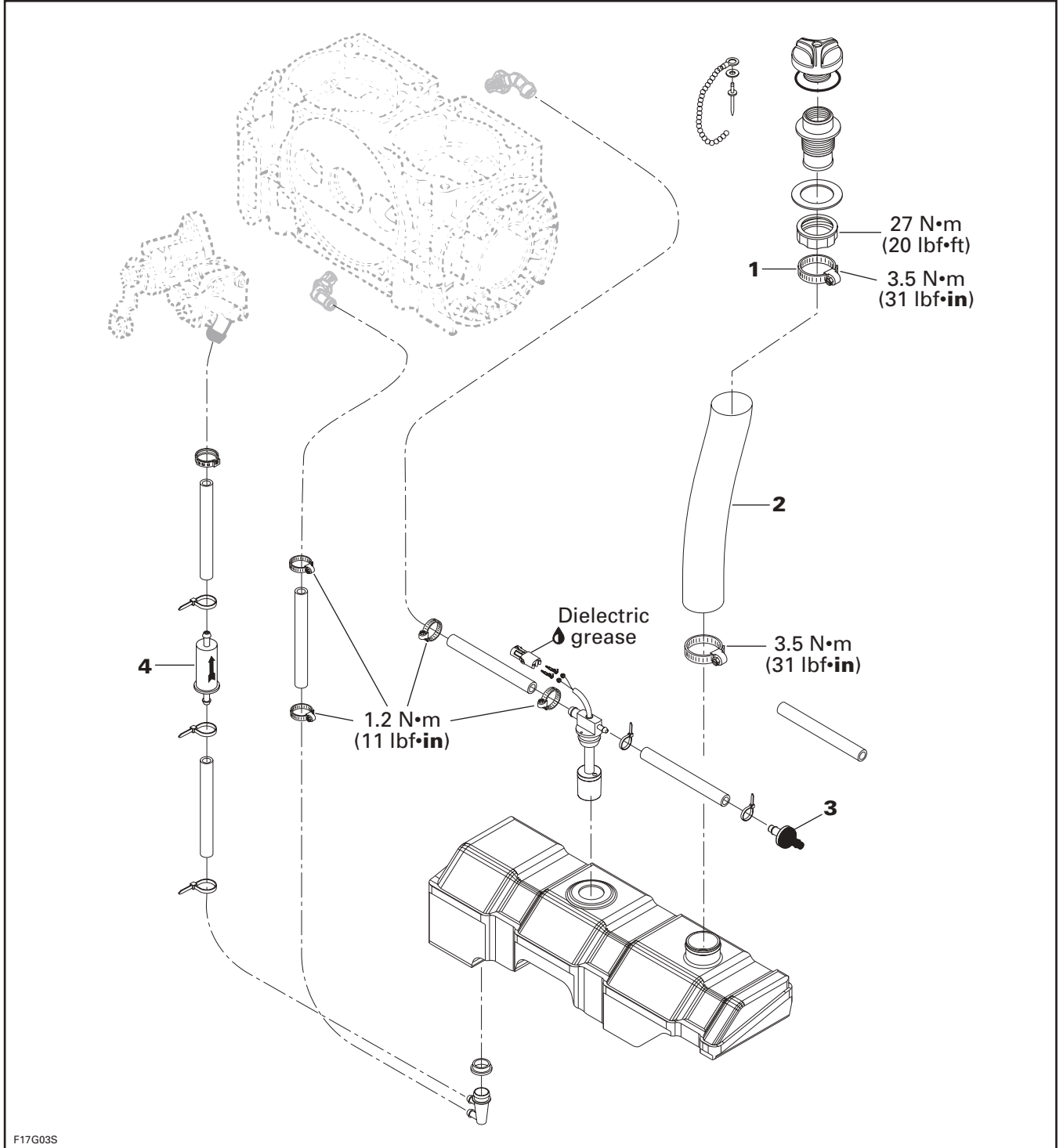


OIL INJECTION SYSTEM

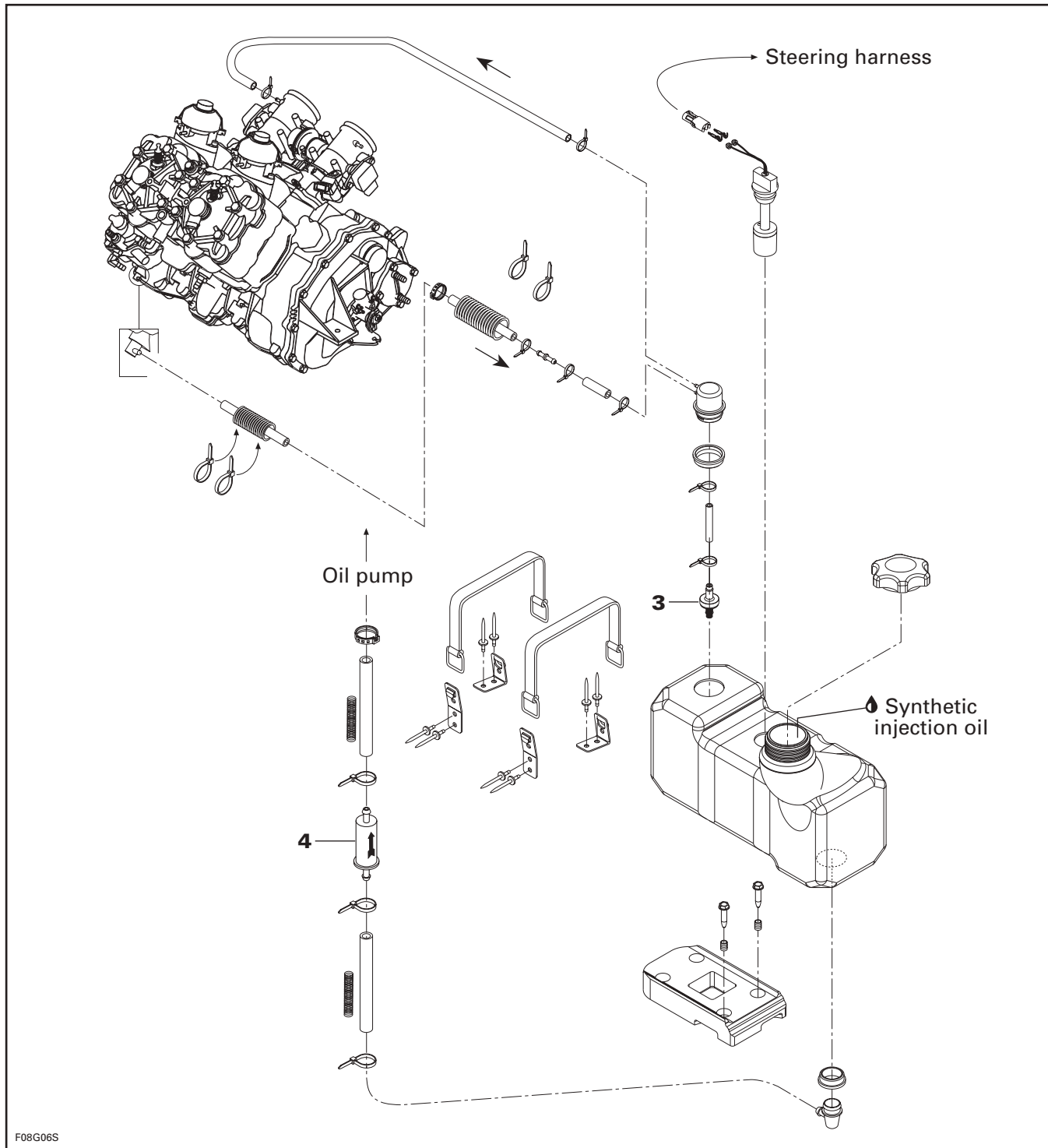
GTI Models



Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 01 (OIL INJECTION SYSTEM)

XP DI Models



F08G06S

GENERAL

Whenever repairing the oil injection system, always verify for water infiltration in reservoir.

Also pressure test the oil injection system.

GTI Models

Clamp and Hose

Verify oil filler neck hose **no. 2** for damage. Always ensure that clamps **no. 1** are well positioned and tightened. Torque clamps to 3.5 N•m (31 lbf•in).

All Models

Check Valve

Black side of the one-way check valve **no. 3** is the valve outlet. It allows air to get in reservoir and prevent oil to flow out.

NOTE: For proper check valve installation, refer to appropriate exploded view given at the beginning of the section.

Oil Filter

Oil filter **no. 4** should be replaced annually.

OIL SYSTEM PRESSURIZATION

WARNING

Whenever oil system components are disconnected or replaced, a pressure test must be done before starting engine. Ensure to verify oil line ends for damage. Always cut damaged end before reinstallation.

Pressure Test

Proceed as follows:

- Fill up oil reservoir.
- Install a hose pincher to rotary valve shaft oil supply hose (except 947 DI engines).
- Install a hose pincher to rotary valve shaft oil return hose (except 947 DI engines).
- Install a hose pincher to oil injection pump supply hose.

XP DI Model

Install a hose pincher to compressor return line (lower hose of the vent adapter on top of oil injection tank).

Disconnect oil tank vent line on PTO side throttle body.

GTI Models

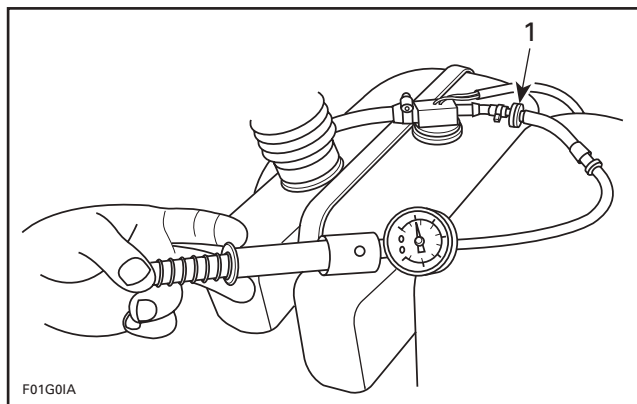
Connect pump gauge tester (P/N 529 021 800) to oil injection reservoir vent check valve.

XP DI Model

Connect pump gauge tester (P/N 529 021 800) to disconnected tube at throttle body.

All Models

NOTE: Use the same pump included in the ENGINE LEAK TESTER KIT (P/N 295 500 352).



TYPICAL

1. Connect pump to check valve

- Pressurize oil system to 21 kPa (3 PSI).

All Models

- If pressure is not maintained, locate leak and repair/replace component leaking. To ease leak search spray a solution of soapy water on components, bubbles will indicate leak location.

XP DI Model

Verify check valve inside vent adapter if pressure does not hold. Also ensure air can enter through check valve in the opposite direction.

All Models

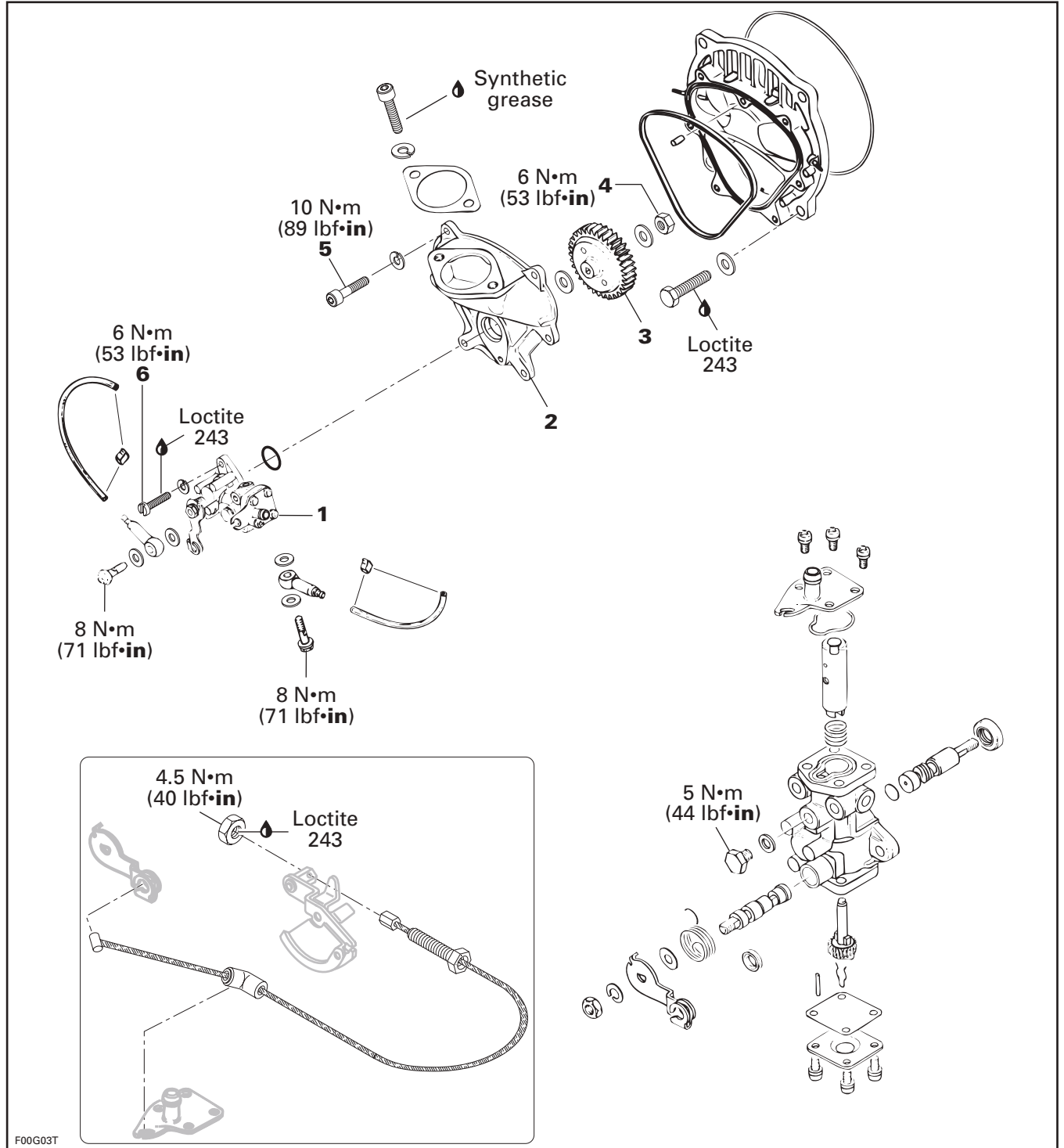
NOTE: The system must maintain a pressure of 21 kPa (3 PSI) for at least 10 minutes. Never pressurize over 21 kPa (3 PSI).

CAUTION: If any leak is found, do not start the engine and wipe off any oil leakage.

Disconnect pump gauge tester and remove hose pinchers. On XP DI model, reconnect line at throttle body.

OIL INJECTION PUMP

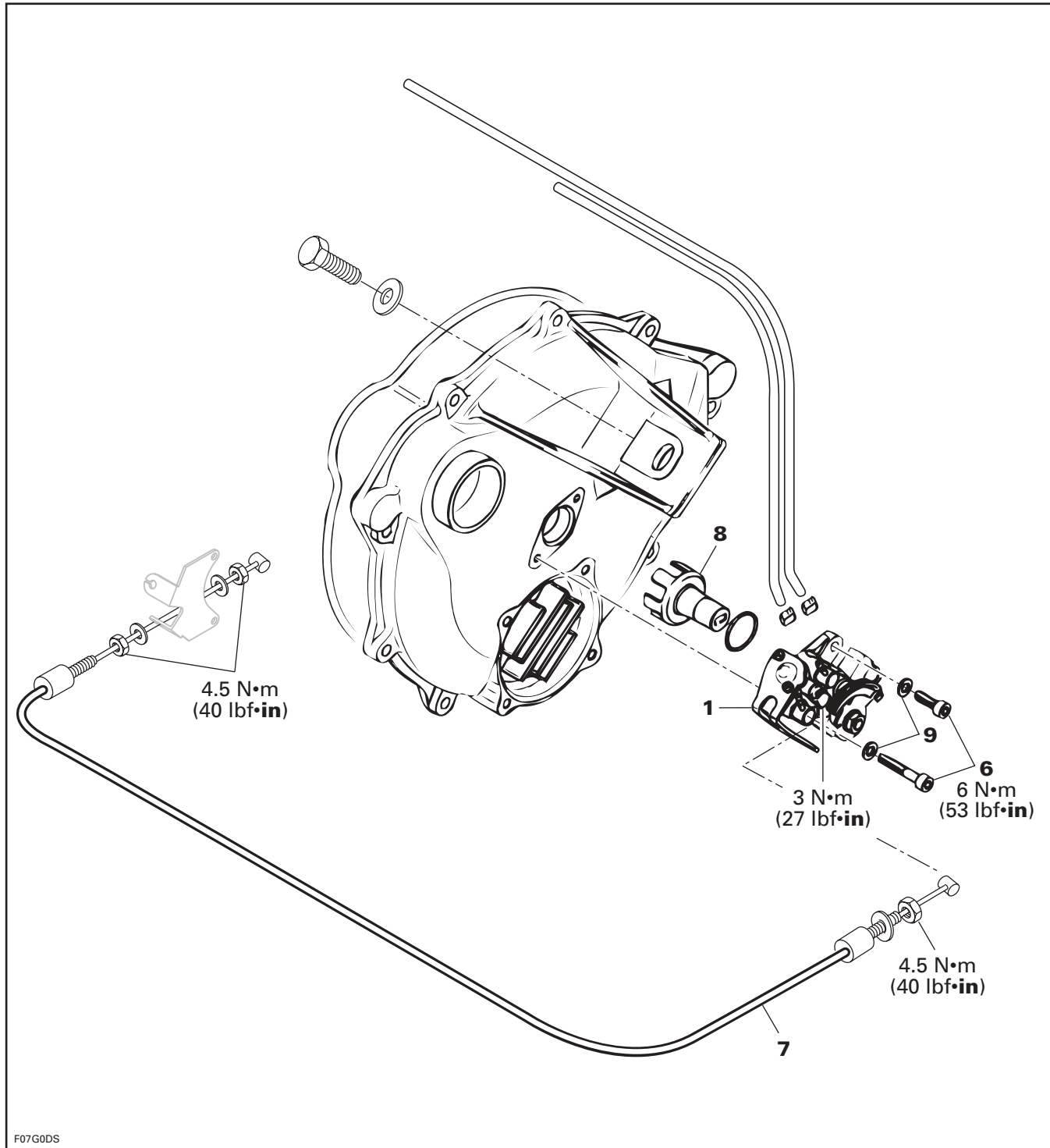
717 Engines



Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)

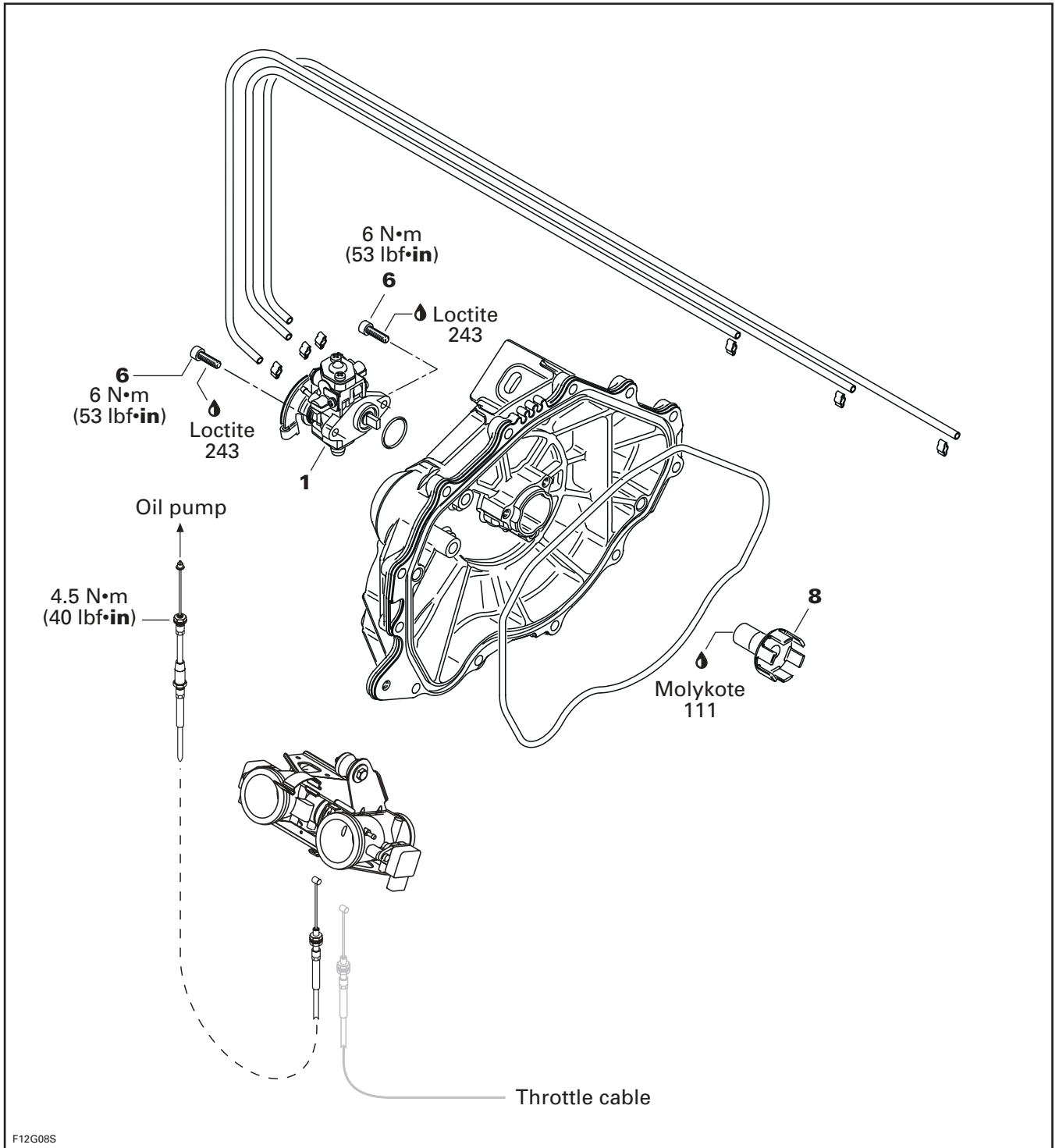
787 RFI Engines



Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)

947 DI Engines



Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)

OIL PUMP IDENTIFICATION

Pump Lever

Different engines need different pumps. See identification on lever.

CAUTION: Always mount proper pump on engine.

ENGINE TYPE	IDENTIFICATION
717	105Q-5
787 RFI	06
947 DI	01

NOTE: The following procedures can be done without removing the engine from hull.

REMOVAL

Oil Injection Pump

717 Engines

Remove air intake silencer (refer to AIR INTAKE).

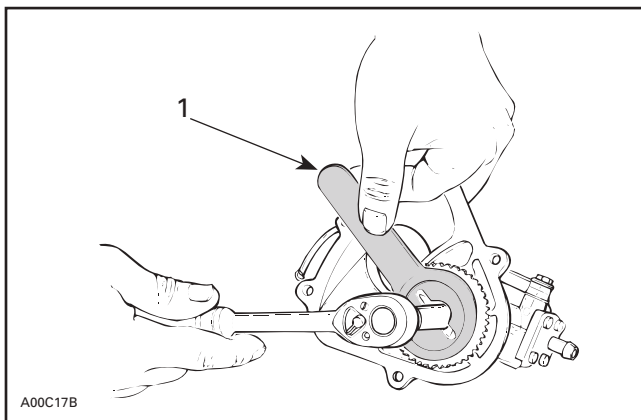
Remove carburetor (refer to CARBURETOR).

Remove rotary valve cover (refer to ROTARY VALVE).

Remove Allen screws **no. 5** retaining intake manifold **no. 2** to rotary valve cover.

Separate intake manifold from rotary valve cover.

To separate oil pump from intake manifold **no. 2**, remove oil pump gear **no. 3** using gear holder (P/N 420 277 905) and unscrew lock nut **no. 4**.



1. Gear holder

Remove 2 Allen screws **no. 6** with flat washers retaining oil injection pump to intake manifold **no. 2**.

Remove pump.

947 DI Engines

Remove tuned pipe head. Refer to EXHAUST SYSTEM.

The cable end has a slight press fit in the lever. Using a small screwdriver, pry cable end out.

787 RFI and 947 DI Engines

Disconnect oil injection pump cable **no. 7**.

Remove 2 Allen screws **no. 6** with flat washers retaining oil injection pump to magneto housing cover.

Pull pump.

Disconnect oil hoses from fittings of oil injection pump.

DISASSEMBLY

NOTE: Some oil pump parts are not available in single parts. A gasket set is available for the pump. Refer to parts catalog.

If the pump is found defective, it should be replaced by a new one.

CLEANING

Discard all seals and O-rings. Clean metal components in a solvent.

ASSEMBLY

717 Engines

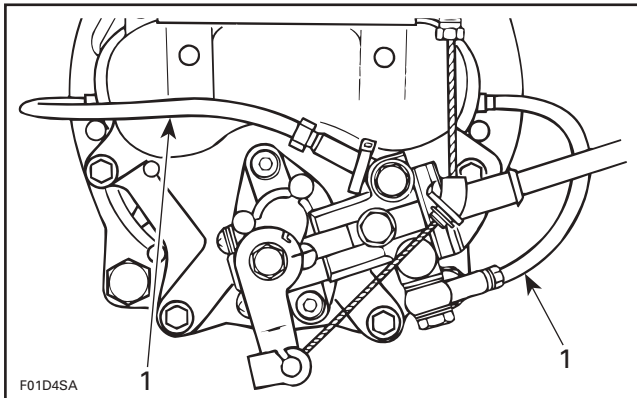
Oil Injection Pump and Intake Manifold

Install oil injection pump **no. 1** to intake manifold **no. 2**. Torque screws **no. 6** to 6 N•m (53 lbf•in).

CAUTION: Whenever oil injection lines are removed, always make the routing as shown.

Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)



TYPICAL

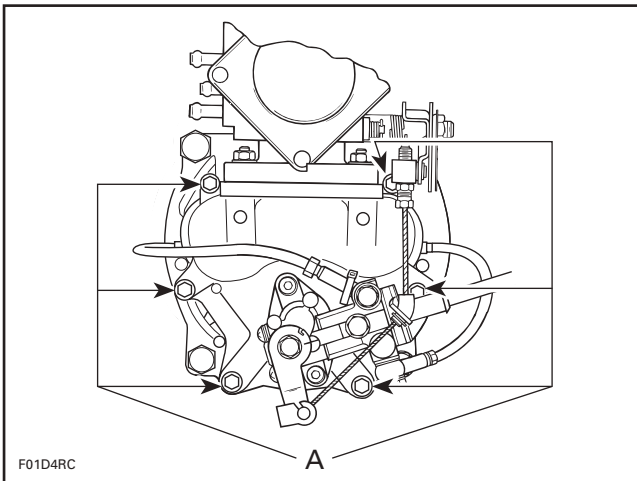
1. Small oil line

Oil Pump Gear

Install gear no. 3 to oil injection pump shaft. Torque lock nut no. 4 to 6 N•m (53 lbf•in).

NOTE: Make sure 1 washer is installed on each side of gear.

Install intake manifold no. 2 to rotary valve cover and torque screws no. 5 to 10 N•m (89 lbf•in).



TYPICAL

A. 10 N•m (89 lbf•in)

787 and 947 DI Engines

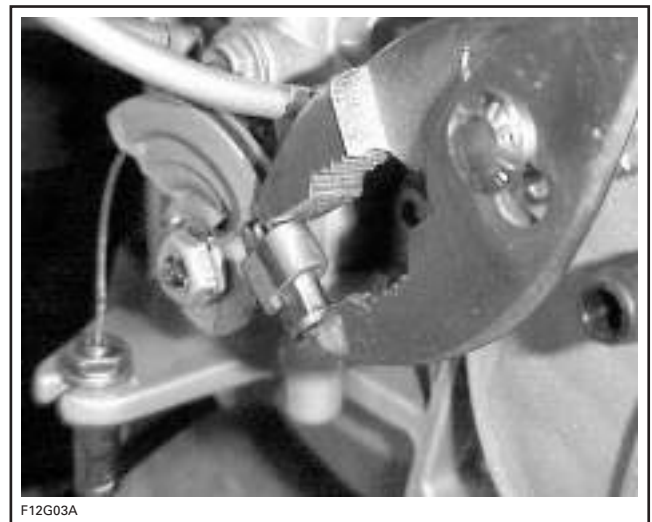
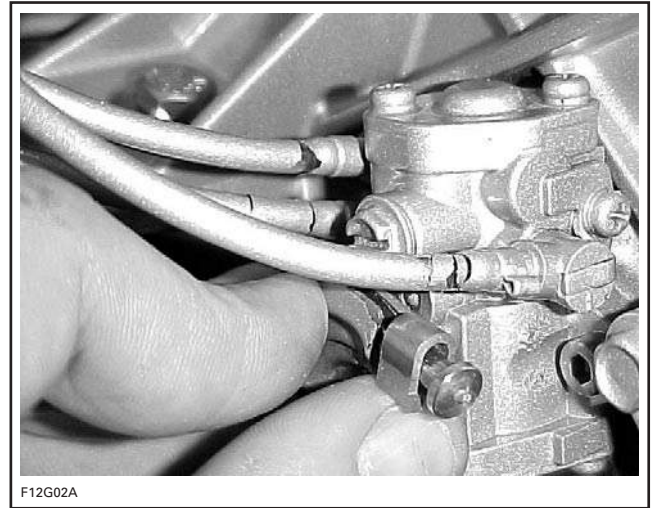
Oil Injection Pump and Shaft

Make sure shaft no. 8 is installed in crankshaft end.

Install pump. Secure with flat washers and screws no. 6. Torque to 6 N•m (53 lbf•in).

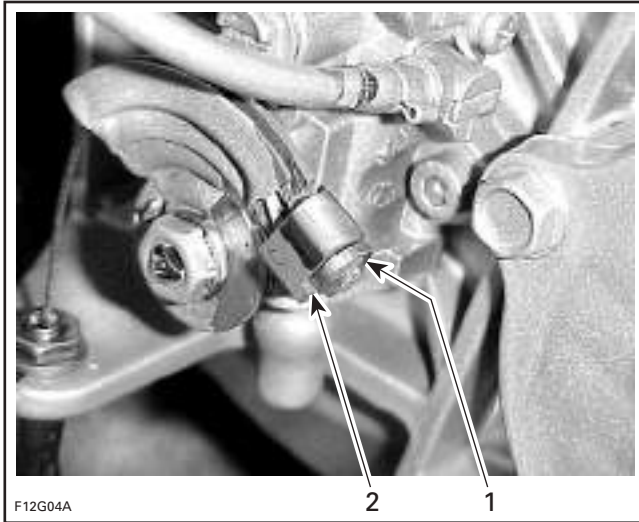
Install oil injection pump cable.

947 DI Engines



Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)



1. Cable end completely inserted
2. Cable end NOT seated on the steps

CAUTION: Ensure cable end is completely entered in its housing. Ensure it is NOT seated on the steps.

ADJUSTMENT

CAUTION: As oil injection pump adjustment is dependent on throttle cable position, make sure to perform throttle cable adjustment first except if otherwise specified.

Preliminary Synchronization

NOTE: To check synchronization of pump as a routine maintenance, see FINAL SYNCHRONIZATION. Make sure idle speed screw on carburetor is properly set on 717 engines.

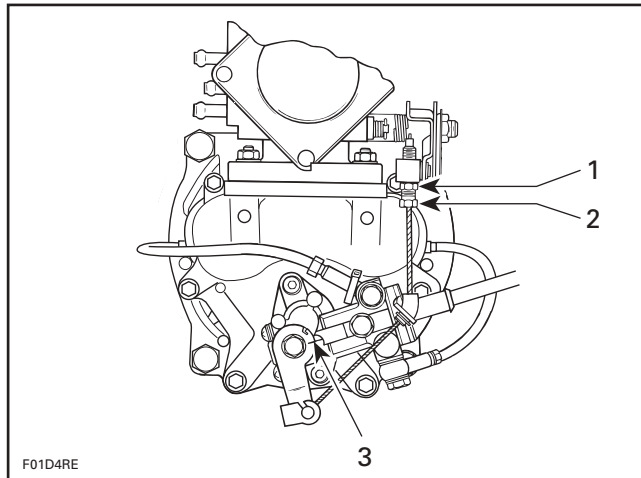
Refer to CARBURETOR for throttle cable adjustment procedure.

NOTE: On a twin carburetor engine, make sure carburetors are properly synchronized.

Turn oil pump cable adjustment nut to align reference marks on pump.

NOTE: A mirror may be used to facilitate this verification.

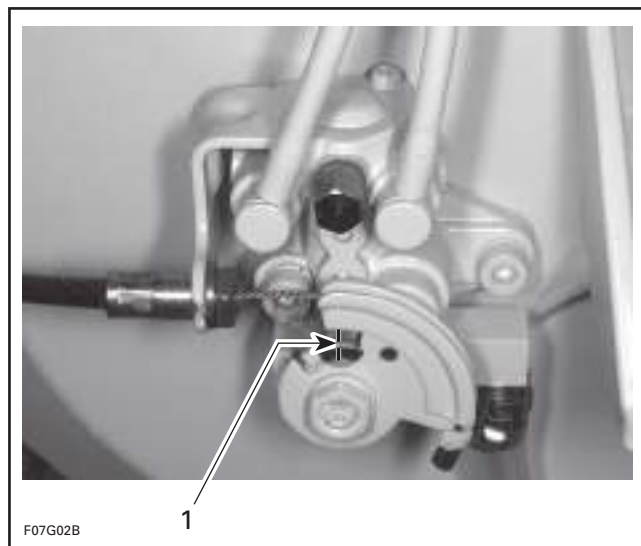
717 Engines



TYPICAL

1. Jam nut
2. Adjustment nut
3. Aligned marks

787 RFI Engines



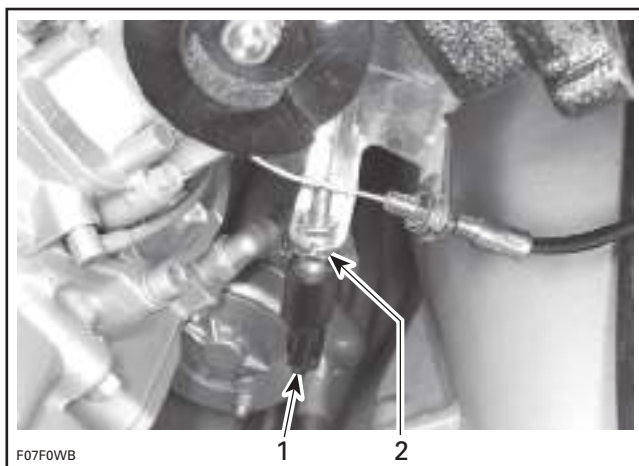
1. Aligned marks

Loosen jam nut and turn cable adjustment nut to obtain proper pump setting.

The adjustment nut and jam nut for the oil injection pump cable are located at the cable support on the throttle body.

Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)

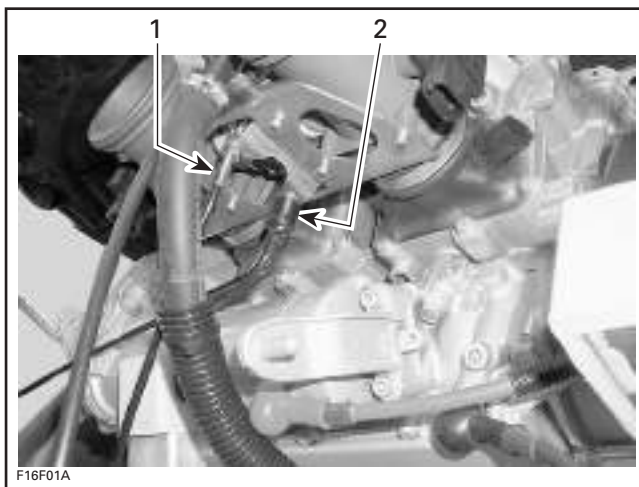


1. Oil pump cable
2. Adjustment nut

947 DI Engines

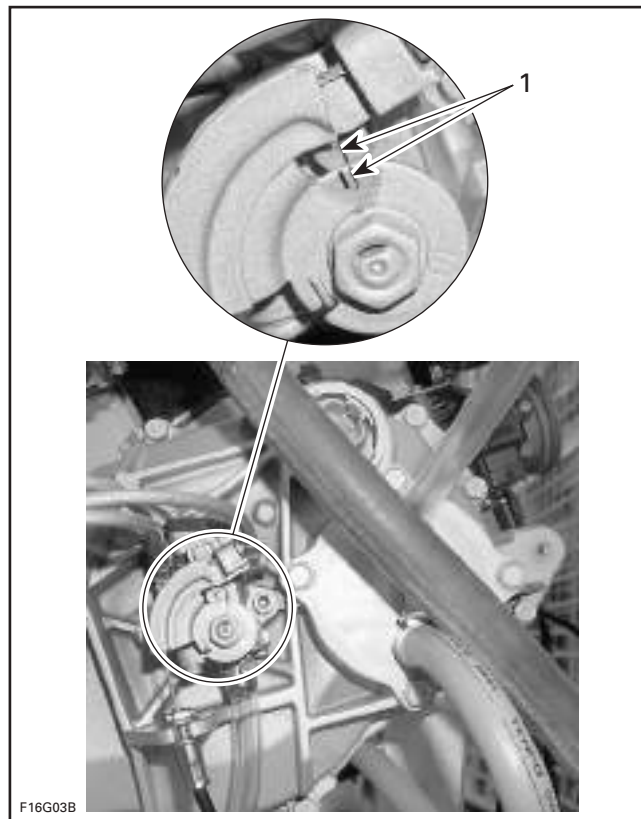
Loosen jam nut and turn cable adjustment nut to obtain pump mark alignment. Refer to following photos.

The adjustment is located under the throttle body bracket.



1. Oil pump cable adjustment
2. Throttle cable

Adjust the cable to the rich position. Use the longest mark.



1. Mark on pump must be facing longest mark on lever

All Engines

Start and bring engine to normal operating temperature.

CAUTION: If watercraft is out of water, engine must be cooled using the flush kit. If air bubbles are present in the oil injection system, bleed system before operating engine.

Adjust idle speed to specification on 717 Engines. Refer to CARBURETOR.

NOTE: On RFI and DI engines, there is no idle speed adjustment to perform.

Stop engine.

Final Synchronization

Eliminate throttle cable free-play by depressing throttle lever until a slight resistance is felt. In this position, marks on pump body and lever must align.

If necessary, turn cable adjustment nut to obtain pump mark alignment. Refer to above illustrations.

Tighten jam nut and recheck alignment marks.

Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)

CAUTION: Proper oil injection pump adjustment is very important. Any delay in the opening of pump can result in serious engine damage.

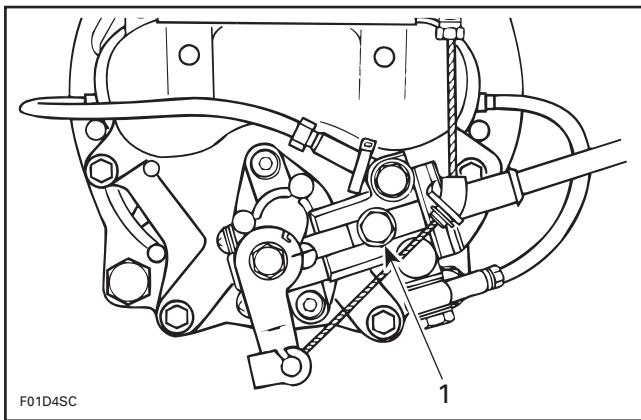
Bleeding

CAUTION: Oil injection system must be bled and adjustment checked before operating engine.

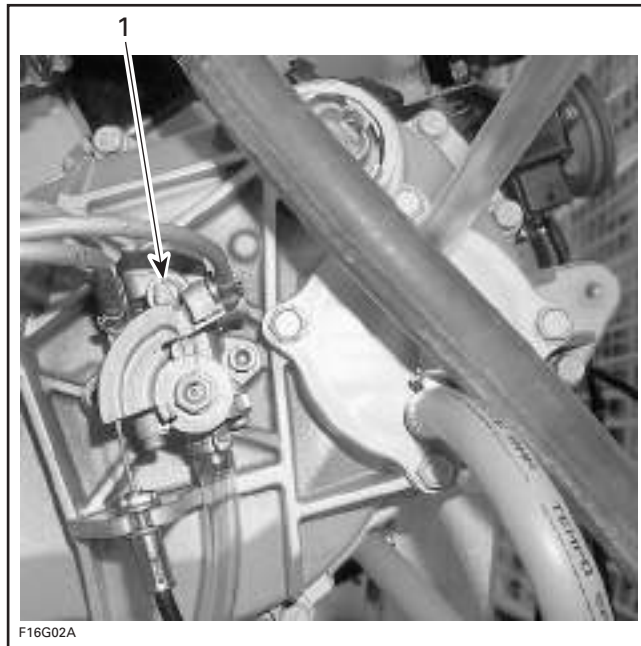
Ensure oil injection reservoir is sufficiently filled.

Install a dry rag below oil injection pump.

Loosen bleed screw to allow oil to flow.



F01D4SC
717 ENGINES
1. Bleed screw



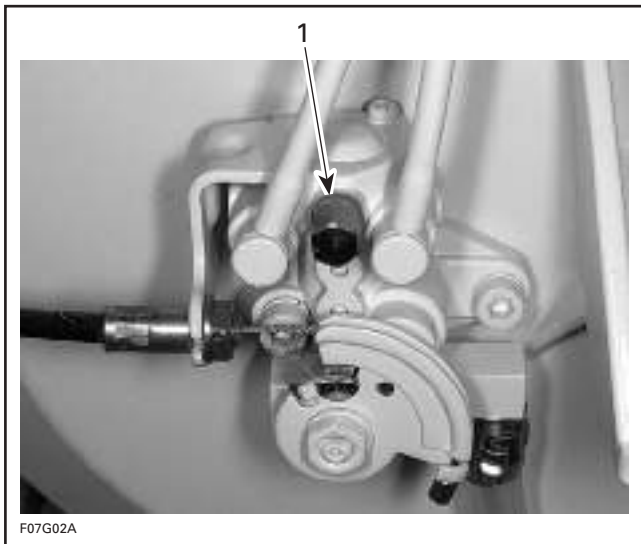
F16G02A
947 DI ENGINES
1. Bleed screw

Keep bleeding until all air has escaped from line. Make sure no air bubbles remain in oil supply line.

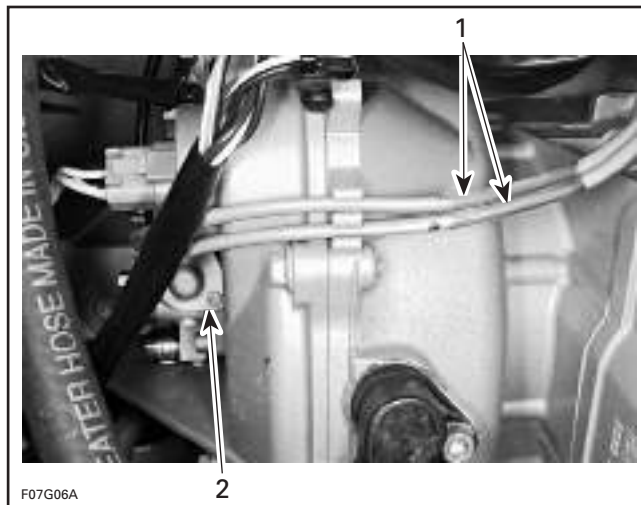
Tighten bleed screw.

Wipe any oil spillage.

Check small oil lines of the pump. They must be full of oil.



F07G02A
787 RFI ENGINES
1. Bleed screw



F07G06A
1. Lines must be full of oil
2. Oil pump

If not, proceed as follows.

Section 11 LUBRICATION SYSTEM (2-STROKE)

Subsection 02 (OIL INJECTION PUMP)

All Engines except 947 DI

Run engine at idle speed while manually holding pump lever in fully open position. Do not activate throttle lever.

947 DI Engines

- Use the VCK (Vehicle Communication Kit) (P/N 529 035 981). Look in the MONITORING section of the B.U.D.S software.
- Use the “Oil lines bleeding” function that allows to “lock” the engine RPM in idle speed while the throttle is fully depressed to ease the bleeding operation.
- Since oil cannot be seen through the small oil lines, press and hold the vehicle throttle to wide open position for 45 seconds.

All Engines

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

CHECKING OPERATION

On Watercraft

NOTE: Oil line supply must be full of oil. See bleeding procedure above.

Start engine and run at idle while holding the pump lever in fully open position.

All Engines except 947 DI

Oil must advance into small oil lines.

All Engines

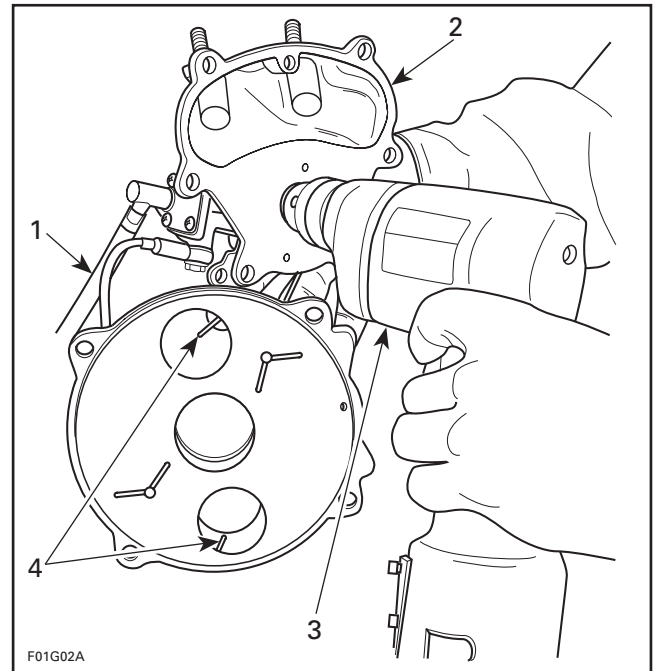
NOTE: The engine should have a rich mixture, idling irregularly and emitting smoke at exhaust outlet.

If not, remove pump assembly and check the pump gear (717 engine) or shaft (787 RFI and 947 DI engines) for defects, replace as necessary. Test pump as described below:

NOTE: Through normal use, oil level must not drop in small tubes. If oil drops, verify check valve operation. Replace as necessary.

Bench Test

Connect a hose filled with injection oil to main line fitting. Insert other hose end in an injection oil container. Using a counterclockwise (reverse position) rotating drill, rotate pump shaft. Oil must drip from fittings in parts of rotary valve cover while holding lever in a fully open position.



TYPICAL

1. Supply oil line to an oil container
2. Hold lever in fully open position
3. Counterclockwise (reverse) rotating drill
4. Oil must drip here

For an accurate test, each port should be checked separately to ensure equal delivery on both ports.

To obtain a precise result of the oil pump delivery rate, rotate it counterclockwise at 1500 RPM for a total time of 5 minutes.

NOTE: To ensure accuracy of test, oil lines should be completely filled before starting test.

Compare the results with the chart below. If oil pump is out of specification, replace it.

ENGINE	OIL PUMP DELIVERY AT 1500 RPM (pump speed) FOR 5 MINUTES
717	9.9 - 12.1 mL (each port)
787 RFI	5.7 - 6.9 mL (each port)
947 DI	7.5 - 9.1 mL (each port)