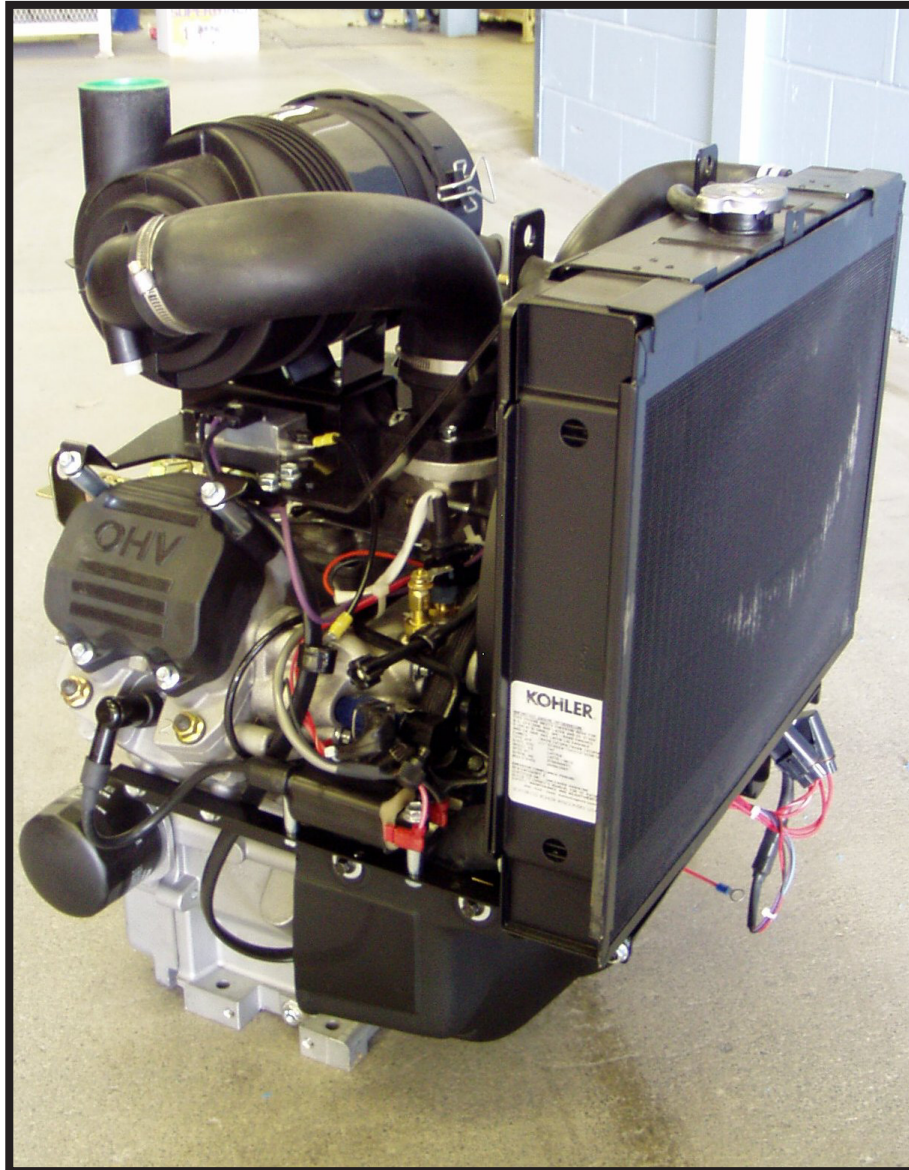


SECTION EN

Engine System Table of Contents

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Kohler Aegis 24H.P Carbureted & 30H.P EFI

General Instructions

WARNING

Detailed information on standard workshop and safety procedures, and general servicing operations is not included in this manual, which has been prepared to assist qualified service personnel. ODG assumes no responsibility or liability for PERSONAL INJURY or VEHICLE DAMAGE which results from any servicing procedure performed, including those instructions outlined in this manual. Before performing a servicing operation, an individual must have determined to his/her satisfaction that personal injury or vehicle damage will not result from the servicing procedure or tools selected.

NOTE

All engine service work should be performed by an authorized Kohler mechanic. Severe damage and/or reduced performance can result from an improperly serviced engine.

IMPORTANT

Basic engine servicing information is provided in this section of the manual. For more detailed servicing operations please refer to the proper engine service manual listed in the chart below.

Models	Engine	Engine Service Manual	Part Number
NV, NH	Kohler Aegis 26 & 31H.P	Engine Service Manual	TP-2527-A

Checking the Engine Oil Level

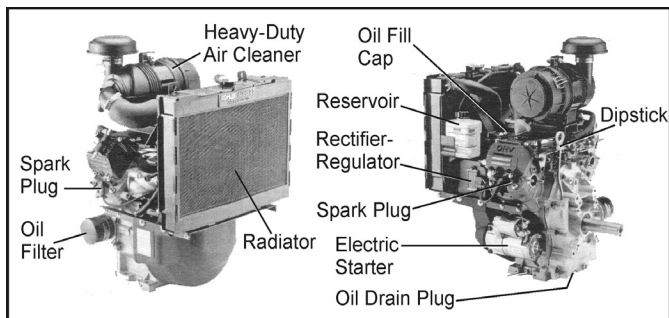
To check the oil during an operating period, shut the engine off, let it cool down and allow the oil time to drain into the sump before checking the oil level. Position the vehicle so the engine is level.

Check the engine oil level each day before operating the engine.

The Kohler Aegis engine is equipped with a dipstick and a separate oil filler tube. To check the oil level, clean the area around the dipstick before removing. Remove the dipstick and wipe it with a clean cloth. Re-insert the dipstick and push it all the way into the tube. Remove the dipstick and check the oil level. The oil level should be between the least between the HI/LOW marks. If the level has dropped any, add oil to bring the level up to the FULL mark. **DO NOT OVERFILL.**

CAUTION

Do not run the engine if the oil level is above the FULL mark or below the ADD mark. Premature engine damage or total engine failure can occur when the oil level is not properly maintained.



Viscosity Table - Kohler Aegis Engine

RECOMMENDED SAE VISCOSITY GRADES	
**	10W-30
**	5W-20, 5W-30
*F -20	0 20 32 40 60 80 100
*C -30	-20 -10 0 10 20 30 40
TEMPERATURE RANGE EXPECTED BEFORE NEXT OIL CHANGE	
*Use of synthetic oil having 5W-20 or 5W-30 rating is acceptable, up to 4°C (40°F).	
**Synthetic oils will provide better starting in extreme cold below -23°C (-10°F).	

Recommended Engine Oil

Use a high quality detergent oil of API (American Petroleum Institute) service class . Choose the correct viscosity of oil for seasonal driving conditions. See chart.

Oil capacity is 1.9 L or 2.0 qts.

Changing Engine Oil

During the initial engine break-in period, change the oil after the first 20 hours of operation. After the break-in period, change the engine oil every 50 operating hours, or more frequently if the vehicle is operated in dusty or dirty conditions.

Draining the Engine Oil

The engine is equipped with a drain plug for draining the oil. The drain plug location for the Kohler Aegis engine is located beneath the driver clutch. **Photo EN-2a** Remove the drive belt for easier access to the drain plug.

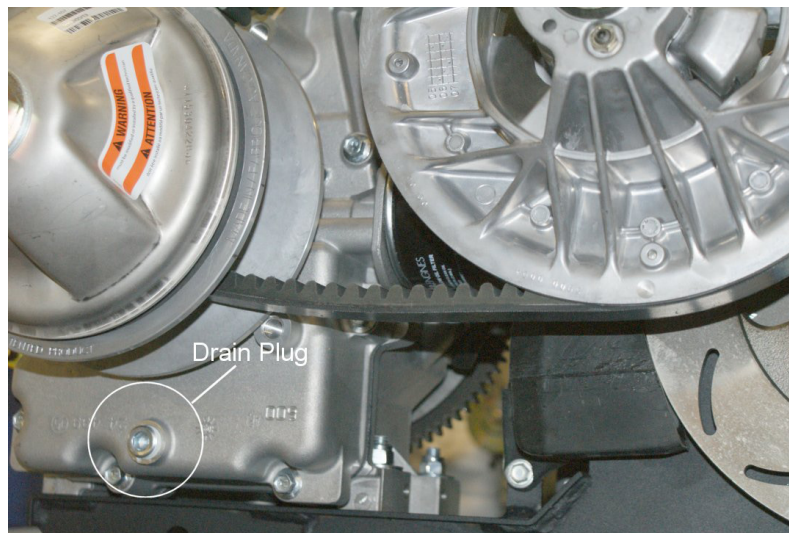


Photo EN-2a

1. Start and warm up the engine so the oil will drain easily.
2. Level the vehicle so the oil will drain completely.
3. Place a suitable container under oil drain of engine and remove drain plug. **PLEASE DISPOSE OF WASTE OIL PROPERLY TO CONSERVE OUR ENVIRONMENT.**
4. When all the oil has been drained from the engine, clean and replace the oil plug.

IMPORTANT

To provide a good view of the draining area and avoid any spills into the lower body, it is best to remove the driven clutch and drive belt. Position the container beneath the drain plug and remove the plug. If necessary, refer to Removing the Drive Belt and Removing the Driven Clutch in section CS of this service guide if necessary.

NOTE

There is limited space between the engine and power pack frame. Cut down an empty plastic container to the correct height so it will fit under the engine oil drain. Make sure the container will hold the amount of oil in the engine.

A ziploc plastic bag makes a convenient oil container. It conforms to the space available and can be closed securely when the oil is drained, then lifted neatly out of the engine compartment.

Oil Filter Replacement

During the initial engine break-in period, change the oil filter (Part No. 12 050 01) when the oil is changed. After that, change the oil filter every 50 hours. Before installing the new filter, lubricate the rubber filter gasket with fresh engine oil. Screw the filter on by hand until the gasket contacts the filter adapter. Tighten 1/2 to 3/4 turn more. Add the specified oil. See previous page for oil capacity. Start and run engine to check for oil leaks. Stop engine and re-check oil level. Add oil if required.

Refilling the Engine

Refill the engine through the oil fill port with the correct amount of oil referring to the chart in the recommended oils section. Make sure the appropriate grade of oil is used. As you add oil, frequently check the level with the dipstick. Do not overfill. Start engine. Check for leaks. Stop the engine. Check the oil level. Add oil only to the “Full” mark on the dipstick.

Air Filter

All Kohler Aegis engines are equipped with a foam precleaner and dry paper air filter element housed in an air cleaner assembly attached to the carburetor.

AVENGER Models

The Kohler Aegis engine is equipped with a heavy duty high density paper air cleaner element surrounding a canister style inner element. Cleaning is not recommended, each element should be replaced when dirty.

See Figure 6-5. For instructions to remove, clean and replace the air filter components, refer to the air cleaner section of the engine Owner’s Manual.

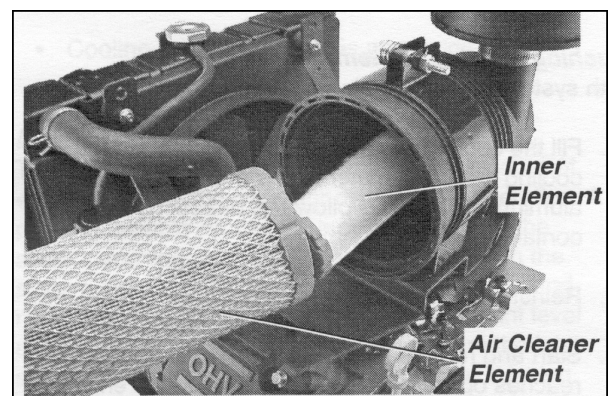


Figure 6-5.

Check the paper air filter element every 100 hours of operation or more often under extremely dusty or dirty conditions.

Spark Plugs - Champion RC14YC

Remove and inspect the spark plugs after every 100 hours of operation. Clean the plugs and reset the gap as detailed in the engine owner's manual.

Replace the spark plugs if the electrodes are corroded or damaged or if the insulator is cracked. Use the correct plug for the engine as detailed in the engine owner's manual.

Re-install the spark plugs carefully, taking care to start the threads properly. Torque the plugs to 10 - 15 ft. lbs (14 to 20 N·m). Do not over tighten.

Fuel Filter

All models of the ARGO are equipped with an in-line fuel filter. HDi and Avenger EFI models have 1 fuel filter, located in the rear compartment at the fuel tank (Part No. 24 050 03). Figure 6-6.



Figure 6-6. HDi and Avenger EFI fuel filter location.

Avenger 700 model Argo utilizes one inline fuel filter located in the engine compartment (near the rear valve cover). Figure 6-6a

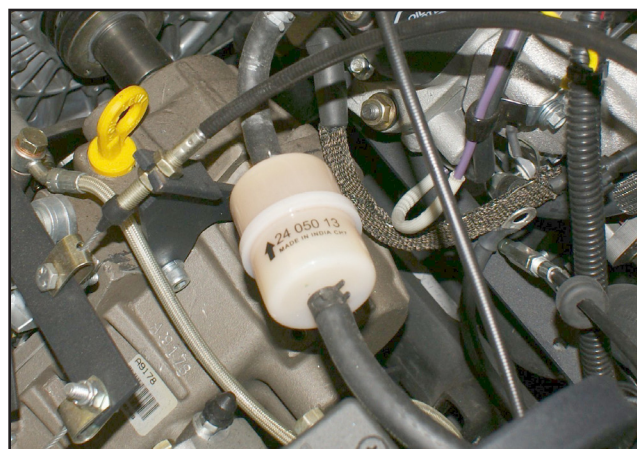


Figure 6-6a. Avenger 700 fuel filter location

Replace the 24 050 03 Kohler high pressure fuel filter (Avenger 750 & HDi) after every 1000 hours of operation or once a year. Replace the 608-71 Kohler fuel filter (Avenger 700) after every 250 hours of operation or once a year.

To replace the filter, loosen the gear clamps with a standard screw driver and pull the rubber fuel lines off of the filter. Install the new filter with the flow arrow pointing toward the engine. Tighten the clamps securely. Start the engine and check for fuel leaks.

Engine Cooling & Exhaust System

Engine cooling air is drawn in on the right side of the engine compartment and expelled with the exhaust on the left side. Keep all ducting and screening in place.

Coolant Recommendations - Kohler Aegis

Use equal parts of ethylene glycol (anti-freeze) and water only. Distilled or deionized water is recommended, especially in areas where the water contains a high mineral content. Propylene glycol based anti-freeze is *not* recommended.

This mixture will provide protection from -37° C (-34° F) to 108° C (226° F). For protection and use outside the indicated temperature limits, follow the anti-freeze manufacturers instructions on the container, but do not exceed 70% anti-freeze.

DO NOT use anti-freeze with stop-leak additive(s), or put any other additives in the cooling system.

Type: Permanent type of anti-freeze; green coloured

Mixed Ratio: 50% mixed

Freezing Point: -35° C (-31° F)

Coolant Capacity: LH690/775 2 L (2.18 U.S. qt)

Engine cooling air is drawn in on the right side of the engine compartment and expelled with the exhaust on the left side. Keep all ducting and screening in place.

IMPORTANT

Refer to the Illustrated Parts manual for identification of all hardware fasteners used in the following disassembly/assembly procedures.

Tailpipe and heat deflector shield may vary in configuration depending on model year

Removing the Engine

1. Locate the tailpipe assembly and detach the connecting springs between the tailpipe assembly and muffler. *Photo 1 & 2*. Pull the assembly out through the hood area.



Photo 1

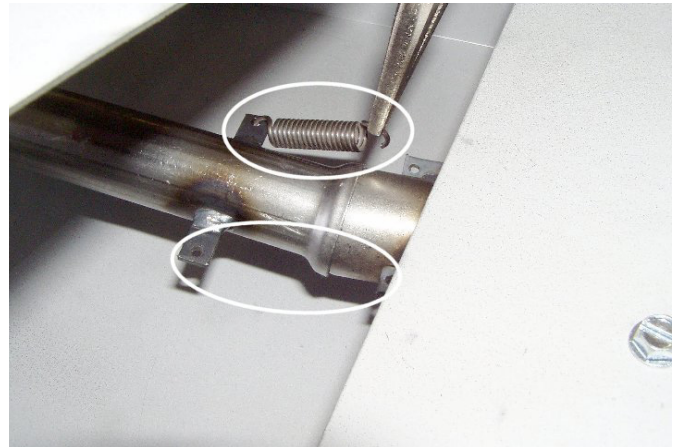


Photo 2

2. Remove the heat deflector shield covering the muffler. *Photo 3*.
3. Disconnect the fuel line from the Carburetor (700 Models) *Photo 4*, or the Fuel Rail (EFI Models).



Photo 3

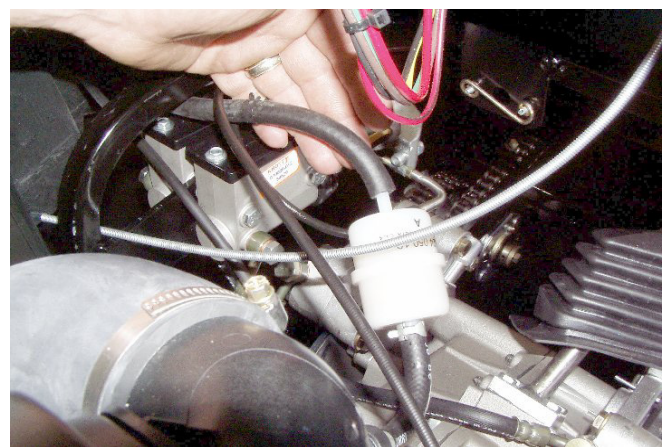


Photo 4

Disconnect All Wiring

4. Disconnect the ground cable at the engine. *Photo 5 & 6*
5. Disconnect the ground wire attached at the front of the engine to the valve cover fastener. *Photo 7*
6. Locate the main wire harness plug-ins at the front of the engine compartment and disconnect all wires. *Photo 8* **NOTE: Unbolt and remove ECU unit /wire harness if removing an EFI engine.**

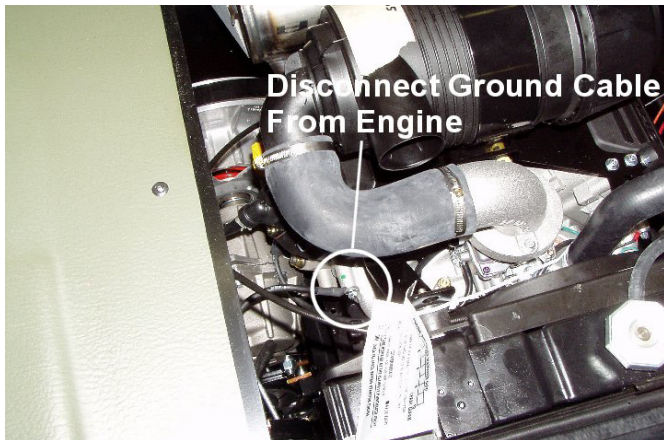


Photo 5

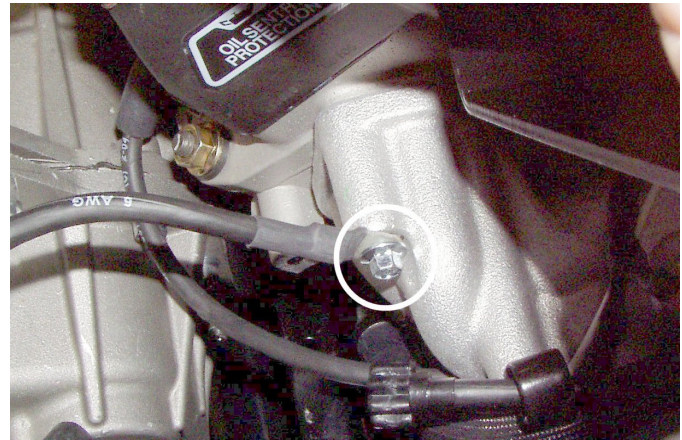


Photo 6

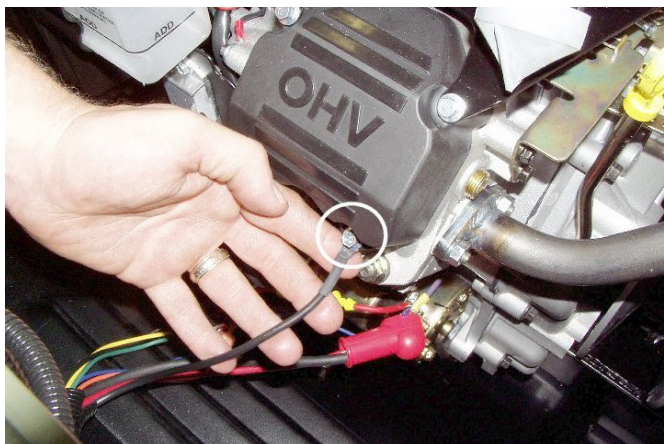


Photo 7

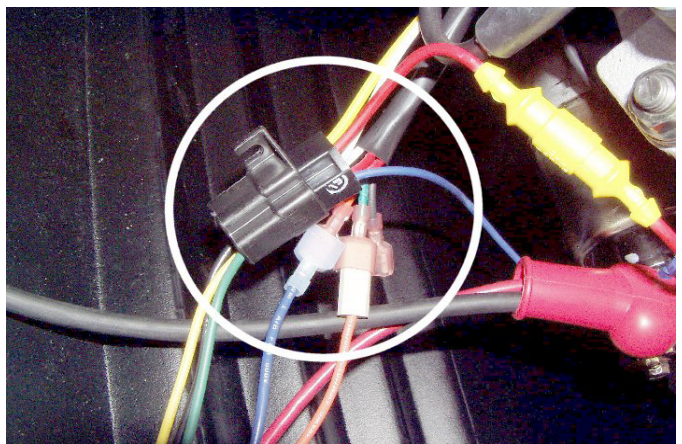


Photo 8

7. Locate the starter at the front of the engine compartment and disconnect all wiring at the solenoid. *Photo 9* **These wires are enclosed within a red rubber boot.**
8. Remove the drive belt between engine and transmission. *Photo 10*

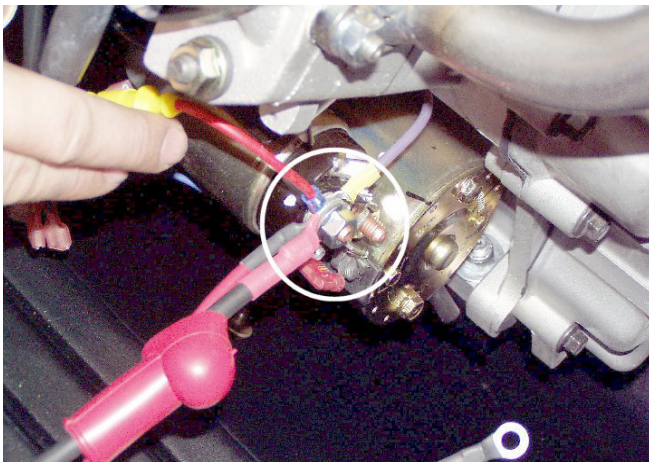


Photo 9

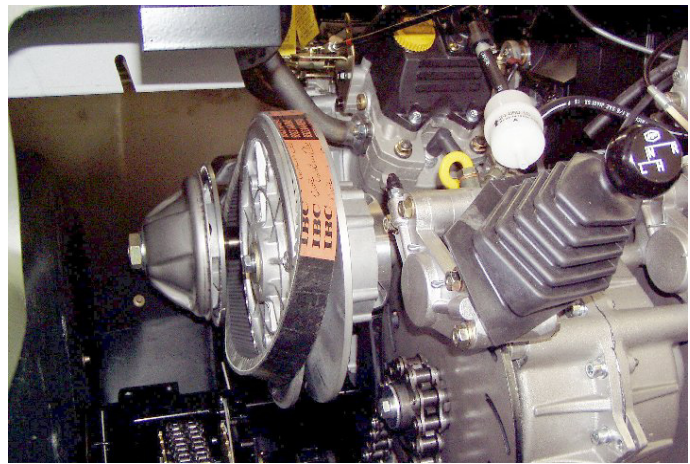


Photo 10

9. Remove the driven clutch from the transmission input shaft. *Photo 11 & 12*



Photo 11

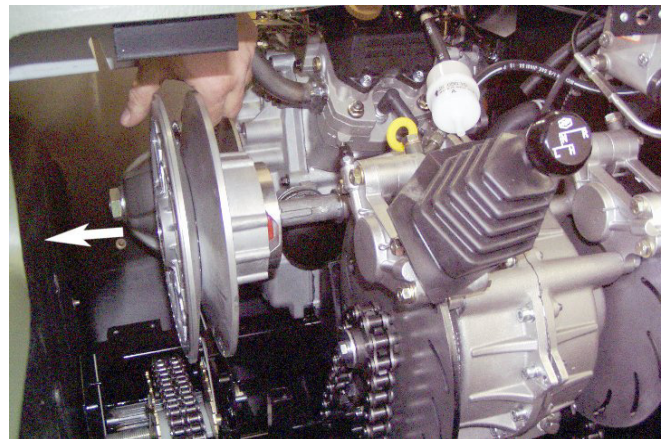


Photo 12

10. Disconnect the brake cooling hose at the brake duct (N/A to HDi Models). *Photo 13*

11. Disconnect the choke (carbureted models only) & throttle cable from the control panel on the engine. *Photo 14 & 15* Make note of which hole the throttle cable is inserted.

NOTE

In some cases, a throttle cable heat shield or sleeve may be installed and will need to be removed when disconnecting the throttle cable from the linkage. Ensure this is replaced during reassembly.

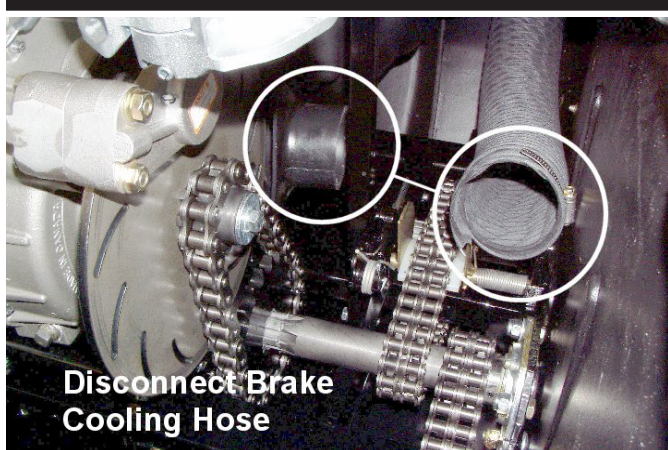


Photo 13



Photo 14

Removing the (4) Engine Mount Fasteners

12. To effectively and efficiently remove the nylon locknuts that are securing the engine to the power pack frame studs, a flat ratcheting style wrench is the recommended tool of choice. *Photo 16.*

See NOTE below.



NOTE

This type of wrench is preferred for removing 3 of the 4 nylon locknut fasteners. The exception is the fastener located at the rear left corner of the engine block (as viewed by the operator in the drivers seat). This fastener requires the use of a regular opened end style wrench.

13. Remove each nylon locking nut and flat washer. *Photo 17*



Lift the Engine From the Vehicle

CAUTION

This procedure requires the use of an overhead hoist. Do NOT attempt to lift out by hand. Ensure all components attached to the engine have been detached. Lift out slowly and carefully. If you wish to remove the muffler from the engine before raising it out, you may do so as an optional procedure. You may find it easier to maneuver the engine up and out with the muffler removed, but it is not necessary.

WARNING

Ensure all hoist chains or belts are secure, and hooks are locked into place. Keep all fingers and hands clear of the area from which the engine is being lifted.

14. Attach the overhead hoist to the engine. There is a hook provided on the engine *Photo 18*, (located near the yellow oil fill plug on earlier spec. engines and beside the rear cylinder head cover on later spec. engines), for connecting one side of the chain. Connect the other side to the rad bracket. *Photo 19*

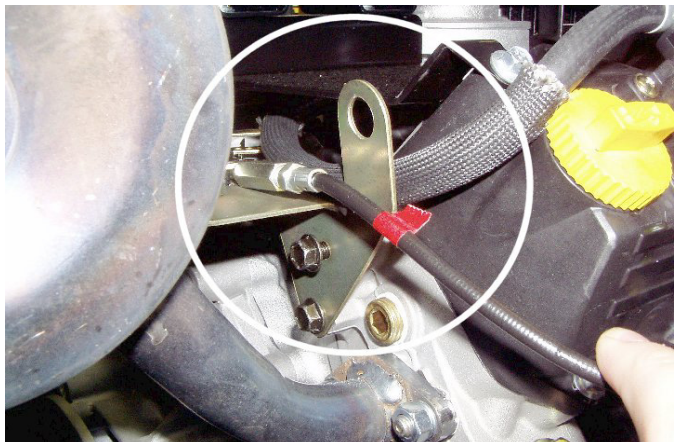


Photo 18



Photo 19

15. Slowly and gently raise the engine through the hood area. Some maneuvering is required as the engine does not necessarily come straight up and out. Avoid damage to any other components as well as the upper body. *Photo 20 & 21*



Photo 20



Photo 21

16. Remove the engine to a clean workbench for further disassembly.
17. Remove the Muffler if it was not previously removed. **Photo 22** (EFI models will have an O2 sensor threaded into the muffler that will need to be disconnected and removed as well.
18. Remove the Fastener securing the Driver Clutch to the PTO and slide the clutch from the shaft. Depending on the model and year of the vehicle, the fastener securing the Driver Clutch will vary. **See chart below.** The PTO has a keyed shaft. **Photo 23 & 24**

IMPORTANT

There are either 5 Spacers (1.19x1.50x.04) or 1 thick Spacer equivalent to the thickness of the 5 Spacers behind the Driver Clutch. This will depend on the age of the vehicle. Earlier models utilized 5 spacers. **Photo 25.**

All 750 EFI Models	HHCS 7/16-20x5.0 LG & WASHER 47x1.37x.12 HI-CARBON (5/8" Socket)
700 Models prior to S/N 28833	FHSC 7/16-20x4.0" LG only (1/4" Hex Head)
700 Models from S/N 28833	HHCS 7/16-20x5.0 LG & WASHER 47x1.37x.12 HI-CARBON (5/8" Socket)

NOTE

All Carbureted LH685-0015, LH690-0011 & LH690-0014 were built with a longer Crankshaft PTO than the LH775-0012 EFI. This changed in May of 2009 when the crankshaft PTO was shortened and standardized to the same specification as the LH775-0012 EFI. The new LH690-0017 specification indicates the shorter PTO Shaft on the Carbureted models.

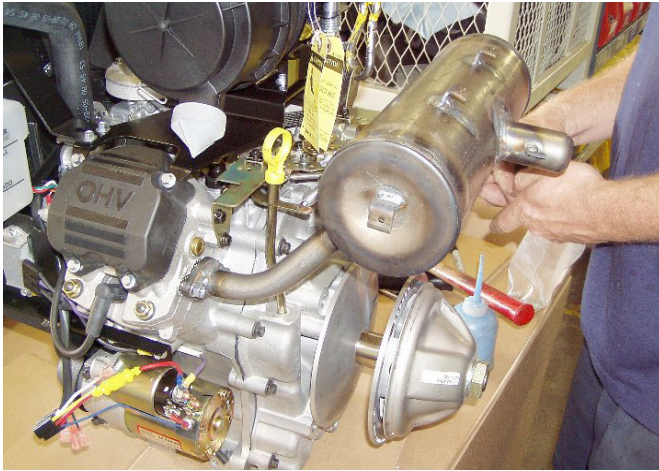


Photo 22

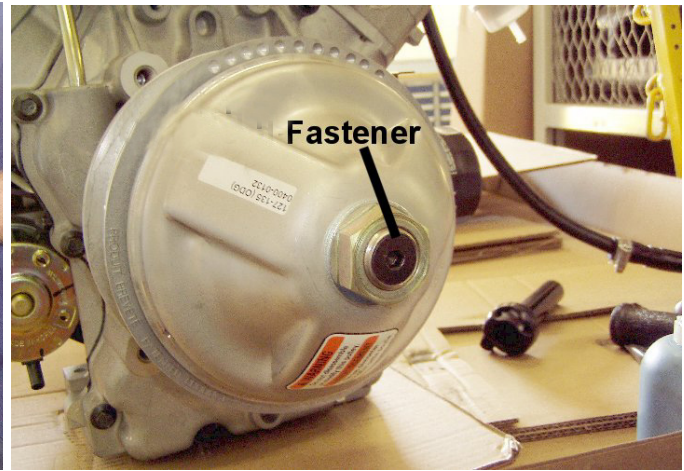


Photo 23

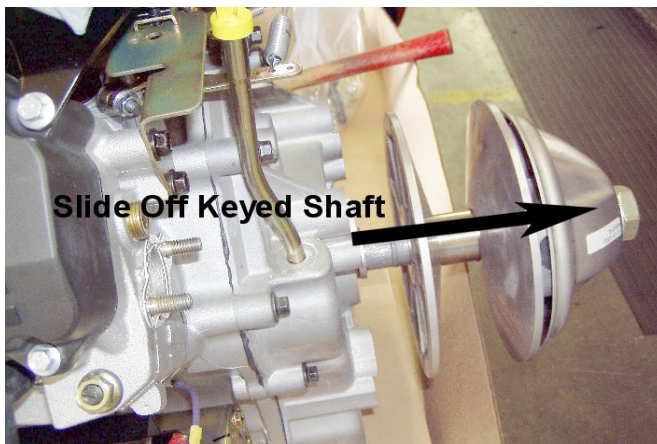


Photo 24



Photo 25

19. Remove the shim(s) that are installed to the PTO.

IMPORTANT

These shim(s) MUST be reinstalled before the driver clutch.

20. Remove all fluids if necessary to service.

Installing The Engine

1. Install the shim(s) to the PTO of the engine. *Photo 1*
2. Apply anti-seize compound to the PTO. *Photo 2*



Photo 1

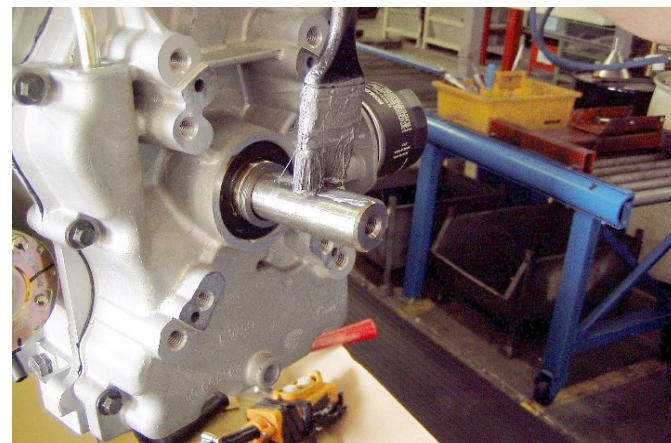


Photo 2

3. Install the key to the keyway of the PTO. *Photo 3*
4. Slide the driver clutch on and up to the shoulder of the PTO. *Photo 4*

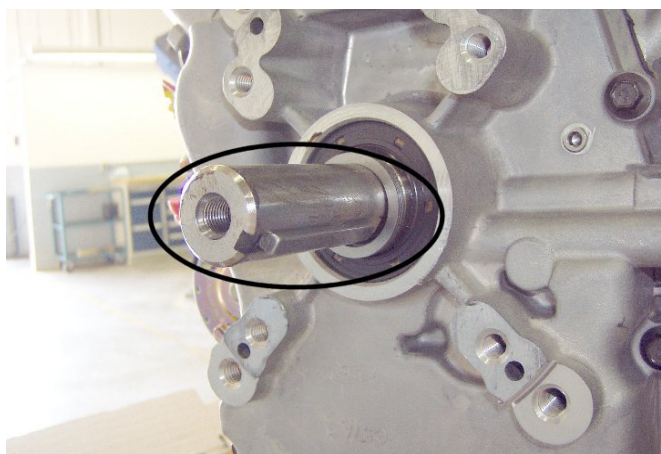


Photo 3

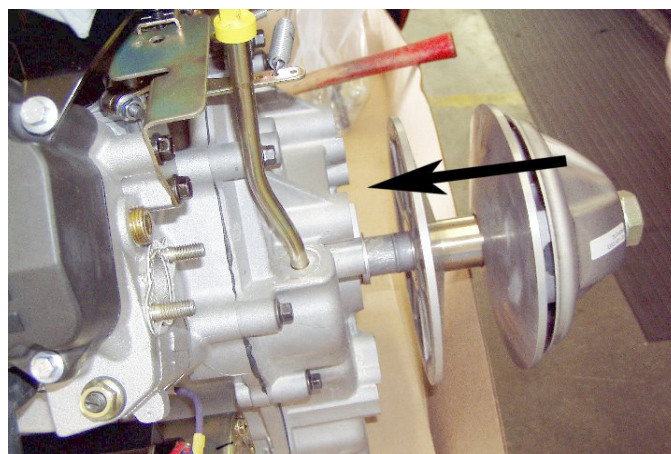


Photo 4

5. Secure the Driver Clutch to the PTO with correct fastener. Apply blue LOCTITE and Torque to specifications. *Photo 5*

IMPORTANT

For part number and descriptions of all components and hardware, refer to the illustrated Argo parts list.

6. Install the muffler assembly to the engine manifold. Torque to specifications. *Photo 6*

IMPORTANT

Always use new manifold gaskets.

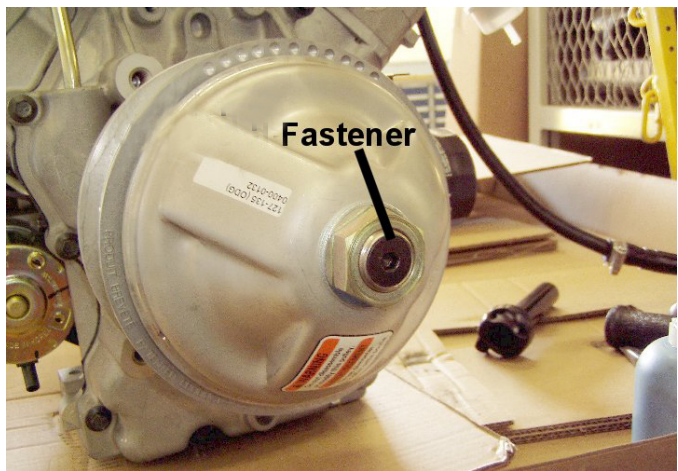


Photo 5

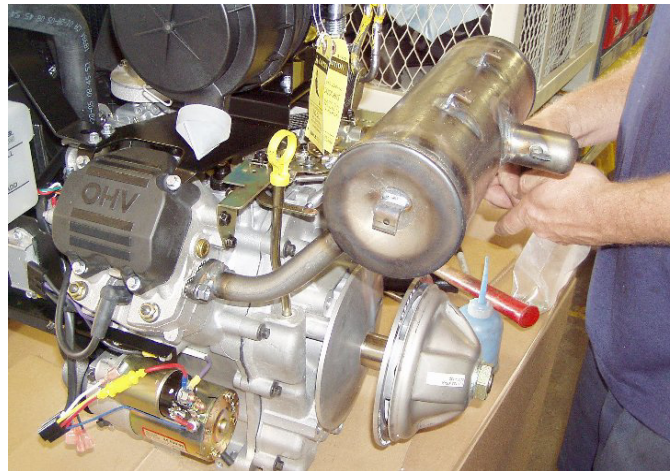


Photo 6

IMPORTANT

If you have removed the Kohler Aegis radiator assembly from the engine for any reason (repair, replacement etc.), ensure, before reinstalling it, that you tie-wrap the bottom of it securely to the lower bracket as in *photo 7 & 8*. This will prevent the lower radiator locating pins from dislodging from the rubber grommets under heavy vehicle application. Damage can occur to both fan and shroud if this is not done. Please note that later spec. engines have retaining clips installed to the locating pins and do not require the tie-wraps to secure the rad in place.

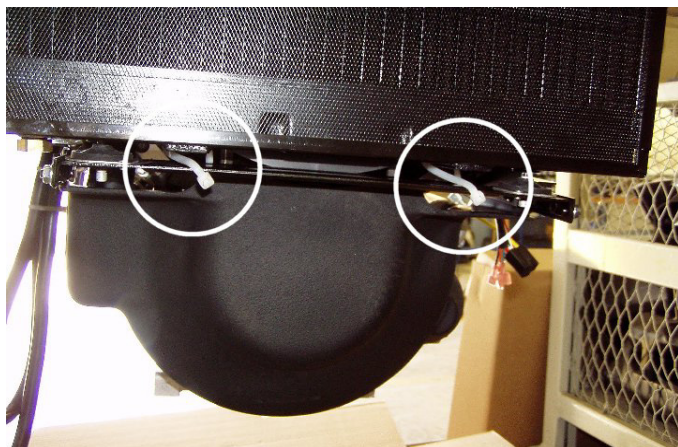


Photo 7

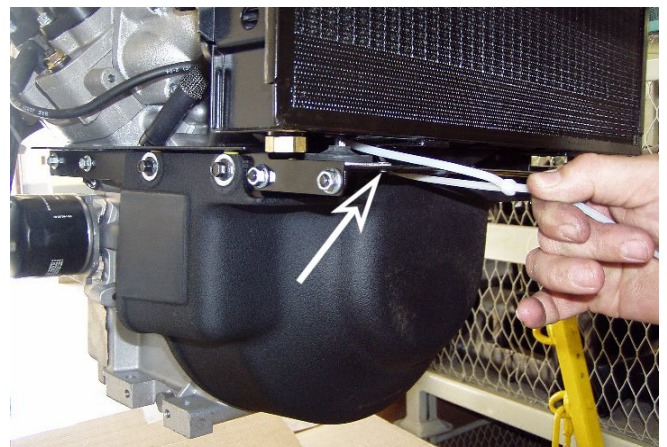


Photo 8

7. Attach the hoist hooks to the engine location as described in 14 of **Removing The Engine**.
8. Swing the engine assembly over the open hood area of the Avenger vehicle. Locate the (4) mounting studs on the power pack frame. *Photo 9*

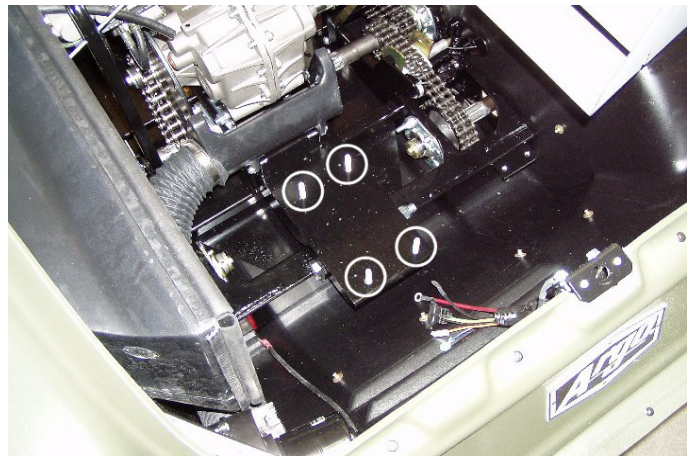


Photo 9

9. Slowly and gently lower the engine through the hood area. Some maneuvering is required as the engine does not necessarily drop in straight on. Avoid damage to any vehicle components as well as the upper body.

IMPORTANT

Align the mounting holes of the engine block with the powerpack frame studs. Once aligned properly, the engine should just drop into place. Do not force or hammer in any way. Damage may occur to the threads of the mounting studs.

IMPORTANT

Once the engine is seated into place, ensure that the rubber rad seal is properly sealing at the face of the radiator. *Photo 12*

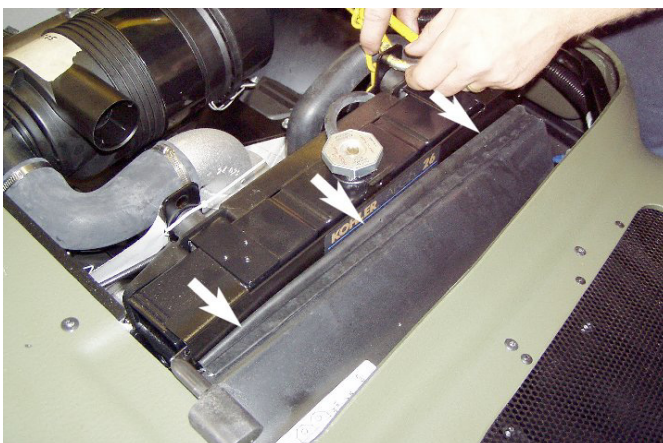


Photo 12



Photo 13

10. Locate the flat washer and nylon locknut used to secure the engine to the power pack frame studs. **Photo 13** Refer to your illustrated parts manual. Install all four fasteners and Torque to specifications. Refer to step 12 of Removing the Engine, for preferred wrenches used to retighten the nylon locknuts.
11. Reconnect the brake cooling hose at the brake duct. **Photo 14**
12. Reconnect the choke and/or throttle cable(s) to the control panel. **Photo 15. Insert the throttle cable into the correct hole. Photo 16** Install the throttle cable heat shield if so equipped.
13. Assemble the key to the keyway of the transmission Input Shaft. Apply anti-seize compound to the length of the shaft. **Photo 17**

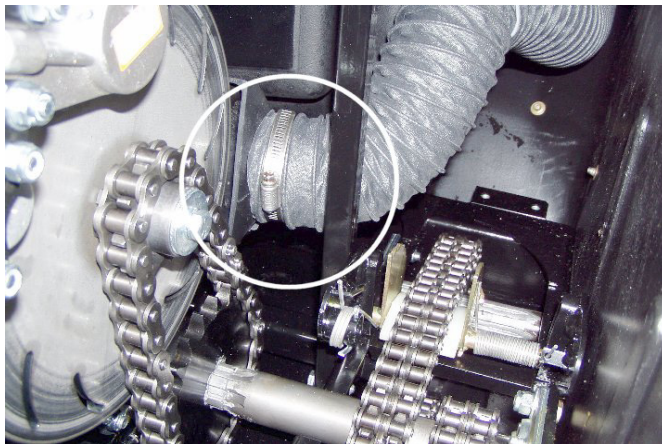


Photo 14

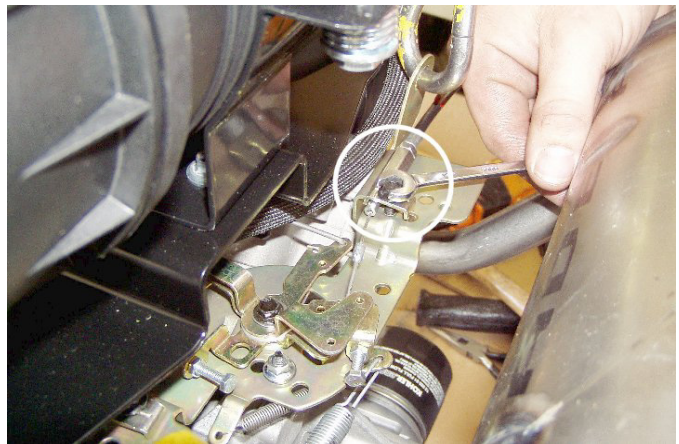


Photo 15

14. Install the Driven Clutch. Apply blue LOCTITE to the threads of the fastener and Torque to specifications. **Photo 18**
15. Reinstall the drive belt between engine and transmission.



Photo 16

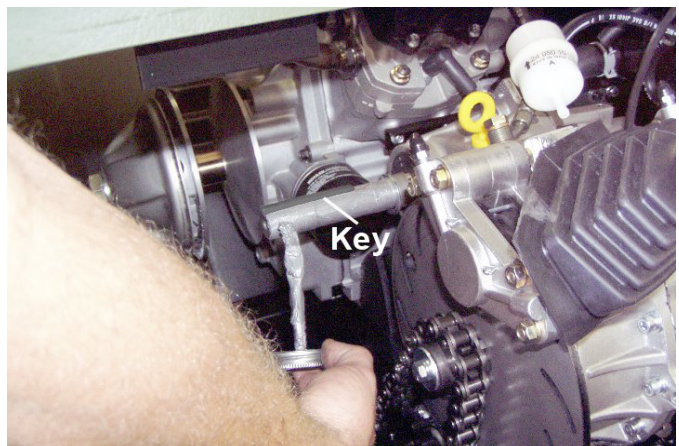


Photo 17

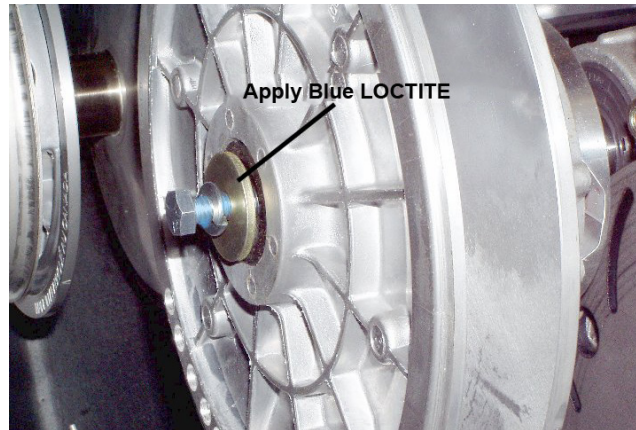


Photo 18

16. Locate the starter at the front of the engine compartment and reconnect both red and black power wires to the starter solenoid. *Photo 19. These wires are enclosed within a red rubber boot.*
17. Reconnect the ground wire attached at the front of the engine to the valve cover fastener. *Photo 20.*

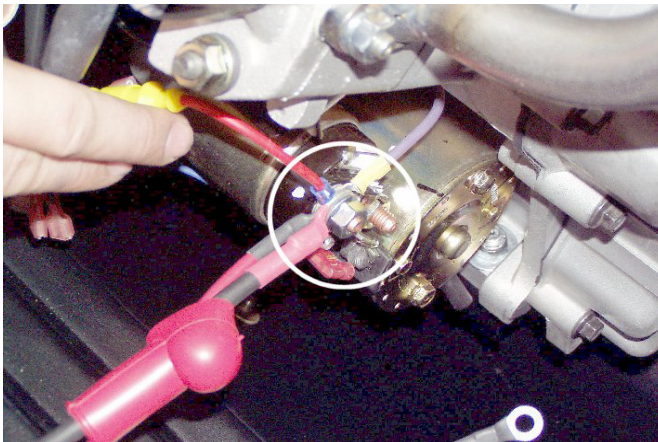


Photo 19

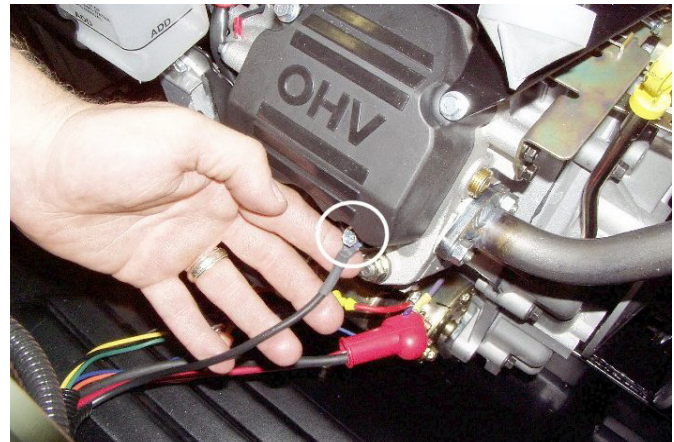


Photo 20

18. Locate the main wire harness plug-ins at the front of the engine compartment and reconnect the main black plug. Reconnect both blue and orange wires (oil pressure and coolant temperature sensors). *Photo 21*

NOTE

Re-fasten the ECU unit to the hood frame at the front of all EFI vehicles

19. Reconnect the ground cable at the engine. *Photos 22 & 23*

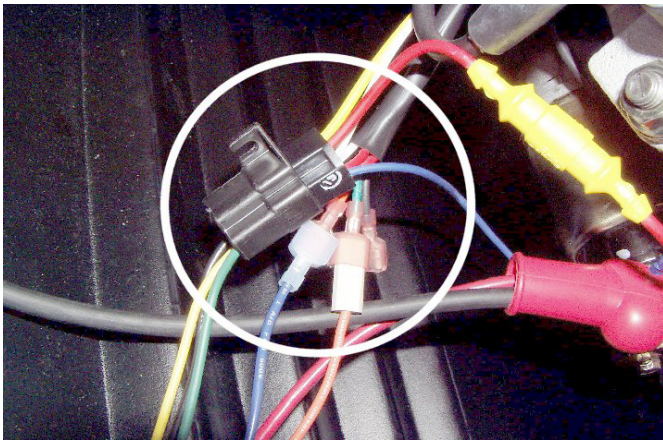


Photo 21

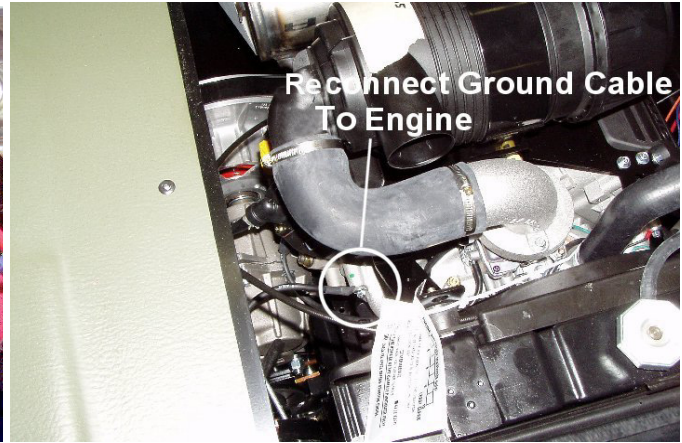


Photo 22

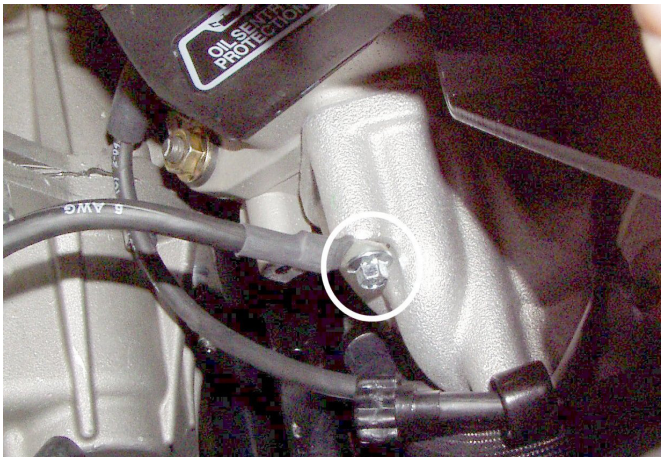


Photo 23

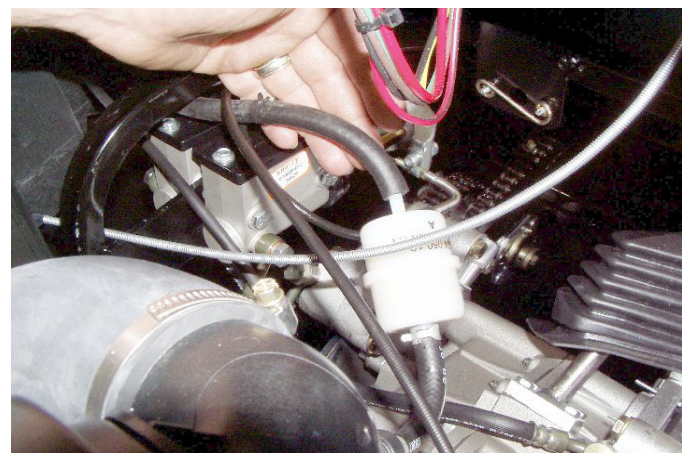


Photo 24

20. Reconnect the fuel line to the carburetor (700 Models) *Photo 24*, or fuel rail (EFI Models).

21. Reinstall the heat deflector shield over the muffler. *Photo 25*



Photo 25

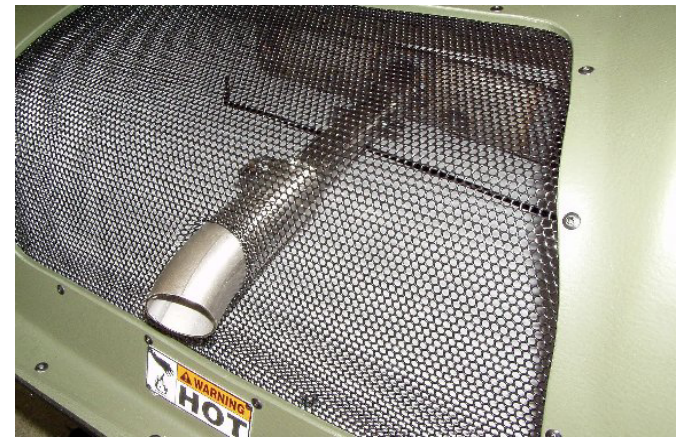


Photo 26

22. Locate and install the tailpipe assembly. Attach the connecting springs between tailpipe assembly and muffler. **Photo 26 & 27** Feed the tailpipe assembly in through the hood area.

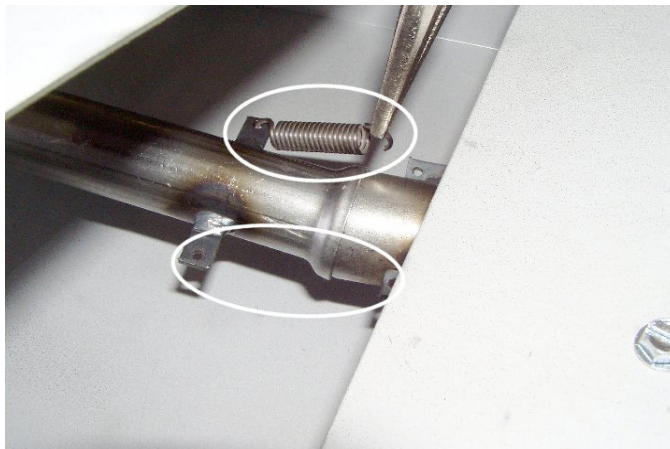


Photo 26

23. Replenish all fluid levels.