconnect the throttle position sensor (TPS), manifold air pressure sensor (MAPS) and manifold air temperature sensor (MATS) (refer to INTAKE section).

Refer to ENGINE MANAGEMENT for location of sensors and connectors.

### **RXP 4-TEC Models**

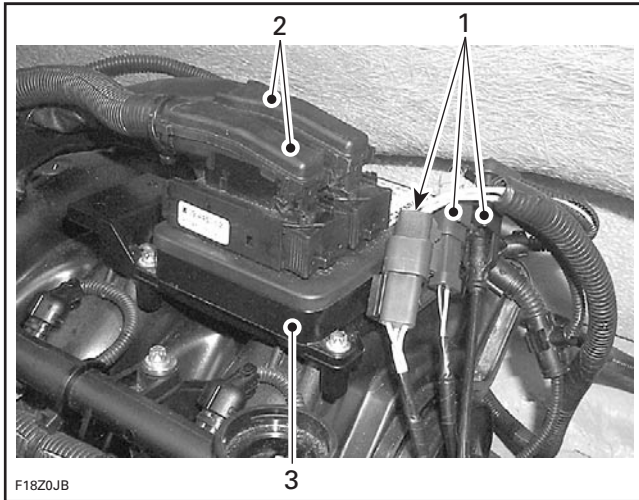
Remove engine cover. Refer to HULL AND BODY.

Remove connectors from engine connector bracket then disconnect. Refer to WIRING DIAGRAMS.

Disconnect ECM and remove from engine to prevent any possible damage while pulling engine out.

## Section 05 ENGINE (4-TEC)

### Subsection 04 (REMOVAL AND INSTALLATION)



1. Remove connectors
2. Disconnect ECM
3. Remove ECM

Unplug VTS connector.

Cut locking ties retaining vehicle wiring harness to engine.



#### VEHICLE WIRING HARNESS

1. Cut locking tie

Move wiring harness forward to make room.

#### All Models

### Exhaust Pipe

To remove exhaust pipe, refer to EXHAUST SYSTEM in ENGINE section.

### O.P.A.S.

To disconnect O.P.A.S., refer to STEERING section.

### Jet Pump Removal

To withdraw jet pump, refer to PROPULSION section.

### Drive System

To withdraw drive shaft, refer to PROPULSION section.

### Cooling System

Drain cooling system, refer to COOLING SYSTEM section.

To remove cooling system hoses, refer to COOLING SYSTEM section.

Disconnect hoses at engine coming from ride plate and coolant expansion tank.

#### GTX 4-TEC Series

### Intake Manifold

To remove intake manifold, refer to INTAKE section.

On Supercharged models, remove inlet tube from supercharger and air duct.

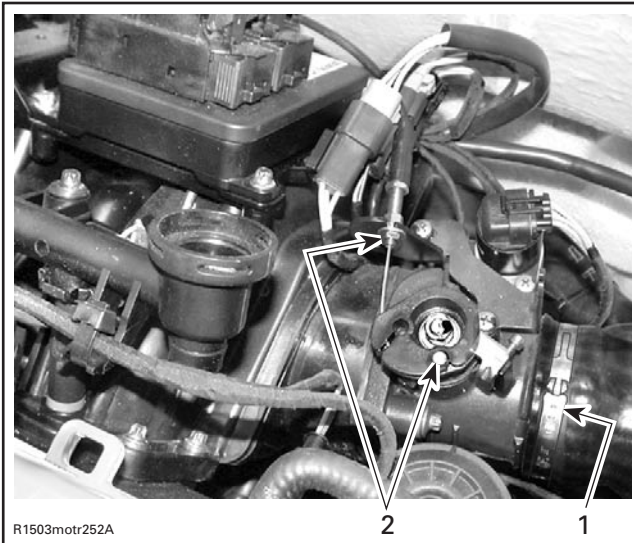
#### RXP 4-TEC Models

### Throttle Cable

Remove inlet hose from throttle body.

Disconnect throttle cable from throttle body.

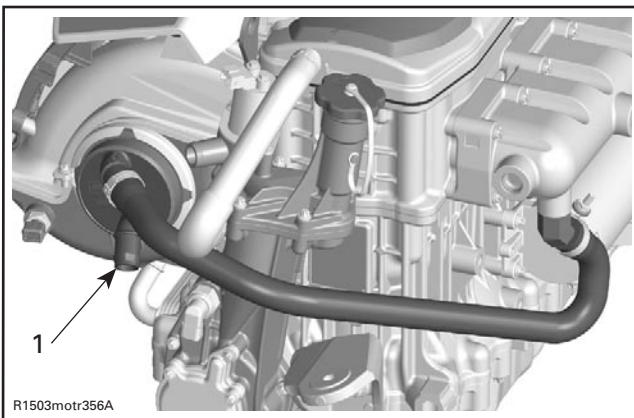
**Section 05 ENGINE (4-TEC)**  
Subsection 04 (REMOVAL AND INSTALLATION)



1. Detach hose
2. Disconnect cable

Disconnect fuel rail supply line.

Disconnect water inlet hose coming from jet pump connected to the intercooler.



1. Disconnect hose here

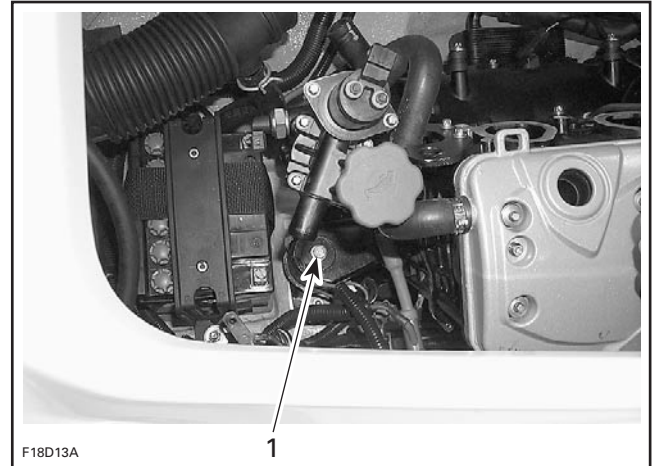
Disconnect TOPS valve hose.

**All 4-TEC Models**

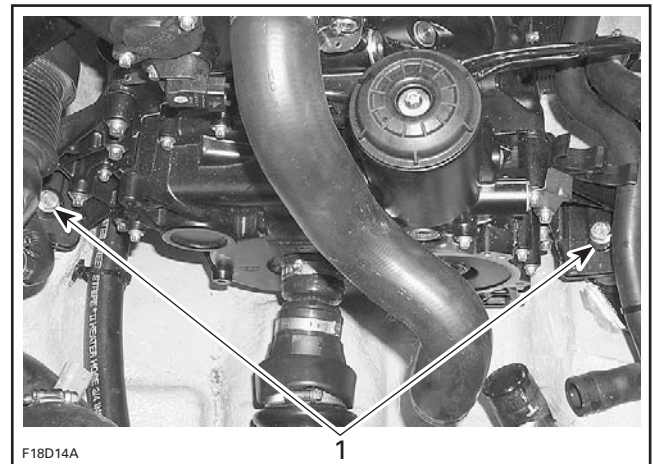
**Engine Support**

**NOTE:** Be careful when removing engine support(s) or rubber mount adapters, shims could have been installed underneath. Shims control engine/jet pump alignment. Always note position of shims for reinstallation, to avoid altering engine alignment.

Remove engine support mount screws.



- FRONT SUPPORT**
1. Remove screw



- REAR SUPPORT**
1. Remove screws

**Lifting Engine**

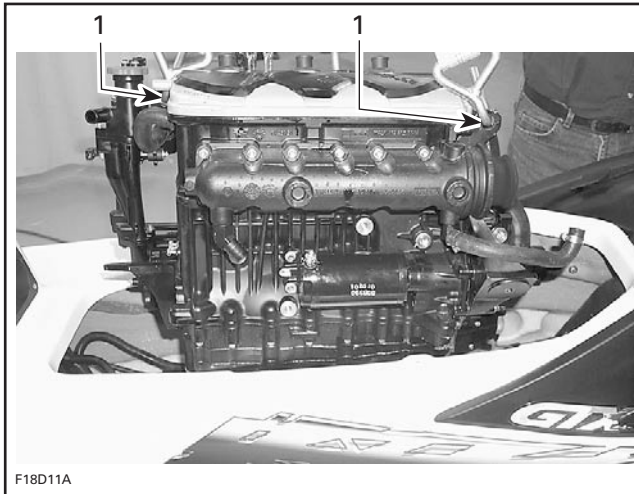
Using a chain block, a hoist or other suitable equipment, slightly lift engine to ease the remaining component removal.

**CAUTION:** Take care not to damage cables.



## Section 05 ENGINE (4-TEC)

### Subsection 04 (REMOVAL AND INSTALLATION)

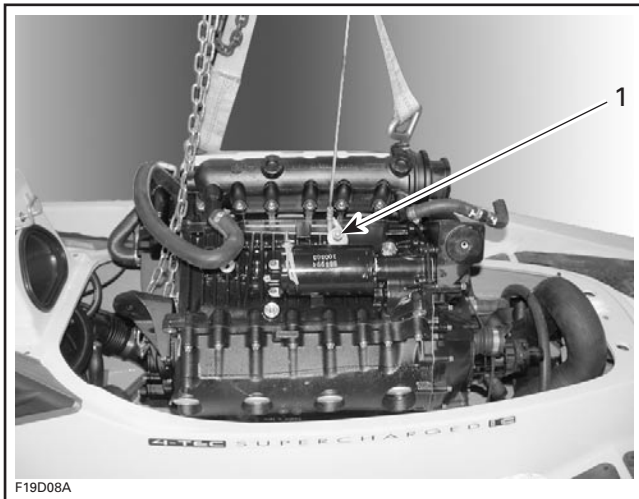


**TYPICAL**  
1. Lifting brackets

#### RXP 4-TEC Models

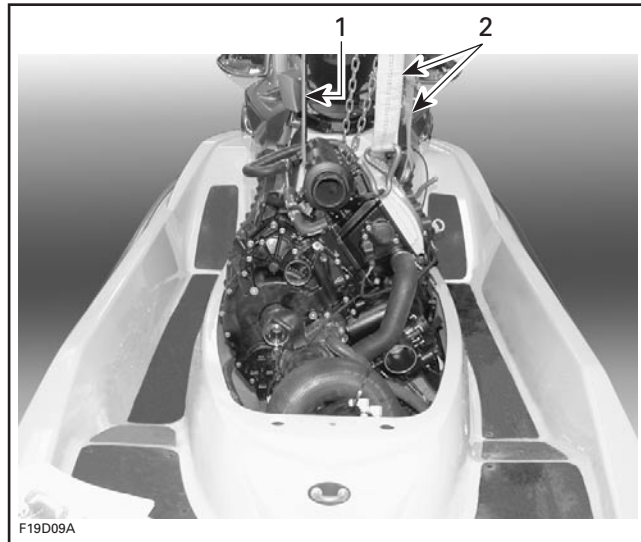
Slightly move engine rearward to take advantage of the larger opening.

The engine have to be hooked-up at an additional location. See illustration.



1. Hook-up a steel rope/chain here

Carefully lift engine by the side with the steel rope/chain and rotate engine so that it can be pulled out of vehicle.

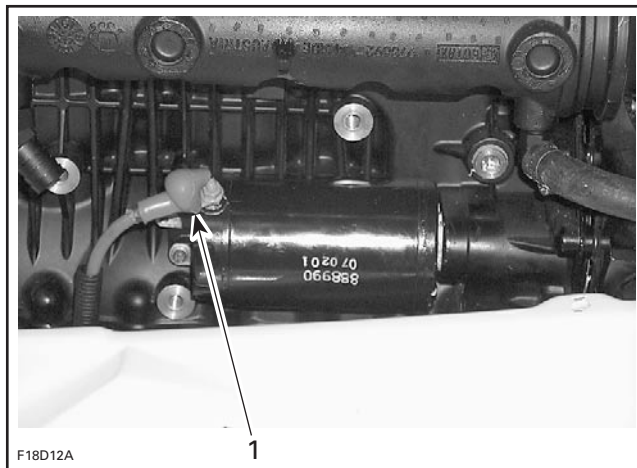


1. Lift steel rope/chain here to rotate engine  
2. Usual lifting brackets

#### All Models

#### Removal of Remaining Components

Disconnect RED positive cable from starter post.



**TYPICAL**  
1. Disconnect RED positive cable

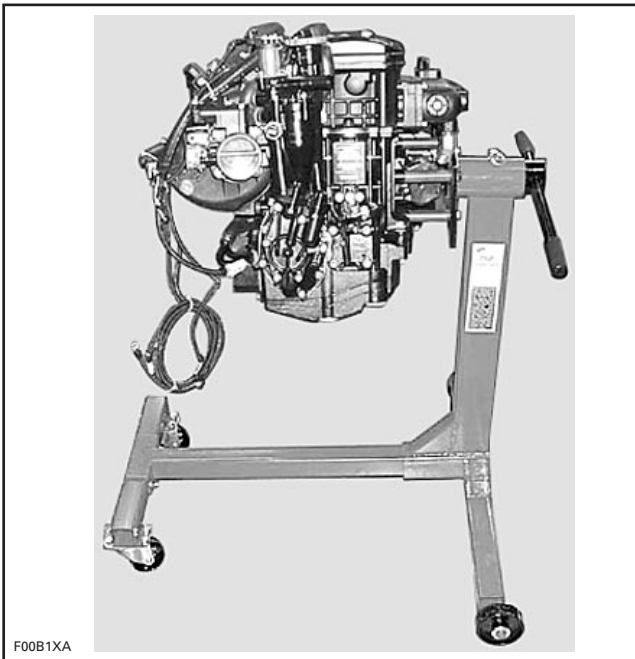
Carry on engine lifting to remove from the body opening.

**CAUTION:** Be careful not to scratch body or to hit any component.

**NOTE:** An engine stand may be used to hold engine.

## Section 05 ENGINE (4-TEC)

### Subsection 04 (REMOVAL AND INSTALLATION)



## CLEANING

Wipe off any spillage in bilge. Clean with the pulley flange cleaner (P/N 413 711 809).

Clean external parts of engine.

## INSTALLATION

**CAUTION:** Whenever removing engine from watercraft, engine/jet pump alignment must be performed at reinstallation.

Installation of engine in watercraft is essentially the reverse of removal procedures. However pay particular attention to the following.

### Rubber Mount, Shim and Screw

Check tightness and condition of rubber mounts. If they have been removed, apply Loctite 243 (blue) on screw threads. Torque screws to 25 N•m (18 lbf•ft).

**CAUTION:** Strict adherence to this torque is important to avoid damaging threads of aluminum insert in bilge.

### Positive Starter Cable and Grounds

Connect starter cable before lowering engine.

Torque nut of positive starter cable to 7 N•m (62 lbf•in). Apply dielectric grease on nut.

Ensure contact surface is perfectly clean then re-connect grounds wires/cable to engine.

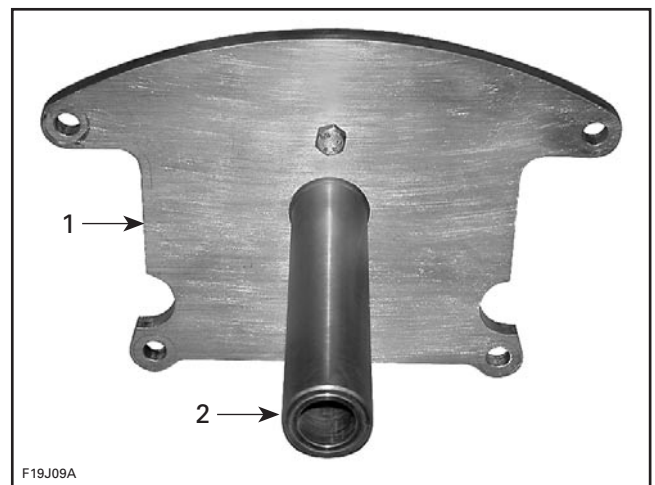
### Engine Support

Do not apply threadlocker to engine support screws and do not torque yet.

### Engine/Jet Pump Alignment

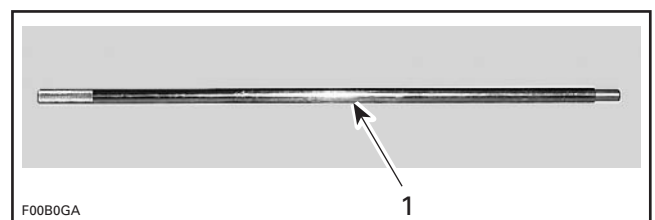
Alignment is necessary to eliminate possible vibration and/or damage to components. Check alignment of engine using the following alignment tools.

Support plate kit (P/N 529 035 506) and plate (P/N 529 035 507).



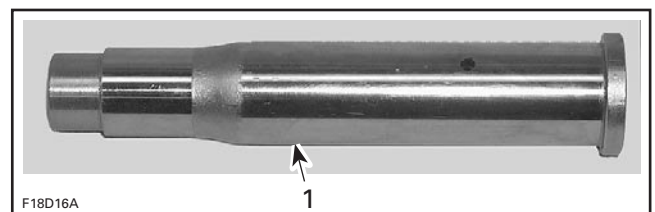
1. Plate
2. Support

Alignment shaft (P/N 295 000 141).



1. Alignment shaft

Engine alignment adapter (P/N 529 035 719).



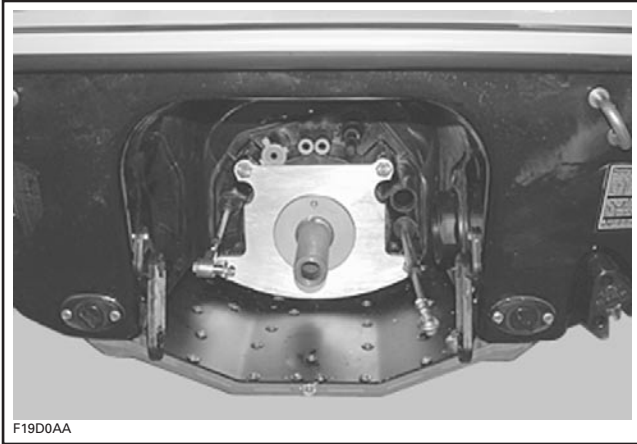
1. Engine alignment adapter

## Section 05 ENGINE (4-TEC)

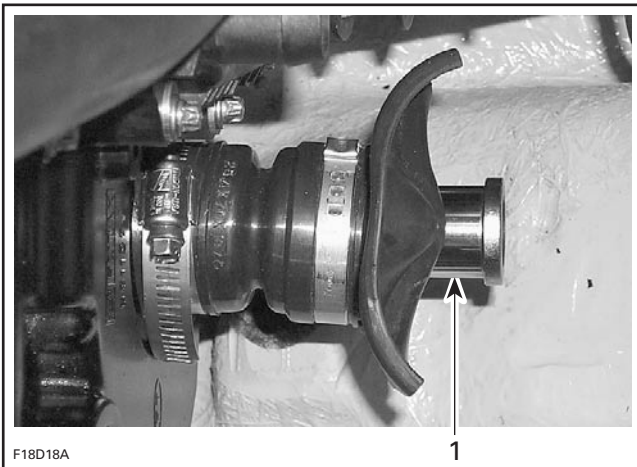
### Subsection 04 (REMOVAL AND INSTALLATION)

To verify alignment proceed as follows:

- Secure plate and support to hull with four nuts.



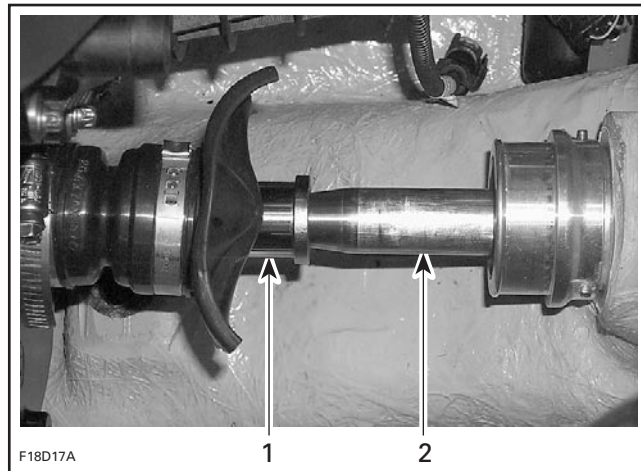
- Install adapter (P/N 529 035 719) in engine PTO housing.



1. Engine alignment adapter

- Carefully slide shaft through support.
- Insert shaft end into engine alignment adapter.

**NOTE:** Ensure the protective hose and carbon ring (or seal carrier) is removed to check engine alignment. If the alignment is correct, the shaft will slide easily without any deflection in engine alignment adapter.

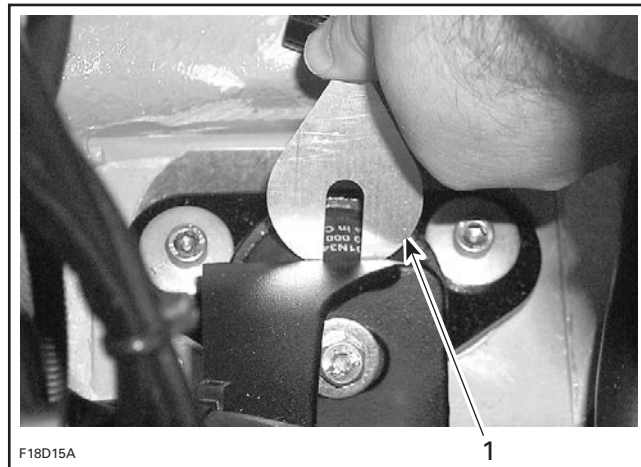


**TYPICAL**

1. Engine alignment adapter
2. Alignment shaft

If the alignment is incorrect loosen engine support screws to enable to align engine alignment adapter with shaft end.

**NOTE:** Use shim(s) (P/N 270 000 024) or (P/N 270 000 025) as necessary between engine supports and rubber mounts to correct alignment.



**TYPICAL**

1. Shim

**CAUTION:** Whenever shims are used to correct alignment, never install more than 5 mm (0.196 in) shim thickness.

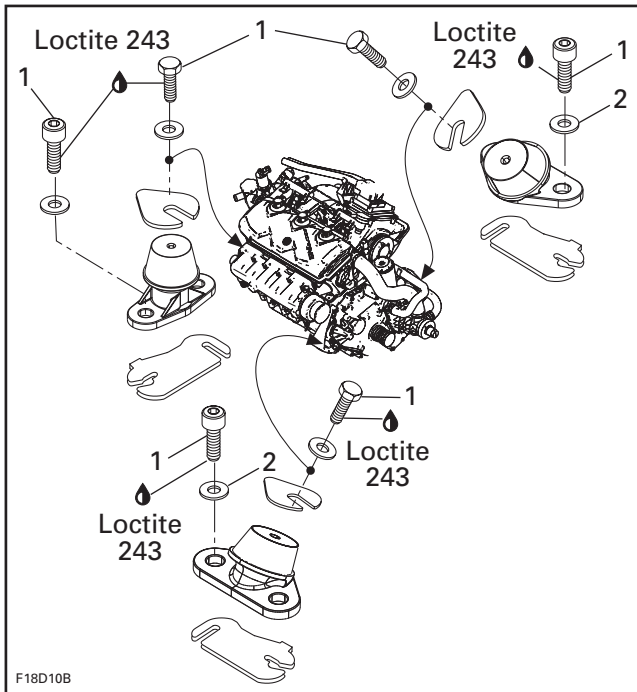
### Engine Support Screws

Apply Loctite 243 (blue) (P/N 293 800 060) on screw threads.

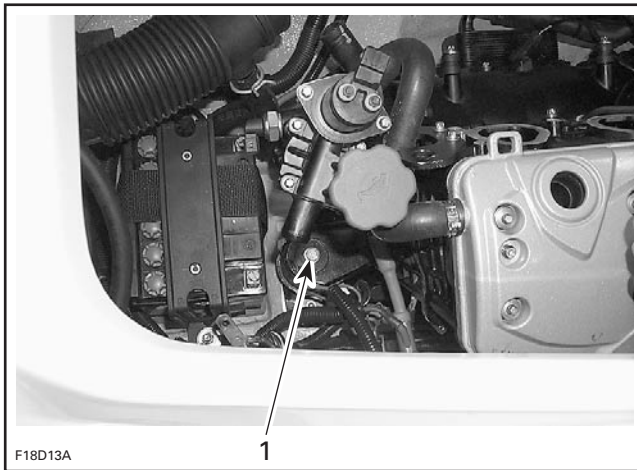
Torque engine support screws to 25 N•m (18 lbf•ft) when procedure is completed.



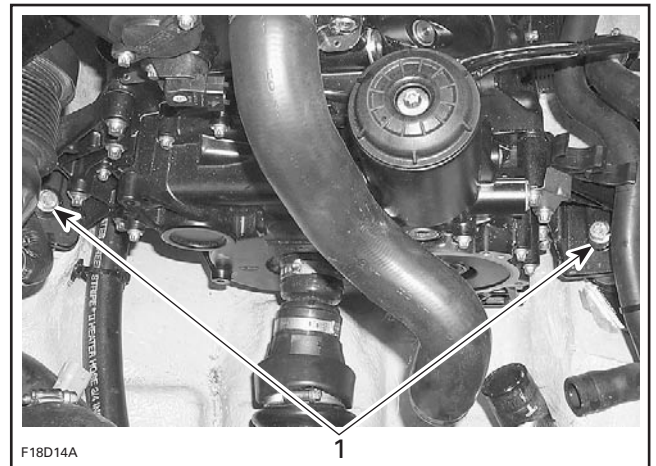
**Section 05 ENGINE (4-TEC)**  
Subsection 04 (REMOVAL AND INSTALLATION)



1. Torque to 25 N•m (18 lbf•ft)
2. Position washer to have the "T" mark on top



1. Torque to 25 N•m (18 lbf•ft)



1. Torque to 25 N•m (18 lbf•ft)

Properly align exhaust pipe. Refer to EXHAUST SYSTEM in ENGINE section.

### Final Inspection

Check throttle cable condition and lubricate it with BOMBARDIER LUBE lubricant.

After its installation, properly adjust throttle cable then perform the TPS reset as specified in ENGINE MANAGEMENT.

Check hose condition and pressure test fuel system, refer to FUEL SYSTEM section.

**⚠ WARNING**

Whenever doing any type of repair on watercraft or if any components of the fuel system are disconnected, a pressure test must be done before starting engine.

Verify all electrical connections.

Run engine and ensure there is no leakage.

**CAUTION:** If watercraft is out of water, engine must be cooled using the flush kit.